BEHAVIORAL HEALTH

Imminent Medicaid Enrollment Lapses after Inpatient Mental Health Treatment in Young Adults
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Research Objective: To discern observable factors that predict Medicaid enrollment discontinuities for young adults (18-26) discharged from an inpatient psychiatric stay.

Study Design: Maryland Medicaid administrative and public mental health system data were used to construct an analytic data set that summarized the following types of individual-level information: demographics (age, race, gender, urban/rural living status), enrollment status (families and children (F&C), Maryland Children’s Health Insurance Program (MCHIP), disabled, or foster care), mental health diagnoses (bipolar, schizophrenia, depression, or substance abuse diagnoses), pregnancy status; and lagged (i.e., past) outpatient mental health, primary care, inpatient somatic, and emergency department based somatic health care events. Contemporary variables were traced for 365 days following (post-discharge from) a specialty mental health inpatient event. Lagged events were summarized based on a 180 day pre-admission period.

Probit regression was used to test which observable factors were significantly correlated to post-discharge Medicaid enrollment discontinuities (i.e., days without coverage). Regression tree analyses were used to hierarchically diagram factors placing enrollees at risk for Medicaid discontinuities.

Population Studied: All Maryland Medicaid enrollees age 18-26 years were included in our analysis if they had a mental health system inpatient event in the period spanning October 2005 to September 2006 (n=1,176). This population roughly corresponds to 1.7% of young adults that age engaged in Medicaid as of September 2006. Forty-nine percent of our study population was male, 46% white, 47% black, and 55% were categorically disabled based on state or federal criteria related to medical assistance eligibility.

Principal Findings: Thirty-two percent of our population experienced an enrollment discontinuity in the year post discharge of at least 1 day, and 28 percent (reduced sensitivity by 4 percent) experienced a discontinuity of at least 30 days. Probit modeling significantly predicted discontinuity (Log likelihood=-596, chi-square= 286, df= 21, pseudo R-square=.19). Significant individual effects (p<.05) were: age of 18 or 20 increased the adjusted-odds of discontinuity by 8.7%, higher income increased those odds by 13%, pregnancy decreased those odds by 14%, F&C/MCHIP status increased those odds by 37%, lagged Medicaid discontinuity increased those odds by 17%, lagged primary care visits decreased those odds by 11%. Sensitivity analyses, including the regression trees and 30 day discontinuity events, largely confirmed those results.

Conclusions: Thirty-two percent of young adults engaged in Maryland Medicaid experienced enrollment discontinuities in the program within one year of inpatient care they received from the state’s public mental health system (which largely overlaps with Medicaid). Correlates to that discontinuity in health coverage are fairly straight-forward as follows: age “cliffs” of 18 or 20 years old (preceding redetermination for those in standard Medicaid or foster care), higher family income (>100 percent of poverty), absence of pregnancy, F&C/MCHIP status, past discontinuities, and lower rates of past primary care use.

Implications for Policy, Delivery, or Practice: Our results isolate observable factors related to
Discontinuity of insurance for low income, publicly insured, young adults with a history of serious mental health issues. Beyond the basic rules of eligibility, missed primary care visits are identified as a significant promoter of future Medicaid discontinuities.

Funding Source(s): NIH

Poster Session and Number: B, #553

Depressive Symptoms and 30-Day Hospital Readmission among Older Adults
Jennifer Albrecht, University of Maryland School of Pharmacy; Ann L. Gruber-Baldini, University of Maryland School of Medicine; Jon Mark Hirshon, University of Maryland School of Medicine; Clayton H. Brown, University of Maryland School of Medicine; Richard Goldberg, VA Maryland Health Care System; Joseph H. Rosenberg, University of Maryland School of Medicine; Angela C. Comer, University of Maryland School of Medicine; Jon P. Furuno, Oregon State University/Orgeon Health and Sciences University School of Pharmacy

Research Objective: Unplanned hospital readmissions among older adults are common and costly to the healthcare system. Beginning in 2013, the Centers for Medicare and Medicaid Services will reduce reimbursement to hospitals with high 30-day readmission rates. Patients with depressive symptoms may be at increased risk of hospital readmission and could provide a target population for interventions to reduce readmissions. This study quantified the association between depressive symptoms at hospital admission and 30-day unplanned hospital readmission among older adults.

Study Design: We conducted a prospective cohort study between July 1, 2011 and August 9, 2012. We measured depressive symptoms with the 15-item Geriatric Depression Scale within 72 hours of hospital admission and defined presence of clinically significant depressive symptoms as a score greater than 5. Three follow-up calls post-hospital discharge were used to assess incidence of 30-day unplanned hospital readmission, defined as an overnight stay at any inpatient facility that did not occur in the emergency department and was not previously scheduled.

Population Studied: Community-dwelling adults aged 65 and older who had been admitted to the general medical and surgical services of an urban, tertiary-care hospital. Exclusion criteria included a Mini-Mental State Examination score less than 15 and inability to communicate verbally or in English. All study participants provided informed consent.

Principal Findings: 3,492 eligible patients were admitted to the hospital during the study period. Of these, 750 patients were enrolled into the study. Mean [standard deviation] age was 73.2 [6.5] years, 49 percent were female, and 72 percent were Caucasian. Prevalence of depressive symptoms at hospital admission was 19 percent. Forty-eight percent of patients with depressive symptoms had ever been told by a doctor that they were depressed. Incidence of 30-day unplanned hospital readmission was also 19 percent. In our adjusted log binomial regression model, depressive symptoms were not significantly associated with increased risk of 30-day unplanned hospital readmission [relative risk [RR] 1.20; 95 percent confidence interval [CI] 0.83, 1.72]. Age [RR 1.03; 95 percent CI 1.00, 1.05], Charlson Comorbidity Index Score [a measure of aggregate comorbidity] [RR 1.07; 95 percent CI 1.01, 1.14], and greater than 2 hospital admissions in the past 6 months [RR 1.53; 95% CI 1.12, 2.09] were significantly associated with an increased risk of 30-day unplanned hospital readmission.

Conclusions: Depressive symptoms, while common in older adults, were not significantly associated with an increased risk of hospital readmission.

Implications for Policy, Delivery, or Practice: Given current incentives to reduce 30-day hospital readmission, these results suggest that interventions targeting those with depressive symptoms may not significantly reduce readmission rates. Hospitals wishing to target patient groups at highest risk of 30-day hospital readmission should focus on older adults with more comorbidities, and those with a history of recent hospital readmissions.

Funding Source(s): AHRQ

Poster Session and Number: B, #554

Depressive Symptoms and Non-Adherence to Discharge Instructions among Older Adults
Jennifer Albrecht, University of Maryland School of Pharmacy; Ann L. Gruber-Baldini, University of Maryland School of Medicine; Jon Mark Hirshon, University of Maryland School of Medicine; Clayton H. Brown, University of Maryland School of Medicine; Richard Goldberg, VA Maryland Health Care System; Joseph H. Rosenberg, University of Maryland School of Medicine; Angela C. Comer, University of Maryland School of Medicine; Jon P. Furuno, Oregon State University/Orgeon Health and Sciences University School of Pharmacy

Research Objective: Unplanned hospital readmissions among older adults are common and costly to the healthcare system. Beginning in 2013, the Centers for Medicare and Medicaid Services will reduce reimbursement to hospitals with high 30-day readmission rates. Patients with depressive symptoms may be at increased risk of hospital readmission and could provide a target population for interventions to reduce readmissions. This study quantified the association between depressive symptoms at hospital admission and 30-day unplanned hospital readmission among older adults.

Study Design: We conducted a prospective cohort study between July 1, 2011 and August 9, 2012. We measured depressive symptoms with the 15-item Geriatric Depression Scale within 72 hours of hospital admission and defined presence of clinically significant depressive symptoms as a score greater than 5. Three follow-up calls post-hospital discharge were used to assess incidence of 30-day unplanned hospital readmission, defined as an overnight stay at any inpatient facility that did not occur in the emergency department and was not previously scheduled.
Population Studied: Community-dwelling adults aged 65 and older admitted to the general medical and surgical services of an urban, tertiary-care hospital. Exclusion criteria included a Mini-Mental State Examination score less than 15 and inability to communicate verbally or in English. All study participants provided informed consent.

Principal Findings: Of 3,492 eligible patients admitted to the hospital during the study period, 750 were enrolled into the study. Mean [standard deviation] age was 73.2 [6.5] years, 49 percent were female, and 72 percent were Caucasian. Prevalence of depressive symptoms at hospital admission was 19 percent. Non-adherence to the medication domain ranged from 11-14 percent at each follow-up time. Non-adherence to follow-up appointments ranged from 6-11 percent, and non-adherence to lifestyle instructions ranged from 43-46 percent. In adjusted longitudinal models, depressive symptoms were significantly associated with non-adherence to medications over time [odds ratio [OR] 1.75; 95 percent confidence interval [95p CI] 1.02, 2.99]. In contrast, depressive symptoms were not significantly associated with non-adherence to follow-up appointments [OR 1.25; 95p CI 0.62, 2.52], lifestyle recommendations [risk ratio [RR] 0.94; 0.75, 1.17], or with a lower [less adherent] summary adherence score [cumulative odds ratio [COR] 1.17; 95p CI 0.78, 1.75]. Social isolation risk, defined as a score of less than 12 on the 6-item Lubben Social Isolation Scale, and number of medications prescribed at discharge were significant predictors of non-adherence to follow-up appointments, lifestyle modifications, and a lower summary adherence score.

Conclusions: Depressive symptoms were associated with non-adherence to the medications domain of the discharge instructions, but not to follow-up appointments, lifestyle recommendations, or overall non-adherence among older adults.

Implications for Policy, Delivery, or Practice: This study may help identify older patients at greater risk of non-adherence to discharge instructions.

Funding Source(s): AHRQ
Poster Session and Number: B, #555

Lack of Relationship of Patient Activation and Health Behaviors among Safety Net Patients
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Research Objective: Self-management support has been especially challenging for primary care practices to integrate into busy practices, especially among small practices and safety net clinics. Patients must be engaged in goal-setting and must become activated in order for investments in self-management systems to work. Patient activation, a measure of a patient’s ability to self-manage his or her own health, has been used in studies of self-management of chronic conditions. We examine the relation of patient activation and patient physical activity and dietary behaviors, focusing on safety net clinics in the process of augmenting self-management supports for obese patients.

Study Design: English and Spanish questionnaires were mailed to eligible patients between April and June 2012. Measures included the patient activation measure (PAM-13) and health behaviors such as physical activity (categories of 10-minute increments from 0 to 60), fruit and vegetable consumption (at least three times weekly), and soda consumption (at least three times weekly). Other predictor variables were grouped into one of the following domains and added sequentially: 1) patient experiences at the clinic (Clinician and Group CAHPS), 2) patient health, and 3) demographics. Multivariate logistic regression models predicting physical activity and dietary behaviors were specified to examine the impact of these factors on the relation of patient activation and health behaviors.

Population Studied: A random patient sample (n=393) was drawn from clinic administrative databases if they had at least two clinic visits in the past year, were age 18 and over, and had a body mass index of 30 to 34. The analytic sample includes a total of 198 patients for an adjusted response rate of 55.3% after excluding questionnaires returned due to invalid addresses. Of these, 38.9% of responses were Spanish-language.

Principal Findings: The majority of patients (70%) were in the highest two of four activation levels. Chronically ill patients also reported higher activation levels, especially diabetics. In unadjusted models, patient activation was only related to the outcome of daily physical activity, where patients in the highest level of activation had 2.21 greater odds of being active for at least 60 minutes daily than less than 60 minutes daily (p<0.05). In the full model for physical activity, only high cholesterol (OR=2.36, p<0.05) and overweight status (OR=4.64, p<0.01) were statistically significant. Patients with higher education and non-Latino White patients had significantly greater odds of fruit and vegetable consumption than other racial and ethnic groups. For soda consumption, Spanish-speaking Latinos were less likely (OR=0.14, p<0.05) to regularly consume soda than other racial and ethnic groups.

Conclusions: In contrast to published literature, there is generally no association of patient activation and health behaviors among safety net patients from diverse backgrounds. However, more chronically ill patients report higher levels of patient activation. Those with high cholesterol may be more likely to be physically active as a part of treatment. Overweight individuals may be more active than individuals with other BMI because they face health consequences but are still closer to a normal BMI.

Implications for Policy, Delivery, or Practice: Future research should examine the sources of the discordance between patient activation and health behaviors among safety net patients.

Funding Source(s): NIH

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Mental Health Services among Individuals with Developmental Disabilities and Co-occurring Mental Health Conditions

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Presenter: Alicia Bazzano, MD, PhD, Assistant Clinical Professor, Pediatrics, David Geffen School of Medicine at UCLA, abazzano@ucla.edu

Research Objective: Individuals with developmental disabilities lack access to mental health care despite estimates that up to 30-35% of individuals with developmental disabilities have co-occurring psychiatric disorders (dual diagnosis). Additionally, persons with dual diagnoses may be at higher risk for taking multiple psychiatric medications and psychiatric
hospitalization. Understanding who are people with dual diagnoses and what characteristics predict poor access to care could better target interventions to prevent negative outcomes. We aimed to describe characteristics of individuals with dual diagnosis and understand factors associated with obtaining care from a mental health provider and medication use.

**Study Design:** We performed a retrospective chart review of cases from the California Department of Developmental Services’ electronic database and, prior to review, case managers confirmed eligibility. We randomly sampled cases, abstracting demographics, developmental disability and mental health diagnoses, utilization of mental health services and psychiatric medication use. We used logistic regression to predict mental health provider use and medication use.

**Population Studied:** We included individuals with developmental disabilities in western Los Angeles County who met one of these criteria, indicating dual diagnosis: psychiatric diagnosis in chart, prescribed psychiatric medications, or care from a mental health professional.

**Principal Findings:** Cases (n = 362) were mostly male (66%), English-speaking (81%), and >26 yr (51%). Children comprised 12% and youth (14-25 years) comprised 37%. Cases lived at home (55%), independently (21%) or in institutions (24%). Race/ethnicity included white (42%), black (28%), Latino (19%) and others (11%). Insurance included Medicaid (55%), private (16%), Medicaid/Medicare (15%), and other/none (14%). Eighty percent had psychiatric diagnoses in charts, 78% took psychiatric medication, 73% saw mental health professionals and 12% had psychiatric hospitalizations in the past 3 years. Of those with psychiatric diagnoses, 81% took medications, whereas without diagnoses, 68% took medications. Ninety percent of whites with Medicaid took psychiatric medications, with 71% taking 2 or more (polypharmacy), whereas 77% of blacks with Medicaid took medications and 47% had polypharmacy. Of Latinos on Medicaid, 68% took medications and 50% had polypharmacy. Of whites with private insurance, 87% took psychiatric medications, and 62% had polypharmacy. Of blacks with private insurance, 57% took medications and 43% had polypharmacy and of Latinos with private insurance, 50% took medications and 12% had polypharmacy. Youth had significantly higher predicted probability of medication use (88%) compared to children (72%) and adults (71%), as did those living in family homes (89%) compared to independently (74%) or in institutions (77%). Latinos had significantly lower predicted probability of medications (67%) compared to whites (83%). Latinos (68%) and living independently (74%) or in family homes (78%) had significantly lower probabilities of having a mental health provider compared to Whites (84%) and institutionalized individuals (90%).

**Conclusions:** Among those with developmental disabilities, Latinos and Blacks--especially on Medicaid--receive different mental health care access and psychiatric medication usage as compared to whites on private insurance.

**Implications for Policy, Delivery, or Practice:** Further research should focus on overcoming barriers to mental health service access for people with developmental disabilities who are minorities and on Medicaid. Policies expanding access to mental health professionals for these groups should be explored.

**Funding Source(s):** Other, California Mental Health Services Act Grant

**Poster Session and Number:** B, #557

**Contacts with Healthcare Providers and Mental Health Facilities Post-Release from Jail Among Adults with Schizophrenia**

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**Presenter:** Carmela Benson, M.S., Associate Director, Health Economics and Outcomes Research, CNS/Psychiatry, Janssen Scientific Affairs, LLC, cbenson5@its.jnj.com

**Research Objective:** To evaluate outpatient healthcare utilization and providers and facilities visited/contacted post-release from jail. We hypothesized a variable contact rate with providers and mental health facilities by study subjects post-release from jail.

**Study Design:** Subjects randomized as of 15March2012 to PRIDE (Paliperidone Research in Demonstrating Effectiveness), an ongoing, pragmatic, 15-month, randomized, active-controlled, open-label study of paliperidone palmitate compared with oral antipsychotic treatment in adults with schizophrenia, were included in this interim analysis. At baseline,
subjects completed the resource use questionnaire (RUQ), which collects socio-demographic information and data on outpatient/inpatient services, emergency visits (ER), emergency medical services (EMS), and contacts with the criminal justice system during two periods: 12 months before the last incarceration and after recent release from jail. Demographic and clinical characteristics, reasons for arrest/incarceration, resource utilization, types of providers, and mental health setting(s) were evaluated and described.

**Population Studied:** Adult, incarcerated schizophrenia subjects who had been recently released from jail.

**Principal Findings:** 340 subjects were included; mean age was 37.8 years (SD=10.51); 64.2% were black or African American and 33.0% white. Average total days of incarceration was 91.1 (SD=187.0); average days from jail release to study screening was 45.7 (SD=62.58). Post-release from jail, 41.1% had no insurance coverage, 7.4% of subjects enrolled in Assertive Community Treatment (ACT), and 11.4% participated in a jail diversion program. Among subjects released from jail, 33.8% were released on probation, and 23.0% on parole.

Post-release from jail, the percentages of subjects with provider visits were as follows: psychiatrist=77.9%, psychiatric nurse=10.4%, primary care physician (PCP)=27.0%, nurse practitioner (NP)=3.6%, nonspecialty nurse (NSN)=5.8%, psychologist =11.3%, and social/case worker (SCW)=36.2%. Community mental health centers (CMHCs) followed by self-help groups (SHGs) were the most visited facilities post-release from jail (CMHC=24.4%, SHG=19.3%); rehabilitation programs and the Veterans Administration (VA) were the least utilized (psychosocial=1.2%, vocational=0.9%, VA=0.6%). Mean rates of subject contact per month with a psychiatrist and a psychiatric nurse were 3.60 and 0.50, respectively. Subject visits to a non–psychiatric-related provider ranged from 0.09 to 2.40 per month (PCP=0.80, psychologist=0.30, NP=0.20, NSN=0.09, SCW=2.40). Facility mean subject contact rates ranged from 0.01 to 7.10 per month (VA=0.01, vocational rehabilitation program=0.05, psychosocial rehabilitation program=0.30, day hospital/treatment center=0.80, alcohol/drug counseling=1.30, CMHC=1.30, SHG=7.10).

**Conclusions:** This interim analysis showed variable contact rates and a higher percentage of subjects visiting a psychiatrist or a CMHC among other types of providers and/or facilities post-release from jail.

**Implications for Policy, Delivery, or Practice:** Post-release from jail, schizophrenia patients are unlikely to seek care and have health insurance coverage. Timely and appropriate access to mental health services post-release from jail may be crucial to maintain the psychiatric and functional conditions of patients and to avoid repeated revolving door detentions in jail. Coordinating prison-based care with outpatient mental health programs may improve the quality of care and may help with society reentry and reduce recidivism.

**Funding Source(s):** Other, Janssen Scientific Affairs, LLC

**Poster Session and Number:** B, #558

**Suicidality during the Postpartum Period**

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**Presenter:** Susan Bodnar Deren, Ph.D., Assistant Professor, Sociology, L. Douglas Wilder School of Govt and Public Affairs, Virginia Commonwealth University, smbodnar@vcu.edu

**Research Objective:** The primary objective of this study is to examine the association between suicidal ideation (SI) with postpartum depressive symptoms, demographic, and psychosocial characteristics in a racially diverse group of women during the first six-months postpartum. The secondary objective is to evaluate how various depression/anxiety instruments and scores, obtained 1-2 days postpartum, correlate with the odds of postpartum SI.

**Study Design:** Data were obtained from 2 postpartum depression prevention randomized controlled trials implemented at a large inner-city urban hospital. Both trials tested the same intervention: 1 trial enrolled self-identified black and Latina mothers, the other trial enrolled white and other minority women. All participants were surveyed prior to randomization (24-48 hours postpartum), at 3-weeks, 3-months, and at 6-months postpartum and answered a series of questions on socio-demographics, depressive
symptoms, clinical characteristics, and psychosocial factors. Depression was assessed using both the Edinburgh Postnatal Depression Scale (EPDS) and the Patient Health Questionnaire-9 (PHQ-9). The primary outcome for this study was suicidal ideation (SI), assessed using the suicide/self-harm questions from both the EPDS and PHQ-9. If a patient scored positively, to either one or both of the questions, over the course of the study, they were considered to demonstrate SI. The key independent variable, maternal depressive symptoms 24-48 hours postpartum, was measured with a modified (suicide question removed) version of the EPDS. A score of 10+ indicated possible depression. In order to ascertain how other psychometric measures might be associated with postpartum SI, we investigated how a modified EPDS score of 13+; PHQ-8 (10+ and 20+); and to measure anxiety, Generalized Anxiety Disorder 7-item Scale (GAD-7) (10+) were correlated with the odds of SI.

**Population Studied:** 1080 mothers who gave birth in a large tertiary New York City Hospital (2009-2010), recruited during their postpartum hospital stay. Eligible subjects were women age 18+, English or Spanish Speaking, had working telephones, and had infants whose birthweights were > 2500 grams and 5-minute Apgar scores > 6.

**Principal Findings:** Three percent of participants presented with SI. Of these, 6% had suicidal intent. Bivariate analysis revealed that scores of 10+ on the EPDS (39% vs. 13%, p<.0001), PHQ-8 (35% vs. 12%, p=.0002) and the GAD-7 (42% vs. 16%, p<.0001) were associated with SI. In adjusted multivariable models, women with postpartum depressive symptoms as compared to those without were more likely to present with SI (OR=2.43, CI=1.03-5.69). Being foreign born (OR=2.66, CI=1.16-6.11), antepartum complications (OR=3.63, CI=1.69-7.82), and depression history (OR=2.39, CI=1.06-5.39) increased the odds of SI. Heightened self-efficacy decreased the odds of SI (OR=0.52, CI=0.30-0.89). The EPDS, PHQ-8 and GAD-7 were all significantly associated with suicidal ideation in unadjusted multivariate analyses.

**Conclusions:** The findings from our study suggest that suicidality may be under-recognized in the postpartum period. Anxiety and depression were correlated with SI.

**Implications for Policy, Delivery, or Practice:** Findings suggest that early postpartum depression screening may identify women at risk for suicidal ideation during the six-month postpartum period. Our results suggest that increased education about depression, anxiety, and suicidal thinking by providers is warranted during the postpartum period.

**Funding Source(s):** NIH

**Poster Session and Number:** B, #559

**Reducing Emergency Room Visits and Hospitalizations among Patients with Behavioral Health Conditions: Lessons Learned from California’s Low Income Health Program**

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**Presenter:** Livier Cabezas, M.P.Aff., Project Manager, Health Economics and Evaluation Research, University of California at Los Angeles Center for Health Policy Research, livier@ucla.edu

**Research Objective:** The study aims to assess the impact of offering comprehensive behavioral health services on the utilization of medical care among Low Income Health Program (LIHP) enrollees with a behavioral health condition (BHC). LIHP is a county-operated Medicaid Waiver demonstration project which expands coverage to eligible low-income adults effective July 1, 2011 through December 31, 2013. Under the Affordable Care Act (ACA), LIHP enrollees will transition to California’s Medi-Cal Program or to California’s Health Benefits Exchange (known as Covered California) in January 2014. Examining the effectiveness of providing comprehensive services in reducing expenditure and improving health outcomes is needed.

**Study Design:** Claims and enrollment data submitted by 13 participating counties and a consortium of 35 rural counties were used. Over 570,000 individuals enrolled in LIHP during the first program year (July 1, 2011-June 30, 2012) were included in the analysis. We identified individuals with any mental health or substance abuse diagnosis and assessed utilization patterns of these individuals compared to those without such diagnosis in logistic regression models. Services assessed included any emergency room (ER), hospitalization, and evaluation and management (E&M) visits. We also assessed difference in patterns of use...
when comprehensive behavioral health services were offered. Comprehensive behavioral health services are defined as substance abuse benefits or integrated medical and behavioral health care.

**Population Studied:** Adults between 19 and 64 years of age who were enrolled in LIHP during the first program year.

**Principal Findings:** Of all LIHP enrollees, 13.9% (79,930) were diagnosed with a BHC at some point during the first program year. Of this group, 64.3% had any E&M visit, over 28.4% any ER visit, and 14.1% had any hospitalizations. The rates of ER visits and hospitalization of these individuals were significantly higher than those without a BHC. After controlling for demographic and chronic conditions, those with any BHC had higher likelihood of hospitalizations and E&M and ER visits. In counties with comprehensive behavioral health services the likelihood of E&M visits was significantly higher for those with any BHC (OR=1.43) than those without (OR=1.14). In contrast, the likelihood of ER visits (0.77 vs. 1.26) and hospitalizations (0.86 vs. 1.43) significantly declined.

**Conclusions:** The findings provide unique evidence that any mental health and substance abuse diagnosis increase the likelihood of medical care use significantly. The findings also provide preliminary evidence that offering comprehensive behavioral health services such as substance abuse benefits or integrating medical and behavioral health services may reduce costly services such as ER visits and hospitalizations and improve primary care delivery.

**Implications for Policy, Delivery, or Practice:** The findings highlight the importance of efforts to integrate and coordinate behavioral and medical care services to improve patient outcomes and reduce costs. Efforts in offering comprehensive behavioral health services will be essential for the Medicaid Expansion and success of Health Benefit Exchanges under ACA. Additional research is needed to determine the implementation challenges of medical and behavioral care integration and ways to overcome these barriers. These efforts are particularly important within the safety net because these providers are likely to continue to serve newly insured populations under ACA.

**Funding Source(s):** Other, Blue Shield of California Foundation

**Poster Session and Number:** B, #560

### Hospital Readmission Among Adult Medical Inpatients with Mild Depressive Symptoms

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**Presenter:** Ramon Cancino, Jr., MD, Academic Fellow, Family Medicine, Boston University School of Medicine/ Boston Medical Center, ramon.cancino@gmail.com

**Research Objective:** Little is known about health care utilization, specifically early hospital readmission rates, in patients with mild depression. Therefore, we aimed to determine whether mild depressive symptoms are associated with hospital readmission within 30 days following discharge among adult inpatients on a general medical service.

**Study Design:** A secondary analysis was performed using data from the Project Re-Engineered Discharge (RED) randomized controlled trials. We used the nine-item Patient Health Questionnaire depression screening tool to identify patients with depressive symptoms. The primary endpoint was hospital readmission, defined as readmissions within 30 days of discharge. We also studied emergency department utilization and primary care physician follow-up appointment attendance rates. Poisson regression was used to control for confounding variables. We surveyed participants 30 days after the index discharge using items from the post-discharge RED questionnaire and the three-item Care Transitions Measure (CTM3).

**Population Studied:** 1,418 English-speaking, hospitalized adults from an urban academic safety net hospital.

**Principal Findings:** The unadjusted hospital readmission rate within 30 days of discharge was 19.6 readmissions per 100 mildly depressed subjects compared with 13 readmissions per 100 non-depressed subjects. For those with moderate to severe depression, the unadjusted hospital readmission rate within 30 days of discharge was 21.1 readmissions per...
Comorbid Depression and Substance Abuse in Safety-net Clients of Health and Community-based Agencies in Los Angeles: Clinical Needs and Service Use Patterns

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Presenter: Evelyn Chang, M.D., M.S.H.S., Health Services Research Fellow, General Internal Medicine, University of California, Los Angeles, evelyn.chang@va.gov

Research Objective: Depression and substance use disorders (SUD) are common among low-income, minority adults who may receive services from health and other community-based sectors. Depending on the sector visited, this population may receive screening, treatment or referral for depression or substance use but rarely integrated services. Little is known about the level of comorbidity across a range of service sectors supporting safety-net clients or use of services for depression in the context of substance abuse comorbidity for clients across diverse community-based settings. This study describes clinical characteristics and service utilization for low-income, primarily African-American and Latino, adults with depression with and without comorbid substance abuse in under-resourced communities.

Study Design: The study uses baseline data from Community Partners in Care (CPIC), a Community-Partnered Participatory Research initiative to improve depression services in under-resourced communities in Los Angeles County. Clients were screened for depression (PHQ 8>=10) in primary care/public health (PC), mental health (MH), substance abuse (SA), and social services (SS), and other community-based settings such as churches and senior centers. Eligible depressed clients enrolled and completed a baseline survey (n=845). We conducted univariate and bivariate analyses to describe the sample and compare those with and without comorbid SA in clinical need and services utilization in the past six months.

Population Studied: Clients were recruited from community agencies participating in CPIC located in two under-resourced communities in Los Angeles County: Hollywood-Metro and South Los Angeles.

Principal Findings: Across sectors, 48.5% (n=407) had co-morbid substance use disorder (SUD); most (n=323, 79.4%) were receiving hospitalization when it is a secondary diagnosis. Future research should focus on determining the benefit of treatment on hospitalized patients who screen positive for mild depressive symptoms. Policymakers should support local and state legislation which would allow for optimization of care transition programs and legislation which provides coverage of outpatient behavioral health services scheduled for the patient at the time of hospital discharge.

Implications for Policy, Delivery, or Practice: First, the hospital discharge process should systematically address barriers to follow-up and medication adherence at the time of discharge. Second, depression screening in this setting may aid in identifying barriers to successful transitions in care. Third, our study calls attention to the fact that no study has studied the treatment of mild depression during an acute hospitalization.

Conclusions: A positive screen for mild depressive symptoms during a hospitalization is associated with less understanding of post-discharge plans and an increased rate of readmission within 30 days of discharge in an urban, academic, safety net hospital population. A positive screen for mild depressive symptoms (PHQ 8>=10) in primary care/public health (PC), mental health (MH), substance abuse (SA), and social services (SS), and other community-based settings such as churches and senior centers. Eligible depressed clients enrolled and completed a baseline survey (n=845). We conducted univariate and bivariate analyses to describe the sample and compare those with and without comorbid SA in clinical need and services utilization in the past six months.

Population Studied: Clients were recruited from community agencies participating in CPIC located in two under-resourced communities in Los Angeles County: Hollywood-Metro and South Los Angeles.

Principal Findings: Across sectors, 48.5% (n=407) had co-morbid substance use disorder (SUD); most (n=323, 79.4%) were receiving hospitalization when it is a secondary diagnosis. Future research should focus on determining the benefit of treatment on hospitalized patients who screen positive for mild depressive symptoms. Policymakers should support local and state legislation which would allow for optimization of care transition programs and legislation which provides coverage of outpatient behavioral health services scheduled for the patient at the time of hospital discharge.

Implications for Policy, Delivery, or Practice: First, the hospital discharge process should systematically address barriers to follow-up and medication adherence at the time of discharge. Second, depression screening in this setting may aid in identifying barriers to successful transitions in care. Third, our study calls attention to the fact that no study has studied the treatment of mild depression during an acute hospitalization.

Conclusions: A positive screen for mild depressive symptoms during a hospitalization is associated with less understanding of post-discharge plans and an increased rate of readmission within 30 days of discharge in an urban, academic, safety net hospital population.
SUD treatment, but less than half (46.0%) had health insurance. Most (73.8%) had family incomes below poverty levels with no significant difference by presence of co-morbid SUD. Clients with co-morbid SUD were more likely than those without to be in transitional housing (21.3% vs 3.8%, p<0.001) and had a higher rates of arrests (39.9% vs 7.3%, p<0.001), 12-month depressive disorder (73.5% vs 53.8%, p<0.001), post-traumatic stress disorder (57.8% vs 39.9%, p<0.001), and mania/psychosis (60.8% vs 27.7%, p<0.001). A greater proportion of clients with both depressive symptoms and SUD went to the ER for any health problems (59.1% vs 46.7%, p<0.001) and were significantly more likely to be admitted for an alcohol, drug, or emotional problem than those without SUD (23.0% vs 7.9%, p<0.001). Clients with both depressive symptoms and SUD had more MH specialty visits (70.4% vs 50.6%, p<0.001) and fewer PC visits (65.6% vs 74.9%, p=0.006) than those without SUD. Those with comorbid SUD received depression services during 67.9% of visits to outpatient MH clinics, 65.0% of visits to PC, 73.4% of visits to SA agencies, 56.6% of visits to SS agencies, 44.6% of visits to churches, and 19.0% of visits to senior centers.

Conclusions: Half of low-income minority adult clients across health and community-based agencies with depressive symptoms were found to have co-morbid SUD. These individuals have significant psychosocial stressors, including lack of housing, insurance and arrests. Depressed clients with co-morbid SUD utilized emergency, MH, and SS agencies at higher rates than those without SUD and had higher admission rates.

Implications for Policy, Delivery, or Practice: The high prevalence of comorbid substance abuse across diverse agencies supporting safety net clients suggests that a community-wide approach may be needed to stabilize health and social outcomes for this vulnerable population.

Funding Source(s): NIH
Poster Session and Number: B, #562

Gender and Race/Ethnicity Differences in Mental Health Care Use during the Great Recession 2007-2009
Jie Chen, University of Maryland at College Park; Rada Dagher, University of Maryland, College

Presenter: Jie Chen, Ph.D., Assistant Professor, Health Services Administration, University of Maryland at College Park, jichen@umd.edu

Research Objective: The 2007-2009 Great Economic Recession is the longest recession in US history. The job loss and wealth reduction during this economic recession may have increased the risk of mental disorders and mental health utilization. Mental health utilization patterns during the recession may also differ by gender and race/ethnicity. This study examined the mental health care utilization before and during the recent economic recession by gender and race/ethnicity.

Study Design: Using Medical Expenditure Panel Survey 2004-2006 and 2007-2009, the study employed a cross sectional analysis to examine the changes in mental health care use (prescription drug use and physician visits treating depression or anxiety disorders) before and during the recent recession. Negative binomial regressions were used to estimate the association of the economic recession and mental health care use for females and males. Race/ethnicity and the interaction terms of the economic recession and race/ethnicity were examined to assess whether racial and ethnic groups had different utilization patterns under the economic recession.

Population Studied: Our analysis included adults aged 18 to 64 years old, who were diagnosed with depression (ICD9 = 296, 311) or anxiety disorders (ICD9 = 300). The total sample of females was 11,216, including 7,760 Whites, 2,034 Latinos, and 1,422 African Americans, and the sample of males was 4,799, including 3,590 Whites, 750 Latinos, and 459 African Americans.

Principal Findings: The recession indicator was significantly associated with higher prescription drug uses for both females (IRR=1.33, p<0.001) and males (IRR=1.14, p<0.05). The increment in prescription drug use was higher among white males compared to Latino males. The IRRs of recession indicators in the physician visits regression showed that males significantly reduced physician visits (IRR=0.70, p<0.01) during the recession. The reduction of physician visits was more substantial among the white males compared to Latino males. Females used more physician visits in the recession (IRR=1.11, p=0.22), but this association was not significant. Our model estimated that during the economic recession, prescription drug use for mental diseases increased by 15%-20% among females and...
Employment as a Mental Health Peer Support Technician in the Veterans Health Administration

Jack Clark, CHQOER, EN Rogers Memorial Veterans Hospital; Susan Eisen, EN Rogers Memorial Veterans Hospital; Mark Schultz, CHQOER, EN Rogers Memorial Veterans Hospital; Bei-Hung Chang, COLMR, Boston VA Healthcare System; Lisa Mueller, VISN 1 MIRECC, EN Rogers Memorial Veterans Hospital; Patricia Sweeney, VISN 1 MIRECC, EN Rogers Memorial Veterans Hospital; Moe Armstrong, San Francisco VAMC; Sandra Resnick, VHA Office of Psychosocial Rehabilitation and Recovery

Presenter: Jack Clark, Ph.D., Medical Sociologist, CHQOER, EN Rogers Memorial Veterans Hospital, jaclark@bu.edu

Research Objective: The VHA, a major provider of mental health care in the US, is employing increasing numbers of Veterans with mental illness as peer support staff. However, the nature of their work and its effects on their own mental health are not well described. This is the first study to characterize the jobs (functions, responsibilities, limitations, satisfaction and burnout) and mental health recovery (self-efficacy, symptoms and functioning, stigma, and quality of life) of Veterans with histories of mental illness employed as peer support technicians in VA mental health programs. We also compared peer support technicians’ employment experiences and mental health recovery with that of Veterans recently hired as vocational rehabilitation specialists through the Homeless Veterans Supported Employment Program (HVSEP), who have histories of homelessness but are not identified as peer support staff.

Study Design: Eligible participants were invited to complete an online survey comprised of established measures of work limitations, job satisfaction, job burnout, self-efficacy, stigma, mental health symptoms and behavior, and quality of life.

Population Studied: All Veterans employed nationally by the VHA as peer support technicians (N=288) or HVSEP vocational rehabilitation specialists (N=378) at the time of the study were eligible. 157 peer support technicians (55%) and 230 vocational rehab specialists (61%) responded to the survey. Across the two cohorts, 25% were female, average age was 50, 45% were racial minorities (primarily African-American) and 7% were Latino.

Principal Findings: The most frequently reported job responsibilities of peer support technicians (noted by more than 75%) were leading groups, sharing recovery experiences, helping Veterans set goals, providing 1:1 mentoring, teaching social skills, serving as a role model, challenging negative self-talk, advocating for Veterans, attending staff meetings, participating in conference calls, entering notes into medical records and doing paperwork. Job responsibilities reported by more than 75% of vocational rehab specialists included helping Veterans find work, helping with job skills, attending staff meetings, participating in conference calls, and entering notes into medical records. Compared with vocational rehab specialists, peer support technicians reported receiving significantly less supervision, and had lower levels of satisfaction with respect to amount of supervision received, senior management at their facility, amount of pay, and opportunities for promotion. Among 16 quality of life areas, only work life showed a statistically significant difference with vocational
Validating a Brief Measure of Mental Health Recovery

Amy Cohen, Greater Los Angeles VA Healthcare Center; Nikki Armstrong, PhD, US Army Health Clinic, Schofield Barracks, HI; Gerhard Hellemann, PhD, University of California, Los Angeles (UCLA); Alexander S. Young, MD, MSHS, Greater Los Angeles VA Healthcare Center and UCLA

Presenter: Amy Cohen, Ph.D., Psychologist, Mental Illness Research, Education, and Clinical Center, Greater Los Angeles VA Healthcare Center, ancohen@ucla.edu

Research Objective: With the groundswell of attention on recovery and patient-centered care in specialty mental health, there have been efforts to transform care to reflect these principles. Efficient and standardized approaches to assess recovery are needed. Although promising instruments exist, most are burdensome and have multiple domains that have not been established as separate constructs. This paper evaluates the psychometric properties of the Mental Health Recovery Measure (MHRM) in a large sample of VA patients and suggests a shortened version, the MHRM-10.

Study Design: As the largest quality improvement study in VA specialty mental health, "Enhancing Quality of Care in Psychosis" provided an opportunity to collect recovery data. Baseline data from this trial involving eight medical centers contributed to this cross-sectional analysis. In addition to the MHRM, measures included demographics, psychiatric symptoms, functioning, quality of life, and satisfaction with care. Reliability and validity of the MHRM were examined through internal consistency, factor analysis, and Pearson correlation procedures.

Population Studied: 795 veterans with schizophrenia who were receiving outpatient mental health treatment enrolled.

Principal Findings: Despite eight conceptual domains suggested by MHRM authors, factor analysis suggested that a single factor solution was most appropriate as it explained 37% of the overall variance in the MHRM, with additional factors accounting for no more than 5% of the overall variance in the measure. Individual MHRM items loaded strongly on this single recovery factor, with all but three items having factor loadings above .400, a common cutoff for including an item in a factor score. The 10-items with the highest factor loadings were chosen to create the MHRM-10, as these items most strongly represented the underlying recovery construct. The factor loadings of the 10-items were all very high and of similar magnitude, ranging from .66-.79. Overall internal consistency for the MHRM-10 was good (Cronbach’s α = .91) and comparable to the full MHRM in our sample (Cronbach’s α = .94), as well as to reliability estimates observed in the MHRM test developers’ two non-Veteran samples (Cronbach’s α = .93 and .95). Pearson correlations between the MHRM-10 and measures of quality of life (r = .52, p < .01), satisfaction with care (r = .19, p < .01), depression symptom severity (r = -.40, p < .01), thought disturbance (r = -.17, p < .01), occupational functioning (r = .14, p < .01), social functioning (r = .08, p < .05), and symptom severity (r = .19, p < .01) were strikingly similar to correlations observed between the full MHRM and these same measures. Total mean score for the MHRM-10 was 27.6 (SD = 6.7; range = 0-40).

Conclusions: The MHRM is a reliable and valid measure that is best interpreted as a total score. A 10-item version of the MHRM maintained comparable psychometric properties, reducing measurement burden. Replication of findings in a different sample and establishing sensitivity to change over time is suggested.

Implications for Policy, Delivery, or Practice: As the VHA expands its initiative to hire 800 more peer support technicians, new strategies are being implemented to upgrade these positions, acknowledge their role in mental health care, and provide opportunities for promotion. These efforts will be important in eliminating disparities and enhancing mental health recovery outcomes.
Implications for Policy, Delivery, or Practice:
These data provide initial support for use of the MHRM-10 to measure recovery in this population. Using this efficient 10-item MHRM would allow for measurement of progress towards a recovery transformation.

Funding Source(s): VA

Poster Session and Number: B, #565

Trends in Smoking and Tobacco Product Use among Individuals with Mental Illness in 2005-2010
Benjamin Cook, Harvard Medical School; Geoffrey Ferris Wayne, Center for Multicultural Mental Health Research; Zimin Liu, Center for Multicultural Mental Health Research

Presenter: Benjamin Cook, Ph.D., M.P.H., Assistant Professor and Senior Scientist, Center for Multicultural Mental Health Research, Harvard Medical School, bcook@chareresearch.org

Research Objective: Significant progress has been made in reducing the prevalence of tobacco use in the United States. However, individuals with mental illness demonstrate greater rates of tobacco use than the general population and comprise between 33% and 50% of remaining smokers. We examine whether declines in tobacco use in the general population have also been realized among individuals with mental illness, assess whether those with and without mental illness differ with regard to product type preferences (e.g. high nicotine, menthol, lower perceived risk) and measure whether these differences vary by race/ethnicity.

Study Design: Analysis of multiple cross-sectional datasets to assess trends in smoking rates and product preferences among individuals with and without mental illness. We estimate unadjusted rates of tobacco use, dependence and product preference by time, mental illness and race/ethnicity. Multivariate regression models using two-way and three-way interactions assess the associations of mental illness and race/ethnicity on trends in tobacco use, adjusting for socioeconomic and health status covariates.

Population Studied: We use six years (2005-2010) of data from the National Survey on Drug Use and Health (NSDUH). We analyze data from individuals with and without mental illness. Mental illness is operationalized as having sufficient depressive symptoms to be likely to have a diagnosis of major depressive episode (MDE) or as having severe psychological distress (SPD) according to the Kessler-6 survey of psychological distress.

Principal Findings: Individuals diagnosed with major depressive episode (MDE) or as having severe psychological distress (SPD) increased their rates of nicotine dependence and use of full flavor cigarettes between 2005 and 2010 while the corresponding trends decreased among those without these conditions. Analyses by race/ethnicity of individuals with MDE or SPD demonstrate substantial increases between 2005 and 2010 in full flavor, high nicotine cigarette use among Asians (2.5% to 9.4%) and Latinos (10.8% to 14.7%) whereas white levels remained relatively steady (15.6% to 16.7%) and Black levels decreased but remained troublingly high (26.9% to 23.8%).

Conclusions: A growing proportion of current smokers have mental illness and racial/ethnic minorities with mental illness may be particularly vulnerable to increased harm from tobacco use.

Implications for Policy, Delivery, or Practice: Results suggest that FDA and other regulatory agencies, and public health departments should increase their efforts to decrease the rates of smoking among individuals with mental illness. Interventions focused on reducing smoking rates among racial/ethnic minorities with mental illness should also be a priority.

Funding Source(s): Other, Milton Foundation

Poster Session and Number: B, #566

Prevalence of Suicidality among Hispanic and African-American Veterans Following Surgery
Laurel Copeland, Scott & White Healthcare; Central Texas Veterans Health Care System; Raphael T McIntyre, Scott & White Healthcare; Eileen M Stock, Scott & White Healthcare; John E Zeber, Center for Applied Health Research, Central Texas Veterans Health Care System; Scott & White Healthcare; Daniel J MacCarthy, South Texas Veterans Health Care System; Mary Jo V Pugh, South Texas Veterans Health Care System

Presenter: Laurel Copeland, Ph.D., Associate Director, Center for Applied Health Research, Scott & White Healthcare; Central Texas Veterans Health Care System, laurelacopeland@gmail.com

Research Objective: The Veterans Health Administration [VA] prioritizes suicide prevention
as a critical focus. Historically, suicidal behavior and ideation [SBI] among Latinos and African Americans has received little attention because of their low suicide rates. Minority veterans may be an exception. VA patients undergoing major surgery exhibit many risk factors for SBI, including being highly disabled with multiple physical and mental disorders; in addition, many are of minority race. Although few individuals express SBI, these actions and thoughts are potent predictors of suicide. Therefore, this study evaluated factors including race and ethnicity associated with postoperative SBI among VA surgery patients.

**Study Design:** Extracts from VA’s electronic medical records were analyzed in the retrospective cohort study. SBI was ascertained by ICD-9 diagnosis and E-codes for suicidal ideation and suicidal behavior, respectively, during the three years following surgery. Postoperative risk of SBI associated with race and ethnicity was estimated via Cox proportional hazards model adjusting for clinical and demographic covariates.

**Population Studied:** The study examined 89,995 VA patients undergoing major surgery October 2005-September 2006 as part of the Surgical Treatment Outcomes for Patients with Psychiatric Disorders [STOPP] study of surgery experiences among veterans with severe mental illness.

**Principal Findings:** African-Americans [16,252; 18 percent] were at increased risk of SBI [HR=1.2; 95% CI 1.1-1.3] while Hispanics were not [HR=1.1; 95% CI 0.95-1.3]. Other risk factors included schizophrenia, bipolar disorder, depression, post-traumatic stress disorder, pain disorders, postoperative new-onset depression, and postoperative complications, while female gender and married status were protective.

**Conclusions:** The postoperative period may be a time of heightened risk for SBI amongst minority patients in the VA. Research into postoperative coping and recovery is needed. Tailored monitoring and post-operative management by minority status may be required to achieve care equity. In terms of mechanism, suicidal behavior and ideation represent untreated mental anguish, especially depression, which may lead to decreased healing and increased new-onset disease after surgery. In other research, minority patients have reported more severe pain and pain-related interference with physical function than their white counterparts, and been more likely to be prescribed medication that was inadequate for their pain intensity after a major surgery.

**Implications for Policy, Delivery, or Practice:** Providers must be cognizant of not only physical pain or other postoperative symptoms but also new or exacerbated mental distress. Postoperative recovery is a process which can be problematic, marked by pain and disability, and for some, suicidal ideation occurs in the process of seeking a solution to the problem. Patient activation interventions may need to be tailored for cultural sub-groups to enable minority patients to better cope with the perioperative period. Effective clinical care for mental, physical, and substance disorders is critical to protect against suicidal behavior and ideation, especially at times of stress which may include major health care events. Differences in post-operative coping by race and ethnicity should be assessed in future research to spur development of tailored postoperative care plans that take into account variation in ability to cope with pain and recovery.

**Funding Source(s):** VA

**Poster Session and Number:** B, #567

**Results from a Developmental Formative Evaluation of the Monitoring and Management of Metabolic Side Effects of Antipsychotic Medications in 12 VA Medical Centers**


**Presenter:** Karen Drummond, Ph.D., Research Health Scientist, HSR&D, Central Arkansas Veterans Healthcare System, karen.drummond@va.gov

**Research Objective:** Second-generation antipsychotics (SGAs) are prescribed to over 80% of veterans with psychotic disorders. Unfortunately, treatment with many SGAs is associated with metabolic side effects such as overweight/obesity, diabetes, and hyperlipidemia. Evidence-based and consensus-based recommendations for monitoring and management of these effects are contained in VA clinical practice guidelines for psychoses, obesity, diabetes, and dyslipidemia. However,
research has found low rates of metabolic monitoring and significant delays in management of metabolic abnormalities among patients treated with antipsychotics. The overall objective of the current study is to test an implementation intervention (an Evidence-Based Quality Improvement / Facilitation [EBQI/F] intervention) to enhance uptake of evidence-based tools and strategies to improve monitoring and management of metabolic side effects of antipsychotics, within the context of a national implementation effort within the VA.

**Study Design:** The study employs a quasi-experimental, multiple case-study design to test the EBQI/F intervention combined with the national implementation strategy, compared to the national implementation strategy alone. The study is being conducted at 12 VA Medical Centers (VAMCs), with six VAMCs assigned to receive the intervention and six assigned to the control group (national implementation strategy only). We are using multi-phase formative evaluation methods to support development of local implementation strategies, document and evaluate the process and success of the EBQI/F intervention, identify barriers/facilitators, and identify potential refinements to the intervention for future implementation efforts. For summative evaluation, we will employ time series analyses to assess intervention effects on performance of guideline-recommended metabolic monitoring and management during pre-implementation, implementation, and post-implementation study periods. This paper reports results of the recently completed first phase of the developmental formative evaluation.

**Population Studied:** The developmental formative evaluation process began with pre-implementation interviews with providers and other clinical staff involved in prescribing antipsychotics and/or the monitoring and management of the metabolic side effects of the medications.

**Principal Findings:** We conducted over 90 pre-implementation interviews with VA mental health providers and other relevant mental health staff members at all twelve participating VA medical centers for the first phase of the developmental formative evaluation. Our analysis of the interview data reveals that critical barriers to guideline-concordant monitoring and management of metabolic side effects of antipsychotic medications exist within the participating VAMCs. Our findings indicate that significant barriers are present at the system, staff, and patient levels.

**Conclusions:** To plan for effective interventions, it is important to understand the current barriers to guideline-concordant monitoring and management and to distinguish between site-specific versus common barriers. While some of the reported barriers are site specific, others were found across multiple VAMCs and may thus be generalizable and of interest beyond the VA.

**Implications for Policy, Delivery, or Practice:** Our study addresses an important patient safety concern for patients taking antipsychotic medications, specifically the need for timely monitoring and management of metabolic side effects of antipsychotics. Quality improvement (QI) in this area could help prevent or reduce morbidity associated with overweight/obesity, diabetes, and hyperlipidemia for these patients. To plan for effective QI it is important to understand the current barriers to guideline-concordant monitoring and management and to distinguish between site-specific versus common barriers.

**Funding Source(s):** VA

**Poster Session and Number:** B, #569

**Harms of Prostate and Colorectal Cancer Screening Identified by Clinicians**

Emily A. Elstad, University of North Carolina at Chapel Hill; Emily Elstad, University of North Carolina at Chapel Hill; Maihan Vu, DrPH, MPH, University of North Carolina at Chapel Hill; Anne Sutkowski-Hemstreet, MPH, University of North Carolina at Chapel Hill; Stacey L. Sheridan, MD, MPH, University of North Carolina at Chapel Hill; Carmen L. Lewis, MD, University of North Carolina at Chapel Hill; Russel Harris, MD, MPH, University of North Carolina at Chapel Hill; Noel T. Brewer, PhD, University of North Carolina at Chapel Hill

**Presenter:** Emily Elstad, MPH, Student, Health Behavior, University of North Carolina at Chapel Hill, elstad@live.unc.edu

**Research Objective:** While many studies have focused on the potential benefits of screening tests, fewer have considered the potential harms. "Harms" are defined as any bad effects that may come from screening for and treating a disease once it is found. Screening for colorectal cancer with colonoscopy can lead to harm by problems from the preparation or the procedure as well as psychological distress. Screening for prostate cancer with the prostate-specific antigen (PSA) test can lead to harm by problems
from biopsy or treatment as well as psychological distress. Our study assessed the harms clinicians cite for prostate and colorectal cancer screening.

**Study Design:** A cross-sectional sample of clinicians completed a paper-based questionnaire. Clinicians were asked to list the harms of PSA testing for a 70-year old man with no family history of prostate cancer and no abnormal PSA tests, and colonoscopy for a 70-year old man with no family history of colon cancer or history of polyps. We categorized harms, used a paired t-test to compare the mean number of harms clinicians mentioned for each screening test, and McNemar’s ?2 test to compare the frequencies of harms cited for the two screening tests.

**Population Studied:** 112 of 158 (71%) of clinicians from 24 family/internal medicine practices in a North Carolina practice-based research network completed the survey. The clinicians were primarily physicians (80% MD/DO), 60% of whom were male and 77% white. Mean age was 45±9.7 (range 29-69) and mean years in practice was 15±9.3 (range 1-40).

**Principal Findings:** Overall, clinicians listed more harms for the PSA test than for colonoscopy (3.01 vs. 2.68, p=.02). Harms that clinicians listed more frequently for PSA than colonoscopy included harms related to: false positive test results/unnecessary follow-up testing (61% vs. 12%, p<.001)and follow-up tests/procedures (30% vs. 5%, p<.001). They also mentioned harms of: treatment, true positives with unclear benefit, and psychological sequelae more frequently for PSA. In contrast, the most frequently cited harms of colonoscopy were harms of the test itself (including prep for the test and sedation) (91% vs. 0% for PSA). Clinicians listed time/inconvenience more often as a harm of colonoscopy (18% vs. 7%, p=.003).

**Conclusions:** Findings support the perception of a “screening cascade” (whereby testing begets further potentially harmful testing, procedures and treatment with unknown benefit) of harms for PSA but not for colonoscopy. For example, clinicians more often cited false positive tests, unnecessary testing/procedures and their harms, and unclear benefits of true positive tests as harms of PSA testing. In contrast, clinicians cited more immediate test-related harms for colonoscopy, omitting other potential harms. Interestingly, PSA screening rates remain high despite current clinical guidelines and apparent acknowledgement of screening harms found in this study.

**Implications for Policy, Delivery, or Practice:** These findings augment our understanding of how clinicians perceive cancer screening harms and are important given nascent research on screening harms relative to its benefits. Our findings can inform future research to reduce harms and improve patient care.

**Funding Source(s):** AHRQ

**Poster Session and Number:** B, #570

**Population Health Approaches and Alternative Strategies for Children’s Mental Health Care in Wisconsin**

Elizabeth Feder, University of Wisconsin; Kara Mandell, University of Wisconsin; Angela Forgues, University of Wisconsin; Iliya Amaza, University of Wisconsin

**Presenter:** Elizabeth Feder, Ph.D., Associate Researcher, Population Health Institute, University of Wisconsin, efeder@wisc.edu

**Research Objective:** To identify innovative population health approaches and alternative children’s mental health care strategies at the community level that may reduce the need for the use of anti-psychotic pharmaceuticals among high risk children.

**Study Design:** This qualitative study used surveys and semi-structured interviews with stakeholders and prescribers to identify novel, population-based strategies to address children's mental health in Wisconsin. Practitioners and stakeholders were identified using a snowball method.

**Population Studied:** Data was abstracted from 41 semi-structured interviews with Wisconsin thought-leaders from a variety of prescribing communities including child psychiatry, psychiatry, family medicine, pediatrics and advance practice nursing. Data was also collected from 21 other stakeholders including executive directors of advocacy and professional organizations, directors of private child and family mental health and social service agencies, leadership of county mental health and human service departments and school of pharmacy faculty.

**Principal Findings:** Stakeholders reported that much of the antipsychotic use in Wisconsin might be preventable through early intervention and/or coordination of other services. The impact of early childhood trauma and disrupted attachment in highly stressed families was cited as an important factor in the emotional and behavioral difficulty of many children, especially
those in the foster care system. The stresses of poverty overall was also identified as a significant contributor to mental health issues. Several Wisconsin communities are engaged in population based non-pharmaceutical prevention and treatment strategies to address risk factors for antipsychotic use. At the prevention level, Richie Davidson has brought regular meditation practice for students at at-risk schools in Madison. The La Causa School in Milwaukee has implemented a treatment intervention, “Nuestros Ninos, Nuestro Futuro” for students in grades 5-8 who have experienced trauma or PTSD. The program uses group-based cognitive-behavioral therapy (CBT) to address the consequences of community violence. Conclusions: Early intervention and family support services are frequently cited as potential avenues to reduce antipsychotic use. Additionally, school-based, population interventions may also show promise in reducing rates of powerful medications among children. Several exemplary programs focused on population mental health have been implemented at the community level in Wisconsin. Implications for Policy, Delivery, or Practice: The rate of antipsychotic use among children has grown enormously in Wisconsin and the nation in recent years. Antipsychotics may not be cost-effective compared with early intervention and have significant side effects that may last much longer than treatment. Wisconsin, like other states, faces a shortage of child psychiatrists, and looking to upstream and population-based approaches may make sense. Many children who are at risk to be treated with antipsychotics may respond to population level interventions. This study identifies several promising practices that have been implemented in communities in Wisconsin. Such population level interventions may help to decrease disparities in prescribing and improve the health of the children of Wisconsin. Funding Source(s): Other, Wisconsin Department of Health Services Poster Session and Number: B, #571

Geographic and Demographic Disparities in the Prescription of Antipsychotic Drugs among Children in Wisconsin
Elizabeth Feder, University of Wisconsin; Kara Mandell, University of Wisconsin; Kristen Voskuil, University of Wisconsin

Presenter: Elizabeth Feder, Ph.D., Associate Researcher, Population Health Institute, University of Wisconsin, efeder@wisc.edu

Research Objective: To identify geographic and demographic disparities in the use of antipsychotic drugs among children in foster care or who receive Medicaid in Wisconsin. Study Design: This study used data from Wisconsin Medicaid claims for children ages 0 to 18 between 2008 and 2011 including county of residence. We identified children who received at least one fill of an antipsychotic prescription using National Drug Codes (NDCs) from the study time period. We used National Provider Index (NPI) numbers to identify provider self-reported specialty. Finally, we used data from the County Health Rankings to identify county-level characteristics including demographic and economic data, disease prevalence rates (including diabetes and mental illness), and access to quality health care (based on the rate of preventable hospital stays, diabetic screening and mammography screening from the Dartmouth Atlas). To identify disparities in prescribing practices, this study used non-linear hierarchical linear modeling and GIS mapping. Quantitative data was augmented by interview data with prescribers treating children in high poverty areas. Population Studied: Children ages 0 to 18 in Wisconsin who were insured by Medicaid including those who were in foster care between 2008 and 2011 (n=439,567), including 13,187 children who received at least one antipsychotic fill. Principal Findings: GIS mapping shows that disparities exist in the number of children who were prescribed antipsychotics by geographic area. Children in foster care were more likely to be medicated, to be medicated for longer, and to experience polypharmacy than other children who receive Medicaid. We do not find disparities in antipsychotic prescriptions by provider type. Using hierarchical linear modeling, we found that children living in counties with higher median income are less likely to receive antipsychotics such that for every thousand dollar increase in median income, the probability of a child receiving an antipsychotic is reduced by five percent (OR=.95, 95% CI: .92-.97). In addition, children living in counties where the population is uninsured are less likely to receive antipsychotics (OR=.84, 95% CI: .72-.98). We did not find relationships between quality of
Community providers. The study will identify perspectives of communities where Veterans live from the need for suicide prevention services in the local overall objective of the study is to examine the underutilization of VA services among Veterans, as well as other Veterans not enrolled in VA care is of great concern. The overall objective of the study is to examine the need for suicide prevention services in the local communities where Veterans live from the perspective of a diverse group of VA and community providers. The study will identify provider and organizational barriers to care with a focus on those unique to Veterans living in rural areas that are at risk for suicide.

**Study Design:** This study used a mixed methods design including both semi-structured interviews and a quantitative survey. Interview questions focused on the perception of Veteran’s needs for VA and/or community-based services and more specifically, suicide prevention services, as well as referral mechanisms to address service needs and potential barriers to receiving services. Survey questions assessed participant demographics, including information about the organization, participant veteran status, and experience with suicide.

**Population Studied:** This study recruited and gathered survey and interview data from a diverse group of stakeholders (N=70) that represent key VA and non-VA community-based agencies that provide a range of health and psychosocial services to veteran and/or military populations living in the state of Missouri.

**Principal Findings:** Preliminary analyses of the survey data indicate that the majority of our participants were white, male, and educated, with less than 15 years of clinical / medical experience. Broad themes from a preliminary qualitative analysis suggest that both community and VA providers perceive a need for increased services, both generalized and suicide prevention-specific. Generalized needs include financial support, transportation, mental health care and increased support during a Veteran’s transition from the military back to civilian life. Suicide prevention services should be tailored to reach each generation of Veterans where they are most comfortable.

**Conclusions:** More can be done by the VA system to improve connections with community providers in several different service sectors. A variety of platforms for communication, including targeted interventions for providers, public service announcements, and smart phone apps, are discussed. These results will inform a future research on the design and feasibility testing of an innovative organizational barrier-breaking intervention study. These results will help create an infrastructure for suicide prevention that is in line with national strategies for suicide prevention, including sustaining and strengthening collaboration among agencies, and reduce barriers to access to suicide prevention services.

**Implications for Policy, Delivery, or Practice:** Clinically, we know that enrolled and non-

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**Stakeholder Perspectives on Improving Access to VHA’s Suicide Prevention Services**

Monica Matthieu, PhD, St. Louis VA Health Care System; Gianni Gardiner, Washington University; Ellen Zeigemeier, Washington University; Miranda Buxton, Washington University; Lu Han, Washington University

**Presenter:** Gianni Gardiner, M.S.W., Research Project Coordinator, Social Work, Washington University, ggardiner@gwbmail.wustl.edu

**Research Objective:** Veterans using VA health care services are at heightened risk for death by suicide. Epidemiological data on previous combat Veteran cohorts and data on underutilization of VA services among Veterans suggest that suicide risk among our newest cohort of Veterans, as well as other Veterans not enrolled in VA care is of great concern. The overall objective of the study is to examine the need for suicide prevention services in the local communities where Veterans live from the perspective of a diverse group of VA and community providers. The study will identify provider and organizational barriers to care with a focus on those unique to Veterans living in rural areas that are at risk for suicide.

**Study Design:** This study used a mixed methods design including both semi-structured interviews and a quantitative survey. Interview questions focused on the perception of Veteran’s needs for VA and/or community-based services and more specifically, suicide prevention services, as well as referral mechanisms to address service needs and potential barriers to receiving services. Survey questions assessed participant demographics, including information about the organization, participant veteran status, and experience with suicide.

**Population Studied:** This study recruited and gathered survey and interview data from a diverse group of stakeholders (N=70) that represent key VA and non-VA community-based agencies that provide a range of health and psychosocial services to veteran and/or military populations living in the state of Missouri.

**Principal Findings:** Preliminary analyses of the survey data indicate that the majority of our participants were white, male, and educated, with less than 15 years of clinical / medical experience. Broad themes from a preliminary qualitative analysis suggest that both community and VA providers perceive a need for increased services, both generalized and suicide prevention-specific. Generalized needs include financial support, transportation, mental health care and increased support during a Veteran’s transition from the military back to civilian life. Suicide prevention services should be tailored to reach each generation of Veterans where they are most comfortable.

**Conclusions:** More can be done by the VA system to improve connections with community providers in several different service sectors. A variety of platforms for communication, including targeted interventions for providers, public service announcements, and smart phone apps, are discussed. These results will inform a future research on the design and feasibility testing of an innovative organizational barrier-breaking intervention study. These results will help create an infrastructure for suicide prevention that is in line with national strategies for suicide prevention, including sustaining and strengthening collaboration among agencies, and reduce barriers to access to suicide prevention services.

**Implications for Policy, Delivery, or Practice:** Clinically, we know that enrolled and non-
enrolled Veterans are often engaged in community-based services in addition to VA care; therefore, a community-based intervention designed by the stakeholders who work with our Veterans is much needed. By examining the interaction between stakeholder groups and pathways to VA care, this intervention will also provide Suicide Prevention Coordinators (SPCs) with information on which community agencies are most in need of VA outreach and services.

**Funding Source(s):** VA

**Poster Session and Number:** B, #573

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**Working with a Severe Mental Illness: Stressful or Salubrious for Overall Mental Health?**

Brent Gibbons, University of Maryland, Baltimore County

**Presenter:** Brent Gibbons, M.P.P., Phd Student, Public Policy, University of Maryland, Baltimore County, sephjoe@gmail.com

**Research Objective:** State provision of vocational rehabilitation services for those with a severe and persistent mental illness (SMI) depends in part on state resources and a state’s inclination to provide such support services. Clearer answers as to how employment affects both the clinical status and use of mental health services by those with a SMI will help states determine if and how such vocational services should be offered. Results may also inform the psychiatric treatment community of the significance (if any) that working has in one’s overall treatment and recovery process.

Evidence suggests employment may improve symptoms and reduce mental health service use (e.g. # of hospitalizations). However, this evidence comes from project-specific evaluation data that 1) fails to control for endogeneity of employment status and 2) may not generalize to broader populations. This study examines the effect that working has on two outcome variables, mental health status and total mental health costs, for all individuals in the study, and separately for individuals eligible through the Federal program Supplemental Security Income (SSI).

**Study Design:** The two primary data sources are 1) the Outcomes Measurement Survey (OMS) for those using Maryland’s PMHS and 2) Maryland PMHS claims data for the same persons and time period. The design is quasi-experimental, with a “treatment” group (n=1,033) and a comparison group (n=5,733) defined by work status (currently working or not) in the 2nd of 3 consecutive OMS interviews over a one-year period. Mental health status is measured by a 24-question instrument that produces an overall score that is not diagnosis specific. Total mental health costs are calculated from claims records from the 6-month period between the 2nd and 3rd interviews. A full information maximum likelihood (FIML) estimation simultaneously models the potentially endogenous variable work status and the outcome variable. FIML allows a probit estimation for the binary dependent variable work status. A test of endogeneity is also feasible under FIML, which if insignificant suggests corrections for endogeneity are unnecessary and OLS regressions are performed instead.

**Population Studied:** The population is those with a SMI, covered through Maryland’s Public Mental Health System (PMHS) between September 2006 and August 2009.

**Principal Findings:** Results are mixed, with mental health status not showing improvement, but total mental health costs being significantly decreased for those who worked. Some differences in results are observed between SSI eligibles and other study subjects. Tests of endogeneity tend to be significant for work status with mental health status as the outcome of interest, but insignificant for the outcome of total mental health costs. An interaction term between the quantitative variable prior mental health status and work status exposes a treatment effect for the outcome mental health status that increases for those with poorer prior mental health status.

**Conclusions:** Please see principal findings and Implications.

**Implications for Policy, Delivery, or Practice:** Implications are that vocational programs may have cost offsets in the form of lowered mental health costs for non-SSI eligibles, but not for SSI eligibles.

**Funding Source(s):** No Funding

**Poster Session and Number:** B, #574

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**New Behavioral Health Issues Identified by Screening in Masshealth Children**

Karen Hacker, Institute for Community Health, Cambridge Health Alliance and Harvard Medical School; Robert Penfold, Ph.D, GroupHealth Research Institute; Lisa Arsenault, Ph.D., Institute for Community Health, Cambridge Health Alliance; Fang Zhang, Ph.D, Department of Population Medicine, Harvard Medical School,
positive modifiers. They were more likely to be all children and 9.7% of screened children had 46% had evidence of screening. Four percent of children with screens and modifiers. Multivariate logistic regression was used to determine predictors of positive screens among children with screens and modifiers (123,385) included, gender (male), age (older), foster care, BH history, and Hispanic ethnicity.

Of the children with a positive modifier, almost half (43%) had no BH history. Compared to those with prior BH history, they were more likely to be female, younger, minority, and from rural residences (P <.0001).

Conclusions: The high rate of newly identified Medicaid children with a BH need suggests that screening is performing well, especially since these children tended to be from historically underidentified groups. Future work is needed to determine whether identification leads to subsequent outpatient mental health treatment in order to better assess screening value.

Implications for Policy, Delivery, or Practice: For states considering mandated behavioral health screening, it is important to note that a majority of identified children may have prior behavioral health history. Screening in primary care may facilitate better integration with mental health. To better assess screening value for newly identified children, it will be important to follow their future service trajectories and determine whether early identification improves health and health service outcomes.

Funding Source(s): NIH

Presenter: Karen Hacker, M.D., M.P.H., Executive Director, Institute for Community Health, Cambridge Health Alliance and Harvard Medical School, khacker@challiance.org

Research Objective: To identify predictors of positive screening modifiers in Massachusetts Medicaid children who received mandated behavioral health (BH) screening.

Study Design: Mandated BH screening began in Massachusetts as part of the Rosie D. vs. Patrick remedy (12/2007). Providers were asked to use a screening CPT code and subsequently a modifier to indicate whether a BH need was identified. MassHealth claims data from before and after the mandate was obtained. Children with at least 300 days of eligibility in Fiscal Year (FY) ’09 (6/08 - 7/09) were identified and categorized into 5 groups based on the first use of the modifier, screening code or claim (salient visit)-children with: (1) screens and negative modifiers, (2) screens and positive modifiers, (3) screens without modifiers, (4) well-child visits without documented screens, and (5) children without well-child visits or screens. Bivariate analyses were conducted to determine differences among groups. Then to examine BH history, continuously enrolled children in FY’08 and ’09 were identified. BH history was defined as any claim prior to the salient screening visit with a mental health diagnosis (ICD9 290-319), a mental health CPT code, or for psychopharmacology. Children with positive modifiers were examined by BH history. Multivariate logistic regression was used to determine predictors of positive screens among children with screens and modifiers.

Population Studied: The population studied included children under 16 with at least 300 days of eligibility in MassHealth and utilization in FY’09.

Principal Findings: There were 355,490 children who met study criteria in FY’09 of whom 46% had evidence of screening. Four percent of all children and 9.7% of screened children had positive modifiers. They were more likely to be male, older and in foster care compared to all others (P <.0001). Of the 316,698 children who met criteria for BH history, 28% had an existing BH history. Of those screened (153,760), 27% had a BH history. Factors that predicted a positive modifier among children with screens and modifiers (123,385) included, gender (male), age (older), foster care, BH history, and Hispanic ethnicity.

Of the children with a positive modifier, almost half (43%) had no BH history. Compared to those with prior BH history, they were more likely to be female, younger, minority, and from rural residences (P <.0001).

Implementation-Focused Process Evaluation of an Incentive Intervention for Substance Use Disorders Treatment

Hildi Hagedorn, VA Substance Use Disorders QUERI, Minneapolis VA Healthcare System; University of Minnesota School of Medicine; Cheryl Stetler, Health Services Department, Boston University School of Health; Ann Bangerter, Center for Chronic Disease Outcomes Research, Minneapolis VA Healthcare System; Saimak Noorbaloochi, Center for Chronic Disease Outcomes Research, Minneapolis VA Healthcare System; Maxine Stitzer, Johns Hopkins University School of Medicine; Daniel Kivlahan, Center of Excellence in Substance Abuse Treatment and Education, VA Puget Sound Healthcare System; University of Washington School of Medicine
Presenter: Hildi Hagedorn, Ph.D., Staff Psychologist, Psychiatry, VA Substance Use Disorders QUERI, Minneapolis VA Healthcare System; University of Minnesota School of Medicine, hildi.hagedorn@va.gov

Research Objective: A pressing concern in healthcare today is the slow rate at which promising interventions move into clinical practice. Hybrid study designs, combining collection of effectiveness and implementation-related data, are one method to speed this process. This hybrid trial tested the effectiveness of an incentive intervention for substance use disorders (SUD) treatment while simultaneously collecting implementation-focused process evaluation data. The goals of this paper are to provide an example of a Hybrid Type I design, to demonstrate the value of theory in developing process evaluation questions/summarizing results and to provide practical guidance for implementation of incentive interventions in SUD clinics.

Study Design: The process evaluation design was informed by the RE-AIM and PARIHS implementation frameworks. Elements from the frameworks guided the development of specific process evaluation questions. Data tools used included the Organizational Readiness to Change Assessment (ORCA), patient surveys, staff and leadership interviews, observational notes, and chart reviews. Information from the different data tools were triangulated to reach conclusions related to each of the implementation framework elements.

Population Studied: The study was conducted in three Veterans Health Administration SUD treatment clinics. Patients were eligible if they were beginning a new treatment episode for alcohol and/or stimulant dependence. One-hundred forty-seven patients completed post-intervention surveys. All clinical staff were eligible to participate. Twenty-six staff completed the ORCA while nine staff and all clinic leaders completed interviews.

Principal Findings: Reach: Sixty percent of patients approached agreed to participate in the intervention. Most declined because the intervention appointments were too frequent. Adoption: Clinic leaders’ perceptions that incentive interventions were evidence-based, strongly supported by national leadership, and improved patients’ program retention were all incentives to adopt the intervention. However, these incentives could not overcome the barriers of lack of funding and staff time to carry out, i.e., implement, the intervention. Clinic leaders reported that facility leadership support in the form of additional funds or staff time would be required for adoption. Implementation: Clinic staff and leadership indicated that high-fidelity implementation would require expert consultation, involving all staff in implementation planning, and clearly defining staff roles in regards to the intervention. Maintenance: Clinical staff and leadership indicated that starting the intervention in only one treatment track would cut down on initial staff and funding requirements, increase staff familiarity and skill with the intervention, and allow for demonstration of intervention impact, all of which would support spread and maintenance of the intervention in other treatment tracks. Evidence: Staff at all clinics generally agreed with the evidence supporting the intervention but indicated their clinics lacked necessary resources. Context: Staff at the involved clinics reported a leadership and staff culture supportive of innovation.

Conclusions: This Hybrid Type I trial expanded the value of the effectiveness trial by concurrently collecting data that provided valuable insights into the design of future implementation efforts.

Implications for Policy, Delivery, or Practice: Research funders should encourage hybrid study designs to increase the rate at which innovative clinical interventions move to the implementation phase of the research pipeline.

Funding Source(s): VA

Poster Session and Number: B, #576

Implementation of Consumer Providers in Mental Health Settings

Alison Hamilton, VA Greater Los Angeles; Matthew Chinman, PhD, VA Pittsburgh Healthcare System & RAND; Amy N. Cohen, PhD, VA Greater Los Angeles Healthcare System & UCLA; Rebecca Shoai Oberman, MSW, MPH, VA Greater Los Angeles Healthcare System; Alexander S. Young, MD, MSHS, VA Greater Los Angeles Healthcare System & UCLA

Presenter: Alison Hamilton, Ph.D., M.P.H., Research Health Scientist, Desert Pacific MIRECC, VA Greater Los Angeles, alison.hamilton@va.gov

Research Objective: Consumer providers (CPs) are individuals with a serious mental illness (SMI) who draw upon their lived
experiences of a mental health disorder to provide services to others with a SMI. Utilizing CPs is considered an innovative clinical approach that can support usual services in a number of ways: they can facilitate the learning of self-management skills, provide hope, engage clients into treatment, serve as role models, and help clients connect with others in their communities. There is growing evidence for the effectiveness of CPs in national and international mental health settings. However, those who have conducted studies of CPs have consistently noted challenges related to implementation of this role, including boundary issues, confidentiality, disclosure of disability status, discrimination, and poorly defined job structure. The objective of this study is to describe facilitators and challenges to implementation of CPs in mental health treatment settings.

**Study Design:** The PEER project (Peers Enhancing Recovery) is the first study to use a systematic approach to implementation of CPs. The project was a one-year cluster randomized controlled trial comparing three mental health intensive case management (MHICM) teams that incorporated CPs compared to three other MHICM teams that continued without CPs. An evaluation of CP implementation was conducted involving semi-structured interviews and focus groups.

**Population Studied:** At intervention sites, consumer providers (n=5), other providers (n=8), and clients (n=10), as well as members of the research team (n=4).

**Principal Findings:** Site preparation, external facilitation, and positive, reinforcing experiences with CPs facilitated implementation. Non-CP staff, particularly MHICM administrators, appreciated having consistent access to expertise and resources, as well as being able to troubleshoot issues with the research team. External facilitation was particularly important when staff within sites were having conflicts. CPs also appreciated access to the research team, and benefited from weekly phone or in-person supervision. All staff conveyed that the CPs were a valuable addition to their teams, particularly when the CPs’ strengths and competencies had been identified and demonstrated. CPs themselves were also able to observe their own contributions, and this reinforced their sense of value on the teams and supported implementation; clients also recognized the value of CPs as role models and empathetic listeners. Role definitions and deficiencies in CPs’ technical knowledge posed challenges to implementation. Although there was widespread support behind maintaining the CP role at the sites, sustainability was not realized due to insufficient resources.

**Conclusions:** Implementation was positive overall, characterized by Diffusion of Innovation concepts of high relative advantage, strong trialability, compatibility with prevailing norms, compelling observability, and relatively low complexity. By preparing and working systematically with intervention sites to incorporate new services, implementation was strengthened and challenges were minimized.

**Implications for Policy, Delivery, or Practice:** Many healthcare organizations are hiring CPs and attention should be paid to implementation issues. External facilitation, ideally guided by an implementation framework, could be an important component of implementation, as are careful planning and anticipation of commonly experienced challenges. Increasing evidence of successful implementation could contribute to eventual sustainability of this effective addition to behavioral health services.

**Funding Source(s):** VA

**Poster Session and Number:** B, #577

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**The Relationship between Adverse Childhood Experiences and Truancy**

Nancy Hardt, University of Florida College of Medicine; Nathan Epps, Florida Department of Juvenile Justice; Kimberley Panther, University of Connecticut; David Wilding, University of Florida; Jeffrey Roth PhD, University of Florida

**Presenter:** Nancy Hardt, M.D., Senior Associate Dean, Pathology, University of Florida College of Medicine, hardt@ufl.edu

**Research Objective:** Background: Florida is unique in that in every judicial district, juveniles complete the same survey upon entry to the juvenile justice system to estimate their risk of reoffending. Among the survey questions asked are whether children have experienced adverse or traumatic events, and whether they have missed school. Adverse childhood experiences (ACEs) as described by Felitti and Anda categorize child maltreatment into abuse, neglect, and family dysfunction. The major predictor of involvement in juvenile justice or delinquency is truancy. The study assesses the relationship between ACEs and truancy among juvenile offenders in Florida.
**Study Design:** Method: The Florida Department of Juvenile Justice (FDJJ) uses a 126-item survey, the Positive Achievement Change Tool, to estimate the likelihood of re-offense among juvenile offenders. Responses on the PACT were coded as indicative of the presence of an ACE in 71,253 children under 18 interviewed between 2005 and 2010. Twenty-nine percent of children were truant. Logistic regression was used to calculate the odds of truancy as a function of number of ACEs.

**Population Studied:** 71,253 children in the Florida Juvenile Justice system.

**Principal Findings:** Results: Only 1.2% of children reported no adverse childhood experiences compared to 36% of the Kaiser Permanente insured reported by Felitti and Anda. Eighty percent of juvenile respondents were male; 62% were minority, and 29% were truant. Domestic violence and parental divorce were the most prevalent ACEs among truant offenders (80% and 78% respectively). Females were more likely to report all 10 ACEs than males and were six times more likely to report sexual abuse than males. Males were more likely to be truant than females. Truant males were 3 times more likely to report domestic violence than non-truant males. In the entire sample of offenders, 37% had 4 or more ACEs and the greater the number of ACEs, the higher the odds of truancy.

**Conclusions:** Conclusion: There is a direct proportional relationship between ACEs sum and truancy. Family dysfunction is the main association observed between ACEs and truant behavior in juvenile offenders. Few policies address prevention of adverse childhood experiences, rather most policies address secondary prevention. The signs of truancy begin as early as kindergarten. Policies for youth need to address youth attendance in school before children get involved in the juvenile justice system. Because the most common adverse experience reported by delinquent children with truancy is domestic violence, additional measures are needed to prevent children’s exposure to domestic violence. To begin, educating the public, especially pregnant women and parents of infants, that exposure to domestic violence can have far reaching consequences. These include reducing the likelihood of educational success and increasing the likelihood of involvement in the juvenile justice system.

**Implications for Policy, Delivery, or Practice:**

**Funding Source(s):** N/A

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**Poster Session and Number:** B, #578

**Association of EMR Use with Anxiety Treatment During Office Visits in the United States**

Jeffrey Harman, University of Florida; Robert L. Cook, MD, University of Florida; Christopher A. Harle, PhD, University of Florida

**Presenter:** Jeffrey Harman, Ph.D., Associate Professor, Health Services Research, Management and Policy, University of Florida, jharman@ufl.edu

**Research Objective:** Electronic Medical Records (EMRs) are commonly believed to improve the quality of care. Although some studies have found EMRs to improve the quality of care, a previous nationally-representative study found that EMRs were associated with lower treatment rates for depression. EMRs have the potential to improve adherence to treatment guidelines for individuals with anxiety disorders, but EMRs may also have a negative impact on treatment for anxiety disorders. The purpose of this study is to assess whether the likelihood of receiving treatment for anxiety disorders is greater during visits to practices with EMRs compared to practices without EMRs.

**Study Design:** This cross-sectional analysis used data from the 2007-2010 National Ambulatory Medical Care Surveys, a nationally representative sample of physician office visits in the U.S. conducted annually by the National Center for Health Statistics. Logistic regression was used to compare the odds of receiving any anti-anxiety medication and/or any mental health counseling or psychotherapy. All analyses use the survey procedures of Stata 10.0 to allow results to be nationally representative and to account for the complex sampling strategy of the NAMCS, and control for patient demographics, previous visits, practice ownership, the number of co-occurring chronic conditions, and type of insurance.

**Population Studied:** The study includes all visits made by patients with a recorded anxiety disorder diagnosis (N=2,971).

**Principal Findings:** There was no significant difference in the adjusted odds of receiving anti-anxiety medication between EMR and non-EMR practices (OR=0.83, p=.242). However, the adjusted odds of receiving mental health counseling or psychotherapy during a visit for an anxiety disorder at a practice with an EMR was less than half that observed during visits to
practices without an EMR (OR=0.46, p=.001). When the adjusted odds of receiving any anxiety treatment was assessed (either anti-anxiety medication or mental health counseling or psychotherapy), visits by patients to practices with EMRs were significantly less likely to have anxiety treatment offered than visits by patients to practices without EMRs (OR=0.63, p=.025).

**Conclusions:** Similar to what was found previously with depression treatment, anxiety treatment was less likely to be offered during visits to EMR practices. It is possible that the time and effort required by physicians to type information into EMRs during visits or other aspects of EMR design are negatively impacting physicians’ ability to manage all of the conditions of their older patients during limited visit times.

**Implications for Policy, Delivery, or Practice:** Physician practices that implement EMRs should carefully monitor and assess the impact of these systems on patient care and consider improvements in the functionality of these systems, particularly for treatment of mental health conditions.

**Funding Source(s):** No Funding

**Poster Session and Number:** B, #579

**Treatment of Obsessive Compulsive Disorder in a Nationwide Survey of Office-Based Physician Practice**


**Presenter:** Jennifer Humensky, Ph.D., Assistant Professor of Clinical Health Policy and Management (in Psychiatry), NYS Center of Excellence for Cultural Competence, Dept of Psychiatry, Columbia University/NYSPI, humensk@nyspi.columbia.edu

**Research Objective:** Obsessive compulsive disorder (OCD) is a chronic condition characterized by obsessions and/or compulsions (e.g., fear of dirt, need for symmetry, compulsive checking). OCD is associated with profound lowered quality of life, social isolation and a large economic burden on society. It is estimated that 2-3 million people are suffering from OCD in the United States. About one in fifty people have had OCD symptoms at some point in their lives. Evidence-based guidelines for the treatment of OCD identify 2 types of efficacious treatments including serotonin reuptake inhibitors (SRIs, i.e., clomipramine and the selective serotonin reuptake inhibitors) and cognitive-behavioral therapy (CBT) consisting of exposure and ritual prevention (EX/RP). Recent research has shown that despite the magnitude of distress and disability associated with OCD, the majority of individuals with OCD are not receiving evidence-based care. The goal of this study is to examine management of outpatient visits with a diagnosis of obsessive compulsive disorder.

**Study Design:** This study comprises a retrospective secondary data analysis of the National Ambulatory Medical Care Survey, a nationally-representative sample of visits provided by non-federally employed office-based physicians in the United States. We examine treatment provided during outpatient visits with a diagnosis of OCD.

**Population Studied:** Persons age 18 years and older who are receiving outpatient visits for OCD (based on ICD-9 code 300.3), from physicians participating in the 2003-2009 NAMCS. Results were weighted and corrected to account for complex sampling.

**Principal Findings:** The population diagnosed with OCD was 51% female and 49% male, and overwhelmingly non-Hispanic white (91%). Only 1.5% were non-Hispanic black, 3% were Hispanic, 5% were other non-Hispanic. Very few were over age 65 (3.5%). The majority were being seen by psychiatrists (88%). Most patients with OCD had been previously seen in the past 12 months by the same physician (96%) with 56% having had 6 or more visits with that physician in the previous 12 months. Preliminary findings indicate that most patients receive medication (85%), primarily SRIs (70%), followed by benzodiazepines (29%), antipsychotics (12%), stimulants (6%) and mood stabilizers (3%). Only 4% reported receiving any psychotherapy, indicating that even fewer are likely to be receiving the intensive EX/RP.

**Conclusions:** The reasons underlying the underutilization of evidence-based treatment for OCD are likely to be multifactorial. Patient-level factors include knowledge about OCD, willingness to seek treatment and preferences for type of treatment. Patients may have limited knowledge about the existence of OCD, and the disorder may impair the ability to recognize the symptoms as a disorder and to seek treatment. Furthermore, EX/RP is time-consuming and resource intensive and some patients may not...
have insurance which covers sufficient treatment. Provider level factors include a lack of trained clinicians, particularly in CBT and EX/RP. System-level factors include the expense of providing specialized, manualized treatment such as EX/RP. Some patients may not have sufficient insurance coverage and some providers might prefer less intensive services that are more easily reimbursed.

Implications for Policy, Delivery, or Practice: Evidence-based OCD treatment is underutilized in office-based physician visits. Identifying the extent of under-utilization is an important first step to identifying ways to promote evidence-based treatment.

Funding Source(s): Other, New York State Office of Mental Health Policy Scholar

Poster Session and Number: B, #580

An Interactive Tool to Estimate Costs and Resources for a First Episode Psychosis Initiative in New York State


Presenter: Jennifer Humensky, Ph.D., Assistant Professor of Clinical Health Policy and Management (in Psychiatry), NYS Center of Excellence for Cultural Competence and Division of Mental Health Services and Policy Research, Dept of Psychiatry, Columbia University/NYSPHI, humensk@nyspi.columbia.edu

Research Objective: Systems of care, in the US and worldwide, are attempting to meet the challenge of providing early intervention services for individuals experiencing a first psychotic episode, as evidence for the effectiveness of such interventions mount. The New York State Office of Mental Health (OMH) is a partner in the NIMH-funded RAISE Connection Program, which established fully dedicated multi-disciplinary FEP teams providing 2 years of comprehensive treatment. Facilitated by its participation in the RAISE initiative, OMH is exploring how to scale up early intervention services for individuals experiencing psychosis across the state. A central planning issue is estimating the number of treatment teams needed across the state. Because the number of teams needed is driven by so many unknowns, our goal was to create a user-friendly modeling tool that would allow users to input various estimates for these variables, and to see the impact of the estimates on projections of number of teams needed and, correspondingly, costs to operate the teams.

Study Design: This study utilized a state-academic partnership to facilitate needs assessment and cost estimates, by developing an interactive Excel-based planning tool. Our goal was to create a user-friendly modeling tool to allow the user to input various estimates for a set of variables and to see 1) the number of teams that would be needed statewide; 2) how large an area’s population needed to be to support an FEP team; and 3) what such teams would cost to operate under various staffing models.

Population Studied: Simulated costs and needs assessment, based on the US Census data of the population in New York State, both statewide, and by smaller geographical areas within the state.

Principal Findings: The tool provides estimated costs and team needs based on high, low and moderate estimates of a number of input variables, including FEP incidence, percentage of individuals approached and agreeing to enter services, the number of clients a team can support, and the duration of treatment. Based on our moderate estimates, we estimate that a population of about 500,000 is needed to support one team.

Conclusions: By identifying the size of the population needed to support one team, administrators can identify areas with the sufficient population within a reasonable travel distance to base a team. Similarly, any entity bidding on a partially- or fully-capitated contract to provide such services can estimate the number of individuals with FEP for which it would be responsible. Program administrators can use the tool for planning and outreach, to minimize wait lists and to anticipate staffing needs. The flexibility of the tool allows for adaptation to other treatment models, such as hub-and-spoke models or part-time team models.

Implications for Policy, Delivery, or Practice: Because the tool allows a user to specify what may be very local parameters, this tool can be adapted easily for use in other treatment settings and to other team-based treatment modalities. This tool is an example of how the development of a state mental health initiative can be facilitated through an academic partnership.
Funding Source(s): N/A, New York State Office of Mental Health Policy Scholar
Poster Session and Number: B, #581

Access to Mental Health Services among Patients at Health Centers
Emily Jones, Office of Economic Analysis, Evaluation, and Modeling in the Office of the National Coordinator for HIT; Lydie Lebrun-Harris, Health Resources and Services Administration; Alek Sripipatana, Health Resources and Services Administration; Quyen Ngo-Metzger, Agency for Healthcare Research and Quality

Research Objective: The main objectives were to examine mental health treatment needs among health center patients, utilization and care delivery patterns, and patient characteristics associated with both unmet need and satisfaction with mental health treatment provided at health centers.

Study Design: This study used data from the 2009 Health Center Patient Survey to explore the factors associated with unmet need and satisfaction with mental health services provided at health centers. Correlates of unmet need and high satisfaction were explored using multivariate logistic regression models, adjusted for age, gender, race/ethnicity, insurance status, educational attainment, mental health status, usual source of care, unmet need for medical care in the past year, whether the patient received substance abuse treatment in the past year region, and urbanity.

Unmet need for mental health care was defined as either a delay or an inability to access mental health care that the patient or a doctor thought was necessary in the last year. Patient satisfaction with the mental health treatment services that were provided in health centers was measured on a five-point Likert scale. Due to the complex sampling design, weighting was applied, so the results are nationally representative of patients served by health centers in terms of characteristics such as age, race/ethnicity, poverty status, gender, and insurance status.

Population Studied: Federally-qualified health centers comprise one of the largest primary care safety net systems, providing affordable comprehensive care to over 20 million underserved patients annually. The 2009 Health Center Patient Survey was fielded to 4,562 patients from 432 clinic sites between September and December 2009; this study uses data from the 3,949 interviews with adult patients.

Principal Findings: One in five health center patients accessed mental health services from any provider, and about seven percent of health center patients received mental health services at a health center. Most of these patients were satisfied with the care that they received, particularly patients with a usual source of care. Delays and unmet need persisted, particularly among patients lacking a usual source of care and in the South and the West. There were no racial and ethnic disparities in patient satisfaction or unmet need.

Conclusions: The primary care system is the main portal of access to mental health treatment, but barriers still loom large in underserved communities, such as affordability, provider scarcity, and stigma. Providing mental health services in the primary care setting is one way to reduce the unmet need and delays in access to treatment that persist.

Implications for Policy, Delivery, or Practice: Strategies to address unmet need include expanding capacity for behavioral health services in health centers and enhancing the coordination of behavioral health and medical care. Best practices for collaborative care include screening patients for behavioral health disorders in primary care, disseminating evidence-based practice guidelines, enhancing provider training and technical assistance, providing financial incentives, and providing referrals to specialty behavioral health providers in the community. Another strategy is building patient health literacy around mental health issues to inform, engage, and activate patients about behavioral health issues.

Funding Source(s): HRSA
Poster Session and Number: B, #582

Racial and Ethnic Disparities In Behavioral Health Visits With Primary Care Providers and Behavioral Health Specialists
Audrey L. Jones, UCLA Fielding School of Public Health; UCLA Center on Bridging Research Innovation, Training and Education, Training and Strategic Communication on
Disparities in BH visits between Black, White, and Latino adults. This study examines racial/ethnic disparities in behavioral health visits with PCPs and BH specialists from 2005-2010.

**Study Design:** We use panel data from the Medical Expenditures Panel Survey to examine racial/ethnic disparities in BH visits between 2005-2010. Logistic regression and negative binomial regression models were used to estimate disparities in the probability of any outpatient BH visit and the mean number of outpatient visits provided to those with any BH visit. Visits were examined separately for BH services provided by PCPs and BH specialists.

**Population Studied:** The sample included 2,858 adults, age 18 or older, with serious psychological distress. Disparities were examined for Non-Latino White (n=1,494), Non-Latino Black (n=570), and Latino adults of Mexican, Central/South American (n=564) and Caribbean (n=230) heritage.

**Principal Findings:** Racial/ethnic minorities experience disparities in both the access to and continuity of outpatient BH services. Black adults were less than two-thirds as likely as Whites to receive a BH visit with a PCP (RR = 0.60, 95% CI = 0.48-0.74). Among those with any visit to a BH specialist, Blacks received 4.23 fewer visits per year than Whites (95% CI = 2.11-6.38). Latinos of Mexican and Central/South American heritage were less likely than Whites to report any visit with a BH specialist (RR = 0.71, 95% CI = 0.49-0.93). When U.S. and foreign born nativity was examined, foreign born Latinos of Mexican and Central/South American heritage experienced disparities in visits with PCPs (RR = 0.71, 95% CI = 0.48-0.96) and BH specialists (RR = 0.52, 95% CI = 0.30-0.78). Race by time interaction terms were non-significant, indicating that disparities in BH visits for high risk populations have not improved in recent years.

**Conclusions:** Racial/ethnic disparities persist in BH service initiation and follow-up, suggesting that policies are needed to expand access to care, reduce fragmentation of services, and improve the continuity of BH services for minorities at-risk for severe mental illness.

**Implications for Policy, Delivery, or Practice:** The Affordable Care Act is likely to improve access to physical and behavioral health services for Black, White, and Latino adults. Given these increased service demands, PCPs must be given the training and supportive resources needed to screen and treat BH disorders in minority populations. To reduce service disparities, there is a need to improve the coordination of BH services between PCPs and BH specialists. This will require a colocation of physical and BH service providers as well as a restructuring of payment arrangements to incentivize physical and BH services coordination.

**Funding Source(s):** AHRQ

**Poster Session and Number:** B, #583

**Geographic Variation in Utilization of Mental Health Drugs among Medicare Beneficiaries**

Cameron Kaplan, University of Pittsburgh; Yuting Zhang, University of Pittsburgh

**Presenter:** Cameron Kaplan, Ph.D., Post-doctoral Associate, Health Policy & Management, University of Pittsburgh, ckaplan@pitt.edu
**Research Objective:** To examine geographic variation in the utilization of mental health drugs among Medicare beneficiaries, and how this has evolved over time.

**Study Design:** We calculated various measures of mental health drug utilization among Medicare Part D beneficiaries in the 306 Dartmouth Atlas of Health Care hospital referral regions, 50 states and the District of Columbia, and 4 national regions (South, West, Midwest, and Northeast). We examined variation in total spending on mental health drugs, the proportion of branded medications, as well as utilization of drugs across various therapeutic classes for mental health. We adjusted for differences in patient demographics, insurance status, and clinical characteristics across regions. These measures were then calculated at various points in time to examine changes in utilization associated with new market entry and patent status changes.

**Population Studied:** We used a 5% sample of Medicare part D claims from 2007 to 2010, obtained from the US Centers for Medicare and Medicaid Services’ Chronic Condition Warehouse. In order to properly adjust for clinical characteristics, our main study sample was limited to those who were enrolled in a stand-alone Part D plan.

**Principal Findings:** We found significant variation in the use of mental health drugs across regions. For instance, the ratio of the 75th percentile of mental health drug spending to the 25th percentile was 1.36. This is larger than the variation in antibiotic spending we reported in a previous work (Zhang et al., 2012, Arch Intern Med.). After adjusting for patient characteristics, the Northeast, West, and Midwest had approximately equal spending on mental health drugs, while the South had 16.1% lower spending on these medications than the other three regions. The variation in the use of expensive atypical antipsychotic drugs explained a large amount of the variation in spending across regions.

**Conclusions:** Mental health drugs are some of the most widely used medications among Medicare beneficiaries. For most subclasses of mental health drugs, there are many choices available that vary greatly in cost, but have similar clinical effectiveness. Variation in spending across regions after adjusting for patient characteristics may be indicative of overuse of high-cost medications in some areas.

**Implications for Policy, Delivery, or Practice:** Areas with high spending on mental health drugs may benefit from programs targeted at improving the use of more cost-effective medications.

**Funding Source(s):** NIH

**Poster Session and Number:** B, #584

**Gender Differences in Prescription of Antipsychotics and Mood Stabilizers with Weight Gain Potential among Veterans with Serious Mental Illness**

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**Presenter:** Julie Kreyenbuhl, Ph.D.,Pharm.D., Associate Professor, Psychiatry, University of Maryland School of Medicine, jkreyenb@psych.umaryland.edu

**Research Objective:** Women veterans are among the fastest growing segments of new health care users in the Veterans Health Administration (VHA). In fiscal year 2010, VHA provided care to over 25,000 women with serious mental illness (SMI) including schizophrenia and bipolar disorder, of whom 63% were prescribed antipsychotic medications (APMs) and 58% mood stabilizer medications (MSMs). Emerging research suggests that women may be more susceptible than men to weight gain and other metabolic side effects of APMs and MSMs and the associated adverse effects on physical health. The objective of this study was to characterize gender differences in prescription of APMs and MSMs according to their weight gain liability.

**Study Design:** We conducted a cross-sectional retrospective study of gender differences in prescription of APMs and MSMs in veterans with SMI receiving care in a Department of Veterans Affairs healthcare network in the U.S. mid-Atlantic region. Administrative health services
utilization and pharmacy records from fiscal year (FY) 2007-11 were the source of data. APMs with low liability for weight gain included aripiprazole, asenapine, fluphenazine, haloperidol, lurasidone, perphenazine, pimozide, and ziprasidone. MSMs with low liability for weight gain included lamotrigine, oxcarbazepine, and topiramate. Multivariable logistic regression analysis was used to examine gender differences in the likelihood of prescription of APMs or MSMs with low versus moderate/high liability for weight gain, adjusting for selected demographic and clinical characteristics.

**Population Studied:** A total of 5,837 male and 974 female veterans with SMI (schizophrenia-spectrum disorders or bipolar disorder) received one or more prescriptions for an APM, and 4,397 male and 903 female veterans with SMI received one or more prescriptions for a MSM, at some point during the 5-year study period.

**Principal Findings:** A larger proportion of female veterans with SMI (49%) received prescriptions for APMs with a low liability for weight gain than males (38%) (p<0.0001). In multivariable analyses, females were more likely than males to be prescribed these treatments (adjusted odds ratio (AOR): 1.47; 95% CI: 1.26-1.73; p<0.0001). Similarly, a greater proportion of female veterans (40%) received prescriptions for MSMs with a lower propensity for weight gain than males (21%) (p<0.0001). In multivariable analyses, female veterans had a higher likelihood than males of being prescribed these agents (AOR: 2.19; 95% CI: 1.7-2.8; p <0.0001).

**Conclusions:** Female veterans with SMI in a single VA healthcare network were more likely to be prescribed antipsychotic and mood stabilizer treatments with a lower risk of weight gain and adverse metabolic effects than males. Whether the apparent preferential use of psychotropic treatments with more benign side effect profiles in female veterans with SMI is more widespread throughout the VHA merits further investigation.

**Implications for Policy, Delivery, or Practice:** The results of this study suggest that prescribing choices for APMs and MSMs by VA mental health prescribers and female veterans with SMI reflect a growing awareness of the potential adverse health consequences of these treatments. Although this suggests women veterans are being subjected to fewer physical health risks from these medications, the precise impact of these treatment decisions on both the physical and mental health of female veterans remains largely unknown.

**Funding Source(s):** VA
patients per case visited and stayed in a medical center under 29 days. 56.9% of total annual out-of-pocket expenses were included under 49,000won and between 50,000won–249,000won. Next, significant variables affecting out-of-pocket expenses were influenced by patient characteristics such as sex, age, main sick, path course of an emergency room, the number of visits. On the other hands, there was no significant difference in visiting an emergency room through a paramedics.

**Implications for Policy, Delivery, or Practice:** Now common negative perceptions, prejudices, and discrimination towards depression and mental illness should be identified early in order to decrease the treatment cost and prevention of long-term illness can be effectively be made as a prerequisite for mental health treatment environment. From 2013, the government is prospected to promote revision of the Mental Health Act in accordance to the lifelong mental health summary initiative and implementation of lifelong mental screening system. Therefore, in order for the government to make a robust and efficient method for the mental wellbeing of the people such as effective prevention program and management, mental health interventions, and mental health-related care instructions, tailored treatment and counseling services, etc. long and sustainable programs need to be developed and implemented.

**Funding Source(s):** CDC

**Poster Session and Number:** B, #586

**Financing Behavioral Health Spending During the Recession: SAMHSA Spending Estimates Through 2009**

Katharine Levit, Truven Health Analytics; Tami L. Mark, PhD, Truven Health Analytics; Rosanna Coffey, PhD, Truven Health Analytics; Sasha Frankel, Truven Health Analytics; Rita Vandivort-Warren, MSW, Health Resources and Services Administration (formerly of SAMHSA); Patricia Santora, PhD, Substance Abuse and Mental Health Services Administration; Kevin Malone, Substance Abuse and Mental Health Services Administration

**Presenter:** Katharine Levit, B.A., Director, Behavioral Health and Quality Research, Truven Health Analytics, katharine.levit@truvenhealth.com

**Research Objective:** The Substance Abuse and Mental Health Services Administration (SAMHSA), has been developing estimates of national spending on mental health and substance abuse treatment for many years. We update the national behavioral health spending estimates through 2009 to capture the impact of the recession. We also re-examine other short-and long-term trends in mental health and substance abuse financing.

**Study Design:** The methods used to construct behavioral health spending estimates are consistent with the CMS National Health Expenditure Accounts framework and methods. The first method used SAMHSA survey results to estimate spending by payer for specialty behavioral health providers. For all other providers, the share of all-health use for behavioral health treatment—adjusted for differences in average charges and cost sharing—was estimated. This share was applied to the CMS all-health spending estimates. The results from both methods were summed after removing any duplication in spending between them.

**Population Studied:** U.S. population.

**Principal Findings:** Behavioral health treatment expenditure growth slowed during the recession (2007–2009); it increased at a 4.3% average annual rate, which was down from 6.1% in the pre-recession (2004–2007) period. Private spending increased 7.2% in the pre-recession period and 2.7% during the recession, while public spending growth continued to increase at its pre-recession pace (5.4% and 5.3%). The behavioral health share of all-health spending fell from 9.4% in 1986 to 7.4% in 1998. This trend reflects behavioral health spending growth that lagged behind the average increases in all-health spending. From 1998 through 2009, the behavioral health share of all-health spending remained unchanged at 7.4%. Substance abuse treatment spending accounted for 14% of behavioral health spending in 2009 and amounted to $24 billion. In almost every year between 1986 and 2009, substance abuse treatment spending grew at a slower pace than all-health treatment spending.

**Conclusions:** Spending on behavioral health treatment slowed during the recession, which was similar to trends in all-health spending. Diverging public and private growth trends resulted from expanding Medicaid and falling private insurance enrollment. The enhanced federal Medicaid match reduced the state share of Medicaid spending, preventing drastic cuts in...
state-funded behavioral health programs through 2009. However, delayed effects of the recession on states' behavioral health funding raise new post-2009 concerns.

**Implications for Policy, Delivery, or Practice:**
Under the ACA, approximately 11 million previously uninsured adults who also have a substance use disorder or experience serious psychological distress will become eligible for insurance exchanges or Medicaid coverage. Medicaid and private insurance will likely see permanent one-time upicks in their level of demand for services. It will be important to track changes in the level of behavioral health spending and funding sources for unintended consequences of PPACA. If people without health insurance continue to use hospitals and specialty mental health and substance abuse centers as their main providers of behavioral health treatment, these providers could potentially see funding deteriorate as Medicare and Medicaid Disproportionate Share Hospital payments are cut and as cash-strapped states continue reduced funding levels of behavioral health authorities.

**Funding Source(s):** Other, Substance Abuse and Mental Health Services Administration

**Poster Session and Number:** B, #587

**Performance of HEDIS Behavioral Health Measures in Commercial Health Plans**
Junqing Liu, National Committee for Quality Assurance; Jeremy Gottlich, National Committee for Quality Assurance; Mary Barton, National Committee for Quality Assurance; Robert Saunders, National Committee for Quality Assurance; Sarah Hudson Scholle, National Committee for Quality Assurance

**Presenter:** Junqing Liu, Ph.D., MSW, Research Scientist, Research, National Committee for Quality Assurance, liu@ncqa.org

**Research Objective:** Behavioral health problems are common, costly and debilitating. Measuring and reporting on quality offers an opportunity to identify gaps in care and drive improvement. This study assessed change in health plans’ performance on behavioral health care over time by using NCQA’s measures.

**Study Design:** This study used commercial health plan data reported to NCQA from 2007 to 2011. Plans reporting data must meet data verification rules and undergo an independent audit. This study aggregated data across all commercial plans to produce performance means. We studied four measures:
- Antidepressant Medication Management among adults with depression
- Follow-Up Care for Children Prescribed ADHD Medication
- Follow-Up after Hospitalization for Mental Illness for member 6 years and older
- Initiation and Engagement of Alcohol and Other Drug Dependence Treatment for members age 13 and older.

**Population Studied:** This study included 410 commercial plans (including health maintenance organizations and preferred provider organizations) from across the United States. The median plan enrollment is 97,722 members, where the 25th percentile is 37,434 and the 75th percentile is 282,209.

**Principal Findings:** Mental health measures showed moderate performance and modest improvements over time. The mean percentage of patients with new episodes of depression treatment who remained on an antidepressant for the 84-day acute phase increased from 62.9 percent (s.d. = 5.9) in 2007 to 65.6 percent (s.d. = 6.5) in 2011; the rate increased from 45.1 percent (s.d. = 6.8) to 49.5 percent (s.d. = 7.0) for the 180-day continuation phase. The proportion of children receiving follow-up visits within the first month of being prescribed ADHD medication increased from 33.7 percent (s.d. = 7.7) to 39.4 percent (s.d. = 7.8); the percentage increased from 38.7 percent (s.d. = 10.3) to 44.2 percent (s.d. = 10.4) for the 9-month continuation phase. Follow up after hospitalization for mental illness had higher performance rates and less improvement over time: the rate of members having a follow-up visit within 7 days of hospitalization increased from 55.6 percent (s.d. = 13.1) in 2007 to 58.9 percent (s.d. = 12.9) in 2011. Within 30 days of hospitalization, the rate increased from 74.0 percent (s.d. = 10.3) to 76.5 percent (s.d. = 10.5). There was a decline in achievement of the only substance use quality measure: the proportion of members who initiated treatment after an episode of substance abuse decreased from 44.5 percent (s.d. = 7.4) to 40.2 percent (s.d. = 7.51), and the rate for engagement in treatment remained at 15.2 percent (s.d. = 5.7) over five years.

**Conclusions:** There were incremental improvements in performance on mental health quality measures among commercial plans but declines in achievement of substance use treatment measures. Substantial gaps in the quality of behavioral health care remain.
Implications for Policy, Delivery, or Practice:
In recent years, measuring and reporting on behavioral health quality measures have revealed some improvements in care, but continue to show room for improvement. Broader efforts to address the lack of progress in improving quality for behavioral health are needed.

Funding Source(s): Other, National Committee for Quality Assurance

Poster Session and Number: B, #588

Costs and Feasibility of Providing Follow-Up Services to Improve Continuity of Care for Suicidal Individuals in Emergency Departments
Chelsea Lyons, University of Rochester Medical Center; Greg Brown, PhD, University of Pennsylvania School of Medicine; Glenn Currier, MD, MPH, University of Rochester School of Medicine and Dentistry; Barbara Stanley, PhD, Columbia University College of Physicians & Surgeons; Kerry Knox, MS, PhD, University of Rochester School of Medicine and Dentistry

Research Objective: The current objective is to determine the feasibility of obtaining cost data for services that work to facilitate outpatient mental health care for people at risk for suicide, following an emergency department (ED), urgent care visit, or hospital visit in diverse health system settings. Additional goals include evaluating these costs, both in terms of immediate cost of facilitation and downstream costs that may be incurred from greater demand for outpatient care.

Study Design: EDs often serve as an initial and sole treatment setting for suicidal individuals, representing a targeted setting to prevent deaths from suicide. These patients are at increased risk for suicide following acute care (McCarthy et al., 2009) and investigators have pointed out that there may be a critical gap in providing outpatient services after these individuals are seen in ED settings, possibly leading to future need for additional acute services.

One example of an attempt to deliver continuous care that has recently been reported (Knox et al., 2012), was a clinical demonstration project implemented in Veterans Affairs (VA) EDs and urgent care facilities: Suicide Assessment Follow-up Engagement: Veteran Emergency Treatment (SAFE VET). This intervention combined Safety Planning (Stanley & Brown, 2008) - a promising ED-based treatment for suicidal individuals - with structured follow-up addressing risk and safety assessment, and treatment linkage. Follow-up was provided by Acute Service Coordinators who worked closely with ED clinicians and outpatient mental health staff.

The cost of intervention designed to link patients into outpatient care is generally unknown. In practice, this type of service is likely to be considerably labor intensive, as often the target population does not access the mental health or medical system on a consistent basis. Examining cost data across a variety care settings, both within the VA and non-VA health settings, will provide a better understanding of the resources involved in promoting continuity of care following an ED visit for suicidality.

Population Studied: Patients presenting to either VA or a non-VA ED or urgent care setting, expressing suicidal ideation or behavior but do not require immediate hospitalization and who are typically classified as moderate suicidal risk.

Principal Findings: Intensive follow-up contacts with at-risk patients may be effective in engaging them into outpatient care. The findings on the cost of implementing SAFE VET and other ED-based follow-up interventions are still forthcoming. The feasibility of accessing this data in VA and non-VA settings presents various challenges, especially given the often transient nature of the population of interest. Even so, this type of data can be obtained.

Conclusions: Intensive follow-up contacts may be an effective means for reducing morbidity and mortality from suicide. In improving quality of care through increased continuity from acute to outpatient psychiatric care, costs may also be reduced.

Implications for Policy, Delivery, or Practice:
The practice of providing intensive follow-up through telephone or direct contact, may be transferable to a wide variety of VA and non-VA emergency departments and urgent care centers to improve outcomes for individuals at risk for suicide after discharge from hospital or ED settings. Doing so may also be cost-effective for health systems.

Funding Source(s): VA
Poster Session and Number: B, #589
**Axis II Psychiatric Disorders and High Cost Health Care Utilization**

J. Catherine Maclean, University of Pennsylvania; Haiyong Xu, University of California at Los Angeles; Michael T. French, University of Miami; Susan Ettner, University of California at Los Angeles

**Presenter:** J. Catherine Maclean, Ph.D., Assistant Professor, Medical Ethics and Health Policy, University of Pennsylvania, maclean@upenn.edu

**Research Objective:** Despite interest in how clinical conditions such as substance abuse, depression, and anxiety impact health care utilization, little is known about the role of Axis II (A2) psychiatric disorders. A2 disorders are a prevalent, yet poorly understood class of conditions that lead to diminished social functioning and impose substantial costs on both the disordered person and those with whom he interacts. The objective of this study is to rigorously analyze the associations between A2 disorders and two measures of health care utilization with relatively high cost, emergency department (ED) episodes and hospital admissions, in a large and nationally representative data set specifically designed to measure psychiatric conditions.

**Study Design:** We estimate logistic regression models that adjust for a rich set of covariates associated with health care utilization. Separate models are estimated for men and women. We construct three sets of A2 disorder variables: 1) any disorder, 2) one disorder and two or more disorders, and 3) unique indicators for the ten disorders classified by the American Psychiatric Association. Thus, we are able to test for a dose-response relationship (i.e., are higher levels of disorder linked with higher risk for health care utilization?) and whether the relationship varies across A2 disorder type.

**Population Studied:** A nationally representative sample of adults 20 to 90 years of age drawn from Wave II (2004/2005) of the National Longitudinal Survey of Alcohol and Related Conditions (NESARC). The survey response rate is 65% in Wave II (N=34,653).

**Principal Findings:** Both men and women with A2 disorders are at elevated risk for ED episodes and hospital admissions. These associations are robust to adjustment for confounding factors, including demographics, access to health insurance, health behaviors, chronic physical health conditions, Axis I disorders, suicide attempts, and injuries. We find evidence of a dose-response relationship, and document that the relationship varies substantially across A2 disorder type with borderline disorder displaying the strongest association with health care utilization.

**Conclusions:** Our findings show that A2 disorders, particularly borderline disorder, are important risk factors for ED episodes and hospital admissions for both men and women. Our results are timely, as containing health care costs is crucial to the long-term solvency of publicly provided health insurance programs.

**Implications for Policy, Delivery, or Practice:** Health policy makers should consider tailoring health interventions to the specific features of A2 disorders. Substance abuse treatment providers have adopted this strategy, and have improved treatment outcomes for patients affected by A2 disorders. Based on our findings, borderline disorder displays the strongest association with hospital admissions and ED visits for both men and women. Although all A2 disorders are notoriously difficult to treat, borderline may be the most responsive condition. A set of clinical studies finds that dialectical behavioral therapy (DBT) can lead to improved social functioning among persons affected with borderline disorder. If health care providers diagnose borderline, perhaps DBT or another evidence-based treatment should be initiated to address both the A2 disorders and related health care utilization.

**Funding Source(s):** No Funding

**Poster Session and Number:** B, #590

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**Economic Fluctuations and Drug Abuse Treatment: Evidence from Admissions Data**

J. Catherine Maclean, University of Pennsylvania; Jonathan H. Cantor, New York University; Rosalie Liccardo Pacula, RAND Corporation

**Presenter:** J. Catherine Maclean, Ph.D., Assistant Professor, Medical Ethics and Health Policy, University of Pennsylvania, maclean@upenn.edu

**Research Objective:** The objective of this study is to analyze the effect of economic fluctuations on admissions to drug abuse treatment. Although there is a substantial literature on the relationship between economic fluctuations and health, few studies have investigated whether use drug use, particularly illicit drug use, varies across the business cycle. The available
findings are mixed and do not provide sufficient information for development of effective policy. Admissions to drug treatment capture a highly problematic level of drug use, thus they are an interesting outcome from a public health perspective. Further, drug abuse treatment represents a direct financial burden on the public: spending on drug abuse treatment is predicted to reach $35 billion by 2014, and public payers will cover 83% of these costs. **Study Design:** We construct measures of total admissions, and admissions by sex, employment status, race/ethnicity, age, referral source, time period, and drug type by state and year. We estimate regression models that adjust for a rich set of covariates associated with admissions to drug treatment. Because changes in admissions may be driven by the demand for, and supply of, treatment, we include supply side proxies in our regressions and isolate the role of demand. We investigate the role of both household income and health insurance coverage. Finally, we explore how the relationship varies across the distribution of admissions using unconditional quantile regression. **Population Studied:** The Treatment Episode Data Set (TEDS) contains the near universe of drug abuse treatment admissions that receive funding from the Federal or state government, or are certified by the state to provide drug abuse treatment. The TEDS contain approximately 33 million admissions to drug treatment between 1992 and 2010. **Principal Findings:** Admissions to drug treatment decrease in economic downturns; and the relationship is largely attributable to changes in demand for treatment. We identify heterogeneity by client characteristics, drug type, referral source, and time period, and show that changes in household income and health insurance explain at most 11% of the relationship between economic fluctuations and admissions. Finally, unconditional quantile regressions reveal that the relationship varies across the admissions distribution: our findings are largely driven by observations with lower admission rates. **Conclusions:** This study provides, to the best of our knowledge, the first estimates of the effect of economic fluctuations on admissions to drug abuse treatment using U.S. data. **Implications for Policy, Delivery, or Practice:** Policy makers may find our results informative. Because we show that overall admissions decrease during downturns, and these changes are mainly attributable to demand for treatment, funding for drug abuse treatment may be an area that does not need to be expanded when the economy contracts and tax-based revenues decline. Our findings suggest that the relationship between economic fluctuations and drug abuse admissions has changed over time, thus when considering how economic fluctuations impact drug use, and perhaps other health behaviors and outcomes, policy makers should rely on recent data whenever possible as older studies may no longer provide accurate information. **Funding Source(s):** No Funding **Poster Session and Number:** B, #591 **Does Leaving School in a Bad Economy Affect Body Weight?: Evidence from Panel Data** J. Catherine Maclean, University of Pennsylvania **Presenter:** J. Catherine Maclean, Ph.D., Assistant Professor, Medical Ethics and Health Policy, University of Pennsylvania, macleanc@upenn.edu **Research Objective:** In this study I test whether leaving school in a bad economy persistently affects body weight. Several empirical patterns motivate this research. Workers who leave school in a bad economy persistently earn lower wages and work in less prestigious jobs, labor market outcomes are associated with health outcomes, and business cycles have short run effects on health. Recent work shows that leaving school in a bad economy persistently affects mental and physical functioning. Understanding risk factors for elevated body weight is important for improving population health and containing medical costs. According to the Surgeon General, obesity has reached epidemic proportions in the United States. The most recent data suggest that 35.7% of men and 35.8% of women are obese and if recent trends continue, 42% of Americans will be obese by 2030. Obesity is a leading cause of preventable death and contributes to a host of morbidities including Type II diabetes, asthma, cancer, and heart disease, and raises medical care costs by $190.2 billion per year. **Study Design:** I examine three measures of body weight at age 40: body mass index (BMI), overweight (BMI >= 25), and obesity (BMI >= 30). Data are drawn from the National Longitudinal Survey of Youth 1979 Cohort
School-leaving is defined by school completion, and includes both graduates and drop-outs. I proxy economic conditions at school-leaving with the state unemployment rate, and exploit variation generated by volatility in the U.S. business cycle between 1976 and 1992 to identify body weight effects. Because the severe recession of the early 1980s lies within this time period, I effectively compare cohorts that left before, during, and after this recession. To address the potential endogeneity of the time and location of school-leaving, I instrument the school-leaving state unemployment rate. I estimate sex-specific equations given the different labor market participation patterns of men and women.

**Population Studied:** A nationally representative sample of adults aged 40 years drawn from the National Longitudinal Survey of Youth 1979 Cohort.

**Principal Findings:** My results suggest that leaving school in a bad economy persistently affects body weight, and the relationship varies by sex: men who leave school in a bad economy have lower bodyweight, and are less likely to be overweight and obese at age 40 than otherwise similar men. Alternatively, women who leave school when the unemployment rate is high are more likely to be overweight at age 40. Results are larger and more precisely estimated after correctly for the endogeneity of economic conditions at school-leaving. I find suggestive evidence that the body weight effects operate through the labor market and marriage market.

**Conclusions:** Economic conditions at school-leaving have a persistent effect on bodyweight, although the relationship varies by sex.

**Implications for Policy, Delivery, or Practice:** These findings suggest the consequences of the 2007 to 2009 recession may include persistently higher weight for women, but not men. Alternatively, women who leave school when the unemployment rate is high are more likely to be overweight at age 40. Results are larger and more precisely estimated after correctly for the endogeneity of economic conditions at school-leaving. I find suggestive evidence that the body weight effects operate through the labor market and marriage market.

**Funding Source(s):** No Funding

**Poster Session and Number:** B, #592

**The Challenge – Detecting Depression in Primary Care**

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**Presenter:** Racheli Magnezi, Ph.D., M.B.A., Head, Health Systems Management Program, Management, Bar Ilan University, magnezir@gmail.com

**Research Objective:** The research objectives were to assess the degree of depression (PHQ-9) among patients attending primary care clinics, evaluate the association of depression with patients’ sense of quality of life (SF-12), and patients’ active involvement in their healthcare, and to compare two screening methods for depressive symptoms (face-to-face and telephone interview). The study design also offered an opportunity to consider the extent of undiagnosed depression by comparing the physicians’ clinical assessment of patients’ level of depression with the patient-rated PHQ-9 scores.

**Study Design:** The survey included 278 patients visiting two primary care clinics. Subjects were interviewed face-to-face in the waiting room or by telephone. They completed three questionnaires that evaluated depression level (PHQ-9), quality of life (SF-12) and self-involvement (PAM) in healthcare (knowledge, skill and confidence in managing chronic health conditions). A PHQ-9 score of 10 or more indicates at least moderate depression. Participating physicians were asked to assess depression in each patient as “diagnosed”, “suspected”, or “not depressed”. They were blinded regarding the patients’ PHQ-9 scores.

**Population Studied:** Subjects included patients aged 18 years and older, who visited two large primary care clinics, in Beer Sheva, Israel, during February 2011.

**Principal Findings:** 177 patients completed the interview face-to-face and 101 by telephone. Based on PHQ-9 scores of 10 or more, 23.4% of subjects reported at least moderate depression, with no difference between the two interview methods. Negative correlations were found between PHQ-9 scores and SF-12 and PAM scores \( r = -0.78, r = -0.35, p < 0.0001 \), respectively. Analysis of covariance (ANCOVA) revealed that SF-12 and PHQ-9 scores were strong predictors of the PAM score \( F \) value 38.2 for the SF-12 and 23.9 for the PHQ-9). However,
when both were entered into the model, only the SF-12 was a significant predictor (F value 13.6). According to the PHQ-9, 78% of patients who scored less than 10 on the PHQ-9 were also considered by their physician as “not depressed.” While nearly half of those whose PHQ-9 score indicated depression were not considered by their physician to be depressed (hidden depression). About 20% of those with a PHQ-9 score less than 10 were suspected or considered to be depressed by the physician. Only 55% of those with a PHQ-9 greater than 10 were diagnosed as depressed by their physician.

Conclusions: Improved awareness and identification of depression by primary care physicians could lead to increased recognition of emotional distress, improved quality of life, and patients’ increased involvement in their own healthcare, thereby enhancing compliance with treatment. Face-to-face interviews were more acceptable to patients than were telephone interviews.

Implications for Policy, Delivery, or Practice: Cognitive and supportive interventions could lead to greater patient involvement in improving their own health. Providing continuing education to physicians on topics related to mental health could lead to greater awareness of and accuracy in diagnosing depression.

Funding Source(s): No Funding
Poster Session and Number: B. #593

An Evaluation of the Cost Effectiveness of XR-NTX Against Existing Treatments for Opioid Dependence
Heide Jackson, University of Wisconsin - Madison; Kara Mandell, University of Wisconsin, Madison; Kimberly Johnson, University of Wisconsin - Madison/NIATx; Debanjana Chatterjee, University of Wisconsin - Madison; David Vanness, University of Wisconsin - Madison

Presenter: Kara Mandell, Doctoral Student, Population Health Studies, University of Wisconsin, Madison, kmandell@wisc.edu

Research Objective: In October 2010, the Food and Drug Administration (FDA) approved extended-release naltrexone (XR-NTX) for the treatment of opioid dependence. The goal of this study is to conduct a cost effectiveness analysis of XR-NTX compared to existing pharmacological treatments (methadone and buprenorphine maintenance treatments) for the treatment of opioid dependence.

Study Design: A discrete state Markov model was used to estimate the payer costs for administering methadone, buprenorphine, or XR-NTX per opioid free day in a simulated cohort of US adult males over a six month period. Deploying a Markov model allows us to overcome many difficulties of assessing outcomes using only clinical trial data—we are able to explicitly model transitions into and out of pharmacological treatment and abstinence within and outside of treatment. Model assumptions, transition probabilities and other data included in the model were based on published literature. Meta-analyses were used when possible. However, because there are only two Phase III clinical trials of XR-NTX, we estimated the model separately using the data from each trial.

Population Studied: The model simulates the experience of a hypothetical cohort of opioid dependent American males age 18-65 who enroll in one of three pharmacological treatments. Opioid use and adherence to treatment are simulated for a six month period.

Principal Findings: Based on our model for 24 weeks, patients are expected to remain in treatment and abstain from opioids approximately 32% of the study period when treated with methadone, 27% of the study period when treated with buprenorphine, and either 30% or 54% (depending on the study data used) of the study period when treated with XR-NTX. Methadone dominates buprenorphine; patients receiving methadone have more opioid free days (37% of days opioid free compared to 32%) and methadone is less expensive to administer than buprenorphine ($1.18 per day compared to $13.52). Using retention and abstinence rates from a study based in the U.S., XR-NTX is dominated by methadone (32% of days opioid free compared to 30%). However, using retention and abstinence rates from a study based in Russia, XR-NTX is cost effective (incremental cost effectiveness ratio [ICER] $4.50 per additional opioid free day).

Conclusions: We find that XR-NTX is not cost effective in a simulated cohort of U.S. males ages 18-65 in the period studied, although it is cost effective in Russia. Our study suggests that methadone is the most cost effective treatment for opioid dependence in the United States.

Implications for Policy, Delivery, or Practice: XR-NTX is not cost-effective for the majority of
the U.S. population. However, limitations in the availability of both methadone and buprenorphine make XR-NTX an important addition to the options available to treat opioid addiction. Though XR-NTX may not be a cost effective treatment at the population level, there is much that is left unstudied concerning special populations and social and patient costs that may have different outcomes.

**Funding Source(s):** No Funding

**Poster Session and Number:** B, #594

**The Characteristics and Outcomes of Patients Treated with Buprenorphine**

Tami Mark, Truven Health Analytics

**Presenter:** Tami Mark, Ph.D., M.B.A., Senior Director, Analytic Consulting And Research Services, Analytic Consulting and Research Services, Truven Health Analytics, tami.mark@truvenhealth.com

**Research Objective:** Addiction to opioids has become an epidemic in the United States. Unintentional poisoning causes 87 people to die each day, and over 90% of these are caused by drugs—primarily opioids (“painkillers). In 2011 nationwide, 4.6 percent of persons aged 12 or older reported using pain relievers nonmedically in the past year. Buprenorphine became available to treat opioid addiction in 2002. In 2011, sales of buprenorphine reached over $1 billion dollars. Given the rapid changes in the nature and prevalence of opioid abuse, more research is needed to understand how and for whom buprenorphine is being prescribed and its effectiveness in “real world” settings. The purpose of this investigation is to describe the characteristics and outcomes of individuals who filled prescriptions for buprenorphine.

**Study Design:** The data were from the Truven Health MarketScan® Commercial Claims and Encounters Database, the MarketScan Medicare Supplemental and Coordination of Benefits Database, and the MarketScan Multi-State Medicaid Database for the years 2007–2009. The MarketScan Commercial database includes insurance claims from approximately 20–30 million employees and dependents annually who are covered by large self-insured employers and regional health plans. The MarketScan Medicare Supplemental database includes approximately 2 million beneficiaries who receive insurance coverage through Medicare and current or former employers. The MarketScan Medicaid database contains claims from approximately 6 million beneficiaries annually from several geographically dispersed States. The characteristics, outcomes, and utilization patterns of the individuals filling prescriptions for buprenorphine were compared to an age- and sex-matched sample 6 months before and 6 months after buprenorphine initiation. Statistical testing was done using chi-square tests or t tests.

**Population Studied:** The primary study population consisted of patients who filled prescriptions for buprenorphine.

**Principal Findings:** Buprenorphine recipients had a high prevalence of comorbidities associated with chronic pain, including back problems (42%), connective tissue disease (24%–27%), and nontraumatic joint disorders (20%–23%). Approximately 69% of recipients filled prescriptions for opioid agonist medications in the 6 months before buprenorphine initiation. Buprenorphine recipients were frequently diagnosed with anxiety (23%–42%) and mood disorders (39%–51%). They filled prescriptions for antidepressants (47%–56%) and benzodiazepines (47%–56%) at high rates. Surprisingly, only 53%–54% of patients filling a prescription for buprenorphine had a coded opioid abuse/dependence diagnosis. Buprenorphine treatment was associated with a reduction in hospitalizations, emergency department utilization, and opioid prescription fills, but the rate of these outcomes remained relatively high.

**Conclusions:** This study reveals that patients who receive buprenorphine are a complex population characterized by high rates of diagnoses associated with chronic pain, such as back, joint, and connective tissue disorders; extensive use of opioid medications (both before and after starting buprenorphine treatment); high rates of hospitalization and ED use; and a noteworthy prevalence of psychiatric comorbidities and psychiatric medication prescriptions. These characteristics apply to both the population with private insurance and those with Medicaid.

**Implications for Policy, Delivery, or Practice:** These results highlight the need for research on ways to improve outcomes from buprenorphine treatment in real-world settings.

**Funding Source(s):** Other, Substance Abuse and Mental Health Services Administration

**Poster Session and Number:** B, #595
Integrating Substance Abuse Treatment into HIV Care: Missed Opportunities in the AIDS Drug Assistance Program

Erika Martin, University at Albany-SUNY; Karen H. Wang, Yale University School of Medicine

Presentation: Erika Martin, PhD, MPH, Assistant Professor, Rockefeller College of Public Affairs & Policy, University at Albany-SUNY, emartin@albany.edu

Research Objective: HIV-infected individuals have a substantial burden of co-morbid substance use disorders, and untreated licit and illicit drug dependencies among people living with HIV contribute to worse HIV care outcomes and increased HIV transmission. We assessed the availability of guideline-concordant medication-assisted therapies to treat substance use disorders on state-administered AIDS Drug Assistance Programs (ADAPs), an important source of drug coverage for low-income HIV patients. We examined the frequency and variation of medication-assisted therapies across state formularies.

Study Design: We collected state ADAP formulary data from 1997 to 2009 from the ADAP annual reports published by the National Alliance of State and Territorial AIDS Directors. We systematically reviewed formularies and compared them to guideline-concordant medication-assisted therapies to treat substance use disorders on state-administered AIDS Drug Assistance Programs (ADAPs), an important source of drug coverage for low-income HIV patients. We examined the frequency and variation of medication-assisted therapies across state formularies.

Population Studied: We analyzed ADAP programs in the 50 states and District of Columbia.

Principal Findings: The most frequently included medication-assisted therapies were those to treat tobacco dependence, followed by medications to treat opioid dependence. Few state ADAPs covered alcohol dependence medications. By 2009, less than 20 percent of states ever had a complete formulary for at least one of the three conditions, and less than 10 percent ever had a complete formulary for all three conditions simultaneously. States did not consistently retain medications on their formularies after their initial adoption, and in any given year, less than one tenth of states covered the complete set of recommended medications for at least one condition, and less than half of states covered a partial formulary for at least one condition.

Conclusions: ADAPs could provide access to medication-assisted therapies for SUD for a significant number of HIV-infected individuals, but these medications have not been widely covered throughout the program’s history. Furthermore, HIV-infected individuals’ state residence affects their coverage for SUD treatment, which may impact health outcomes. Increased availability of medication-assisted therapies through ADAP could facilitate integrated HIV and SUD care. Integrating these medical services will be necessary to meet the National HIV/AIDS Strategy’s goals to increase access to care, improve health outcomes, and reduce new infections.

Implications for Policy, Delivery, or Practice: Although there are clinical and policy recommendations for integrated SUD and HIV treatment, payment issues including complex funding streams are a barrier. Our results reveal a large disconnect between clinical guidelines and program decisions, as well as large disparities across states. Reviewing the availability of medication-assisted therapies to treat SUD on public formularies is important for understanding structural barriers to treatment, and identifying geographic inequities in access to treatment.

Funding Source(s): RWJF

Collaborative Chronic Care Models: Review and Meta-Analysis to Guide Research and Policy

Christopher Miller, VA Boston Healthcare System; Mark Bauer, MD, VA Boston Healthcare System

Presentation: Christopher Miller, Ph.D., Psychology Postdoctoral Fellow, Center for Organization, Leadership, and Management Research, VA Boston Healthcare System, christopher.miller8@va.gov

Research Objective: Collaborative chronic care models (CCMs) improve outcome in chronic medical illnesses and depression treated in primary care. Through a systematic review, meta-analysis, and meta-regression, we aimed to extend this work by investigating the utility of CCMs for several
outcome domains across mental health conditions.

**Study Design:** Study Design: Through systematic review, randomized controlled trials (RCTs) of CCMs versus other care delivery models were identified via an extensive literature search. CCMs were defined a priori as interventions with at least three of the six elements identified in Improving Chronic Illness Care: patient self-management support, clinical information systems, delivery system redesign, decision support, organizational support, and community resource linkages. Data extraction included population/setting factors, trial implementation characteristics, intermediate clinical processes, mental health symptoms, quality of life, social role function, and cost. Follow-up analyses on depression and QOL were subjected to cumulative meta-analysis and meta-regression.

**Population Studied:** Population Studied: Data were extracted from 57 trials (161 total analyses) reported in over 70 peer-reviewed articles. Trials were conducted in a variety of different types of clinics and healthcare systems, and were also diverse at the patient level in terms of common demographic variables such as age, gender, and ethnic minority status.

**Principal Findings:** Principal Findings: Metanalysis indicated significant overall effects across disorders and care settings in depression, mental and physical quality of life, and social role function (d=0.20-0.33). Total healthcare costs did not differ from controls conditions. Cumulative meta-analyses indicated that effect sizes favoring CCM for outcome domains of depression, mental quality of life (QOL), and physical QOL have stabilized. Four of six CCM elements (patient self-management support, clinical information systems, system redesign, and provider decision support) were common among reviewed RCTs, while the remaining two elements (healthcare organization support in the context of community resource linkages) were rare. Meta-regression indicated that a single CCM element was statistically associated with the success of the model, and meta-regression did not identify specific factors associated with CCM effectiveness. Nonetheless, results within individual trials suggest that CCMs may be most effective for patients with at least moderately severe symptoms.

**Conclusions:** Conclusions: CCMs can improve mental and physical outcome for individuals with various mental disorders across a wide variety of care settings, with effects derived primarily from four original CCM elements.

**Implications for Policy, Delivery, or Practice:** Implications for Policy, Delivery or Practice: CCM effect sizes for major outcome domains have stabilized. Indicate that the CCM framework is robust and broadly applicable across settings and across mental health diagnoses. Despite the scant attention paid to healthcare organization support in the context of RCTs, implementing and sustaining this established model will likely require this CCM element. While CCMs have typically been tested as population-based interventions, evidence supports stepped care application to patients with more severe illness. Future priorities include developing implementation strategies to support adoption and sustainability of the model, and maximizing fit of this multi-component framework to fit the local environment.

**Funding Source(s):** VA

**Poster Session and Number:** B, #597

**Opioid-Related Emergency Department Visits and Hospital Admissions in Maryland**

Patience Moyo, University of Maryland Baltimore; Ting-Ying Huang BSPharm, University of Maryland Baltimore; Yu-Jung Jenny Wei PhD, University of Maryland Baltimore; Linda Simoni-Wastila PhD, University of Maryland Baltimore; Jeanne Yang MCP, University of Maryland Baltimore; Corinne Woods MPH RPh, University of Maryland Baltimore

**Presenter:** Patience Moyo, B.A., Graduate Student, Pharmaceutical Health Services Research, University of Maryland Baltimore, pmoyo@umaryland.edu

**Research Objective:** Drug abuse is a major public health concern in the United States. While the use of heroin and other illicit drugs remains problematic, the misuse and abuse of prescription opioids drives much of the recent increase in fatal and non-fatal drug poisonings and overdoses. According to the Centers for Disease Control and Prevention, nearly 75% of prescription drug overdoses are caused by opioids. Opioid use, whether for medically-indicated or recreational purposes, can lead to adverse consequences that result in emergency department (ED) visits or hospitalization. The objective of this study is to examine the prevalence and trends of opioid-related ED visits.
and hospital admissions across the state of Maryland.

**Study Design:** We examined county-level changes in opioid-related hospital admissions using Maryland Health Services Cost Review Commission (HSCRC) data. Opioid-related visits constituted diagnoses of accidental opioid poisoning, opioid dependence, and nondependent opioid abuse identified using International Classification of Diseases, ninth revision [ICD-9-CM] codes 304.0, 304.7, 305.5, 305.6, E850.0-E850.2. Both prescription and illicit opioids, including heroin, were captured. The results were expressed as opioid-related visits as a proportion of: (1) all visits and (2) all substance-related visits. Substances in substance-related hospital and ED visits included alcohol, cocaine, cannabis, and amphetamines. Geographic information system software (ArcMap) was used to map the changes in the frequency of ED visits and hospitalizations at the county level.

**Population Studied:** Patients who were admitted at least once to the hospital or at least one ED visit at any one of at least 49 hospitals in Maryland.

**Principal Findings:** In 2010, Maryland experienced 1,983,961 total ED visits and 696,463 total hospital admissions. The proportion of ED visits involving any substance was 1.6%; 0.4% of all ED visits were opioid-related. The proportion of hospitalizations that were substance-related was 7.3%, and 3.4% were opioid-related. Opioids comprised a considerable proportion of substance-related hospitalizations (46.2%) and ED visits (26.9%). The majority of patients admitted to the hospital with an opioid-related diagnosis were male (nearly 60%), middle age (mean age=43 years), and nearly equal proportions were white and black. Analysis of the 24 jurisdictions in Maryland in 2010 revealed 19 had increased proportions of opioid-related hospital admissions from 2009. Counties in the Eastern Shore experienced both the greatest increases (1.2% in both Queen Anne’s and Kent) and reductions (-0.34% in Wicomico and -0.21% in Talbot) of opioid-related hospital admissions between 2009 and 2010.

**Conclusions:** In Maryland, opioid analgesics were frequently implicated in both emergency department and hospital admissions. Opioid poisoning, abuse, and/or dependence accounted for 3.4% of all substance-related hospital admissions, and 0.4% of all substance-related ED visits.

**Implications for Policy, Delivery, or Practice:** Opioid-related intoxications are becoming more common among substance-related diagnosis. As such, it is essential for the state to develop strategies to curb opioid abuse and misuse, and to expand resources for substance abuse monitoring, prevention, and treatment.

**Funding Source(s):** Other, Maryland State Epidemiological Outcomes Workgroup and DHMH

**Poster Session and Number:** B, #598

**What Is It Like to Be a Young Adult Living with HIV/AIDS in Uganda?**
Pamela Mukaire, Loma Linda University School of Public Health

**Presenter:** Pamela Mukaire, MEd, MPH, Student, Health Promotion & Education, Loma Linda University School of Public Health, pmukaire@llu.edu

**Research Objective:** The study aimed to describe the challenges of young adults living with HIV/AIDS, and to explore recommendations from them for management of HIV infection and prevention of further transmission of the disease.

**Study Design:** Using in-depth interviews, this cross-sectional narrative inquiry was organized around experiences of HIV infection, disclosure, social support, self care, sexuality and transmission prevention. Recruitment utilized flyers and poster at treatment centers and radio announcements in low literacy villages.

**Population Studied:** Nine young adults aged 18 to 24 from three urban and rural districts were interviewed; male and female, with heterosexual and vertically acquired HIV, in school and out of school, single and in unions with HIV negative and positive children, in good and poor health with the most reported health ailments of malaria and cough.

**Principal Findings:** Gender, age, being an orphan, intergeneration adult AIDS death, intergenerational poverty and food insecurity played a decisive role in vulnerability to contracting and spreading HIV/AIDS. Vertical infected youth experienced more debilitating emotional problems to include suicide ideation or attempts, isolation and challenges socializing or envisioning a “normal” future. Horizontally infected youth reported an unwillingness or readiness to disclose status to sexual partners. Some knowingly engaged in
unprotected sex without disclosure, but later proposed and encouraged couple HIV testing to their sexual partners. Almost all parenting youth gave up primary care giving of their infants to their parents and relatives as a measure of reducing the risk of mother-to-child transmission. Some females struggled with the demands of pregnancy and compromised health to meet socio-cultural expectations of child bearing. Youth reported lack of (a) gainful employment; (b) privacy at free antiretroviral treatment facilities as a major barrier to utilization of health services, (c) formalized social support for rural youth leading to increased isolation, hopelessness, and use of sex as a means of economic survival, (d) food and fluid complicating antiretroviral drug adherence, and (e) self-efficacy to consistently negotiate condom use.

**Conclusions:** HIV/AIDS lived experience needs to be conceptualized as a developmental and social process with new emerging roles and identities. A combination of preventive knowledge, socio-economic and food resource programs is essential to meet basic survival needs that significantly influence impoverished youth’s behavior change and health outcomes.

**Implications for Policy, Delivery, or Practice:** HIV treatment and care programs need to integrate the identification of work opportunities, and provision of skills training for income generating opportunities in their preventive care services. Integrate developmentally appropriate multiple supports to address mental health challenges for HIV infected youth and their families. Social, economic, nutritional and psychological support need to be matched to individual needs (single vs. parenting youth, rural vs. urban youth, vertically infected vs. sexually infected youth)

Health professionals need to empower and provide support to improve timely beneficial disclosure and partner notification, and testing and counseling to prevent HIV infection and to increase partner’s timely access to treatment, care and support. ART centers need to routinely screening for and preventing malaria as a dual health burden co-infection in Uganda is important to improve the quality of life of these youth.

**Funding Source(s):** No Funding

**Poster Session and Number:** B, #599

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**From Roadblocks to Roadmaps: Reimbursement Strategies for Integrated Mental Health Services in Primary Care**

Allison O’Donnell, MPH, VA Ann Arbor Center for Clinical Management Research; Kristina Nord, VA Ann Arbor Center for Clinical Management Research/Department of Psychiatry, University of Michigan; Mark Williams, MD, Integrated Behavioral Health, Mayo Clinic; Amy Kilbourne, PhD, MPH, VA Health Services Research & Development (HSR&D), Quality Enhancement Research Initiative/Department of Psychiatry, University of Michigan

**Presenter:** Kristina Nord, M.S.W., Project Manager, VA Ann Arbor Center for Clinical Management Research/Department of Psychiatry, University of Michigan, kmnord@umich.edu

**Research Objective:** Interventions such as the Chronic Care Model (CCM) have shown to improve both medical and psychiatric outcomes in primary care settings in individuals with mental disorders, but have not been widely implemented. We explore challenges and opportunities for reimbursement under the current fee-for-service system and present a reimbursement roadmap for CCM in primary care settings.

**Study Design:** Review of current literature and regulatory guidelines

**Population Studied:** Health care professionals that provide mental health services in primary care

**Principal Findings:** A key barrier for CCMs not being widely implemented is the lack of a reimbursement model that adequately compensates providers for core CCM components. Furthermore, in primary care, CCMs are uniquely challenged by the financial and administrative fragmentation of physical and mental health care. The fee-for-service model (FFS) lends little opportunity for reimbursement and sustainability of CCM components. Components that require ongoing investment over time such as care management are especially difficult to finance. We discuss how DIAMOND (Depression Improvement Across Minnesota, Offering a New Direction) was initiated in response to these challenges.

**Conclusions:** For CCMs to be sustainable and utilized in the future, bundled reimbursement payment models will need to be negotiated between payers and providers. Initiatives under
health care reform may assist in facilitating the uptake of CCMs through bundled payments that emphasize quality over quantity.

**Implications for Policy, Delivery, or Practice:**
Frontline providers as well as clinical managers should be involved in the process of developing a sustainable CCM reimbursement model in the age of health care reform for sustainable integrated care to occur.

**Funding Source(s):** NIH

**Poster Session and Number:** B, #601

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**Hurricane Katrina: Stress, Substance Abuse, and Exercise in Non-Impacted Vulnerable Counties**
Michael Pesko, Weill Cornell Medical College

**Presenter:** Michael Pesko, Ph.D., Instructor Of Public Health, Public Health, Weill Cornell Medical College, mip2037@med.cornell.edu

**Research Objective:** Natural disasters may impact perceptions of risk among individuals living in areas prone to similar catastrophes. This may lead to stress and increased use of healthy and unhealthy stress reduction outlets.

**Study Design:** I use Hurricane Katrina as a natural experiment to study the hurricane’s impact on stress and three stress-reduction outlets, smoking, binge drinking, and exercise, for residents of at-risk communities that were not directly impacted by Hurricane Katrina. Heterogeneity in substance abuse responses by education is explored at an individual level to examine if increases in risk perceptions may have larger impacts for those with less skill in matching subjective and objective risk, or if Hurricane Katrina led to the dissemination of accurate risk information that was previously less known by low-educated individuals. I match geographical and meteorological data of hurricane storm surge and wind damage risks onto data from the Behavioral Risk Factor Surveillance System for years 2004-2006 at the county level. The counties directly impacted by Hurricane Katrina are removed from the analysis, and I confirmed the stability of population trends between treatment groups and the control group of residents residing in areas not impacted by hurricanes.

**Population Studied:** The Behavioral Risk Factor Surveillance System is representative of the United States non-institutionalized adult population.

**Principal Findings:** Using a difference-in-difference analysis, the study demonstrates that following Hurricane Katrina individuals living in counties vulnerable to storm surge experienced increases in stress, smoking, binge drinking, and exercise compared to the control group. Substantial heterogeneity by education is present. Stratified results suggest that low-educated individuals experienced stress increases that were larger than for the full population. Exercise in the population of low-educated individuals increased proportionately to stress, but substance abuse increased by twice as much. Education, rather than income, accounts for these differences. Results are robust to using placebo outcome variables of having health insurance and having a primary physician. Results are also robust to alternative definitions of at-risk areas.

**Conclusions:** These results suggest that Hurricane Katrina increased perceptions of hurricane risks and, in turn, led to increases in stress and the use of stress-reduction outlets. Education plays a role in both tempering increases in stress and in promoting healthy stress reduction outlets in vulnerable areas following natural disasters.

**Implications for Policy, Delivery, or Practice:** Public health officials and medical providers should be aware that sudden changes in risk perception can increase substance abuse, even far away from the disaster. Increased screening for substance abuse may be warranted in the aftermath of large-scale natural disasters. Additionally, greater dissemination of accurate hurricane risk information, particularly to low-educated individuals, before disasters strike may help to prevent sudden changes in risk perception that have harmful secondary consequences.

**Funding Source(s):** No Funding

**Poster Session and Number:** B, #602

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**Psychiatric Boarding in U.S. Emergency Departments**
Stephen Pitts, Emory University; Marc M. Gautreau MD, MBA, University of Massachusetts Medical School; Frances L. Vaughn Ph.D., Emergency Care Coordination Center, Assistant Secretary for Preparedness and Response

**Presenter:** Stephen Pitts, M.D.,M.P.H., Associate Professor, Emergency Medicine, Emory University, srpitts@emory.edu

**Research Objective:** Although emergency department (ED) boarding of admitted patients is
recognized as the most important cause of ED crowding, it is not known to what extent the historic national decline in psychiatric treatment capacity contributes to this. Nevertheless, reporting of median psychiatric boarding times has become a formal Centers for Medicare and Medicaid Services (CMS) throughput measure (CQM ED-2 NQF 0497). There has been no national accounting of the burden of ED psychiatric care in the last decade, but emergency department crowding continues to grow to the breaking point in many communities. We sought to determine the extent of boarding among psychiatric ED visits nationally.

**Study Design:** We measured association by means of cross-tabulation (Rao and Scott modification for complex sampling) and used survey regression for multi-variable analyses in these serial cross-sectional samples. Trends are given as the regression coefficient on the variable “survey year” taken as a continuous variable.

**Population Studied:** The National Hospital Ambulatory Medical Care Survey (NHAMCS) is a nationally representative annual survey of ED visits. We defined psychiatric visits using a combination of diagnostic and cause-of-injury codes as described in a previous study

**Principal Findings:** During the study interval (2001-2008) there were 6.5 million psychiatric-related ED visits (PREDV) annually, or 5.6 percent of all visits (95% CI 5.4 to 5.8). There was a 1.2% annual increase in the odds of PREDV (p-value 0.051). In multivariable analysis the odds of PREDV was higher among whites, males, age group 25-45, Medicare, Medicaid, uninsured payer status, and urban location; and less likely among blacks, the U.S. South, and privately insured persons. The overall geometric mean length-of-visit was higher for PREDV (199 minutes) than non-PREDV (135 minutes), a difference of 39 percent (95% CI 36 to 42). There was a 2.2 percent annual increase in the length of visit for PREDV, but this did not differ significantly from a 2.6 percent increase in the length of other visits. But the difference in median length-of-visit was much higher for psychiatric visits requiring transfer in urban EDs (323 minutes) than either non-psychiatric transfers (210 minutes) or psychiatric hospitalizations (267 minutes).

**Conclusions:** Although psychiatric visits continue to account for a large proportion of all ED visits nationally, the increasing trend in visits noted before 2000 in a previous publication has abated. Psychiatric boarding is not a unique problem when patients are admitted: they board the same amount of time as non-psychiatric patients. Excessive psychiatric boarding occurs exclusively in patients who are transferred to another facility.

**Implications for Policy, Delivery, or Practice:** Current CMS throughput measures apply to boarding intervals for admitted patients, but our analysis suggests that transfers from hospital EDs to psychiatric facilities may account for much more delay, and should also be included in this throughput measure.

**Funding Source(s):** Other, HHS/ASPR/OPEO/ECCC

**Poster Session and Number:** B, #603

**Perceived Efficacy in Patient-Physician Interactions and Diabetes Control**

Haiyan Qu, University of Alabama at Birmingham; Richard Shewchuk, University of Alabama at Birmingham

**Presenter:** Haiyan Qu, Ph.D., Assistant Professor, Health Services Administration, University of Alabama at Birmingham, hyqu@uab.edu

**Research Objective:** The goal of this study is to identify profiles of confidence in interaction with physicians based on patients’ responses to the 5-item perceived efficacy in patient-physician interactions (PEPPI) scale.

**Study Design:** An interview survey was conducted with patients who were recruited in a community-based peer support program for patients with type 2 diabetes in rural Alabama in 2010. A Model-based cluster analysis was conducted to model the unobserved heterogeneity in confidence based on patterns of patients’ responses to the following five questions: How confident are you in your ability: 1) to know what questions to ask a doctor, 2) to get a doctor to answer all of your questions, 3) to make the most of your visits with your doctors, 4) to get a doctor to take your chief health concern seriously, and 5) to get a doctor to do something about your chief health concern. These items were measured using a 10-point Likert scale (1 = not at all confident to 10 = extremely confident).

**Population Studied:** Patients (n=420) aged from 24 to 89 years with a mean age of 59.6, 75.7% were females, 86.9% were Black, 58.1% achieved, at best, high school education, 68.6% reported annual household income less than $30,000. On average, their HbA1c was 8.0%
and BMI was 36.3kg/m2. About 39.1% patients used insulin therapy.

**Principal Findings:** Respondents were categorized as belonging to one of three classes based on Bayesian posterior probabilities estimates. Class 1, a highly confident class, included 181 patients (43.0%). Patients in this class reported consistently high levels of confidence with all facets of PEPPPI (9.57-9.98). Patients in this class had on average, statistically lower HbA1c (7.5%) than patients in the other classes. Approximately 81% were female and 30% reported annual incomes of $30,000 or more, and 34% patients used insulin therapy.

There were 179 patients (42.7%) assigned to Class 2, a moderately confident class. Patients in this class reported moderately levels of confidence for all indicators of PEPPPI (8.1 to 8.6).

Patients in Class 2 were on average more affluent (38% reported annual incomes of $30,000 or more), and more likely to be male (31%) than patients assigned to the other classes. The average HbA1c was 8.3%.

Sixty patients (14.3%) were assigned to Class 3, a highly unconfident class. In contrast to patients in Class 1, patients in this class reported consistently low levels of confidence for all indicators of PEPPPI (4.02 to 4.98). Patients in this class had on average, higher HbA1c (8.3%), than patients in the highly confident class (Class 1). Patients in Class 3 were on average poorer (only 16% reported annual incomes of $30,000 or more), and more likely to be insulin therapy users (50%) than patients assigned to the other classes.

**Conclusions:** Patients’ perceived efficacy in patient-physician interactions may influence patients communicating effectively with their physicians about diabetes treatment.

**Implications for Policy, Delivery, or Practice:** A significant variation across classes was observed in terms of patient perceptions about confidence in communication with physicians. A patient-centered tailored program needs to be developed for patients with type 2 diabetes to help them improve communication skills with their physicians.

**Funding Source(s):** N/A

**Poster Session and Number:** B, #604

**Health Plans’ Use of Technology to Improve Quality of Behavioral Health Care**

Constance Horgan, Brandeis University; Amity Quinn, Brandeis University; Sharon Reif, Brandeis University; Deborah Garnick, Brandeis University; Elizabeth Merrick, Brandeis University; Dominic Hodgkin, Brandeis University; Maureen Stewart, Brandeis University; Amity Quinn, Brandeis University; Timothy Creedon, Brandeis University

**Presenter:** Amity Quinn, MA, PhD Student, Institute for Behavioral Health, Brandeis University, amity@brandeis.edu

**Research Objective:** Health information technology (HIT) is a strategy that private health plans may use at the system, provider, and patient levels to improve the quality of behavioral health care. Health plans may use HIT in their interactions with managed behavioral health organizations, providers, and patients to collect, manage, and exchange financial and clinical information. One objective of this survey of private health plans is to examine health plans’ HIT policies and activities.

**Study Design:** We present findings from the third round of the Brandeis Health Plan Survey on Alcohol, Drug and Mental Health Services, an in-depth survey of the delivery and management of substance abuse and mental health services in commercial health plans conducted in 2010. Each plan was asked about its top three commercial products. The survey addressed administrative and clinical issues, including how health plans utilize HIT in their interactions with specialty behavioral health care entities, providers, and patients. We conducted univariate and bivariate analyses; data are weighted to present national estimates.

**Population Studied:** The 2010 survey was conducted in 60 market areas. A total of 389 commercial health plans reported on 939 products. The response rate was 89 percent.

**Principal Findings:** Health plans that utilized their own specialty behavioral health organization for delivery and management of behavioral health services were generally more likely to use HIT at the system, provider, and patient levels than health plans that did not use a specialty behavioral health organization and those that used one owned by a separate company. Among health plans that use a specialty behavioral health organization owned by a separate company, 4 percent exchanged claims information with the specialty behavioral health entity using a common data system. Twenty-six percent of products reported providing financial support for electronic health records as a way to attract and retain behavioral health professionals.
behavioral health treatment within 7 days of
Less than 50 percent of these patients receive
settings with diagnoses of deliberate self
delivered emergency departments or inpatient
people were discharged from U.S. c

Research Objective:

Funding Source(s):

Poster Session and Number: B, #605

The Cost-Effectiveness of Providing Transitional Care Services to Individuals with Suicidal Ideation or Deliberate Self-Harm
John Richardson, Truven Health Analytics; Tami L. Mark, Truven Health Analytics; Richard McKeon, Substance Abuse and Mental Health Services Administration

Presenter: John Richardson, M.P.H., Senior Analyst, Truven Health Analytics, john.richardson@truvehealth.com

Research Objective: In 2009, over 1.3 million people were discharged from U.S. community hospital emergency departments or inpatient settings with diagnoses of deliberate self-harm or suicidal ideation. Less than 50 percent of these patients receive behavioral health treatment within 7 days of discharge from the hospital. The low rate of follow-up is stunning in light of the well-established fact that the period immediately following discharge for a suicide attempt is a time of greatly heightened risk for a subsequent suicide attempt. The goal of this study was to model costs and economic benefits of care transitions for persons at risk for suicide who were admitted to hospitals or emergency rooms, to determine which interventions are most cost effective.

Study Design: We created a model that compares the costs of providing transitional care services and the resulting increase in follow-up treatment to the savings that come from a decrease in readmission rates. We gathered inputs on the annual number of ED visits and hospital discharges where an individual was diagnosed with suicidal ideation or deliberate self-harm using the 2009 Healthcare Cost and Utilization Project (HCUP) Nationwide Emergency Department Sample (NEDS). We used the 2006-2010 Truven Health MarketScan Commercial Claims and Encounters Database and the Truven Health Multi-State Medicaid Database to estimate the baseline rate of follow-up treatment, the cost of follow-up treatment, and the percentage and cost of readmissions.

We estimated the reduction in readmission rates and the effectiveness of transitional care services from the literature. A sensitivity analysis was carried out to identify the inputs that had a large impact on the return on investment calculation. The model is currently being updated with actual cost and effectiveness information from the National Suicide Prevention Lifeline programs.

Population Studied: Individuals with private insurance or Medicaid who had an ED visit or hospital stay related to suicide or self-harm.

Principal Findings: The sensitivity analyses reveal that care transition intervention costs are a key determinant of whether the intervention will result in savings or minimal expenditures, with $93 as the break-even point under our baseline assumptions for Medicaid. Another key model input is the likelihood of readmission. Under baseline assumptions for the Medicaid population, the break-even point occurs when 14% or more of the population is readmitted.

Conclusions: The model suggests that one way to improve the cost effectiveness of care transitions may be to focus on relative low cost care transition models and on patients at highest risk of another suicide attempt.
Implications for Policy, Delivery, or Practice:
In an increasingly constrained fiscal health care environment, using empirical models to demonstrate the most cost-effective ways to reduce suicides by improving care transitions may be critical to more widespread adoption of post-discharge interventions to reduce suicide and readmission costs. Current quality and financing reforms provide an opportunity to enhance the transitions of care for those with suicidal ideation or deliberated self-harm.
Funding Source(s): Other, SAMHSA
Poster Session and Number: B, #606

Black, White, Green and Gray: Michigan’s Medical Marijuana Policy and the Impacts on Users
Juliette Roddy, University of Michigan, Dearborn; Paul J. Draus, University of Michigan Dearborn

Presenter: Juliette Roddy, Ph.D., Associate Professor, Social Sciences, University of Michigan, Dearborn, jroddy@umich.edu

Research Objective: In March of 2008, Michigan joined 16 other states in allowing for medical use of marijuana. Implementation of the laws allowing for legal use has been erratic and inconsistent across the state, with dispensaries declared illegal businesses in 2011 by the Michigan Supreme Court, and marijuana users in different environments and social groups report varied effects of the law on their use. This research reports the effects of Michigan’s Medical Marijuana laws on urban minority users within the city of Detroit, most consuming illegally.
Study Design: Responses on historical consumption as well as current drug seeking, purchasing and use are reported for 38 (on-going) users using an adapted version of the Marijuana Smoking History Questionnaire (Bonn-Miller and Zvolensky, 2005). Qualitative interviews focus on participants’ self reported assessment of changes in patterns of seeking, purchasing and use following the passage of the medical marijuana laws, including their choice of dealers, availability of different varieties of marijuana, and preferences concerning the places where they buy/use or the people they buy from or use with
Principal Findings: These findings are compared to existing research on legal marijuana purchasing (Aggarwal, in press), heroin purchasing (Roddy and Greenwald, 2009; Roddy, Steinmiller and Greenwald, 2011) and crack (Roddy and Draus, working paper). Illegal marijuana purchasing is quick and local compared to legal purchasing. Less polydrug use, including alcohol, is reported in this sample than in previously reported crack and heroin samples.
Conclusions: The characterization of the urban minority marijuana user has been defined by this sample. The population reports increased access to marijuana, with ‘medical marijuana’ appearing in the street markets. We predict that future research (on-going) will show a marked difference between these illegal urban smokers and the legal white suburban counterparts. The project also has plans to characterize suburban legal minority users and urban majority illegal users.
Implications for Policy, Delivery, or Practice: Michigan’s policy of allowing for medical use without allowing for dispensary purchasing has increased illegal street sales of marijuana. In addition, it has put urban minorities at increased risk for criminal prosecution.
Funding Source(s): N/A, University of Michigan Dearborn Campus Grant
Poster Session and Number: B, #607

Differences in the Impact of Point of Care Health Assessment across Diverse Primary Care Settings
Hector Rodriguez, UCLA Fielding School of Public Health; Beth A. Glenn, UCLA Fielding School of Public Health; Tanya Olmos, UCLA Fielding School of Public Health; Dylan H. Roby, UCLA Fielding School of Public Health; Roshan Bastani, UCLA Fielding School of Public Health

Presenter: Hector Rodriguez, Ph.D.,M.P.H., Associate Professor, Department of Health Policy and Management, UCLA Fielding School of Public Health, hrod@ucla.edu

Research Objective: Primary care clinicians are challenged with addressing adult patients’ multiple behavioral health issues during 15-minute office visits. The problem may be especially acute in federally-qualified health centers (FQHCs) compared to higher-resource settings. We compare the total number of problem health behaviors and patient reports of clinical discussions across FQHCs, practice-based research network (PBRN) practices, and...
VA primary care practices enrolled in a NIH-funded study.

**Study Design:** Health assessments were administered in 9 primary care practices. The assessment included health behavior and psychological status domains: Perceived Health, Anxiety and Depression, Stress, Sleep Quality, Tobacco Use, Risky Drinking, Substance Use, Diet/Nutrition, Physical Activity. Completed assessments (n=463) were available to clinicians during clinical encounters and clinicians were encouraged to discuss results with patients. Research staff conducted follow-up surveys (n=409) to assess patient-clinician discussions. Using published cutpoints for “positive screens,” we calculated the proportion of respondents who would qualify for primary care intervention for each domain. To examine how problem health behaviors differed by setting (FQHC vs. PBRN vs. VA), we specified multilevel regression models predicting the total number of positive screens per patient. These models accounted for patient-clustering within sites using site random effects and controlled for patient age, sex, marital status, educational attainment, employment, U.S.-nativity. We also examined how each domain differed by setting in adjusted random effects logit models and the extent to which patients’ experiences of the clinician encounter was similar across settings.

**Population Studied:** 463 adult patients receiving non-urgent care during the 1-3 week implementation period.

**Principal Findings:** The median total number of positive screens per patient was similar across FQHCs (3.7-positives, SD=1.8), PBRN practices (3.8-positives, SD=1.9), and the VA clinic (4.1-positives, SD=2.0). The most common problem health behaviors were similarly ranked across settings, but a higher proportion of VA patients reported high-stress, problem alcohol use, smoking, smokeless tobacco use, depression, and drug use compared to FQHC and PBRN patients. FQHC patients were more likely to report “fair” or “poor” health status. In multivariate random effects models accounting for patient sociodemographic characteristics, differences in problem areas between settings were largely attenuated. FQHC patients were more likely to screen positive for low fruit/vegetable consumption (p<0.05) and problem alcohol use (p<0.05). VA patients were more likely to screen positive for high-stress (p<0.05). FQHC patients, however, were less likely to report that their clinician shared results from the assessment (53.7% vs. 67.7%, p<0.05), asked about their concerns with results (46.7% vs. 67.0%, p<0.01), asked which concerns they would like to work on (48.7% vs. 81.3%, p<0.001), helped identify steps to address concerns (64.6 vs. 85.6, p<0.001). There were no differences in the use of the assessment during the clinical encounter between PBRN and VA practices.

**Conclusions:** The sociodemographic profiles of FQHC and VA patients explain most differences in problem health behaviors across settings. FQHC patients were less likely to report that their clinician reviewed results or provided guidance for goal-setting for health behavior change.

**Implications for Policy, Delivery, or Practice:** Facilitating patient-clinician discussions about health behaviors appears to be most challenging in resource-constrained FQHCs, a challenge that will likely intensify as health care reform unfolds.

**Funding Source(s):** NIH

**Poster Session and Number:** B, #608

**Medicare and Medicaid Cost and Utilization for Medicare and Medicaid Enrollees with Schizophrenia**

Michelle Roozeboom, General Dynamics Information Technology; Kathy Schneider, General Dynamics Information Technology

**Presenter:** Michelle Roozeboom, Ph.D., Senior Analytics Manager, General Dynamics Information Technology, michelle.roozeboom@vangent.com

**Research Objective:** Medicare and Medicaid cost and utilization is higher for individuals identified as having a physical or mental health condition, compared to those without any chronic conditions. Linkage of Medicare and Medicaid data allows for accurate evaluation of cost and utilization of dual eligible beneficiaries, and enables comparisons to individuals who only receive Medicare coverage and individuals who only receive Medicaid coverage. Combined Medicare and Medicaid data available in the Medicare Medicaid Linked Enrollee Analytic Data Source (MMLEADS) from the Chronic Condition Data Warehouse (CCW), allows for research of physical and mental health conditions, eligibility, enrollment, cost and utilization for individuals enrolled in either Medicare or Medicaid. MMLEADS is a suite of annual person-level and service-level analytic files designed to serve as a tool for improving...
the care for Medicare and Medicaid enrollees. A Conditions Data File provides information for the 27 CCW conditions, and for nine mental health and tobacco use clinical conditions developed specifically to enhance research of the Medicare-Medicaid population. The MMLEADS files do not contain information for the Medicaid-only non-disabled population (largely consisting of women and children).

The objective was to highlight some key features of this new data product, and use the data to evaluate cost and utilization for Medicare and Medicaid enrolled individuals identified as having schizophrenia compared to individuals without the condition.

**Study Design:** The 2008 MMLEADS was used for identification of individuals with schizophrenia, classification of Medicare-Medicaid enrollment status (MME type), and calculation of cost and utilization statistics. Analyses were limited to individuals identified as either Medicare full fee for service (FFS) or Medicaid FFS based MME type due to limitations of managed care data available in the MMLEADS.

**Population Studied:** The study population consisted of 53,378,728 individuals who were identified as either Medicare only (n=38,888,163), Medicare-Medicaid eligible (n=8,961,728), or Medicaid only with a disability (n=5,529,059).

**Principal Findings:** Approximately twelve percent of the Medicare-Medicaid eligible population is identified as having schizophrenia (11.98%) compared to 9.1% of Medicaid only with a disability, and 1.7% of Medicare only. Per capita payments for individuals with schizophrenia who were enrolled in Medicaid only were $35,390 compared to $17,688 for those without the condition. Medicare-Medicaid eligible individuals with schizophrenia had total per capita payments of $50,549 ($25,246 Medicare and $25,303 Medicaid) compared to $28,471 ($15,326 Medicare and $13,145) for those without the condition; and Medicare only individuals with schizophrenia had Medicare per capita payments of $26,167 compared to $7,615 for those without the condition. Medicare-Medicaid eligible individuals with schizophrenia had 659 hospital admissions per 1,000 beneficiaries compared to 412 for individuals without schizophrenia.

**Conclusions:** The use of the MMLEADS allows for efficient analysis of Medicare and Medicaid cost and utilization for individuals with mental health conditions. These individuals have high cost and utilization compared to individuals with similar eligibility without a mental health condition. A biased understanding of utilization for dually enrolled people is obtained if using only Medicare or only Medicaid data. Examination of high-cost or high-use conditions for Medicare and Medicaid enrollees should consider data from both programs to obtain a complete and accurate assessment.

**Implications for Policy, Delivery, or Practice:** Interventions designed to reconfigure care for people with mental health conditions may reduce hospital admissions and reduce cost.

**Funding Source(s):** CMS

**Poster Session and Number:** B, #609

**The Use of Behavioral Health Quality Measures by State Agencies and Implications for Health Care Reform**

Julie Seibert, Truven Health Analytics

**Presenter:** Julie Seibert, Ph.D., Research Leader, ACRS, Truven Health Analytics, julie.seibert@truvenhealth.com

**Research Objective:** A key feature of the Affordable Care Act is the requirement of a National Quality Strategy to “improve the delivery of health care services, patient health outcomes, and population health.” This three-part aim is of particular importance for individuals who require behavioral health services. However, historically, the quality improvement infrastructure for behavioral health care has been less well developed than that of general health care. This is due, in part, to lack of funding, lack of established clinical databases and lack of relevant standardized quality measurement tools that can be easily adopted and implemented by State agencies. However, due to anticipation of health care reform and the increase in managed behavioral health care, many states are developing and adopting behavioral health care quality measures. This study aims to ascertain what quality measures state agencies funding behavioral health services are using and what measures are agencies adopting that go beyond what is currently required by the National Committee for Quality Assurance (NCQA).

**Study Design:** In order to determine what states are reporting on the quality of behavioral health care, we accessed all of the state mental health agency web sites as cataloged by the National Association of State Mental Health Program Directors Research Institute. We then
looked for quality indicators by searching under sections labeled “reports”, “publications”, “data” or “special projects”. We then searched for state Medicaid managed care contracts, quality strategies, and other quality documents to review. We used the terms “Medicaid managed care contract”, “quality strategy”, and “behavioral health quality indicators” preceded by specific state names. We initially focused on states that were known to have behavioral health Medicaid managed care programs, but subsequently added the remaining states in order to capture indicators that were not specific to managed care.

**Population Studied**: The population studied includes documents publicly provided by state mental health agencies and state Medicaid agencies.

**Principal Findings**: A review of the documents we located on the web showed that many state agencies used the HEDIS measures that were specific to behavioral health and a consumer satisfaction survey. Surveys included the Consumer Assessment of Healthcare Providers and Systems (CAHPS) survey, the Mental Health Statistics Improvement Program (MHSIP) Consumer Survey or a locally developed satisfaction survey. Some state agencies supplemented these measures with locally developed measures that relied on administrative data or non-administrative data such as chart review or state-specific databases such as critical incident or client outcomes reporting databases. Major categories of measures relying on administrative data included financial measures, variations on follow-up services, medication adherence, re-admissions and service utilization. Hybrid measures addressed early intervention and screening, medication reviews and treatment and crisis plan reviews.

**Conclusions**:

**Implications for Policy, Delivery, or Practice**: There continues to be a paucity of behavioral health quality measures used by state agencies outside of NCQA measures. There is a need for additional standardized measures that rely on administrative data as well as non-administrative data. There is a particular need for additional substance abuse measures, as Medicaid expansion will potentially increase the number of individuals requiring substance abuse services.

**Funding Source(s)**: Other, SAMHSA

**Poster Session and Number**: B, #610

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**Social Networks Boost Diabetes Education and Reduce HbA1c and Blood Sugar**

Fadia Shaya, University of Maryland School of Pharmacy; Viktor V. Chirikov, University of Maryland School of Pharmacy; DeLeonardo Howard, University of Maryland School of Pharmacy; Clyde Foster, University of Maryland School of Pharmacy; Soren Snitker, University of Maryland School of Medicine; Julian Costas, Sanofi US; Kathrin Kucharski, Sanofi US; Jeffrey Frimpter, Sanofi US

**Presenter**: Fadia Shaya, Ph.D., M.P.H., Professor; Director Of Research And Outreach Cips, CIPS: Center for Innovative Pharmacy Solutions, University of Maryland School of Pharmacy, fshaya@rx.umaryland.edu

**Research Objective**: The goal of the “Diabetes Peer to Peer (P2P, registered trademark) Study” was to assess the effect of social networks for diabetes information sharing on the improvement of diabetes management in patients with type 2 diabetes in the Baltimore metropolitan area.

**Study Design**: In this prospective cohort study enrolling patients with diabetes, those in the intervention group (P2P) were asked to recruit peers, form small groups, and attend monthly diabetes education sessions, emphasizing peer-support. Patients in the control group were recruited individually to attend standard diabetes education sessions. The primary outcomes were changes in Hemoglobin A1C (HbA1c) and blood glucose. Secondary outcomes included clinical indicators (blood pressure, BMI), functional status, self-efficacy, perceived cohesion, social network connectedness, and diabetes knowledge. Socio-demographics, drug history, and comorbidities were also recorded. Multivariate regression models, finalized after a stepwise selection process, were built to assess mean absolute changes in HbA1c and blood glucose at the first follow-up, at 3 months.

**Population Studied**: Diabetic patients (N=136) recruited from a largely African American population residing in the Baltimore metropolitan area.

**Principal Findings**: Of a total of 136 enrolled, the intervention patients (68) had more metformin use, higher BMI, lower social network scores, and lower diabetes knowledge at baseline. All other baseline characteristics were evenly distributed between arms. At follow-up, P2P patients had a larger reduction in HbA1c (-0.47 vs. -0.31 percent, P=0.17) and blood
participating practices and chi

generated from observations across ten

subsequent visit. Descriptive statistics were
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delivered to patients that were current smokers.

cessation intervention above their baseline rate

small monetary incentive for each additional

their deliver

encourage health care providers to increase

improvement program, Health eQuits, to

Health and Mental Hygiene piloted a pay for

Study Design:

cessation interventions.

Research Objective:

Evaluation

Director

Presenter:

Sarah Shih, M.P.H., Executive

Director, Health Care Quality Information and

Evaluation, New York City Department of Health

and Mental Hygiene, sshih@health.nyc.gov

Research Objective: Evaluate patient smoking

status by characteristics of the patient and

cessation interventions.

Study Design: New York City Department of

Health and Mental Hygiene piloted a pay for

improvement program, Health eQuits, to

courage health care providers to increase
	heir delivery of cessation interventions with

patients who smoke. Providers were offered a

small monetary incentive for each additional

cessation intervention above their baseline rate
delivered to patients that were current smokers.

A smoker who quit was defined as one who

went from current to former smoker on a

subsequent visit. Descriptive statistics were

generated from observations across ten

participating practices and chi-square tests were

used to assess significance between groups by

gender, age, race, the types of insurance and

receipt of cessation interventions. Three types of

cessation interventions were included in this

study: only medication (nicotine replacement

therapy, varenicline or bupropion), only

counseling on the benefits of quitting by health

care provider, or both. Multivariate logistic

regression was used to examine the effect of

smoking cessation interventions.

Population Studied: Patient level data were

collected from October 2009 through March

2012 and de-identified from ten Community

Health Centers (CHCs); all settings had adopted

electronic health records, assisted by the

Primary Care Information Project. Data included

patient demographics and information from

office visits (N=334,768). Smoking status for

patients was documented as Current Smoker,

Former Smoker, or Non-Smoker. The study

included patients ages 18 years or older and

with a recorded smoking status (N= 126,725).

Principal Findings: From patients with a

recorded smoking status, 30 percent were

identified as current smokers, 11 percent as

former smokers and, 59 percent as non-

smokers. A total of 36,779 smokers were

available for analysis. Majority of the smokers

had Medicaid insurance (69.9%) and 31.8%

were Hispanic, 44.4% were black race/ethnicity,

and 54.9% were female. Of the current smokers,

65.6% did not receive any cessation

interventions. Those who received cessation

interventions were more likely to be older (ages

35 – 64), of black ethnicity, and with Medicaid

insurance. Counseling only was the most

common treatment mode (57.4%), followed by

both counseling and medication (23.6%), and

medication only (19.0%). Unadjusted quit rates

by treatment were highest for medication only

(8.44%), followed by both medication and

counseling (7.13%), counseling only (5.11%).

After controlling for patient’s characteristics,
types of insurance and the survey answers of

the smart form, the quit rate for smokers with no

intervention was (5.37%). Patients who received

both medication and counseling were more likely
to quit (OR = 1.86, [1.56, 2.22]) than patients

that received only medication (OR=1.73, [1.44,

2.09]) and non-significant for patients with only

receipt of counseling (OR=1.01, [0.89, 1.16]).

Conclusions: Though the program was

successful in increasing the delivery of cessation

intervention to smokers (from 26.2% to 48.5%),

combined medication and counseling

interventions have a more positive effect on quit
children receiving behavioral health services or under the age of 18 using antipsychotics among those enrolled children for whom there are superior, evidence of efficacy, is driven in part by strong evidence of the adverse effects of antipsychotic use, and mounting evidence that children may be at even greater risk for adverse effects from these medications than adults. Prior authorization may be an effective policy mechanism for reducing the rate of use among children for whom there are superior, evidence based treatment modalities. Despite the increasing interest among state Medicaid programs in interventions to influence the use of antipsychotic medication in children, we are unaware of empirical studies that have examined this issue. The findings from this research is needed to understand the extent to which such policies impact different groups of children that vary either clinically or socio-demographically.

Implications for Policy, Delivery, or Practice: The impact of prior authorization policies on antipsychotic medication use varied by age: Among 6-12 year old children, use of antipsychotic medication decreased by approximately 4% (p<0.01) following the prior authorization policy, while no such effect was observed for children 0-5 years or 13-17 years of age.

Conclusions: Prescription policies affecting children’ receipt of antipsychotics may not have a comparable impact on all children. Future research is needed to understand the extent to which such policies impact different groups of children that vary either clinically or socio-demographically.

Implications for Policy, Delivery, or Practice: The impact of prior authorization policies on adult prescribing has been mixed. Policymakers’ concern about the increased use of antipsychotics in children, particularly among children with disorders for which there is limited evidence of efficacy, is driven in part by strong evidence of the adverse effects of antipsychotic use, and mounting evidence that children may be at even greater risk for adverse effects from these medications than adults. Prior authorization may be an effective policy mechanism for reducing the rate of use among children for whom there are superior, evidence based treatment modalities. Despite the increasing interest among state Medicaid programs in interventions to influence the use of antipsychotic medication in children, we are unaware of empirical studies that have examined this issue. The findings from this
Identifying and Assessing Provider Networks Serving High-Need Individuals with Serious Mental Illness: An Innovative Use of Medicaid Claims
Bradley D. Stein, RAND Corporation; Mark Sorbero, University of Pittsburgh Medical Center, CCBHO; Thomas E. Smith, Columbia University College of Physicians & Surgeons; Michael Cham, Blenderhouse; Sheila Donohue, New York State Office of Mental Health; Carole Taylor, Community Care Behavioral Health Organization; Susan M. Essock, Department of Psychiatry, College of Physicians and Surgeons, Columbia University

Presenter: Mark Sorbero, M.S., Director, Healthcare Analytics, Outcomes and Evaluation Research, University of Pittsburgh Medical Center, CCBHO, mark.sorbero@gmail.com

Research Objective: The objective of this research was to identify professional networks among mental health providers, and explore if rates of being “lost to care” for individuals with serious mental illness vary across these networks.

Study Design: Using methods adopted from social network analysis, administrative data from a quality improvement initiative conducted in a large urban center in 2010 were used to examine the care for 14,128 high-need adults with serious mental illness. Distinct networks depicting connections between providers sharing at least 100 of these individuals with another provider were constructed, and rates of individuals shared by providers who were lost to care were assessed.

Population Studied: We studied Medicaid-enrolled individuals age 18 years and older currently receiving or who had previously received court-mandated outpatient mental health treatment or prison-based mental health services, had recently received Assertive Community Treatment, intensive or supportive case management, or had two or more psychiatric emergency room or inpatient hospitalizations in the prior 12 months. These “high-need” individuals were presumed to be in ongoing need of mental health services.

Principal Findings: Five distinct provider networks serving high need individuals with serious mental illness were identified. The number of provider organizations sharing at least 100 individuals in each network varied from 11 provider organizations in the largest network to 5 in the smallest, as did the average number of individuals shared between providers, which ranged from 256 individuals to 149 individuals. None of the networks were dominated by a single provider, and geographic proximity did not appear to be the primary factor in determining involvement in a network. There was substantial variation across networks and type of provider organization in the rate individuals shared by network providers were identified as being lost to care.

Conclusions: Provider networks serving high need individuals with serious mental illness can be identified with administrative data. The variation in patterns of care that can be identified in such provider networks have the potential to serve as the basis for the development of targeted system level interventions to decrease the likelihood of individuals being lost to care.

Implications for Policy, Delivery, or Practice: These analyses identify provider networks serving high-need populations and patterns of disengagement from care among providers within such networks. They provide a potential system-level tool for policy makers and other stakeholders seeking to target intervention efforts to address this public health challenge. In recent years, there have been increasing calls to use existing information to improve the health care delivery system. Social Network Analysis methods, like the ones employed in this study, have already been demonstrated to illustrate common practice patterns and sharing of information among physical health providers, and may be one approach to using administrative data to provide useful information to providers and regulatory officials struggling to manage the high rates of treatment discontinuation and resultant poor outcomes among individuals with mental health disorders.

Providing Medical Care Management in Mental Health Settings: Lessons and Data from the Bangor Beacon Program
Barbara Sorondo, Eastern Maine Medical Center
**Presenter:** Barbara Sorondo, MD, MBA, Director, Clinical Research Center, Eastern Maine Medical Center, bisorondo@emh.org

**Research Objective:** To evaluate the impact of using medical care management that includes electronic text messaging with patients who have a primary mental health/addiction diagnosis, and one of 4 chronic medical problems (diabetes mellitus, asthma, chronic obstructive pulmonary disease, cardiovascular disease).

**Study Design:** Quasi-experimental cohort analysis comparing patients’ baseline health status and self-report measures (medication adherence, disease management self-efficacy, quality of life, satisfaction with treatment) with their status on these same measures at 6 and 12 months after initiation of care management. Changes in healthcare utilization associated with the initiation of care management was evaluated by comparing the number of emergency/urgent care visits and the number of hospitalizations in the 6 months prior to care management with the number at 6 months post care management.

**Population Studied:** All mental health clients older than 18 years of age, with one of the following concomitant conditions: diabetes mellitus, COPD, CHF or asthma, who agreed to receive medical care management were invited to participate in the study.

**Principal Findings:** Outcome measures collected in this project generally suggested that clients receiving medical care management through their mental health treatment agency improved in the 12 months following enrollment. Improvements in health measures such as blood pressure, LDL cholesterol, and HbA1C were modest but in the desired direction. The most significant improvements were seen in patients’ self-report of perceived health status, medication adherence, and self-efficacy of disease management. The fact that patients perceived themselves as having improved is important in its own right. It may also be that perceived improvement in chronic illness self-management is the first step towards improvement in more biologically based measures of health.

**Conclusions:** This paper summarizes the experience of implementing a medical care management model for people with both a severe mental illness and a chronic health problem.

**Implications for Policy, Delivery, or Practice:** Future efforts to develop medical care management models for mental health patients with chronic illnesses might focus on enhancing tools for identifying and tracking patient groups with targeted chronic disease as part of existing electronic health record systems. Identifying and studying the effectiveness of strategies to enhance client engagement in health management is another area in need of attention. For example, electronic communication strategies for building relationships and improving treatment adherence such as texting treatment reminders or web-based video interactions, may offer cost effective ways to support clients in improving their health status. Study of optimal client:staff ratios for effective medical care management will also be an important and ongoing issue.

**Funding Source(s):** Other, Office of the National Coordinator for Health Information Technology

**Poster Session and Number:** B, #615

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**Integrating Behavioral Health Care into the Patient-Centered Medical Home**

Judith Steinberg, University of Massachusetts Medical School; Megan Burns, M.P.P., Bailit Health Purchasing, LLC; Michael Bailitt, M.B.A., Bailit Health Purchasing, LLC; F. Alexander Blount, EdD, Center for Integrated Primary Care, University of Massachusetts Medical School

**Presenter:** Judith Steinberg, M.D., M.P.H., Deputy Chief Medical Officer, Commonwealth Medicine, University of Massachusetts Medical School, judith.steinberg@umassmed.edu

**Research Objective:** To design an innovative approach to assist primary care practices that are transforming into PCMHs with behavioral health integration through the creation of a practice self-assessment tool and a toolkit for implementation of behavioral health integration elements. The MA PCMH Initiative (MA PCMH) is a statewide, three-year, multi-payer demonstration of PCMH implementation in 45 primary care practices. MA has emphasized the integration of behavioral health and primary care (integrated care) in its PCMH model. Participating practices receive technical assistance in the implementation of integrated care and their progress towards implementation is measured.

**Study Design:** Practice self-assessment of their status of implementation of 39 identified behavioral health integration elements. A set of 39 elements of care integration was developed, starting with previous work by Mountainview
Consulting and organized within 5 domains: (1) Relationship Care and Communication Practices, (2) Patient Care and Population Impact, (3) Community Integration, (4) Care Management, and (5) Clinic System Integration. The elements of integration were translated into a practice self-assessment survey by assigning a scale of integration for each element. Typically, the scale ranged from “rarely” accomplish the particular element of integration to “routinely”. The self-assessment tool was administered using Survey Monkey to the 45 practices in March 2012, as a baseline assessment. Practices were instructed to have the primary care team complete the survey in conjunction with the behavioral health provider with whom they work. Results were compiled and analyzed across all respondents. An online toolkit to support practices’ implementation of each element was developed.

**Population Studied:** The 45 MA PCMH primary care practices include community health centers, large and small private practices and academic medical practices.

**Principal Findings:** The response rate was 96%. Fifty-two percent of responding practices completed the survey as a team. Selected results include: 16% of respondents routinely incorporate smooth hand-offs between primary care and behavioral health providers; 35% routinely screen patients for alcohol use and depression; 70% routinely or sometimes provide referrals to self-help supports in the community; 9% routinely have effectively coordinated integrated treatment plans; and 33% provide same day access for behavioral health visits.

**Conclusions:** This baseline practices self – assessment of integrated care has identified several areas for improvement that inform our technical assistance to the practices and which the practices can use to focus their implementation efforts. The online behavioral health integration toolkit, which provides concrete steps to implementation of the integration elements and links to practice tools, such as templates for integrated care plans, can be a resource to practices. Measurement of progress towards achieving behavioral health integration will be assessed through interval re-administration of the self-assessment tool and through clinical quality measures of integration.

**Implications for Policy, Delivery, or Practice:** Integration of primary care and behavioral health is an important component of PCMHs. Practices need support in implementing integration elements and a method to assess their implementation progress.

**Funding Source(s):** Other, State

**Poster Session and Number:** B, #616

**Using Financial Incentives to Improve Quality of Behavioral Health Care: National Findings on Private Health Plans**

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**Presenter:** Maureen Stewart, Ph.D., Senior Research Associate, Heller School for Social Policy and Management, Brandeis University, mstewart@brandeis.edu

**Research Objective:** As private health plans work to ensure delivery of high value care, the design of payment approaches and financial incentives are tools they can use to improve quality of care and member health. Payments can be designed to provide positive or negative incentives and may be directed at a number of levels including: provider organizations, individual providers, other specialty behavioral health vendors, or health plan members. One objective of this survey of private health plans is to identify payment techniques currently used in behavioral health and examine associated health plan characteristics.

**Study Design:** We present findings from the third round of the Brandeis Health Plan Survey on Alcohol, Drug and Mental Health Services, an in-depth survey of the delivery and management of substance abuse and mental health services in commercial health plans. The telephone survey of executive and medical directors addressed a variety of issues including administrative characteristics of the health plan, provider payment, and use of incentives. We
Prevalence of Mental Illness among VA Primary Care Patients and Relationship to Clinical Outcomes
Ranak Trivedi, University of Washington/VA Puget Sound

Presenter: Ranak Trivedi, Ph.D., Research Assistant Professor/Core Investigator, Department of Health Services/HSR&D Center of Excellence, University of Washington/VA Puget Sound, ranak.trivedi@va.gov

Research Objective: To estimate the prevalence of common mental illnesses among Veterans seen within VA primary care, and examine their associations with patient outcomes.

Study Design: 1-year prospective study

Population Studied: We examined the VA’s corporate data warehouse to identify all Veterans who made at least one face-to-face to a primary care provider during the year prior to implementation of the patient centered medical home model, the Patient Aligned Care Team (PACT). We determined the prevalence and co-occurrence of 5 common psychiatric conditions: depression, post-traumatic stress disorder (PTSD), substance use disorders (SUD), anxiety, and serious mental illness (SMI). SMI consisted of bipolar disorder and schizophrenia.

We considered a Veteran to have a diagnosis of depression, PTSD, anxiety, or SMI if he or she had ≥2 outpatient or ≥1 inpatient diagnosis of the relevant ICD9 codes. A patient was deemed to have SUD if there was ≥1 inpatient or outpatient diagnosis based on ICD9 codes. Multivariate regression models were used to assess associations between presence of psychiatric conditions hospitalization or death during the subsequent year. Covariates included age, co-morbidity, sex, race, visits in primary care mental health integration, and specialty mental health care visits.

Principal Findings: Of 5,169,380 Veterans included, 58% were White, 94% were male, and 59% were married. The prevalence of the 5 mental conditions was: depression (12%), PTSD (8%), SUD (5%), anxiety (4%), and SMI (3%). 29% were diagnosed with 1 of these 5 mental illnesses. 14% had 2 mental illnesses and 3.65% had 3 illnesses. The most common co-occurring mental illnesses were depression and PTSD (3%). Among Veterans with depression, 31% also had PTSD and 17% had SUD. Among Veterans with SMI, 28% also had depression,

Conclusions: Positive financial incentives are commonly used by health plans, but often do not apply to behavioral health conditions. While financial penalties are included in contracts with managed behavioral health organizations, almost no plans report financial penalties for providers or provider organizations.

Implications for Policy, Delivery, or Practice: Payment approaches and associated incentives are key tools for health plans to use to drive delivery of quality care. Financial incentives are not often targeted to specific behavioral health conditions; more attention to these conditions may result in improved quality of care.

Funding Source(s): NIH
23% had SUD and 21% had PTSD. Chronic medical problems were also common among Veterans with mental illness including diabetes (25%), hypertension (50%) and ischemic heart disease (17%). Hospitalizations within 1 year ranged from 14% for patients with PTSD to 24% for those with SUD. One-year mortality ranged from approximately 2% (PTSD) to 3.5% (SUD). After adjustment for covariates, all categories of mental illnesses were associated with greater likelihood of 1 year hospitalizations: PTSD (OR=1.05; 95%CI=1.03, 1.06), depression (OR=1.65; 95%CI=1.63, 1.68), SMI (OR=2.19; 95%CI=2.15, 2.24), anxiety (OR=1.31; 95%CI=1.29, 1.33), and SUD (OR=2.25; 95%CI=2.22, 2.30). PTSD was associated with lower likelihood of mortality within 1 year (OR=.79; 95%CI=.77-.82) whereas depression (OR=1.24; 95%CI=1.21, 1.27), SMI (OR=1.51; 95%CI=1.46, 1.57), anxiety (OR=1.07; 95%CI=1.04, 1.10) and SUD (OR=1.88; 95%CI=1.83, 1.92) were associated with higher odds of death within 1 year.

Conclusions: Mental health conditions are common among Veterans receiving primary care and frequently co-occur. Presence of any of these conditions was associated with a higher risk for hospitalization and all except PTSD was associated with higher risk of mortality.

Implications for Policy, Delivery, or Practice: Primary care is often the first opportunity to treat patients with common mental illnesses. Their association with clinical endpoints such as mortality and hospitalizations provides impetus to integrate psychiatric care within PACT.

Funding Source(s): VA

Poster Session and Number: B, #618

Trends in Buprenorphine and Methadone Sales and Utilization in the United States, 1997-2012

Lydia Turner, Johns Hopkins School of Public Health; Stefan P. Kruszewski, MD, Stefan P. Kruszewski, MD & Associates; Ramin Mojtabai, MD, PhD, Department of Mental Health, Bloomberg School of Public Health; Daniel Webster, ScD, MPH, Department of Health Policy and Management, Johns Hopkins Bloomberg School of Public Health; Suzanne Nesbit, PharmD, Department of Pharmacy, Johns Hopkins Hospital; Randall Stafford, MD, PhD, Stanford University, Program on Prevention Outcomes and Practices; G. Caleb Alexander, MD, MS, Department of Epidemiology, Bloomberg School of Public Health

Research Objective: To characterize trends in ambulatory use and sales of buprenorphine and methadone in the United States.

Study Design: Cross-sectional analyses of buprenorphine and methadone utilization and sales using data from the IMS Health National Disease and Therapeutic Index, a nationally representative survey of ambulatory care (1997-2012), the IMS Health National Prescription Audit, reflecting retail, long-term care and mail-order pharmacy sales (2007-2011), and the IMS Health National Sales Perspective, capturing distribution of products from manufacturers to suppliers (2007-2011).

Population Studied: We used three prescription audits to determine the ambulatory use and sales of buprenorphine and methadone. (1) The IMS Health National Disease and Therapeutic Index provides nationally representative estimates of office-based, patient-care physicians through a two-stage stratified sampling method and samples approximately 4,800 physicians each calendar quarter. (2) The IMS Health National Prescription Audit is an industry standard source of national prescription dispensing activity for all pharmaceutical products. (3) The IMS Health National Sales Perspective, capturing distribution of products from manufacturers to suppliers (2007-2011).

Principal Findings: Between 2003 and 2011, there was a sharp increase in buprenorphine ambulatory treatment visits, with an annual rate of increase of approximately 37%, reaching nearly 2 million treatment visits during 2011. During this period, the proportion of buprenorphine treatment visits accounted for by psychiatrists decreased from 92% to 37%. Two-thirds of 2011 treatment visits were for individuals 20-39 years of age, while 91% of these visits were for drug abuse or dependence and 90% involved the use of combination buprenorphine/naloxone (Suboxone) rather than other buprenorphine products. Between January 2007 and December 2011, there were modest increases in retail pharmacy prescriptions for methadone, from approximately 325 to 375 thousand monthly prescriptions. By contrast, buprenorphine sales increased by an average of 40% annually during this period, from
approximately 0.5 million during the first quarter of 2007 to 2.7 million during the last quarter of 2011. Despite these increases, methadone sales from manufacturers to distributors remained generally steady and four-fold greater than buprenorphine sales.

**Conclusions:** Since 2003, there has been a large increase in buprenorphine utilization. While the impact of increases in buprenorphine use on the epidemic of prescription opioid abuse remains to be examined, the increases reflect a substantial shift in the landscape of opioid dependence treatment.

**Implications for Policy, Delivery, or Practice:** In response to a growing epidemic of opioid abuse, an increasing number of individuals require care for opioid dependence. Historically, methadone has been the mainstay of such treatment. We document rapid increases in buprenorphine sales and ambulatory utilization during the past decade. Important questions remain regarding buprenorphine’s real-world treatment effectiveness, cost-effectiveness, patterns of abuse and misuse, and evolving role in the treatment of opioid dependence.

**Funding Source(s):** AHRQ

**Poster Session and Number:** B, #619

**Primary Care Internet-Based Interventions to Prevent Adolescent Depression in Randomized Clinical Trials**

Tracy Gladstone, PhD, Wellesley College; Benjamin Van Voorhees, University of Illinois at Chicago; Monika Marko-Holguin, University of Illinois at Chicago

**Presenter:** Benjamin Van Voorhees, M.D., M.P.H., Associate Professor, Pediatrics, University of Illinois at Chicago, bvanvoor@uic.edu

**Research Objective:** Internet-based interventions for youth depression hold promise, but further research is needed to explore the acceptability of these approaches, and ways of integrating emerging technologies for behavioral health within the primary care system. In addition, research is needed to determine how best to access at-risk adolescents from hard-to-reach populations.

**Study Design:** We developed a primary care Internet-based depression prevention intervention, CATCH-IT, to address these needs and are conducting a randomized clinical trial comparing CATCH-IT to a general health education Internet intervention. CATCH-IT was developed utilizing the media theory of "Synchronization of the Senses" to incorporate character stories, peer videos and design/picture elements to create a unified experience meeting today’s social media standards. The intervention also includes an Internet-based parent program incorporating psycho-educational material about youth depression and role-playing video vignettes. A primary care physician motivational interview is used to engage youth and parents with the CATCH-IT program. The Health Education model was developed based on the current well-child curriculum used for primary care visits. We are fielding the interventions in a two-site trial sponsored by the National Institute of Mental Health.

**Population Studied:** The current study targets 13-17 year-olds who are recruited from routine visits to primary care clinics in both urban and suburban settings. All adolescents visiting the clinics are screened for future risk of depressive episodes and, if at-risk, offered enrollment in the trial.

**Principal Findings:** We enrolled N=34 adolescents/expected 400 and N=34 parents/expected in the PATH study, from a total of N=9 practice sites in N=4 major health systems. Adolescents were primarily African American (N=18), and N=10 self-identified as Hispanic. A total of N=102 adolescents participated in a phone screen based on self-reported depressive symptoms, from which 34 were found eligible for enrollment. Overall, practices identified potentially eligible subjects by screening an estimated 24% of adolescents visiting the doctor, and an estimated 12% of adolescents were enrolled. The mean number of modules started or completed was 2.72/14 (SD=3.64) for adolescents and N=1.9/5 (SD=2.05) for parents. Both adolescents and parents noted the availability of character stories, self-diary peer videos and incentives for participation as the most attractive components. Practices noted challenges in economic concerns (N=2 closed), HIPPA compliance requirements, work flow, importance of compensation comparable to private insurance contracts, scheduling, and time required to perform screening.

**Conclusions:** Cultural adaptation and media theory, combined with indirect peer-based interactions, appeared to strengthen participation and engagement by adolescents and parents. In addition, embedding this new technology within the primary care setting may have increased access to hard-to-reach populations.
implications for policy, delivery, or practice: Internet-based interventions must meet today’s social media standards in order to engage adolescents and parents. Close collaboration with primary care practices is required in order to address challenges in implementation.

Funding Source(s): NIH

Poster Session and Number: B, #620

Preliminary Evaluation of a Novel Suicidal Alert Response System within an Automated Telephonic Assessment and Monitoring System for Depression Care Management

Irene Vidyanti, University of Southern California; Shinyi Wu, University of Southern California; Pai Liu, University of Southern California; Caitlin Hawkins, University of Southern California; Magaly Ramirez, University of Southern California; Jeffrey Guterman, Los Angeles County Department of Health Services; Kathleen Ell, University of Southern California

Research Objective: A novel suicidal alert system was developed for use within an automated depression telephonic assessment and monitoring system. Preliminary evaluation of the performance of the suicidal alert system in its first year of implementation was conducted. The alert system is triggered if a patient responded to the last item of the Patient Health Questionnaire (PHQ)-9 with a score higher than one during an automated telephone assessment (ATA) call (i.e. patient had high intention of self-harm). Three physicians were dedicated to respond to the alerts in a predetermined order. When the alert system was triggered, the system immediately sent a text message and an e-mail to the first responder. If the system did not receive the acknowledgement from the first alerted responder within 15 minutes, the second responder would be alerted. This waterfall fashion alert system continued until a physician took responsibility for the call. The physician was then expected to call the patient and assess his/her status.

Study Design: To evaluate the suicidal alert system, we collated all triggered suicide intention alerts, along with the timestamps of the time the call was completed and the alert was responded to. We then analyzed the alert response time (i.e. the elapsed time between each completed call that triggered the suicidal alert and its response from the provider).

Population Studied: The system was tested on 444 patients in three safety-net clinics contained within the Los Angeles County Department of Health System (LAC-DHS) which made up one arm of a three arm depression care management study. Patients were 18 years or older with diabetes and received primary care in any one of these three sites.

Principal Findings: There were 25 suicide intention alerts out of 2189 calls (1224 calls with completed PHQ) over the period of 10/27/2011 – 9/21/2012. The average response time of 32 minutes was within our target response time of 75 minutes (comprising alert polling interval of 30 minutes and three layers of waterfall at 15 minutes per layer). The maximum alert response time was 2 hours and 4 minutes, which still fell within an acceptable response time range. All patients with alerts were responded to in a timely manner, and none of the patients were assessed to be at high risk for self-harm by the responding providers.

Conclusions: Our finding that all the suicidality alert response times fall within an acceptable range show the promise of our novel suicidality alert response system in helping ensure patient safety within an automatic depression screening and monitoring system.

Implications for Policy, Delivery, or Practice: This suicidal alert system addressed urgent care needs and allowed providers to immediately address patient issues. It is an important safety feature that should be implemented within an automatic depression screening and monitoring system. The suicidal alert system, along with the automated depression screening and monitoring system, acts as a useful complement to provider-based depression screening. By shifting the burden of part of the screening and monitoring away from time-pressured providers, the system has the potential to facilitate more timely depression identification and treatment, particularly in resource-constrained settings such as safety-net clinics.

Funding Source(s): Other, American Recovery and Reinvestment Act

Poster Session and Number: B, #621
CHILD HEALTH

Nationwide Emergency Department Visits by Children for Dental Conditions, 2009
Arif Ahmed, University of Missouri-Kansas City; Lakshmi Venkitachalam, MPH, PhD, University of Missouri - Kansas City; Felicity Pino, MS, University of Missouri - Kansas City; Mary M. Gerkovich, PhD, University of Missouri - Kansas City; William E. Lafferty, MD, University of Missouri - Kansas City

Presenter: Arif Ahmed, BDS, PhD, MSPH, Associate Professor Of Health Administration, Public Affairs, University of Missouri-Kansas City, ahmedar@umkc.edu

Research Objective: Despite improvements in coverage and utilization, dental care remains one of the most frequent unmet health care needs of children in the United States. Access to dental care is difficult for many children, particularly those on public financing programs. The hospital emergency departments (ED) nationwide have become the entry point to the health care system for a large number of individuals seeking care for issues that are preventable and/or can be addressed more efficiently at other care delivery venues. A large majority of ED visits for dental complaints are of such nature and the underlying issues are typically not resolved by the services provided at the ED. The objectives of this study were to create a national estimate of ED visits by children for dental complaints and to describe the characteristics associated with those visits.

Study Design: Visit-level data of ED visits for dental complaints by patients 0-19 years of age were extracted from the Nationwide Emergency Department Sample (NEDS) 2009 dataset. First listed diagnoses within the ICD-9-CM codes range 520.0 - 523.9 were used to identify such visits. Sample weights were applied to create national estimates by age group, expected primary payer, location of the patient’s residence, and type of ED event.

Population Studied: The NEDS is a stratified sample of hospital emergency departments in community, non-rehabilitation hospitals in the United States. The 2009 NEDS includes almost 29 million ED visits from 964 hospital-based EDs in 29 states. Approximately 83.8 million individuals 0-19 years of age constituted 27.3% of the US population in 2009.

Principal Findings: Visits by patients 0-19 years of age constituted 10.26% of the estimated 867,968 ED visits for dental conditions nationwide at a rate of 106 visits per 100,000 population. Of these patients, 95.73% were treated and released at the ED. Female patients visited the ED at a higher rate (114/100,000 population) compared to male patients (99/100,000 population). For both sexes, the greatest proportions of visits were by patients ages 16-19 years followed by less than 6 years. The primary expected source of payment for 54% of the visits was Medicaid. Greatest proportions of visits were by patients living in large central metropolitan areas (27.2%) and neighborhoods with median annual income below $40,000 (40.21%).

Conclusions: The poor and vulnerable children seek dental care at the hospital ED at disproportionately higher rates compared to other children. While no direct conclusion can be drawn from this study, the findings corroborate those of other state and regional studies and lend evidence that despite various mitigation efforts, access to dental care for children on Medicaid continues to be problematic nationwide.

Implications for Policy, Delivery, or Practice: Access to preventive and routine dental care for children, particularly those on Medicaid, needs improvement. States’ efforts to increase Medicaid reimbursement for providers at conventional dental care settings should be supplemented by exploration of alternative settings and workforce for delivering preventive and treatment services and oral health education to the vulnerable population.

Funding Source(s): No Funding
Poster Session and Number: A, #149

Priority Mental Health Diagnoses for Quality Measurement in the Inpatient and Emergency Department Settings Nationally
Naomi Bardach, University of California, San Francisco; Tumaini R. Coker, MD MBA, University of California Los Angeles; Bonnie T. Zima, MD MPH, University of California Los Angeles; Anne L. Lynn, MPP, Minnesota Department of Human Services; J. Michael Murphy, EdD, Massachusetts General Hospital; Penelope K. Knapp, MD, University of California Davis; Justine G. Nelson, PhD, Minnesota Department of Human Services; Rita Mangione-Smith, MD MPH, Seattle Children’s Hospital

Presenter: Naomi Bardach, M.D., M.A.S., Assistant Professor, General Pediatrics,
University of California, San Francisco, bardachn@peds.ucsf.edu

**Research Objective:** There is a national call for robust pediatric quality measures in the inpatient and emergency department (ED) settings. Mental health is a key priority with 5% of all pediatric ED visits having a mental health diagnosis and of these, 15% leading to admission. National quality measures should focus on the most common and costly conditions; however, no published studies have examined this for pediatric mental health. Our objective was to use national data to rank pediatric mental health conditions in the inpatient and ED settings by frequency, and to examine how rankings vary by patient characteristics, hospital type, and resource utilization.

**Study Design:** Cross-sectional.

**Population Studied:** We analyzed discharges from a nationally representative database of pediatric hospitalizations (the Kid Inpatient Database from the Agency for Healthcare Research and Quality’s HealthCare Utilization Project 2009 [KID]) and a database from 40 freestanding children’s hospitals nationally (the Pediatric Health Information System 2010 [PHIS]). We examined the relative frequency of 17 ICD9-defined mental health diagnostic groupings in each database, stratifying by inpatient vs. ED, primary vs. secondary diagnosis, and gender. Frequency ranking was according to proportion of all mental health visits in each database. Resource utilization ranking was done in KID according to aggregate annual charges.

**Principal Findings:** Depression was the most frequent primary psychiatric diagnosis in both inpatient and ED settings. In the PHIS ED, the top primary diagnoses were depression (29.0%), externalizing behavior disorders (22.4%), miscellaneous disorders (11.3%), and anxiety (9.1%). The most frequent primary inpatient diagnosis in hospitals nationally and in freestanding children’s hospitals was depression (44.1% [KID] and 47.5% [PHIS]) of mental health discharges). In KID, the next ranking primary diagnoses were bipolar disorder (18.1%), psychosis (12.1%), and externalizing behavior disorders (6.2%). In PHIS, the next ranking primary diagnoses were externalizing behavior disorders (11.7%), bipolar disorder (9.9%), and anxiety disorder (6.5%). When all diagnoses were included (primary or secondary) in KID, substance abuse was the third ranking diagnosis (12.4%). The most frequent primary diagnosis, depression, did not vary by gender, but other top ranking psychiatric diagnoses did. The most frequent primary diagnoses by gender were: For girls and boys in KID, depression (girls: 51.2% and boys: 37.6%), bipolar disorder (18.2% and 17.7%), and anxiety (8.0% and 15.9%). For girls in PHIS, depression (51.4%), eating disorders (10.2%), bipolar (9.1%), and anxiety (8.3%). For boys in PHIS, depression (43.4%), externalizing disorder (16.7%), and bipolar disorder (10.8%). Estimated aggregate annual charges for the most common psychiatric diagnoses were substantial: For depression (n=100,988): $1.364 billion, mean/visit= $13,917). For bipolar disorder (n=41,345): $717 million, mean/visit $16,994). For psychosis (n=27,589): $551 million, mean/visit $19,606).

**Conclusions:** Diagnoses for pediatric mental health quality measurement can be prioritized according to frequency of occurrence and resource utilization.

**Implications for Policy, Delivery, or Practice:** Pediatric priority diagnoses in the inpatient setting are depression, bipolar disorder and psychosis; in the ED they are depression, externalizing disorders, and anxiety. Substance abuse is also a high-priority diagnosis, as a common comorbid condition. Including anxiety and externalizing behavior disorders will address important conditions for girls and boys, respectively.

**Funding Source(s):** AHRQ

**Poster Session and Number:** A, #150

**Perinatal Home Visiting Program Positively Impacts Breast Feeding and Parenting:**

**Findings from the Best Start LA Evaluation**
Sarah Benatar, Urban Institute; Ian Hill, The Urban Institute; Heather Sandstron, The Urban Institute

**Presenter:** Sarah Benatar, Ph.D., Research Associate, Health Policy Center, Urban Institute, sbenatar@urban.org

**Research Objective:** To analyze the impacts of a locally designed home visiting model (Welcome Baby!) for pregnant women and mothers of infants launched as part of a larger community investment project in downtown Los Angeles called Best Start LA (BSLA).

**Study Design:** A six-year evaluation that employs mixed methods to assess program implementation and outcomes; this presentation
primarily focuses on results derived from the longitudinal in-home survey component designed to compare child and family outcomes at 12, 24 and 36 months of age. We survey mothers who received Welcome Baby! home visiting services and also a comparison group of mothers who did not receive Welcome Baby! but live in the pilot community. Families participate in a 90-minute survey and home observation at each wave. In addition, we conducted annual case studies of implementation to document the progress of the overall BSLA investment—and Welcome Baby! specifically—through interviews with home visiting staff, as well as focus groups with Welcome Baby! participants and graduates. **Population Studied:** The child and family survey sample includes 734 low-income mothers and their infants. Approximately 90 percent of mothers are Latino, 70 percent are immigrants, and only half have at least a high school diploma. Annual case study interviews with approximately 12 Welcome Baby! administrators and home visitors and two rounds of focus groups with more than 40 Welcome Baby! participants were also conducted. **Principal Findings:** In-depth case studies have documented the implementation of the Welcome Baby! model. During the program’s first three years, roughly 2,000 parents of newborns received home visits from nurses and college educated “parent coaches” designed to promote breastfeeding, child health and development, effective parenting, home safety, and use of community resources. Visits occur prenatally, at 72 hours postpartum, two weeks, one month (phone call), three months, and nine months. This home visiting model has been altered slightly since it was first launched in response to early case study findings. Focus groups with parents and home visitors find that mothers place high value on the Welcome Baby! service, form strong bonds with home visitors, and perceive improved breastfeeding and parenting. Notably, parents and home visitors assert that the program’s medium-intensity model falls short of meeting the needs of high-risk mothers. Findings from the 12-month wave of the in-home survey indicate that home visiting recipients have a higher likelihood of exclusive breastfeeding, more sensitive parenting behaviors, and more stimulating home environments than the comparison group. **Conclusions:** Welcome Baby! has had a positive effect on families in the pilot community. Small changes designed to be more responsive to the needs of the community have improved the program. **Implications for Policy, Delivery, or Practice:** Home visiting can be a critical component of perinatal care, providing valued maternal support and education, links to other supportive services, and reinforcing critical health behaviors such as breastfeeding, immunizations, nutrition, appropriate child development, effective parenting, and home safety. Subsequent waves of the survey will track longer-term nutrition impacts, child health and development, and school readiness. Evaluation results will inform the implementation of this home visiting program in 13 additional communities across Los Angeles County. **Funding Source(s):** Other, First 5 LA **Poster Session and Number:** A, #151

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**Examining the Spread of the School-Based Health Center Concept within the United States**

Brian Bruen, George Washington University

**Presenter:** Brian Bruen, MS, Lead Research Scientist & Lecturer, Department of Health Policy, George Washington University, bkbruen@gwu.edu

**Research Objective:** The objective of this research is to describe how the school-based health center (SBHC) concept expanded from humble beginnings in a handful of diffuse localities to approximately 2,000 locations spread across broad swaths of the country. SBHCs primarily serve low-income, minority and other at risk children in school settings, providing a variety of preventive ambulatory care services and health education. **Study Design:** This study is a case study of existing research focused on social and political factors that contributed to the expansion of the number of school-based health centers in the United States. It is based on a review of the literature about the creation and diffusion of the SBHC concept. It is supplemented by case study interviews with experts, state officials and SBHC providers about the factors that contributed to the successful expansion of this relatively hidden health care system. **Population Studied:** This paper focuses on school-based health centers and the patients/communities that they serve. **Principal Findings:** The number of SBHCs in the United States increased from roughly 100 centers in the early 1990s to more than 1,900...
centers today. The factors described the paper reflect a number of different social, financial and political influences on the development of the SBHC model and its expansion into new locations. For example, early support from the Robert Wood Johnson Foundation helped to solidify the SBHC model and attract attention and financial support, including Medicaid funding. Proponents built support for the movement by defusing—and often accommodating—their opponents, and securing political and financial support. There are many parallels to theories and empirical research from other fields such as political science and public policy in this story, all of which offer insights into why the SBHC movement continues to achieve success despite its small size and politically weak target populations.

Conclusions: Continued expansion requires SBHCs and their supporters to continue to focus on the strengths of existing centers, which include building support from the community and key policymakers, improving measurement of impacts and highlighting success stories to secure more political and financial support, and sharing educational materials and technical assistance to promote further development and innovation.

Implications for Policy, Delivery, or Practice: See conclusions.

Funding Source(s): No Funding

Poster Session and Number: A, #152

Measuring Autism Spectrum Disorder Severity and its Influence on Children's Health Services: A Structural Equation Modeling Approach

Adam Carle, Cincinnati Children's Hospital Medical Center

Presenter: Adam Carle, Ph.D.,M.A., Assistant Professor of Pediatrics, University of Cincinnati School of Medicine, Cincinnati Children’s Hospital Medical Center, adam.carle@cchmc.org

Research Objective: Autism Spectrum Disorder’s (ASD) prevalence and incidence has increased dramatically. This has led to increased research efforts to understand ASD’s impact on these children and their families. Among other things, researchers have begun to examine the relationship between disease severity and the condition’s impact on the family. To this end the National Center for Health Statistics recently conducted the first ever Pathways to Diagnosis and Services survey, a nationally representative survey of children with ASD, intellectual disability (ID), and developmental delay (DD). The survey included numerous questions about children and their families’ experiences, as well as a new scale designed to measure children’s ASD severity. However, to date, no research has addressed how best to use the scale’s items to measure ASD severity (i.e., should investigators create a single severity score or multiple subscale scores?), nor has research examined whether severity predicts children’s outcomes using this scale and data. To address this, I used structural equation modeling (SEM) to simultaneously develop a valid measurement model for the scale and examine the relationship between the construct(s) measured by the scale and the extent to which the severity construct(s) measured by the scale predict a condition’s financial impact on the family and the number of hours caregivers spent arranging care.

Study Design: I used SEM and cross-sectional data from the 2011 Pathways to Diagnosis and Services survey. Pathways, a follow-up to the 2009-2010 National Survey of Children with Special Health Care Needs (NS-CSHCN), is a nationally representative survey of CSHCN 6-17 years old who have ever been diagnosed with ASD, ID, or DD. Among other things, parents answered questions about severity and the condition’s impact on the family.

Population Studied: We included all children (2,689) with complete data on the 49 questions measuring severity, one question measuring the condition’s financial impact on the family, and one question measuring the number of hours caregivers spent arranging for their child’s care.

Principal Findings: SEM demonstrated that a bifactor model with a general factor (on which all items loaded) measuring ASD severity and a specific factor (consisting of a small item subset) measuring social difficulties, best represented the scale’s structure. SEM indicated that increased ASD severity significantly predicted an increased financial impact on the family (b = 0.22, p < 0.01) and that severity’s influence on hours arranging care partially mediated this relationship. Social problem severity did not significantly predict financial impact or hours arranging care.

Conclusions: To best derive severity score for the 46 Pathways items measuring severity, stakeholders should use SEM-based methods to best measure general and social severity. As ASD severity increased, the financial impact on
the family increased. Hours arranging care partially mediated this relationship.

**Implications for Policy, Delivery, or Practice:** Findings indicate that stakeholders can create a general ASD severity score from the 46 Pathways items. However, without SEM, the score will confound general and social severity. Second, results show that efforts to reduce ASD’s financial impact should focus on interventions that reduce the number of hours caregivers spend arranging care, especially for children experiencing the most severe symptomatology.

**Funding Source(s):** NIAMS (NIH)

**Poster Session and Number:** A, #153

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**The MMR Vaccine Autism Controversy: Did Autism Concerns Affect Vaccine Take-Up?**

Lenisa Chang, University of Cincinnati

**Presenter:** Lenisa Chang, Ph.D., Assistant Professor, Economics, University of Cincinnati, lenisa.chang@uc.edu

**Research Objective:** As a result of In the wake of strong (although later refuted) claims of a link between autism and the measles-mumps-rubella (MMR) vaccine, I examine whether fewer parents immunized their children and if there was a differential response by mother’s education level. This task is complicated because the controversy in the US coincided with expansions in public insurance coverage for children and other programs that affect childhood immunizations, as well as another controversy regarding mercury containing preservatives in childhood vaccines.

**Study Design:** Observational study using the US National Immunization Survey from 1995-2006. Use a time trends analysis and a few differing strategies that compare the take up of MMR to other vaccines.

**Population Studied:** Children between 19 months and 36 months old.

**Principal Findings:** I find that the MMR-autism controversy led to a decline of at least 2 percentage points in the take up of MMR and a negative spillover onto other vaccines. I find some evidence that more educated mothers responded more to the controversy, which is consistent with the hypothesis that more educated individuals absorbing health information more quickly. However, this disparity persisted, albeit to a smaller scale, even after new research and information about the lack of such link became widespread in the media.

**Conclusions:** Media plays an important role in the information of parents about vaccines and parental education has a complicated relationship with children's health outcomes.

**Implications for Policy, Delivery, or Practice:**

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #153

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**Assessing Teen Health Literacy Using Brief Screening Items**

Deena Chisolm, The Ohio State University; Elizabeth Earley, Nationwide Children’s Hospital; Kelly Kelleher, Nationwide Children's Hospital; Sarah Scholle, National Committee on Quality Assurance

**Presenter:** Deena Chisolm, Ph.D., M.S., Associate Professor, Research Institute at Nationwide Children's Hospital, The Ohio State University, chisolm.1111@osu.edu

**Research Objective:** Youth-reported data are an important but underutilized component of pediatric healthcare quality measurement. To integrate youth-reported measures in quality assessment systems, however, we must consider how health literacy is associated with competence to complete surveys in written, telephone, or computerized format. Administration of a health literacy assessment along with a youth-reported quality of care survey could allow assessment of reliability and validity to be stratified by literacy level but the lack of validated self-report health literacy items for teens has made such an undertaking difficult. This pilot study assesses the relationship between interviewer-assessed and self-reported health literacy in an adolescent population as preliminary research for developing proxy measures that can be included in surveys of youth reported health care quality.

**Study Design:** Respondents completed the REALM-Teen and three health literacy screening items previously tested in adult populations. These items assess confidence in completing health forms, use of help in reading health materials, and difficulty understanding written health information.

**Population Studied:** 205 youths, between the ages of 12 and 18, were recruited from three sources: the adolescent medicine clinic at Nationwide Children's Hospital (n=60), a general email sent to the staff of NCH (n=61), and Medicaid managed care enrollees with chronic health conditions (n=84).
**Principal Findings:** The mean respondent age was 15.9, 59% were female, and 62% were White. Overall, 16% of youths were identified as having inadequate health literacy (REALM-Teen score <=44) and an additional 27% had marginal scores (REALM-Teen 45-60). Inadequate health literacy was most common in the clinic population (25%) compared to the general (15%) and chronic illness (7%) samples. No significant age difference was seen. Over half of the population (55%) reported at least one health-literacy related limitation on the screening items, with 36% always or usually using help to read materials, 23% reporting problems learning about health due to difficulty reading, and 31% feeling only somewhat confident in completing forms. The chronic disease population reported higher limitations in form literacy. Boys had higher rates of accessing help to read materials. The literacy screening items demonstrated moderate significant bivariate correlations with the REALM-teen (range r=0.29-0.36). Summing the three items to create a composite score increased the correlation with the REALM-Teen to 0.43.

**Conclusions:** Limitations in health literacy are evident in a noteworthy proportion of adolescents, particularly minorities and clinic-based teens. Based on our correlational analysis, we believe that a reasonable proxy indicator can be created to identify lower-literacy youths completing health surveys.

**Implications for Policy, Delivery, or Practice:** Including such a proxy will allow development of analytic methods for addressing responses from respondents with lower literacy. It will also allow testing of whether health literacy differentially influences responses to surveys offered through different modes (e.g., telephone, paper, electronic)

**Funding Source(s):** AHRQ

**Poster Session and Number:** A, #155

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**Morning Bell: The Effect of Earlier School Days on Adolescent Health and Academic Outcomes**

Heather Dahlen, State Health Access Data Assistance Center (SHADAC)

**Presenter:** Heather Dahlen, M.A., B.A., B.B.A., Research Assistant, State Health Access Data Assistance Center (SHADAC), heather.mattson@gmail.com

**Research Objective:** To examine how changing school start times affect body mass index (BMI), academic performance, and behavioral outcomes of elementary school-aged children.

**Study Design:** The study utilizes the nationally representative Early Childhood Longitudinal Survey- Kindergarten cohort (ECLS-K) to analyze the impact of moving school starts time on child academic and behavioral outcomes. Students who attended schools where the start of the academic day was moved from late (8:00 a.m. or after) to early (prior to 8:00 a.m.) between two waves of data collection (third and fifth grade) were identified. This “natural experiment” led to models that exploit this variation over time (comparing pre- and post-changing start time periods) and across student population groups (comparing students in schools that did change their starting time to those that did not). The dependent variables are the child outcomes—test scores, behavioral measures, and BMI. The ECLS-K provides information on math, science, and reading scores. The behavioral outcomes include measures of self-control, anxiety, and aggression toward other students. Lastly, BMI is measured using a child’s height, weight, and age in months. All dependent variables are found in the third and fifth grade waves of data. The methodology used is a difference-in-differences model that allows the effects of school start time to be disentangled from other aspects of school policy as well as the underlying trends in child educational production functions. Whereas prior studies have focused on local, district-level data, this is the first to utilize nationally representative panel data.

**Population Studied:** Children between the ages of eight and eleven (third through fifth grade).

**Principal Findings:** Initial descriptive statistics suggest that children whose schools moved the school day to an earlier time between third and fifth grade had lower test scores, poorer behavioral scores, and higher BMIs in fifth grade than children whose schools did not change start times. Preliminary findings suggest the magnitude of these changes increase as the minutes increase; students whose days were pushed up more than 30 minutes during the two time frames had larger declines in test scores, bigger instances of behavioral problems, and larger increases in BMI than those whose days were only moved 15 minutes (all relative to the control group of unchanged start time students).

**Conclusions:** Moving school start times to earlier in the day might have unintended consequences. Recent sleep pattern research
has discovered that adolescents have different circadian rhythms than adults, suggesting that when school days begin earlier children lose sleep and simply cannot make up the loss by going to bed earlier. When students are sleepier their school work, behavior, and weight are all potentially negatively affected.

Implications for Policy, Delivery, or Practice: As academic start times are made earlier, there might be some negative effects on child development. While there are many valid reasons for beginning the school day earlier, such as additional daylight after school for extracurricular activities, more time with family and homework, and cost savings through shared busing services, they are not without potential drawbacks.

Funding Source(s): No Funding

Poster Session and Number: A, #156

The Impact of Maternal Depression on Child Academic and Socioemotional Outcomes
Heather Dahlen, State Health Access Data Assistance Center (SHADAC)

Presenter: Heather Dahlen, M.A., B.A., B.B.A., Research Assistant, State Health Access Data Assistance Center (SHADAC), heather.mattson@gmail.com

Research Objective: To test whether maternal depression affects child cognitive and non-cognitive outcomes, including the impacts of severity and duration of maternal depression.

Study Design: This study uses nationally representative data from the Early Childhood Longitudinal Survey--Kindergarten cohort (ECLS-K). Three methodological approaches were used to estimate the effect of maternal depression on child outcomes: 1. Value-added regression models that used the lagged child outcome measure of interest as a control for unmeasured covariates in later years of schooling, 2. Inverse probability weighted models that adjusted for preexisting observed differences between the treatment (those with depressed mothers) and control (those without) groups, and 3. Bounding of the causal effects of maternal depression using a technique established by Altonji, Elder and Taber (2005). A key contribution to the literature on maternal depression and child outcomes results from the inclusion of the bounding methodology, as it uses the difference in observed traits across children associated with mothers that have varying degrees of depression to demonstrate both the size and direction of the role of the unobserved variables affecting the results.

Population Studied: Elementary school-aged children (Kindergarten through eighth grade).

Principal Findings: For Kindergartners, any or moderate depression in their mothers led to reductions in math scores of 0.07 and 0.06 standard deviations. Third graders with moderately depressed mothers had a .1 standard deviation reduction in reading scores. Eighth grade students had rather large reductions in both math and reading scores when their mothers experienced either any or moderate depression levels, with scores ranging from 0.05 to 0.15 standard deviations lower than their counterparts whose mothers were not depressed. While severity did not impact test scores, it did play a role in non-cognitive outcomes. For kindergartners whose mothers were moderately depressed, they scored 0.08 standard deviations lower in interpersonal skills and this nearly doubled to 0.13 standard deviations when their mother was severely depressed. This pattern was similar for externalizing problem behavior and internalizing problem behavior as well, suggesting severity of depression might play a stronger role when children are younger. In terms of chronicity, my results show that if the mother is depressed both when the child is in kindergarten as well as third grade, many of the outcomes are adversely affected (math and reading scores, approaches to learning, self-control, and problem behavior). However, there were no chronicity effects for eighth graders.

Conclusions: Results indicate that maternal depression negatively affects both cognitive and noncognitive child development. Across all years in the panel, the presence of maternal depression adversely impacts at least one child outcome, and the results were often stronger for the socioemotional outcomes than test scores. Additionally, both severity and chronicity of maternal depression matter and dampen child outcomes. Following the bounding correction for endogeneity, my results remain significant, indicating that the effects of maternal depression on child outcomes are not driven by unobservable variables affecting the results.

Implications for Policy, Delivery, or Practice: Prior research has established the positive link between maternal depression and income. My results demonstrate that there are spillover effects of maternal depression on child development. Thus, one policy implication might
be to strengthen the depression screening mechanisms for income-tested government programs and provision of depression treatment. When mothers are mentally unhealthy, I have shown that they spend less time on child development, leading to detrimental effects for the child in school. For the teachers of such children, spending extra time with them either assisting learning or correcting negative socioemotional behaviors reduces the total time he or she has with the rest of the class. By increasing the treatment of depression, it is more than just the mother who is helped.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #157

**Research Objective:** We sought to implement a process for the timely development and review of measures required under the Children’s Health Insurance Program Reauthorization Act (CHIPRA) in time for posting by January 2013.

**Study Design:** AHRQ and CMS awarded grants to 7 CHIPRA Centers of Excellence (COEs), and assigned the COEs 43 measure topics for development or enhancement; priorities were selected based on CHIPRA requirements and gaps, importance, and the likelihood of an evidence base. A set of critical CHIPRA-specific desirable attributes was identified collaboratively, and codified in a CHIPRA Candidate Measure Nomination Form (CPCF) that was used for public and COE measure nominations. A Subcommittee of the AHRQ National Advisory Council (SNAC) used information provided in the CPCF and a Modified Delphi approach (3 rounds) to assess the measures and make recommendations.

**Population Studied:** Children, adolescents and pregnant women enrolled in Medicaid or CHIP.

**Principal Findings:** 77 measures in total were submitted: the SNAC reviewed the 63 measures with minimally sufficient information. The SNAC recommended 5 measures for potential voluntary use by Medicaid and CHIP and 2 for other uses. Recommended measures addressed key clinical areas of adolescent vaccination, asthma medication management, prenatal care, adolescent tobacco use, and appropriate use of CT scans. CMS, taking into consideration programmatic importance and the capacity of State programs and CMS itself, recommended 3 of the measures as additions to the Medicaid and CHIP core set.

**Conclusions:** The 2012 process implemented to meet CHIPRA requirements for improvements to the core set and to develop measures for other uses was complex but orderly and successful.

**Implications for Policy, Delivery, or Practice:** Several additional measures have been vetted and are available for assessing the quality of health care services for children and pregnant women in Medicaid and CHIP and other public and private programs, and to guide quality improvement efforts.

**Funding Source(s):** CMS, Agency for Healthcare Research and Quality

**Poster Session and Number:** A, #158

**Introducing and Scaling Up Integrated Community Case Management of Childhood Illness: Findings from the Child Survival and Health Grants Program**

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**Presenter:** S. Katherine Farnsworth, M.A., Technical Advisor, Health, Infectious Diseases and Nutrition, U.S. Agency for International Development, skfarns@gmail.com

**Research Objective:** Despite recent improvements in some developing countries, morbidity and mortality in children under five remains unacceptably high. A growing body of evidence supports the integrated Community Case Management (CCM) of childhood illness. A critical element in reducing mortality from the primary causes of death in children, CCM targets conditions that account for a large percentage of childhood deaths and for which effective treatments are available, namely: pneumonia, diarrhea, and malaria.

As CCM programs expand, there are areas where the global community is interested to
capture key lessons from implementation experience. In 2012, USAID through its Child Survival and Health Grants Program (CSHGP) conducted a systematic review of its projects and operations research to assess policy and program barriers that limit treatment of childhood illness. The objective was to assess the learning potential of projects, facilitate the scale up of key findings, and ultimately improve the effectiveness, equity, and quality of child health services.

**Study Design:** The study was conducted in four parts: a desk review to “landscape” the portfolio of CCM projects; a review of project monitoring indicators; benchmark maps; and case studies. The availability of information was quantified, and we described the portfolio based on project description; national context; project approaches; implementation; and results by access, quality, demand, environment, coverage and morbidity and mortality.

**Population Studied:** We screened 152 projects, identifying 10 completed and 12 on-going projects fulfilling CCM criteria. Nearly all projects were implemented at meaningful administrative scales (one or more districts) using official cadres to deliver CCM, which further increases the potential for health system learning. Nearly all were in rural sub-Saharan Africa.

**Principal Findings:** The landscape survey yielded modest results, but the benchmark survey and the case studies strongly suggest that CSHGP grantees have positively enabled many national environments for CCM. Benchmark maps, especially when corroborated by third parties, confirm the contributions of grantees in many components across several countries. CSHGP projects have and are measuring performance data for each of the eight CCM benchmark components. In total, the 21 projects tracked 140 indicators to monitor CCM performance, of which 51 closely match recommended indicators, with another 89 measuring similar phenomena by different metrics.

Nine projects are conducting research to inform priority CCM operations research questions. One project in Cameroon reported changes in the morbidity profile of pneumonia concomitant with introducing CCM. Two projects were able to demonstrate large reductions in under-five mortality rates through a marked increase in the coverage of all three treatment interventions.

**Conclusions:** Given the adverse mortality, ecologic profile, and the likely cause-structure of child mortality in project sites, CSHGP project settings are well-suited for CCM. Generalizing results requires caution because these impact areas are generally more challenging than typical rural African settings. Nevertheless, it was found that CSHGP projects build CCM capacity by sharing, championing and supporting the global CCM research agenda.

**Implications for Policy, Delivery, or Practice:** Informed by the review and emerging global experience, several notable “best practices” for CCM were identified. Cost-recovery schemes within CCM could inform the equity vs. efficiency debate surrounding user fees. In addition, alternative financing mechanisms are being explored in different settings, such as insurance and health savings groups. Annual benchmark mapping would allow tracing common paths for countries as they introduce and scale up CCM.

**Funding Source(s):** Other, USAID

**Poster Session and Number:** A, #159

**Socioeconomic Status and Hospitalization Costs for Common Pediatric Conditions**

Evan Fieldston, University of Pennsylvania School of Medicine & CHOP; Isabella Zaniletti and Matthew Hall, Children's Hospital Association; Jeffrey Colvin, University of Missouri-Kansas City School of Medicine; Laura Gottlieb, University of California San Francisco School of Medicine; Michelle Macy, University of Michigan School of Medicine; Elizabeth Alpern, University of Pennsylvania School of Medicine; Rustin Morse and Paul Hain, Children's Medical Center, Dallas; Samir S. Shah, University of Cincinnati School of Medicine

**Presenter:** Evan Fieldston, M.D., M.B.A., M.S., Assistant Professor, Pediatrics, University of Pennsylvania School of Medicine & CHOP, fieldston@email.chop.edu

**Research Objective:** Child health and development are influenced by biomedical and socioeconomic factors. Few studies have explored the relationship between community-level income and inpatient resource utilization for children. To analyze inpatient costs of care for children with common medical conditions at freestanding children’s hospitals in relation to their home ZIP code’s median annual household income (HHI). We hypothesized that hospitalized children from areas with lower median HHI would have higher costs.

**Study Design:** Retrospective cohort study focused on 5 common All Patient Refined
Diagnostic Related Groups (APR-DRG): asthma, diabetes, bronchiolitis & RSV pneumonia, pneumonia, and kidney & urinary tract infections. Main exposure was median annual HHI, divided into 4 groups (based on multiples of federal poverty level). Standardized costs of hospitalization care were modeled using mixed-effects methods for each APR-DRG. Costs were adjusted for severity of illness. Analyses were done at the hospitalization level and patient level. Post-hoc tests compared the adjusted standardized costs of patient in the lowest and highest income groups.

**Population Studied:** 105,619 pediatric patients at 32 freestanding children's hospitals in the Pediatric Health Information System (PHIS) from 2010-2011 with 5 common medical diagnoses. Main exposure of interest was MA-HHI, divided into 4 groups (based on multiples of federal poverty level).

**Principal Findings:** There were 116,631 hospitalizations: 3 of 5 conditions had differences at the hospitalization level and 4 of 5 had differences at the patient level, with the lowest-income groups having higher costs. The hospitalization level cost difference ranges from $205 (asthma, p=0.001) to $539 (diabetes, p<0.001), translating to differences of 5.6% to 8.8%, respectively. At the patient level, the cost difference range was $153 (3.4%) (pneumonia, other p<0.05) to $1401 (22.1%) (diabetes, p<0.001). Higher costs were typically for room costs, not for lab, imaging, or pharmacy costs.

**Conclusions:** Lower community-level household income is associated with higher inpatient costs of care for 4 of 5 common pediatric conditions.

**Implications for Policy, Delivery, or Practice:** These findings highlight the need to consider socioeconomic status in healthcare system design, care delivery, and reimbursement calculations.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #160

**APR-DRG Severity of Illness Scores Correlate Poorly with Clinical Risk Scores in Pediatric Cardiac Surgery**
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**Presenter:** Evan Fieldston, M.D., M.B.A., Assistant Professor, University of Pennsylvania & CHOP, fieldston@email.chop.edu

**Research Objective:** All Patient Refined Diagnosis Related Groups (APRDRG) severity of illness (SOI) scores are often used to adjust for patient risk in outcomes and quality analyses using administrative data. It is not known whether SOI scores correlate more with intrinsic patient risk at the time of a hospitalization/procedure, or with complications occurring later in the hospital stay. Our objective was to determine the association between SOI, markers of patient and procedure risk, and peri-operative complications in children undergoing cardiac surgery.

**Study Design:** Clinical data from the Society of Thoracic Surgeons (STS) Congenital Heart Surgery Database were linked to administrative data from the Pediatric Health Information Systems (PHIS) Database for patients 0-18 yrs undergoing cardiac surgery with bypass at our institution (2007-11). Correlation (rho) between SOI score (from PHIS) and a validated metric of cardiac case complexity/ risk (STS STAT score) was determined. Logistic regression was used to assess the impact of peri-operative complications on SOI score stratified by STAT category, and adjusting for patient pre-operative characteristics (age, weight, genetic syndrome, and other STS pre-operative risk factors).

**Population Studied:** Pediatric patients 0-18 yrs old undergoing cardiac surgery with bypass at The Children’s Hospital of Philadelphia between 2007-11.

**Principal Findings:** We evaluated 1,614 operations on 1,404 children (22% neonates, 36% infants, 41% children). Mean SOI and STAT scores were 2.8(SD 0.97) and 2.3(SD 1.3), and 41% of patients had =1 complication. Overall, correlation between STAT and SOI scores was 0.51, and was lower in neonates and infants (rho=0.29, 0.20) than in children (rho=0.41). In analysis stratified by STAT category, and adjusting for patient pre-operative characteristics, those with ICD9 codes indicating peri-operative complications had higher SOI scores across all STAT categories, with the greatest effect in the lower STAT categories.

**Conclusions:** In children undergoing heart surgery, those with similar procedural risk scores and pre-operative characteristics were
more likely to have higher SOI if they had a complication.

Implications for Policy, Delivery, or Practice:
These findings suggest that SOI is not appropriate for severity/acuity adjustment, as it reflects a combination of pre-operative/procedural risk and peri-operative complications. Further research is needed to evaluate whether this holds true for other conditions.

Funding Source(s): No Funding
Poster Session and Number: A, #161

Effect of a School-Based Health Promotion Program on Children in Primary Schools: A Cluster Randomized Controlled Trial
Ludwig Grillich, Danube Univeristy Krems; Christina Kien, Danube Univeristy Krems; Gerald Gartlehner, Danube Univeristy Krems

Research Objective: To assess the effectiveness of a school-based health promotion program to improve motor-skills, physical activity, physical and psychological well-being, and emotional and social experiences in schoolchildren aged 8 to 11 years.

Study Design: The design of our study was a cluster randomized controlled trial (CRCT) with a follow-up of two years (Trial registration DRKS00000622 – German register of clinical studies). The units of randomization were school-classes. After baseline assessment, 53 classes from 45 elementary schools in Austria were randomly assigned to an intervention (n=26) or control arm (n=27). The intervention consisted of 36 hours of teacher education: 20 hours of individual training on how to teach in a way that includes the need of the children for physical activity and 16 hours of group training on theoretical backgrounds and practical didactical technics (e.g., Running Dictation).

The control group received no intervention. The final assessment took place in April 2012. The main outcome measures included Emotional Quality of Life in Classroom, Social Quality of Life in Classroom, Psychological Quality of Life, Physical Quality of Life, Motor Skills, Physical Activity and Ability to Concentrate. All outcomes were measured in children with published valid and reliable instruments. The statistical analysis was done using a Multilevel Analysis (MLA) with nested set. R with the NLME package. We used “Full Information Maximum Likelihood” (FIML) to estimate missing data.

Population Studied: 840 elementary school children aged 8 to 11 years (intervention n = 397; control group n = 443).

Principal Findings: At baseline the parents agreed to their children’s participation in the study. 816 children (mean age of 8.7 years, 50% female) completed the baseline and follow-up assessments.

Children in the intervention arm compared with the control showed significant differences in one of the seven outcomes. In Motor Skills they had more Precise Body Coordination (p < 0.01), faster Ability to respond (p < 0.01) and better Spatial Orientation (p < 0.01). But there were no significant results in Kinesthetic Differentiation Capability (p = 0.47) and Coordination under Time Pressure (p = 0.24). Also the other five outcomes showed no significant results.

Conclusions: The school based health promotion program had a positive effect on the coordinative abilities of children in this program.

Implications for Policy, Delivery, or Practice: The findings of this evaluation showed that the program has a positive effect on Motor Skills of children, so the study delivers some evidence for decision makers to continue with this particular health promotion program in schools. However there is also need for optimizing, five relevant outcomes showed no significant results. Thus, it is recommended that improvements are made to the intervention theory of the program and to reconsider the number of hours of teacher intervention.

Funding Source(s): Other, Lower Austria Health and Social Fund
Poster Session and Number: A, #162

Falling Far Short of the Surgeon General’s Recommendation: A National Picture of Human Milk for Infants in Neonatal Intensive Care
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Pennsylvania School of Nursing; Alexandra L. Hanlon, Ph.D., University of Pennsylvania School of Nursing; Eileen T. Lake, Ph.D., R.N., FAAN, University of Pennsylvania School of Nursing

Presenter: Sunny G. Hallowell, Ph.D., Pediatric Nurse Practitioner, Lactation Consultant, University of Pennsylvania, hallowellnp@gmail.com

Research Objective: In 2011, the U.S. Surgeon General’s Call to Action asked healthcare professionals to support breastfeeding as the standard of care in all settings caring for women and children. An unprecedented declaration by the American Academy of Pediatrics followed, identifying breastfeeding and the receipt of human milk as the normative standards for infant feeding and nutrition. Evidence of the indisputable nutritional, immunological and behavioral benefits of human milk prompted the endorsement by the Joint Commission and the National Quality Forum of the use of “exclusive breast milk feeding” as a perinatal standard for full-term infants in the postpartum setting. Despite evidence that early receipt of human milk reduces the risk of morbidity and mortality, especially among very low birth weight (VLBW) infants, a high-risk pediatric population that comprises half of infant deaths annually, this standard has not been applied to the neonatal intensive care unit (NICU). The purpose of this study was to measure the frequency of breastfeeding support by nurses and receipt of human milk by VLBW infants in the NICU, which is not known. We also determined if the numbers and qualifications of nurses, their professional practice environment and the availability of lactation consultants increased the number of infants who received this care.

Study Design: This cross-sectional, secondary analysis utilized 2008 nurse survey data from the parent study funded by the Robert Wood Johnson Foundation, and infant hospitalization data from 104 NICUs in the Vermont Oxford Network (VON), a NICU quality collaborative. In 2008, the US VON centers comprised 578 hospitals, which included approximately 65% of NICUs and 80% of all VLBW infants born in the United States. These are the only national multihospital data available on the receipt of human milk in any newborns. Study measures were constructed at the NICU-level from 6060 nurse survey respondents, the 15,233 infants nurses cared for on their last shift worked, and 7886 VLBW infants cared for on these units from the VON database.

Population Studied: VLBW infants in NICUs.

Principal Findings: Hardly any infants (6%) were discharged on exclusive human milk. The majority (54%) were discharged on formula only. The remaining infants (42%) received human milk mixed with fortifier or formula. Nurses reported providing breastfeeding support to one in five infants whose parents were present. Sixty percent of infants had parents present for part or the entire shift. Most NICUs (64%) had no lactation consultants. Significantly higher fractions of infants received breastfeeding support and human milk (p < .05) in NICU’s with supportive professional practice environments, baccalaureate-prepared nurses, and nurses with at least five years NICU experience.

Conclusions: The country is falling far short of the Surgeon General’s recommendation for this high-risk pediatric population. The findings suggest that NICU nurses provide breastfeeding support around the clock, typically without a lactation consultant available.

Implications for Policy, Delivery, or Practice: This study provides evidence that nurses are essential to providing lactation care to NICU infants, for whom the receipt of human milk is an issue of patient satisfaction, quality patient care, effectiveness, and survival.

Funding Source(s): Other, University of Pennsylvania School of Nursing - 2012 Pilot Award

Poster Session and Number: A, #163

Cost-Sharing, Income, and Financial Barriers to Care among Children with Asthma
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Presenter: Courtnee Hamity, Ph.D., Senior Research Associate, Division of Research, Kaiser Permanente, courtnee.l.hamity@kp.org
Research Objective: Patients increasingly are paying for larger shares of their health care costs. There is limited information on how the effects of cost-sharing could vary by household income, especially in pediatric populations. We examined the associations between cost-sharing, income, and changes in care-seeking and financial burden among children with asthma.

Study Design: We conducted telephone and mailed surveys of parents of children with asthma. We assessed whether subjects changed their care-seeking for prescription drugs, office visits, or the emergency department (ED) due to costs. Parents also reported whether they experienced financial burden (borrowed money or cut back on necessities) due to the cost of their child's asthma care. We classified patients as having high cost-sharing if their brand drug and office visit copayments were >$25 and ED copayments were >$50. We classified subjects' potential subsidy eligibility based on whether they were enrolled in Medicaid, SCHIP; not currently subsidized with household income <=400% FPL or income>400% FPL. We used logistic regression and adjusted for patient gender, age, race/ethnicity, parent education, prior asthma hospitalizations/ED visits, cost-sharing, and subsidy status/income.

Population Studied: A stratified random sample of children, ages 4 to 11, with an asthma diagnosis and >=1 controller medication dispensed in 2011 in an integrated delivery system (N=769, response rate=59.0%).

Principal Findings: Overall, 26% of the study population was enrolled in Medicaid or SCHIP; among the unsubsidized, 61% had incomes <=400% FPL and 13% had high cost-sharing. Among all subjects, 3% switched to a cheaper asthma drug, 10% used less medication than prescribed, 7% delayed/avoided an office visit, and 6% delayed/avoided an ED visit due to costs. In multivariate analyses, higher vs. lower cost-sharing was associated with patients more frequently switching to a cheaper asthma medication (10.4% vs. 2.1%, p<0.05), delaying/avoiding an office visit (24.2% vs. 5.9%, p<0.05), and delaying/avoiding an ED visit (14.6% vs. 4.8%, p<0.05). Unsubsidized patients with incomes <=400% FPL vs. >400% FPL were also more likely to delay/avoid an ED visit (9.5% vs. 1.8%, p<0.05). Overall, 16% of subjects reported financial burden due to the cost of their child's asthma care; this was more likely among those with higher vs. lower cost-sharing (OR=28.2% vs. 14.2%), and patients with income<=400% FPL (22.7%), SCHIP (17.5%), or Medicaid (15.0%) vs. income>400% FPL (4.2%, p<0.05 for all comparisons).

Conclusions: Higher cost-sharing is associated with delaying or avoiding office and ED visits among children with asthma, which could lead to worse outcomes. Some parents report financial burdens due to the cost of their child's asthma care; this was more likely among those with higher cost-sharing and income<=400% FPL, including those without subsidies and those enrolled in SCHIP and Medicaid.

Implications for Policy, Delivery, or Practice: The Affordable Care Act (ACA) will extend coverage to many children and includes Medicaid expansions and premium subsidies for families with incomes less than 400% of the federal poverty level (FPL). These coverage expansions could be especially important for children with chronic conditions; however, lower-income children with employer-sponsored coverage or incomes >250% FPL are not eligible for cost-sharing subsidies and may continue to be at higher risk for cost-related problems.

Funding Source(s): AHRQ

Poster Session and Number: A, #164

Patterns of Behavioral Health Service Utilization and Diagnoses among Medicaid-enrolled White, Black and Latino Children with ADHD

Melanie Hinojosa, University of Florida; Nancy Rudner, University of Florida, Department of Health Outcomes and Policy; Matthew Van Voorhis, University of Florida, Department of Health Outcomes and Policy; Elizabeth Shenkman, University of Florida, Department of Health Outcomes and Policy

Presenter: Melanie Hinojosa, Ph.D., M.S., Assistant Professor, Health Outcomes and Policy and Institute for Child Health Policy, University of Florida, msh@ufl.edu

Research Objective: Attention deficit-hyperactivity disorder (ADHD), among the most common pediatric disorders, affects 4-12% of school-age children. Non-white children are less likely to be diagnosed with ADHD compared to white children, but when diagnosed, they have more severe or complicated forms of ADHD and more comorbid behavioral health (BH) conditions. Our objective is to examine BH patterns and predictors of health care utilization
patterns among low-income non-white children with ADHD and co-occurring BH conditions.

**Study Design:** Children with ADHD were identified in the database and their outpatient BH service use was examined for the year. Logistic regression analyses examined the likelihood of outpatient visits for co-occurring BH diagnoses among children with ADHD and the associated factors including race, ethnicity, sex, and age of the child, severity of physical health conditions present, and county-level poverty rates.

**Population Studied:** This study utilizes health care claims, encounter, and enrollment data for 21,342 children ages 2 to 18, with a BH diagnosis participating in the Texas Medicaid program in 2010.

**Principal Findings:** A substantial proportion of children with ADHD were seen in outpatient settings for other BH conditions including mood disorders (9.8%), anxiety disorders (9.5%), developmental delays (5.6%), conduct disorders (7.0%), and other mental health diagnoses (13.0%). Black children with ADHD were more likely to have a conduct disorder (OR=1.24, p<.01), developmental delay (OR=1.22, p<.01), schizophrenia (OR=1.81, p<.01) and/or substance use disorder (OR=1.59, p<.01) compared to white children. Latino children were more likely to use health care for developmental delays (OR=1.37, p<.01), and substance use disorder (OR=1.73, p<.01) compared to whites. Factors that predict higher BH outpatient utilization were a) being older, b) having more severe physical health conditions, and living in a county with a higher rate of poverty. Girls with ADHD were more likely to utilized care for mood disorders (OR=1.38, p<.01) and anxiety disorders (OR=1.53, p<.01) compared to boys and were less likely to utilize care related to conduct disorders (OR=.81, p<.01), developmental delays (OR=.77, p<.01), and/or substance use disorder (OR=.54, p<.01).

**Conclusions:** Severity of comorbid physical health conditions, complexity of ADHD diagnosis, gender, age and county characteristics each predicted BH utilization among children with ADHD. Rather than explaining the racial and ethnic disparities, however, including these factors in our model highlighted the disparities. For example, unadjusted models of utilization for substance use disorder showed no difference between races, but adjusted models show Black and Latino children with ADHD were more than 1½ times as likely to have outpatient care for substance use.

**Implications for Policy, Delivery, or Practice:** Future work will focus on determining factors related to the causes of different utilization patterns for co-occurring mental illness in this population including family resources and perceptions of health care. This has implications for developing systems of care to adequately address multiple co-occurring BH conditions especially among racial and ethnic minority children.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #165

**Development of a Suite of Antipsychotic Measures for Youth in Medicaid and in Foster Care**

Molly Finnerty, MD, NYS Office of Mental Health; Edith Kealey; Jennifer Klima, Nationwide Childrens; Emily Leckman-Westin, NYS Office of Mental Health; Kelly Kelleher, Nationwide Childrens; Mark Olfsen, Columbia University; Scott Bilder, Stephen Crystal, Sheree Neese-Todd, Rutgers University; Candice Groseclose, Sepheen Byron, NCQA; Sarah Scholle, NCQA

**Presenter:** Edith Kealey, Research Scientist, edith.kealey@omh.ny.gov

**Research Objective:** As part of a national effort to develop new quality measures for children in Medicaid and CHIP, the National Collaborative for Innovation in Quality Measurement in collaboration with the Rutgers-based MEDNET multistate consortium, is developing measures assessing the use of antipsychotics among children in Medicaid and the Foster Care system. Increased use of antipsychotics among youth, especially publically insured youth, with the highest prevalence for youth in Foster Care, has raised national concerns of appropriateness, safety, and efficiency, and has made antipsychotic utilization a high priority target for quality measure development. This presentation will describe the development and testing of a suite of claims based measures of antipsychotic utilization for the Foster Care and the general Medicaid youth population.

**Study Design:** An environmental scan identified candidate measure concepts. Evidence reviews were presented to three advisory panels, which prioritized among measures and proposed additional measure concepts. An expert workgroup developed draft technical specifications, building upon and expanding the
work of the 16-state Medicaid Medical Directors Learning Network/CERTs Antipsychotics in Children Project, NYS PSYCKES measures, and the measures developed by the MEDNET collaborative. Alternative measure specifications were tested, e.g. continuous enrollment. Measure testing included feasibility, reliability, predictive validity, and disparities for foster care and the general Medicaid population. Feasibility and face validity were also assessed by obtaining feedback from stakeholders.

**Population Studied:** The study population included youth enrolled in the Medicaid program, 0-21 years of age, in Foster Care and in the general Medicaid population. Definitions were tested and measures assessed in three databases: 1) New York State Medicaid database, 2) National Medicaid data (2004 – 2008), and 3) MEDNET 5-state Medicaid database.

**Principal Findings:** A total of 8 antipsychotic utilization measure constructs were generated: 1) antipsychotic polypharmacy, 2) antipsychotic use in very young children, 3) high doses of antipsychotics, 4) metabolic screening for youth on antipsychotics, 5) baseline metabolic screening prior to starting an antipsychotic, 6) use of antipsychotics in the absence of a first line indication, 7) absence of a psychosocial intervention prior to starting an antipsychotic medication, 8) medical follow-up after starting an antipsychotic medication. Input from the advisory panels generally indicated high importance of antipsychotic measures. It was feasible to assess most measures using claims data. However, the validity of some measures would be improved through EMR assessment. In addition, measures that required assessment of mental health services may not be able to be assessed in all states using Medicaid data. Measures needed to be adapted for Foster care due to shorter duration of continuous enrollment in Foster Care, which varied by age.

**Conclusions:** Overall, antipsychotic measures are a high priority for states, and are feasible for states to assess using Medicaid data. Results suggest that most of these measures can be reliably used for Foster Care populations using shorter continuous eligibility criteria.

**Implications for Policy, Delivery, or Practice:** This suite of measures may be useful for states in monitoring antipsychotic utilization among vulnerable populations of youth in Medicaid and their Foster Care programs.

**Funding Source(s):** AHRQ

**Poster Session and Number:** A, #166

**Utilization Patterns among Adolescents in New Mexico School-Based Health Centers: A Profile of Frequent Users**

Kevin Koenig, AcademyHealth; Tara Trudnak, PhD, AcademyHealth; Gerry Fairbrother, PhD, AcademyHealth; Paula LeSueur, MSN CFNP, Envision New Mexico; Mary Ramos, MD, MPH, FAAP, Envision New Mexico; Jane McGrath, MD, Envision New Mexico; Yolanda Cordova, MSW, New Mexico Office of School and Adolescent Health

**Presenter:** Kevin Koenig, MPP, Research Associate, AcademyHealth, kevin.koenig@academyhealth.org

**Research Objective:** The objectives are to describe the services that are delivered to students in New Mexico’s (NM) SBHCs and to examine differences in diagnoses and services between frequent users and infrequent users of SBHC services.

**Study Design:** An analysis was conducted on medical claims from 61 SBHCs in New Mexico during the 2010-2011 school year. The analysis also included an examination of the most common types of diagnoses or services for “frequent users” (defined as 5 or more visits) and “infrequent users” (1 or 2 visits). A logistic regression was conducted to examine whether behavioral, reproductive, asthma or acute care diagnoses predict frequent use of the SBHC. Odds ratios were adjusted for age, gender and race.

**Population Studied:** Adolescents 14-19 years of age who visited a SBHC during the 2010-2011 school year.

**Principal Findings:** During the 2010-2011 SY, 10,017 students aged 14-19 years made 33,434 visits to SBHCs. Most of the visits were for behavioral health (37%) or reproductive health (28%) services, but 11% of visits were for checkups, with the remaining for “other” conditions, usually acute. Most students (63%) had only one or two visits, but approximately 20% of students were frequent users, with 5 or more visits. These frequent users accounted for 59% of all visits. Frequent users also had different types of diagnoses and services than infrequent users. Frequent users were more likely to have a visit for behavioral (69%) or reproductive health (56%) services, whereas the users with one or two visits were more likely to have a checkup (36%). About one-fifth of student (21%) had at least one psychotherapy

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Identifying Children with Complex Chronic Conditions

Elizabeth La, University of North Carolina at Chapel Hill; Tim O’Brien, AccessCare; Lynn Guerrant, AccessCare; Marisa Domino, University of North Carolina at Chapel Hill; Charles Humble, AccessCare; Steve Wegner, Community Care of North Carolina

Funding Source(s): CMS
Poster Session and Number: A, #167

Implications for Policy, Delivery, or Practice: SBHCs appear to fill an important niche in the health care delivery system: providing behavioral and reproductive health services to a high need population. The ability of adolescents to access services where they attend school is an important aspect of the SBHC model of care.

Research Objective: In North Carolina, 53 percent of Medicaid’s child health expenditures are attributed to the 5 percent of children with special health care needs. Medical home and accountable care models, such as Community Care of North Carolina (CCNC) and the Child Health Accountable Care Collaborative (CHACC), have the potential to improve health outcomes and lower health expenditures for children with special needs through better coordination of services and shared responsibility between providers. In order to be successful, these programs must be able to identify the subpopulation of children with special needs who would benefit most from these models of care. The objective of this study was to use administrative data to identify and describe the characteristics of children with complex chronic conditions.

Study Design: We used an iterative approach, incorporating informal feedback from CHACC providers, to select a method for identifying children with special needs in Medicaid data. The initial method relied on hospital admission frequency, costs, and diagnoses between January 1, 2009 and December 31, 2011 (at least 3 admissions in any 365-day period, costs greater than $100,000, and the presence of a chronic diagnosis). Feedback from CHACC providers indicated that information on patients was too outdated. We are currently updating the method for identifying children to rely on hospital admission frequency, duration, and diagnoses between January 1, 2011 and June 30, 2012 (at least 2 admissions or 1 admission with length of stay greater than 30 days and the presence of a complex chronic diagnosis). We used descriptive statistics to summarize demographic characteristics, as well as inpatient and emergency department utilization of the target population.

Population Studied: The initial and modified samples include all children under the age of 17 enrolled in North Carolina Medicaid who met the selection criteria already described. We excluded children with diagnoses related to cancer, infection, mental illness, asthma, or who were pregnant.

Principal Findings: A total of 3,333 children had at least 3 hospital admissions during any 365-day period between 2009 and 2011. These patients had a total of 17,609 hospital admissions (cost=$211.0 million) and 18,562 emergency department visits (cost=$14.6 million). Of these children, 21% (n=699) had costs exceeding $100,000 during the 3-year period. This subgroup had a total of 4,532 hospital admissions (cost=$133.9 million) and 3,953 emergency department visits (cost=$3.3 million). Final results from the updated method of identifying children with complex chronic conditions will be presented in June.

Conclusions: Administrative data can be used to identify children with complex chronic conditions in a timely manner. Using Medicaid data from North Carolina, we identified a small subgroup of children who account for a large amount of hospital utilization and costs.

Implications for Policy, Delivery, or Practice: These methods can be used to help providers...
identify children with complex chronic conditions who are high cost, frequent users of hospital services, and might benefit from medical home or accountable care initiatives.

**Funding Source(s):** CMS, CMS Innovation grant for North Carolina Community Care Network (Grant Number 1C1CMS331015-01-00)

**Poster Session and Number:** A, #168

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**Tobacco Use and Smoking Intentions among Fifth-Grade Students**

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**Presenter:** Joseph Ladapo, M.D., Ph.D., Assistant Professor, Population Health, Department of Population Health, New York University School of Medicine, jladapo@post.harvard.edu

**Research Objective:** To evaluate the association of sociodemographic characteristics and contextual factors with cigarette smoking and future smoking intentions among fifth-graders living in three US metropolitan areas.

**Study Design:** We used multivariate logistic regression models to examine how cigarette smoking and intentions to smoke within one year are associated with individual and contextual factors previously identified in studies of older adolescents. Guided by social theories of behavior, these include (1) number of friends who smoke, (2) parental disapproval of smoking, (3) parental communication about not smoking, (4) performance in school, and (5) educational aspirations. Communication, which was assessed by asking children how often parents spoke to them about not smoking and about how to say no when asked to smoke, was considered present if students reported frequent conversations. We adjusted for common socioeconomic measures, including gender, race/ethnicity, highest household education, and household income, along with year-assessed to capture smoking trends. Analyses also accounted for the effects of design and nonresponse weights, clustering of children within schools, and stratification by site.

**Population Studied:** 5,119 fifth-grade children and their parents were enrolled in the Healthy Passages study and interviewed between August 2004 and September 2006. Participants were recruited from public schools in Birmingham, Alabama; Houston, Texas; and Los Angeles County, California. We randomly sampled schools with probabilities designed to yield a balanced sample of non-Hispanic black, non-Hispanic white, and Hispanic children.

**Principal Findings:** Twenty-nine percent of the children were black, 22 percent were white, 44 percent were Hispanic, and 5 percent were another race/ethnicity. Mean age was 11 years, median family income was 25,000 to 50,000 dollars, and nearly one-quarter of parents had less than a high school education. The prevalence of ever smoking a cigarette among black, white, and Hispanic children was 9.6, 4.9, and 5.6 percent, respectively. The prevalence of smoking within the past 30 days was 1 percent in each racial/ethnic group. In adjusted analyses, children were more likely to have smoked a cigarette if any of their friends smoked (adjusted odds ratio, aOR 5.1, 95 percent CI 3.8-6.9) or they had trouble with schoolwork (aOR 2.2, CI 1.5-3.3). They were less likely to have ever smoked cigarettes if their parents were college-educated versus not (aOR 0.5, CI 0.3-0.9) or disapproved of smoking (aOR 0.3, CI 0.1-0.6). Similarly, children were more likely to state that they intended to smoke or felt they might smoke in the future if any friends smoked (aOR 4.1, CI 2.7-6.1) or they had trouble with schoolwork (aOR 2.1, CI 1.0-4.4). However, only parental disapproval (aOR 0.2, CI 0.1-0.6) and communication about not smoking (aOR 0.5, CI 0.3-0.8) had protective associations.

**Conclusions:** Preadolescent fifth-graders share some of the same risk factors for smoking that have been found in prior studies of older adolescents, and parental disapproval and communication about not smoking may dampen future intentions to smoke.

**Implications for Policy, Delivery, or Practice:** Preventive school-based anti-smoking programs and mass media campaigns, which have largely emphasized peer influences and health harms, may benefit from greater emphasis on parental
influence related to communication and expressed disapproval of smoking.

**Funding Source(s):** CDC  
**Poster Session and Number:** A, #169

**Nursing Care Rationing Linked to Practice Environments in Pediatric Settings**  
Eileen Lake, University of Pennsylvania; Pamela De Cordova, University of Pennsylvania; Sharon Barton, Children's Hospital of Philadelphia; Shweta Singh, University of Pennsylvania; Linda Aiken, University of Pennsylvania

**Presenter:** Eileen Lake, Ph.D.,R.N., Associate Professor, School of Nursing, University of Pennsylvania, elake@nursing.upenn.edu

**Research Objective:** Better nursing practice environments are known to be associated with better nurse and patient outcomes. Researchers have examined the practice environments of critical care, psychiatric, and adult medical-surgical nurses. However, there is a paucity of evidence about pediatric nursing practice environments. Our objective was to examine nurse rationing as measured by nursing tasks left undone and link it to the practice environment in pediatrics.

**Study Design:** A secondary analysis of cross-sectional nurse survey data from 2006 was conducted. Pediatric nurses were asked on the most recent shift of work, what specific tasks were required but left undone because of limited time to complete them. These included: adequate patient surveillance, skin care, teaching patients, administering medications, documentation, coordinating patient care, pain management, oral hygiene, treatments, preparing for discharge, develop or update care plans, and comforting patients. Nurses were also surveyed about the practice environment using the NQF-endorsed Practice Environment Scale of the Nursing Work Index (PES-NWI) which includes five subscales of the following domains: Collegial Nurse-Physician Relations, Staffing and Resource Adequacy, Manager Leadership and Support, Nursing Foundations for Quality, and Nurse Participation in Hospital Affairs. Nurse-level data were aggregated to the hospital-level after establishing reliability of the subscales. A composite of the five sub-scales was computed and quartiles were created (i.e., bottom 25%, middle 50%, top 25%). One-way ANOVAs and multivariate regression models were used to test for associations between the PES-NWI composite and the fraction of nurses in each hospital who reported each task left undone.

**Population Studied:** There were 335 hospitals included from California, Florida, New Jersey, and Pennsylvania representing hospitals with substantial pediatric patient populations and pediatric nurses.

**Principal Findings:** Of 12 tasks that nurses could identify as being left undone, most were left undone by 13% of the nurses, but this varied from 2% to 28%. Develop or update care plans was left undone most frequently (28%) and pain management was rarely not done (2%). Nurse practice environments were rated as favorable (composite exceeding 3.0) for 25% of hospitals. The subscales with the most and least favorable ratings were Nursing Foundations for Quality (mean = 3.08) and Manager Leadership and Support (mean = 2.65). For 10 of the 12 tasks analyzed, there was a statistically significant relationship between the practice environment and tasks left undone (p <0.01). Overall, hospitals in the top quartile of the practice environment had the fewest tasks left undone. Likewise, hospitals in the bottom quartile had the highest percentage of tasks left undone.

**Conclusions:** One in ten pediatric nurses cannot complete required care. Nurses in pediatric care settings that have better practice environments may have to ration care less often which should have benefits for patients.

**Implications for Policy, Delivery, or Practice:** To decrease nurse rationing of care in pediatrics, hospitals should place emphasis and efforts on improving practice environments. Further research should examine how tasks left undone in less professional practice environments may impact pediatric patient safety.

**Funding Source(s):** NIH  
**Poster Session and Number:** A, #170

**An Evidence-Based Care Pathway with Quality Indicators for the Management of Adolescent Depression**  
Eric Lewandowski, NYU Child Study Center; Mary C. Acri, NYU Child Study Center; Kimberly E. Hoagwood, NYU Child Study Center; Sarah H. Scholle, National Committee for Quality Assurance; Sepheen Byron, National Committee for Quality Assurance; Andrea Ireland, National Committee for Quality Assurance; Samantha Frank, NYU Child Study Center; Sarah M. Horwitz, NYU Child Study Center
Presenter: Eric Lewandowski, Ph.D., Research Scientist, Child and Adolescent Psychiatry, NYU Child Study Center, eric.lewandowski@nyumc.org

Research Objective: Care for adolescent depression is suboptimal and could be improved through the development and use of quality indicators. The goal of this work was to develop quality indicators for adolescent depression to be used for quality monitoring and improvement, and for reporting by clinics, health plans and states for meaningful use incentives.

Study Design: Quality indicators for the identification and management of adolescent depression were developed based on clinical practice guidelines and empirical research. Candidate indicators were refined based on panel reviews by consumers, clinicians, state officials, and experts in child psychiatry, pediatrics, and quality measurement.

Population Studied: This work focused on adolescent depression, a prevalent and disabling condition resulting in emotional suffering as well as social and educational dysfunction.

Principal Findings: Based on guidelines, empirical literature, panel review, and expert consultation, an 11-step care pathway was developed for the management of adolescent depression in primary care and specialty mental health settings from case identification through symptom remission, including: screening; diagnostic assessment; suicide assessment; brief supportive counseling; treatment initiation; chart documentation and communication between providers; treatment adherence for medication and psychotherapy; symptom monitoring and reassessment; remission; treatment adjustment. For several steps in this pathway, there was insufficient evidence on which to base quality indicators; for others, empirical studies and guideline recommendations were not precise enough to guide the specification of quality indicators, despite acknowledgement these steps were important for quality care.

Conclusions: Limitations of the current evidence base and indicator review process will hinder the development and widespread endorsement of quality indicators that would improve depression care for adolescents.

Implications for Policy, Delivery, or Practice: Efforts to address these limitations may take two directions. First, researchers may design studies to provide evidence supporting the development of quality indicators for the management of adolescent depression. Priority areas for research include: developing standardized clinical and suicide assessments that are feasible in primary care, including adaptive computer-based assessment approaches; developing triage algorithms linked to symptom severity to complement diagnostic and suicide assessments carried out by non-specialist providers; establishing the appropriate tools, interval, and feedback systems for symptom tracking during treatment; standardized brief counseling interventions that are feasible in primary care; depression medication adjustment algorithms for adolescents. Second, indicator developers and review bodies may consider adjusting the indicator review and approval process, as well as accepted evidence standards to incorporate research findings from relevant non-adolescent and non-mental health populations, as well as quasi-experimental and indirect or implicit evidence.

Funding Source(s): AHRQ
Poster Session and Number: A, #171

Ameliorating Family Impacts among Children with Autism Spectrum Disorder: The Role of Health Care Quality
Katharine Zuckerman, MD, MPH, Oregon Health & Science University; Olivia Lindly, Oregon Health & Science University; Olivia Lindly, MPH, Oregon Health & Science University; Karen Kuhlthau, MA, PhD, Massachusetts General Hospital; Christina Bethell, PhD, MBA, MPH, Oregon Health & Science University

Presenter: Olivia Lindly, M.P.H., Research Associate, Pediatrics, Oregon Health & Science University, lindly@ohsu.edu

Research Objective: This study examined which system of care performance domains are most strongly associated with reduced family financial and employment impacts among children with special health care needs (CSHCN) with current autism spectrum disorder (CSHCN+ASD) relative to either CSHCN with functional limitations or CSHCN who have neither ASD nor functional limitations (CSHCN-ASD).

Study Design: Cross-sectional, parent-reported data from the 2009/10 National Survey of Children with Special Health Care Needs were used to conduct weighted bivariate and logistic regression analyses. Family financial and employment impact dependent variables
included (1) families experienced financial problems due to the child’s health condition(s); (2) families paid >$1000 in annual out-of-pocket medical expenses; (3) family members did not change jobs due to concerns about maintaining the child’s insurance; (4) family members cut-back and/or stopped working due to the child’s health condition(s); (5) families spent $11 hours weekly providing/coordinating care for the child; and (6) families experienced =2 of these five employment or financial impacts. The following Maternal and Child Health Bureau (MCHB) core outcomes were used as key indicators of health care system performance: (1) families were partners in shared decision-making; (2) medical home care receipt; (3) consistent, adequate health insurance; (4) preventive care receipt for early, continuous special health care needs screening; (5) ease of access to community health services; and (6) receipt of transition to adult health care services. A composite measure of whether or not CSHCN met all age-relevant MCHB core outcomes was also used as an independent variable. All analyses were adjusted for race/ethnicity, primary household language, household income, sex, age, geographic region, and insurance type.

Population Studied: A nationally-representative sample of non-institutionalized CSHCN age 3 to 17 years including 28,296 CSHCN-ASD without functional limitations, 6,505 CSHCN with functional limitations and 30,25 CSHCN+ASD.

Principal Findings: Across all health care system performance domains, CSHCN+ASD fared worse than CSHCN-ASD regardless of functional status. CSHCN+ASD were also significantly more likely to experience all financial and employment family impacts than CSHCN-ASD regardless of functional status. Meeting all age-relevant system of care core outcomes significantly reduced the likelihood of experiencing family financial and employment impacts across the three CSHCN subgroups. Among CSHCN+ASD, shared decision-making, medical home care receipt, and ease of access to community health services reduced the adjusted odds of experiencing family financial or employment impacts.

Conclusions: CSHCN+ASD are more prone to experience poor health care quality and family financial and employment impacts relative to other CSHCN, regardless of functional status. Receiving high quality health care may lessen the likelihood of family impacts among CSHCN. CSHCN+ASD and their families may benefit from the system of care domains most closely aligned with medical home care.

Implications for Policy, Delivery, or Practice: Targeted policies and programs advancing improved system of care performance are imperative to reduce family impacts among CSHCN+ASD. Health care delivery models fostering effective care coordination, family-centered care, involvement of families in decision-making, and ease of access to community health services may be especially paramount for organizations and practitioners seeking to promote wellness and ultimately health equity among CSHCN+ASD and their families.

Funding Source(s): HRSA

Poster Session and Number: A, #172

The Effect of the Infant Health and Development Program on Special Education and Therapeutic Service Use at Age 6.5 Years

Jonathan Litt, Beth Israel Deaconess Medical Center; Marie McCormick, M.D., Sc.D., Harvard School of Public Health

Presenter: Jonathan Litt, M.D., M.P.H., Neonatologist, Neonatology, Beth Israel Deaconess Medical Center, jlitt@bidmc.harvard.edu

Research Objective: The aim of this study is to evaluate the effect of participation in an intensive early intervention program for infants with low birth weight (LBW) on receipt of special education and physical and occupational therapy services at early school-age.

Study Design: The Infant Health and Development Program included home visits, child development center attendance, and parent support groups for infants <2500 gram birth weight. A multi-site, randomized trial compared this intensive program to usual pediatric care. We fit logistic regression models to assess program impact on the receipt of special education, remedial math, remedial, physical therapy (PT), and occupational therapy (OT) at age 6.5 years. We also tested for effect modification by key covariates.

Population Studied: The population studied is infants with low birth weight. There were two pre-specified birth weight groups: low birth weight (2001 - 2500 grams) and VLBW (= 2000 grams). There were recruited from 8 geographically distinct academic medical centers in the United States.
Principal Findings: Of the 985 infants in the original sample, 853 participated in 6.5 year follow-up. Fifteen percent (132) received special education, 7% (63) remedial math, and 11% (98) remedial reading, while 4% (38) needed PT and 5% (41) OT. Compared to controls, the intervention group was half as likely to receive remedial reading (OR 0.62, 95% CI 0.39, 0.99), while twice as likely to receive PT (Or 2.11, 95% CI 1.08, 4.12) or OT (Or 1.91, 95% CI 0.99, 3.68). There was no evidence for effect modification by birth or demographic variables. Conclusions: Our finding of decreased odds of receiving remedial reading assistance is consistent with improved cognitive scores at 3 and 5 years in the intervention group. The increased use of therapeutic services at age 6.5 is surprising. This finding likely reflects the effects of the intervention on raising parental awareness of their child’s risk for developmental delays and enhancing parental advocacy skills.

Implications for Policy, Delivery, or Practice: The results of this study highlight limitations in our current assessments of the benefits of interventions for children at risk for developmental problems. It is unclear whether decreased service use stems from lack of availability or increased utilization results from social and cultural differences in the acceptability of intervention services. From a program planning and evaluation perspective, measures of functional status would provide a more refined and meaningful view of children's outcomes beyond service use.

Funding Source(s): No Funding

Poster Session and Number: A, #173

Patient-Centered Medical Home Reduces Odds of High Emergency Department Usage among Children with ADHD

Benyamin Margolis, Health Resources and Services Administration; Sue C. Lin, MS, Health Resources and Services Administration

Presenter: Benyamin Margolis, Ph.D.,M.P.H., Health Scientist, Maternal and Child Health Bureau, Health Resources and Services Administration, bmargolis@hrsa.gov

Research Objective: To determine whether coordinated, ongoing, comprehensive care within a medical home reduced the odds of high emergency department usage (EDU) among children reported to have attention-deficit hyperactivity disorder (ADHD) by a parent/caregiver.

Study Design: We used the 2009/2010 National Survey of Children with Special Health Care Needs (NS-CSHCN). The NS-CSHCN is a national, randomized telephone survey sponsored by the Maternal and Child Health Bureau, Health Resources and Services Administration and administered by the National Center for Health Statistics, Centers for Disease Control and Prevention.

Population Studied: The NS-CSHCN sample consisted of 40,242 children. The survey was administered in English, Spanish, Mandarin, Cantonese, Vietnamese, and Korean. Based on an affirmative response by a parent/caregiver to “Does subject child currently have ADD or ADHD?”, 11,412 children ages 0-17 were classified as having ADHD. Emergency Department Use (EDU) was dichotomized into 0-2 EDU (low) and 3 or more EDU (high) categories. We examined receipt of coordinated, ongoing, comprehensive care within a medical home through bivariate analysis of each Medical Home Quality Indicator component. We included those components with significant chi-squared p-values of <0.05 in the multivariate analysis and controlled for family structure, child’s age, and type of insurance.

Principal Findings: Over 91% (n=10,428) of our sample reported low (0-2) EDU, with the remaining 984 children reported to have made 3 or more visits to the ED in the past 12 months. Although almost 97% of our sample had insurance, the proportion of high EDU children on public insurance was significantly higher than the low EDU group (62.6% vs. 37.6). Relative to the high EDU group, families of children with 0-2 EDU were significantly more likely to report receipt of effective care coordination (Adjusted OR=1.35; 95% CI= 1.06, 1.72), more than twice as likely to report their children had “no problems obtaining referrals when needed” (AOR =2.19; 95% CI= 1.73, 2.77), and almost three times more likely to get help coordinating care (AOR=2.73; 95% CI=1.70, 2.73). Providers were also more likely to listen carefully (AOR=2.06, 95% CI=1.52, 2.78), be sensitive to values and customs (AOR=1.91; 95% CI=1.41, 2.59), provide needed information (AOR=1.77; 95% CI=1.34, 2.35), and make families feel like a partner (AOR=1.71; 95% CI=1.26, 2.31).

Conclusions: Receiving well-coordinated care within a medical home was more likely to reflect the experiences of families of children with low EDU. Our findings identified associations between effective referral, receiving help coordinating care, family-centeredness of care,
and EDU, suggesting high EDU families experience a substantially different primary care experience from those families who report low EDU.

Implications for Policy, Delivery, or Practice: The implementation of family centered elements of medical home relies heavily on clinical provider skills and effective referral protocols. Our study suggests that coordinated care to manage ADHD is associated with fewer ED visits for children with ADHD, possibly due to controlling impulsivity characteristic of ADHD. As a complement to implementing referral guidelines, improving providers’ training and preparedness to enhance listening and sharing skills will help families become better included in assuring their children’s ADHD is well-controlled and thus less likely to engage in behaviors leading to ED utilization.

Funding Source(s): No Funding

Poster Session and Number: A, #175

Pediatric Medical Necessity Criteria as a Coverage Coordination Mechanism Between Medicaid and the Health Insurance Exchanges
Anne Markus, George Washington University; Kristina West, George Washington University

Presenter: Anne Markus, J.D., Ph.D., Associate Professor, Health Policy, George Washington University, armarkus@gwu.edu

Research Objective: The study examines the significance of medical necessity (MN) criteria for coordinating seamless coverage for children transitioning between Medicaid and the health insurance exchanges. Our first aim is to investigate how pediatric MN is defined in state Medicaid programs which purchase services from Managed Care Organizations (MCOs) for their enrollees, and whether the same definition is used by contracting MCOs. Our second aim is to identify best practices in pediatric MN definitions that could be used to bridge child health coverage between Medicaid and the exchanges’ Qualified Health Plans (QHPs) in states that will be active purchasers of QHPs, especially for children with multiple conditions.

Study Design: The study method consisted of a desk review of state codes of regulations and administrative codes to extract pediatric medical necessity definitions. The legal language was then compared to the MN criteria in model MCO contracts and two provider manuals per state to examine how the state pediatric MN definition has been replicated in these implementing documents. We reviewed states with a full risk Medicaid managed care (MMC) model as the closest example to states which will act as active purchasers of QHPs.

Population Studied: Over 110 statutes, regulations, contracts and provider manuals in 33 states with a full-risk MMC model in order to determine the applicable pediatric medical necessity criteria.

Principal Findings: All of the states we reviewed have a reference to the EPSDT program and the federally-mandated pediatric MN standard “to correct or ameliorate” in their regulations, meaning that all states cover both rehabilitative and habilitative care. However, this is not consistently reflected in the published MCO contracts and provider manuals, half of which do not have a reference to the standard. In addition, only 9 states have in their regulations a MN criterion that can be interpreted as a preventative standard of care for child health.

Conclusions: Not including pediatric MN standards in MCO contracts can have the effect of delegating to the MCOs the ability to define their own MN standard, which could result in inconsistencies in coverage. This practice could transfer to the coverage decisions within the QHPs in the exchanges. Having a single, statutory defined, pediatric MN definition in compliance with the federal standard will ensure continuous coverage options for children regardless of which health plan they are using. We propose best examples of pediatric MN definitions from states.

Implications for Policy, Delivery, or Practice: Considering the recently proposed Essential Health Benefits regulations, the most notable differences in child health coverage between exchanges and Medicaid would likely be in hearing care and habilitative care in QHPs. Further, exchanges cover pediatric care (including dental and vision) for children up to 19, while EPSDT covers children up to 21 years of age. A comprehensive state pediatric medical necessity definition for all state-contracted or state-regulated plans for children up to 21 years of age will allow children with multiple conditions to receive needed health care. The examples of definitions in this paper can be used by state administrators when developing and implementing exchange regulations on coverage transitions for children.

Funding Source(s): N/A

Poster Session and Number: A, #176
The Effects of Direct to Consumer Advertising on Medication Use among Medicaid Children with Asthma

Luceta McRoy, Health Administration; Meredith Kilgore, Ph.D., University of Alabama at Birmingham; Robert Weech-Maldonado, Ph.D, University of Alabama at Birmingham; David Bradford, Ph.D., University of Georgia; Nir Menachemi, Ph.D., University of Alabama at Birmingham; Michael Morrisey, Ph.D., University of Alabama at Birmingham

**Research Objective:** National guidelines recommend treatment of asthma with preventive long-term medication, but adherence remains low, resulting in high healthcare utilization among those affected by the chronic disease. Although there are conflicting studies views on the effects of direct to consumer advertising (DTCA) since the easing of restrictions by the Food and Drug Administration (FDA) in 1997, studies have shown some benefits of DTCA including increased medication adherence. However, there are no studies that link DTCA to asthma medication use. The purpose of this study is to examine the effects of DTCA on asthma medication use among children.

**Study Design:** This longitudinal study combined Medicaid administrative data and a national advertising data set on asthma medication from 1999 to 2002. Dependent variable is asthma medication use which includes use of long term and short-term asthma medication drugs. Independent variable is DTCA measured as advertising expenditure by county over the study period. A squared term for DTCA was also used to examine the nonlinear effects of DTCA. Covariates include race measured as whites and blacks; age measured as year at baseline; and gender measured as male and female. As series of logistic regression with population fixed effects were used in the analysis.

**Population Studied:** The sample studied consisted of Medicaid children between the ages of 5 and 18 who had an asthma diagnosis at any time during the study period 1999 to 2002.

**Principal Findings:** The principal findings of the study showed that DTCA significantly increased the likelihood of asthma medication use among all Medicaid children (p < .01) in the study. There were no differences between the effects of DTCA on white and black children’s asthma medication use. DTCA was significantly associated with asthma medication use (p<0.01). At higher levels of DTCA expenditure, the asthma medication use was more likely to decrease (p<.01).

**Conclusions:** The results of this study link DTCA with asthma medication use. However, the effects of DTCA decrease at higher levels of spending. Among Medicaid children, the effects of DTCA on asthma medication use are similar.

**Implications for Policy, Delivery, or Practice:** DTCA provides a gateway to disseminate information that could assist in improved health outcome and should be carefully considered in health policy issues. The findings from this study may also be important for allocation of Medicaid funds for asthma treatment, guidance of organizations and other agencies to reduce the burden of asthma.

**Funding Source(s):** N/A

**Poster Session and Number:** A, #177

Developing and Testing a New Trauma Team Activation Protocol for Use at a Level I Pediatric Trauma Center

Rosemary Nabaweesi, Johns Hopkins Hospital; Paul M. Colombani, Johns Hopkins Medical Institutions; Laura Morlock, Johns Hopkins Bloomberg School of Public Health; Stephen Bowman, National University; Charles Lule, Johns Hopkins Medical Institutions

**Presenter:** Rosemary Nabaweesi, DrPH, MBChB, MPH, Senior Project Analyst, General Pediatric Surgery, Johns Hopkins Hospital, rnbawe1@jhmi.edu

**Research Objective:** To assess the association between Trauma Team Activation criteria and Intensity of Resource Use at an academic pediatric Trauma Center with an urban/suburban catchment area

**Study Design:** We analyzed the performance of the current TTA protocol, developed and tested the sensitivity and specificity of a new TTA protocol as it relates to intensity of resource utilization. Logistic regression and Receiver Operating Characteristic curves were the analytic methods used.

**Population Studied:** Children younger than 15 years of age who sustained a traumatic event and were transported to the Institution's Level I Pediatric Trauma Center by Emergency Medical Services from 2008 through 2011

**Principal Findings:** 1,991 children met the inclusion criteria, 80% of the sample was used in
developing the new TTA and 20% was used for testing the new TTA. The medians for age, length of stay and Injury Severity Score (ISS) were 8 years, 1 day and 4 respectively. The odds of using resources intensely among children with a Glasgow Coma Scale less than 9 (GCSLT9), abnormal pulse, abdominal injury and chest injury were 6, 3, 18 and 9 times those of children who did not meet these criteria. The C-statistic for the Receiver Operating Characteristic (ROC) curve of the logistic regression for Intensity of Resource Use (IRU) was 0.7928 and 0.7964 for the logistic regression on level of TTA assignment.

Conclusions: The newly developed Trauma Team Activation protocol identified criteria of Glasgow Coma Scale less than 9, abnormal pulse, abdominal and chest injuries. When any of these criteria are present will initiate a full Trauma Team Activation.

Implications for Policy, Delivery, or Practice: This research work developed a TTA protocol that has the potential to assign patients to the most appropriate TTA level, thus improving effectiveness and efficiency.

Funding Source(s): No Funding

The Number of Smokers at Home Affects Child Asthma Prevalence, Health Care Utilization and Costs

Kevin Nelson, M.D., Ph.D., Fellow, Pediatrics, University of Utah

Research Objective: Smoking and tobacco smoke exposure (TSE) are the largest preventable causes of U.S. medical illness and costs. TSE occurs mostly at home, affecting 32 million U.S. children. TSE is associated with development of asthma and poor asthma control. Decreasing TSE has been the subject of policy and medical interventions. However, little data exist about the effect of the number of smokers in the home on child asthma. We investigated the association between the number of smokers in the home and child asthma prevalence, exacerbation frequency, HCU, and total costs.

Study Design: We used cross-sectional data from the Medical Expenditure Panel Survey (MEPS) from 2001-2009. MEPS is a national survey of HCU and costs. We determined national estimates for asthma prevalence, exacerbations, HCU (ED/hospital admissions, outpatient visits, prescription medications), and total costs in 2009 dollars based upon the number of smokers (0, 1, 2 or 3 smokers) in the child’s residence. We determined the number of adults, including parents, who smoke and live in the child’s residence using datafields for “smoking status” and “number of adults” living in the child’s residence. Asthma exacerbations were captured by the datafields “exacerbations during the last year” and “ED/hospital admissions.” Child asthma prevalence and exacerbations were analyzed using multivariable logistic regression, and HCU and total costs using generalized linear regression. We controlled for age, sex, race/ethnicity, income, insurance, asthma control, comorbid conditions, and each year of study data. We assessed asthma control using the ratio of quick relievers to total asthma medication (quick relievers+controllers).

Population Studied: The study population included child asthmatics age 5-17 years with TSE. Asthma prevalence was determined for all children age 5-17 years.

Principal Findings: Among the 8544 child asthmatics identified, 35.3% had TSE at home. Demographic characteristics of our samples were age (mean: 11.0±3.7 years), sex (41.1% female), and race/ethnicity (36.3% white, 30.0% black, 26.3% Hispanic, and 7.4% other).

Children living with more smokers were more likely to have asthma compared to children living with no smokers (1 smoker: OR=1.31, p<0.01; 2 smokers: OR=1.28, p<0.01; 3 smokers: OR=1.90, p<0.01). Compared to children living with no smokers, the likelihood of asthma exacerbations increased for children living with 2 (OR=1.42, p<0.01) or 3 smokers (OR=1.61, p=0.01). Children living with 2 (beta=0.24, p<0.01) or 3 (beta=0.32, p<0.01) smokers were more likely than children living with no smokers to have increased ED/hospital admissions. Estimated healthcare costs were higher for child asthmatics living with 1 ($212), 2 ($477), or 3 ($621) smokers compared child asthmatics living with no smokers.

Conclusions: Child asthma prevalence, exacerbations, HCU, and costs significantly increased with the number of smokers in the home.
Implications for Policy, Delivery, or Practice: The increased asthma morbidity and cost with increasing number of smokers in the home suggest effective interventions to reduce TSE among children with asthma are needed, including treating parental smoking. Other interventions include smoke free home rules, smoke free car laws, and other targeted policy interventions to reduce HCU and costs related to TSE among child asthmatics.

Funding Source(s): No Funding
Poster Session and Number: A, #179

Childhood Health and Education: The Impact of Influenza at Different Ages on Education

Nolan Noble, University of Notre Dame

Presenter: Nolan Noble, M.A.,M.S.,B.A., PhD Student/NSF-IGERT Trainee, Department of Economics, University of Notre Dame, nnoble@nd.edu

Research Objective: This paper explores the latent effect of childhood health on educational attainment for a moderate ever-present shock. I estimate the effect of increased influenza virulence during childhood on educational outcomes.

Study Design: Influenza is a severe annual health threat to children, and virulence varies greatly across states and over time. This paper exploits this variation. I combine a large dataset from the Multiple Cause of Death (MCOD) files and the 1980, 1990, and 2000 US Censuses. This large dataset is examined using econometric analyses. Elderly influenza deaths are used as a proxy for influenza virulence. Outbreaks in influenza likely to affect children can be measured through elderly influenza mortality.

Population Studied: The US Census provides a random sampling of all individuals in the United States. This paper focuses on those individuals born between 1969 and 1977 for most educational attainment and health outcomes. Additionally, for individuals being currently progression on time during primary school and high school those born between 1969 and 1973 (for primary) and between 1970 and 1974 along with 1980 and 1984 (for high school).

Principal Findings: Individuals are 0.10–0.79 percentage points less likely to report higher levels of educational attainment due to influenza during the entirety of their childhood. High influenza virulence in early childhood (<6 years) works to increase educational attainment by 0.01–0.79 percentage points. Children exposed to influenza during the latter portion of primary school (3rd to 6th grade) have an average 0.14–0.97 percentage points decrease in educational attainment. There is also evidence that influenza at early ages increases the likelihood of permanent disabilities.

Conclusions: Overall influenza reduces schooling. However, immunity acquisition in children too young to attend school serves to increase their educational attainment. These gains are outweighed by losses suffered from influenza later in childhood. Individuals are 0.32%–1.85% less likely to report higher education when exposed to median influenza throughout childhood. This implies lost wages of $9.4–$37.4 billion.

Funding Source(s): Other, Notre Dame
Poster Session and Number: A, #180

A Systematic Approach to Screening for Adolescent Depression and Enhancing the Quality of Primary Care Depression Management and Monitoring

Ardis Olson, Geisel School of Medicine at Dartmouth; Susan Smiga MD, Geisel School of Medicine at Dartmouth; Rebecca Horvath RN, Geisel School of Medicine at Dartmouth; Louis Kazal MD, Geisel School of Medicine at Dartmouth; Deborah Johnson MHA, Geisel School of Medicine at Dartmouth

Presenter: Ardis Olson, MD, Professor of Pediatrics, Pediatrics/Community and Family Medicine, Geisel School of Medicine at Dartmouth, Ardis.L.Olson@dartmouth.edu

Research Objective: To describe the implementation of a new primary care multipractice system to identify youth depression, provide quality treatment and monitor outcomes to fulfill the US Preventive Services Task Force adolescent depression recommendations.

Study Design: The Teen Mental Health project provided primary care practice supports to
enhance primary care management skills, establishment of routine adolescent depression screening using the Columbia TeenScreen PHQ-9 adapted for Adolescents, and a centralized registry to provide feedback to practices about outcomes. New quality of care indicators were defined for adolescent depression screening, primary care treatment planning, and outcomes monitoring. Components of the quality improvement practice supports provided were: 1) training clinicians and staff in systematizing screening and skills for depression/suicide risk assessment and management; 2) offering centralized psychiatric consultation for clinicians; 3) tracking of outcomes with uniform measures within a centralized registry. **Population Studied:** 467 depression screen positive youth, detected after 4904 adolescents were screened at health visits. These youth were cared for by 50 clinicians within 13 diverse non-affiliated pediatric and family medicine practices in VT and NH. **Principal Findings:** 9.2% of youth screened PHQ9-A positive either on the basis of depressive symptoms (score of 11 or more) or suicidal risk. Of those screened positive 23.8% responded that in the past month they had serious thoughts about taking their life. More than half of positive youth (54.8%) were newly detected cases. The majority (77%) of teens/families agreed to follow up care/outcomes monitoring by the practice. The above findings did not differ significantly by gender except more males(41%) than females(28%) declined follow up. Registry data shows the following quality of care components were provided at the initial clinician visit: psycho-education (70%), guidance about mental health self care (65%), mental health counseling in place or new referral (81%), started or changed antidepressant medication (64%), discussed suicide safety plan (49%). 38% of youth identified as positive had a follow up visit within 8 weeks. Of these, 68% had a repeat PHQ-9A to assess course. No practices had a protocol for follow up or use of an objective measure to monitor progress prior to the project. All active practices established consistent screening routines, however there was considerable variation in establishing regular data entry into the registry. Pre-intervention practice readiness measures did not predict practice implementation differences. While all clinicians within these practices screened, depression care was more likely to be provided by female providers to female adolescents with the majority of care provided by a few individuals within each practice. Information will be provided comparing variation in screening, management, and use of the registry by electronic medical record status, primary care specialty, leadership and administrative facilitators and barriers. **Conclusions:** A multi-practice systems change approach with an external catalyst providing supports, has resulted in a change in practice culture to embrace adolescent depression screening and care as a part of the medical home. **Implications for Policy, Delivery, or Practice:** To expand the primary care medical home to address youth mental health issues it will require flexible timeline for implementation, external supports and identification of resources for maintaining routines and registries. **Funding Source(s):** AHRQ **Poster Session and Number:** A, #181 **Peer Social Networks Influence on Health and Education** Wendy Parker, Albany College of Pharmacy and Health Sciences; Rachel A. Smith, Baruch College **Presenter:** Wendy Parker, Ph.D., Assistant Professor Of Sociology, Arts and Sciences, Albany College of Pharmacy and Health Sciences, wmpc@mac.com **Research Objective:** To understand if a high school student’s health status is related to their position in their social network in high school. To determine if health is predictive of local and/or global social network status for US adolescents. In terms of education, can we explain how peer network relationships are connected to postsecondary attainment. **Study Design:** Using Wave I and Wave IV data from Add Health, we utilize constructed peer network measures in linear and logistic regression models to assess health, education and peer relationships. **Population Studied:** Add Health is a longitudinal, nationally representative sample of 90,118 adolescents in grades 7-12 attending 80 high schools and 50 middle schools in 1994-95. **Principal Findings:** Findings to date have shown for the health models: Health status is related to peer networks for adolescents. Adolescents in poorer health are a part of social
networks that: Have less centrality and have decreased proximity prestige (closeness); Have fewer both in and out degree ties; but have increased mutuality or mutual ties. For the education models: Results are mixed regarding the relationship between high school peer network status and whether a student goes on to any form of postsecondary education; High school peer network measures appear to be positive predictors of bachelor’s degree attainment or enrollment (vs. no college)

**Conclusions:** Adolescents who are in poorer health are not as well connected in the network and when they are it is to others who are also less well connected. Overall adolescents in poorer health have fewer friendship ties (in or out). Conversely adolescents in better health have more friendship ties (both in and out), are more closely connected to all those in the network, and are connected to more well connected adolescents.

**Implications for Policy, Delivery, or Practice:** If health and peer relationships are connected in high school, perhaps health behavior interventions can be focused on peer groups rather than just individuals to strive for better health outcomes.

If we can demonstrate connections between health and education at the relationship level for US adolescents, we can think about prevention and intervention packaging in a whole new way.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #182

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**Research Objective:** Wide geographic variation exists in pediatric subspecialty supply in the US, prompting calls for change in recruitment and delivery of pediatric subspecialty care. It is not known, however, whether children in areas with decreased supply receive less subspecialty care or have worse health outcomes. Our objective was to compare pediatric subspecialty visits and health outcomes in states with high and low subspecialty supply.

**Study Design:** The 2009-10 National Survey of Children with Special Health Care Needs is a nationally-representative survey of children with chronic medical conditions. For the preceding year, parents reported subspecialty use and the following health outcomes: unmet subspecialty need, missed school days, emergency department visits, functional limitations, health information received, and perceived financial burden related to medical needs. Using the 2010 Area Resource File, states were grouped into quintiles of pediatric subspecialty supply per population. The associations between pediatric subspecialty supply, utilization, and outcomes were measured with both unadjusted analyses and multivariable logistic regression (adjusting for sociodemographic variables and primary care experience). Analyses accounted for population weights and survey design.

**Population Studied:** 40,242 children with one or more chronic medical condition.

**Principal Findings:** Nationally, 46% of children with a chronic medical condition reported a subspecialty visit in the prior year. In unadjusted results, 49% of children in states with highest quintile of supply reported seeing a subspecialist compared to 41% of children in states with lowest quintile of supply (p<0.001). In our multivariable model, compared to children in states with highest subspecialty supply, children in states with lowest subspecialty supply were less likely (OR 0.75, 95% CI 0.67-0.85) to have seen a subspecialist in the preceding year. Children in states with lowest supply were more likely to have increased unmet subspecialty need (11%, compared to 7% in states with highest supply, p<0.001) and increased illness-related financial burden (23%, compared to 18% in areas of highest supply, p<0.001), but subspecialty supply was not associated with significant differences in the other examined health outcomes.

**Conclusions:** Children with chronic medical conditions in states with lower pediatric subspecialty supply were less likely to receive subspecialty care and more likely to report...
unmet subspecialty need. However, lower subspecialty supply was not associated with differences in most health outcomes, including missed school days, emergency department visits, functional limitations, and receipt of adequate health information.

Implications for Policy, Delivery, or Practice: Policies to address the maldistribution of pediatric subspecialists or to expand the geographic reach of current pediatric subspecialists (such as telemedicine) may help improve access to pediatric subspecialists and reduce reported unmet need. However, further research will be necessary to determine whether such strategies actually improve health outcomes.

Funding Source(s): Other, HRSA funded NRSA T32 Training Grant for Primary Medical Care

Poster Session and Number: A, #183

Trends in Pediatric Quality Indicators for Outpatient Care, 2007-2011
John Richardson, Truven Health Analytics; Mark W. Smith, Truven Health Analytics

Presenter: John Richardson, M.P.H., Senior Analyst, Truven Health Analytics, john.richardson@truvenhealth.com

Research Objective: Examine the trends in pediatric quality indicators for outpatient care.

Study Design: A retrospective claims analysis examined compliance with 16 quality indicators among commercially insured children from 2007 to 2011. The indicators pertained to the outpatient treatment of both acute and chronic health conditions: common cold, otitis media, concussion, asthma, diabetes, depression, eczema, and migraines. We examined the results altogether and by sex. We also used a Cochrane-Armitage test to identify significant linear trends over time.

Population Studied: Outpatient records of children ages 0 to 17 were analyzed using the Truven Health MarketScan Commercial Claims and Encounters Database. The database includes medical claims from large employers and health plans across the United States that provide private healthcare coverage for more than 20 million employees, spouses, and dependents each year.

Principal Findings: We found a significant positive trend in the quality of outpatient treatment provided for the common cold, otitis media, diabetes, depression, and eczema. All but the treatment examined for otitis media also had more than a 2.5 percentage point increase or the total percentage point increase accounted for more than a 5 percent reduction in the quality gap. For asthma, three indicators had a significant positive trend (proper use of controller medications, use of inhaled corticosteroids, and receiving the flu shot), but two indicators had a significant negative trend (no emergency department visit among young children, and having four office visits in two years). There was a small but significant negative trend in providing a CT scan to children with a concussion (-0.8 percentage point difference, p less than 0.0001). We found no significant change in the quality of care for migraines. Six of 16 quality indicators had less than 50 percent compliance each year. Among males, the largest increases in quality were in providing flu shots to children with asthma (7.2 percentage point increase), HbA1c testing for diabetes (5.9 percentage points), calcineurin inhibitors not as a first line of treatment for eczema (5.1 percentage points), and monitoring during the first six months of treatment for depression (4.7 percentage points). Among females, the largest increases in quality were in lipid profiling for diabetes (6.8 percentage point increase), providing flu shots for children with asthma (6.7 percentage points), and HbA1c testing for diabetes (5.3 percentage points).

Conclusions: Outpatient care for children has been improving for the majority of the selected acute and chronic conditions in this study. Even with these increases, however, in many cases fewer than half of children receive high-quality treatment.

Implications for Policy, Delivery, or Practice: Quality reform will need to continue to address relatively low rates of compliance. Where electronic health records are not available, outpatient claims can be used as a means to monitor trends in the quality of pediatric care over time.

Funding Source(s): NIH

Poster Session and Number: A, #184

Outcomes of Co-Management, an Innovative Care Model
Karen Rubin, Connecticut Children's Medical Center; Eminet Abebe Feyissa, MPH, Connecticut Children's Medical Center; Erin Cornell, MPH, Connecticut Children's Medical Center; Cristian Ionita, MD, Connecticut Children's Medical Center; David Wang, MD, Connecticut Children's Medical Center; Regina
Kostyun, MS.Ed ATC, Connecticut Children's Medical Center; Jennifer Schwab, MD, FAAP, University of Connecticut School of Medicine

**Presenter:** Karen Rubin, M.D., Associate Clinical Chair Of Pediatrics, Endocrinology, Connecticut Children's Medical Center, krubin@ccmckids.org

**Research Objective:** The main objective of the study was to expand on earlier findings which demonstrated the feasibility of implementing Co-Management, an innovative model of care, in the primary care setting. Using this model, teams consisting of a primary care provider (PCP) and one or more subspecialists developed a set of tools for management of relatively common pediatric conditions such as concussion. The study aimed to assess broad outcomes, including the potential of the model to minimize variation and enhance the quality of care, reduce unnecessary referrals and testing, and potentially reduce system level cost. Provider satisfaction was also measured.

**Study Design:** Co-managed patients who were prospectively enrolled were compared to a retrospective audit of demographically comparable, non-co-managed patients with the same condition from the same practice.

**Population Studied:** All patients with suspected concussion aged 3-18 years at a suburban practice were eligible. Nine PCPs, including 7 MDs and 2 APRNs, participated.

**Principal Findings:** Eighty-three patients with suspected or confirmed concussion were enrolled by 9 PCPs, resulting in a total of 205 Co-Management visits. Co-Management enhanced the quality of care as demonstrated by PCPs’ adherence to the consensus-based algorithm: 98% of co-managed patients had at least one top symptom identified by the PCP; all had the diagnosis (concussion or other) identified and confirmed using the Co-Management tools; and 98% had at least one recommended treatment option (e.g. rest, level of activity) identified. All PCPs stated that they are very or somewhat satisfied with Co-Management as a model of care.

Eighty-eight percent of co-managed patients had at least one follow-up visit scheduled with the PCP compared to 75% in the control group (n=20). In the co-managed group, 92% of patients were exclusively managed by the PCP and 8% were referred to subspecialist care compared to 85% and 15% in the non-co-managed group. Seventy-one percent of the Co-Management referrals (n=7) were appropriate according to the Co-Management algorithm.

Billing data, obtained for 165 Co-Management and 45 non-Co-Management office visits, showed that 82% were billed as level 4 or 5 visits in the co-managed group compared to 56% in the control group (p = 0.001).

**Conclusions:** The findings indicate that Co-Management of concussion can enhance the quality of care by demonstrating adherence to a consensus-based algorithm. The results also support the feasibility of building PCP capacity to enable more independent management of care for patients with relatively common pediatric conditions. The level of provider satisfaction with the model adds to the evidence of feasibility. That PCPs billed Co-Management office visits at higher levels compared to non-Co-Management visits suggests that the model can divert the care of less complex patients from expensive ED or subspecialist settings to primary care, potentially reducing system-level costs.

**Implications for Policy, Delivery, or Practice:** The Co-Management model is particularly timely in the current health care context as it is a valuable resource for the implementation of the patient-centered medical home and accountable care. Model scalability, possible with an investment in a Co-Management infrastructure and the alignment of provider incentives, has the potential to significantly improve the quality of care and reduce unnecessary costs.

**Funding Source(s):** Other, Child Health and Development Institute of Connecticut and Yale Center for Clinical Investigation

**Poster Session and Number:** A, #185

**Variation in Adverse Perinatal Outcomes among Asians and Pacific Islanders in Hawaii**

Tetine Sentell, University of Hawaii at Manoa; Hyeong Jun Ahn, Biostatistics Core, University of Hawaii John A. Burns School of Medicine; Ann Lee Chang, Obstetrics, Gynecology, and Women's Health, University of Hawaii John A. Burns School of Medicine; Jill Miyamura, Hawaii Health Information Corporation

**Presenter:** Tetine Sentell, Ph.D., Assistant Professor, Office of Public Health Studies, University of Hawaii at Manoa, tsentell@hawaii.edu

**Research Objective:** Empirical evidence regarding adverse perinatal outcomes across
heterogeneous Asian and Pacific Islander subgroups is limited, despite the importance of this topic to health disparities research and quality improvement efforts.

**Study Design:** Detailed discharge data from all Hawaii childbirth hospitalizations from January 2008 to June 2012 were used. Outcomes considered were preterm delivery (defined from MS DRG), low birth weight (less than 2500g), and macrosomia (greater than 4000g) as well as an AHRQ patient safety indicator: birth trauma, injury to neonate (using AHRQ guidelines). Outcomes were compared in descriptive and multivariable models across seven maternal racial/ethnic groups: Filipinos, Hawaiians, other Pacific Islanders (e.g., Samoan, Tongan, Micronesians), Japanese, Chinese, White, and other race/ethnicity. Multivariable Poisson regression models estimated rate ratios (RR) with 95 percent confidence intervals (CI) adjusting for maternal age group, payer, rural vs. urban hospital location, high-risk pregnancy, and multiple gestation.

**Population Studied:** A total of 65,817 childbirth hospitalizations out of 73,123 maternal-related hospitalizations were considered. Total maternal-related hospitalizations were 23 percent Native Hawaiian, 20 percent Filipino, 19 percent White, 13 percent other race/ethnicity, 11 percent other Pacific Islanders, 10 percent Japanese, and 3 percent Chinese. Age group, payer, hospital location, multiple gestation, and high-risk pregnancies varied significantly across race/ethnicity.

**Principal Findings:** In multivariable models, Filipinos (RR: 1.69; CI: 1.53-1.87), other Pacific Islanders (RR: 1.25; CI: 1.11-1.40), Native Hawaiians (RR: 1.24; CI: 1.12-1.38), and Japanese (RR: 1.22; CI: 1.08-1.38) had significantly higher rates of preterm deliveries than Whites. For low birth weight, Filipinos (RR: 1.83; CI: 1.67-2.01), Japanese (RR: 1.57; CI: 1.40-1.75), and Native Hawaiians (RR: 1.22; CI: 1.11-1.35) all had significantly higher rates than Whites. All racial/ethnic groups had significantly lower rates of macrosomia than Whites except for other Pacific Islanders who did not vary significantly from Whites; RR for macrosomia ranged from 0.86 among Hawaiians to 0.34 among Filipinas. Birth trauma, injury to neonate, was significantly less for both Hawaiians (RR: 0.67; CI: 0.45-0.99) and Japanese (RR: 0.56; CI: 0.34-0.94) compared to Whites, but did not differ significantly for other racial/ethnic groups.

**Conclusions:** Patterns in adverse perinatal outcomes vary across Asian and Pacific Islanders subgroups, revealing distinct patterns of clinical interest. For instance, Chinese did not report any poor newborn outcomes, while Filipinos had the highest rates of preterm deliveries and low birth weight. These important differences would likely be hidden in combined Asian and Pacific Islander analyses. Also, analyses did not reveal typical patterns of perinatal outcome disparities with Whites, for instance, having higher rates of macrosomia and birth trauma compared to Native Hawaiians.

**Implications for Policy, Delivery, or Practice:** Asian and Pacific Islanders subgroups must be disaggregated to understand clinical patterns, to identify possible disparities, and to design effective interventions.

**Funding Source(s):** AHRQ

**Poster Session and Number:** A, #186

**Pediatricians and Bullying: Parent and Community Perspectives on the Pediatrician's Role in Screening, Prevention, and Intervention**

Rashmi Shetgiri, University of Texas Southwestern Medical Center and Children's Medical Center; Blanca Villasenor, BA, University of Texas Southwestern Medical Center; Glenn Flores, MD, University of Texas Medical Center and Children's Medical Center

**Presenter:** Rashmi Shetgiri, M.D., M.S.H.S., Assistant Professor of Pediatrics, Pediatrics, Division of General Pediatrics, University of Texas Southwestern Medical Center and Children's Medical Center, rashmi.shetgiri@utsouthwestern.edu

**Research Objective:** Bullying affects 30% of US children. The American Academy of Pediatrics recommends that pediatricians address bullying with children and families, but not enough is known about what specific role pediatricians might play. The objective was to identify parental and community perspectives on pediatricians' role in identifying bullying, improving Bright Futures bullying-related materials, and primary-care-based bullying-prevention strategies.

**Study Design:** Six focus groups and 16 semi-structured interviews were conducted with parents, stratified by the child's bullying (bully, both bully and victim, victim, or uninvolved); 2 interviews were conducted with school administrators and 6 with leaders of community-based organizations (CBOs). Fourteen questions were asked in 4 domains. Sessions
were audiotaped, transcribed, and analyzed using margin coding and grounded theory. Themes were independently identified by 3 coders, with disagreements resolved by consensus.

**Population Studied:** Parents of children 5-17 years old, and school and community leaders.

**Principal Findings:** The 51 participants included 43 parents and 8 key informants. Parents stated that pediatricians can identify bullying by asking children questions such as “does anybody at school tease you?” Parental denial was cited as a challenge, with victims’ parents “not believing it is as bad” and parents of bullies resistant, as “nobody wants to believe your kid is doing that.” Bullying-prevention strategies cited included educating children and parents about effects of bullying, and providing counseling. Bright Futures materials could be more effective by having doctors review questionnaires with parents, using materials as tools to guide discussion, and providing brochures and DVDs. Parents of victims and bully-victims stated that pediatricians could complement community bullying-prevention activities by working with schools: “if they have a kid they are concerned about, they can let the school counselor know, so they can be on the lookout for that child.” Parents of bullies stated that reporting bullying to teachers is not helpful; encouraging children to defend themselves was viewed as preferable. Key informants stated that pediatricians should be more involved in bullying prevention, audiovisual materials should be provided and reviewed with parents, and doctors should contact schools when bullying is suspected. School administrators cited student confidentiality as a potential barrier to working with pediatricians. CBO leaders suggested that pediatricians should make contacts with community organizations.

**Conclusions:** Parents and key informants stated that pediatricians can play essential roles in identifying and preventing bullying. Pediatricians can identify bullying by asking children whether they are being teased at school. Bullying-prevention strategies include the use of Bright Futures materials to discuss bullying, providing brochures and DVDs, educating families about the effects of bullying, and providing counseling. Parents of bullies encouraged children to defend themselves. Parents and key informants recommended working with schools to prevent bullying.

**Implications for Policy, Delivery, or Practice:** The study results could be used to improve pediatricians’ bullying-prevention practices. Use of written and audiovisual formats of Bright Futures materials might improve patient education about bullying. It may prove useful for pediatricians to work closely with schools and community organizations to monitor and intervene with bullies and victims and jointly advocate for bullying-related prevention and counseling policies.

**Funding Source(s):** Other, Academic Pediatric Association Young Investigator Award

**Poster Session and Number:** A, #187

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**Quality of Outpatient Care in 2010 for Children with Medicaid or Commercial Insurance**

Mark W. Smith, Truven Health Analytics; John Richardson, Truven Health Analytics

**Presenter:** Mark Smith, Ph.D., Director, Truven Health Analytics, mark.w.smith@truvenhealth.com

**Research Objective:** To compare the quality of outpatient care received by children in Medicaid and those with commercial private insurance.

**Study Design:** This was a retrospective analysis of administrative insurance claims. Fifteen quality indicators were identified in four acute and four chronic health conditions. Indicator definitions were applied to a pair of large claims databases. The percentages of children meeting the standards of care were calculated within each insurance category (private or Medicaid) overall and by sex and age group.

**Population Studied:** Children ages 0-17 whose claims appear in the 2010 Truven Health MarketScan Commercial Claims Database and the Truven Health MarketScan Multi-State Medicaid Database.

**Principal Findings:** Children in Medicaid were significantly more likely to receive 7 types of high-quality care, of which 6 had clinically meaningful differences: recommended antibiotics for otitis media (67.4% vs. 61.2%), no antibiotics for the common cold (92.0% vs. 88.8%), proper controller medications for asthma (93.6% vs. 90.4%), retinal exam for diabetes (57.8% vs. 28.8%), lipid profiling for diabetes (45.5% vs. 40.4%), and calcineurin inhibitors only as a second line of treatment for eczema (61.3% vs. 48.2%). Commercially insured children fared better on 8 indicators on average, always by a clinically meaningful amount: inhaled corticosteroids for asthma.
(49.9% vs. 47.6%), influenza vaccination for those with asthma (36.1% vs. 25.3%), HbA1c testing for diabetes (64.1% vs. 55.2%), microalbumin testing for diabetes (38.0% vs. 32.3%), monitoring during the first six months of treatment for depression (64.2% vs. 59.5%), and at least six months of medication for major depression (61.0% vs. 57.3%). For the treatment of depression, the disparities were primarily among females. Differences were consistent across age groups, although for nearly half of the quality indicators compliance for both the Medicaid and commercial insurance populations decreased with age.

Conclusions: Medicaid providers are closing the quality gap: while many earlier studies have found private insurance to provide better-quality care, in 2010 we find that children in Medicaid were about as likely to receive high-quality outpatient care in 2010 as were privately insured children. Regardless of insurance type, however, high-quality outpatient care for both acute and chronic conditions is often not provided.

Implications for Policy, Delivery, or Practice: The Medicaid program manages to provide ambulatory care roughly similar to that of private insurance despite a smaller pool of providers and a population that faces many barriers to obtaining care. The striking disparities between publicly and privately insured children on certain indicators deserve exploration. Overall, a considerable effort would be needed to achieve even 80% compliance on each of these indicators.

Funding Source(s): NIH
Poster Session and Number: A, #188

Adolescent Self-Report of Patient-Centered Care: Association with Receipt of High Quality Primary Care and Unmet Needs
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Presenter: Sara Toomey, M.D., M.P.H., M.Phil., Instructor, Division of General Pediatrics, Children's Hospital Boston, sara.toomey@childrens.harvard.edu

Research Objective: To examine whether patient characteristics are associated with adolescent self-report of patient-centered care (PCC) and whether adolescent receipt of PCC is associated with characteristics of high-quality primary care and fewer unmet needs.

Study Design: We conducted a cross-sectional analysis of a representative sample of adolescents. The main outcome was adolescent report of PCC. PCC was derived as a dichotomous variable from four key components of patient-centeredness. Specifically, they are asked if their doctors or health providers listened carefully to them, explained things in a way that was easy to understand, showed respect for what they said, and spent enough time with them. To meet criteria for receipt of patient-centered care, an adolescent reported that his/her doctor or health provider “usually” or “always” performed each of these four activities over the last 12 months. Markers of high-quality adolescent primary care included access to private conversations and having health providers who discussed health behaviors and screened for risk behaviors. Health-related outcomes included self-report of global health status, quality of life (PedsQL), and unmet need. Additional covariates included gender, race/ethnicity, insurance status, highest household education, household income, research site, and children with special health care needs (CSHON) status. We conducted weighted bivariate and multivariate analyses.

Population Studied: The analysis includes a representative sample of 5,147 10th graders and their parents in three U.S. metropolitan areas.

Principal Findings: Fifty-nine percent of adolescents reported that they received PCC. Adolescent report of PCC differed by race/ethnicity: Asian (46%), Black (53%), Hispanic (45%), and White (58%, p<0.001). Adolescent report of PCC also differed by insurance status: adolescents with private insurance (58%), with public insurance (45%), and without insurance (47%, p<0.001). Adolescents with better health status were more likely to report PCC (Excellent 58%, Very good 55%, Good 45%, Fair/Poor 43%; p<0.001). Report of PCC was associated with markers of high quality adolescent primary care and fewer

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Implications for Policy, Delivery, or Practice: PCC is a defining element of the patient-centered medical home. Few studies have examined adolescents’ reports of having received PCC. Demonstrating that adolescents’ report of PCC is associated with markers of high quality primary care and fewer unmet needs provides support for asking adolescents directly about whether they receive PCC as a measure of the quality of adolescent primary care.

Funding Source(s): CDC
Poster Session and Number: A, #189

Birth Complications and Neonatal Readmissions: Trends 2002-2009, Payers and Major Diagnoses
Tara Trudnak, AcademyHealth; Gerry Fairbrother, PhD, AcademyHealth; Pamela Owens, PhD, Agency for Healthcare Research and Quality; Lisa Simpson, MB, BCh, MPH, FAAP, AcademyHealth

Presenter: Tara Trudnak, Ph.D., MPH, Senior Research Manager, AcademyHealth, tara.trudnak@academyhealth.org

Research Objective: The objectives of this paper are 1) to examine overall trends and trends in payer types of complicated births and 30-day neonatal readmissions from 2002 through 2009, 2) to describe most common diagnoses associated with complicated births and readmissions, and 3) to determine most likely payer type for these diagnoses.

Study Design: Data from 2002-2009 were examined from the Healthcare Cost and Utilization Project (HCUP), Nationwide Inpatient Sample (NIS). Diagnoses were identified using all listed ICD-9-CM classifications and categorized using the Clinical Classifications Software (CCS). The most prevalent diagnoses for complicated births and 30-day readmissions were ascertained. Analysis included a chi-square test for trend to assess differences over time, and a logistic regression to determine likely payer source (Medicaid, Private or Uninsured) for the most prevalent diagnoses. Odds ratios were adjusted for infant’s gender, race/ethnicity and hospital characteristics.

Population Studied: Newborns with diagnosis other than live birth (complicated birth), and readmissions that occurred within 30 days of birth.

Principal Findings: All payer hospital discharge, average costs and average length of stay for complicated births and 30-day hospital readmissions showed a trend toward increasing from 2002 to 2009, but did not reach statistical significance (p=.08). In 2009, there were 859,853 discharges for complicated births and 30-day readmissions with an average cost per discharge of over $13,000. The proportion of complicated births and neonatal readmissions paid for with private insurance decreased substantially from 2002 to 2009 (p<.0001), while the proportion paid for by Medicaid substantially increased (p<.0001). By 2008 Medicaid was paying for more complications and readmissions than private insurance.

Among complicated births, the most prevalent diagnoses in 2009 were preterm birth/low birthweight (23%), followed by respiratory distress (18%) and jaundice (10%). Preterm birth/low birth weight and respiratory distress together (41.3% of the neonates) account for 61% of the aggregate cost with almost the same mean length of stay of about 14 days. Compared to private insurance, Medicaid paid for more preterm/low birthweight (p<.0001) and respiratory distress (p<.005) complications, whereas private insurance paid for more 30-day readmissions for jaundice relative to Medicaid (p<.006).

Conclusions: This study found an overall increase in hospital discharges for complicated births and 30-day readmissions from 2002 to 2009. Most strikingly, over time, the number of complicated birth/30-day readmissions paid for by Medicaid increased, while the number paid for by private payers decreased.

Implications for Policy, Delivery, or Practice: Policies to prevent some of the high-cost birth complications have the potential for both reducing costs as well as improving birth outcomes.

Funding Source(s): Other
Poster Session and Number: A, #190
The Joint Influence of Individual Choices and Family Characteristics on Youth Obesity: A Latent Class Analysis
Hongmei Wang, University of Nebraska Medical Center, College of Public Health; Junyoon Kim, UNMC; Liyan Xu, Creighton University

Presenter: Hongmei Wang, PhD, Assistant Professor, Health Services Research, University of Nebraska Medical Center, College of Public Health, hongmeiwang@unmc.edu

Research Objective: Over the last three decades, obesity has reached epidemic proportions among children in the United States. Studies suggest that individual physical activity and eating behavior choices, parent control, and advising of primary care providers are factors related to youth overweight status and weight control efforts. However, few studies have examined how the combination of these factors will impact the youth overweight status. This study aims to gain a deeper understanding on the joint influence of these factors on youth overweight status using a Latent Class Analysis method to inform policy interventions targeting the epidemic of youth obesity.

Study Design: The authors of this paper utilize survey data for youth aged 12 to 19 years in a Midwest city to examine the joint effects of individual behavior choices, family background, and physicians advice on youth weight status. The survey was conducted by phone in Fall 2008 to collect information on weight status, weight control methods, physical activity, dietary behaviors, parenting style, and physician's advising of local youth. The final sample of the survey contained 894 responses with a total response rate of 37.5%. A latent-class analysis was conducted to group the youths based on four factors: physical activity, dietary behaviors, parenting style, and physician's advice on obesity. A logistic regression was followed to examine the relationship of these groups to the weight status of the youth to examine the joint influence of the four factors on youth weight status.

Population Studied: The target population is youth aged 12 to 19 years that resided in the county. African American and Hispanic youth were over-sampled to produce estimates for these groups with adequate precision.

Principal Findings: LCA analysis returned three groups of youth, with Group I representing youth with good physical activity and eating behavior, parental control, and physician advice; Group II representing youth with good physical activity and eating behavior, parental control, but without physician advice; Group III representing youth not with healthy eating and physical activity and eating behaviors, permissive parenting, and physician advice. The logistic regression results suggest that youth in Group I are less likely to be overweight than youth in Group III (OR=2.54). Similarly, youth in Group II are less likely to be overweight than youth in the third group (OR=2.92).

Conclusions: Logistic regression results suggest that healthier individual behaviors and tighter parental control together may have prevented youth from getting overweight. Interestingly, we don’t observe a stronger preventive effect from Group I than Group II, which suggest that whether physicians provide advice during the youth’s wellness check up visit on physical activity and nutrition actually don’t have any significant influence on the weight status of youth.

Implications for Policy, Delivery, or Practice: The study results suggest that policies targeting reducing youth obesity should consider a combination of interventions at different levels to be most effective. Additionally, the study results suggest primary care physicians' involvement needs to be more in-depth and comprehensive to make an impact on prevention of youth overweight.

Funding Source(s): Other, Live Well Omaha Kids

Poster Session and Number: A, #191

Antipsychotic Use among Medicaid Children in Eight States
Daniel Weinberg, IMPAQ International, LLC; Norma Gavin, RTI International

Presenter: Daniel Weinberg, Ph.D., Research Associate Economist, IMPAQ International, LLC, dweinberg@impaqint.com

Research Objective: According to multiple studies, utilization of atypical antipsychotic drugs (AAPs) has increased substantially in recent years, and this trend is also present among vulnerable populations. We examine the use of AAPs and first generation antipsychotics (FGAPs) among Medicaid children to ascertain which drugs are most commonly prescribed and the age, race/ethnicity, gender, and eligibility groups to which they are prescribed. We also examine longitudinal trends and consider the
consistency of utilization patterns across study states.

**Study Design:** We use the Environmental Scanning and Program Characteristics (ESPC) Database (a CMS-sponsored database containing state-level data on Medicaid program characteristics) and other relevant data to select study states having complete prescription drug claims data. We consider the following criteria: enrollment in comprehensive managed care; proportion of full-benefit fee-for-service (FFS) child enrollees with prescription drug claims; and average FFS drug spending per full-benefit FFS child enrollee. We combine MAX person summary and prescription drug files to produce analytic files for the analyses, and use the FirstDataBank prescription drug crosswalk to identify NDC codes for AAPs and FGAPs.

**Population Studied:** All individuals aged less than one year to 20 years in Alabama, Colorado, Iowa, Illinois, Louisiana, North Carolina, New Hampshire, and Oklahoma who were non-dua Medicaid-eligibles for at least eight months during the study years, 2005-2008.

**Principal Findings:** Utilization rates are defined as the number of children per thousand who had at least one prescription fill (either new prescriptions or refills) for the drug under study. Overall antipsychotic (AP) utilization rates range from 17/1000-31/1000 prescription fills. Across all study states, AP utilization increased from 20.9 fills per 1,000 children in 2005 to 23.3 in 2008 (an increase of 11.4 percent). Between 2.4/1000 and 5/1000 children have fills for two distinct AP drugs; between 0.5 and 1.1 have fills for three or four unique AP drugs, and very few children, 0.01 per thousand (179 children in our sample) have five or more prescription fills for distinct APs.

Patterns in AP utilization are remarkably similar across study states. FGAPs account for a small proportion of AP utilization (range: 0.03/1000-0.12/1000). Risperidone is the most prescribed AAP in seven of the eight states (range: 8.5/1000-13.7/1000), followed by quetiapine (range: 3.7/1000-13.7/1000) and aripiprazole (range: 3.7/1000-10.0/1000). In all but one state, 15-17 year-olds have the highest AP utilization rates (range: 30.2/1000-83.5/1000) followed by 12-14 year-olds. In all states, infants have the lowest AP utilization rates (range: 0.02/1000-0.12/1000). Males' AP utilization rates (range: 22.5/1000-53.8/1000) are approximately twice those of females (range: 10.5/1000-25.4/1000). In six study states, Whites have the highest AP utilization rates (range: 23.9/1000-52.9/1000) while Asians and Hispanics have the lowest. Children in the foster and blind/disabled eligibility groups have the highest AP utilization rates (range: 89.7/1000-171.0/1000 and 100.8/1000-206.5/1000 for foster and blind/disabled, respectively) in comparison to the other eligibility groups (1931, poverty, medically needy, other).

**Conclusions:** The utilization patterns observed in this study are robust across study states and provide additional evidence that AAP utilization is increasing among Medicaid children. More research is necessary to understand why utilization is increasing among this vulnerable population.

**Implications for Policy, Delivery, or Practice:**

**Funding Source(s):** CMS

**Poster Session and Number:** A, #192

**Access to Needed Mental Health Care Among Children with Special Needs and their Families: Do Medical Homes Matter?**

Wendy Weller, SUNY Albany SPH

**Presenter:** Wendy Weller, Ph.D., Associate Professor, Health Policy, Management and Behavior, SUNY Albany School of Public Health, wweller@albany.edu

**Research Objective:** The purpose of this study is to examine the relationship between having a quality medical home and unmet mental health care need among children with special health care needs (CSHCN) and their families.

**Study Design:** This is a cross-sectional study using data from the 2009-2010 National Survey of Children with Special Health Care Needs (NS-CSHCN). Multivariable logistic regression models were used to assess the association between having a medical home and unmet mental health need for CSHCN and family members after controlling for sociodemographic and health characteristics. Models were constructed for an overall medical home composite measure as well as for each of the five component elements of the medical home (usual source of care, personal physician or nurse, family-centered care, receipt of needed referrals, and effective care coordination).

Additional analyses, stratified by presence of a chronic emotional, behavioral, or developmental problem (EBDP), were conducted to examine if the effect of having a medical home on mental health service access differed for children with and without a chronic EBDP.
Population Studied: The study population included CSHCN (n=10,620) and family members of CSHCN (n=4,232) who were reported to need mental health care services.

Principal Findings: The adjusted odds for unmet mental health care need were significantly higher for CSHCN who did not have a medical home compared to those with a medical home (adjusted odds ratio [OR]: 2.95; 95 percent confidence interval [CI]: 2.19-3.97); similar results were obtained for family members (adjusted OR: 3.80; 95 percent CI: 2.54-5.76). Each of the five component elements of the medical home was significantly associated with unmet mental health care need for CSHCN; children who lacked a given medical home element were more likely to have an unmet mental health care need. Among family members of CSHCN, three of the five medical home elements were significantly associated with unmet mental health care need: family-centered care, receipt of needed referrals, and effective care coordination. Children with and without a chronic EBDP without a medical home were significantly more likely to have an unmet mental health care need. While each of the five medical home elements was significantly associated with unmet mental health care need for CSHCN with a chronic EBDP, only two were significantly more likely to be associated with an unmet mental health care need for CSHCN without a chronic EBDP (received needed referrals and effective care coordination).

Conclusions: CSHCN and their families are more likely to experience an unmet need for mental health care if the child does not have a medical home.

Implications for Policy, Delivery, or Practice: Medical home access for CSHCN with mental health care needs is important for linking both children and their families with needed mental health services. Ensuring that medical homes provide family-centered care, effective care coordination, and needed referrals, may be particularly important for guaranteeing that CSHCN and their families receive the mental health care services they need.

Funding Source(s): No funding

Research Objective: Breastfeeding confers important health benefits for very preterm infants and facilitates maternal-child bonding. Establishing breastfeeding in the neonatal intensive care unit (NICU) is complex, and mothers may need to pump milk frequently for long periods before the baby can nurse. Following an international survey showing wide variation of breastfeeding rates for very preterm babies between European regions (from 20% to over 80%), we aimed to identify organisational and policy factors in the NICU that could explain this variation.

Study Design: Face-to-face, semi-structural interviews were conducted with health care providers in four NICUs in three European regions with different breastfeeding rates: Ile-de-France, France (low), Trent, UK (medium) and Lazio, Italy (high). Verbatim transcripts were coded using a theoretical framework derived from the literature on guideline implementation. Regional-level differences were analysed for practices related to breastfeeding initiation, management of breast milk and breastfeeding continuation/maintenance.

Population Studied: Interviews were held with the health professional(s) within the NICU with the most knowledge about the unit’s breastfeeding policy (lactation consultants (n=7), nurses (n=8), and doctors (n=7)). Tertiary units were purposively selected to reflect a range of breastfeeding rates and geographic and socio-cultural contexts within each region.

Principal Findings: The way health professionals approach mothers to start lactation differed by region. In the UK region, emphasis

Differences in Breastfeeding Management in Neonatal Intensive Care Units: A Cross-Country Qualitative Study
Jennifer Zeitlin, French National Institute of Health and Medical Research (INSERM); Mercedes Bonet Semenas, Epidemiological Research Unit on Perinatal and Women’s Health, INSERM, Paris; Béatrice Blondel, Epidemiological Research Unit on Perinatal and Women’s Health, INSERM, Paris; Emmanuella Forcella, Agenzia di Sanità Pubblica della Regione Lazio, Rome, Italy; Marina Cuttini, Unit of Epidemiology, Pediatric Hospital Bambino Gesù, Rome, Italy; Rocco Agostino, Department for Mother’s and Infant’s Health, Hospital S. Giovanni Calibita–Fatebenefratelli, Rome, Italy; Elizabeth S Draper, Department of Health Science, University of Leicester, Leicester, United Kingdom;

Presenter: Jennifer Zeitlin, ScD, MA., Senior Research Fellow, Epidemiological Research Unit on Perinatal and Women’s Health, French National Institute of Health and Medical Research (INSERM), jennifer.zeitlin@inserm.fr

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Principal Findings: The way health professionals approach mothers to start lactation differed by region. In the UK region, emphasis
was placed on the value of breast milk for the preterm infant and health professionals expressed high efficacy related to their ability to convince mothers to initiate expression. In contrast, French personnel were concerned with allowing maternal choice and avoiding guilt about not breastfeeding. In Lazio, there was a strong expectation that all women would provide milk and breastfeed because of the importance for mother-infant bonding. Informants in all regions felt that the use of fresh milk facilitated breastfeeding and enhanced maternal motivation; however, respondents in Ile-de-France were also concerned with the health risks associated with the use of fresh milk and HCMV transmission and bacterial contamination. French and British personnel cited multiple patient and services obstacles to maintaining lactation and putting babies to the breast. In the Italian region emphasis was placed on putting the infant to the breast as soon as possible and on the normalizing effect of breastfeeding on the maternal-child relationship after a preterm birth.

**Conclusions:** Regions with higher breastfeeding rates highlighted the importance of breastfeeding for maternal-child bonding and the benefits of fresh breast milk and had less complex practices for managing mother's milk. Personnel in the French region where rates were lowest were more attuned to the potential infectious risks of breastfeeding, had more complex procedures for breast milk donation and expressed concerns about the difficulties that breastfeeding could entail for mothers.

**Implications for Policy, Delivery, or Practice:** Recommendations to promote breastfeeding in the NICU tend to focus on technical aspects related to personnel training, lactation and breastfeeding establishment. Integrating country-specific beliefs about the advantages and disadvantages of breastfeeding may improve the effectiveness of these recommendations. Information on the management of breastfeeding in other countries may be valuable for units trying to improve breastfeeding rates in this high risk population. Reference 1. Bonet et al. Arch Dis Child Fetal Neonatal Ed. 2011

**Funding Source(s):** Other, European Commission

**Poster Session and Number:** A, #194

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**Enhanced Access Services in Pediatric Primary Care and Emergency Department Utilization**

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**Presenter:** Joseph Zickafoose, M.D., M.S., Researcher, Mathematica Policy Research, jzickafoose@mathematica-mpr.com

**Research Objective:** 1) To measure the prevalence of enhanced access services in pediatric primary care, and 2) to evaluate associations between enhanced access services and ED use.

**Study Design:** Internet-based cross-sectional survey. Parents were asked about enhanced access services in their child's primary care office, including: phone advice during and outside office hours, same-day sick visits, evening (after 5 PM) and weekend office hours, and electronic communication. National prevalence of parents' reports of each service was described using weighted survey data. Multivariate negative binomial regression was used to assess the associations between parents' report of emergency department (ED) utilization in the prior 12 months and the availability of specific enhanced access services, controlling for family sociodemographics. Analyses were performed for full study sample, as well as sub-groups with higher rates of ED use (children with special health care needs [C-ShCN], racial/ethnic minorities, and children with public insurance).

**Population Studied:** National sample of parents with children ages birth-17 years.

**Principal Findings:** 820 parents participated in the survey (response rate 41%). Most parents knew about clinic services available during weekday daytime hours, but many did not know about services outside regular office hours (don't know: weekend hours 22%, after hours phone advice 27%, evening hours 50%). The majority of parents knew about and reported usually or always having access to same-day sick visits (79%) and advice by telephone both during (80%) and outside of (54%) office hours. Less than half of parents reported access to appointments at their child's primary care office.
on weekends (47%) or any evening (23%). Few parents reported email communication or a patient portal (13%). CSHCN reported equal or more availability of enhanced access services. Racial/ethnic minorities were less likely to report access to same-day sick visits (white: 83%, black: 80%, Hispanic: 66%; p<0.05) and phone advice during office hours (white: 83%, black: 71%, Hispanic, 75%; p<0.05). Publicly-insured and uninsured children were less likely to report access to same-day sick visits (private: 84%, public: 76%, uninsured: 61%, p<0.05) but were more likely to report access to phone advice outside office hours (private: 15%, public: 25%, uninsured 21%, p<0.05).

In multivariate analysis of the whole population, the only enhanced access service significantly associated with ED use was the availability of evening hours on 5 or more nights a week (adjusted incidence rate ratio [aIRR]: 0.51 [95% CI 0.28-0.92]). In sub-group analyses, evening hours on 5 or more nights a week were also associated with lower ED use for Hispanic children (aIRR: 0.17 [0.04-0.77]) and publicly-insured children (aIRR: 0.43 [0.19-0.97]).

Conclusions: Parents are frequently unaware of enhanced access services in their child’s primary care office. Evening office hours may be effective at reducing emergency department use if available throughout the week. Future research should investigate correlations between parents’ and practices’ reports of enhanced access services and associations with ED use using objective measures, such as claims.

Implications for Policy, Delivery, or Practice: Primary care practices should communicate existing enhanced access services to families and consider expanded hours if targeting unnecessary ED use.

Funding Source(s): Other, Blue Cross Blue Shield of Michigan Foundation

Poster Session and Number: A, #196

COMPLEX CHRONIC CONDITIONS

Exploring the Relationship between Perceived Illness Burden and Advance Care Planning among Older Adults with Chronic Illnesses

Susan Bodnar Deren, Virginia Commonwealth University

Presenter: Susan Bodnar Deren, Ph.D., Assistant Professor, Sociology, L. Douglas Wilder School of Govt and Public Affairs, Virginia Commonwealth University, smbodnar@vcu.edu

Research Objective: The objective of this study is to examine the extent to which patients’ perceived illness burden (PIB) is associated with advance care planning (ACP) behaviors (end-of-life discussions, living will (LW), and durable power of attorney for health care (DPAHC) and combined directives (LW and DPAHC)). PIB is a measure of patient appraisals that captures the complex relationship between functional limitations and perceived burden among individuals with comorbid chronic illnesses.

Study Design: Data were obtained from the New Jersey End-of-Life (NJEOL) study (2006-2008), an ethnically diverse sample of 305 non-institutionalized older adults with a number of complex chronic conditions, including cancer, Type II diabetes, and/or congestive heart failure. Patients were recruited from two large university hospitals and one comprehensive cancer center in NJ. The interview process consisted of a 1.5 hour face-to-face, structured interview and included questions regarding sociodemographics, health status and behaviors, EOL planning, and attitudes toward treatments, religion/spirituality, and social supports. The primary outcome for this study was the presence of ACP behaviors (EOL discussion, LW, DPAHC or combination). A composite variable that measures participants’ perceived illness burden is the key independent variable and was constructed based on participants’ responses to two questions assessing their current level of physical functioning (SF-12) and perceptions about being a burden to self and others (Illness Perception Questionnaire-R). Stepwise multinomial logistic regression models were estimated to examine how PIB affected the likelihood of ACP.

Population Studied: 305 non-institutionalized older adults in New Jersey. Eligible participants were aged 55 and older, either English- or
Spanish-speaking, had a working telephone, had no cognitive limitations, and identified by their doctors as having one or more of the following health conditions: cancer, Type II diabetes, or congestive heart failure.

**Principal Findings:** The respondents had a mean age of 69; 64 percent were women; and were racially diverse (56 percent white, 25 percent African-American, 19 percent Latino). Forty-six percent had a LW, 41 percent DPAHC, and 69 percent had EOL discussions. Twenty-eight percent had both a high level of disability and a high level of perceived burden, 18 percent high-disability/low-burden, 11 percent low-disability/high-burden, and 41 percent low-disability/low-burden. Multinomial logistic regression, controlling for health/sociodemographic variables revealed individuals with high PIB compared to those with low PIB were more likely to have EOL discussions (OR=2.95, CI=1.25-6.94); have a LW (OR=2.24, CI=1.03-4.87); have a DPAHC (OR=4.39, CI=1.84-9.46); and a combined directive (OR=4.73, CI=1.95-9.48). Actual illness categories and number of comorbidities did not significantly affect the likelihood of engaging in ACP.

**Conclusions:** These findings suggest that PIB is an important factor in ACP; eliciting patient perceptions about the consequences of their illness may facilitate increased levels and more meaningful ACP.

**Implications for Policy, Delivery, or Practice:** When discussing advance care planning with patients, clinicians should discuss the complex relationship between functional limitations and perceived burden among individuals with comorbid chronic illnesses. Discussions about PIB with patients may be the gateway for clinicians to engaged in ACP discussions and may increase the levels of and validity of advance care planning.

**Funding Source(s):** NIH

**Poster Session and Number:** B, #628

**Benefits of a Patient-Centered Medical Home for Patients with Chronic Conditions:**

**Improving the Quality of Care While Reducing Costs**

Linda Pikulin, MA; Amanda Borsky, CNA; Eric Christensen, PhD, CNA; CDR Jamie Lindly, MSC, U.S. Navy

**Presenter:** Amanda Borsky, MPP, Research Analyst, Health Research and Policy, CNA, borskya@cna.org

**Research Objective:** To understand the effect of a patient-centered medical home (PCMH) on healthcare utilization and costs for patients with chronic conditions.

**Study Design:** A retrospective analysis of a patient-level utilization database to determine the impact of the PCMH on various utilization and cost metrics using a pre-post design. Utilization measures included changes in primary care and specialty care encounters, hospitalizations, and emergency room (ER) visits, as well as provider continuity. Cost reductions were measured by per member per month (PMPM), which includes all inpatient and outpatient services, as well as pharmacy and ancillary costs.

**Population Studied:** The study included four family medicine and pediatric PCMHs that are part of the Military Health System (MHS) at U.S. Navy military treatment facilities. Patients were enrollees of each PCMH which included active duty and their dependents along with retirees and their dependents. We identified patients with chronic conditions using the Agency for Healthcare Research and Quality Clinical Classification Software categories.

Approximately 40 to 50 percent of enrolled active duty patients had one or more chronic conditions. Chronic conditions that were most prevalent among the active duty population included chronic pain, asthma, and hyperlipidemia.

**Principal Findings:** For all patients across sites, provider continuity improved with PCMH implementation (increased by 6.5% to 29.2%). Utilization of inpatient and ER services were usually less after PCMH implementation. There was little change across sites for primary care utilization. Patients with multiple chronic conditions had significantly higher PMPM costs than those without chronic conditions. For example, based on estimates for a 50-year-old male retiree, PMPM costs for those with multiple chronic conditions were between $700 and $1,400 compared to less than $200 for those without a chronic condition. The results show substantial reductions in PMPM costs and variation in PMPM costs for patients with chronic conditions (as well as for patients without chronic conditions). In fact, PMPM reductions increased with the number of chronic conditions (i.e., greater reductions in costs for the more chronically ill). PMPM costs decreased by a range of 9.4 to 22.4 percent for patients with
hypertension and decreased by a range of 2.0 to 20.4 percent for patients with diabetes.

**Conclusions:** After PCMH implementation, utilization of inpatient and ER services decreased and provider continuity improved. These findings align with the goals of PCMH to improve the continuity and quality of care. In addition, PCMH implementation also resulted in cost reductions and reduction in variation of costs. In percentage terms, PMPM changes were very similar for chronic and non-chronic patients. However, because those with chronic conditions cost 2 to 3 times more than those without chronic conditions, the PCMH model has a greater dollar cost reduction for those with chronic conditions.

**Implications for Policy, Delivery, or Practice:** These findings suggest that PCMH can not only improve the care for patients with chronic conditions, but it can also reduce the overall costs and variation of costs.

**Funding Source(s):** Other, U.S. Navy, Bureau of Medicine and Surgery

**Poster Session and Number:** B, #629

**Findings from the New York State YMCA Diabetes Prevention Program: Outcomes in a Community-based Setting**

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**Presenter:** Anne Bozack, M.P.H., B.A., Project Director, Center for Evaluation and Applied Research, New York Academy of Medicine, abozack@nyam.org

**Research Objective:** Approximately one-third of American adults have prediabetes and are at an elevated risk of developing Type 2 diabetes. However, the Diabetes Prevention Program demonstrated that individuals who achieve modest weight reduction and participate in regular physical activity may reduce their risk between 58 and 71 percent. The New York State YMCA Diabetes Prevention Program, Y-DPP, implemented a group-based lifestyle change program through YMCA branches across New York State. This 16-week program was led by trained coaches and focused on strategies for nutrition, physical activity, and behavior change. Participants were primarily identified and referred through local health care providers. The purpose of this study was to better understand Y-DPP implementation processes and to determine the effectiveness as replicated in a community-based setting. The primary outcome was participant weight loss associated with a reduction in diabetes risk. Secondary outcomes included changes in health-related quality of life, knowledge, and behavior.

**Study Design:** A mixed methods pre-post evaluation of the Y-DPP was conducted between 2010 and 2012. Participants completed surveys at baseline, at the end of the program, and six months after program completion. Data were also gathered from weekly attendance and weight trackers. Focus groups were conducted at selected sites with current and former participants.

**Population Studied:** The study included 26 Y-DPP sections, across 14 sites. Participants, N=254, were predominantly female, 70 percent, white, 79 percent, or black, 16 percent, and had a mean age of 60.

**Principal Findings:** On an intent-to-treat basis, participants lost a mean of 11 pounds by the end of the program, p less than .05. Half of the participants achieved the goal of losing 5 percent or more of their body weight. Most participants maintained weight loss or continued to lose weight after program completion; 60 percent achieved at least 5 percent weight loss six months after the program. Self-reported general health status improved and was sustained at the six-month follow-up. A higher proportion of participants reported that their health was very good or excellent at the end of the 16 weeks. Six months after the program, more than 70 percent of participants reported that their general health was much better or somewhat better than before the program. Outcomes were consistent with qualitative findings. Participants reported improvements in physical and mental wellbeing, for example - The difference was like night and day, as far as my energy level and my mood and everything else. Participants also reported changes in health-related knowledge and behavior - I've become more aware of food portions…My wife started calling me a born again nutritionist.

**Conclusions:** The successful implementation and outcomes of this lifestyle change program by community-based YMCA branches across geographically diverse regions of New York State demonstrates the potential of the model to be replicated.
Implications for Policy, Delivery, or Practice: As private insurers and policymakers consider reimbursements for disease-prevention programs as a cost-effective alternative to clinical treatment, these findings are especially promising. Community-based settings offer existing and emerging opportunities for building community capacity to scale the National DPP and increase accessibility to populations at the highest risk for developing diabetes.

Funding Source(s): Other, New York State Health Foundation

Poster Session and Number: B, #630

Survey of Pain Management Practices at US Hemophilia Treatment Centers: Interim Results
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Presenter: Tyler Buckner, M.D., Post Doctoral Fellow, Sheps Center for Health Services Research, University of North Carolina, tbuckner@unch.unc.edu

Research Objective: Hemophilia is an inherited bleeding disorder characterized by frequent joint and soft tissue hemorrhages. Repeated bleeding into joints leads to chronic arthropathy and severe, often debilitating chronic pain. In the United States, approximately 70% of persons with hemophilia receive medical care in a federally-funded comprehensive hemophilia treatment center (HTC), and two-thirds of these patients receive at least some pain management services from the HTC. Scrutiny of pain management practices has increased in response to rising numbers of deaths due to opioids in the US, but little is known about what practices are employed in US HTCs. This survey of HTCs aims to assess current approaches to pain management for patients with hemophilia, highlight strengths of the systems currently in place at HTCs, and identify potential opportunities for improvement.

Study Design: All HTCs in the United States are eligible to participate. Nurse coordinators at each HTC are contacted by telephone and asked to participate in the 58-question survey. The survey assesses HTC demographics, clinic personnel, pain assessment and management practices, documentation, and policies related to opioid medication use and follow-up procedures.

Population Studied: Federally-funded HTCs in the US, most of which are affiliated with academic medical centers. Respondents in this interim analysis are predominantly located in the southeastern US. 17 of 144 US HTCs have completed the survey as of 12/1/2012: 5 pediatric, 3 adult, and 9 combined pediatric and adult centers.

Principal Findings: Assessment: Although nearly all centers consistently ask patients to rate their pain, very few (2 of 17) HTCs systematically assess HRQoL, functional status, or other patient-reported outcomes related to pain’s impact on patients’ well-being. Only one center regularly screens for depression.

Management: Although most HTCs use opioid medications to treat chronic pain for some patients, none have defined treatment algorithms specific for pain management.

Follow-up: Follow-up and monitoring requirements are not standardized across HTCs.

Conclusions: Pain assessment and management practices vary widely among the HTCs surveyed. This interim analysis suggests that a comprehensive, systematic approach to pain management is not present in most HTCs.

Implications for Policy, Delivery, or Practice: For many individuals with hemophilia, the HTC functions as a medical home, providing management of a chronic disease and its myriad complications and coordinating care among multiple subspecialties for each patient. Pain management practices in HTCs need to be standardized to improve the quality of care provided and to enhance patient safety. Methods for designing a comprehensive pain management program and for measuring the impact of these changes need to be developed. To optimize the effectiveness of efforts to improve these clinical practices within HTCs, multiple stakeholders should be involved throughout the program’s design and implementation. Improving these systems for delivering care through the HTC network would not only impact thousands of persons with hemophilia, but it would also serve as a model for improving pain management practices in other groups of patients with chronic pain syndromes.

Funding Source(s): AHRQ

Poster Session and Number: B, #631
**One-Year Survival After Cardiac or Vascular Surgery by Pre-Existing Severe Mental Illness Status**

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**Presenter:** Laurel Copeland, Ph.D., Associate Director, Center for Applied Health Research, Scott & White Healthcare; Central Texas Veterans Health Care System, laurelacopeland@gmail.com

**Research Objective:** Severe mental illnesses [SMI] - schizophrenia, bipolar disorder, depression, and post-traumatic stress disorder [PTSD], are persistent disorders that affect every aspect of life including physical health. Health deficits may arise via risky lifestyle behaviors such as smoking and drinking, and impaired self-management. Individuals often develop cardiovascular disease; therefore, they may undergo cardiac or vascular surgery. This study examined whether patients with pre-operative SMI had heightened risk of death after cardiac or vascular operations.

**Study Design:** The retrospective secondary data analysis used administrative extracts from the Veterans Health Administration, relying on diagnosis codes, prescription fills, and utilization recorded in the prior year. Non-VA use was not captured. A covariate-adjusted Cox proportional-hazards model assessed correlates of one-year survival including SMI. Following preliminary test for interaction between SMI and surgery type, models assessed correlates of survival among patients having cardiac operations and among those with vascular operations only.

**Population Studied:** Patients having inpatient surgery in the VA October 2005-September 2009 were included. Exclusion criteria were index stay exceeded 29 days, illogical death data, non-veteran per VA priority status, or indeterminate inpatient facility.

**Principal Findings:** Among 55,864 patients, 35,784 had vascular operations only, 14,248 had CAVG only, 2,593 other cardiac operations primarily valve repairs, 2,225 multiple cardiac operations, and 1,014 had both cardiac and vascular operations; 1 in 5 died within one year. Rates of death varied, from 1 in 10 for CAVG to 1 in 4 for vascular operations. One in nine had SMI, mostly PTSD [6 percent]. Following cardiac operations, instantaneous risk of death was associated with married status (better survival), age (older: worse survival), and more drug effects were noted: statins, antihypertensives or hypoglycemics (better); corticosteroids or antipsychotics (worse). Bipolar disorder was associated with increased risk of death following cardiac operations [HR=1.7] but decreased risk following vascular operations [HR=0.7]. Although patients with schizophrenia had the highest rate of death at 24 percent, this diagnosis was not significantly associated with mortality within type of surgery.

**Conclusions:** High unadjusted rates of postoperative death attach to patients with preoperative psychotic disorders but SMI is a limited risk factor in covaried models of survival. The effect of bipolar disorder requires further research into potential mechanisms. The one-year death rate for patients with schizophrenia may denote relatively late referral to surgical intervention. Focused efforts to address comorbidities could improve outcomes for vulnerable patients.

**Implications for Policy, Delivery, or Practice:** Families of patients with schizophrenia should be counseled regarding the long-term survival deficit facing their loved ones. Care of patients with SMI may require collaborative planning among primary care, specialty care, and mental health providers.

**Funding Source(s):** VA

**Poster Session and Number:** B, #632
Availability of Oral Substitutes for Traditional Parenteral Cancer-Related Treatments: Impact on Therapy Initiation, Duration, and Dose Adequacy

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Presenters: Amy Davidoff, Ph.D., Senior Economist, Center for Financing, Access and Cost Trends, Agency for Healthcare Research and Quality, amy.davidoff@ahrq.hhs.gov

Research Objective: Historically, parenteral (infused or injected) drugs have been the mainstay of pharmacologic cancer treatments. In recent years, development of new oral drugs for use in cancer patients has accelerated. The comparative ease of oral drug use and different toxicity profiles may expand treated patient pools, and result in improved medication adherence. Myelodysplastic syndromes (MDS) are a group of hematologic malignancies often associated with anemia, for which patients may receive chronic red blood cell (RBC) transfusions. Iron chelation therapy (ICT) is indicated in patients with transfusion-related iron overload. Parenteral-ICT is administered subcutaneously over 8-12 hours, 5-7 days/week. An oral ICT was FDA-approved in November 2005. In this study we examine how market entry of oral-ICT affected overall ICT utilization, duration, and adherence to therapy.

Study Design: This observational study examined ICT use rates, dose adequacy and adherence. ICT use was identified from procedure or drug codes on Part B or D claims. A key independent measure was calendar time relative to oral-ICT market entry. Cox proportional hazard models examined the effect of time period on the probability of ICT initiation, adjusting for followup duration. Among ICT users, Cox proportional hazard models were used to examine the effect of oral- versus parenteral-ICT use on duration.

Population Studied: Using 100% Medicare enrollment and claims data from 2005-2008, we selected beneficiaries diagnosed with MDS. Cohort members had to be enrolled in Medicare Parts A and B, but without Medicare Advantage, from 12 months before MDS diagnosis, and Part D enrolled from January 2006 or MDS diagnosis. MDS patients had to be ICT-eligible based on a history extensive RBC transfusion.

Principal Findings: Of 3,843 ICT-eligible patients 13.8% received ICT, with 81.6% of those receiving oral, and 29.5% receiving parenteral-ICT. Relative to the latter half of 2005, the risk of ICT initiation increased beginning in 2007, with a hazard ratio of 1.793 (95%CI:1.13-2.84;p=0.012) associated with cohort entry in the latter half of 2008. Treatment duration was longer for beneficiaries using oral compared to parenteral-ICT (median 47 weeks vs. 17 weeks, p<0.01). Only 7.1% of parenteral-ICT users received an adequate dose, compared to 72.8% of oral ICT users.

Conclusions: Market entry of an oral ICT agent was associated with increased use of ICT among Medicare beneficiaries with MDS. Among ICT users, oral ICT was associated with substantially longer duration and dose adequacy.

Implications for Policy, Delivery, or Practice: A key motivation for development of oral cancer drugs is the expanded access to prescription benefits associated with Medicare Part D. As oral substitutes for parenteral drugs enter the market, the question will be whether access to appropriate therapy is improved, and whether patients are more likely to complete the recommended duration of therapy at meaningful doses. Our study suggests that oral formulations are associated with better patient compliance and adherence, which may lead to improved outcomes in the future. Increases in cost of therapy and spending shifts to Part D are likely.

Funding Source(s): NIH, GlaxoSmithKline

Poster Session and Number: B, #633

Differences in Health Services Utilization and Costs between Antihypertensive Medication Users Versus Non-Users in Adults with Diabetes and Concomitant Hypertension from MEPS Pooled Years 2006-2009

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Presenters: Mary Lynn Davis-Ajami, Ph.D., M.B.A., M.S., Assistant Professor, Organizational Systems and Adult Health, School of Nursing, University of Maryland, Baltimore, davis-ajami@son.umd.edu

Research Objective: To compare population level baseline characteristics, individual level utilization and costs between antihypertensive medication users versus non-users in adults with diabetes and concomitant hypertension.

Study Design: We used a longitudinal retrospective observational research design using public use Medical Expenditure Panel Survey household component (MEPS-HC) pooled years 2006-2009 data to analyze adults > 18 years with non-gestational diabetes and coexistent essential hypertension. Two groups were created: 1) antihypertension medication users. 2) no antihypertensive pharmacotherapy. We examined emergency department (ED) and hospital utilization, and average annualized health care costs. Accounting for MEPS complex survey design, longitudinal weight was used for all analyses. Logistic regressions examined likelihood of utilization and any antihypertensive medication use and multiple linear regression models with log transformation assessed association between costs and antihypertensive medication use.

Population Studied: A cohort of adults aged > 18 years from the US civilian non-institutionalized population with non-gestational diabetes and coexistent essential hypertension.

Principal Findings: We identified 3261 adults with diabetes. Of those, 66% (n=2137) had concomitant hypertension representing 38.7 million individuals during 2006-2009. 16% (n=338) lacked prescriptions for antihypertension pharmacotherapy representing a weighted population frequency approximating 425,000. Mean age was 62.9 years and the overall sample was predominately female (52%) white (77%), from the southern US geographical region (42%), high school educated (50%), insured with private insurance (57%), from higher income levels, and in fair to poor perceived health status (48%). Significantly, the non-antihypertensive pharmacotherapy users were from white racial backgrounds (82% vs. 77% p = 0.033), fewer of black race (12% vs. 18%, p = 0.038), single (51% vs. 43%, p = 0.048), with 11% fewer covered by private insurance (47% vs. 58%), 7% more uninsured (13% vs. 6%) and 4% more covered by public insurance (40% vs. 36%, p < 0.001) than antihypertensive medication users. Significantly, the 16% (n= 338) non-antihypertensive pharmacotherapy group showed greater mean nights hospitalized (3.6 versus 1.7, p = 0.0120), greater all-cause hospitalization per 1000 patient month (41 versus 24, p = 0.0007), 64% greater likelihood for hospitalization, lower mean diabetes-related, and hypertension-related ambulatory visits, 32% lower total average annualized expenses , and 32% lower average annualized medical utilization expenses compared to antihypertensive medication users.

Conclusions: We observed significantly different baseline characteristics, greater hospitalization, and lower costs between antihypertension medication users versus non-users in adults with diabetes and coexistent hypertension.

Implications for Policy, Delivery, or Practice: The substantially greater hospitalization with lower expenses among non-antihypertensive medication users with diabetes and concomitant hypertension warrant further study. These findings may reflect a possible overall disengagement from regular, customary care which may serve to drive down short-term costs, whereas our findings for greater hospitalization may affect costs over the long-term. Given tight BP control guidelines and known poor health outcomes from elevated BP in individuals with diabetes, those not using any antihypertensive pharmacotherapy in the presence of known essential hypertension may represent a vulnerable population deserving additional research and health care provider attention.

Funding Source(s): No Funding

Poster Session and Number: B, #634

Association of Patient Experience with Care Coordination, Outcomes, and Multiple Chronic Conditions

Eva DuGoff, Johns Hopkins University School of Public Health

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Research Objective: This study explores the relationship between patient experiences of care coordination and patient-reported emergency room (ER) use and hospital use in older adults with multiple chronic conditions.
Study Design: Survey data were collected using a two-stage mail survey from July 2011 to September 2011. The survey was a 45-item questionnaire including questions on patient experiences with care coordination: 1. In the last 6 months, when your doctor ordered a blood test, x-ray or other test for you, how often did someone from your doctor’s office follow up to give you those results? 2. Does your doctor give you a written plan or instructions to help you manage your own care at home? 3. In the past 6 months, has any doctor given you instructions for one of your conditions that conflicted with what you have been told to do for another condition? 4. In the last 6 months, how often did your doctor seem informed and up-to-date about the care you received from specialist physicians? 5. In general, do you think the doctors you see communicate with each other about your care? Survey data were linked to administrative claims from July 2010 to September 2011 and demographic data from a Medicare Advantage Special Needs Plan. Population Studied: 765 survey respondents who were members of a Medicare Advantage Special Needs Plan enrolled in Alabama, Georgia, Mississippi, South Carolina, and Texas. Principal Findings: We find that only some patient experience measures are associated with self-reported ER use and hospital use. Subjects reporting not always receiving a written plan had greater odds of reporting ER use and hospital use. The odds of ER use increased with increasing numbers of co-morbidities among subjects reporting not always receiving written instructions. However, we observed the inverse relationship among subjects who reported not always receiving a written plan and hospitalization. Reported receipt of conflicting advice was associated with greater odds of ER use, but was not associated with hospital use. Among subjects who reported receiving some conflicting advice, the odds of ER use decreased with increasing co-morbidities. Conclusions: Previous studies have suggested that more concrete questions get more reliable responses that are more closely associated with care outcomes. While this is generally confirmed with this analysis, we find that patient reported receipt of written instructions or care plan is most highly correlated with ER and hospital use. The relationship between patient experiences items and outcomes varies by number of chronic conditions.

Implications for Policy, Delivery, or Practice: In using patient experience measures to assess providers, it is important to consider which adverse events or outcomes these measures predict. Policymakers should consider including additional patient experience measures in the patient experience surveys that are predictive of use and poor outcomes.

Funding Source(s): Other, Health Assessment Laboratory Dissertation Award

Poster Session and Number: B, #635

Comparing the Effectiveness of an Innovative Surgical Approach for the Definitive Treatment of Patients with Ulcerative Colitis

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Presenter: Krista Evans, M.D., M.S., Postdoctoral Research Fellow, General Surgery, Sheps Center for Health Services Research, kevans@unch.unc.edu

Research Objective: Ulcerative Colitis (UC) is an inflammatory disease of the colon, and in severe or persistent disease, can be treated surgically with Proctocolectomy with Ileal Pouch Anal Anastomosis (IPAA). However, this procedure is prone to anastomotic complications. In patients who are at moderate or high risk for a postoperative complication (nutritionally deplete, on high dose/long term corticosteroid therapy, or fulminantly or acutely ill from UC) a diverting loop ileostomy is widely utilized at the time of IPAA to minimize risk of postoperative leak, abscess or pelvic sepsis. The objective of our study is to determine if anastomotic leak risk associated with IPAA is a consequence of the operation itself or the condition of the patient when the operation is performed. Our practice is to perform an innovative variant 2-stage procedure for higher risk patients (abdominal colectomy followed by completion proctectomy/IPAA once the patient has improved clinically and nutritionally). Pouch creation following this management should be of similar risk to those who are less ill and undergo a single-stage procedure.
Study Design: This is a retrospective review of the electronic medical record within the University of North Carolina Hospitals system of all patients with UC who underwent IPAA surgery from 2003-2009. Patients were grouped according to procedure: variant 2-stage compared to single and classic 2-stage. To evaluate the difference in preoperative population characteristics and risks for postoperative complications, we performed bivariate analyses using chi-square and t-test. At the time of the meeting, we will have collected and analyzed data on body mass index, number of inpatient hospital days from time of first surgery, and number of operations more than anticipated for the staged procedure. Our primary endpoint: demonstrable pouch leak, and secondary endpoints: intraabdominal abscess and stoma complications were compared using stepwise logistic regression and controlling for significant preoperative factors associated with a postoperative complication.

Population Studied: 109 (33%) patients underwent variant 2-stage and 219 (67%) patients underwent single and classic 2-stage surgeries combined.

Principal Findings: Statistically different risk factors for postoperative complication between the two groups (variant 2-stage versus single- and classic 2-stage) include dysplasia/cancer diagnosis (5.5% 21.5%); urgent or emergent indication for surgery (58.7%, 0.5%); and overall (83%,53%), high dose (53%, 8%), and long term (60%, 41%) steroid use at first procedure. Gender, age, length of follow-up, tobacco use, diabetes mellitus, 5-aminosalicylic acid, immunologic, or biologic use at first procedure did not differ significantly between the groups. The odds of demonstrable pouch leak were significantly decreased (0.39; 0.19-0.82) in the variant-2 stage compared to the single and 2-stage procedure. The odds of intraabdominal abscess (1.07; 0.46-2.53) and stoma complications (0.71; 0.38-1.34) were not significantly different.

Conclusions: While the variant 2-stage patients had more pre-operative risk factors for postoperative complications, this group had equivalent or better postoperative outcomes than the single or classic 2-stage patients. These data suggest that anastomotic complications after IPAA for UC are more the consequence of the conditions under which IPAA is performed, rather than the procedure itself.

Implications for Policy, Delivery, or Practice: Utilization of a variant 2-stage IPAA permits chronically and acutely ill UC patients to be managed safely. This could decrease number of operative procedures and hospital admissions and thereby improve quality of life for these chronically ill patients.

Funding Source(s): NIH

Poster Session and Number: B, #636

Impact of Behavioral Health Disorders on Cost, Quality and Outcomes of Care for Maine Medicaid Members with Diabetes and Other Chronic Medical Conditions

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Research Objective: This longitudinal study assesses the impact of behavioral health disorders (BH) on cost, utilization, quality and outcomes for long-term Mefdicaid(MaineCare) enrollees and informs development of analytic infrastructure for evaluation of Health Homes and other health system re-design efforts.

Study Design: The cohort consists of five behavioral health (BH) populations: no BH; mental illness, substance abuse; co-occurring mental illness/substance abuse; and intellectual/developmental disability. Analyses of administrative and vital statistics data describe factors affecting cost, utilization, quality and outcomes for persons in each of the BH groups, stratified by the number of chronic medical co-morbidities.

Population Studied: The cohort consists of 63,141 adult MaineCare members followed over five years. Medicaid members differ from other insured populations given their high degree of social stressors: poverty, unemployment, low education, unstable food and housing.

Principal Findings: 49% of the cohort has at a BH disorder. MaineCare members have high rates of medical co-morbidities; those with BH disorders have significantly higher rates of each chronic medical condition and greater numbers of multiple co-morbidities; 40-50% of those with...
BH disorders have 3 or more medical co-morbidities compared to 21% of those with no BH diagnosis. Among BH groups medical costs exceed BH costs. Medical costs rise in tandem with increasing numbers of medical co-morbidities, but having any BH disorder accounts for as much increase is having 3 medical conditions. At any level of medical co-morbidity, medical costs increase by 25-250% depending on the BH sub-group. Utilization of medical services (emergency Room, hospital, 30 day readmission, avoidable hospitalization) is significantly higher among those with BH disorders. BH costs are likewise influenced by the number of medical conditions in certain BH-disordered populations. Those with BH disorders have higher prevalence of diabetes and diabetes complications, lower quality care and over time, worsening diabetes, new incidence of diabetes and death compared to those with no BH disorder. Improved BH status appears to protect against worsening diabetes over time, while a declining BH status increases risk of death among those with diabetes by 73%.

Conclusions: Long term Medicaid members with high degrees of social stressors have high rates of BH disorders and multiple chronic medical conditions. Specific findings vary by BH group, but generally members with BH disorders have higher service utilization and costs, greater burden of diabetes and other chronic diseases, and greater morbidity/ mortality than members with no BH disorders.

Implications for Policy, Delivery, or Practice: As health systems move to greater accountability for whole populations and new reimbursement systems, it is critical that system re-design includes strategies targeting the needs of the most complex patients who have multiple medical and behavioral health disorders as well as socio-economic stressors. Improving cost effectiveness, quality of care and outcomes for these populations depends on developing structures supporting integration, across physical and behavioral health, in surveillance, research methodology and provision of care. Medicaid administrative and vital statistics data are useful resources for longitudinal comparative effectiveness research on high-need populations. Standardized systems for analysis of Medicaid data has promise for comparing effectiveness of different policies being implemented under health care reform across multiple states.

Funding Source(s): AHRQ

Poster Session and Number: B, #637

Readmission Rates and Total Medical Cost Differences between Medicare Beneficiaries with Atrial Fibrillation or Other Conditions Vary by Initial Admission Type

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Presenter: Sloane Frost, MPP, Research Analyst, Mathematica Policy Research, Incorporated, sfrost@mathematica-mpr.com

Research Objective: Improving post-hospitalization quality of care via successful care transitions depends on many factors, including the reason for hospitalization. This study examined the relationship between 30-day post-discharge readmission rates and total medical costs in the 12 months after discharge, by reasons for the initial admission, for Medicare beneficiaries with atrial fibrillation (AF) and those without AF but with other chronic conditions (CAD, COPD, heart failure [HF], and diabetes).

Study Design: We calculated risk-adjusted beneficiary-level readmission rates and post-discharge 12-month medical costs, controlling for demographic characteristics, comorbidities, and previous health care use. We calculated these outcomes for six types of high-cost index discharge diagnoses: acute myocardial infarction (AMI), HF, stroke, CABG, and percutaneous coronary intervention (PCI).

Population Studied: Medicare Fee for Service (FFS) claims and enrollment data (2006-2009) from the Chronic Condition Warehouse (CCW) were used to analyze both groups. Beneficiaries were randomly selected from the Medicare FFS population: those with AF were drawn from a 10% random sample of AF patients, and the comparison group was from a 2% random sample of all Medicare beneficiaries. The study population included 99,272 patients (43,367 with AF) ranging from 56,824 admitted for bleeding to 5,558 for CABG.

Principal Findings: For all initial admission types, 30-day readmission rates were higher for the AF group. Differences between the AF and non-AF groups were largest for those with an index discharge diagnosis for AMI (33% higher), CABG (20% higher), or PCI (30% higher)
admission. Total medical costs in the 12 months after discharge were also always higher for those with AF. The largest difference (18%) was after admission for AMI ($28,890 with AF vs. $24,500 without AF), which was significant at the p<0.01 level. All other differences in total medical costs were less than 10% between the groups, and average expenditures were 7.9% higher for beneficiaries with AF across all index admissions measured.

**Conclusions:** Medicare beneficiaries with AF had higher 30-day readmission rates than their peers with other common chronic illnesses regardless of their initial admission type (4.3% higher for initial admission of heart failure, 19.8% for CABG, 23.1% for stroke, 33.2% for AMI, and 29.6% for PCI). Differences between the groups varied by the index discharge diagnosis. Similarly, expenditures were higher for beneficiaries with AF compared to other Medicare FFS beneficiaries with common chronic conditions, but these differences varied by initial admission type.

**Implications for Policy, Delivery, or Practice:** These findings underscore the need for CMS to examine the service utilization and health outcomes for beneficiaries with AF, who present challenges in regards to cost containment and readmission outcomes as much as, if not slightly more than, beneficiaries with other common chronic conditions. Particularly as medical providers work to reduce readmissions and improve health outcomes, AF beneficiaries represent a vulnerable and large population whose quality of life and financial savings can be improved with a better understanding of the relationship of initial discharge diagnosis type to subsequent readmissions.

**Funding Source(s):** Other, Boehringer Ingelheim Pharmaceuticals, Inc.

**Poster Session and Number:** B, #638

**Primary Care-Integrated Complex Care Management Programs: Lessons from Early Adopters**

Clemens Hong, Harvard Medical School/Massachusetts General Hospital; Allison L Siegel, Massachusetts General Hospital; Timothy G Ferris, Massachusetts General Hospital

**Presenter:** Clemens Hong, Instructor Of Medicine, Medicine, Harvard Medical School/Massachusetts General Hospital, cshong@partners.org

**Research Objective:** To assess key operational attributes of leading primary care-integrated complex care management programs (PC-CCMPs).

**Study Design:** Based on literature review and recommendations from an expert steering committee, we identified 20 operating, PC-CCMPs that met inclusion criteria: a whole-person focus and existing data indicating positive outcomes. We performed three 1-hour key informant interviews (an executive leader, a program manager, and a front-line care manager (CM)) at each of the 18 PC-CCMPs that agreed to participate. We assessed 8 domains: context, patient selection, patient engagement, primary care engagement, CM team structure, key activities and resources, information technology (IT), and CM training. Two investigators independently reviewed detailed notes from each audiotaped interview and then collectively identified key recurring themes.

**Population Studied:** Three key informants from each of 18 PC-CCMPs across the US

**Principal Findings:** Located in more than 14 states, the programs served urban (15) and rural (6) populations insured by commercial payers (8), Medicare (10), and Medicaid (8). Payers (7), delivery systems (8), and regional CM entities (4) managed PC-CCMP operations. Three programs served both urban and rural settings, 8 were multi-payer initiatives, and payer/delivery system partners jointly operated 2 programs. Only 5 programs were components of a broader primary care transformation initiative. Existing evaluation data from these PC-CCMPs revealed increased quality, provider and patient experience, and decreased mortality, acute care utilization, and costs.

PC-CCMPs selected patients based on risk prediction models, event-triggers (e.g. hospitalization), referral, or hybrids of these approaches; identifying mutable patients was a challenge with no consensus. Co-location of the CM, early/regular face-to-face interaction, cultural concordance (finding the right CM fit for diverse patients and practices), achieving early successes, and focus on longitudinal relationships were keys to both patient and provider engagement. CM team structure varied considerably in their make-up and level of integration depending on context and target population; however, the majority leveraged a multidisciplinary team-based approach to meet complex patient needs and improve efficiency. PC-CCMPs used different approaches to
engage important community-care partners such as hospitals/EDs, skilled nursing facilities, and community-based home health, behavioral health, and social service agencies. CM caseloads ranged from 25-200 patients and depended on patient complexity, intensity of intervention, CM training, and support from technology and a multidisciplinary team. Patient touches were frequent and often face-to-face, in the clinic or community. The central task of the CM was to build trusting relationships with the patient, physician, and other community-care partners. Other tasks included: comprehensive assessment and creation of a care plan to address needs/barriers, self-management support, care coordination, and patient advocacy. Care Management IT infrastructure was generally limited, and programs universally identified motivational interviewing as the most important component of CM training.

Conclusions: Health care costs are concentrated in a small group of complex individuals. Payers and healthcare delivery systems are increasingly looking to use CMs to improve care and reduce costs for their complex patients. Interviews of key informants in 18 successful PC-CCMPs reveal numerous shared operational attributes.

Implications for Policy, Delivery, or Practice: As health systems adopt PC-CCM strategies, they should apply lessons from these successful PC-CCMPs to optimize opportunities to improve care and reduce costs.

Funding Source(s): CWF
Poster Session and Number: B, #639

Primary Care-Integrated Complex Care Management Programs for Medicaid and Dual-Eligible Patients: Lessons from Early Adopters
Clemens Hong, Harvard Medical School/Massachusetts General Hospital; Allison L Siegel, Massachusetts General Hospital; Timothy G Ferris, Massachusetts General Hospital

Presenter: Clemens Hong, Instructor Of Medicine, Medicine, Harvard Medical School/Massachusetts General Hospital, cshong@partners.org

Research Objective: To assess key operational attributes and best practices of leading primary care-integrated, complex care management programs (PC-CCMPs) serving Medicaid and dual-eligible (M&DE) patients.

Study Design: Based on literature review and recommendations from an expert steering committee, we identified 20 operating, PC-CCMPs that met inclusion criteria: whole-person focus and existing data indicating positive outcomes. We performed 1-hour, semi-structured interviews with 3 key informants (executive leader, program manager, and care manager (CM)) from each of the 18 PC-CCMPs agreeing to participate. In a subset of 10 programs that served M&DE patients, we identified M&DE-specific approaches in the following domains: patient selection and engagement, primary care engagement, CM team structure, key activities and resources. Two investigators independently reviewed detailed notes from each audiotaped interview and then collectively identified recurring themes and best practices.

Population Studied: Three key informants from each of 10 PC-CCMPs serving M&DE patients across the US.

Principal Findings: Located in urban (8) and rural (4) settings in 10 states, PC-CCMP operations were managed by payers (4), delivery systems (5), and regional CM entities (3). Two programs served both urban and rural settings, 3 were multi-payer initiatives, and payer/delivery system partners jointly operated 2 programs. Existing evaluation data from these PC-CCMPs revealed increased quality, provider/patient experience, and decreased acute care utilization/costs. PC-CCMPs selected patients based on quantitative (e.g. risk prediction models) or qualitative (e.g. referral) approaches, or hybrids of the two. Respondents felt that qualitative approaches were better for identifying mutable patients. Patient engagement was challenging due to a high level of mobility, competing priorities, poor communication access, loss of insurance coverage, and issues of trust. PC-CCMPs used many approaches to address these issues including: early/regular face-to-face interaction, use of culturally concordant CM team members, such as community health workers (CHWs), increased emphasis on harm-reduction strategies and motivational interviewing, and greater integration with behavioral health providers. Several PC-CCMPs maintained discretionary funds to address patient needs, and one program provided free cellular phones to patients to increase engagement. CM caseloads ranged from 25-150 patients, but were much lower than PC-CCMP counterparts serving Medicare and commercial
Depression as a Risk Factor for Poor Self-Care in Patients Hospitalized with Heart Failure

Mary Johantgen, University of Maryland School of Nursing; Robin P. Newhouse, University of Maryland School of Nursing; Sue Thomas, University of Maryland School of Nursing; Heesook Son, Consultant

Research Objective: Meta-analytic results have demonstrated that depression in heart failure (HF) is associated with poorer health outcomes (Rutledge et al, 2006). Yet, the mechanisms for these relationships are not clear. For patients hospitalized with HF, the objectives of this study were to: 1) describe the frequency of depressive symptoms by demographic factors; and 2) to examine the relationship between depressive symptoms and self-care confidence, self-care management, readiness for discharge, and HF knowledge.

Study Design: The descriptive study reported here was a part of a prospective cohort, multi-site study of HF patients in U.S. hospitals achieving Magnet® Recognition. The Improving Heart Failure Outcomes (IHO) study was designed to evaluate the effect of standardized nursing education on HF patient outcomes after discharge. Depressive symptoms were measured with the Beck Depression Inventory and then aggregated to four levels based on scoring guidelines. The Self-Care Heart Failure Index V6.2 (Riegel, 2012) measured self-care maintenance, management, and confidence.

Population Studied: The 492 patients studied were admitted to a single unit in one of 40 Magnet® hospitals who volunteered to participate. Patients meeting inclusion criteria (primary diagnosis of HF, speaking English, anticipated discharge to home) were recruited on admission to the hospital. Patients were excluded from analyses if they had an intervention procedure or transferred to another hospital unit, or were not discharged to home.

Principal Findings: Twelve percent of the entire sample was assessed as having moderate or severe levels of depressive symptoms. Age, measured with 3 levels, was significantly related to depressive symptoms [X2(9) = 30.344, p<.001]. Patients older than 65 years most frequently experienced mild depressive symptoms, whereas patients 51-65 years had the highest proportions of moderate/severe depressive symptoms. Depressive symptoms did not significantly vary by gender, New York Heart Association (NYHA) class, education, or ethnicity. However, self-care confidence [F (3, 561) = 6.561, p<.001] and patient readiness for discharge [F (3, 447) = 5.321, p<.001] were significantly different among the four depressive symptom groups. Patients with minimal depressive symptoms reported higher self-care confidence as compared to those with mild depressive symptoms (p<.001). Patients with minimal depressive symptoms reported higher scores of readiness for discharge (p=.003) as compared to those with higher levels of depression. Self-care management and knowledge of HF were not significantly different in patients with HF who were depressed.

Conclusions: HF patients with higher levels of depressive symptoms are less ready for discharge from acute care hospitals and have less self-confidence in their ability to manage their HF at home despite having no difference in HF knowledge, or self care management and
maintenance. Younger HF patients may be at particular risk for depression.

**Implications for Policy, Delivery, or Practice:**
Individuals who have co-morbid depression with HF may require better psychological assessment, additional discharge planning, and closer follow-up to support self-care and potentially prevent readmission. Symptoms of depression should routinely be assessed even for younger HF patients.

**Funding Source(s):** Other, American Nurses Credentialing Center

**Poster Session and Number:** B, #641

**Effect of Chronic Illness Complexity on Receipt of Evidence-Based Depression Care**
Neil Jordan, Northwestern University Feinberg School of Medicine; Min-Woong Sohn, Northwestern University Feinberg School of Medicine; Brian Bartle, Hines VA Hospital; Marcia Valenstein, University of Michigan; Todd Lee, University of Illinois-Chicago

**Research Objective:** The rate of guideline concordance with antidepressant treatment among veterans with new episodes of depression is low. The problem may be even more pronounced for depression patients with coexisting, multiple chronic conditions (MCC). The objective of this study is to examine, for persons with new episodes of depression, the effect of various groups of chronic diseases (clusters of MCC) on the likelihood of receipt of evidence-based depression treatment.

**Study Design:** In this study of Veteran Affairs (VA) patients, we used VA administrative data to identify our depression-MCC cohort, which consisted of VA patients who experienced a new depressive episode in 2007. Comorbid conditions for the study cohort were identified during the year prior to the first date of depression diagnosis in 2007 (index date) using ICD-9 codes from AHRQ Clinical Classification Software. We focused on chronic conditions managed with medication or psychosocial interventions (arthritis, cardiovascular & cerebrovascular conditions, diabetes, infectious disease, non-melanoma cancer, peptic ulcer/GERD, respiratory disease, substance/alcohol abuse). Patients were assigned to mutually exclusive clusters based on the grouping of these 8 conditions. Guideline concordant (GC) depression care was defined during both acute (12 weeks) and continuation (180 days) phases and includes adequate receipt of antidepressant medications. We determined the association between clusters of chronic illness and likelihood of receipt of GC depression care while adjusting for age, race, marital status and gender.

**Population Studied:** We identified a cohort of 531,932 VA patients, ages 18-64, who had a new depressive episode during 2007.

**Principal Findings:** A total of 43,189 patients met the inclusion criteria. Nearly 90% of the cohort was male with an average age of 55. Overall, 63.4% of veterans received GC depression care during the acute phase, and 37% received GC care through the continuation phase. Compared to patients with depression alone, those with cardio-/cerebrovascular disease, peptic ulcer/GERD, or arthritis had 8%-13% higher odds of receiving GC depression treatment during the acute phase (p<.01). Patients with depression and substance/alcohol abuse had 15% lower odds of receiving acute phase GC depression treatment than patients with depression alone (p<.01). Compared to patients with depression alone, those with cardio-/cerebrovascular disease or peptic ulcer/GERD had 9%-10% higher odds of receiving GC depression treatment during the continuation phase (p<.01). Patients with depression and substance/alcohol abuse had 19% lower odds of receiving acute phase GC depression treatment than patients with depression alone (p<.01). Relatively few of the most prevalent MCC clusters were significantly associated with receipt of GC depression treatment.

**Conclusions:** Over 1/3 of veterans with an acute depressive episode failed to receive short-term, evidence-based depression care, and nearly 2/3 did not receive recommended treatment out to 180 days. There was no consistent association between specific clusters of chronic conditions and guideline concordant depression care.

**Implications for Policy, Delivery, or Practice:**
The proportion of veterans with an acute depressive episode that receive optimal depression treatment is suboptimal. There continues to be need for practice- and system-level interventions to increase quality of depression treatment for persons with an acute depressive episode.
Funding Source(s): AHRQ
Poster Session and Number: B, #642

Health Insurance-Motivated Disability Enrollment: Implications for Policy and Research
Jae Kennedy, Washington State University, Spokane; Elizabeth Blodgett, Department of Health Policy and Management, University of North Carolina, Chapel Hill

Presenter: Jae Kennedy, Ph.D., Professor, Health Policy and Administration, Washington State University, Spokane, jjkennedy@wsu.edu

Research Objective: The United States currently relies on employer-based health insurance to cover working-age adults and their families. As a result, Americans who are unable to engage in full-time work because of a chronic health condition must not only seek out wage replacement, but also pursue alternative sources of health insurance. However, purchasing private insurance is rarely an option for this population, owing to high costs and structural barriers such as lifetime spending caps, waiting periods, and exclusions of preexisting conditions from coverage. Consequently, workers often apply for disability benefits in part to obtain public health insurance; a uniquely American phenomenon that we call health insurance–motivated disability enrollment (HIMDE). The Patient Protection and Affordable Care Act of 2010 has the potential to significantly reduce HIMDE by expanding health insurance coverage options for workers with disabilities.

Study Design: Review of the disability and health policy literature.


Principal Findings: The Affordable Care Act contains multiple major reforms that should reduce new health insurance–motivated applications for disability benefits and increase the percentage of enrollees who return to work. It achieves this through policy changes in the private and public insurance systems that benefit different subgroups among people with disabilities.

Conclusions: There is unlikely to be an immediate large and sustained drop in enrollment in disability programs, owing to various economic and demographic factors. The aging of the U.S. population, tight economic conditions driving disabled workers out of the job market, and raising of the retirement age will all increase pressure on disability programs even as HIMDE decreases after the ACA’s implementation.

Implications for Policy, Delivery, or Practice: As the ACA is implemented and evaluated, we urge health services and disability researchers to consider a reduction in HIMDE as an important measure of the success of health care reform for Americans with disabilities.

Funding Source(s): Other, National Institute on Disability and Rehabilitation Research (NIDRR)
Poster Session and Number: B, #643

Multimorbidity and Long-Term Care Dependency – A Five Year Follow-Up
Daniela Koller, Dartmouth Institute for Health Policy and Clinical Practice; Gerhard Schoen, University Medical Center Hamburg-Eppendorf; Martin Scherer, University Medical Center Hamburg-Eppendorf; Hendrik van den Bussche, University Medical Center Hamburg-Eppendorf; Gerd Glaeske, Centre for Social Policy Research, University of Bremen; Ingmar Schaefer, University Medical Center Hamburg-Eppendorf; Heike Hansen, University Medical Center Hamburg-Eppendorf

Presenter: Daniela Koller, Researcher, Dartmouth Institute for Health Policy and Clinical Practice, koller.daniela@googlemail.com

Research Objective: Not only single, but multiple chronic conditions are becoming the normal situation rather than the exception in the older generation. Yet, treatment guidelines still focus on single diseases and do not include the complexity of multiple chronic diseases. Previous studies showed a correlation between multimorbidity and functional impairment, but the impact on long-term care dependency is not clear yet. The objective of this study is to follow up a cohort of older adults over 5 years to estimate the impact of multiple chronic conditions on long-term care dependency.

Study Design: This study is based on claims data of a large German statutory health insurance company. Individual information of all insured persons is available in pseudonymous form. The main outcome was the time until long-term care dependency. The follow up started on January 1st, 2005 and lasted for 5 years until December 31st, 2009. To evaluate differences between persons with multimorbidity and those without we first calculated Kaplan-Meier curves, stratified for multimorbidity. Furthermore, three distinct Cox
Multimorbidity was defined as three or more chronic conditions based on ICD-10 codes. Multimorbidity was defined as three or more chronic conditions out of this list.

**Principal Findings:** Mean follow-up was 4.5 years. Persons with multimorbidity had a higher risk of becoming care dependent (HR: 1.85, CI 1.78-1.92). After five years, 91.3% of those without multimorbidity are still not care-dependent, compared to 84.7% in the multimorbid group (p for log rank <.0001). This result remains significant after adjusting for age and sex. With every year of age the risk for care dependency increases by 16%; sex does not have a significant influence. The conditions with the highest risks long-term care dependency are Parkinson’s disease and dementia. For both diseases, the risk for care dependency is significantly higher for non-multimorbid persons (HR of 6.40 vs. 2.68 for Parkinson and HR: 5.70 vs. 2.27 for dementia, respectively).

**Conclusions:** Our results point to a higher influence of degenerative diseases on long-term care dependency, also showing that specific diseases have a stronger impact for patients that do not have multiple chronic diseases. Through the inclusion of 46 chronic conditions and the large database those results can add newer and broader knowledge to the existing evidence on multimorbidity and care dependency.

**Implications for Policy, Delivery, or Practice:** The results should form the basis for future health policy decisions on the treatment of patients with multiple chronic diseases and also show the necessity to introduce new ways of long-term care provided to this population. A health policy focus on chronic care management already in the ambulatory setting and introducing guidelines for multimorbidity is crucial to secure health services delivery for the older population.

**Funding Source(s):** Other, Federal Ministry of Education and Research, Germany

**Poster Session and Number:** B, #644

**Multiple Chronic Comorbidities in Type 2 Diabetes: Prevalence and Consequences**

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**Presenter:** Pei-jung Lin, Ph.D., Assistant Professor, Center for the Evaluation of Value and Risk in Health, Tufts Medical Center, plin@tuftsmedicalcenter.org

**Research Objective:** Despite the predominance and high costs of multiple chronic comorbidities (MCCs) among diabetes patients, which condition clusters are most prevalent and most influential in predicting adverse outcomes remains unclear. This study examined the most common patterns of MCCs, and assessed hospital readmissions and emergency room (ER) visits associated with specific condition clusters.

**Study Design:** Cross-sectional analysis of the 2008-2012 Humedica dataset containing data extracted from electronic health records, encounter files, and lab values supplied by U.S. providers. Of the 14 comorbidities in the 2012 American Diabetes Association guidelines, we selected the eight conditions that each affected >=10% of the patients and analyzed the most common patterns of mutually exclusive clusters in a type 2 diabetes cohort (n=162,332). We calculated the percent of total 30-day readmissions and total ER visits by MCC cluster. We used logistic regression models to explore the risk of readmissions and ER visits in MCC subgroups, controlling for age, sex, race, neighborhood income, insurance status, HbA1c, BMI, cholesterol, blood pressure, number of office visits, and number of prescription drugs.

**Population Studied:** 162,332 adults (aged >=18 years) with type 2 diabetes who had >=24 months of ambulatory and hospital data from integrated delivery networks.
Principal Findings: 89.1% of diabetes patients had >=1 comorbidity and 40.9% had >=3. The leading combination of MCCs was hypertension and hyperlipidemia only (21.1%). Overall, 62.5% of patients had this combination plus one other condition and 27.6% had the combination plus two other conditions. Other common clusters included hypertension only (10.9%), hyperlipidemia only (5.0%), and the combination of hypertension and hyperlipidemia plus coronary artery disease (CAD, 4.7%). 19.4% of subjects discharged from the hospital were readmitted within 30 days, and 23.2% had at least one ER visit during the study period. 15.3% of total readmissions and 19.3% of ER visits were for patients who had co-existing hypertension and hyperlipidemia, or who had this cluster plus CAD and/or chronic kidney disease (CKD). The likelihood of readmissions and ER visits significantly increased with the number of comorbidities. Compared with subjects without any comorbidity, individuals with CAD and/or CKD in addition to hypertension and hyperlipidemia were significantly more likely to have readmissions (ORs=1.01-2.11) and ER visits (ORs=1.01-1.23).

Conclusions: Adults with type 2 diabetes have substantial comorbidities. The leading MCC cluster is hypertension and hyperlipidemia only. Not only a higher number of comorbidities, but certain MCC clusters, such as hypertension and hyperlipidemia plus CAD and/or CKD, are associated with more readmissions and ER visits.

Implications for Policy, Delivery, or Practice: To date single-disease frameworks, including diabetes guidelines, do not sufficiently account for MCCs and, importantly, do not detail how these comorbidities may affect treatment plans and patient outcomes. Most diabetes outcomes research has focused on disease-specific measures but ignored how MCCs affect broader health outcomes (e.g., readmissions, ER visits) that can have important consequences. Our analysis highlights important comorbidity clusters to be addressed in guidelines. Specific MCC clusters should be targeted by tailored prevention programs in order to reduce diabetes costs and improve quality.

Funding Source(s): Other, West Health Institute

The Future of Chronic Care through the Glasses of a National Position Paper
Dominique Paulus, Belgian Health Care Knowledge Centre; Koen Van den Heede, Belgian Health Care Knowledge Centre; Sophie Gerkens, Belgian Health Care Knowledge Centre; Anja Desomer, Belgian Health Care Knowledge Centre; Raf Mertens, Belgian Health Care Knowledge Centre

Presenter: Dominique Paulus, M.D.,Ph.D,MSc., Senior Expert Physician, Belgian Health Care Knowledge Centre, dominique.paulus@kce.fgov.be

Research Objective: This paper presents the development and content of a national position paper for chronic care. Health care systems are now at a turning point with an urgent need to develop better care for the chronically ill instead of focusing on acute conditions in hospital settings.

Study Design: The position paper is based on various data sources: (1) publications from international organizations; (2) chronic disease plans from Pennsylvania, Québec, Denmark and The Netherlands; (3) scientific literature on patient empowerment and on new functions for healthcare professionals; (4) description of the Belgian initiatives and; (5) consultation of more than 100 stakeholders.

Population Studied: The target population are the chronically ill who have medical, social or other needs in relation to their illness. This approach differs from the usual disease-oriented initiatives.

Principal Findings: The position paper on chronic care proposes 20 recommendations subdivided into 50 concrete actions. First, routine care of high quality in outpatient settings: the starting point is an individualized care plan, based on the patient’s life goals and designed in collaboration with the multidisciplinary primary care team. One prerequisite is the access to the electronic medical record (EMR) for all care providers. Action points further relate to the attractiveness of primary health care professions, task delegation and development of new functions in primary care. Complex situations call for the intervention of a case manager and for collaborations between providers from the medical and social worlds. Second, seamless care between the first line of care and specialized services: specialized services play a key role in the initial diagnosis
and in the care for exacerbations or complications. They can assist the primary care team for pathology-related questions. Sharing the EMR and interventions by a discharge manager should favor a seamless transition between settings.

Third, empowering patients and informal caregivers: they need accurate, relevant and timely information by trained professionals in order to fulfill their new role as partners in chronic care. Financial and logistical support of informal caregivers, including respite care and adaptation of the living environment should contribute to maintaining the patient at home when possible.

Finally, recommendations advocate the set up of a quality system, harmonization between coordination structures, accessibility, equity and payment systems that reward integrated care of high-quality.

**Conclusions:** This project shows the numerous action points to be implemented in order to reorient a health care system towards the needs of the chronically ill.

**Implications for Policy, Delivery, or Practice:** A new orientation of health care systems towards chronic care calls for changes in multiple domains (human resources, financing, quality) and in particular investments in the first line of care. This dynamic reform should be continuously monitored and adapted to the constantly changing patient needs, societal values, healthcare system, budgetary resources and scientific knowledge.

**Funding Source(s):** Other, Belgian Health Care Knowledge Centre

**Poster Session and Number:** B, #646

**Meaningful Activity Participation of Older Adults with Cancer**

Mackenzi Pergolotti, University of North Carolina, Chapel Hill

**Presenter:** Mackenzi Pergolotti, M.S. OTR/L, Pre-doctoral Fellow, Cecil G Sheps Center for Health Services Research, University of North Carolina, Chapel Hill, pergolot@email.unc.edu

**Research Objective:** Participation in activity that is personally meaningful leads to improved emotional and physical well-being and quality of life. However, little is known about the degree to which older adults with cancer participate in activity that they rate to be personally meaningful and how that relates to clinical and demographic factors. The objective of this study was to examine meaningful activity participation of older adults with cancer.

**Study Design:** We recruited adults 65+ with a diagnosis of cancer from a large academic medical center outpatient oncology clinic in the Southeast for a cross-sectional study examining meaningful activity participation. Measures included a brief geriatric assessment with demographic questions, Karnofsky Performance Status Tool and a Timed "Up and Go" Test. We also included patient reported subscales of the following instruments: an IADL subscale from the Multidimensional Functional Assessment Questionnaire: Older American Resources and Services, and an ADL subscale from the Medical Outcomes Study- Physical Health and scores from the Meaningful Activity Participation Assessment (MAPA). The MAPA was designed in order to assess an older person’s personal meaning of activity participation, weighted by their frequency (Eakman, 2010). We used multivariate regression to examine the relationship between risk factors for decreased quality of life (age, sex, race, marital status, education & functional ability) and MAPA scores.

**Population Studied:** Patients were included, who had an appointment at the outpatient oncology clinic that were ≥65 years of age, and gave consent to complete the Geriatric Assessment and MAPA. Patients were excluded if they did not have a cancer diagnosis, and if they did not read English. A total of forty-nine adults formed the study sample.

**Principal Findings:** Preliminary findings suggest higher levels of education and functional ability was significantly associated with higher scores on the MAPA. The mean MAPA score was 446 and it ranged from 208-63. Higher scores on the MAPA are related to better psychological well being and mental health. The average age was 73 years with a range from 65-89 years, 51% of the sample was female and 78% White, all with a diagnosis of cancer. 27% of the patients were diagnosed with breast cancer, followed by lymphoma (13%) and lung cancer (13%). 73% reported at least some college education, 87% were retired, 57% were married and 42% lived alone.

**Conclusions:** Education and level of functional status are significantly related to meaningful activity participation. To our knowledge, this is the first study to examine the relationship between patient-reported meaningful activity participation and clinical and demographic factors of older adults with cancer.
Implications for Policy, Delivery, or Practice: Examining the degree of meaningful activity participation of older adults with cancer will inform future research towards improving the survivorship care provided through engaging patients in empirically based treatments they find personally meaningful and that are aimed at improving their quality of life.

Funding Source(s): AHRQ. This research was partially supported by a National Research Service Award Pre-Doctoral Traineeship from the Agency for HealthCare Research and Quality sponsored by the Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill

Poster Session and Number: B, #647

Implementation and Initial Validation of a Tool, Minnesota Edinburgh Complexity Assessment Method, to Assess Patient Complexity within a Primary Care Based Preventative Screening Program in Scotland

Rebekah Pratt, University of Minnesota; Carina Hibberd, University of Stirling, Scotland; Isobel Cameron, University of Aberdeen, Scotland; Stewart Mercer, University of Glasgow, Scotland; Margaret Maxwell, University of Stirling, Scotland

Presenter: Rebekah Pratt, Ph.D., Assistant Professor, University of Minnesota, rjpratt@umn.edu

Research Objective: The Minnesota Edinburgh Complexity Assessment Method (MECAM) is a tool to assess complex patients in primary care. MECAM has four key domains, being, health and wellbeing, social environment, health literacy and communication. This study researched the implementation of MECAM in Keep Well, a Scotland wide preventative care program targeting low income patients at risk of coronary heart disease. The main objective was to develop and establish face validity of the MECAM, specifically in its ability to identify mental health-related needs. Secondary aims were to conduct preliminary external validity testing of the MECAM; establish how best to integrate the MECAM into existing health checks and; evaluate the implementation and perceived value of MECAM.

Study Design: This mixed methods prospective cohort study undertook face validation testing, conducted preliminary external validity testing, piloted implementation, and conducted a case study in a population of known complexity.

Three sites in Scotland participated. Completed data were collected for 243 patients from underserved populations.

Population Studied: Keep Well is delivered by nurses based in General Practitioner clinics, in Scotland. Nurses collected data for 286 low income patients at baseline and 243 patients post implementation. Additionally, a case study on use with homeless and gypsy traveler patients was also conducted.

Principal Findings: Face validation was established for use with nurses in primary care in Scotland. MECAM did not impact patient satisfaction, but did lead to increased referral to a broader range of services, particularly to those addressing psychological, social and lifestyle needs. Nurses valued MECAM and found it easy to implement. Partial external validation was established in relation to the SF-36. The time taken to complete was acceptable in the context of this screening program. MECAM worked well in populations of known high complexity.

Conclusions: MECAM offers much promise as an assessment of complexity that identifies biopsychosocial complexity, and supports clinician decision making to address those needs. MECAM was well accepted by clinicians and implemented successfully. MECAM appears to offer good potential to support collaborative and integrated consultations, and may increase the referral of patients to a wider range of resources.

Implications for Policy, Delivery, or Practice: Clinicians participating in the study agreed that use of the MECAM encouraged a more comprehensive assessment of patient needs (physical, mental and social). MECAM also demonstrated that it may broaden referrals in response to patient needs. This highlights the potential of MECAM to contribute to better understanding patient needs, both at an individual and patient population level. This may have important implications for how care is delivered, particularly through assisting with the identification of non-medical needs which may routinely interfere with care. Additionally, the role of such assessments in current health initiatives in primary care, such as the medical home, warrants further exploration as a tool which may enhance team approaches to care. The role of such tools in supporting policy level initiatives to better understand the assessment of level of complexity, payer models by complexity and risk assessments, such as in relation to readmissions, should be reviewed.
The Nexus of Traumatic Brain Injury and Mild Cognitive Impairment

Mary Jo Pugh, South Texas Veterans Health Care System; Carlos Jaramillo, South Texas Veterans Healthcare System; Blessen Eapen, South Texas Veterans Healthcare System; Jacqueline Pugh, South Texas Veterans Healthcare System; Thomas Kent, Michael E. DeBakey VA Medical Center, Houston; Gustavo Roman, Methodist Hospital, Houston

Research Objective: TBI is the signature injury of the wars in Afghanistan and Iraq, with a majority being mild TBI (mTBI). TBI may cause MCI and is associated with increased risk of neurodegeneration, highlighting a need for accurate early diagnosis and appropriate follow-up of TBI patients. MCI is a useful concept for early symptomatic diagnosis of Alzheimer’s disease; however, no studies have examined the link between TBI severity and MCI, nor the contributing effect of PTSD to cognitive loss in TBI. We tested the hypothesis that severity of traumatic brain injury (TBI) is associated with mild cognitive impairment (MCI) controlling for post-traumatic stress disorder (PTSD).

Study Design: This retrospective database study used diagnostic data (ICD-9CM codes) from the Department of Veterans Affairs (2010-2011) to identify individuals with TBI and MCI using validated algorithms. TBI was classified as penetrating (pTBI), severe, moderate, or mild (mTBI) based on the most severe type coded. To address potential confounding with PTSD we created a TBIxPTSD interaction term, and used logistic regression analysis to examine the odds of TBIxPTSD categories associated with MCI compared to those without TBI or PTSD.

Population Studied: Veterans of Afghanistan and Iraq wars who received VA care in both FY10 and FY11.

Principal Findings: Of the 303,716 individuals who received VA care in 2010-2011, 2,155 (0.71%) were diagnosed with MCI. The odds of MCI diagnosis with pTBI+PTSD was lower than pTBI alone (albeit not significantly; 116.7; 95% CI 44.1-63.4 vs. 29.2; 95% CI 23.2-36.8 respectively; p<.001).

Conclusions: The relationship between MCI and TBI is strongest in more severe TBI, and for severe TBI comorbid PTSD was not significantly different than TBI alone. While MCI was also associated with mTBI alone, having comorbid PTSD conferred significantly higher odds of MCI. These data suggest that PTSD should be included in epidemiological study of mTBI and neurodegenerative disorders.

Implications for Policy, Delivery, or Practice: This significantly increased risk of mild cognitive impairment even among those with mTBI suggests that the VA healthcare system may need to provide training to patient aligned care teams regarding identification and treatment of MCI and consider expanding access to relevant specialty care (e.g., neurology, geriatrics/memor)

Funding Source(s): VA

Poster Session and Number: B, #649

The Nexus of Traumatic Brain Injury and Dementia

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Research Objective: TBI is the signature injury of the wars in Afghanistan and Iraq, with a majority being mild TBI (mTBI). TBI may cause MCI and is associated with increased risk of neurodegeneration, studies linking mild TBI to dementia are limited and no studies have examined the contributing effect of PTSD to dementia in TBI. We tested the hypothesis that severity of traumatic brain injury (TBI) is

CI 40.9-333.4 vs 216.6; 95% CI 72.4-647.6; p>.1), in contrast to mTBI+PTSD, which was significantly higher than mTBI alone (52.9; 95% CI 44.1-63.4 vs. 29.2; 95% CI 23.2-36.8 respectively; p<.001).

Conclusions: The relationship between MCI and TBI is strongest in more severe TBI, and for severe TBI comorbid PTSD was not significantly different than TBI alone. While MCI was also associated with mTBI alone, having comorbid PTSD conferred significantly higher odds of MCI. These data suggest that PTSD should be included in epidemiological study of mTBI and neurodegenerative disorders.

Implications for Policy, Delivery, or Practice: This significantly increased risk of mild cognitive impairment even among those with mTBI suggests that the VA healthcare system may need to provide training to patient aligned care teams regarding identification and treatment of MCI and consider expanding access to relevant specialty care (e.g., neurology, geriatrics/memor)

Funding Source(s): VA

Poster Session and Number: B, #649
associated with dementia in Veterans from the Wars in Afghanistan and Iraq, controlling for potential confounding of post-traumatic stress disorder (PTSD).

**Study Design:** This retrospective database study used diagnostic data (ICD-9CM codes) from the Department of Veterans Affairs (2010-2011) to identify individuals with TBI and dementia using validated algorithms. TBI was classified as severe (includes penetrating), moderate, or mild based on the most severe type coded. We controlled for age, sex, race, and PTSD.

**Population Studied:** Veterans from the Wars in Afghanistan and Iraq, who received VA care in FY10 and FY11.

**Principal Findings:** Of the 303,716 individuals who received VA care in 2010-2011, 571 (0.2%) were diagnosed with dementia. The odds of diagnosis with severe TBI (205.6; 95% CI 90.0-470.1) was significantly higher than moderate (27.3; 95% CI 17.3-42.9) or mild (5.2; 95% CI 2.9-9.2; p<.001) TBI. PTSD diagnosis was associated with reduced odds of dementia (.41; 95% CI .27-.62). There was no significant interaction between TBI and PTSD.

**Conclusions:** As expected, the relationship between dementia and TBI is strongest in more severe TBI, but the association with mTBI remained significant after controlling for demographic characteristics. The impact of mTBI remained the same after controlling for PTSD. Unlike prior analyses that found an interaction between mTBI and PTSD for cognitive impairment, and there was no significant interaction between TBI severity and PTSD for dementia.

**Implications for Policy, Delivery, or Practice:** While the number of individuals affected is small at this time, 10-20% of Veterans of the Afghanistan/Iraq wars have TBI exposure, and the average age of those patients was 36 in FY11. Patient aligned care teams may benefit from training to identify patients with cognitive decline early in order to provide treatments which may delay the onset of more severe dementia symptoms.

**Funding Source(s):** VA

**Poster Session and Number:** B, #650

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**Health Care Costs and Service Use Among Privately Insured Individuals with Autoimmune Conditions Treated with Specialty Medications**

Naomi Sacks, Boston University, School of Public Health; Terese Condon, MBA, IMS Health Payer Solutions

**Presenter:** Naomi Sacks, PhD, Senior Analyst, IMS Health Payer Solutions, Health Policy and Management, Boston University, School of Public Health, nsacks@bu.edu

**Research Objective:** Identify correlated variations in health care expenditures and service use among privately insured individuals with auto-immune conditions treated with specialty medications.

**Study Design:** IMS LifeLink Health Plan Claims Database data used to estimate plan allowed annual per patient spending and utilization rates. Calendar year 2010 and 2011 claims for health plan members under age 65 used to identify auto-immune condition patients in 2010, and cost and utilization estimates generated for 2011. Treatment settings defined using diagnosis (ICD-9), place of service (POS), revenue, and CPT codes.

**Population Studied:** 6.9 million members with 24 months of continuous enrollment were identified in 19 health plans across the United States. A subset of 107,519 was identified with HIV/AIDS (N=8,512), Crohn’s Disease (N=11,529), Multiple Sclerosis (N=10,613), Psoriasis (N=26,661), Psoriatic Arthropathy (N=4,886), Rheumatoid Arthritis (N=39,369) and/or Ulcerative Colitis (N=12,115).

**Principal Findings:** Mean annual per patient spending, $18,257 (vs. All Members: $4,076), ranged from $10,803 (Psoriasis) to $17,919 (Rheumatoid Arthritis), $26,409 (HIV/AIDS) and $35,157 (MS). Spending was distributed across inpatient ($17,907; 15%) outpatient ($7,432; 41%) services and retail pharmacy ($8,104; 44%) settings (vs. All Members: 20%, 59%, 21%). Retail pharmacy was approximately 2/3, and inpatient a much smaller proportion of HIV/AIDS (Rx: 66% IP: 11%) and MS (Rx : 64%; IP: 8%) spending; outpatient and inpatient were higher proportions for Crohn’s Disease (OP: 50%; IP: 21%) and Ulcerative Colitis (OP: 49%; IP: 24%) expenditures. Retail pharmacy specialty medication spending was over 2/3 of all pharmacy spending ($5,576; 68%; vs. All Members: $167; 4%), represented 52% of retail pharmacy specialty prescription medication across the 6.9 million study sample plan members, but varied by condition, ranging from $4,237 (Ulcerative Colitis; 22%) to $11,048 (Psoriatic Arthropathy; 79%) to $17,485.
prescriptions annually, at a mean per prescription cost of $214, with 4.4 for specialty medications, at $1272 mean cost per prescription (vs. All Members: 12.45; $69; $811). Annual per patient specialty medication prescriptions, and per prescription costs, ranged from 1.23/$770 (Ulcerative Colitis) to 4.85/$806 (Rheumatoid Arthritis) to 6.05/$3,169 (MS). Over half (2.73) of RA patient specialty prescriptions were for generics ($66/per Rx); nearly all MS specialty prescriptions (5.8; 96%) were for branded medications. Specialty medications administered in outpatient settings ($1,298; 7% of all spending; vs. All Members: $107; 4%), combined with retail pharmacy dispensed specialty medications, were 38% of all spending ($6,874 vs. All Members: $275; 7%) and ranged from 15% (Ulcerative Colitis) to 26% (Crohn’s) to 55% (HIV/AIDs) and 60% (MS).

Conclusions: Specialty drug prescriptions and specialty drugs administered in outpatient settings contribute substantially to expenditures for auto-immune condition patients. Compared to all members, inpatient and outpatient service spending were smaller proportions of all expenditures, but were relatively higher proportions for Crohn’s Disease and Ulcerative Colitis patients.

Implications for Policy, Delivery, or Practice: Improved coordination and ongoing analysis of specialty drug treatment costs, use and benefits across medical and pharmacy benefits and care settings could improve care access and cost management. Prior authorization and cost sharing incentives for optimal site of care may also improve access and cost management.

Funding Source(s): No Funding

Poster Session and Number: B, #651

The Role of Limited English Proficiency in Health Care Use of Those with Chronic Conditions: Findings from California’s Low Income Health Program

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Presenter: Erin Salce, M.P.H., Senior Research Associate, UCLA Center for Health Policy Research, erin.salce@ucla.edu

Research Objective: The objective of this study is to assess variations in utilization patterns of chronically ill Low Income Health Program (LIHP) enrollees by limited English proficiency (LEP). LIHP is a county-operated Medicaid Waiver demonstration program which expands coverage to eligible low income adults effective July 1, 2011 through December 31, 2013. Under the Affordable Care Act (ACA), LIHP enrollees will transition to California’s Medi-Cal Program or to California’s Health Benefit Exchange. The delivery of care to those with chronic conditions and LEP can be more challenging and would require culturally competent care coordination and management services. The safety net providers participating in the LIHP program deliver such services.

Study Design: We used claims and enrollment data from 12 participating counties and a consortium of 35 rural counties. Over 500,000 individuals enrolled in LIHP during the first program year were included in the analysis. Preference for communication in a language other than English was used as a proxy for LEP status. Sex, age, federal poverty level (FPL), county and a chronic condition indicator were used in logistic models of use. Chronic conditions included diabetes, asthma and chronic obstructive pulmonary disease, cardiovascular disease and congestive heart failure, dyslipidemia, and hypertension. Services examined included use of any inpatient, emergency room (ER), and outpatient evaluation and management (E&M) visits during the program year.

Population Studied: Adults between 19 and 64 years of age enrolled in the county-operated Low Income Health Program, a Section 1115 Waiver demonstration which provides health care coverage to individuals who are not eligible for Medicaid and have incomes below 200% FPL.

Principal Findings: Compared to non-LEP enrollees, LEP enrollees were more likely to be female, over the age of 55, and have a diagnosis of diabetes, dyslipidemia, or hypertension. Over 30% of LIHP enrollees with a chronic condition were LEP, with 70% of LEP enrollees preferring Spanish, 23% preferring Asian American languages, and 7% preferring another language. Those with chronic conditions had higher rates of E&M, ER, and inpatient visits. However, those with LEP and chronic conditions had a significantly higher likelihood of E&M visits (OR=1.5) than non- LEP (OR=1.1), after controlling for sex, age, FPL, chronic
conditions and variations in county implementation of the LIHP. In contrast, those with LEP and chronic conditions had a lower likelihood of ER (0.6 vs. 0.7) and inpatient (0.6 vs. 0.7) visits.

Conclusions: The higher rates of E&M visits and lower use of ER and inpatient care among chronically ill and LEP LIHP enrollees may be due to better culturally competent primary care visits which in turn contributed to lower use of more costly emergency and inpatient services.

Implications for Policy, Delivery, or Practice: The effectiveness of care delivery under the Medicaid expansion and Health Benefit Exchange programs may be improved with additional effort to improve delivery of culturally concordant care coordination and management care. English proficiency and language preference can play a significant role in the service use of chronically ill populations. These findings highlight how the care of chronically ill populations can be more successfully managed.

Funding Source(s): Other, Blue Shield of California Foundation

Poster Session and Number: B, #652

Ambulatory Care Sensitive Conditions and 30 Day Hospital Readmission for Adults with Diabetes
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Research Objective: The purpose of this study was to describe the rate of 30 and 90 day hospital readmission with ambulatory care sensitive conditions (ACSC) among adults with diabetes and identify independent factors associated with ACSC hospital readmission.

Study Design: We conducted a retrospective cohort study of adult patients hospitalized with a principal (PDM) or secondary diagnosis of diabetes (SDM). Data were drawn from the Clinical Data Warehouse of a tertiary referral hospital in northern Manhattan. ICD9 codes 250.xx at the index hospital admission informed PDM or SDM. ACSC was defined as the Agency for Healthcare Research and Quality’s Prevention Quality Indicators with focus on 12 of 14 indicators relevant to adults with diabetes.

We compared 30 and 90 day readmission rates by DM status (PDM, SDM, without diabetes) at the index hospitalization by chi-squared test. We computed frequency of ACSC as a reason for readmission for each category and examined associations between DM status and ACSC readmission using univariable and multivariable logistic regression models controlling for demographic (age, gender, race/ethnicity), payer, and clinical factors (hospital length of stay [LOS], distance to the hospital [estimated as distance from the centroid of patient zip code to the hospital], renal failure, dialysis, surgery lasting 30 minutes or longer, severity of illness [graded by 3M All Patient Refined Diagnosis Related Groups] and mean blood glucose level) identified at the index hospital admission.

Population Studied: Adults with PDM or SDM hospitalized at a large tertiary care facility in northern Manhattan between January 1, 2006 and December 31, 2008 were studied. Hospitalizations for pregnancy and their associated conditions were excluded.

Principal Findings: Of 68,622 patients (1,365 PDM; 14,142 SDM; 53,115 without DM) meeting inclusion criteria, 6,674 (9.7%) and 11,495 (16.8%) patients were readmitted within 30 and 90 days respectively. Stratified by age and DM status, 30 day readmission rate was higher for PDM compared to SDM and without diabetes in both patients >=65 years (17% versus 13%, 11%) and <65 years (13% versus 11%, 8%). ACSC accounted for a greater proportion (92%) of 30 day readmissions for PDM compared to that of SDM (15%) and without DM (9%).

Controlling for demographic, payer and clinical factors, ACSC readmission was more likely for PDM patients who had received dialysis (aOR 2.3, 95% CI 1.1-4.7), a surgical procedure (aOR 2.2, 95%CI 1.3-3.7) or had higher severity of illness (aOR 5.2, 95% CI 1.4-19.1) at the index hospitalization whereas SDM readmitted for ACSC were more likely to be male (aOR 1.4, 95% CI 1.0-2.0), non Hispanic black (aOR 1.8, 95% CI 1.1-3.1), Hispanic (aOR 1.8, 95% CI 1.1-3.0) or had higher severity of illness (aOR 2.2, 95% CI 1.2-4.0) but less likely for surgical patients (aOR 0.4, 95% CI 0.2-0.6).

Conclusions: The risk of ACSC readmission was 6 times higher for PDM compared to both SDM and those without DM. Of interest, racial/ethnic disparity was not associated with readmission for PDM but predicted readmission for SDM. These results may inform early identification of DM patients for intervention at the index hospitalization to prevent avoidable hospital readmission.
Implications for Policy, Delivery, or Practice: Hospitalization for ACSC is avoidable and contributes to excess healthcare cost. Access to diabetes education at the index hospitalization to improve self-management knowledge and transition programs to facilitate connection with community based care at discharge is needed to reduce avoidable hospitalization for PDM and SDM at risk.

Funding Source(s): NIH
Poster Session and Number: B, #653

Chronic Condition Clusters that Predict Frequent Health Care Encounters among the Elderly

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Presenter: Jennifer St Sauver, MPH, PhD, Associate Professor, Mayo Clinic; stsauver.jennifer@mayo.edu

Research Objective: Clinical care is frequently targeted toward management of isolated disorders. However, to optimize health care coordination, it is critical to identify groups of conditions associated with high utilization. The purpose of this study was to identify morbidity clusters associated with frequent health care encounters in individuals >= 65 years of age.

Study Design: We obtained all International Classification of Diseases, ninth revision (ICD-9) codes received in 2005-2008 by the residents of Olmsted County, MN who were >=65 years old in 2009. ICD-9 codes were grouped into 257 Clinical Classification Codes proposed by the Agency for Healthcare Research and Quality. We examined the upper quartile of encounters in 2009 as the primary outcome (>=18 encounters). Patient encounters included contact with a health care provider for lab testing as well as provider care visits. Recursive partitioning was used to identify variables and interactions which predicted frequent health care encounters. Trees were pruned at the endpoints that contained <10% of the study population, and were summarized by odds ratios (OR) and 95% confidence intervals (CI) for each branch using logistic regression. The terminal nodes were similar for men and women, so only overall results are reported.

Population Studied: Residents of Olmsted County, MN who were >=65 years old in 2009 (9,803 women and 7,533 men), and had granted permission for their medical information to be used for research (98% of the population in this age range).

Principal Findings: We identified three groups associated with frequent health care encounters 1) other aftercare (OR: 2.20, 95% CI: 2.01, 2.41); 2) cardiac dysrhythmia and other aftercare (OR: 5.15, 95% CI: 4.67, 5.69); 3) cardiac dysrhythmia, other aftercare, and other heart disease (OR: 11.77, 95% CI: 10.36, 13.36). The control group included all subjects with no other aftercare. The predominant ICD-9 codes in the other aftercare group were V58.61 “long-term use of anti-coagulants” (69%), V58.69 “long-term use of other medications” (6%) and V58.83 “therapeutic drug monitoring” (5%).

Conclusions: We examined all possible ICD-9 diagnostic codes over four years in an elderly Midwestern population. When all conditions were considered, persons with cardiac dysrhythmia, monitoring therapeutic drugs (particularly anticoagulants), and nonspecific heart disease codes had the highest number of health care encounters. Efforts are now needed to identify the underlying “mechanisms” responsible for these results (e.g., indications for, management of, and complications for anticoagulation therapy in heart disease patients).

Implications for Policy, Delivery, or Practice: Identification of such combinations of conditions is important to develop chronic disease management guidelines for people with multiple morbidities to reconcile contradictory recommendations, to help reduce complications, and to decrease costs of care.

Funding Source(s): NIH
Poster Session and Number: B, #654

Patients with Co-occurring Hypertension, Obesity, and Depression: Who Receive Diagnoses and Treatments? Is Treatment of One Condition Associated with Changes in Other Conditions?

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Research Objective: Hypertension, obesity, and depression are three leading causes of disability, with substantial impacts on individuals and the public. Research on them as co-occurring chronic conditions often relies on Medicare claims, which may underestimate their true burden. We used electronic health record (EHR) data from a large multispecialty practice to examine the number of people with these conditions by age category. We also assessed the probability that previously untreated patients would receive antihypertensives and examined the impact of such treatment on health outcomes in people with the other comorbidities (obesity and depression).

Study Design: Observational study using EHR data between 2002 and 2010. Besides descriptive analyses, we used multilevel modeling to examine trends in blood pressure (BP) and body mass index (BMI) over time, and to examine the relationship between hypertension treatment and BMI/BP trajectories, controlling for patient, physician, and clinic-level factors. We used propensity score stratification to reduce treatment selection bias.

Population Studied: Approximately 162,000 patients from a multispecialty group practice identified as overweight/obese, hypertensive, and/or depressed between 2002 and 2010.

Principal Findings: The majority of people with at least two of the three multiple chronic conditions (MCC) (71%; 23,806 of 33,326) were younger than 65 years. Many people are not formally diagnosed: only 53% (14,254 of 27,016) of obese patients based on BMI had a weight-related diagnosis. About 62% (34,945 of 56,111) of patients with high BP were diagnosed and/or treated for hypertension. Among high BMI patients, the odds of having a weight diagnosis is 20% higher if they have depression, and 40% higher if they have hypertension. Even controlling for frequency of visits, the co-occurring depression and overweight was associated with an increasing BMI growth trajectory (coeff=0.06, p<.001), whereas co-occurring depression, overweight, and hypertension was associated with a decreasing BMI growth trajectory (coeff=-.04, p<.01). Propensity score stratification method enabled us to find that antihypertensive treatment was associated with slower increase in BMI (coeff=-0.05, p<0.05) among patients with the highest propensity to receive hypertension treatment. Missing patient-reported mental health data prevented us from examining the propensity of antidepressant treatment, unfortunately.

Conclusions: The burden of depression, obesity, and hypertension is substantial. A high proportion of patients with weight problems were not formally diagnosed as such, but having co-occurring depression or hypertension increased their odds of getting a diagnosis for weight problem. Overweight patients with depression had faster rises in BMI whereas overweight patients with hypertension had slower rises in BMI. Treatment for hypertension was associated with slower BMI growth, regardless of whether they were also depressed.

Implications for Policy, Delivery, or Practice: Obesity and hypertension (and we suspect depression) are often under-recorded. Having multiple conditions, however, appears to lead to more accurate recording of diagnoses, independent of the number of visits. BMI trajectories over time are affected by the constellation of co-morbidities and associated treatments. The EHR is valuable for MCC research because it captures both what is recorded as a diagnosis on a bill and on problem list which can be more than what is in Medicare claims. Collecting patient-reported mental health data in EHR will make it even more powerful.

Funding Source(s): AHRQ

Are Caregivers in Poor Health Able to Effectively Facilitate Access to Preventive Care in Dependent Older Adults?

Joshua Thorpe, University of Pittsburgh School of Pharmacy; Carolyn Thorpe, University of Pittsburgh School of Pharmacy; Richard Schulz, University of Pittsburgh Center for Social and Urban Research

Research Objective: Effective caregiving for a dependent older adult with complex medical needs is challenging. Dependent older adults often have extensive disease-specific and preventive care needs. Therefore, one of the greatest caregiving challenges is coordinating patient care and facilitating access to health
services. The burden of these responsibilities takes a toll on caregiver health, and many caregivers juggle their own complex medical needs alongside those of the patient. However, very little is known about how caregiver health impacts their ability to obtain recommended health services for their care-recipient. The purpose of this study was to examine the relationship between informal caregiver physical and mental health and receipt of recommended preventive care in dependent older adults.

**Study Design:** We pooled data from the 2000-2008 Medical Expenditure Panel Survey (MEPS), a nationally representative survey of non-institutionalized US households, to identify care-recipient/caregiver dyads. Older care-recipients were identified as respondents aged 65+ receiving IADL or ADL help who remained in the community for the entire year. Primary informal caregivers were identified as per two criteria: 1) resides in a household with an identified care-recipient, and 2) self-identified as the most knowledgeable of the health of all household members and therefore served as the MEPS household respondent. Sensitivity analyses were conducted using more restrictive definitions of primary caregiver status (e.g., restricting to households with only 2 members: care-recipient and MEPS household respondent) and results were robust. We examined a range of dichotomous indicators of preventive service use as dependent variables (flu shot; blood pressure check; cholesterol check; colon and breast cancer screening; dental examination). Key caregiver health variables included number of chronic conditions; SF-12 physical health; SF-12 mental health; and caregiver self-reported memory problems. All models were adjusted for patient predisposing, enabling, and medical need variables. Survey-weighted logistic regression models were used to examine the relationship between caregiver health variables and care-recipient receipt of preventive care.

**Population Studied:** U.S. civilian non-institutionalized older adults receiving ADL/IADL assistance and their co-residing informal caregiver.

**Principal Findings:** The sample included 1,491 care-recipient/caregiver dyads, representing nationally an average of 4.47 million dyads in the community per year. According to nested likelihood ratio testing, caregiver health variables were jointly significant predictors in all models of care-recipient preventive use. Adjusting for all care-recipient variables, poorer caregiver mental health was associated with a decreased likelihood of 3 of 6 preventive services (blood pressure, mammogram, dental exam), and poorer physical health was associated with 4 of 6 (blood pressure, flu shot, colon cancer, dental exam). The relationship between caregiver number of chronic conditions and preventive service use was complex and non-linear. Having a caregiver with no conditions (compared to only 1 condition), or with multiple conditions, were risk factors for non-receipt of several preventive services.

**Conclusions:** Informal caregivers burdened by their own impairments and complex health issues may face challenges in facilitating access to preventive care in dependent older adults.

**Implications for Policy, Delivery, or Practice:** Results from this study suggest that policies and interventions designed to support the health of informal caregivers are critical to the success of community-based models of care and older adult’s ability to age in place.

**Funding Source(s):** No Funding

**Poster Session and Number:** B, #656

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**Preventable Hospitalizations in Patients with Diabetes and Chronic Kidney Disease**

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**Presenter:** Chin-Lin Tseng, Dr.P.H., Health Research Scientist/Assistant Professor, Center for Healthcare Knowledge Management/Departernent, Center for Healthcare Knowledge Management, chin-lin.tseng@va.gov

**Research Objective:** Preventable hospitalizations (PHs) can be prevented by timely and effective ambulatory care. This study aimed to assess rates of PHs in patients with diabetes and chronic kidney disease (DM-CKD). The PHs included nine Agency for Health Research and Quality Prevention Quality Indicators and three additional ones relevant to this population.

**Study Design:** Serial cross-sectional cohort study. We used both VHA and Medicare data files to calculate annual age- and sex-standardized rates of the 12 PHs (in per 1,000)
and derived percent of five-year rate change. The standard population used for age and sex adjustment was the first cross-sectional cohort (fiscal year (FY) 2000).

Population Studied: We assembled serial cross-sectional cohorts of veterans who received health care in the Veterans Health Administration (VHA) system and had DM-CKD in FYs 2000-2004.

Principal Findings: The study cohort increased from 155,081 in FY2000 to 255,638 in FY2004. They were 67.5±10.1 years old in FY2000 to 68.3±10.0 in FY2004, mostly men (97.4%-97.6%) and Whites (80.7%-83.5%); 31.8%-32.9% had stage 3-5 CKD. Overall, the rate of any PH was 103.1 in FY2000 and 73.7 in FY2004, a 28.5% decrease. Consistently over the years, hear failure (35.5-23.3 per 1,000 in FYs 2000-2004) and acute kidney disease (AKI; 32.6-25.3) were the top 2 PHs; lower extremity ulcers (1.0-0.6) and hypertension (1.7-1.3) were the lowest two. By category, the PH rates from high to low were cardiovascular (hypertension, heart failure, angina without procedure; 43.7-27.1 in FYs 2000-2004), AKI (32.6-25.3), infections (pneumonia, urinary tract infection; 20.3-15.8), metabolic decompensation (short term, uncontrolled diabetes, dehydration, hypoglycemia; 13.7-9.5), and lower extremity (amputations, ulcers; 6.1-3.3). For individual PH and PHs by category, there were downward trends of various degrees. Individually, the rate decrease ranged between 18.9% (pneumonia) and 62.3% (Angina without procedure). By category, decrease in rates from low to high were infections (22.1%), AKI (22.2%), metabolic decompensation (30.7%), cardiovascular (38.0%), and lower extremity (46.3%).

Conclusions: After adjusting for age and sex, there were 103.1 in FY2000 and 73.7 in FY2004 per 1,000 VHA veterans with DM-CKD who had any PH; the rate decreased 28.5% over the five years. Heart failure and AKI had the highest rates, and lower extremity ulcers and hypertension had the lowest ones. There seems to be consistent downward trends (of various degrees) in PHs in VHA patients with DM-CKD; the decrease in the PH rate ranged from 18.9% in pneumonia to 62.3% in Angina without procedure.

Implications for Policy, Delivery, or Practice: It is important to further evaluate changes in patient mixes as well ambulatory care over the years and their association with the rates of PHs to facilitate efforts in improving quality of care among this group of patients with complex chronic conditions.

Funding Source(s): VA

Poster Session and Number: B, #657

Drug Overdose in a National Cohort on Opioid Analgesics: Effect of Depression, Antidepressants and Benzodiazepines

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Research Objective: In a national cohort of patients with chronic non-cancer pain (CNCP), we examined associations with risk of drug overdose for opioid analgesic (OA) prescriptions (RXes) risk defined by dose and duration, benzodiazepine and anti-depressant Rxes.

Study Design: In this retrospective cohort study of Aetna’s national health maintenance organization (approximately 2.1 million enrollees annually), we identified 279,049 persons aged 18 to 64, enrolled >1 year from 1/2009 to 7/2012 who filled 2 or more RXes for non-injectable Schedule II or III OAs. In this group, exclusions (N=57,986) included: cancer diagnosis (not basal cell) within 6 months of an OA Rx, methadone or buprenorphine-naloxone for opioid dependence, and incomplete diagnostic or demographic data. Claims and enrollment data included: demographics (age, gender, US region), inpatient and outpatient encounters, ICD-9-CM diagnosis codes, and filled RXes for OAs, benzodiazepines, and anti-depressants. We created indicators from ICD-9 codes for 5 types of CNCP, depression, and anxiety disorder. For each 6-month interval from first OA Rx until last enrollment date or July 2012, we
defined 4 OA risk categories: NO risk (0 days), LOW risk (1-60d at <40 morphine equivalent daily dose in mg [MED]), MEDIUM risk (1-60d at 40-99 MED or >61d at <40 MED), HIGH risk (>100 MED or >60d at 40-99 MED). We also examined duration of benzodiazepine and antidepressant therapy. Our outcome was any encounter with the diagnosis of drug overdose within each 6-month interval. Using repeated measures logistic regression, we examined the adjusted association of OA risk with the outcome, adjusting for demographic and clinical variables as well as interactions of OA risk with benzodiazepines, antidepressants, anxiety, and depression.

**Population Studied:** The cohort of 221,063 privately insured persons aged 18 to 64 with at least 2 OA Rxes for CNCP was followed for 881,555 6-month intervals.

**Principal Findings:** The cohort is 57% female, median age 45 (IQR: 35-54) and residing in the South (47%), West (18%), Midwest (6%) and Northeast (29%). One or more overdose events occurred in 1469 6-month intervals. After adjustment, only patients with HIGH OA risk had higher (p=0.003) odds of drug overdose versus NO OA (adjusted odds ratio [OR]=1.28, 95% CI 1.09 to1.50). Duration of benzodiazepine therapy (days) was positively associated with overdose versus none: [1-30d: OR=1.72 (CI 1.44-2.05); 31-90d: OR=2.23 (CI 1.88-2.64); 91-180d: OR=2.65 (CI: 2.27-3.09)]. The ORs for overdose were also higher for persons on short-term (1-60d) antidepressants versus longer-term (61-180d) [OR=1.23; (CI 1.04-1.45); p=0.017] and versus no antidepressants [OR=1.69; (CI 1.44-1.98); p<0.001]. The only significant interaction was for depression diagnosis and antidepressants which showed a markedly increased odds of overdose for depression & 1-60d antidepressants versus no depression & no antidepressants [OR=18.32, (CI 14.93-22.47), p<0.001].

**Conclusions:** High dose OAs significantly increase the risk of drug overdose among persons with CNCP but the highest risk is for longer benzodiazepine use and depressed persons initiating antidepressant therapy.

**Implications for Policy, Delivery, or Practice:** Policies and clinical programs are needed to address the risks of drug overdose in persons with CNCP treated with OAs using benzodiazepines or initiating drug treatment for depression.

**Funding Source(s):** NIH

**Poster Session and Number:** B, #658

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**Reliance, Continuity, and Quality of Primary Care in VA and Medicare Programs**

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**Presenter:** Virginia Wang, Ph.D., M.S.P.H., Investigator, Center for Health Services Research in Primary Care, Durham VA Medical Center, virginia.wang@duke.edu

**Research Objective:** Continuity of care is considered a critical characteristic of high-performing health systems, because receiving care from a single provider has been strongly associated with better care experiences, fewer emergency room visits and fewer hospitalizations. Most prior studies have examined continuity of care within a single health care system. Patients who have access to and obtain services in multiple health care systems, such as Medicare-eligible veterans enrolled in the VA Health Administration, may experience care discontinuity and undermine quality of care. The objective of this study was to examine whether quality of diabetes care was associated with continuity of care or veterans’ VA reliance for primary care.

**Study Design:** Retrospective cohort study of Medicare-eligible veterans enrolled in the VA with diabetes in 2001-2004. Using VA administrative and Medicare claims data, we examined under-provision, guideline-concordant provision, and over-provision of HbA1c testing, microalbumin testing and eye exams using ordered logistic regressions. We tested the predictive power of continuity of primary care provider (i.e., Modified Modified Continuity Index) and VA reliance for primary care (i.e., VA-only, Medicare-only, or Dual-system use), controlling for patient characteristics and time.

**Population Studied:** 1,867 Medicare-eligible veterans with diabetes.

**Principal Findings:** In 2001-2004, over half of these veterans with diabetes received primary care from a single provider (i.e., Modified Modified Continuity Index). VA reliance was strongly associated with better care experiences, fewer hospitalizations, and lower odds of diabetes-related hospitalization. The predictive power of continuity of care was modest but significant. The predictive power of VA reliance was stronger and significant for guideline-concordant provision of diabetes care, and modest but significant for under-provision of diabetes care and over-provision of HbA1c testing.
care in VA-only, approximately 25% sought primary care in Dual settings, and fewer received primary care in Medicare-only. Continuity of care was higher for Medicare-only users, VA-only users next, and lowest among Dual-system users. Under-provision of quality of diabetes care was common and over-provision was rare. Veterans who only obtained primary care in VA had higher rates of guideline-appropriate care than Medicare-reliant veterans or dual users. In adjusted analyses, veterans who relied only on Medicare for primary care were less likely to be over-tested for HbA1c and microalbumin (p<0.001) than veterans who relied only on VA for primary care. Dual users of VA and Medicare primary care were significantly more likely to be under-provided or over-provided HbA1c testing (p<0.001), microalbumin testing (p<0.001) and eye exams (p<0.05) than VA only users. Continuity of care was not associated with any diabetes quality of care metrics.

Conclusions: VA reliance was a stronger predictor of three diabetes quality processes for Medicare-eligible veterans in 2001-2004 than continuity of primary care.

Implications for Policy, Delivery, or Practice: The higher rates of guideline-appropriate care among veterans who only used VA primary care may be due in part to informational continuity that implicitly comes with the VA’s longstanding availability of a nationally accessible electronic health record (EHRs) that offsets discontinuity of provider care when veterans see different providers within the VA system. Wider adoption of EHRs should improve informational continuity within health systems to enable quality improvements that VA has realized through effective leveraging of EHR data.

Funding Source(s): VA

Poster Session and Number: B, #659

In the Presence of a Mental Health Comorbidity, What Predicts Guideline Adherence for a Chronic Condition (Type 2 Diabetes)?
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Presenter: Lisa Welch, Ph.D., Director, Center for Qualitative Research, New England Research Institutes, lwelch@neriscience.com

Research Objective: Evidence-based guidelines are often considered the standard for facilitating and assessing clinical care. Most guidelines are constructed for individual illnesses, but patients often present with multiple comorbidities. Little is known about how the presence of comorbidities affects guideline adherence. This study examines the predictors of guideline adherence for type 2 diabetes in the presence of a mental health comorbidity.

Study Design: A randomized balanced factorial experiment was conducted with physicians who observed video vignettes of an established patient presenting with type 2 diabetes with worsening glycemic control, weight gain, and elevated blood pressure. Vignette patients were systematically varied by age, gender, race, and comorbidity type (depression, schizophrenia with normal affect [SNA] or bizarre affect [SBA], and eczema as control). Verbal presentation was standardized. After viewing the vignette, respondents took part in a structured interview about clinical management, attitudes toward the patient, practice culture, disease management tool use, and professional satisfaction. The outcome (higher/lower adherence to diabetes guidelines) was scored on a 0-100 scale summing whether respondents would attend to constructs of published diabetes guidelines: diabetes treatment (glycemic control, self-management, psychosocial care); prevention/management of diabetes complications (cardiovascular disease, nephropathy, retinopathy, foot care/neuropathy); and additional physical and laboratory evaluations for comprehensive diabetes evaluation. A multivariate ANCOVA model with backwards elimination tested for significance of predictors and meaningful interactions with comorbidity, with control for potential confounders.

Population Studied: 256 primary care physicians

Principal Findings: The average level of guideline adherence was 43.6 (range: 3.0-92.5). Guideline adherence was significantly higher among physicians who reported using more disease management tools (p=.009) and general use of guidelines in their practice (44.9 vs. 36.5; p=.048). Compared to patients with eczema, guideline adherence was only 2.1 points higher for patients with depression (95%CI: -9.6,13.9)
but lower for patients with SNA (-4.0; 95%CI: -16.6,8.6) or SBA (-4.5; 95%CI: -16.3,7.4).

Further, for patients with SBA, physicians ranking schizophrenia higher than diabetes on their problem list exhibited somewhat lower adherence to diabetes guidelines compared to those ranking diabetes higher (-10.6; 95%CI: -18.9,-2.3); for patients with SNA, the trend was the same. Though physician view of patients' ability to self-manage health explained some of the difference in adherence among comorbidities (p=.02), the effect of comorbidity remained significant (p=.008). Professional satisfaction was not significantly associated with guideline adherence.

**Conclusions:** On average, respondents reported low adherence to diabetes guidelines in the presence of a comorbidity (mental health or eczema). That some physicians scored above 90 supports that the outcome variable captured relevant clinical actions, suggesting that low average adherence may reflect substantial clinical inertia. The finding of slightly lower guideline adherence in the presence of comorbid schizophrenia is consistent with literature showing that patients with serious mental illness risk lower quality of care and higher mortality from diabetes.

**Implications for Policy, Delivery, or Practice:**
Results identify two practice patterns—using more disease management tools and general use of guidelines in clinical practice—that support guideline adherence for patients with diabetes, providing actionable strategies that healthcare organizations and policymakers can target to enhance guideline implementation.

**Funding Source(s):** NIH

**Poster Session and Number:** B, #660

**Physician Styles of Clinical Management for a Chronic Condition (Type 2 Diabetes)**
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**Presenter:** Lisa Welch, Ph.D., Director, Center for Qualitative Research, New England Research Institutes, lwelch@neriscience.com

**Research Objective:** Substantial research shows that variation in physician decision making contributes to healthcare disparities. Although several nonmedical factors (e.g., patient, physician, organizational characteristics) are known to affect physicians’ decisions, little is known about whether there are general styles of decision making (vs. singular clinical actions) or whether such styles may be applied differently depending on patient comorbidities. This study examines clusters of physician decision making styles for type 2 diabetes, overall and in the presence of a mental health comorbidity.

**Study Design:** A randomized balanced factorial experiment was conducted with physicians who observed video vignettes of an existing patient presenting with type 2 diabetes with worsening glycemic control, weight gain, and elevated blood pressure. Vignette patients were systematically varied by age, sex, race, and comorbidity type (depression, schizophrenia with normal affect [SNA] or bizarre affect [SBA], and eczema as control). Verbal presentation was standardized. Physician respondents were balanced by gender and more/less clinical experience (<=10 or >=21 years). After viewing the vignette, respondents took part in a structured interview about clinical management. Cluster analysis was performed using standardized residuals after accounting for any predicted differences based on the patient/physician characteristics in the study design.

**Population Studied:** 256 primary care physicians

**Principal Findings:** We identified three clusters depicting unique styles of diabetes management that were robust to controls for physician (gender and level of experience) and patient characteristics (age, sex, race, and comorbidity type). Compared to “middle of the road” physicians (N=84) in cluster 1, physicians in cluster 2 “interventionists” (N=88) were more likely to prescribe medications (e.g., antihyperglycemic, antihypertensive) or suggest referrals (e.g., nutritionist, ophthalmology). Physicians in cluster 3 “minimalists” (N=84) were less likely to perform exams (e.g., abdominal, head, neck, skin) or tests (e.g., chem. panel, liver function). A second cluster analysis was performed, without control for comorbidities. This analysis revealed a trend towards variation in the distribution of physician styles among clusters by comorbidity (p=0.13, chi-square test), with a significant difference in the distribution for those physicians who ranked schizophrenia higher on their problem list compared to diabetes (p=0.002, Fisher exact test). In this analysis, physicians ranking schizophrenia as the bigger problem were over-represented among the “minimalists” of diabetes care.
Hypertension is not well understood. We performed a study to determine the association between BMI category and overall mortality in hypertensive patients.

**Study Design:** We conducted a retrospective cohort study of patients in The Health Improvement Network (THIN) database to determine mortality risk for hypertensive patients in each BMI category. Hypertension was defined as the presence of a hypertension-related diagnosis code in the medical record. BMI was calculated from the first height and weight data recorded. A Cox proportional hazards survival model was used to account for confounders and censored data. The analysis was adjusted for age, sex, past history of diabetes or cardiovascular disease, smoking status, patient adherence to anti-hypertensive medications, socioeconomic status and other comorbidities as represented by the Charlson Comorbidity Index.

**Population Studied:** We identified 394,194 adult patients with previously diagnosed hypertension, recorded BMI data and follow-up of at least 1 year from the THIN database. Mean patient age was 57.3 years, and 52.9% of patients were female. Among all patients, 4,796 had BMI less than 18.5; 121,596 had BMI between 18.5 and 25; 160,610 had BMI between 25-30; 73,016 had BMI between 30-35; 34,176 had BMI greater than 35. Preexisting cardiovascular history (myocardial infarction, peripheral vascular disease, cerebrovascular accident, congestive heart failure or peripheral vascular disease) was present in 10.2% of patients.

**Principal Findings:** Compared to patients with BMI 18.5-25, having a BMI of 25-30 was associated with lower overall mortality risk (hazard ratio 0.90, p < 0.0001). Grade 1 obesity (BMI 30-35) was associated with a slight increase in mortality (hazard ratio 1.06, p = 0.0006). Increased mortality was associated with having a BMI less than 18.5 (hazard ratio 2.03, p < 0.0001) or greater than 35 (hazard ratio 1.38, p < 0.0001).

In subgroup analysis, being overweight was associated with lower mortality in smokers (hazard ratio 0.86, p < 0.0001) but not non-smokers (hazard ratio 0.97, p = 0.13).

**Conclusions:** In hypertensive patients, being overweight by BMI did not predict increased mortality. Grade 1 and higher obesity was associated with increased mortality, with greater risk at higher BMI categories. The protective
Effect of overweight BMI was present in smokers but not non-smokers.

**Implications for Policy, Delivery, or Practice:**
In clinical practice, it is common for providers to base recommendations for weight loss on elevated BMI. In the absence of additional clinical markers of metabolic mortality risk, an overweight BMI alone should not be used to guide weight loss recommendations in hypertensive patients, especially for patients with a history of smoking.

**Funding Source(s):** Other, Harvard Medical School Center for Primary Care

**Poster Session and Number:** B, #662

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**Systolic Blood Pressure Targets and Cardiovascular Morbidity and Mortality in Patients with Hypertension**

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**Presenter:** Wenxin Xu, B.A., Medical Student, Harvard Medical School, wenxin_xu@hms.harvard.edu

**Research Objective:** Hypertension is the most common risk factor for cardiovascular events worldwide. Current guidelines recommend treating blood pressure to a goal of less than 140/90 mm Hg, but evidence that treating mild systolic hypertension improves outcomes is limited. We sought to determine the association between systolic hypertension treatment goals and cardiovascular risk.

**Study Design:** We performed a retrospective cohort study of patients in The Health Improvement Network (THIN) database to determine patient outcomes at various systolic blood pressure (SBP) treatment targets. Hypertension was defined as the presence of a hypertension-related diagnosis code in the medical record. SBP target was defined as the lowest blood pressure category at which anti-hypertensive medications were intensified. The primary composite outcome was defined as death or acute cardiovascular event (myocardial infarction, stroke, congestive heart failure, or peripheral vascular disease). Death from all causes and stroke served as secondary outcomes. A Cox proportional hazards survival model was used to assess time to outcome while adjusting for age, sex, baseline blood pressure, past history of diabetes or cardiovascular disease, smoking status, patient adherence to anti-hypertensive medications (as measured by medication possession ratio), socioeconomic status and other comorbidities as represented by the Charlson Comorbidity Index.

**Population Studied:** We identified 392,669 adult patients with previously diagnosed hypertension. Mean patient age was 57.3 years, and 53.0 percent of patients were female. Median follow-up time was 125 months; 15.3 percent of patients died or had an acute cardiovascular event during the follow-up period. Preexisting cardiovascular history (myocardial infarction, peripheral vascular disease, cerebrovascular accident, congestive heart failure or peripheral vascular disease) was present in 10.2 percent of patients.

**Principal Findings:** Compared to a SBP target of 140 mmHg or less, a SBP target of 130 mmHg or less was associated with increased risk of acute cardiovascular event or death (hazard ratio 1.09, p < 0.0001). SBP targets of 150 mmHg (hazard ratio 1.08, p < 0.0001) or greater were also associated with increased risk. In secondary analyses, a SBP target of 140 mmHg or less was associated with lower all-cause mortality compared to targets of 130 mmHg (hazard ratio 1.06, p = 0.0009) or 150 mmHg (hazard ratio 1.07, p = 0.0002). There was no significant difference in stroke risk between SBP treatment targets of 130 versus 140 mmHg (p = 0.28), though both strategies were superior to a target of 150 mmHg (hazard ratio 1.08, p = 0.0002). In all analyses, SBP targets above 160 mmHg were associated with further increased risk of both the composite and secondary outcomes.

**Conclusions:** Compared to the strategy of intensifying anti-hypertensive therapy when systolic blood pressure is greater than 140 mmHg, both higher and lower blood pressure targets were associated with increased cardiovascular morbidity and mortality.

**Implications for Policy, Delivery, or Practice:**
In patients with hypertension, both excessively high and low SBP targets were associated with increased cardiovascular events and death. A SBP target of 140 mm Hg may represent the best balance between the risks of overtreatment and undertreatment for hypertension.

**Funding Source(s):** Other, Harvard Medical School Center for Primary Care

**Poster Session and Number:** B, #663
CONSUMER CHOICE AND BEHAVIOR

A Randomized Controlled Trial of Implementation Strategies for PSA Screening Decision Support Interventions Comparing Men Turning 50 versus Men Over 50

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Presenter: Jared Adams, M.D., Ph.D., Health Policy Fellow, Health Services Research, Palo Alto Medical Foundation Research Institute, Palo Alto, CA; UCSF Philip R. Lee Institute for Health Policy Studies, San Francisco, CA, impmsgs@netscape.net

Research Objective: Men turning 50 are faced with the choice to be screened for prostate cancer for the first time. We hypothesized that men turning 50 would be more likely to review a decision support intervention (DESI) about PSA screening than men over 50 and subsequently less likely to undergo screening.

Study Design: A random sample of men turning 50 and another cohort ages 50 to 75 with no screening in the past year from electronic medical records (EMR). We randomized patients into 4 arms: (1) mailed Informed Medical Decisions Foundation PSA-DESI, (2) invitation to a shared medical appointment (SMA) to watch and discuss the PSA-DESI, (3) both mailed DESI and invitation to a SMA (DVD+SMA), and (4) a control group. Four months after randomization, a survey was administered and EMR reviewed.

Population Studied: Men eligible for PSA prostate cancer screening at a large multispecialty group practice.

Principal Findings: A total of 811 (of 1448; 56%) men turning 50 and 958 (of 1578; 60.7%) men aged 51 to 75 (mean age 59±6) completed the questionnaire. Eighty percent of men over 50 had a prior PSA test. Contact with PCPs was similar in the four month follow up period (30% and 33%; p=.08). but men turning 50 were more likely to discuss PSA screening with their physicians (55.2% vs. 44.6%; p=.01); and were less likely to get a PSA test (9.9% vs. 19.3%; p<.0001). Overall DESI uptake was lower in men turning 50 (9.5% vs. 13.3%; p=.03). Methods of DESI implementation did not produce significant differences in PSA test rates (9.1% in arm 1, 6.5% in arm 2, 8.1% in arm 3, and 5.9% in the control arm; p=.65). In regression models, only prior PSA testing (OR 3.1, 95%CI 1.6—5.9) predicted likelihood of PSA testing.

Conclusions: In this large scale randomized controlled trial of real world PSA decision support effectiveness, PSA screening did not differ by implementation strategy. Men turning 50 were more likely to discuss PSA testing with their doctor, but less likely to choose to be screened. Higher PSA screening rates in men with a prior history of testing may represent resistance to change in cancer screening habits.

Implications for Policy, Delivery, or Practice: These findings highlight the importance of facilitating informed decision making at the onset of screening eligibility, or before cancer screening is considered for the first time.

Funding Source(s): NIH

Poster Session and Number: C, #960

The Impact of Retail Clinics on Total Outpatient Care

Scott Ashwood, RAND; Ateev Mehrotra, University of Pittsburgh and RAND; Martin Gaynor, Carnegie Mellon University; Amelia Haviland, Carnegie Mellon University; Claude M. Setodji, RAND

Presenter: Scott Ashwood, M.A., Ph.d. Candidate, Public Policy, RAND, ashwood@rand.org

Research Objective: Retail clinics are a new model for delivering outpatient care and have
been touted as a mechanism to decrease spending. Prior work has shown that two-thirds of visits to retail clinics are new visits rather than substitution for physician office and ED visits and therefore drive increases in acute care costs. However, this work could be criticized, because total utilization of outpatient care could still be lower for retail clinic users, because they might use the physician less frequently for chronic illness and preventive care. In this study we assess this question and look at the impact of retail clinics on utilization of all outpatient care.

**Study Design:** We used commercial claims and enrollment data covering 2005-2009 to compare patterns of utilization for retail clinic users and non-users in 22 markets around the United States. We used propensity score matching to identify a comparison cohort of enrollees that were similar to retail clinic users and used a differences-in-differences model structure to compare changes in levels of utilization in the year before and after a retail clinic visit. In addition to total outpatient utilization we compared levels by setting and by type. We estimated an average effect for the entire study population as well as for important sub-populations, like new health care users.

**Population Studied:** Our sample includes all enrollees who visit a retail clinic 2007-2009 in the 22 study cities (n=367,448) as well as a random sample of the remaining enrollees (n=1,010,910). We restrict our study population to enrollees aged <65 and who live within 20 miles of a retail clinic.

**Principal Findings:** We find that visiting a retail clinic is associated with an increase in the following year of 18.2% in total outpatient visits per person, an increase of 20.0% in preventive care visits, and an increase of 25.7% in simple acute care visits. We see the same impact for most of the sub-populations we examined.

**Conclusions:** In our population, retail clinic visits are associated with an increase in all types of utilization, including preventive care and chronic illness care. These effects are consistent across most of the sub-populations we examined.

**Implications for Policy, Delivery, or Practice:** Visiting retail clinics is associated with increases in acute care utilization and total outpatient utilization. The increase in preventive care may be a positive impact, but the results do not support the idea that retail clinics can decrease spending.

**Funding Source(s):** RWJF

**Poster Session and Number:** C, #961

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**From the Closest Observers of Patient Care: Consumer Understandings of Hospital Quality**

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**Presenter:** Naomi Bardach, M.D., M.A.S., Assistant Professor, General Pediatrics, University of California, San Francisco, bardachn@peds.ucsf.edu

**Research Objective:** With the inclusion of patient experience measures in the Centers for Medicare and Medicaid value-based purchasing program, patient experiences have become a focus of national attention. In addition, recent work has shown that online hospital patient experience ratings are associated with patient outcomes including mortality and readmissions. Our objective was to analyze online hospital reviews to assess the extent to which they reflect nationally accepted conceptual frameworks for quality and delineate additional domains of quality that may explain the association with patient outcomes.

**Study Design:** Narrative reviews came from Yelp.com, the only publicly available website with multiple hospitals with multiple reviews. 100 comments, sorted by date, were sampled in February 2012 from online publicly available reviews on hospital quality, stratified by region according to proportion of the 2010-2011 census population in that region. We used thematic qualitative analysis, deductively coding the Institute of Medicine (IOM) quality domains and the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) domains, and inductively coding new themes. The review was the unit of analysis. We assessed the frequency of each IOM and HCAHPS domain and we described new themes qualitatively.

**Population Studied:** Narrative reviews from inpatients or friends or family members of inpatients were included (n=48). Reviews that were less than a full sentence and reviews from hospital employees were excluded. In order to code for the HCAHPS domains, reviews of
outpatient services or the emergency department were excluded.

**Principal Findings:** We found that the IOM domains most commonly noted in reviews were patient-centeredness (n= 45, 93.8%), effectiveness (54.2%), and timeliness (33.3%). Few reviews noted the HCAHPS domains of explanation of medications (14.6%) and discharge instructions (4.2%). Additional themes included: medical teamwork and coordination between providers; the out of pocket costs of care; poor experiences with billing departments; hospital reputation; and the interplay between a patient’s expectations and their experience of care.

**Conclusions:** Patients and friends and family members observing hospital medical care value some aspects of care known to be important, such as efficacy and timeliness of care. Reviewers also note additional elements that are potentially modifiable for the hospital, such as billing department communications, and potentially important to patient outcomes, such as care coordination.

**Implications for Policy, Delivery, or Practice:** Unstructured patient observations may be a valuable source of actionable feedback. It may be important to track whether consumer definitions of quality evolve over time with ACA implementation and the resulting cost and quality transparency.

**Funding Source(s):** NIH

**Posters Session and Number:** C, #962

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**Regional Variations in Awareness of Quality Reports among People with Chronic Conditions**

Dennis Scanlon, Penn State University; Neeraj Bhandari, Penn State; Yunfeng Shi, Penn State University; Neeraj Bhandari, Penn State University

**Presenter:** Neeraj Bhandari, Phd Student, health policy and administration, Penn State, nwb5090@psu.edu

**Research Objective:** Recent years have seen the emergence of performance measurement and public reporting of quality of health care as a major reform strategy for improving health care. Very little empirical information on regional variation in awareness of comparative quality information (CQI) exists. The aim of this study is to examine regional variation in awareness of CQI for doctors, hospitals and health plans among the fourteen market sites that are part of the Aligning Forces for Quality (AF4Q) Project, a national level community-based multi-stakeholder health improvement collaborative. A further aim is to compare regional incidence of awareness with regional availability of CQI that has been publicly reported by state, local and national entities.

**Study Design:** We conducted a descriptive analysis of the data from two rounds of consumer survey of chronically ill consumers residing in one of the 14 AF4Q communities. We derived population weighted estimates of prevalence of awareness of CQI on doctors, hospitals and health plans by region and time period, along with estimates of change in awareness of CQI for individuals from across the two time periods, 2007-2008 and 2011-12. We calculated Pearson correlation coefficients between change in regional awareness and change in regional availability of CQI on doctors, hospitals and for selected chronic conditions.

**Population Studied:** Adults with one or more of five chronic conditions (diabetes, heart disease, hypertension, asthma, and depression) who reside in one of the 14 AF4Q communities.

**Principal Findings:** The percentage of overall population residing in the fourteen regional markets (all-site population) that was aware of any CQI was 45.6% in 2007-08 and 48.2% in 2011-12, yielding an increase in awareness of CQI of 2.6% over nearly four years. During the same time period, among the all-site population, awareness of CQI on doctors increased by 3.39% (12.7% in 2007-08 to 16.1% in 2011-12), of CQI on hospitals increased by 1.13% (25.3% in 2007-08 to 26.4% in 2011-12), and of CQI on health plans increased by 2.3% (27.2% in 2007-08 to 29.5% in 2011-12). We found a significant negative correlation between change in percentage of site population aware of a physician quality report and changes in availability of ambulatory patient experience report (-0.39) and publicly available physician quality report (-0.38). On the other hand, change in percentage of site population aware of any quality report was positively correlated with change in availability of quality reports with diabetes measures (0.42) but was not correlated with change in availability of reports with depression measures (-0.02).

**Conclusions:** Although there is some variability in regional awareness patterns for CQI across regions represented by AF4Q alliances, the increases in awareness of CQI among chronic disease patients from 2007-08 to 2011-12 have
been modest and lag behind relative availability of CQI.  

Implications for Policy, Delivery, or Practice:  
Our study provides some of the first empirical analyses on regional patterns and the change of awareness of CQI among a key target group for public reporting initiatives i.e. consumers with chronic conditions, over a period of time marked by intensifying national and regional public reporting efforts. Our findings suggest a need for more intensive focus on promoting awareness of CQI among consumers in order to fully realize health policy goals linked to public reporting.  

Funding Source(s): Other, University Intramural Grant  

Poster Session and Number: C, #963  

Nonurgent Utilization of Emergency Room Services in California  
Brian Chen, University of South Carolina  

Presenter: Brian Chen, Assistant Professor, University of South Carolina, bchen@mailbox.sc.edu  

Research Objective: To evaluate the prevalence, socioeconomic, and behavioral determinants of utilization of emergency department services for non-urgent medical conditions in California, 2005-2011, with an emphasis on the geographical distances between the patients’ zip code of residence, the Emergency Department visited, and the closest Federally Qualified Health Centers for the underserved populations.  

Study Design: Retrospective secondary data analysis using ordinary least squares and probit models, using data from the California Office of Statewide Health Planning and Development on all emergency department visits, 2005-2011.  

Population Studied: All emergency room visits in California, 2005-2011  

Principal Findings: Almost 30% of all ED visits are classified as “non-urgent” according to the NYU ED algorithm. Even among patients eligible to receive care at Federally Qualified Health Centers (FQHCs), non-urgent ED utilization was frequent despite the geographical proximity of a FQHC.  

Conclusions: Nonurgent utilization of ED services is rampant, even when alternative and more cost-effective methods of care are available. This presents a significant waste of scarce health care resources.  

Implications for Policy, Delivery, or Practice:  
Better promotion of the availability of health care resources, as well as a triage and referral system among the most overcrowded emergency departments may be warranted.  

Funding Source(s): Other, University Intramural Grant  

Poster Session and Number: C, #964  

The Impact of High-Deductible Health Plans on Emergency Department Use and Subsequent Hospitalizations among Patients with and without Mental Illness  
Chia-hung Chou, University of Chicago; Christine Y. Lu, Harvard Medical School and Harvard Pilgrim Health Care Institute; Dennis Ross-Degnan, Harvard Medical School and Harvard Pilgrim Health Care Institute; Stephen B. Soumerai, Harvard Medical School and Harvard Pilgrim Health Care Institute; J. Frank Wharam, Harvard Medical School and Harvard Pilgrim Health Care Institute  

Presenter: Chia-hung Chou, Ph.D., Research Associate (Assistant Professor), Medicine, University of Chicago, chchou@uchicago.edu  

Research Objective: High-deductible health plans (HDHPs) have become increasingly popular in healthcare systems as a means to contain rising health care costs. Studies have shown that patients switching to HDHPs were less likely to go to the emergency department (ED) than those remaining in traditional plans (HMOs). The avoidance of needed care due to increased out-of-pocket costs can be particularly harmful for patients with mental illness. Our objective was to assess the effect of HDHP membership on ED visits and subsequent hospitalizations among patients with and without mental illness.  

Study Design: We analyzed Harvard Pilgrim Health Care administrative claims and membership data from 2001 to 2008. Using a pre-post with comparison group design and difference-in-difference models, we retrospectively evaluated the effect of HDHPs on ED visits and hospitalizations among patients age 18 to 64 with and without mental illness. ED visits were classified as low, indeterminate, or high severity. We examined changes in rates of ED visits and hospitalizations among members who experienced an employer-mandated switch to an HDHP relative to control group members who remained in HMOs. The index date in our pre-post analyses was the date on which a member was switched to a HDHP.  

Population Studied: The HDHP study group comprised members whose employers switched
them to an HDHP. The control group included members whose employers offered only traditional plans. Mental health patients were identified by specified ICD 9 codes and prescriptions records. The mental health and non-mental health cohorts were propensity-score-matched separately using caliper matching without replacement. On average, 3.2 concurrently enrolled control group members were matched to each HDHP member. The final study cohorts consisted of 12,497 HDHP members (including 2,747 members with mental illness), and 37,611 control group members (including 8,659 members with mental illness).

**Principal Findings:** The HDHP and control groups were closely balanced on observed characteristics, including age, gender, health status, employer size, and comorbidities. HDHP members with mental illness experienced relative declines in ED visits (-5%) and hospitalizations (-9%) compared to controls following transition to HDHPs, but these differences were not statistically significant. In contrast, ED visits and hospitalizations declined by 18% and 24% respectively among HDHP members without mental illness compared to controls (95% confidence interval -25% to -11%; and -35% to -11% respectively) after the first year of follow-up. The comparisons between HDHP members and controls, with or without mental illness, were similar across different levels of severity for ED visits.

**Conclusions:** Our preliminary analyses showed reductions in ED visits and hospitalizations among HDHP members, and the observed decreases were significant among patients without mental illness. Further analyses are underway to examine if HDHPs have negative impact on care-seeking behaviors among patients with mental illness compared to those without mental illness.

**Implications for Policy, Delivery, or Practice:** Previous cost-sharing literature suggests patients with mental illness are more at risk of forgoing needed care in the context of increased out-of-pocket costs. As HDHPs become widely popular due to their deemed potential in containing rising health care costs, rigorous studies are warranted to determine HDHPs’ intended and unintended impacts on various outcomes of different patient populations.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #965

**Preferences for Family Involvement in Care by Consumers with Serious Mental Illness**

Amy Cohen, Greater Los Angeles VA Healthcare Center; Amy L. Drapalski, PhD, VA Capital Network Mental Illness, Research, Education and Clinical Center; Shirley M. Glynn, PhD, Greater Los Angeles VA Healthcare Center and UCLA; Deborah Medoff, PhD, VA Capital Network Mental Illness, Research, Education and Clinical Center and University of Maryland, Baltimore; Li Juan Fang, MS, VA Capital Network Mental Illness, Research, Education and Clinical Center and University of Maryland, Baltimore; Lisa Dixon, MD, MPH, New York State Psychiatric Institute, Columbia University College of Physicians and Surgeons, New York City

**Presenter:** Amy Cohen, Ph.D., Psychologist, Mental Illness Research, Education, and Clinical C, Greater Los Angeles VA Healthcare Center, ancohen@ucla.edu

**Research Objective:** Despite robust evidence of efficacy, family services for individuals diagnosed with serious mental illness are of limited availability and drastically underutilized. Underutilization may be due to a mismatch between consumer and family preferences and the services offered. This study is the first systematic report on preferences for family involvement by consumers with serious mental illness.

**Study Design:** These data come from a multi-site, randomized controlled trial of a shared-decision making intervention. 232 mental health consumers diagnosed with serious mental illness at three VA medical centers enrolled. Baseline interviews elicited demographics, treatment preferences regarding family involvement, and perceived benefits and barriers to involvement. Measures of symptom severity, family functioning, and chart diagnoses were collected.

**Population Studied:** Veterans with serious mental illness who had regular family contact but no family involvement in their mental health care were the population included.

**Principal Findings:** Consumers were, on average, 52 years old (SD=9), male, African American, and not currently married. The vast majority had a diagnosis of bipolar disorder or schizophrenia. Consumers had low levels of clinician-rated psychotic symptoms: PANSS positive subscale mean=13.3 (SD=5), PANSS negative subscale mean=12.9 (SD=5).
Consumers’ level of mental health recovery, as measured by the Mental Health Recovery Measure (MHRM), was consistent with the literature from several mental health consumer groups (mean=76.2, SD 18.3), indicating moderate levels of recovery. In terms of consumer preferences, 78% (171/219) wanted their family involved in their care and many desired involvement through several methods: family contact with the treatment team (71%), educational materials for the family (62%), family attendance at an educational or support group (56%); and family attendance at a treatment session (51%). Preference for family involvement was significantly predicted by perceived benefits (p<.01) after controlling for need for family services (family conflict, family-related quality of life, and symptom severity), enabling factors (family contact, family capacity), demographic variables (age, gender, race, living with family, and marital status), and perceived barriers (F=5.78, df=12, 149, p<.01). This model explained 32% of the variance in perceived preferences, which was significantly more variance explained than a model without demographic characteristics, benefits and barriers (F=7.92, df=7,149, p<.001). None of the measures of need, enabling factors, psychosocial factors, or the perceived barriers were significant individual predictors of preferences.

Conclusions: Consumers in this study wanted their family involved; many desired involvement via several methods. The degree to which a consumer expected benefits from family involvement in care predicted the degree of desired family involvement, whereas anticipating barriers did not.

Implications for Policy, Delivery, or Practice: Family services should be offered to all consumers annually. Since research indicates that family involvement has some of the most robust positive outcomes, it is imperative that clinicians be quite skilled in using motivational interviewing and collaborative decision making skills to help consumers understand the benefits of family services. Provider incentives to include families in services should be considered.

Funding Source(s): VA

Health Practices, Beliefs and Values among the Uninsured
Norma Conner, University of Central Florida

Presenter: Norma Conner, Ph.D., R.N., Assistant Professor, College of Nursing, University of Central Florida, norma.conner@ucf.edu

Research Objective: To determine the predisposing population characteristics including demographics, health beliefs, self-care practices, locus of control, and values identified by uninsured adults, so healthcare providers can respond with appropriate interventions to reduce the disparities created by an uninsured status. Andersen's (1995) behavioral model of health services use was used as the framework for this study.

Study Design: This qualitative study consisted of a combination of focus groups and individual interviews. Informed consent measures were followed. Ninety minute focus group and sixty minute individual interviews, consisting of 10 open-ended questions in 3 categories, were conducted in a semi-structured format. Sessions were tape recorded, and transcribed verbatim. A demographic data sheet was also completed by each participant.

Population Studied: Participants were recruited from community based organizations such as worship sites in Central Florida. Participants meeting the study criteria of male and female, uninsured, 18 year of age and older but younger than 65 years of age, able to read and write in English were included in the study.

Principal Findings: Participants ranged in age from 19 to 69, and were heterogeneous in gender, marital status, employment and insurance eligibility. Main circumstances leading to an uninsured status included loss or change of employment, expense of coverage, self-employed status, and frustration over the Medicaid process. Beliefs, practices, and experiences related to an uninsured status include avoiding activities where injury is possible such as sports, borrowing money from family members to pay high cost to access private healthcare, information seeking among other uninsured individuals to obtain care, presenting false symptoms to access care, plans for emergency care or needed surgery that begin with presenting at the Emergency Department, and maintaining automobile insurance as required by law. Personal meaning attributed to having insurance included feeling
valued, and having choices and real autonomy in health care decision making. Most indicated an external locus of control related to whether or not they had insurance.

**Conclusions:** An individual’s uninsured status creates health behaviors such as telling untruths, and borrowing money to access health care. There exists an information network among the uninsured where they share information on getting health care. Lack of health insurance compromises values upheld in the US such as autonomy and self-determination when healthcare is beyond reach.

**Implications for Policy, Delivery, or Practice:** Health policy mandating insurance coverage is poorly understood. Health care providers are important to the education of the uninsured regarding responsibility to acquire health insurance coverage in connection with the Affordable Healthcare Act, health maintenance practices, how to recognize conditions requiring intervention, and accessing no/low cost healthcare services in the community. Health care providers can advocate for the uninsured to eradicate the need to lie to gain access to primary care and narrow the cost for service gap between the insured and the uninsured. Faith-community nurses are one resource providing important free services to help uninsured individuals manage their chronic conditions and link to other community resources.

**Funding Source(s):** Other, Internal UCF

**College of Nursing**

**Poster Session and Number:** C, #967

**Implementing and Evaluating the Guide to Patient and Family Engagement: Improving Hospital Quality and Safety by Engaging Patients and Family Members in Their Care**

Kristin Carman, PhD, American Institutes for Research; Pamela Dardess, American Institutes for Research; Ushma Patel, MSPH, American Institutes for Research; Lauren Smeeding, American Institutes for Research; Callan Blough, American Institutes for Research; Margaret Savage, American Institutes for Research; Kirsten Firminger, PhD, American Institutes for Research; Marjorie Shofer, MBA, BSN, Agency for Healthcare Research and Quality

**Presenter:** Pamela Dardess, M.P.H., B.A., Senior Research Analyst, American Institutes for Research, pdardess@air.org

**Research Objective:** The Patient Protection and Affordable Care Act (ACA) highlights the role of consumers in improving health care and emphasizes the importance of patient engagement and patient experiences of care. The tangible importance of consumer engagement is realized in the Hospital Value-Based Purchasing Program, where hospitals face payment incentives that include patient experiences of care in the form of HCAHPS scores.

The purpose of this study was to implement and evaluate a Guide to Patient and Family Engagement in Hospital Safety and Quality that is intended to help hospitals develop effective partnerships with patients and families to drive improvements in engagement and quality. The Guide, funded by the Agency for Healthcare Research and Quality, and based on an evidence-based conceptual framework, includes four strategies that support patient engagement: Working with Patients and Families as Advisors: Helping hospitals work with patients and families as organization-level advisors. Communicating to Improve Quality: Improving communication between patients, families, and hospital staff from the point of admission. Nurse Bedside Shift Report: Supporting safe handoffs by involving patients and families in nurse change-of-shift report. IDEAL Discharge Planning: Engaging patients and families in the transition from hospital to home.

**Study Design:** In 2011, three hospitals began a 9-month implementation of the Guide. We conducted a pre-post evaluation to capture lessons learned, assess the Guide’s impact on the knowledge, attitudes, and behaviors of patients and staff; and investigate changes in hospital culture. Our mixed-method evaluation involved collecting qualitative (interviews with hospital staff, observation, focus groups with patients, and documentation collection), quantitative (staff and patient surveys), and extant data from hospitals (e.g., HCAHPS).

**Population Studied:** The Guide was implemented in three hospitals that varied in size, location, teaching status, and patient population: a 324-bed independent hospital in Annapolis, MD; a 200-bed community hospital in Chicago, IL; and a 72-bed rural hospital in Greenville, SC.

**Principal Findings:** Hospitals implemented the Guide with minimal technical assistance. Evaluation findings demonstrated positive outcomes associated with implementation. The staff survey demonstrated significant associations between Guide implementation and...
constructs related to Perceptions of Leadership (i.e., attitudes and behaviors of hospital leaders related to PFCC), Communications of Hospital Standards (i.e., communication of the importance of PFCC concepts), and General Practices of Care (i.e., behaviors related to integrating patients and families into care). During the implementation period, hospitals observed HCAHPS scores that trended upward, particularly in the communication, pain management, and discharge domains. Qualitative data showed that Guide strategies helped patients be more informed about their care and improved communication between patients and nurses.

Conclusions: The Guide provides evidence-based strategies that hospitals can implement to increase patient engagement and affect outcomes related to quality and satisfaction.

Implications for Policy, Delivery, or Practice: There is a growing view that consumers are a critical part of the solution to growing health care costs and lagging quality. With the inclusion of HCAHPS scores in the Hospital Value-Based Purchasing program, it’s critical to understand what organizations can do on a concrete level to promote engagement. This study addresses the dearth of on-the-ground evidence and outcomes about how to promote patient and family engagement.

Funding Source(s): AHRQ

Conveying Information to the Public About the Hazards of Hospital Care

Presenter: Rachel Dolin, M.A.Sc., Research Associate, L&M Policy Research, LLC, rdolin@lmpolicyresearch.com

Research Objective: Since 2002, the Centers for Medicare & Medicaid Services’ Compare websites have become the primary vehicle for reporting provider-specific quality information to the public, both to hold providers accountable for the care they deliver and to engage the public in efforts to improve quality. Legislative and administration initiatives are expanding the focus to include measures of safety, efficiency, and value. In the context of ongoing government-wide initiatives to promote safety, this study sought to explore consumers’ perceptions and understanding of information about medical errors, preventable deaths, injuries, complications, and infections in hospital settings, as it would be displayed on the Hospital Compare website.

Study Design: Using a qualitative research design, we consulted with subject matter and policy experts in public health, conducted a literature review on risk communication in health care decision making, and performed an environmental scan of related public reporting practices to develop draft narrative explanations, messaging, and displays of comparative hospital performance on patient safety indicators (PSIs), inpatient quality indicators (IQIs), hospital-acquired conditions (HACs), and healthcare-associated infections (HAIs), to be displayed on the Hospital Compare website. In field research carried out in 2009 (PSIs and IQIs) and 2011 (HAIs and HACs), we conducted a combination of one-on-one in-depth cognitive interviews and small group discussions with a convenience sample of consumers recruited from the community at five sites, to elicit their perceptions and interpretation of the displayed information. We also interviewed a small number of referring physicians at two of the sites. We identified common themes and variations in respondents’ interpretation, based on study team observations and analysis of written notes and recorded interview transcripts.

Population Studied: Patients and family caregivers of patients aged 40-70 (n=94), mixed by race, gender, education levels, and prior hospital experience; community-based primary care physicians (n=6) and surgeons (n=2).

Principal Findings: Patients and family caregivers, like referring physicians, understand that individual safety indicators reflect serious risks to patients’ health and safety. However, they do not necessarily agree with messaging that hospitals or healthcare providers should be held responsible for things gone wrong. Consumers have limited awareness of the prevalence or magnitude of medical errors, preventable deaths, injuries, complications, and infections; they commonly misinterpret displays of both individual and comparative performance rates, as reported, regardless of reporting format; and they are unsure how, if at all, the information should be used.

Conclusions: Technical measures of patient safety, as currently reported, do not accurately
or effectively convey information to the public about the hazards of hospital care.

**Implications for Policy, Delivery, or Practice:**
To engage consumers effectively in public dialogue around safety, communication strategies should be developed that raise public awareness about the problems, their magnitude, and their prevalence, supported by reporting formats that allow consumers to discern meaningful variations in hospital patient safety.

**Funding Source(s):** CMS

**Poster Session and Number:** C, #969

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**Innovative Data Mining Predictive Models in Improving Chronic Disease Care: Identifying Patients in Cardiovascular Domains**

Emad ElSebakhi, MEDai Inc., an Elsevier Company; Anton Berisha, MEDai Inc., an Elsevier Company; Omnia H. Elhagrassy, Mansoura University

**Presenter:** Emad ElSebakhi, Ph.D., Senior Scientist, Health Science, MEDai Inc., an Elsevier Company, ai_cornell@yahoo.com

**Research Objective:** Cardiovascular disease (CVD) is the number one cause of death worldwide. It covers a wide array of disorders, including diseases of the cardiac muscle and of the vascular system supplying the heart, brain, and other vital organs. The objective of this research is to optimize data mining in the participant selection process for chronic care management programs (CCMPro). This motivation will be achieved by investigating the strengths and capabilities of the most recent cutting edge-innovative ensemble learning and functional networks intelligence modeling schemes on cardiovascular databases for estimating and identifying patients in cardiovascular domains.

**Study Design:** Recently, data mining offers a significant advantage over conventional statistical techniques which often requires the normality assumption. Predictive modeling techniques are used by disease management programs to risk-stratify members in order to optimize the utilization of available clinical resources. Normally, data mining predictive modeling assigned a risk score for each member to identify members with chronic conditions that are amenable to disease management interventions. These chronic conditions markers can be used to evaluate the prevalence of chronic conditions within a population. Members with multiple chronic conditions would have a marker for each condition, and then they will have significant healthcare needs and would benefit from the focus on the care offered by a disease management program.

**Population Studied:** The training algorithms and methodologies will be proposed with its utilization in the clinical databases taking into considerations the new healthcare reforms strategies with its affordable care act (ACA) for better quality treatment, while reducing cost. Based on three years of data from numerous lines of businesses (Commercial/Medicare/Medicaid), we estimate the risk for future adverse events, identify physician practice patterns, and predict quality of care outcomes (e.g., risk of future cardiac diseases, namely, CHF, CAD, MI…etc).

**Principal Findings:** Comparative studies will be carried out to compare the model performance using different quality measures (c statistic, sensitivity, specificity, positive predictive value, root mean-squared errors) and identified population size to assess the differences among different cut point selection approaches, while identifying those members (patients) with: (i) an opportunity for cost reductions and then a chance for ROI; (ii) who are more severe.

**Conclusions:** Comparative studies will be carried out to compare the model performance using different quality measures (c statistic, sensitivity, specificity, positive predictive value, root mean-squared errors) and identified population size to assess the differences among different cut point selection approaches, while identifying those members (patients) with: (i) an opportunity for cost reductions and then a chance for ROI; (ii) who are more severe. The available disease management programs from both providers and payers: (Screening, Planning, and Acting) strategies, physicians and nurses will be able to provide the proper care management and outreach program by utilizing the results with the evidence-based cut points that incorporate condition-specific variations in risk. In addition, by efficiently targeting and intervening with future high-cost members, health care costs can be reduced.

**Implications for Policy, Delivery, or Practice:**
By efficiently targeting and intervening with future high-cost members, health care costs can be reduced.

**Funding Source(s):** CDC

**Poster Session and Number:** C, #970
Competition in the Post-ACA Health Insurance Marketplace: How Health Insurance Exchanges Can Successfully Attract and Retain Consumers

Brandy Farrar, American Institutes for Research; Jill Yegian, American Institutes for Research; Coretta Mallory, American Institutes for Research; Harmoni Joie Noel, American Institutes for Research; Steven Garfinkel, American Institutes for Research

Presenter: Brandy Farrar, PhD, Researcher, Health Policy and Research, American Institutes for Research, bfarrar@air.org

Research Objective: The Patient Protection and Affordable Care Act §1311(c)(4) requires that Health Insurance Exchanges (HIEs) be in place and ready to offer coverage by January 1, 2014. While the legislative mandate requiring all individuals to have health insurance creates a ready-pool of potential Exchange enrollees out of the uninsured, this is not a captive audience. Exchanges will have to compete for business with insurance companies and brokers who fulfill similar functions. The biggest incentive to enrolling in an Exchange is that this the only way to receive the premium discounts and tax subsidies provided by the ACA. But is this enough of a value proposition to entice the millions of uninsured Americans to purchase their health insurance through Exchanges? The purpose of this study is to identify the key issues consumers will consider when deciding whether to purchase insurance through the Exchanges. These findings will inform Exchanges as they seek to become and remain competitive in the health insurance marketplace.

Study Design: Data for this study come from the formative research conducted as part of the development of the Health Insurance Exchange Enrollee Satisfaction Survey, a survey commissioned by the Centers for Medicare & Medicaid Services to inform consumer decision-making about purchasing health coverage. Four focus groups with 33 individuals were conducted to solicit consumers’ perspectives on health insurance, health care, and the impending HIEs. Focus group transcripts were systematically reviewed for emergent themes.

Population Studied: Each focus group targeted consumers with characteristics similar to potential Exchange enrollees: (1) uninsured, with chronic conditions; (2) uninsured, low-income; (3) uninsured, young and healthy; and (4) members of the Massachusetts Health Connector Commonwealth Care program.

Principal Findings: Participants identified three main issues that would influence their decision to enroll in a HIE: the administrating agency, the quality and affordability of plans, and the type of assistance provided. First, participants assumed that if HIEs were administered by the government, they would be overly bureaucratic and that if they were run by payors, financial interests would trump consumer needs. These assumptions resulted in a skepticism and distrust of HIEs that muted interest in enrolling. Second, participants will consider whether their out-of-pocket costs will “really” be manageable given their financial situations and if the plans will be accepted by good doctors (especially their own). If not, participants are prepared to pursue other options, including opting out of coverage all together (even in the face of penalties). Third, consumers will consider the method, quality, and degree of customization associated with assistance. Displeasure with any of these areas would frustrate participants, leading them to end the process.

Conclusions: The financial assistance offered by the Exchanges provides a clear advantage to other options consumers face to meeting the insurance mandate. However, these benefits alone will not be enough.

Implications for Policy, Delivery, or Practice: Exchanges also need to market themselves in ways that reduce skepticism and distrust, create true cost savings that make purchasing through an Exchange feasible and worth it, offer high quality QHPs, and provide high quality customer assistance in ways that meet the needs of multiple types of consumers.

Funding Source(s): CMS
Poster Session and Number: C, #971

Patient Activation by DTCA Influences Primary Care Physicians’ Prescriptions of Celebrex for Osteoarthritis

Michael Fischer, Brigham and Women’s Hospital/Brigham Medical School; Jeffrey N. Katz, Brigham and Women’s Hospital; Lisa D. Marceau, New England Research Institute; Felicia L Trachtenberg, New England Research Institute; Jing Yu, New England Research Institute; John B. McKinlay, New England Research Institute

Presenter: Michael Fischer, M.D., M.S., Associate Professor Of Medicine, Division of Pharmacoepidemiology and
Research Objective: Direct to consumer marketing of medications is intended to “activate” patients to request the advertised medication from their physicians. There is limited data on the extent to which physicians alter prescribing patterns in response to specific requests from activated patients.

Study Design: We performed a factorial experiment in which primary care physicians viewed clinically authentic videotapes of “patients” presenting with symptomatic knee osteoarthritis (OA). The “patients” were played by professional actors who differed by sex, race (white, Black, Hispanic) and SES (higher, lower). Each physician viewed one vignette of a patient with typical symptoms of knee OA lasting for several months. In one half of vignettes the patient was ‘activated’ and asked: “I’ve seen ads for Celebrex and it looks just like what I need…A woman I work with takes it and she said it really works for her…so, I really want to try that.” The non activated patients requested help with their pain but did not ask for any specific medications: “I just want something to make it better.” Activated and nonactivated vignettes were balanced on sex, race and SES. Physicians were balanced by sex and years of experience. After viewing the videotape, the physicians completed a questionnaire in which they indicated the treatment(s) they would likely prescribe. We examined the association between patient characteristics, particularly activated vs. non-activated, and the medications the physicians said they would prescribe (celecoxib, non-selective NSAIDs, other) using a multivariate ANOVA model.


Principal Findings: 53% of the PCPs presented with a vignette including an active request for celecoxib reported that they would prescribe celecoxib, as compared with 24% of physicians seeing the identical vignette without an active medication request (p<0.0001). Physicians receiving an active request for celecoxib were less likely to report that they would prescribe a non-selective NSAID (29%) than physicians whose simulated patients did not request celecoxib (42%; p=0.06). Most of the non-selective NSAIDs specified are available as generics. Further, physicians who received an active request for celecoxib prescribed either a COX-2 or a traditional NSAID for 82% of vignettes, compared to 66% of physicians who did not receive an active request (p=0.004). The associations between active request and physician prescribing patterns were not influenced by patient characteristics (gender, race, SES) or physician characteristics (gender, experience).

Conclusions: Physicians presented with an activated request for celecoxib by a patient with typical knee OA were more than twice as likely to prescribe celecoxib compared to physicians encountering a non-activated patient who provided the same clinical history and they were also considerably more likely to prescribe any NSAID (selective or non-selective).

Implications for Policy, Delivery, or Practice: Given the higher price, increased risk of cardiovascular toxicity and similar efficacy of celecoxib compared to non-selective NSAIDs, these findings suggest that some types of patient activation may increase health care costs and compromise appropriateness of prescribing.

Funding Source(s): NIH

Poster Session and Number: C, #972

Explaining the Growing Gap in Smoking by Education
Abigail Friedman, Harvard University; David Cutler, Harvard University

Presenter: Abigail Friedman, B.A., PhD Candidate, Harvard PhD Program in Health Policy, Harvard University, afriedm@fas.harvard.edu

Research Objective: From 1950-1987, the education gradient in smoking grew rapidly, yielding differential trends in life expectancy as well as education gaps in low birth weight and old age disability rates. We test three explanations for the growing gaps in smoking rates: differential response by education to cigarette prices, differential response to tobacco company advertising, and differential response to public health information. We use data on initiation and cessation as well as choice of less harmful (i.e., lower tar and nicotine) cigarettes to examine the impact of these variables.

Study Design: Retrospective cohort studies of smoking initiation and cessation apply logistic regression to a new dataset we compiled on annual cigarette advertising expenditure as well as retrospective smoking histories derived from the 1978-1980 and 1987 NHIS data. Brand choice analyses are cross-sectional and use
newly available data on cigarette brands smoked by respondents to the 1978-1980 NHIS, released by the NCHS in response to our request. Based on primary sources, we assign each brand to its late-1970s filtration category—unfiltered, low filtration, or high filtration—and use multinomial logistic regression to examine education differentials in cigarette choice.

Population Studied: More than 45,000 respondents to the 1979-1980 and 1987 National Health Interview Survey, all ages 25 to 64 at interview.

Principal Findings: For both initiation and cessation decisions, we find statistically significant education differentials in responses to cigarette advertising as well as the availability of information on brand-specific tar and nicotine levels. Additionally, more educated male smokers are relatively more likely to quit when cigarette taxes are higher. All of these differentials contribute to the observed smoking gradients.

Brand choice analyses find that more educated smokers choose lower risk (i.e., high filtration) cigarettes, even when analyses are conducted within cigarette parent brands (such that marketing is similar). Controlling for cigarette filtration group, more educated smokers also smoke fewer cigarettes per day. Among high filtration cigarette smokers, more educated individuals differentially favor parent brands exclusively devoted to hi-fi cigarettes over those including multiple filtration-types. While the former results point to a risk-reduction motivation, this latter finding suggests that the marketing of high filtration brands might also contribute to the observed differential.

Conclusions: Our findings point to an education differential in smoking responses to cigarette advertising, risk information, and (for male smokers) tax rates as key drivers of rapid growth in smoking’s education gradient during the mid-twentieth century, with brand choice analyses suggesting differential demand for risk-reduction and aspects of brand-marketing as likely drivers of this behavior.

Implications for Policy, Delivery, or Practice: While immediate policy implications are limited due to the time period under consideration, better understanding what drives these differential responses might suggest new approaches to shrinking smoking’s education gap. Future research should consider the extent to which marketing practices, personality traits, cognitive factors, and behavioral tendencies explain these patterns, as well as how they play out in an internet era.

Funding Source(s): N/A, National Institute on Aging

Poster Session and Number: C, #973

Engagement in Health and Wellness: Behavioral Economics and Incentives

Teresa Gibson, Truven Health Analytics / Harvard Medical School; J Ross Maclean, MD, Bristol-Myers Squibb; Ginger Carls, PhD, Truven Health Analytics; Brian Moore, PhD, Truven Health Analytics; Emily Ehrlich, PhD, Truven Health Analytics; Victoria Fener, StickK.com; Jordan Goldberg, StickK.com; Colin Baigel, MD, Bristol-Myers Squibb

Presenter: Teresa Gibson, Ph.D.,M.A., Senior Director, Healthcare Research, Truven Health Analytics / Harvard Medical School, teresa.gibson@thomsonreuters.com

Research Objective: Many employers have extended the size and scope of their incentive-based wellness programs since the final ruling on wellness incentives under HIPAA was released in 2006. In January 2011, a large firm implemented an online commitment program integrating principles of behavioral economics in the incentive-structure for workplace health promotion. Each employee could make their own commitments to meet health goals within predefined categories. Employees then earned points that could be redeemed immediately online for gift cards and prizes with a total value of up to $300 per person. The objective of this study was to analyze engagement with an online employer wellness commitment program and evaluate whether these types of programs tend to attract mostly healthy individuals (e.g. primary prevention) or if users also include employees with chronic conditions or high prior spending (e.g. secondary prevention). This study provides one of the first views of real-world use of an incentive-based commitment program with significant financial rewards integrated with information on health status and health spending.

Study Design: This cross-sectional study compared demographic and health characteristics of users and nonusers and analyzed individual and aggregate measures of engagement as well as engagement patterns of employees by health status and health spending.
Population Studied: Detailed 2011 data from the commitment program was combined with information from administrative medical claims data for 2,147 continuously-enrolled employees of a large firm. Measures were created reflecting the level of involvement with the program: number of commitments, progress report submission rate, referee usage, number of supporters, number of journal entries, completion of a health risk appraisal, completion of a biometric screening, points earned, smoking cessation success, and pounds lost. We then used factor analysis to generate an engagement measure that aggregated the 10 individual engagement measures into a single, employee-level measure using factor loadings as weights. This single explained 38% of the total variation in employee engagement.

Principal Findings: Employees of all ages participated in and engaged in the program. Engagement declined with age. Engagement rates for men age 18-34 were 3.91 times the rate of those of men age 55-64 (p<0.01) and engagement rates for women age 18-34 were 2.90 times the rate of women age 55-64 (p<0.01). Employees with a significant chronic illness or high levels of medical spending in the previous year participated and engaged at rates similar to those without chronic illness or high spending (p>0.10).

Conclusions: Unlike traditional programs, an online incentive-based wellness program including self-defined health goals can be used to reach employees with chronic illness and high prior spending.

Implications for Policy, Delivery, or Practice: Health care reform amends qualifying wellness plan requirements as of 2014 and employers will be permitted to allow up to a 30% incentive for achieving a health goal (and up to 50% for certain tobacco related goals). While traditional wellness programs are likely to continue to be offered, participation-based incentive programs can be utilized not only for primary prevention but for secondary prevention and management by individuals with chronic illness and high spending.

Funding Source(s): Other, Bristol-Myers Squibb (as an Employer)

Poster Session and Number: C, #974

How Physicians’ Presentation of Information about PCI to Patients with Stable Angina May Contribute to Their Belief that It Is a Life-Saving Intervention

Sarah Goff, Baystate Medical Center; Kathleen M. Mazor, EdD, University of Massachusetts Medical School and Meyers Primary Care Institute; Michael B. Rothberg, Cleveland Clinic Foundation

Presenter: Sarah Goff, M.D., Assistant Professor, Medicine, Baystate Medical Center, sgoff911@gmail.com

Research Objective: More than 600,000 percutaneous coronary interventions (PCI) are performed annually in the U.S. For patients with chronic stable angina, the benefit of PCI is limited to symptom reduction, yet many patients mistakenly believe that PCI will prevent myocardial infarction (MI) or death. We sought to illuminate how physicians’ presentations of PCI may contribute to patients’ misperceptions.

Study Design: Using the Verilogue Point-of-Practice Database (which includes visits with >600 physicians in 9 geographic regions throughout the U.S.), we searched outpatient/non-acute visit transcripts recorded between March 2008 and August 2012 for mention of PCI, cardiac catheterization, angiogram or stent placement. After we developed an a priori codebook, one team member performed qualitative content analysis on all the transcripts, adding codes iteratively until theoretical saturation was achieved. A second member read a subset of transcripts and recommended revisions to the codebook. Codes were then revised and sorted into pertinent themes.

Population Studied: Patient-cardiologist discussions about percutaneous coronary intervention.

Principal Findings: We analyzed 36 transcripts. Patients ranged in age from 44-88 years (median = 67) and 9 (23%) were women. “Rationale for recommending PCI” was as a major theme. The associated sub-theme, “Physician presentation of PCI benefit” illuminated how physicians’ presentations may contribute to patients’ misperceptions. Many physicians informed patients that catheterization was the “only way to know for sure” about their coronary artery disease, suggesting that catheterization would be preferable to uncertainty about the presence, extent and location of disease. The implication was that
once they “know for sure”, an intervention could improve the patient’s outcome; “That will show us for sure...then we can probably just [sic] go ahead...put in a stent...[and] have it taken care of”. Some physicians over-simplified the pathophysiology by using plumbing imagery “...sometimes we can also use a Roto-Rooter [to eliminate a blockage]”. They also stated that PCI would “fix” the problem; “the next step forward is a cardiac catheterization, with the intent of fixing a problem if there is a problem”. When patients questioned the need for PCI, some physicians overstated PCI benefits both implicitly and explicitly; “You sound good, you look good, but I want to keep it that way... I don’t want things to happen to you while you’re walking the steps or riding your bike,” and “I wouldn’t want you to have another heart attack.” Only one physician explicitly stated that symptom reduction was the only benefit of PCI for stable angina and that there would be no reduction in mortality or risk for MI. Although many physicians informed patients that they would need to take medication, few discussed maximizing medical management as an alternative to PCI. When discussions of alternatives to PCI did occur, it was generally only after a patient expressed hesitation about PCI.

**Conclusions:** In this study, some physicians presented information about PCI in a manner that may contribute to patients’ misperception of the benefit of PCI for stable angina.

**Implications for Policy, Delivery, or Practice:**
A larger quantitative study is required to understand how often physicians may misrepresent the benefits of PCI and how changes in presentation may affect patient decision-making.

**Funding Source(s):** Other, Foundation for Informed Medical Decision Making

**Poster Session and Number:** C, #975

A Randomized Controlled Trial to Improve Low-Income Pregnant Women’s Access to Pediatric Quality of Care Data: Rationale and Study Design for “IDEAS for a Healthy Baby”

Sarah Goff, Baystate Medical Center; Katherine White, Baystate Medical Center; Penelope S. Pekow, Baystate Medical Center; Kathleen M. Mazor, University of Massachusetts Medical School; Peter K. Lindenauer, Baystate Medical Center

**Presenter:** Sarah Goff, M.D., Assistant Professor, Pediatrics, Baystate Medical Center, sgoff911@gmail.com

**Research Objective:** Efforts to increase transparency regarding health care quality and safety are partially guided by the belief that making quality performance data publicly available will enable patients to make more informed choices. Although the amount of data reported on websites and through other channels has increased, use by consumers remains limited and largely restricted to white, college educated and middle-aged consumers. Barriers to using these data include failure to recognize that quality varies, that the data are publicly reported, and that the data may be difficult to understand. Populations with low health literacy and numeracy are disproportionately affected by these barriers.

The objectives of the study are to: 1) test the efficacy of an office-based patient navigator to assist low income pregnant women in using publicly reported data to select a pediatric care provider; 2) assess the efficacy of the intervention in subgroups defined by parity, race/ethnicity, and health literacy; 3) evaluate the importance of publicly reported quality data compared to other factors when selecting a pediatric provider; and 4) assess the intervention’s impact on self-management of health care.

**Study Design:** Women will be recruited between 20-34 weeks of gestation. Women in the intervention arm will receive an informational pamphlet about health care quality plus two 20 minute sessions with a trained patient navigator who will help participants to use and interpret information about the quality of care provided at local pediatric practices on the Massachusetts Health Quality Partners website. Women in the control group will only receive the informational pamphlet. A survey designed for this study will be administered to all participants at baseline and post-intervention to assess outcomes of interest. Health literacy, numeracy and level of activation for self-management of health care will be assessed as potential mediators of intervention effectiveness.

**Population Studied:** English speaking women ages 16-50 attending a prenatal clinic that serves primarily a low income population at a large urban medical center will be enrolled in the study.

**Principal Findings:** The primary study outcome will be the average performance on clinical
quality measures and patient experience scores for the practices selected in the intervention versus control groups. Secondary outcomes will include analyses of efficacy among groups of women defined by parity and an assessment of the relative importance of factors women considered when choosing a pediatric care provider.

**Conclusions:** As health care quality data become increasingly available in publicly reported formats, there is a risk that barriers to accessing and understanding these data may increase health disparities. This study tests the theory that helping pregnant women with low health literacy and numeracy overcome these barriers will increase the consideration of performance on quality measures when choosing a pediatrician.

**Implications for Policy, Delivery, or Practice:** Use of support personnel such as patient navigators may increase the importance of performance on quality measures when choosing a pediatrician.

**Funding Source(s):** AHRQ

**Poster Session and Number:** C, #976

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**WIC Policy Changes and Healthy Eating**

Tami Gurley-Calvez, University of Kansas Medical Center; Kandice Kapinos, U.S. Census Bureau

**Presenter:** Tami Gurley-Calvez, Ph.D., Assistant Professor, Department of Health Policy and Management, University of Kansas Medical Center, tgurley-calvez@kumc.edu

**Research Objective:** To investigate the impact of recent changes to the US Department of Agriculture (USDA) Food and Nutrition Service (FNS) food packages provided through the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) servicing low-income and nutritionally-at risk pregnant and postpartum women, infants and children. In particular, the FNS issued an interim rule in 2007 to modify the WIC food packages to improve dietary intake among participants while maintaining cost neutrality. States had to implement this rule by no later than October 2010. Not only were the food packages changed to include vouchers for fruits and vegetables for WIC participants, but the minimum stock requirements of WIC vendors were changed. While states were allowed to impose more stringent requirements, the FNS required at a minimum that WIC vendors stock at least two varieties of fruits and two varieties of vegetables. This study investigates whether a) provision of the vouchers resulted in a greater fruit and vegetable consumption among WIC participants and b) whether the effects were larger for individuals in states with more stringent vendor stocking requirements.

**Study Design:** We utilized a difference-in-difference (DD) strategy to investigate the effect of the interim rule on WIC participants’ consumption of fruits and vegetables using Behavioral Risk Factor Surveillance System (BRFSS) data from 2005-2011. Our identification strategy relies on cross-state differences in both provisions of the produce vouchers and WIC vendor policies to answer the question of whether increased access to healthier foods, namely greater fruits and vegetables, resulted in healthier diets among adults. Mechanically, our DD models regress daily fruit or vegetable intake on year indicator variables interacted with an indicator variable for whether the state imposed stringent stocking requirements and include a rich set of sociodemographic and health controls and state fixed effects. We also conduct falsification exercises to examine whether the new food packages decreased consumption of fruit juice, for which benefits were not changed.

**Population Studied:** We first restrict our sample to low-income pregnant females, but also consider other samples, including low income families with children.

**Principal Findings:** Our preliminary findings suggest that the voucher increased fruit and vegetable consumption among low-income pregnant females. However, we find no evidence that this effect was stronger in states with more stringent vendor stocking requirements.

**Conclusions:** Our work suggests that providing a cash voucher to WIC participants to purchase more fruits and vegetables increases fruit and vegetable consumption among WIC participants. While we found no evidence that changes to vendor stocking requirements yielded changes in consumption, more work is needed to investigate this.

**Implications for Policy, Delivery, or Practice:** This work has implications for future policy interventions aimed at increasing healthful eating. In particular, our work suggests that subsidizing healthier foods may encourage individuals to eat more healthful foods.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #977
Factors Related to Attrition from VA Healthcare Use: Findings from the National Survey of Women Veterans


Presenter: Alison Hamilton, Ph.D., M.P.H., Research Health Scientist, Desert Pacific MIRECC, VA Greater Los Angeles, alison.hamilton@va.gov

Research Objective: To compare individual characteristics and perceptions about VA care between women Veterans who discontinued VA use (“attriters”) and women Veterans who continued VA use (“non-attriters”), and to compare recent versus remote attriters.

Study Design: Cross-sectional, population-based 2008-09 national telephone survey.

Population Studied: 626 attriters and 2,065 non-attriters who responded to the National Survey of Women Veterans.

Principal Findings: Fifty-four percent of the weighted VA ever user population reported that they no longer use VA. Forty-five percent of attrition was within the past ten years. Attriters had better overall health (p=0.007), higher income (p<0.001), and were more likely to have health insurance (p<0.001) compared with non-attriters. Attriters had less positive perceptions of VA than non-attriters, with attriters having lower ratings of VA quality and of gender-specific features of VA care (p<0.001). Women Veterans who discontinued VA use since 2001 did not differ from those with more remote VA use on most measures of VA perceptions. Overall, among attriters, distance to VA sites of care and having alternate insurance coverage were the most common reasons for discontinuing VA use.

Conclusions: We found high VA attrition despite recent advances in VA care for women Veterans. Women’s attrition from VA could reduce the critical mass of women Veterans in VA and affect current systemwide efforts to provide high-quality care for women Veterans. An understanding of reasons for attrition can inform organizational efforts to re-engage women who have attrited, to retain current users, and potentially to attract new VA patients.

Implications for Policy, Delivery, or Practice: Access to care is a VA priority. Since attrition is the flip side of access, preventing VA attrition is aligned with key VA priorities. In an era of increased consumer healthcare choice, the VA, like other healthcare institutions, needs to remain a provider of choice. An understanding of reasons for attrition can inform efforts to re-engage patients who have attrited, to retain current users, and even, potentially, to attract new VA patients. At the patient level, increased continuity of care through re-engagement or sustained, continuous engagement in care could promote early intervention to avert or reduce late-life diseases and their concomitant adverse effects on healthcare costs and quality of life.

Funding Source(s): VA

Poster Session and Number: C, #978

Designing a Cost Comparison Tool for Cancer Patients: “The more people know ahead of time, the better”

Nora Henrikson, Group Health Cooperative; Leah Tuzzio, Group Health Research Institute; James Ralston, Group Health Research Institute; Diana SM Buist, Group Health Research Institute

Presenter: Nora Henrikson, Ph.D., M.P.H., Research Associate II, Group Health Research Institute, Group Health Cooperative, henrikson.n@ghc.org

Research Objective: Increasing healthcare costs are shifting to patients. Mounting evidence suggests people receiving chemotherapy want to know their out-of-pocket costs at the time of treatment selection and that cost may factor into treatment choice. We conducted this study to elicit user feedback on the utility and design of a prototype of a “treatment cost calculator”.

Study Design: We conducted a design evaluation of two paper prototypes based on a prior needs assessment. Our prototypes included prices for alternative chemotherapy regimens for colorectal cancer (Capox and Folfox-6) and a statement of their similar effectiveness and different costs, side effects, and number of infusion cycles. Costs for medication, infusion, labs, and supportive medications were included, as well as total cost and hypothetical patient out-of-pocket expense for the episode of care. The two prototypes differed by level of cost detail provided.

Participants were observed and interviewed while using the prototypes under simulated conditions. We used a modified think-aloud
design protocol to elicit participants’ perspectives about the prototype’s strengths, weaknesses and potential usefulness. Transcripts of the audio recordings were open-coded by two researchers to identify salient themes.

**Population Studied:** Twelve people receiving chemotherapy for cancer in 2012 at a nonprofit, member-governed integrated healthcare system. Two thirds of participants were female, median age 68 (42-77), two (17%) were participants in high-deductible health plans; 10/12 (83%) were Medicare beneficiaries. Half of participants had stage II cancer; half were stage III. Most common cancer types were breast (33%), and colorectal cancer (17%).

**Principal Findings:** Of 100 mailed invitation letters, we completed recruitment with the first 32 people we contacted. Twelve people (38%) declined, we were unable to reach eight (25%), and 12 (38%) consented and were interviewed. Most participants (10/12, 83%) found the prototype useful for selecting treatment or expense planning in the clinic setting. Participants appreciated seeing both total and patient-specific costs but preferred accurate price quotes over estimates or ranges. The majority said the tool would be most appropriate and useful during treatment planning rather that at the time of diagnosis. Just over half named a preference for using the tool in collaboration with either a doctor or nurse. Participants suggested a range of additional features. No one suggested deletions. Two participants contrasted sharply with others by objecting to the costs of cancer treatment being discussed in the clinical setting.

**Conclusions:** Our results suggest that clinic-based cost calculators are acceptable and useful to a meaningful portion of oncology patients. The preference of a minority of patients not to discuss costs in the clinic setting and the range of requests for specific features suggests that a personalized approach to cost comparison at the treatment planning stage is warranted.

**Implications for Policy, Delivery, or Practice:**
Cost comparison tools can provide a needed service of improved price transparency at the point of care and could improve clinical practice and patient-centered care.

**Funding Source(s):** Other, Group Health Research Institute Development Fund

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**Assessing U.S. Household Purchase Dynamics for Dietary Fiber**

Miguel Henry-Osorio, Virginia Commonwealth University; Diansheng Dong, ERS

**Presenter:** Miguel Henry-Osorio, Ph.D., Instructor, Healthcare Policy and Research, Virginia Commonwealth University, mehenryosori@vcu.edu

**Research Objective:** Provide a first attempt at examining household purchase dynamics for dietary fiber. We investigate what drives consumers’ demand for dietary fiber in a dynamic choice and household level context, accounting for temporal correlations between current and previous purchases and controlling for left-censoring of observations across households and over time. Our goal is to better understand the dynamics of U.S. household purchasing decisions regarding fiber and perhaps explain why consumption remains at under half the recommended levels. This research may provide new insights that ultimately improve interventions or educational policies to enhance consumer demand for dietary fiber.

**Study Design:** For this study, we create a unique dataset by merging the 2009 Nielsen Homescan panel data and the 2005-2011 Gladson databases using heuristic algorithms and multiple sequential imputations based on product information (e.g., the Universal Product Code). The fiber household demand is modeled as a function of household demographic and socio-economic variables (household size, household income, age of the female head, education of the female head, employment of the female head, household participation in the WIC program, household type, Hispanic ethnicity, being African American, age and presence of children at the household, summer, fall, winter, east, central, and west), a price variable (the dollars per gram of fiber purchased), and a lagged-purchase variable of first order.

**Population Studied:** The Homescan Core panel data offer national coverage (excluding Alaska, Hawaii, and all off-shore U.S. territories), and consist of a panel of U.S. households. The Gladson nutrient database set provides information for an extensive group of packaged products sold in the U.S. on nutritional and front-of-package claims from industry leaders. Our final household population is of almost 47000 households (over 20 million observations).
Principal Findings: Household purchase decisions are characterized by significant unobserved heterogeneity, statistically significant positive serial correlation, and negative and significant state dependence. We also find that covariates that are not integral determinants of fiber intake are household participation in the WIC program, the age and presence of children between 13 and 17, not being Hispanic, and employment of the female head. The education level of the female head has a negative impact on fiber purchases, whereas coupons have the reverse effect. 

Conclusions: Habit persistence effects show that lagged purchases have a strong effect on current household decisions so that households purchasing previously would buy less fiber at time t. Regarding dynamic effects, elasticities of current fiber purchases vary depending on whether a previous fiber purchase occurred or not. In general, the demand for fiber is inelastic, becoming more elastic when it is conditioned on a non-purchase occasion at time period t-1. Household’s purchase timing becomes shorter when conditioning the probability of purchasing on a non-purchase occasion at time t-1 relative to the case in which the purchase probability is conditioned to a purchase occasion at time t-1.

Implications for Policy, Delivery, or Practice: Revisions to the WIC food packages, implemented in 2009, included the addition of whole grain bread (or brown rice or whole grain tortillas), the requirement that half of all breakfast cereals allowed by the state be whole grain, and the provision of cash vouchers for the purchase of fruits and vegetables. An avenue of future research would be to expand the current sample to 2010-11 Homescan datasets to determine whether show if the participation in new the WIC program becomes an integral determinant of fiber choices.

Funding Source(s): No Funding

Poster Session and Number: C, #980

Public Quality Reporting - Do Consumers Know and Care?

Marco Huesch, University of Southern California Price School of; Aram Galstyan, USC; Elizabeth Currid-Halkett, USC; Jason Doctor, USC

Presenter: Marco Huesch, Ph.D., Assistant Professor Of Public Policy, Leonard D. Schaeffer Center for Health Policy and, University of Southern California Price School of, huesch@usc.edu

Research Objective: Public reports seek to inform consumers of important healthcare quality and affordability attributes, and may inform decision-making if consumers are aware of, and can rely and act on such information. We tested these three conditions in the ‘highly shoppable’ condition of maternity care.

Study Design: We used a media access platform with sentiment analysis to investigate blog, forum, social media and traditional media ‘share of voice’ for major public reports of hospital quality in California in 2012. For maternity care in Los Angeles, we examined inter-item reliability of the major public reports, the reported variation in 10 maternity care quality, experience and affordability metrics, and the availability of alternative hospitals for each metric within 10 mile radius choice sets of all 55 maternity hospitals.


Principal Findings: Irrespective of social, online or traditional media type, the three commercial suppliers (Healthgrades, Thomson Reuters Best Hospitals, and US News & World Report Top Hospitals) of hospital quality information dominated consumer awareness. The federal government’s HospitalCompare lookup tool was a distant 4th in mentions across all platforms, but in turn overwhelmingly dominated the state-level OSHPD and the non-profit CalHospitalCompare reports which were effectively absent from publicly disclosed social media or blog conversations. Commercial reports had higher sentiment scores than state, federal or non-profit reports. Inter-item reliability was poor: Cronbach’s alpha did not suggest high consistency of measurement across the reports. Within each report, factor analyses were not interpretable except for Healthgrades and HospitalCompare. These suggested that three separate latent constructs appeared to be recoverable: clinical quality, proneness to intervention (e.g. cesarean section), and subjective patient satisfaction. Variation in objective and subjective reported quality and experience metrics was high. Except for the generally low variability across hospitals in HospitalCompare’s patient experience results (CoV 10%), there was generally substantial variation across hospitals in each metric. This was particularly so for utilization metrics such as VBAC (107%), episiotomy rate (73%), and breastfeeding rates (50%). Alternatives were generally available in each choice set: averaged across the 55 hospitals, consumers had


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substantial choices based on their hypothesized preferred metric within a choice set comprising all hospitals within a 10 mile radius of any particular hospital.

**Conclusions:** Consumers are more aware of and more positively disposed towards commercial hospital quality reports. Despite individual deficiencies and omissions, in aggregate the reports provided sufficient, usable information to consumers regardless of preferences.

**Implications for Policy, Delivery, or Practice:** Public stakeholders whose objectives are enhancement of quality, greater transparency and more empowered consumers through better quality reporting can profitably learn from the private sector. Their approaches to the coverage of providers, the content and reliability of the reported metrics, the validity of underlying constructs, and the achievement of market ‘share of voice’ and consumer ‘share of mind’ are all potentially valuable.

**Funding Source(s):** AHRQ

**Poster Session and Number:** C, #981

**Online Privacy and the Top 20 Health Sites**

Marco Huesch, University of Southern California Price School of

**Presenter:** Marco Huesch, Ph.D., Assistant Professor Of Public Policy, Leonard D. Schaeffer Center for Health Policy and, University of Southern California Price School of, huesch@usc.edu

**Research Objective:** Patients use the internet to access health-related information. In turn, web sites and their affiliated 3rd parties gather personal information from users. The resulting risk to privacy is increasingly well-known in the media, and computer science literature. Despite existing guidelines for healthcare online privacy, this problem remains poorly understood within the healthcare field. Therefore we used internet tools to understand the extent of this problem within popular health-related news and information websites.

**Study Design:** We used proprietary tools used to detect but not block the activity of more than 1,300 potential 3rd party entities including advertisers, data collectors, data aggregators and social networks. These place and use cookies, scripts, tags, and iframes to deliver advertising, monitor traffic for analytics, or serve page functionality. To track online behavior, tracking entities (e.g. tynt) directly insert beacons, conversion pixels, and cookies or place social buttons on the webpage to potentially gather information on user’s prior, current and subsequent online activity. A web proxy tool was used to monitor actual tracking communication between 3rd party elements on the test computer and the web while browsing. Within each site we browsed 10 pages randomly and searched for ‘depression’, ‘herpes’ and ‘cancer’.

**Population Studied:** A convenience sample of 20 high volume health category websites

**Principal Findings:** All 20 sites had at least one 3rd party element. The majority of these elements had non-tracking functions. However, 13 of the 20 websites had tracker elements. Physician-oriented sites had none, except for MdLinx.com. Commercial and mass media sites had more, and were more likely to allow social button tracking. Zip codes and home domain name were leaked to advertising delivery sites, and by one popular consumer health site to a tracker element scorecardresearch. Our computer’s IP address was leaked by two sites to tracker sites, and by one journal to a non-tracker site. Searches for sensitive terms such as “herpes” very often leaked to 3rd parties including tracking sites. Sensitive search terms were not leaked to 3rd party tracker elements on government sites, nor on 4 of 5 physician-oriented websites. Enabling proprietary privacy protection tools did not dramatically affect functionality of the websites.

**Conclusions:** Healthcare privacy concerns traditionally revolve around loss or theft of patient information from provider health records or the infrequent misuse of such information by providers. Yet much health-related information is not stored in electronic health records nor yet fully known by providers. Individuals possess information about their own symptoms, signs, disease burden, treatment and increasingly often search for related information online. To protect online user privacy, web sites generally restrict themselves and their 3rd party affiliates to aggregating user data and not allowing directly identifiable data to be generated or used. Nevertheless, the common installation and use of 3rd party tracker elements found in this study on popular websites is worrisome.

**Implications for Policy, Delivery, or Practice:** Patients and physicians concerned about online privacy may therefore obtain much of the benefit, and run far fewer risks, by using commonly available privacy tools when searching and browsing online.
How Effective is Health Coaching in Improving Health Outcomes and Reducing Health Services Utilization and Costs?

Yvonne Jonk, University of Minnesota Rural Health Research Center; Karen Lawson, MD, ABIHM, University of Minnesota Center for Spirituality and Healing; Heidi O’Connor, MS, University of Minnesota Rural Health Research Center; Kirsten Riise, PhD, Medica Research Institute; David Eisenberg, MD, Harvard Medical School; Bryan Dowd, PhD, University of Minnesota, Division of Health Policy and Management; Mary Jo Kreitzer, PhD, RN, FAAN, University of Minnesota Center for Spirituality and Healing

Research Objective: To evaluate the effectiveness of health coaching in improving health outcomes and reducing health services utilization and costs.

Study Design: High risk health plan enrollees were invited to participate in a health coaching intervention designed to improve participants’ health and wellbeing, motivate behavior change, increase motivation and self-efficacy, and manage health conditions. Health coaching participants chose to participate in either an active or self-directed track. Active participants voluntarily filled out a health inventory assessing their lifestyle, health, stress levels, quality of life, readiness to make lifestyle and behavior changes, and patient activation levels at baseline and upon completion of the program. Primary data were collected from January 2009 to December 2010.

Health coaching participants (i.e. the experimental group) were matched using propensity scores to a group of health plan members who didn’t participate in health coaching (i.e. the controls) and who were otherwise eligible to participate. The likelihood of participating in health coaching was estimated via logistic regression. Independent variables included the demographic, health plan, and health characteristics of the health plan members. Administrative claims data were used to analyze differences in health services utilization and costs between the experimental and control groups from the six months prior to and six months after participation in health coaching, i.e. June 2008 to June 2011. Matched controls were assigned pseudo-enrollment dates mimicking the experimental group’s distribution of the pre and post periods. A fixed effects difference in differences model was used to address the impact of health coaching on the experimental group’s use of health services and expenditures relative to the controls, controlling for sectoral trends.

Population Studied: Study participants were members of a health insurance plan that offered a telephonic health coaching program to assist in managing their health and healthcare needs.

Principal Findings: Of the 6,940 active participants, 1,082 completed pre and post health inventories, and 570 completed pre and post Patient Activation Measures (PAM). While less than 7% of potential candidates actively participated in health coaching, approximately half of those actively participating met at least one identified goal. On average, participants attended eight telephonic coaching sessions over a period of six months. Participants realized a 12% reduction in high stress levels, an 18% improvement in healthy eating, a 21% improvement in exercise levels, and a 12-15% increase in the percent reporting good physical and emotional health. Individuals realized an average of 8-9 point increase in Patient Activation scores with 60% reporting a clinically significant improvement of 5 points or more. Relative to controls, health coaching participants realized a significant reduction in outpatient and emergency room utilization and costs.

Conclusions: This study finds evidence of improvements in health and behavior outcomes and reduced health care expenditures following health coaching. Particular high risk subpopulations such as patients with diabetes and cardiovascular disease may warrant further study. While still in its initial stages of development, this program has the potential to expand its outreach and enrollment efforts.

Implications for Policy, Delivery, or Practice: Encouraging high risk enrollees to participate in health coaching appears to be a cost effective approach to improving population health while reducing outpatient and emergency room utilization and costs. Larger, more definitive studies are needed.

Funding Source(s): N/A

Poster Session and Number: C, #982
Out-of-Pocket Expenses and Treatment Choice for Men with Prostate Cancer

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Presenter: Olivia Jung, B.A., B.S., Doctoral Student, Health Policy Management, Harvard Business School, ojung@hbs.edu

Research Objective: To describe the knowledge of, and attitudes toward, out-of-pocket expenses (OOPE) associated with prostate cancer treatment.

Study Design: We undertook a qualitative research study for which we recruited patients with clinically localized prostate cancer. Patients answered a series of open-ended questions during a semi-structured interview and completed a questionnaire about the physician’s role in discussing OOPE, the burden of OOPE, the effect of OOPE on treatment decisions, and previous knowledge of OOPE.

Population Studied: We recruited patients with clinically localized prostate cancer who had been treated within the previous 6-18 months with surgery or external beam radiotherapy. We excluded patients who had received androgen deprivation therapy, did not speak English, or were cognitively impaired. A total of 41 (26 white and 15 black) eligible patients were enrolled from the urology and radiation oncology practices of the University of Pennsylvania.

Principal Findings: Qualitative assessment revealed 5 major themes: (a) “my insurance takes care of it”; (b) “health is more important than cost”; (c) “I did not look into it”; (d) “I cannot afford it but would have chosen the same treatment”; and (e) “It is not my doctor’s business.” Only 2 patients stated they knew “a lot” about the likely OOPE for different prostate cancer treatments before choosing their treatment.

Conclusions: Few patients with prostate cancer had knowledge of OOPE before making treatment choices in this single-institution study.

Implications for Policy, Delivery, or Practice: Despite recent calls for greater transparency in cost sharing for cancer treatment, the vast majority of patients reported having little knowledge of OOPE before making cancer treatment decisions. To begin to address the profound knowledge gap around OOPE, researchers could explore the use of a simple screening question about OOPE at initial consultations for cancer care. Moreover, communication models should be evaluated to reduce patients’ potential reticence to discuss treatment costs. The success of future efforts aimed at the laudable goal of participatory decision-making will require researchers to design and test methods to optimally frame these discussions and to train physicians and other healthcare team members on the best practices to achieve cost transparency.

Funding Source(s): Other, grant from the Leonard Davis Institute for Health Economics at the University of Pennsylvania

Poster Session and Number: C, #984

The Time Trends and the Determinants of Adult Obesity Measured by a Fatness-Based Index

Minchul Kim, University of California, Davis

Presenter: Minchul Kim, Ph.D., Postdoctoral Scholar, Department of Public Health Sciences, University of California, Davis, mkim1971@gmail.com

Research Objective: A rapid and sustained rise in the obesity rate during the past three decades has stimulated a considerable amount of literature. The literature mainly defined obesity by a body mass index (BMI, weight in kilograms divided by height in meters squared). However, this measure has been criticized because it fails to distinguish body fat from lean body mass. My objectives are to (1) measure the prevalence of obesity defined by the fatness-based percent body fat (PBF, the ratio of body fat to total weight multiplied by 100) over time, and to (2) explore policy options to reduce the PBF-based obesity.

Study Design: I developed the PBF algorithm equation using the variables (such as weight, height and age by gender and race) from the
Principal Findings: The average PBF-defined obesity rate is 62% (22% in 1984 and 79% in 2009), being much greater than 21% (10% in 1984 and 34% in 2009) of the BMI-defined. On average, the former increased annually by 1% compared to 0.9% of the latter. Racial and gender differences are contradictory between two obesity indexes (outcome variables). The White American and the Female are less obese in the BMI-defined obesity, but more obese in the PBF-defined obesity than the African American and the Male, respectively. The per capita number of fast food restaurants and their prices are effective factors to control the prevalence of obesity. For instance, an additional opening of fast-food restaurant (per 10,000 person) increases the PBF-defined obesity rate by 2.4% compared to 1.9% of the BMI. A dollar rise of fast-food price reduces the PBF-defined obesity rate by 5% compared to 2.7% of the BMI.

Conclusions: The obesity is far more prevalent in the United States and it is increasing slightly faster when measured by PBF, compared to BMI. Controlling the fast food restaurants and their prices is an effective tool to manage the prevalence of obesity.

Implications for Policy, Delivery, or Practice: A measure of fatness should be included in survey data for providing additional and helpful insights about the obesity prevalence change over time because NHANES III is available only until 1994. Regulating additional opening of fast food restaurants or raising a sale tax on the fast food is effective to reduce American's fatness in body.
A Discrete Choice Analysis of Cigarette Brand-Switching in China: Findings from ITC China Survey

Justin S. White, University of California at Berkeley; Jing Li, University of California at Berkeley; Teh-wei Hu, University of California at Berkeley; Geoffrey T. Fong, University of Waterloo, Canada & Ontario Institute for Cancer Research, Toronto, Ontario, Canada; Yuan Jiang, Center for Disease Control and Prevention, China

Presenter: Jing Li, M.A.,B.A., Student, Health Services and Policy Analysis, University of California at Berkeley, jingli86@berkeley.edu

Conclusions: As a result, the study found that S Hospital's reputation rested on for internal consumers, the physical factor, human factor, and connection factor; for external consumers, connection factor. For C Hospital internal customers relied on the human factor and connection factor and for external customers, human factor, accessibility factor, and connection factor largely contributing to the reputation of the hospital. As such, the differences in perception depending on region, internal and external customers indicate the need for specialized medical services to meet the demands of their needs. Therefore, the recognition and assessment of the customer's needs by the hospitals and adjustment in their marketing strategies are necessary.

Implications for Policy, Delivery, or Practice: Now not only do we need to make general hospitals competitive but we need to employ market strategies to increase the viability of small and medium sized regional hospitals by analyzing the hospitals that have gone through successful transitions. Also by changing the mindsets of regional health care consumers by making them think of turning to their regional hospitals first by satisfying the patient's needs, and hospitals deploying different positioning towards patients.

Funding Source(s): AHRQ

AHRQ

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Funding Source(s): AHRQ

Poster Session and Number: C, #986

A Discrete Choice Analysis of Cigarette Brand-Switching in China: Findings from ITC China Survey

Justin S. White, University of California at Berkeley; Jing Li, University of California at Berkeley; Teh-wei Hu, University of California at Berkeley; Geoffrey T. Fong, University of Waterloo, Canada & Ontario Institute for Cancer Research, Toronto, Ontario, Canada; Yuan Jiang, Center for Disease Control and Prevention, China

Presenter: Jing Li, M.A.,B.A., Student, Health Services and Policy Analysis, University of California at Berkeley, jingli86@berkeley.edu

Research Objective: Understanding consumers' behavioral responses to cigarette prices is key to determining tobacco control and taxation policy. This study explores consumer choice among different price tiers of cigarettes in China. We investigate whether consumers who trade down to a cheaper cigarette brand resulting from longitudinal and geographic variation in China's price spread contributes to the country's relatively low price elasticity of demand for cigarettes. We further identify the socio-demographic sub-groups that are most likely to engage in this price-reducing behavior.

Study Design: We observe a smoker’s choice of cigarette brand at multiple points in time, and we use relative price variation across six cities over four years in China to identify the impact of cigarette prices on brand-switching. We construct tier-specific market cigarette prices using the median of smoker reported prices in each cigarette brand variety, which we argue are exogenous to bias in self-reported price. We employ a discrete choice framework to model smokers' choice among different cigarette price tiers, controlling for smokers' demographic characteristics. Our main results are derived from a mixed multinomial logit model that allows for random variation in individual preference and response to cigarette price.

Population Studied: This study focuses on adult urban smokers in China, although the results may be illustrative of urban smoking populations elsewhere. We use the first three waves of the International Tobacco Control (ITC) China Survey, conducted in six large cities in China between 2006 and 2009. The final analytical sample includes 3,477 smokers who are present in at least two waves (8,552 person-years).

Principal Findings: Overall, 38% of smokers switched price tiers from one wave to the next, including both trading down and trading up. A ¥1 (about $0.16) increase in the market price of a given cigarette tier is associated with 2 to 9 percentage points decrease in the probability of smokers' choosing that tier. There is significant variation in the magnitude of smokers' response to price. Smokers with higher income are more sensitive to cigarette price changes than those with lower income, whereas smokers with lower education are significantly more likely to engage in brand-switching in response to price change than are those with higher education.

Conclusions: China's large price spread across cigarette brands appears to alter the tier and brand selection of an un-negligible number of consumers, especially those with high income and those with low education. Our results offer predictions of the substitution patterns among different cigarette tiers in response to price changes, and provide a plausible explanation for
China’s relatively low price elasticity of cigarette demand found in previous literature.

**Implications for Policy, Delivery, or Practice:**
Tobacco pricing and tax policy can influence consumers’ incentives to switch brands. China’s current ad valorem taxes appear to widen the price difference between cigarette tiers, hence encouraging trading down. An increase in specific excise tax rates would likely discourage the practice.

**Funding Source(s):** NIH

**Poster Session and Number:** C, #987

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**Public Reporting as a Communication Tool to Aid Vulnerable Consumers in Healthcare Decisions: The State of the Science**
Daniel Longo, Virginia Commonwealth University; Justin S. Lee, PhD, MSW, Benton College; Barbara A Wright, MLS, Virginia Commonwealth University

**Research Objective:** Objectives are to:
Determine if public reporting is utilized in making healthcare decisions by vulnerable consumers defined as African American, Latino and White populations with Type II diabetes; and
Determine the gaps in knowledge of healthcare public reports utilization by vulnerable populations
- Identify barriers and facilitators to help vulnerable diabetic populations make informed decisions about personal healthcare services

**Study Design:** A systematic literature review was conducted of relevant databases, reports, books, websites, and grey literature. In addition to examining websites containing reports, bibliographic databases were searched that included: MEDLINE, PsycINFO, Business Source Complete (EBSCOhost), CINAHL, The Cochrane Database of Systematic Reviews, and Web of Science®. These database searches utilized a combination of both index terms unique to the individual databases and text words or key words.

**Population Studied:** The criteria for the literature/information included in this review focused on:
publicly available reports or information to guide patient decision making; patients use of public reporting; vulnerable populations; diabetes type; peer-reviewed publications; and relevant ‘grey literature’ and/or web sites.

**Principal Findings:** With a search retrieval of over 8498 journal citations and other information sources, 473 citations were initially identified as addressing our objectives. Of these results, 79 citations were determined to be most relevant regarding gaps in knowledge of healthcare public report utilization by vulnerable populations.

**Conclusions:** Despite the large retrieval of potential relevant literature identified by our initial search (n=8498) after review and analysis only .009 percent met our inclusion and exclusion criteria. The literature review revealed: Despite 26 years of the availability of public reports, consumers today rarely use them and are generally unaware of the availability of such reports. There is little evidence that reports are designed for underserved population. Much work is needed to assist consumers in using consumer reports.

**Implications for Policy, Delivery, or Practice:**
The federal Patient Protection and Accountable Care Act has the stated mandate “to improve the dissemination of measures of healthcare quality and resource use, [and] to build the science of public reporting.” However, early studies on the design and use of consumer reports cite the public’s confusion and lack of understanding regarding the utility of such reports. Much added work is required.

**Funding Source(s):** AHRQ

**Poster Session and Number:** C, #988

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**Reaching Out – Using the American Community Survey to Target Enrollment Efforts**
Elizabeth Lukanen, University of Minnesota

**Presenter:** Elizabeth Lukanen, M.P.H., Senior Research Fellow, State Health Access Reform Evaluation, University of Minnesota, elukanen@umn.edu

**Research Objective:** To highlight the American Community Survey (ACS) as a resource to target Medicaid and Exchange outreach. For states striving for universal coverage, the Affordable Care Act Medicaid expansion and insurance exchange provisions offer an excellent opportunity. As we have seen in the past, however, simply expanding eligibility doesn’t lead to maximized coverage gains. States will need to make a concerted effort to reach out to those who are eligible and educate them about the new coverage options. Given the cost of outreach, it is important for states to have a targeted outreach strategy. The
Objective of this paper is to illustrate how the ACS can identify the location of those likely to be eligible for Medicaid and for this exchange and to provide information on key characteristics of interest. In addition, the paper will explore other sources of information that can be used in conjunction with the ACS to further enhance outreach strategies.

**Study Design:** This paper uses three years of the American Community Survey data (2009 - 2011). Potential Medicaid and exchange eligibility is determined by insurance status (uninsured) and income, as defined by a health insurance unit. Descriptive analysis was conducted for select states at the lowest level of geography supported by the data (Public Use Microdata Area – PUMA) and by various characteristics of interest (e.g. age, sex, language proficiency, education, presence of school aged children in the household, receipt of other public programs, etc.). This analysis was mapped and select maps were overlaid with other information of interest (e.g. locations of schools, community center, major cities).

**Population Studied:** Uninsured, non-elderly, non-institutionalized, U.S. Citizens.

**Principal Findings:** In many states, exchange and Medicaid eligible populations are concentrated in specific locations and key patterns emerge at a sub-state level. In some states, the characteristics of individuals in the eligibility categories are similar; but in others, there are key differences. Within each eligibility category, characteristics also differ by geography. Layering maps of likely eligible participants with characteristics like schools and community centers help to illustrate other patterns useful for outreach planning.

**Conclusions:** The large state sample of the American Community Survey makes it an excellent resource in identifying the location of exchange and Medicaid eligible individuals at a sub-state level and to determine their characteristics. Layering these different types and levels of information can help guide effective outreach decisions. For example, you might find that the Medicaid eligible population is significantly older than the exchange-eligible population— in which case you may need separate outreach campaigns across different media outlets to reach each group. Or, if a significant number of Medicaid eligible uninsured are in a family with a school aged children— conducting outreach through schools might be an effective approach (this can be further enhanced by layering on a map of schools).

Assessing education levels across the two income groups can also be useful when considering literacy levels and complexity of outreach messages.

**Implications for Policy, Delivery, or Practice:** Many states are eager to utilize the ACA Medicaid expansion and insurance exchanges to expand coverage. By using the American Community Survey (free and publicly available), states can target their resources to develop a data-driven outreach and enrollment strategy.

**Funding Source(s):** RWJF

**Implications of Undergoing Revision Joint Replacement at a Different Hospital**

Stephen Lyman, Hospital for Special Surgery; Kevin Bozic, UCSF; Christopher Dy, HSS; Timothy Wright, HSS; Robert G. Marx, HSS; Hung Do, HSS; Ting-Jung Pan, HSS; Doug Padgett, HSS

**Presenter:** Stephen Lyman, Associate Professor, Hospital for Special Surgery, lymans@hss.edu

**Research Objective:** The frequency with which patients undergo revision total joint replacement at a different hospital from where they underwent primary joint replacement deserves closer attention because of the financial burden associated with revision surgery. The safety of changing hospitals for revision joint replacement also needs to be better understood to inform regionalization strategies.

**Study Design:** A cohort of 509,211 patients who underwent primary total joint replacement between 1997-2005 in California and New York was identified from statewide all-payer discharge databases. Unique patient identifiers were used to identify referral to a different hospital for revision joint replacement during the study period. Diagnosis codes were used to identify complications following revision surgery. Patient characteristics (age, sex, race, comorbidities, insurance type, preoperative diagnosis), community characteristics (education level, poverty level, population density), and hospital characteristics (annual joint replacement volume, bed size, teaching status) were compared using regression modeling to determine predictors for referral for revision joint replacement and the effect of these referral patterns on complications after revision surgery.

**Population Studied:** All patients undergoing both primary and revision joint replacement in

**Principal Findings:** Revision occurred in 3.3% of all patients, with 30.4% of revisions performed at a different hospital from that of the primary surgery. Medicare and Medicaid patients were less likely to refer for revision than patients with private insurance. The most predictive factor for referral for revision at another hospital was time since surgery. Patients who had their primary surgery at large teaching hospitals and hospitals with high joint replacement volume were less likely to change hospitals. Hospital referral resulted in an increased risk (OR 1.30) of short-term complications following revision surgery. In exploring classes of complication, there was a significant increased risk of orthopaedic complications (OR 1.26) and other medical complications (OR 1.40).

**Conclusions:** The single most influential factor for undergoing revision at a different hospital was the time since primary surgery. Patients may change residences, insurance plans, or primary care provider while the processes underlying the cause for revision are developing. The decision to refer to another hospital may result in a higher likelihood of complication after revision surgery. This may reflect a relative unfamiliarity with the patient's medical conditions in the setting of a referred revision joint replacement.

**Implications for Policy, Delivery, or Practice:** Patients should be educated on the importance of compliance with long-term follow-up with the original treating surgeon. Further, strategies should be explored which would aid in maintaining a continuity of care to mitigate this risk. This provides further evidence of the inefficiency of care derived from a fractured fee for service payment system in which delivery is discontinuous over episodes of care.

**Funding Source(s):** NIH

**Poster Session and Number:** C, #990

**Potential Impacts of the ACA on Receipt of Recommended Preventive Care**

Stacey McMorrow, Urban Institute; Genevieve Kenney, Urban Institute; Dana Goin, Urban Institute

**Presenter:** Stacey McMorrow, Ph.D., Research Associate, Health Policy Center, Urban Institute, smcmorrow@urban.org

**Research Objective:** The benefits of many preventive health care services, including immunizations and screenings for cancer and chronic disease, are well-established. Despite this evidence, the use of many preventive services remains well below recommended levels. The Affordable Care Act (ACA) includes several provisions with the potential to improve receipt of recommended services, primarily by expanding access to affordable health insurance coverage. This paper examines the pre-ACA receipt of eight preventive services by non-elderly adults and considers the contributions of insurance coverage and other factors to their service use patterns.

**Study Design:** We use data from the 2005-2010 Medical Expenditure Panel Survey (MEPS) to measure the receipt of eight preventive services including blood pressure and cholesterol checks, mammograms and pap tests, and flu vaccines. We examine the gaps in receipt of preventive care for adults with incomes below 400 percent of the federal poverty level (FPL) compared to those with higher incomes. We then use a regression-based decomposition analysis to consider the factors that explain the gaps in service use by income. This technique allows us to identify how much of the gap in use between low and high income adults is explained by differences in their observable characteristics, including insurance coverage, education, age, and health status, and how much is due to other factors. We also use multivariate models to predict the change in service use if uninsured adults gain coverage as expected under the ACA.

**Population Studied:** We focus on non-elderly adults (18-64) with incomes below 400 percent of the FPL because they are the target of the ACA coverage expansions and compare their preventive service use to that for adults with higher incomes.

**Principal Findings:** Adults with incomes below 400 percent of the FPL were found to use preventive services at much lower rates than those with higher incomes. Our decomposition results suggest that differences in insurance coverage play a significant role in explaining the gaps in preventive service use between low and high income adults. Differences in age, education, and health status also play important roles, however. Our analysis also finds that covering the uninsured population with Medicaid or private coverage as intended under the ACA would increase preventive service use among the low-income population, but that use of some preventive services is still likely to fall below recommended levels.
Conclusions: Coverage is an important driver of preventive service use and the ACA coverage expansions are therefore expected to result in increased receipt of these services for those gaining new coverage or expanded benefits. However, the importance of factors other than coverage in explaining the gaps in preventive service use for low-income adults indicates that the ACA will not address all barriers to preventive care.

Implications for Policy, Delivery, or Practice: Promoting the importance of preventive care through education and awareness campaigns may help to improve adherence to prevention guidelines. However, the role of providers is critical to individual compliance and incentives for providers to adhere to screening guidelines may therefore prove important in eliminating remaining gaps in preventive care.

Funding Source(s): RWJF

Poster Session and Number: C, #991

How Do Hospitals Compete for Patients?

Hint: It’s Not Based on Price or Quality
David Muhlestein, Ohio State University College of Public Health; Chrisanne Wilks, M.P.A., Ohio State University College of Public Health; Jason Richter, M.B.A., M.H.A., Ohio State University College of Public Health

Presenter: David Muhlestein, J.D., M.H.A., M.S., Doctoral Candidate, Division of Health Services Management and Policy, Ohio State University College of Public Health, muhlestein.1@osu.edu

Research Objective: Determine if price and quality information is available on hospital websites and identify the factors on which hospitals advertise to compete for patients.

Study Design: Review of hospital websites looking for advertising or information on price, quality, patient safety, customer satisfaction, personal stories, service, access, amenities, technology, research, awards, patient education, affiliations and employment opportunities.

Population Studied: Websites of a 10% simple random sample of all Medicare-registered hospitals.

Principal Findings: Only 1% of hospitals advertise or focus on price information while only 19% have hospital websites with any price information available on their website. Price information that is available is limited to billed charges for selected procedures, as opposed to negotiated rates, and no hospitals provide out-of-pocket estimates based on insurer. Quality information is advertised or focused on in only 6% of hospital websites while some quality data is available from 41% of hospital websites. The quality data that is available is limited to a few conditions and is aggregated at the hospital, not the physician, level. 57% of hospitals advertise for specific service lines, 50% advertise based on access and 31% advertise based on amenities. Hospitals do, though, advertise based on proxies for quality such as awards (34%) and advanced technology (24%).

Conclusions: Hospitals do not compete for patients on the basis of price or quality data and the information that is available is insufficient for consumers that do want to choose a hospital based on those factors. Hospitals primarily compete for patients based on services or amenities, indicating a focus on the patient experience of care.

Implications for Policy, Delivery, or Practice: Consumer-directed strategies, such as encouraging health savings accounts, have not led hospitals to compete on the basis of price or quality. Instead, hospitals compete for patients based on experience factors such as location, the quality of rooms or the attentiveness of staff. This may be because patients, at the time of needing hospital care, are more interested in those non-price, non-quality factors. A better approach is to shift the interest in consumer-directed care away from choosing providers at the point-of-service, and instead encourage patients to choose low cost, high quality providers much earlier, such as when they purchase health insurance, rather than waiting until they are sick.

Funding Source(s): No Funding

Poster Session and Number: C, #992

Measuring Health Insurance Literacy: Understanding Consumers’ Ability to Choose and Use Private Health Insurance
Kathryn Paez, American Institutes for Research; Julie Goldstein, American Institutes for Research; Deepa Ganachari, American Institutes for Research; Coretta Mallery, American Institutes for Research; Harmoni Joie Noel, American Institutes for Research; Jennifer Lucado, American Institutes for Research; Eloisa McSorley, American Institutes for Research; Chris Pugliese, American Institutes for Research

Presenter: Kathryn Paez, Ph.D., R.N., Principal Researcher, Health Policy and Research, American Institutes for Research, kpaez@air.org
Research Objective: The research aim is to develop a validated measure assessing the health insurance literacy (HIL) of consumers in the private market. To achieve this aim, we researched the types of problems consumers face in selecting and using health insurance; developed a conceptual model of HIL; and drafted a 100-item pool of questions assessing HIL. As the result of the ACA, mostly low- and moderate-income Americans will have the opportunity to purchase insurance for the first time. Fulfilling the potential of this significant legislation hinges upon consumers’ understanding of health insurance and their options for coverage. Little empirical information is available about what consumers in the private marketplace actually do understand, or how organizations advising consumers and insurance carriers can move past the complexities and communicate insurance concepts and benefit language in a way consumers can apply to their own situations.

Study Design: This mixed methods study included interviews with health insurance counselors and focus groups with consumers. Results of our field test of the HIL measure with 600 consumers will be available by May 1, 2013.

Population Studied: We are studying consumers, age 18 to 65, who have or will purchase commercial health insurance and health insurance counselors working with these consumers. Twenty interviews were held with counselors working in four regions of the U.S. Three focus groups with the newly insured, people with families and those with chronic conditions were held in the mid-Atlantic region and California.

Principal Findings: Interviews with insurance counselors shed light on the challenges consumers experience selecting and using health insurance. Counselors noted that consumers fail to grasp the underlying concept of pooling risk to protect all. Consumers assess the value of insurance by looking at whether the costs incurred through the year for health services and drugs covered by insurance will match or exceed the monthly premium. Consumers frequently purchase insurance under the false assumption that they are covered for all the care they need because they pay a monthly premium. Insurance counselors attribute the assumption to lack of familiarity with provider networks, drug formularies, and authorization processes. Consumers put off reading about their plan benefits because they perceive it requires too much time and is too complicated.

Conclusions: Health insurance is one of the most complex products consumers will ever purchase. Consumers vary in their ability to make informed insurance decisions and navigate health insurance.

Implications for Policy, Delivery, or Practice: A body of evidence created by the use of a validated health insurance literacy measure will move the discussion from the nonspecific--“most consumers know little” and “health insurance is just too complicated”--to targeted action where information and outreach can be systematically tailored to the audience.

Funding Source(s): Other, Missouri Foundation for Health, American Institutes for Research

Poster Session and Number: C, #993

Psychological Attitudes Predict Smoking Cessation Over Time in the Women’s Health Initiative

Ana Progovac, University of Pittsburgh Graduate School of Public Health; Yue-Fang Chang, University of Pittsburgh; Karen Matthews, University of Pittsburgh; Michael Scheier, Carnegie Mellon University; Benjamin Chapman, University of Rochester Medical Center; Robert Wallace, University of Iowa; Catherine Messina, Stony Brook University; Hilary Tindle, University of Pittsburgh

Presenter: Ana Progovac, B.S., PhD Student, Health Management & Policy, University of Pittsburgh Graduate School of Public Health, amp164@pitt.edu

Research Objective: Low levels of optimistic attitudes and high levels of cynical attitudes toward others independently predict morbidity and mortality in Women’s Health Initiative (WHI) participants. At study entry, smokers were less optimistic and more cynical than nonsmokers. The present analysis examines whether
optimism and/or cynical hostility affected future smoking behavior among smokers, particularly postmenopausal women.

**Study Design:** WHI participants who were smokers at study entry (n=10,242) completed the Life Orientation Test-Revised (assessing optimism/pessimism (LOT-R)) and the Cook Medley cynical hostility subscale (both scores divided into quartiles). Multivariable mixed model logistic regression assessed self-reported smoking status (Y/N, ascertained by questionnaire) at 1, 3, 6 years after study entry, adjusted for baseline factors: age; ethnicity; education; insurance status; region; body mass index; cardiovascular disease, diabetes, cholesterol, or hypertension; any alcohol use; physical activity; and smoking pack years. Women were not specifically counseled to quit smoking through WHI.

**Population Studied:** WHI recruited 161,809 postmenopausal women during year 1994-1998 and followed them for up to 9 years in the main study. Women were between ages 50 to 79 years old at baseline, and the sample represents diverse racial, ethnic, and socioeconomic backgrounds across 40 recruiting centers in the United States. Exclusion criteria at enrollment included: substance abuse (aside from smoking or alcohol), mental illness, dementia, life expectancy less than three years, or not planning to live in the same area for at least 3 years. This analysis involves women who reported current smoking at baseline and who had information on psychological attitudes (n=10,242).

**Principal Findings:** On average, women were 61.0 years old (SD 6.8) and had smoked 28.9 pack years (SD 22.2). Over 6 years, 35.7% quit smoking. The least (vs. most) optimistic women were less likely to be high school graduates, physically active, white, insured, or to consume any alcohol (all p=0.001). They were more likely to report diabetes, hypertension, and obesity (all p=0.001) and greater pack-years (p=0.025). Least optimistic women were 33% less likely to quit smoking over time (OR=0.67 [0.56-0.81], p<0.0001), which held after adjustment (OR=0.72 [0.59-0.88], p=0.012). The most (vs. least) cynical hostile women closely resembled the least optimistic women on all factors. The most cynical women were also less likely to quit smoking over time in unadjusted (OR=0.58 [0.48-0.70], p<0.0001) and adjusted models (OR=0.60 [0.49-0.74], p< 0.0001).

**Conclusions:** The least optimistic and most cynical women were less likely to quit smoking over time. These findings underscore the role of psychological attitudes in longitudinal smoking behavior even among older adults.

**Implications for Policy, Delivery, or Practice:** More research is needed to investigate whether cessation programs that are tailored for attitudes (such as low optimism or high cynical hostility) are helpful. In addition, the extent to which psychological attitudes may be modified to assist in smoking behavior change is unclear, as are the precise interventions to effect this change. Whether psychological attitudes may help predict success in other populations (i.e., < 50, male, etc.) also requires further study.

**Funding Source(s):** NIH

**Poster Session and Number:** C, #994

**Patient Activation and Health Literacy as Predictors of Health Information Use in the Netherlands**

Jessica Nijman, NIVEL - Netherlands Institute for Health Services Research; Jany Rademakers, NIVEL - Netherlands Institute for Health Services Research; Michelle Hendriks, NIVEL - Netherlands Institute for Health Services Research; Anne Brabers, NIVEL - Netherlands Institute for Health Services Research; Judith de Jong, NIVEL - Netherlands Institute for Health Services Research

**Presenter:** Jany Rademakers, Dr., Head Of Research Department, NIVEL - Netherlands Institute for Health Services Research, j.rademakers@nivel.nl

**Research Objective:** To examine the relative contribution of patient activation and functional health literacy to the seeking and use of health information in the Netherlands.

**Study Design:** Survey study with self administered questionnaires in which patient activation was measured with the recently translated version of the Patient Activation Measure (Dutch PAM-13), functional Health literacy with the Dutch version of the Set of Brief Screening Questions (SBSQ) and the seeking and use of health information with a set of six statements and questions (Fowles et al. 2009): 1) “I find the internet an important source of information about health and illness”, 2) “I think I can recognize reliable websites about health and illness”, 3) “Do you read books about health and illness?”, 4) “I know where I can find information to compare the quality of care in hospitals.”, 5) “I know where I can find information to compare the quality of health care
Research Objective: In the national debate over rising healthcare spending, the time spent by patients seeking care (and the associated costs of this time) has not been adequately assessed. This time spent on medical care may negatively impact individuals and may result in lost productivity for employers and society. We quantified the time spent by adults seeking medical care for themselves, other adults, or children. Additionally, we estimated variation in time spent by socioeconomic status, and we quantified the cost of time spent.

Study Design: The American Time Use Survey is an annual nationally-representative survey by the Bureau of Labor Statistics. Respondents describe time use during the preceding 24 hours. Using 2003-2010 weighted survey data, we analyzed time spent waiting for and obtaining medical care ("visit time") and time traveling to medical care ("travel time") per visit when seeking care for themselves or another individual. We analyzed visit time stratified by respondent socioeconomic characteristics (education, income, race, age, and rural/urban residence). For employed respondents, we estimated the cost of visit and travel time ("total time") using reported wage data and imputing missing wage data using sociodemographic variables. We estimated total annual ambulatory visit counts and direct medical expenditures using the Medical Expenditure Panel Survey, allowing comparison of direct medical costs and time costs. Analyses accounted for population weights and survey design.

Population Studied: The sample consisted of 2000 members of the 'Dutch Health Care Consumer Panel' of NIVEL, the Netherlands Institute for Health Services Research. The sample was representative regarding gender and age for the Dutch population aged 18 years and older.

Principal Findings: More activated consumers were more likely to seek and use health information. Patient activation proved to be a stronger predictor for seeking and using health information than functional health literacy.

Conclusions: Health information use does not only depend on the level of reading skills, but also on other patient related characteristics such as feeling responsible for one’s own health, motivation to look for information and self-confidence to be able to ask questions.

Implications for Policy, Delivery, or Practice: Health communication strategies, both on an individual and on a public level, will have to address more aspects than literacy alone in order to be effective.

Funding Source(s): Other, Ministry of Health, Welfare and Sport (the Netherlands)

Poster Session and Number: C, #995

The Time Spent Receiving Medical Care in the United States and the Associated Time Costs

Kristin Ray, University of Pittsburgh School of Medicine, Children's Hospital of Pittsburgh; A. V. Chari, Ph.D., Rand Corporation; John Engberg, Ph.D., Rand Corporation; Marnie Bertolet, Ph.D., University of Pittsburgh Graduate School of Public Health; Ateev Mehrotra, M.D., MPH, University of Pittsburgh School of Medicine, Rand Corporation

Principal Findings: Among those seeking care, 49% were employed (n=1925). Based on hourly wages for those employed, the average total time cost per visit was $42 in 2010 dollars. On an annual basis among employed individuals, total time spent seeking medical care was 1.7 billion hours, and total time cost was $37.2 billion.

Conclusions: In the US health care system, the time spent seeking care and costs of this time are substantial. The time spent annually by employed individuals seeking care exceeded the number of hours worked by 800,000 full time employees. For every dollar of direct medical expenditures for outpatient care, 17 cents were
In 2006, Massachusetts residents increased from 86.6% in 2006 to 94.4% in 2010. Massachusetts residents are estimated to have a 7.6% increased probability of being insured compared to residents of neighboring states due to MA-HCR. However, the effect of an individual mandate on rates of insurance among trauma patients is unknown. We sought to examine whether or not an individual mandate would confer higher rates of insurance among injured patients.

**Funding Source(s):** Other, HRSA funded NRSA T32 Training Grant in Primary Medical Care

**Poster Session and Number:** C, #996

**Effect of an Individual Mandate on Rates of Insurance for Injured Patients**

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**Presenter:** Heena Santry, M.D., M.S., Assistant Professor, Surgery and Quantitative Health Sciences, University of Massachusetts Medical School, heena.santry@umassmemorial.org

**Research Objective:** Policymakers theorize that comprehensive healthcare reform (HCR) will increase insurance rates among able-bodied, community dwelling adults 18-64 years old now mandated to purchase subsidized or unsubsidized insurance. Trauma is the leading cause of death and disability for these non-elderly Americans among whom marked socioeconomic disparities in both injury incidence and insurance rates have been documented. In 2006, Massachusetts implemented comprehensive HCR (MA-HCR) including an individual mandate. As a result of MA-HCR, insurance rates among Massachusetts residents increased from 86.6% in 2006 to 94.4% in 2010. Massachusetts residents are estimated to have a 7.6% increased probability of being insured compared to residents of neighboring states due to MA-HCR. However, the effect of an individual mandate on rates of insurance among trauma patients is unknown. We sought to examine whether or not an individual mandate would confer higher rates of insurance among injured patients.

**Study Design:** We undertook a retrospective cohort analysis of trauma registry data utilizing implementation of MA-HCR as a natural experiment. Manual review of discharge billing sheets was used to determine type of personal insurance, or lack thereof, at the time of injury. After excluding 2006-2008 as an implementation period, we compared rates of insurance between in-state residents and out-of-state residents in the pre-HCR period (2004-2005) and the post-HCR period (2009-2010) using univariate tests of association. Multivariable models estimated likelihood of insurance adjusted for demographic factors, injury mechanism, and severity.

**Population Studied:** Adult, non-elderly patients (18-64 years old) from central Massachusetts and surrounding states (NH, RI, CT, NY, VT) that did not implement HCR who were treated during the study periods at our level 1 trauma center located in central Massachusetts.

**Principal Findings:** There were 2,414 patients pre-HCR (11.0% out-of-state, N=266) and 2,745 patients post-HCR (9.8% out-of-state, N=268). In-state and out-of-state patients had similar age and sex distributions but out-of-state residents were more likely to be white (91.2% vs. 80.8%, p<0.0001), sustain blunt trauma (95.7% vs. 90.2%, p<0.0001), and present with severe injury (Injury Severity Score >25: 17.8% vs. 11.9%, p<0.0001). On univariate analyses, insurance rates increased for in-state residents post-HCR (76.7% (1647/2,148) to 84.3% (2088/2477), p<0.0001) and for out-of-state residents (77.4% (206/266) to 83.2% (223/268), p=0.094). In multivariable models including age, race, sex, mechanism of injury, and injury severity, residing in Massachusetts did not increase the odds of having insurance pre- or post-HCR.

**Conclusions:** In this single center study of trauma patients, overall insurance rates for
injured patients were significantly lower than those in the general population, both before and after HCR. We noticed a statistically significant increase in insurance rates from before to after MA-HCR in Massachusetts residents. A somewhat smaller increase for out-of-state residents was also observed but was not statistically significant, possibly due to limited sample size.

**Implications for Policy, Delivery, or Practice:** Further research should address the factors that may simultaneously increase risk of injury and preclude compliance with an individual mandate. Addressing these disparities when implementing insurance exchanges as part of the individual mandate accompanying federal HCR may improve insurance rates among non-elderly, able bodied community dwelling adults.

**Funding Source(s):** NIH

**Poster Session and Number:** C, #997

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**The Growth of Publically Funded Participant-Directed Long-Term Services and Supports Programs in the United States**

Mark Sciegaj, Penn State; Isaac Selkow, Boston College; Kevin Mahoney, Boston College

**Presenter:** Mark Sciegaj, Ph.D., M.P.H., Associate Professor, Health Policy and Administration, Penn State, mxs838@psu.edu

**Research Objective:** Since 2000 numerous changes in federal law, regulation, and policy were implemented to promote the growth of participant-directed long-term services and support (PD-LTSS). However, in 2011 little was known about the actual number of PD-LTSS programs, the populations that they serve, their size, or their policies and procedures. To fill this gap, this study sought to create a comprehensive inventory of PD-LTSS programs in the United States.

**Study Design:** A mail/web survey of 300 program administrators was conducted.

**Population Studied:** The survey of state PD-LTSS administrators identified 212 PD-LTSS programs.

**Principal Findings:** The number of PD-LTSS programs has grown considerably since 2001. PD-LTSS programs serve all ages and types of disability. The number of participants enrolled in these programs has also grown considerably since 2001 but the majority of programs report enrollments of less than 500.

**Conclusions:** Federal policy and program changes have influenced the growth of programs.

**Implications for Policy, Delivery, or Practice:** Further research should address the factors that may simultaneously increase risk of injury and preclude compliance with an individual mandate. Addressing these disparities when implementing insurance exchanges as part of the individual mandate accompanying federal HCR may improve insurance rates among non-elderly, able bodied community dwelling adults.

**Funding Source(s):** RWJF

**Poster Session and Number:** C, #998

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**Community Level Quality Reporting and the Awareness and Use of Physician Quality Information among Individuals with Chronic Illnesses**

Yunfeng Shi, Pennsylvania State University; Dennis P. Scanlon, Pennsylvania State University; Neeraj Bhandari, Pennsylvania State University

**Presenter:** Yunfeng Shi, Ph.D., M.P.A., Research Assistant Professor, Pennsylvania State University, yus16@psu.edu

**Research Objective:** A tremendous amount of resources from all levels of governments and various private organizations have been dedicated to promoting public reporting of care quality. However, up to now, the overall impact of those efforts on care quality and consumer choice seems to be small or unclear. Our study examines consumers’ direct response to information change due to quality reporting. More specifically, we analyze how the change in the amount and relevancy of quality information is related to the change in consumers’ awareness and use of such information. We focus on physician quality information, which is less studied previously.

**Study Design:** We use a unique longitudinal data set built from two major sources: Aligning Forces for Quality Consumer Survey (AF4QCS) and Community Quality Reporting Tracking Database (AF4QTD). Aligning Forces for Quality (AF4Q) is a community based quality improvement initiative funded by the Robert Wood Johnson Foundation. AF4QCS has been conducted in two waves. The baseline survey was completed in 2008, with a 48% response rate. The second round was completed in 2012, with a retention rate of 60%. AF4QTD regularly tracks the number and contents of public and health plan reports released in 14 communities. We estimate our key parameters using a
Influence of Internet and Social Media Use on Patient Provider Communication among Racial/Ethnic Minorities
Sandhya Shimoga, University of California, Los Angeles

Presenters: Sandhya Shimoga, M.Sc MS, PhD Candidate, School of Public Health/Health Policy & Management, University of California, Los Angeles, sshimoga@ucla.edu

Research Objective: While there is some disparity in internet use among racial and ethnic minorities, it is reported often that once the initial barrier of use is removed, use of internet and social media is associated with improved communication among all patients. Current study aims to add to the relatively small number of empirical studies that address such relationships. Study objectives include examining - i) whether there are any differences by race/ethnicity in the use of internet for seeking health related information and ii) whether social media use is associated with better communication with providers. I hypothesize that compared to Whites, racial and ethnic minorities use internet to a lesser extent to seek health related information, and trust health information from the internet to a lesser extent, controlling for SES and other factors. Also, social media use is associated with better communication with providers with no difference with respect to race or ethnicity, controlling for SES and other factors.

Study Design: Data on 3,959 adults from the 2012 Health Information National Trends Survey (HINTS) administered by National Cancer Institute are used for this study. To address the first hypothesis, multivariate logistic regression were conducted with use of internet, use of internet in the past 12 months and trust in internet resources as the outcome variables with race as primary regressor. To address the second hypothesis, ordered logistic regressions were conducted with social media use as the primary regressor and measures for patient communication as outcome variables.

Population Studied: Nationally Representative Adult Sample (n=3,959)

Principal Findings: There was no significant difference by race in the use of internet for seeking health related information. However, Hispanics were found to have lower trust in information on health from internet compared to whites (OR = 0.7, p < 0.05) and similar result was found for other minorities excluding African Americans; there was no significant difference found between African American and White patients in terms of trust. Social media users were found to report higher chances of being able to ask all their questions during healthcare consultations compared to non users (OR p<0.1) and there was no difference between racial groups. Having a regular provider was the most significant predictor of other communication measures such as the ease of understanding provider instructions or being able to be involved in their healthcare decisions.

Conclusions: While use of internet for seeking health information is prevalent among all groups, minorities seem to trust such information to a lesser extent. This may be due to language
barriers or not being able to understand information which is predominantly in English. Moreover, even if they have access to non-English information, there was no information on whether communication with provider happened with the same language. As this is a cross sectional study, it could not be ascertained whether trust in internet resources precedes or follows the use of internet.

**Implications for Policy, Delivery, or Practice:**
Encouraging the use of internet and social media may reduce racial disparities in some aspects of patient provider communication.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #1000

**Enrollment in Medicare Advantage Plans in Miami-Dade County: An Accident of Birth?**
Anna Sinaiko, Harvard School of Public Health; Christopher Afendulis, Ph.D., Harvard Medical School; Richard Frank, Ph.D., Harvard Medical School

**Research Objective:** Evidence from behavioral economics reveals that decision-making in health sector choice environments can be affected by circumstances and choice architecture. We characterized the choice set of Medicare Advantage plans (MA) in Miami-Dade County in 2004-2008, a period when MA became more generous than traditional Medicare (TM) in terms of expected out-of-pocket costs (OOPC) and benefits provided. We then analyze the demand for MA to assess impact of timing, active versus passive decision-making, and other individual characteristics on choice of MA.

**Study Design:** We use a unique dataset on the plan choices of all Medicare beneficiaries to estimate logistic regression models of the probability that a beneficiary is enrolled in MA. Dependent variables include whether a beneficiary enrolled in MA within their first twelve months of eligibility for the program and remain continuously enrolled in MA (which we term being in the “incident cohort”), whether they were enrolled in MA in the previous year, the relative cost of MA vs TM, beneficiary age, race, and the year they became eligible for Medicare. Models include year fixed effects for the period of our data; standard errors are clustered at the beneficiary level.

**Population Studied:** We include all Medicare beneficiaries in Miami-Dade County age 65+ during 2004-2008, except those eligible for Medicaid, the long-term institutionalized, and those enrolled with an insurer outside of Miami-Dade. We analyzed 1,028,772 elderly person-year observations, or about 171,000 beneficiaries per year.

**Principal Findings:** The number, diversity, and generosity of MA plans in Miami grew between 2004 and 2008, including those without physician network restrictions. Among new MA enrollees each year, slightly more than half are from the incident cohort each year and the remainder switch in from TM. Individuals who joined MA during their incident year are significantly more likely than those in the non-incident cohort to be enrolled in MA (marginal effect = 0.08, p<0.001), as are beneficiaries in MA in the prior year (marginal effect 0.28, p<0.001) For beneficiaries in TM, the probability of switching into MA significantly decreases with each year of tenure in Medicare (p<0.05).

**Conclusions:** Becoming eligible for Medicare is the key transition point for MA. Because of the timing of when they aged into Medicare, those beneficiaries turning 65 in 2004-08 disproportionately benefited from entering MA, while those already in Medicare were most likely to be the ones leaving money on the table.

**Implications for Policy, Delivery, or Practice:** The effects of health plan search frictions such as inertia and defaults suggest that policy that helps enrollees in TM overcome a "default" option of staying in TM, evaluate MA options and decide to switch plans will be important to achieving an efficient marketplace for MA plans, for it will create incentives for MA plans to compete for all beneficiaries and not just the newest. Such policy may also make non-incident beneficiaries better off.

**Funding Source(s):** Other, National Institute on Aging

**Poster Session and Number:** C, #1001

**Promoting High-Value Choices to Consumers: Consumer Testing and Education**
Jennifer Stephens, American Institutes for Research; Jill Yegian, American Institutes for Research; Cailin Falato, American Institutes for Research; Lee Thompson, American Institutes for Research
Research Objective: Health reform is expected to reshape health care delivery by aligning provider, purchaser, and consumer incentives to encourage more efficient, evidenced-based care. Much of the cost information that is available has not been meaningful or compelling to consumers—it is not personal nor does it reflect their out-of-pocket costs. There is, however, evidence that demand for cost information is growing among certain populations of consumers, including those with shoppable conditions (e.g., knee replacement), high out-of-pocket costs, and those in search of a new doctor. This study focuses on how consumers respond when presented with public reports of cost information and how coalitions are successfully engaging consumers in making high value choices.

Study Design: AIR conducted 27 one-on-one, 90-minute interviews with health care consumers over three rounds of testing in York County, PA; San Mateo, CA; and Memphis, TN. We asked consumers about the types of costs they search for and consider, where they get that information, and how they view quality of care in terms of cost. Consumers were shown displays of quality and average costs of care for hospital procedures and displays of quality and costs of doctor office visits. Using this information, three coalitions used the information from this and other research to create training sessions to help consumers understand and choose high value care.

Population Studied: We recruited consumers between 18 and 64 years old and a mix of gender, race/ethnicity, education, household income, chronic disease (existence and type), and health insurance type. Consumers showed a vested interest in health care costs (e.g., confirmed that they pay some or all of their health care costs out-of-pocket).

Principal Findings: Our findings suggest that consumers are more likely to understand and apply cost information to make high value (high quality, affordable cost) health care choices that represent their out-of-pocket costs. Consumers are more likely to understand and use cost information in public reports when reports contain quality information, alongside cost information and feature clear labeling and reflect measures relevant to the consumer. Consumers are highly unlikely to change their physician if they have an established relationship even in the face of this information.

Conclusions: There are several ways in which coalitions can support informed decision-making and promote high value choices by consumers: 1) educate both consumers and employers on the importance and availability of high-value health care; 2) target consumers who are responsible for paying for some portion (or all) of the costs of a service out-of-pocket; 3) describe high-value care to consumers as “high-quality care at an affordable cost;” 4) display quality, cost, and other comparative information (e.g., location, office hours) together on a single page; and 5) advocate for collecting and reporting measures that are more compelling and actionable for consumers.

Implications for Policy, Delivery, or Practice: Insurers, employers, providers, and coalitions can educate and encourage consumer choices of high value care through educational programs and advocacy for relevant reporting measures. Programs that engage consumers over a series of training sessions and teach about health insurance, quality, cost, may impact consumer selection of high value care.

Funding Source(s): RWJF

Poster Session and Number: C, #1003

Geographic Distance as a Barrier to VA Women's Health Care Use

Donna Washington, VA Greater Los Angeles Healthcare System & UCLA; Su Sun, VA Greater Los Angeles Healthcare System; Martin Lee, VA Greater Los Angeles Healthcare System; Michael Mitchell, VA Greater Los Angeles Healthcare System; Mark Canning, VA Greater Los Angeles Healthcare System; Elizabeth Yano, VA Greater Los Angeles Healthcare System

Presenter: Donna Washington, M.D., M.P.H., Physician, Professor Of Medicine, Medicine, VA Greater Los Angeles Healthcare System & UCLA, donna.washington@va.gov

Research Objective: Women veterans’ numerical minority within the VA creates challenges to providing universal VA access to women’s health services (WHS). We investigated the influence of distance to VA WHS on women veterans’ VA use.

Study Design: Using a population-based, cross-sectional design, we surveyed 2,174 women veterans about demographic
characteristics, healthcare systems used (VA, non-VA, none), and chronic conditions (none, medical only, mental health). Using geographic information system techniques, we calculated their driving distance to the nearest VA site and to the nearest VA site offering WHS. Administrative data provided VA facility and services used. Multinominal logistic regression identified predictors of use. Zero truncated negative binomial regression estimated effect on number of VA visits for VA users.

**Population Studied:** Population-based sample of 2,174 women veterans (VA users and VA nonusers) residing in southern California or southern Nevada.

**Principal Findings:** The median distance to the nearest VA site was 8.5 miles (range 0.1-161; interquartile range 8.1), and to the nearest VA site with on-site WHS was 19.3 miles (range 0.1-252; interquartile range 23.3). For 58.7% of women veterans, the nearest VA site did not offer WHS. Greater distance to VA sites delivering WHS predicted WHS use outside the VA for those with mental health conditions or with no chronic conditions. Adjusting for age, chronic conditions, and VA priority group, for each 10 mile increase in distance to VA WHS, the relative risk ratio (RRR) favoring no WHS use versus VA use was 1.16 (95% confidence interval [C.I.] 1.03-1.3), and the RRR favoring WHS use outside VA was 1.15 (95% C.I. 1.1-1.2). Among VA users, lack of WHS at the closest VA site was associated with use of more distant sites that offered on-site WHS. Use of VA sites without WHS was associated with lower adjusted visit rate (incidence rate ratio 0.6; 95% C.I. 0.4-0.8).

**Conclusions:** We found geographic barriers to meeting women veterans’ chronic care needs. Lack of close proximity to VA WHS deterred use, particularly among those with mental health comorbidity. Concentration of services at a limited number of sites also led to preferential VA medical center over community-based outpatient clinic use.

**Implications for Policy, Delivery, or Practice:** Interventions to increase access require identifying strategies for ensuring that designated primary care providers with appropriate women’s health expertise are available in geographically dispersed VA sites. Virtual education modalities and virtual support for provision of specialty care services are promising interventions to achieve these aims.

**Funding Source(s):** VA

**Poster Session and Number:** C, #1004

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**Re-Defining Cost and Quality: The Intersection of Consumer Decision-Making, Science, and Art**

Catherine West, Center for Health Information and Analysis; Marjorie Radin, Center for Health Information and Analysis

**Presenter:** Catherine West, Director Of Health Systems Policy And Stakeholder Relations, Health Systems Performance, Center for Health Information and Analysis, catherine.west@state.ma.us

**Research Objective:** In an effort to improve healthcare cost and quality transparency and help consumers and providers to make more efficient decisions, one provision of Massachusetts’ healthcare cost containment legislation calls for a consumer health information website designed to share a variety of cost and quality data. Existing websites with similar objectives address quality but not cost, or address both but have substantial gaps that limit their utility. We examined cross-sector experiences to identify these gaps and develop possible solutions.

**Study Design:** Beginning in September 2012, we conducted a comprehensive literature review to develop an interview guide. We conducted one-on-one key informant interviews with 26 stakeholders, analyzed commentary from 18 stakeholders who responded to our Request for Information, and evaluated 19 existing state and national websites.

**Population Studied:** Stakeholders included Massachusetts health plans, provider organizations, researchers, consumer advocacy organizations, state and national foundations, state and federal agencies, and vendors.

**Principal Findings:** To effectively promote more efficient decision making in healthcare spending, consumer healthcare websites must be both useful and used, two related but distinct objectives. Profound shortcomings exist in both of these areas. Stakeholders indicate that consumers need price and quality information presented together in an easily understandable manner that allows for comparisons. Display is important and simple information is more effective for consumers to understand and utilize. Moreover, total costs and costs to insurers are not immediately relevant to most consumers. Perhaps most significantly, consumers do not use websites they do not know exist. Physicians may not understand the
Association between Local Area Unemployment Rates and Use of Veterans Affairs Primary and Mental Health Care

Edwin Wong, Department of Veterans Affairs; Paul L. Hebert, PhD, Department of Veterans Affairs, Health Services Research and Development; Susan Hernandez, MPA, University of Washington, Department of Health Services; Adam Batten, BA, Department of Veterans Affairs, Health Services Research and Development; Sophie Lo, MS, Department of Veterans Affairs, Office of Analytics and Business Intelligence; Jaclyn M. Lemon, BS, Department of Veterans Affairs, Health Services Research and Development; Stephan D. Fihn, MD MPH, Department of Veterans Affairs, Office of Analytics and Business Intelligence; Chuan-Fen Liu, PhD MPH, Department of Veterans Affairs, Health Services Research and Development

Poster Session and Number: C, #1005

Funding Source(s): No Funding

Conclusions: To improve usefulness, health plan data should be standardized to offer comparative data, and the website should display out-of-pocket costs rather than total cost or insured cost. To improve usability, websites should not assume that patients understand how to access the health care system and data should be plan- (or product-) specific. Data should also be integrated with sites or mobile apps where consumers are already going for reliable and effective health information. Further research may be needed to determine exactly how best to define a target audience, assess consumer-driven needs, and further the goal of more rational, better-value health care consumption with the ultimate goal of better quality (in terms of outcomes and satisfaction) at lower cost.

Implications for Policy, Delivery, or Practice: As states seek to engage consumers in the ACA drive to improve value in healthcare, understanding the gaps in information and evidence-based strategies for outreach are critical. Future policy endeavors, including the Massachusetts consumer website, a plan-based total cost estimator tool, and other public and private consumer engagement initiatives could benefit from considering the various stakeholder perspectives solicited for this study. Collaboration is critical to creating a web-based tool that is meaningful. Focus groups with consumers, followed by end-user testing, implementation and evaluation are next steps.

Study Design: This retrospective cohort study analyzed utilization of primary and mental health care. Using VA administrative databases, we calculated repeated quarterly utilization measures at the facility-level as the total number of visits for patients assigned to a primary care clinic. We measured local area unemployment rates (LAURs) quarterly for each facility as the unemployment rate in the labor market area in which a primary care clinic was located. The impact of the LAUR on VA utilization was examined by estimating fixed effects negative binomial models to account for clinic-level heterogeneity. All regression models adjusted for clinic characteristics (average age, proportion male, clinic size, average patient risk, and clinic type (hospital-based or community-based)) and seasonal variation. To account for differences in VA utilization due to Medicare eligibility, all analyses were performed separately among patients below and above 65 years of age. We then calculated incidence rate ratios, which reflected the percent change in quarterly utilization due to a unit increase in the LAUR, holding all other variables constant.

Population Studied: We used the VA Primary Care Management Module to identify 8,493,362 unique patients receiving care from 972 primary care clinics during Fiscal Year (FY) 2003 to FY2012.

Principal Findings: The mean number of facility-level visits was increasing over time for
all utilization categories and age subgroups. Between FY2003-Quarter 1 (Q1) and FY2012-Q4, the mean number of visits increased from 1,931 to 2,674 for primary care and 1,918 to 3,049 for mental health, among patients under age 65. Between FY2003-Q1 and FY2012-Q4, the mean number of visits increased from 2,412 to 2,493 for primary care and 351 to 738 for mental health, among patients age 65 and over. After covariate adjustment, a one percentage point increase in the LAUR was associated with a 0.96% (p<0.001) increase in primary care visits among patients under 65, but was not associated with primary care utilization among patients over age 65 (-0.10%, p=0.228). For mental health, a one percentage point increase in the LAUR increased visits by 2.06% (p<0.001) for the under age 65 group and 0.81% (p<0.001) for the over age 65 group.

Conclusions: LAURs were associated with increases in primary care utilization among veterans under age 65 and mental health utilization for all veterans.

Implications for Policy, Delivery, or Practice: Collectively, our results highlight the importance of the state of the economy for fiscal planning of government health programs including VA.

Funding Source(s): VA

Poster Session and Number: C, #1006
2009 resulted in approximately 4,580 new enrollees statewide. The calculated enrollment elasticity was 0.058. Therefore, from the lowest average unemployment rate of 4.1 in 2006 to the peak of 11.9 in 2009, an increase of 174 percent, resulted in an increase in the average number of enrollees by just under 10 percent. For every 1 percentage point increase in the unemployment rate, total program expenditures increased 2.1% (p < 0.001). Changes in types of health care expenditures included a 2.8% increase for prescription drugs (p < 0.001), 2.4% for hospital care (p < 0.107), 2.2% for dental services (p < 0.001), 1.9% for outpatient care (p < 0.001), and 1.6% for emergency department services (p < 0.005).

**Conclusions:** ALL Kids enrollment was influenced by county unemployment. This suggests many Alabama families lost insurance coverage and experienced declines in income following job losses. As a result, ALL Kids saw modest expenditure increases. This increase in enrollment occurred despite the number of children in families whose incomes fell sufficiently for them to qualify for Medicaid.

**Implications for Policy, Delivery, or Practice:** The ALL Kids program can use these estimates to anticipate changes in enrollment with rising or falling unemployment rates within Alabama counties. Additionally, projected changes in expenditures can be anticipated in developing the program’s budget.

**Funding Source(s):** Other, Alabama Department of Public Health

**Poster Session and Number:** C, #1014

**Drivers of Health Insurance Coverage in the Decade Prior to the Affordable Care Act**

Fredric Blavin, The Urban Institute; Stacey McMorrow, The Urban Institute; Sharon Long, The Urban Institute; Genevieve Kenney, The Urban Institute

**Presenter:** Fredric Blavin, Ph.D., Research Associate, Health Policy Center, The Urban Institute, fblavin@urban.org

**Research Objective:** The last decade saw large increases in uninsurance rates for adults driven primarily by a decline in the rate of employer-sponsored insurance (ESI). The Affordable Care Act (ACA) is intended to reverse these declines in insurance coverage, but its success will depend on how it addresses the key determinants of recent changes in insurance coverage. Prior research has identified many of the drivers of coverage changes in the 1980s and 1990s, including premium growth, Medicaid expansions, labor market factors, and macroeconomic forces. In this paper, we examine the determinants of coverage changes from 2000 to 2010 and use the results to consider the likely effects of the ACA on insurance coverage overall and for lower-income adults.

**Study Design:** We use data from 2000-2010 Current Population Survey (CPS) to measure changes in insurance coverage and collect data from a variety of sources to capture key determinants of health insurance coverage. We model changes in any, private, and public coverage from 2000-2010 and consider the role of demographic, economic and policy factors in shaping pre-ACA coverage trends. We pay particular attention to the role of changes in premiums, health care costs, and Medicaid eligibility over the last decade as these are the factors most likely to be affected by the ACA.

**Population Studied:** We limit our analysis sample to non-elderly adults ages 19-64 as this is the population targeted by the ACA coverage expansions.

**Principal Findings:** The past decade saw an increase in the nation’s uninsured of nearly 13 million. Results from a descriptive decomposition analysis show that as much as half of this growth in the uninsured appears to be driven by secular changes that led to declines in ESI and that would have led to even greater increases in uninsurance had Medicaid/CHIP not expanded to cover more children and adults.

For the multivariate analysis, we hypothesize that health care costs, overall and as reflected in premiums for private coverage, and eligibility for public coverage will be key factors in explaining trends in health insurance coverage over the last decade. Preliminary data shows rapidly increasing health care costs over the period, combined with a limited expansion of Medicaid eligibility for adults. At the same time, private coverage, including ESI, has declined, with public coverage and uninsurance both growing. Consistent with prior research, we also expect to find that the growth in the unemployment rate and falling incomes during the most recent recession will have had a significant impact on ESI and overall coverage rates.

**Conclusions:** Understanding the impacts of the ACA on insurance coverage will require understanding the structure of the market in which the ACA will be implemented. Trends in
insurance coverage leading up to the ACA reflect the complex interaction of individual and market forces, along with significant state variation in coverage policy.

**Implications for Policy, Delivery, or Practice:**
While we expect the ACA to yield a substantial increase in insurance coverage in 2014, addressing the underlying drivers of declining health insurance coverage, including rising health care costs, will be central to ensuring that those gains are maintained over time.

**Funding Source(s):** RWJF

**Poster Session and Number:** C, #1015

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**Medicaid Undercount in the American Community Survey: Initial Results**

Kathleen Thiede Call, University of Minnesota; Michel Boudreaux, University of Minnesota, SHADAC; Joanna Turner, University of Minnesota, SHADAC; Brett Fried, University of Minnesota, SHADAC

**Presenter:** Kathleen Thiede Call, Ph.D., Associate Professor, State Health Access Data Assistance Center, University of Minnesota, callx001@umn.edu

**Research Objective:** Surveys provide the only source of data describing the distribution of health insurance in the general population and change in coverage over time necessary for evaluating the impact of health reform. The American Community Survey (ACS) is the newest federal survey to add questions about health insurance. The large sample size of the ACS makes it a unique source for understanding coverage dynamics at the subgroup level. However, measuring health insurance coverage is challenging and virtually every survey undercounts Medicaid enrollment. If enrollees do not report Medicaid, estimates of other coverage or being uninsured will be biased upwards and Medicaid estimates will be biased downwards. The extent of the Medicaid undercount in the ACS is currently unknown. We use ACS which has been linked to Medicaid administrative data to describe (1) the extent that the ACS undercounts Medicaid enrollment; (2) the type of coverage reported for those not reported as being Medicaid enrolled; and (3) the geographic and demographic correlates of misreporting.

**Study Design:** We use linked 2008 ACS (the first year health insurance variables were available) and monthly Medicaid Statistical Information System (MSIS) data. This allows us to examine the extent of the Medicaid undercount in the ACS for people enrolled in Medicaid (MSIS) at the time of the survey and what insurance coverage (e.g., private or other public), if any, is reported if not Medicaid. We conduct bivariate and multivariate analysis to examine the correlates of misreporting. We compare the ACS results to published results from the other federal surveys.

**Population Studied:** Non-institutionalized Medicaid population.

**Principal Findings:** Preliminary results suggest that the Medicaid undercount in the ACS tracks closely to undercount estimates from other surveys. The percent of Medicaid enrollees for whom Medicaid is accurately reported varies across surveys and is reasonably high (approximately 75%) in surveys like the ACS, MEPS and NHIS that ask about coverage at the time of the survey and lower in the CPS (57%) that asks respondents to refer back to coverage in the prior calendar year, and results vary by subgroup. The percent of Medicaid enrollees for whom lack of insurance is erroneously reported is low leading to modest upward bias to estimates of uninsurance.

**Conclusions:** This study provides a first look at Medicaid undercount in the ACS. Measuring health insurance is challenging and valid estimates of coverage and coverage dynamics are critical to evaluating health reform efforts. This study indicates that error in Medicaid reporting in the ACS is lower than the CPS and similar to the NHIS and MEPS.

**Implications for Policy, Delivery, or Practice:** Although there is some upward bias in estimates of uninsurance, the bias is modest and consistent with results from other national survey that measure insurance at a point-in-time (ACS, NHIS and MEPS) as compared to the CPS that require that respondents report on health insurance 15-18 months prior to the survey. The level of accuracy and consistency with other national surveys should provide policymakers confidence in using the ACS data to evaluate the impact of the Affordable Care Act (ACA) at the national and state level.

**Funding Source(s):** Other, Census Bureau

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**Perspectives on Co-Management for Rural Veterans from Primary Care Providers in Iowa: A Mixed Methods Study**

Mary Charlton, University of Iowa College of Public Health/Iowa City VA; Anne H. Gaglioti, Department of Family Medicine, University of
Involving quantitative survey data and qualitative study design:

**Study Design:** A mixed methods design involving quantitative survey data and qualitative data from semi-structured telephone interviews was used to elicit information from non-VA providers.

**Population Studied:** Survey instruments were mailed to 270 non-VA primary care providers (PCPs) participating in a Midwestern rural practice based research network in 2011. Providers were asked to indicate if they were willing to participate in a telephone interview.

**Principal Findings:** Of the 270 PCPs in the network, 67 (25%) completed questionnaires and 21 (7%) completed a subsequent interview. Providers who completed the written questionnaire were primarily physicians (94%), predominantly male (76%), and had an average of 19.9 years of service at their current practice. Survey responses indicated 74% found communication with VA to be “poor” or “non-existent” and 42% percent believed poor communication with VA has resulted in poor patient outcomes. Interviews underscored the patient as the main vehicle for information transfer between providers; a practice not viewed as ideal. Non-VA providers felt they were interacting with VA as a system rather than communicating with VA providers as individuals, which they attributed to an inability to identify/access VA providers directly. Interview respondents described their role in caring for veterans as providing continuous care as well as acute, urgent, or emergency care due to limited access to these services at the VA.

**Conclusions:** VA system barriers appear to hinder communication between providers across systems, possibly resulting in fragmented care. Community-based, non-VA PCPs who are caring for rural veterans are frustrated by the lack of communication and care coordination with the VA system and have come to rely on the patient as the vehicle of communication between providers.

**Implications for Policy, Delivery, or Practice:** In light of the expansion of VA healthcare benefits for returning veterans, expansion of Medicaid coverage under the Affordable Care Act, and the continued disproportionate contribution of rural counties to the ranks of active military recruits, the population of rural veterans using (both) VA and non-VA systems will continue to increase. By addressing barriers to communication between VA and non-VA systems with education, outreach, and systems-based improvements, the burden of communication could be transferred from the veteran patient to a less haphazard and medically safer venue. In turn, this could...
potentially result in improved care coordination, patient and provider satisfaction, and improved veteran health outcomes.

**Funding Source(s):** VA

**Poster Session and Number:** C, #1017

Recession Associated Health Care Expenditure Reduction in the United States: Access vs. Intensity

Jie Chen, University of Maryland at College Park

**Presenter:** Jie Chen, Ph.D., Assistant Professor, Health Services Administration, University of Maryland at College Park, jichen@umd.edu

**Research Objective:** The great economic recession 2007-2009 is the longest recession in the United States (US) history. Recent statistics showed that total health care expenditures in US decreased during the recession. This study is going to (1) examine whether recession-associated health expenditure reductions differ along the distribution of health care expenditure. Particularly, we were interested to see whether the health care expenditure reduction was more substantial at the lower end of health care expenditure (proxy for health care access or preference for preventive care) and/or at the higher end of health care expenditure (proxy for intensiveness or quality of care). (2) examine whether racial and ethnic disparities in health care expenditure persisted or deteriorated during the recession.

**Study Design:** We used the nationally representative data set of Medical Expenditure Panel Survey of 2005-2006 and 2008-2009. Our outcome variables were the annual health care expenditures: total health care costs, and costs on different types of health care services, i.e. physician visits, prescription drug, outpatient visit, inpatient visit, and emergency department (ED) visit. Quantile multivariate regressions were employed to estimate the different associations between recession and health care expenditures along its distribution. Race/ethnicity and other covariates were controlled to examine whether recession had different impacts on health expenditures for the minorities.

**Population Studied:** Our analysis included adults aged 18 to 64 years old.

**Principal Findings:** Recessions were significantly associated with lower health care expenditure at the lower end of the distribution (17%, 15%, and 4% reduction of health care expenditure at the 10th-50th percentile of the distribution), but not at the higher end of the health care. Racial and ethnic disparities were more substantial at the lower end of health expenditure. The reduction of health care expenditure was similar for all race/ethnicity. Recessions were associated with significant decrease in prescription drug cost, and it was associated with higher physician costs at the 50th percentile and above. Recessions were significantly positively associated with ED costs along the distribution of health care expenditure.

**Conclusions:** The recession was associated with substantial reduction in receiving primary care, indicating the possible deteriorating health care access induced by the recession, especially among people without health insurance. Our results did not show that recession was associated with the expenditure reduction among those requiring large amount of health care resources. Prescription drug cost reduction might indicate the likelihood of substituting generic drugs for expensive brand name ones, especially among the racial and ethnic minorities. Higher ED costs during the recession suggested the importance to restore the efficiency of providing health care access. Increased physician expenditures at the higher end of the distribution might show some evidence of physician supplier induced demand. Racial and ethnic disparities faced substantial barriers in health care access compared to the whites, and these disparities persisted during the recession.

**Implications for Policy, Delivery, or Practice:** Our results provided evidence that Affordable Care Act has the potential to buffer the disproportionate reductions in health care cost induced by the economic downturn.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #1018

Financial Burden of Medical Care: A Family Perspective

Robin Cohen, National Center for Health Statistics; Whitney Kirzinger, National Center for Health Statistics; Renee Gindi, National Center for Health Statistics

**Presenter:** Robin Cohen, Ph.D., M.S., Statistician, Division of Health Interview Statistics, National Center for Health Statistics, rcohen@cdc.gov

**Research Objective:** Recently published data from the National Health Interview Survey
Health insurance coverage provides a means for mitigating financial risk associated with health care costs. As more persons gain coverage under the Affordable Care Act (ACA), it is important to monitor the financial burden of medical care. This paper will explore family and person level demographic characteristics and their association with financial burden of medical care.

Study Design: This study used NHIS data, which are nationally representative of the civilian noninstitutionalized population. Data were derived from the NHIS Family component, which collects information on all family members in each household. In 2011, three new questions addressing financial burden of medical care were added to the NHIS Family component. These questions addressed problems paying medical bills, paying medical bills over time, and having medical bills that cannot be paid at all. A composite measure of any financial burden was developed based on a positive response to “problems paying medical bills in the past 12 months” or a positive response to “currently have medical bills that are being paid over time.” For those families that currently have medical bills being paid over time, there may not be negative consequences. In 2011, information was collected on 40,496 families and 101,875 persons.

Population Studied: Civilian noninstitutionalized resident population of the United States

Principal Findings: Based on the person level analysis, children aged 0–17 years were more than three times as likely as adults aged 75 and over to be in families having problems paying medical bills in the past 12 months. Analysis on a family level confirmed these findings, as families with children are more likely to experience financial burden for medical care than families without children. The highest level of financial burden for medical care was found in families between 100%-199% of the federal poverty level (near poor). Families with mixtures of health insurance coverage types (e.g. some members with private health insurance and other with public coverage) experienced greater financial burden than those families where all persons had private health insurance. Additional analyses using logistic regression techniques are still underway to examine an individual’s age, race and ethnicity, and health status with financial burden of medical care and a family-based complementary examination of family health insurance status, family composition, size, and poverty level and their associations with financial burdens for medical care.

Conclusions: Families with children, near poor families, and families who have a mixture of health insurance coverage types within the family unit are the most likely to experience financial burden.

Implications for Policy, Delivery, or Practice: One of the goals of ACA is to make medical care for affordable (through subsidies, tax credits, and provision of essential health services). The NHIS can be used to monitor the financial burden of medical care in the United States as new provisions of the law become effective.

Funding Source(s): No Funding

Poster Session and Number: C, #1019

State Variation in Perceptions of Health Insurance Coverage by the Uninsured: Implications for the Affordable Care Act

Peter Cunningham, The Center for Studying Health System Change; Amy Bond, Center for Studying Health System Change

Presenter: Peter Cunningham, Ph.D., Senior Fellow, The Center for Studying Health System Change, pcunningham@hschange.org

Research Objective: Prior research has shown that whether people have positive or negative perceptions of health insurance strongly influences whether they enroll in coverage or remain uninsured. The purpose of this paper is to examine variation across states in the percent of uninsured who agree that (1) they are healthy enough that they don’t need health insurance, and (2) health insurance is not worth the cost.

Study Design: Analysis of the 2002-2009 Medical Expenditure Panel Survey. MEPS has the capability of producing state-specific estimates for the 29 largest states. Multiple years of the MEPS are pooled to increase state-specific samples of the uninsured and the statistical precision of estimates. Estimates of state variation in perceptions of health insurance coverage by the uninsured adjust for differences in characteristics of the uninsured, including their age, health status, prevalence of chronic conditions, family income, race/ethnicity, and general tolerance of risk.

Population Studied: Adults age 18-64 who were uninsured the entire year.
**Principal Findings:** Nationally, about 18 percent of the uninsured say that they do not need health insurance, while 38 percent say that health insurance is not worth the cost. However, there is considerable variation across states in these perceptions. The percent of uninsured who say they do not need health insurance ranges from about 12 percent in the state of Tennessee to 27 percent in Colorado. The percent who say that health insurance is not worth the cost ranges from about 31 percent in Tennessee to 46 percent in Pennsylvania. Differences in characteristics of the uninsured across states explain some but not all of the state variation in perceptions. Additional analysis suggests that there are differences across states in the “culture of insurance” that influences perceptions. For example, the uninsured have more favorable perceptions of health insurance coverage in states where (1) the insured population also have favorable perceptions; (2) a higher percentage of small businesses offer coverage to workers, and; (3) state Medicaid spending on low income populations is greater.

**Conclusions:** The results of this study show that perceptions of health insurance coverage by the uninsured – and therefore whether they are likely to enroll in the ACA’s coverage expansions – vary considerably across states. Most of the variation is not explained by differences in the characteristics of uninsured people, and to some extent reflects differences across states in the culture of health insurance coverage.

**Implications for Policy, Delivery, or Practice:** The Affordable Care Act will increase insurance coverage through expansions of Medicaid eligibility and premium subsidies for uninsured people. Federal and state governments have a variety of strategies planned and underway to encourage enrollment in the new coverage options. Despite tax penalties for failing to enroll, some states are likely to encounter greater resistance from their uninsured populations in enrolling in coverage, and should emphasize strategies that include educating and promoting the value and importance of insurance coverage.

**Funding Source(s):** RWJF

**Poster Session and Number:** C, #1020

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**Drug Access, Medication Adherence and Medical Expenditures for Medicare Patients with Congestive Heart Failure**

Timothy Dall, IHS Global Insight; Paul Gallo, IHS Global Insight; Tericke Blanchard, IHS Global Insight; Samantha Shoemaker, Pharmaceutical Research and Manufacturers of America; Jennifer Bryant, Pharmaceutical Research and Manufacturers of America

**Research Objective:** It is widely acknowledged that increasing appropriate use of medications offers significant opportunity to improve health outcomes and realize greater value from our healthcare system. However, research consistently demonstrates that prescription medications are often not used as directed. Congestive heart failure (CHF) represents one example of a prevalent and costly condition for which there is room for improvement in ensuring adequate levels of medication adherence. Evidence suggests adherence rates are in the range of 50%-70%. Medicare Part D exemplifies one opportunity to increase access to and use of medications, and a growing body of literature suggests this to be the case. This study quantifies the healthcare utilization and expenditure implications of Part D implementation for patients with CHF.

**Study Design:** Using the 2006-2010 Medical Expenditure Panel Survey (MEPS), we identified a nationally-representative sample of individuals diagnosed with CHF (N=1,012). In combining empirical analysis with evidence derived from peer-reviewed literature, we examined the relationship between Part D, medication utilization, and use of other healthcare services. We stratified the study sample to estimate average expenditures per encounter and rates of utilization for hospitalizations, emergency visits, ambulatory visits, and home health visits. Cost data were obtained from the MEPS and 2010 Nationwide Inpatient Sample (n=71,147 with CHF as the primary diagnosis), applying hospital-specific cost-to-charge ratios to estimate average expenditures per hospitalization. A microsimulation procedure was utilized to estimate the impact of Part D and subsequent increases in medication utilization on the probability and rate of use for other healthcare services.

**Population Studied:** Approximately 2.2 million people in the U.S. were diagnosed with CHF in 2012, of which approximately 1.3 million are in the Medicare program.

**Principal Findings:** CHF-related medical expenditures totaled $6.5 billion in 2012.
(including $3.7 billion for Medicare patients). Based on review and analysis of literature, the implementation of Part D was associated with a 10.0% weighted average increase in prescriptions used to treat CHF annually and a 9.6% increase in total annual prescriptions. The impact of Part D on drug utilization was over three times greater among CHF patients with no or limited prior coverage. Additionally, we calculated that Part D reduced CHF expenditures by approximately 2% (or $60/CHF beneficiary in Medicare for a total of $73 million in savings annually. Despite increased medication use, adherence levels remain suboptimal. Improving adherence to reach target levels (80% or better) could reduce CHF-related health care use by 7.6% ($491 million among the entire CHF population and $278 million among Medicare beneficiaries annually).

**Conclusions:** Establishment of Part D had a significant impact on improving adherence to medications prescribed to treat CHF, and results in reductions in healthcare use, overall medical expenditures, and saved lives. **Implications for Policy, Delivery, or Practice:** Improved access and adherence to treatment regimens can reduce potentially avoidable hospitalizations, emergency visits, and other healthcare use. These findings support the value of implementing programs or policies aimed at improving appropriate medication use. **Funding Source(s):** Other, Pharmaceutical Research and Manufacturers of America **Poster Session and Number:** C, #1021

**Potential Impact of the Affordable Care Act on Non-Elderly Adult Cancer Survivors**

Amy Davidoff, Agency for Healthcare Research and Quality; Steven Hill, Agency for Healthcare Research and Quality; Didem Bernard, Agency for Healthcare Research and Quality; K. Robin Yabroff, National Cancer Institute

**Presenter:** Amy Davidoff, Ph.D., Senior Economist, Center for Financing, Access and Cost Trends, Agency for Healthcare Research and Quality, amy.davidoff@ahrq.hhs.gov

**Research Objective:** Adults with active cancer or a cancer history may face limited insurance options due to difficulties gaining or sustaining employment, reduced offers of employment related insurance (ESI), particularly in small firms, and/or difficulty purchasing insurance in the non-group market. We examined existing health insurance options, and the potential of the Affordable Care Act (ACA) to improve access to insurance for cancer survivors through adult Medicaid expansions and insurance exchange subsidies. **Study Design:** We used data from the 2008-2009 Medical Expenditure Panel Survey (MEPS) household component. Adjusted gross income, modified to include Social Security payments, was used to compute income as a percent of the federal poverty level (%FPL). Federal and state specific Medicaid and CHIP eligibility rules were applied to relevant income and assets to identify currently eligible survivors. To assess eligibility under the ACA, respondents were stratified based on income relative to the threshold of 138% FPL (Medicaid), 400% FPL (subsidized insurance exchanges), and >400% FPL (unsubsidized insurance exchange) with adjustments for citizenship and immigrant status. Insurance-related hardship was based on reported delays or unmet need for medical, prescription, or dental care in a 12 month period, and/or out-of-pocket burden that was 20% or more of simulated after-tax income. Weights adjusted for multiple responses. **Population Studied:** The cohort included cancer survivors aged 18-64 years identified as “ever told by a physician that you had cancer.” **Principal Findings:** The cohort included 1694 cancer survivors, 65% female, 83% white non-Hispanic, 62% currently married. 69% had employment related insurance (including Tricare), while 16% were uninsured. Overall 19% of cancer survivors reported either delayed or forgone healthcare due to costs or insurance issues, including 39% of the uninsured. Overall 14% of cancer survivors were eligible for Medicaid or CHIP pre-ACA, including 12% of the uninsured. Two-thirds of the cohort had offers of ESI from employers, including 34% of the uninsured. Assuming full implementation of the Medicaid expansions, 22% would be Medicaid eligible under the ACA, including 42% of the uninsured. One third of cancer survivors would be eligible for the subsidized participation in the insurance exchanges, as would 39% of the uninsured. Of those reporting a financial access burden, 49% would be eligible for Medicaid under ACA, and an additional 35% would be eligible for subsidized participation in insurance exchanges. **Conclusions:** A substantial proportion of non-elderly adult cancer survivors were uninsured and the uninsured disproportionately report financial burdens or reduced access to care. A small portion of the uninsured failed to takeup
available public coverage, while one third did not enroll in offered ESI. Under the ACA, most of the uninsured, and an even larger proportion of those facing access problems would be eligible for Medicaid or subsidized insurance.

Implications for Policy, Delivery, or Practice: Full implementation of the ACA would dramatically enhance insurance availability, and be likely to reduce access barriers for vulnerable adults with cancer. Further research on take-up of currently available Medicaid or employment related insurance will help to inform likely effects of ACA on realized insurance coverage for cancer survivors.

Funding Source(s): AHRQ
Poster Session and Number: C, #1022

Barriers to Providing Contraceptive Care Under the Women’s Health Waiver

Ruth Eudy, University of Arkansas; Loretta Alexander, UAMS College of Public Health; Victoria Evans, Hendrix College

Research Objective: The Arkansas Medicaid Women’s Health Waiver (WHW), begun in 1997 as the Family Planning Waiver, has resulted in significant reductions in unwanted pregnancies and over $743 million in cost savings through Demonstration Year 2011. However, although the number of private providers participating in the WHW has steadily increased, approximately 80% of women who receive family planning services through the WHW continue to use local public health clinics. Previous evaluation reports noted private provider turnover rates between 26% and 36%, rates not easily explained by available data. The Centers for Medicare and Medicaid Services (CMS) asked the evaluators to determine the reasons private providers may elect not to participate. Subsequently, the evaluation team included a survey to determine private providers’ knowledge of WHW services and what they perceived as barriers to participation.

Study Design: A population-based survey was conducted using Dillman survey methods, with mail and telephone follow-ups. Quantitative data analyses included descriptive statistics, Chi-Square tests for differences in proportions and t-tests for differences in means. Qualitative data analysis included sorting open-ended responses by typology or theme.

Population Studied: All Arkansas-licensed and practicing physicians, registered nurses and nurse practitioners providing health services to women of childbearing age.

Principal Findings: Among physician respondents 73% did provide reproductive health services. Among those who did, 88% were aware of the WHW. However, only 39% participated. Among nurse respondents 65% provided reproductive health services; 83% of these were aware of the WHW; and 42% participated. Respondents were asked to select reasons they believe that providers may have difficulty participating. Both physician and nurse providers rated all barriers higher than the mean of 3 on a 5-point Likert scale. For both groups, the only significant difference between WHW participants and non-participants was that non-participants were significantly more likely (t = 4.07 , p < 0.0001 for physician non participants; t = 2.58, p < .01 for nurse non-participants) to find that problems with billing Medicaid were barriers, not the actual reimbursement rates or other attributes of the WHW services.

Physicians were more likely (t = 2.26, p < 0.03) to perceive that the WHW’s lack of coverage for health conditions other than reproductive health is a barrier to provider participation. Nurses were more likely (t = -2.05, p < 0.05) to find that problems with reimbursement were a barrier. The survey concluded with one open-ended question soliciting comments about barriers to participation. The most common themes in the qualitative responses were lack of knowledge about the program and concern about providing or referring for services that weren’t covered.

Conclusions: Although a majority of providers are aware of the WHW, fewer than 50% participate. Physicians find the limited coverage under the waiver to be a barrier to providing care; other providers cited reimbursement issues as the primary barrier.

Implications for Policy, Delivery, or Practice: These findings will serve to inform providers and policy makers as we move forward with implementation of contraceptive care measures as an integral part of preventive care within the Affordable Care Act.

Funding Source(s): CMS
Poster Session and Number: C, #1023

Evaluation of the Children’s Health Insurance Program (CHIP) Outreach and Enrollment Grant Program: Cycle I Grantees
Janet O’Keefe, RTI International; Kathleen Farrell, RTI International
**Presenter:** Kathleen Farrell, Project Director, RTI International, kfarrell@rti.org

**Research Objective:** Conduct a formative evaluation to determine effective strategies to enroll and retain eligible children, identify major challenges and methods to overcome them, and identify key lessons learned about outreach and application assistance that can be used to inform other initiatives.

**Study Design:** Reviewed grant applications, and quarterly, annual, and final reports on grant activities and outcomes over the two year grant period. Collected additional information from grantees through telephone interviews and e-mail communications. Synthesized information from grant reports and grantee interviews into standardized annual and final report summaries.

**Population Studied:** 68 Cycle I grantees, including nonprofit community-based organizations, state primary care associations, legal aid organizations, and county and state agencies.

**Principal Findings:** In states that have enrolled a high percentage of the eligible CHIP/Medicaid population, it is extremely difficult to locate and enroll the remaining eligible children. Specifically tailored methods and strategies to contact the remaining hard-to-reach eligible uninsured children are needed. Outreach and education are important, but not sufficient to increase enrollment. Face-to-face assistance leads to more completed applications because many people have difficulty completing the paperwork. The uninsured, CHIP/Medicaid-eligible population is not homogeneous so multiple strategies are needed to find and enroll eligible uninsured children, particularly those in rural and remote areas and in hard-to-reach groups. Prior to implementing initiatives, it is essential learn what types of outreach and assistance strategies work best with the targeted audience, and customize marketing strategies and materials to meet their specific needs. An enrollment strategy that is effective at one time in one area may not be effective elsewhere or at other times. Even what seems to be the most culturally appropriate, community-focused outreach strategy may not yield the anticipated number of uninsured eligible children. Despite best efforts, some strategies will not work due to factors that cannot be controlled, although assessing the circumstances may provide information that can be used to modify the approach or use it in a setting where it might be more successful.

**Conclusions:** Major shifts in numbers (positive or negative) are the result of major policy changes, such as expanding eligibility to permit parents to enroll or creating a fast-track eligibility determination process. Although community-based efforts play an important role, the ease or difficulty with which uninsured children can be enrolled and stay enrolled are the most important factors. Allowing families to self-declare income and using searchable databases to document identity and citizenship would help to reduce denials because of lack of required documents. Renewals would be facilitated by state policies that allow passive renewals; pre-populated renewal forms; allowing parents to call-in renewal information; 12 month continuous eligibility; and “re-set the clock” policies that allow renewals for another 12 months at any time during the year, for example, when a child uses health services.

**Implications for Policy, Delivery, or Practice:** The findings provide policymakers, state officials, and other stakeholders with important insights into effective approaches for enrolling eligible children, which can be applied as the ACA is implemented.

**Funding Source(s):** CMS

**Poster Session and Number:** C, #1024

**Medicaid Reimbursement Policy for Statins: Implementation and Utilization Impact**

Michael Fischer, Brigham and Women's Hospital/Harvard Medical School; Jennifer M. Polinski, Brigham and Women's Hospital; Lindsay Ritz, Brigham and Women's Hospital; Niteesh K. Choudhry, Brigham and Women's Hospital; Sebastian Schneeweiss, Brigham and Women's Hospital

**Presenter:** Michael Fischer, M.D., M.S., Associate Professor Of Medicine, Division of Pharmacoepidemiology and Pharmacoeconomics, Brigham and Women's Hospital/Harvard Medical School, mfischer@partners.org

**Research Objective:** State Medicaid programs struggle to control medication costs, often using policy tools such as prior authorization (PA) or preferred drug lists (PDL) to direct drug use. It is unclear whether these policies succeed in reducing the use of overly expensive medications or encouraging the use of highly effective generic medications. Statins, the most

**Funding Source(s):** CMS
widely used lipid-lowering medications, offer a useful case study since both generic and brand-name options are available with differing costs but similar efficacy.

**Study Design:** Detailed policy data were collected from state Medicaid agencies on whether PA or PDL policies were in place for specific statins from 2002-2009. State-level aggregate Medicaid drug use data for each calendar quarter in each state were obtained from the Centers for Medicare and Medicaid services. We evaluated the impact of PA or PDL policies on the composition of statin prescribing (branded statins as a percentage of all statins), and on the cost of statins (statin cost per prescription).

**Population Studied:** 50 Medicaid programs (49 states plus DC).

**Principal Findings:** At the start of 2002, 13 states had statin-specific policies in place (7 with PA, 5 with PDL, 1 with both) and 37 states had no policies. Implementation of both types of policies increased sharply in 2003-2004 and at the start of 2005 only 10 states had no policies while 34 states had both PA and PDL for statins. At the end of 2009 just 3 states had no policies in place. Statins accounted for 2-3% of all Medicaid prescriptions from 2002-2005, with similar rates in states with and without policy. Statin use dropped in all states in 2006 as older patients obtained Medicare drug coverage, averaging 1.5% of prescriptions through the end of the study period.

States using PA policies alone used 20% fewer brand-name statins (75% vs 95%) than other states until late 2006, at which time generic simvastatin became available. In early 2007 use of brand-name statins equalized across states and declined in parallel from 70% to 40% by the end of the study period. Cost per statin prescription was similar across states initially and decreased in all states after generic simvastatin became available. By the end of 2009 the average cost per statin prescription was $61 in the three states with no statin policy and $55 in states using both PA and PDL policies.

**Conclusions:** States that used PA policies for statins had initial success in controlling the use of more expensive brand-name versions, but these effects were swamped by the generic availability of simvastatin, one of the most widely used agents in the class. Most states implemented both PDL and PA policies, though the rates of brand-name statin use and cost per prescription were similar in these states compared to states with no policy.

**Implications for Policy, Delivery, or Practice:** Some Medicaid policy tools can affect the medications used by beneficiaries, but our results do not show large and consistent impacts on medication costs. Since there are substantial administrative costs to implementing these policies, further studies using patient-level data will be required to determine whether these policies are changing clinical decision-making and are cost-effective for Medicaid programs.

**Funding Source(s):** AHRQ

**Multiple Risks, Multiple Jeopardy: Effect of Medical Shocks on Meeting Basic Needs in a Time of Recession**

**Ashley Fox, Mount Sinai School of Medicine; Mark J. Schlesinger, Yale University**

**Presenter:** Ashley Fox, Ph.D., M.A., Assistant Professor, Health Evidence and Policy, Mount Sinai School of Medicine, ashley.fox@mount Sinai.org

**Research Objective:** Although a good deal of research has examined the effect of being uninsured, few studies have assessed the economic and health-related impacts of large medical expenses on insured Americans. These can affect Americans lives in three distinct ways: (1) as additional medical costs not covered by insurance, (2) as additional costs for rising insurance premiums, and (3) as losses of earnings that coincide with medical expenses, if serious illness keeps people from working. Drawing on a unique panel dataset collected in the wake of the recent economic crisis, the objective of this research was to examine the impact of large medical expenses on insured Americans’ well-being, a problem arguably left unaddressed by the ACA.

**Study Design:** The Survey of Economic Risk Perceptions and Insecurity (SERPI), was fielded as part of the nationally representative American National Election Survey (ANES) 2008-2009 Panel Survey. Given its panel design, the dataset allows for an analysis of the timing of economic and health sequelae following the experience of incurring a recent large medical expense or a co-occurring loss of earnings associated with being too sick to work. Outcome measures included economic harms (losing one’s house, being evicted, unpaid bills, deep indebtedness, draining retirement), health harms
(refraining from going to the doctor, bringing one’s child to the doctor, or buying medications because of cost), basic needs (hunger and food insecurity) measured in 2009. Controls included gender, race, age, education, household income and wealth, measured in 2008.

**Population Studied:** A random sample of 2,203 adult Americans completed the survey.

**Principal Findings:** Eight percent of the sample experienced a large out-of-pocket medical expenditure, 10% experienced an increase in the cost of coverage, and 7% lost time from work due to illness or injury in the past 6 months. Insured individuals who had experienced a large out-of-pocket medical expenditure were four times more likely to be suffering from moderate food insecurity and twice as likely to report not having bought drugs because of cost. Individuals who had experienced an increase in the cost of coverage were more likely to be hungry and experience severe food insecurity, and to have not taken a child to the doctor because of cost and financial problems. Individuals who have been kept from work because of an injury were more likely to report moderate food insecurity and having lost their home.

**Conclusions:** Even without among those with health insurance, large medical expenditures resulted in significant economic hardship and negative health-related coping behaviors. Few of these economic strains are addressed by the Affordable Care Act, where, in spite of large subsidies to purchase health insurance up to certain thresholds, many are concerned that health insurance will continue to put significant financial strains on households that can compromise their health and economic stability.

**Implications for Policy, Delivery, or Practice:** Continuing to look for ways to smooth medical costs to consumers and reduce cost inflation will be necessary to diminish the economic and health related sequelae associated with rapidly rising costs of health care.

**Funding Source(s):** Other, Rockefeller Foundation

**Poster Session and Number:** C, #1026

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**The Impact of Retail and Urgent Care on Conventional Primary Care Appointment Availability**

Ari Friedman, University of Pennsylvania; Karin V. Rhodes, Perelman School of Medicine, University of Pennsylvania; Daniel Polsky, The Wharton School, University of Pennsylvania

**Presenters:** Ari Friedman, B.A., MD/PhD
Student, Wharton Health Care, University of Pennsylvania, abfriedman@gmail.com

**Research Objective:** Traditionally, patients seeking general outpatient care have turned to conventional primary care clinics (PCCs), which provide scheduled, longitudinal, outpatient care. Patients’ ability to obtain timely access to their primary care provider has declined, however. Retail clinics (RCs) and urgent care clinics (UCCs), which treat similar conditions but which emphasize unscheduled, episodic care, have developed to fill this gap. Little is known about how RCs and UCCs affect access, which patients these clinics serve, and whether PCCs respond to RC and UCC entry (for instance, they might reorganize to increase appointment availability).

This study investigates the interrelationships between three aspects of access to primary care: appointment wait times (days to next available appointment), geographic accessibility, and insurance acceptance.

**Study Design:** Clinic locations were obtained from Merchant Medicine (UCCs), SK&A Healthcare (PCCs), and directly (RCs). The Area Resource File supplied county provider density (mid-level and physician providers per capita). The 2010 Census furnished population counts and demographics. InterStudy provided county insurance proportions. To measure appointment availability, we made over 10,000 telephone calls to traditional primary care clinics (PCCs, not RCs or UCCs) using simulated patients. Calls were randomized by scenario (urgent primary care versus less urgent) and insurance status (Medicaid, private insurance, and uninsured).

To assess the impact of RC and UCCs on PCC appointment wait times, we will match PCCs close to RC/UCCs to those far from one, then compare outcomes via Weibull regression. Matching will be based on clinic provider count, and area characteristics (population, income, urbanicity, provider density, and percent elderly, Hispanic, and black).

We also regressed clinic counts against controls for area characteristics (as above) via negative binomial regression for all 784 counties in the ten study states.

**Population Studied:** Non-elderly, non-pediatric population in ten states.

**Principal Findings:** RCs and UCCs contributed to more geographic availability of episodic care in rural states. For example, 13 percent of
Montanans have a UC within 5km, compared to 65 percent for PCCs. Whereas for Massachusetts, 3 and 95 percent of the population have an UC or PCC within 5km. In county regressions, RCs and UCCs were significantly more likely to serve areas with high uninsurance than were PCCs. Complete data from the telephone study will be available in early March 2013. We will then assess the impact of proximity to RC and UCCs on appointment availability by insurance status using the matching strategy. We will also estimate how much further each individual must travel to reduce their PCC appointment wait time by one day. By re-estimating this statistic with the addition of RCs and UCCs, we will quantify their contribution to greater access.

Conclusions: The addition of for-profit unscheduled care to the primary care landscape has altered the choices available for some patients. RCs and UCCs appear to serve a more disadvantaged population than do PCCs.

Implications for Policy, Delivery, or Practice: RCs and UCCs have the potential to increase access, but may also fragment care due to their lack of a longitudinal relationship. Policymakers should prioritize interoperable health information technology and increased payment for care coordination to mitigate these effects.

Funding Source(s): RWJF
Poster Session and Number: C, #1027

Gender Differences in Healthcare Cost, Use, and Insurance Coverage
Paul Gorrell, IMPAQ International LLC; Laney Light, IMPAQ International

Presenter: Paul Gorrell, Ph.D., Senior Research Scientist, Health Data & Systems Analysis, IMPAQ International LLC, pgorrell@impaqint.com

Research Objective: To investigate gender differences in healthcare cost, use, and insurance coverage in order to increase our understanding of the policy implications of changes in health insurance as they affect men and women 45-64 and 65 and over.

Study Design: The Medical Expenditure Panel Survey (MEPS) is a nationally representative survey of the civilian, non-institutionalized, population. This study uses recently released data for 2010 to generate person- and event-level estimates of healthcare cost, use, and insurance coverage. The study analyzes data by gender for two age groups: 45-64 and 65 and over. Data were analyzed using statistical software which accounts for the complex design properties of MEPS and generates valid variance estimates. Weighted, nationally-representative estimates are reported overall and by gender for the specified age ranges.


Principal Findings: This study presents a detailed look at gender differences in healthcare cost, use, and insurance coverage among adults 45 and over. It is well documented that healthcare costs are not evenly distributed among the population. Consistent with prior work, we find that in 2010 the top 5% of the civilian population ranked by their healthcare expenditures account for 50% of all healthcare expenditures. Overall women represent 51% of the civilian (and MEPS) population but account for 54% ($707 billion) of the $1.26 trillion in 2010 civilian healthcare spending. Prior studies have associated this with the difference in life expectancy (80 years for women; 75 for men). However, we report a similar pattern for the 45-64 population, with women accounting for 56% of healthcare expenditures (and 51% of the 45-64 population). This difference cannot be due to life expectancy differences. We also report significant gender differences in the patterns of use and insurance coverage among both age groups. Hospital inpatient stays and prescribed medicines account for over half of all expenditures. More than 1 in 4 (27%) of the top 5% had 2 or more inpatient stays in 2010, with females comprising 71% of those with 2 or more hospital stays. Women had more hospital stays on average in 2010, but among those with an inpatient stay, men in each age group had higher per-person and per-stay costs, as well as longer lengths of stay. Women 45-64 had higher per-person prescribed medicine costs, but the gender difference was not significant for the 65-and-over population. We also report important differences in insurance coverage for the 45-64 age group, with almost 10% of women on Medicaid at some point in 2010, compared with 5.8% of men. Women were significantly more likely than men to have only public insurance coverage for all of 2010.

Conclusions: A detailed investigation of gender differences among men and women 45-64 and 65 and over reveals a complex pattern of cost, use, and insurance coverage differences that cannot be accounted for by any single factor such as differences in longevity. In particular,
different patterns emerge for the 45-64 population with women accounting for the majority of overall costs, but men, for example, having higher per-person and per-stay costs for inpatient stays. With respect to insurance coverage, changes in Medicaid and public insurance options will affect a higher percentage of women than men based on the reported findings.

**Implications for Policy, Delivery, or Practice:**
The results of this study extend current knowledge and increase our understanding of gender differences in cost, use, and insurance coverage for the two age groups studied. Understanding the reported patterns will be important for assessing the potential differential effects on women and men in these age groups as healthcare reform progresses and changes in Medicaid and other insurance options are implemented. Further, they indicate the importance of clearly understanding healthcare cost, use, and coverage patterns among policy-relevant subpopulations in assessing potential effects of ACA implementation nationally, as well as with respect to State variation in Medicaid expansion.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #1028

**Measuring the Impact of Language Access Regulations on HMO Enrollees with Limited English Proficiency**
Max Hadler, UCLA Center for Health Policy Research; Xiao Chen, UCLA Center for Health Policy Research; Erik Gonzalez, David Geffen School of Medicine at UCLA; Dylan H. Roby, UCLA Center for Health Policy Research

**Presenter:** Max Hadler, MPH, MA, Research Associate, Health Economics and Evaluation Research Program, UCLA Center for Health Policy Research, mhadler@ucla.edu

**Research Objective:** Evaluate California’s preparedness to incorporate newly-insured populations with limited English proficiency (LEP) under the Affordable Care Act by measuring LEP individuals’ ability to understand their physicians in the wake of a state law requiring commercial HMOs to provide qualified interpretation and translation services. We also developed a sociodemographic and health status profile of LEP populations according to health insurance coverage to help planning for language access services.

**Study Design:** We used data from the 2007 and 2009 California Health Interview Survey (CHIS) to compare language access of LEP respondents before and after enforcement of language access regulations began. Data from 2009 were used to develop a demographic profile of LEP enrollees in four public and private insurance categories. Pairwise tests of proportions measured change from 2007 to 2009 and differences within the 2009 LEP population.

**Population Studied:** All CHIS respondents ages 18-64 who reported speaking English not well or not at all – a representative sample of the California population for that group.

**Principal Findings:** From 2007 to 2009, the proportion of LEP enrollees in the four categories of insured respondents – commercial HMO (8.3% to 9.0%), commercial preferred provider organization (PPO; 4.4% to 4.8%), public HMO (23.9% to 27.2%), and public fee-for-service (23.8% to 25.2%) – trended upward but not significantly. Difficulty understanding doctor trended downward for commercial HMOs (12.1% to 9.5%) but also not significantly. Looking only at 2009 (the most recent year available), LEP enrollees in commercial HMOs were significantly less likely to have trouble understanding their doctor if they were in excellent, very good, or good health compared to LEP enrollees in fair or poor health. Just over half of LEP enrollees in commercial HMOs (56%) who needed help communicating with their doctor reported receiving help from trained staff or professional interpreters.

**Conclusions:** The lack of significant change in difficulty understanding doctor among LEP enrollees in commercial HMOs suggests that language access regulations have yet to affect health care communication barriers. The overlapping timing of the regulations and CHIS surveying may partially explain the results because some responses referred to physician visits that happened before regulations were fully enforced by the Department of Managed Health Care (DMHC). Other factors, including persistent use of family members and untrained health plan staff as interpreters, may also explain the continued struggle for language access. DMHC monitoring has confirmed that health plans admit to continued gaps in staff training. The disparity in understanding among LEP enrollees in fair or poor health underscores the importance of special focus on LEP populations with complex health issues.
Implications for Policy, Delivery, or Practice: CHIS and the language access regulations are specific to California, but the state has been a leader in language access issues. These results have important implications for other states looking to bridge persistent language access gaps. The timing is particularly important in the context of the Affordable Care Act as an increasing number of LEP individuals gain insurance and greater access to health care services through qualified commercial health plans. Effective language access regulations and enforcement are crucial to ensuring high-quality care for these vulnerable groups.

Funding Source(s): Other, California Office of the Patient Advocate

Poster Session and Number: C, #1029

State Variation in Potential for ACA Reforms to Address High Burden Medical Out-of-Pocket Spending: Results from the Current Population Survey

Lacey Hartman, State Health Access Data Assistance Center; Gilbert Gonzales, University of Minnesota, Division of Health Policy and Management; Sharon Long, Urban Institute

Presenter: Lacey Hartman, Senior Research Fellow, University of MN, State Health Access Data Assistance Center, hartm042@umn.edu

Research Objective: To use new state level data on out-of-pocket spending from the Current Population Survey to estimate the potential impacts of the Affordable Care Act (ACA) reforms on high burden spending across states.

Study Design: In order to examine the potential for the ACA to alleviate high burden spending, we apply statutory premium and out-of-pocket spending limits included in the ACA to simulate spending amounts for people who are likely to be income-eligible for Medicaid, premium assistance subsidies, or caps on non-premium spending beginning in 2014.

Population Studied: We use 2010 and 2011 data from the Current Population Survey (CPS) to produce state level estimates of the share of the population with high burden out-of-pocket spending, which we define as spending more than 10% of family income on health care. The CPS is a monthly household survey that the Census Bureau conducts for the Bureau of Labor Statistics to provide data on labor force participation and unemployment. Information about out-of-pocket spending and health insurance coverage is collected through the Annual Social and Economic Supplement (ASEC).

Principal Findings: We find the share of the population with high burden spending would decrease in all states with full implementation of the policy changes under the ACA. We also find that the median out-of-pocket spending would decrease from $2,200 to $1,540 if states fully implement the Medicaid expansion and all of those eligible for Medicaid and the subsidies under the exchange enroll. With full implementation of the ACA, approximately 11.8 million people will no longer have high burden spending—many of whom would be low-income individuals newly enrolled in Medicaid. However, high burden spending would remain a problem for many families, and the variation in the burden of high costs across states would persist. Because most of the reductions in out-of-pocket spending would occur among the low-income population that would be eligible for Medicaid, the impacts of the ACA on high burden spending will be significantly smaller in states that opt out of the Medicaid expansion following the recent Supreme Court ruling that allows for that possibility.

Conclusions: High burden health care spending is a significant issue for residents in every state, affecting more than 56 million Americans nationwide. There is also considerable variation in high burden spending across the states. If fully implemented, the ACA would likely alleviate high burden spending for many individuals, but our estimates suggest that the problem will persist for many families.

Implications for Policy, Delivery, or Practice: The variation across states in high burden spending persists after applying eligibility criteria for ACA provisions addressing affordability. Most of the reductions in out-of-pocket spending burden are among the low-income population that would be eligible for Medicaid, but the impacts of the ACA on high burden spending will be significantly smaller in states that opt out of the Medicaid expansion. It will be important to assess drivers of state level variation in high burden spending after the ACA reforms are implemented to inform future policy solutions. For example, our findings suggest that those with employer based coverage may make up a disproportionate share of individuals who are estimated to continue to have high out-of-pocket cost burdens after the ACA reforms are implemented. Given the uncertainty about how employer coverage and costs will be impacted
by the ACA reforms, it will be important to track high burden spending for this group over time.

**Funding Source(s):** RWJF

**Geographic Variation In Cesarean Delivery In The United States**

Rachel Henke, Truven Health Analytics; Lauren M. Wier, Truven Health Analytics; Richele Benevent, Truven Health Analytics; William D. Marder, Truven Health Analytics; Bernard S. Friedman, Agency for Healthcare Research and Quality; Herbert S. Wong, Agency for Healthcare Research and Quality

**Research Objective:** The primary objective of this study was to determine whether the geographic variation in cesarean section rate is consistent for private insurance and Medicaid. The secondary objective was to identify the patient, population, and market factors associated with cesarean section rate and determine if these factors vary by payers.

**Study Design:** We obtained 2009 hospitalization data from the 44 states that contributed to the Agency for Healthcare Research and Quality Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID) to measure the cesarean section rate at the core based statistical area (CBSA) level. We linked the hospitalization data to data from the U.S. Census Bureau, the Area Resource File, the American Hospital Association, and the National Practitioner Data Bank at the CBSA level to measure population and market characteristics. We calculated unadjusted and risk-adjusted CBSA cesarean delivery rates by payer. We estimated a hierarchical logistical model to determine the factors associated with cesarean delivery.

**Population Studied:** We included all deliveries identified by DRG (370–375) and MS-DRG (765–768; 774–775). We excluded deliveries with the following: any diagnosis of abnormal presentation, preterm birth, fetal death, or multiple gestation diagnosis codes; any breech procedure codes; and previous cesarean delivery diagnosis in any diagnosis field.

**Principal Findings:** Private insurance had a higher primary cesarean rate (18.9 percent) compared to Medicaid (16.4 percent). The correlation between Medicaid and private cesarean rate at the CBSA level was 0.76. The factors predicting cesarean rate were largely consistent across payers, with the following exceptions: under age 18 was associated with a greater likelihood of cesarean section for Medicaid but a greater likelihood of vaginal birth for private insurance; Asian and Native American background were associated with a greater likelihood of cesarean section for private insurance but a greater likelihood of vaginal birth for Medicaid; the percent African American in the population predicted an increased cesarean section rates for private insurance only; the number of acute care beds per capita predicted an increased cesarean section rate for Medicaid only; the number of OB/GYN per capita predicted an increased cesarean section rate for private insurance only, and the number of midwives per capita predicted an increased vaginal birth rate for private insurance only.

**Conclusions:** Differences in cesarean rates for Medicaid compared to private insurance can be partially explained by differing relationships between patient, population and market characteristics and the probability of cesarean section by payer.

**Implications for Policy, Delivery, or Practice:** Understanding the driving forces of geographic variation in frequent and high-resource inpatient procedures, such as cesarean delivery, is key to improving quality of care and reducing healthcare costs.

**Funding Source(s):** AHRQ

**Current Health and Insurance Status of Adults Who Will Be Newly Eligible for Medicaid in 2014**

Steven C. Hill, AHRQ; Julie Hudson, AHRQ; Steven C. Hill, AHRQ; Thomas M. Selden, AHRQ; Salam Abdus, Social and Scientific Systems, Inc

**Research Objective:** Describe adults currently eligible but not enrolled in Medicaid and those who will be newly eligible for Medicaid under the Affordable Care Act (ACA).

**Study Design:** Data were from the nationally representative Medical Expenditure Panel Survey (MEPS), which collects detailed information that facilitates simulating Medicaid eligibility: types of income, assets, family structure, and pregnancy. Eligibility under the
ACA was simulated using final federal regulations and assuming all states elect to expand coverage. Multiple Medicaid eligibility categories, such as section 1931 (family coverage), waivers, and medically needy programs were simulated. We used detailed 2005-2009 Medicaid eligibility rules including income eligibility thresholds, income disregards, asset tests, immigration status, the budget units states used for blended families, the processes states used to allocate and deem income in blended families, eligibility of nonparent caretakers and how their income was used in determining eligibility of their parents and siblings. We compared three groups: (1) adults enrolled in Medicaid, excluding those eligible due to disability, (2) adults currently eligible for but not enrolled in eligibility categories states must cover with full benefits, including waiver programs, and (3) adults newly eligible (modified adjust gross incomes not exceeding 138% of poverty), including adults pre-ACA eligible for only limited Medicaid benefits and those eligible for stateoptional programs, such as medically needy. We present point-in-time estimates measured as of the first interview of the second year of the panel. All estimates account for the complex survey design.

**Population Studied:** Adults age 19-64 in MEPS panel 10 through 14, spanning 2005-2009, who were not Medicare beneficiaries and not eligible for Medicaid due to disability. Among them, 2,770 were enrolled in Medicaid, 1,793 were eligible but not enrolled, and 7,221 will be newly eligible.

**Principal Findings:** Our point-in-time estimate is about 23.9 million adults will be newly eligible for Medicaid under the ACA: 14.1 million were uninsured and 8.5 million had employment-related insurance. About 5.0 million adults were eligible for Medicaid under current rules but not enrolled: about 3.0 million were uninsured and about 1.8 million had employment-related insurance. Among those without employment-related insurance, compared with nondisabled Medicaid enrollees, the newly eligible were more likely to live in the South and be older. Compared with nondisabled Medicaid enrollees, the currently eligible but not enrolled adults had better physical and mental health. Both groups were less likely to have any chronic conditions, especially obesity, asthma, and diabetes, than Medicaid enrollees.

**Conclusions:** If all states elect to expand Medicaid, the number of uninsured adults at a point in time could be up to 14.1 million less than in 2005-2009. Both newly eligible and currently eligible but not enrolled adults were healthier than current enrollees.

**Implications for Policy, Delivery, or Practice:** The population currently eligible but not enrolled may be less expensive per capita, because they are less likely to be obese and have diagnosed chronic conditions than current nondisabled Medicaid enrollees, even though this group tends to be older. Anticipated per capita costs of "newly eligible" adults have clear implications on States future Medicaid decisions.

**Funding Source(s):** AHRQ

**Poster Session and Number:** C, #1032

**The Politics of Health Insurance Exchanges: Lessons from Idaho and Michigan**

David Jones, University of Michigan School of Public Health

**Presenter:** David Jones, M.A., M.S.P.H., Doctoral Candidate, Health Management and Policy, University of Michigan School of Public Health, davidkj@umich.edu

**Research Objective:** State-based health insurance exchanges are one of the most important elements of the Affordable Care Act (ACA). Understanding the political factors that shaped state decisions to create their own exchange to cede control to the federal government is crucial to evaluating the ACA's success and informing future reform efforts. In the initial months after the ACA was enacted, all but one state began planning for an exchange. By December 2012 only 19 states submitted proposals to create an exchange. Meanwhile, 27 states had sued the federal government over the constitutionality of the law and several states had returned large federal grants in protest. What changed in the 2.5 years after the ACA was enacted that caused less than half the states to create an exchange, particularly in Republican-controlled states?

**Study Design:** Mixed methods, including quantitative analysis of 50 states and two in-depth case studies were employed to examine state decisions to create an exchange as a consequence of partisan control in state government, public opinion, institutional differences such as elected vs. appointed insurance commissioners, roles of interest groups such as the insurance industry and the Tea Party, and heterogeneity in bureaucratic and legislative capacity. The analysis drew on more than 100 interviews with leaders in the
legislative and executive branches at the state and federal levels, as well as relied on publicly available data sources such as opinion polls and government documents.

**Population Studied:** All 50 states are examined, with a particular focus on Idaho and Michigan. Idaho is one of a small number of states led entirely by Republicans that is creating an exchange. Michigan, also led by Republicans, failed narrowly to pass enabling legislation though is pursuing the partnership model.

**Principal Findings:** Despite multiple efforts by the Obama administration to increase flexibility and funding, very few states beyond the initial implementers decided to create an exchange. Partisanship largely drove state decisions; however, the dynamics of why and how are more complex. The extent to which factors such as the growth of the Tea Party and public opinion were significant was contingent upon differences in institutional design. Governors, although the focal point of policymaking, faced multiple constraints in advancing their political agenda.

**Conclusions:** The future of the exchanges will largely be determined by the politics of implementation. The Supreme Court decision and President Obama's re-election ensured the survival of state exchanges. However, success remains uncertain as program funding is being challenged in the courts and in Congress, and because success is eventually determined by the implementation of individual states. Results of the study lay the groundwork for continuing evaluation of state exchange implementation.

**Implications for Policy, Delivery, or Practice:** Future federal reforms need to give more thought to the role of states in implementation. More states may have created an exchange if a clear path not requiring legislation would have been identified at the outset or if states had to commit to a path earlier.

**Funding Source(s):** Other, University Research Grant

**Poster Session and Number:** C, #1033

**Conversion to For-Profit Status and its Impact on Access, Quality, and Outcomes in U.S. Hospitals**

Karen Joynt, Harvard School of Public Health; E. John Orav, Harvard School of Public Health; Ashish K. Jha, Harvard School of Public Health

**Presenter:** Karen Joynt, MD, MPH, Instructor, Health Policy and Management, Harvard School of Public Health, kjoynt@partners.org

**Research Objective:** The number of non-profit hospitals converting to for-profit status has accelerated over the past decade, leading many policymakers to worry that after conversion, these hospitals will focus more on improving payer mix and maximizing profits, paying less attention to quality of care or patient outcomes. Therefore, we sought to evaluate what happens to hospitals’ margins, payer mix, quality, and outcomes when they switch from non-profit to for-profit status.

**Study Design:** We used data from Medicare files as well as the American Hospital Association from 2002 through 2010 to identify hospitals that converted to for-profit status and matched them on size, location (based on hospital referral region), and teaching status to similar hospitals that did not convert. For each hospital that converted to for-profit status, as well as for each of the controls, we identified the hospital’s operating margins, and the proportion of each hospital’s patients that were poor (as measured by the Disproportionate Share Hospital or DSH Index). We calculated hospitals performance on Hospital Compare quality metrics as well as mortality rates for common medical conditions. We constructed multivariable difference-in-differences models to compare the year prior to conversion to the year after conversion. We also tested for differences in trend using linear models, looking up to three years after conversion.

**Population Studied:** U.S. acute-care hospitals.

**Principal Findings:** Between 2002 and 2010, there were 216 hospitals that converted to for-profit status. Hospitals that converted to for-profit status had improvements in their operating margins the year following a conversion compared with similar hospitals that did not convert, but this was not statistically significant (-1.1% pre-conversion to 1.6% post-conversion versus -0.2% to 0.5% for controls over the same time period, p=0.36 for difference in differences). Hospitals that converted to for-profit status had comparable change in their proportion of care provided to the poor (DSH Index 28.8% pre-conversion to 26.2% post-conversion, versus 30.3% to 26.8% for controls, p=0.63). We found that hospitals that converted had similar improvements in their composite process scores for acute myocardial infarction (AMI), congestive heart failure (CHF), and pneumonia (PN).
compared to controls (81.5% pre-conversion to 86.6% post-conversion, versus 83.8% to 87.4% for controls, p=0.21). Similarly, there were no differences in changes in mortality rates for AMI (p=0.17), CHF (p=0.80), or PN (p=0.52) at converters compared to controls. Linear models yielded similar results.  

**Conclusions:** We found no evidence that conversion to for-profit status was associated with changes in the proportion of care provided to the poor, or worsening of quality or clinical outcomes.  

**Implications for Policy, Delivery, or Practice:** These findings should provide some reassurance to those concerned that the recent increase in hospitals converting to for-profit status will have deleterious effects on access to care for the poor, the quality of care provided, or clinical outcomes for common medical conditions.

**Funding Source(s):** Other, Internal department funds

**Poster Session and Number:** C, #1034

**Young Adults with Private Coverage: Were They Previously Uninsured and Are They Better Off?**

Whitney Kirzinger, National Center for Health Statistics; Robin A. Cohen, National Center for Health Statistics; Renee G. Gindi, National Center for Health Statistics

**Presenter:** Whitney Kirzinger, M.P.H., Health Statistician, Division of Health Interview Statistics, National Center for Health Statistics, wkirzinger@cdc.gov

**Research Objective:** The percentage of young adults aged 19-25 with private health insurance coverage has increased since September 2010, when the Affordable Care Act (ACA) extended dependent health coverage. It may be expected that the observed increase in private coverage is attributable to uninsured young adults obtaining private plans through their parents. However, current national estimates of health insurance coverage do not provide insight into changes in an individual’s coverage type or prior coverage status. The objective of this research is to better understand health coverage among young adults with respect to their previous coverage status, and further explore changes they have experienced since the recent policy change.

**Study Design:** Data were from preliminary Family Core and Sample Adult files of the 2008-June 2012 National Health Interview Survey (NHIS), a cross sectional survey conducted by the National Center for Health Statistics. Data were from retrospective questions about coverage status and opinions about that coverage. Data were combined into six-month periods to maximize precision and reliability of the estimates, while retaining the ability to observe fluctuations over time relative to the implementation of the relevant ACA provision. Measures analyzed included having any period with no health insurance coverage in the past 12 months, current health insurance status, and personal opinion of changes in coverage. While 19-25-year-olds were the focus of this analysis, other age groups were included for comparison.

**Population Studied:** Civilian non-institutionalized residents of the United States aged 19-64.

**Principal Findings:** If young adults moved from uninsured to private coverage after September 2010, we would expect to see a greater percentage of privately insured young adults from Q4 2010 through Q3 2011 saying they had been uninsured in the last year compared with earlier time periods. Once the ACA provision was in effect for one full year, we would expect decreasing or stable percentages of privately insured young adults saying they had been uninsured in the last year. Among privately insured young adults aged 19-25, the percentage with any period of uninsurance in the past 12 months increased from 9.8% to 13.2% in the first half of 2011, decreased to 7.5% in the second half of 2011, and then did not change significantly in the first half of 2012. For comparison, among other age groups, there were no changes in the percentages with any period of uninsurance from 2008 through June 2012. In the last half of 2011, young adults aged 19-25 with private coverage were significantly more likely to say their health care coverage was better or the same compared to one year ago, compared with the first half of 2011.

**Conclusions:** Results provide evidence that newly insured young adults aged 19-25 may have come from the previously uninsured population, and that they perceive their health insurance coverage to be better than or the same as one year ago.

**Implications for Policy, Delivery, or Practice:** This analysis underscores the potential for combining the NHIS’s well-established health insurance information with its data addressing health care reform in order to provide researchers and policymakers a more
Are Distance Based on Addresses Better than ZIP Codes for Assessing Geographic Access to Cancer Care?

May Kuo, University of North Carolina at Chapel Hill; Anne-Marie Meyer, Lineberger Comprehensive Cancer Center, University of North Carolina at Chapel Hill; Stephanie B. Wheeler, Health Policy and Management Department, University of North Carolina at Chapel Hill; Brian Frizzelle, Carolina Population Center, University of North Carolina at Chapel Hill; Marc Peterson, Carolina Population Center, University of North Carolina at Chapel Hill; William Carpenter, IV, Health Policy and Management Department, University of North Carolina at Chapel Hill

Presenter: May Kuo, PhD, Research Associate, Lineberger Comprehensive Cancer Center, University of North Carolina at Chapel Hill, tkuo@email.unc.edu

Research Objective: Distance is used as a proxy measure for geographic access to healthcare, but measures of distance vary in their precision according to the granularity of the data and methods of calculation. Methodological differences in estimating distance may partially explain the inconsistent relationships observed in the literature between distance and healthcare access. Although studies exist on the correlations between different distance metrics, the impact of different distance measures on healthcare access has not been directly examined. In this study, we examined the impact of distance on receipt of radiation therapy (RT) after breast cancer surgery using different methods (e.g., straight line and Network distance) and with different levels of measure granularity (e.g., address and ZIP code centroids).

Study Design: A retrospective cohort was created from women diagnosed with breast cancer and reported to the North Carolina Central Cancer Registry in 2003-2005. Women who were eligible for RT were identified by linking registry data to Medicare insurance claims and using diagnostic and procedural codes (e.g., CPT/HCPCS and ICD 9). Physicians providing RT were also identified from the claims and relevant address information was abstracted from the Medicare Physician Identification and Eligibility Records. Patients’ address information was obtained from the NC registry. Both the addresses and ZIP code centroids from patients and physicians were geocoded using ESRI ArcGIS. We computed Euclidean distance using SAS GEODSIT function and network distance using ArcGIS. Logistic regression models were used to examine the probability of treatment receipt associated with distance to nearest provider. Models were adjusted for patient demographics, tumor characteristics, other treatment, and a measure of patient’s county as urban or rural. We compared models using the following distance measures: Euclidean distance from address, Euclidean distance from ZIP code centroid, network distance from address, and network distance from ZIP code centroids. Effect of distance metric was obtained by comparing the model-predicted probability of radiation therapy receipt for each distance measure.

Population Studied: We identified 1,938 Medicare-insured women who were eligible for RT in our registry-linked claims cohort. Sixty-five percent of the study sample received RT, and the mean age was 74 years. The majority of the women were white, diagnosed at an early stage, and living in urban areas.

Principal Findings: There was no difference in the mean Euclidean distance using addresses vs. ZIP codes. However, longer network distances were obtained from ZIP codes compared to addresses. Results from regression models suggested that distance is negatively related to receipt of radiation treatment. Moreover, the magnitude of the effect appeared to be influenced by the type of distance measure, granularity of the data used for computing distance and urban vs. rural areas.

Conclusions: When Euclidean distance is used, addresses and ZIP codes are equally well in predicting cancer care; however, when network distance is used, results from addresses and ZIP codes may differ.

Implications for Policy, Delivery, or Practice: Our study provides valuable information for researchers who are interested in using distances to evaluate geographic access to healthcare. This is increasingly important to health services research where actual address data are increasingly difficult to obtain.

Funding Source(s):

Poster Session and Number: C, #1036
Coverage Alternatives for Poor Adults in States without a Medicaid Expansion
Rachel Licata, Kaiser Family Foundation; Vann Newkirk, MSPH, Kaiser Family Foundation; Anthony Damico, MHS, Kaiser Family Foundation

Presenter: Rachel Licata, M.P.H., Senior Policy Analyst, Kaiser Family Foundation, rachell@kff.org

Research Objective: Two central goals of the 2010 Affordable Care Act (ACA) are reducing the number of uninsured and increasing the affordability of coverage. One mechanism to accomplish this is the expansion of Medicaid to almost all individuals with incomes below 138% of poverty. The June 2012 Supreme Court decision made this expansion optional for states, and as of December 2012, nine states have indicated that they do not plan to expand Medicaid. Adults with family incomes over 100% of poverty can still receive subsidies for insurance coverage through the Exchange in non-expansion states, but those with incomes below poverty may be left without any ACA coverage options. This analysis assesses current and future insurance options for adults living with incomes below poverty in the context of the ACA provisions and Supreme Court decision.

Study Design: We analyzed data from the April-July 2010 Survey of Income and Program Participation (SIPP). We examined current health insurance coverage (uninsured, Medicaid, other public, private non-group, or employer-sponsored insurance (ESI)) as well as work status and firm characteristics. We also assessed ESI offer rate and eligibility using variables unique to SIPP. We determined income and eligibility using constructed health insurance units (HIUs), which group individuals based on their eligibility for subsidies in the Exchange, rather than by household or relatedness. This approach allowed us to classify adults by their eligibility for exchange subsidies under the ACA, thus determining more precisely who might not receive assistance if Medicaid is not available.

Population Studied: Analysis was limited to non-elderly adults ages 19-64, who were not enrolled in Medicare and had an HIU income of less than 100% of poverty ($22,050 for a family of four in 2010).

Principal Findings: Among poor adults, forty-eight percent were uninsured, 20 percent had ESI and 23 percent were enrolled in Medicaid. Most adults in this income range are not working or do not have a worker in the family. However, even among poor adults who are working, only 32 percent received an ESI offer, as most poor workers are employed by small firms and 66 percent work part-time. Among the poor workers who are offered coverage, most decline due unaffordability of coverage.

Conclusions: The Medicaid expansion could cover nearly all adults below poverty in expansion states, but in states that do not expand Medicaid, many poor adults are likely to go without coverage. Several key aspects of the ACA, including the creation of the Exchanges and incentives to offer ESI, will not provide insurance options to most poor adults. Many may continue to remain uninsured or may lose current insurance with the expiration of the Medicaid Maintenance of Eligibility.

Implications for Policy, Delivery, or Practice: The Medicaid expansion is a crucial component of the ACA goal of reducing the number of uninsured. Without this expansion, many poor adults are likely to go without coverage. Given the impact of the uninsured on uncompensated care costs and safety net providers, states should consider the consequences of not expanding their programs.

Funding Source(s): No Funding
Poster Session and Number: C, #1037

Protecting Vulnerable Families from Losing Coverage
Kristen Lloyd, Rutgers; Dorothy Gaboda, Rutgers Center for State Health Policy; Jose Nova, Rutgers Center for State Health Policy

Presenter: Kristen Lloyd, Research Analyst, Rutgers, klloyd@ifh.rutgers.edu

Research Objective: Continuity of health insurance coverage is important for achieving optimal utilization of medical care. The Affordable Care Act expands insurance coverage, but previous research indicates possible risks to maintaining seamless coverage for families whose eligibility for public coverage, employer-sponsored coverage, and Exchange-based coverage is likely to fluctuate over time. As a gateway state, a higher proportion of New Jersey families will have to contend with eligibility and enrollment issues stemming from immigration status in addition to changes in life
and/or economic circumstances which put them at risk for eligibility disruptions. These families often face administrative and logistical complexity in accessing health coverage and care. Therefore, it is important states understand the characteristics of families who are vulnerable to churning in order to develop strategies for maintaining continuous coverage.

**Study Design:** Cross-sectional data from the 2009 New Jersey Family Health Survey are analyzed to identify working-age parents who are at risk for churning. Bivariate and multivariate analyses are used to identify the numbers and characteristics of vulnerable parents.

**Population Studied:** New Jersey community-dwelling working-age parents of children under age 19 who are eligible for public or subsidized Exchange coverage.

**Principal Findings:** Parents vulnerable to changes in coverage eligibility are more likely younger, in single-parent families, have lower family incomes, and less likely to be working. They have worse self-rated health, lower levels of utilization, and are less likely to have a usual source of care than parents not at risk for churning. They also express attitudes indicating a weak attachment to health insurance as a mechanism for managing their health care. Among parents at risk for churning, non-access-dependent indicators of health are worse among immigrant adults even though they are socioeconomically comparable to native-born adults and no less likely to have visited a doctor or have a usual source of care. Immigrant parents are more likely to be Hispanic and to express attitudes indicating a weak attachment to health insurance.

**Conclusions:** Immigrant parents in New Jersey, and their children by extension, are particularly vulnerable to churning and the health consequences of disrupted coverage. Parents with a weak attachment to health insurance are likely to require targeted support to maintain enrollment in health coverage.

**Implications for Policy, Delivery, or Practice:** States with large immigrant populations have additional considerations in planning their health insurance outreach and enrollment systems to assist vulnerable adults and their families in maintaining health coverage. Strategies to synchronize family coverage, to incentivize insurance plans to participate in all Exchange programs, to engage parents when they experience life changes affecting eligibility, and to ensure the cultural and linguistic sensitivity of all efforts targeting immigrants are important for promoting seamless coverage. Moreover, assurance of the consistency of health coverage can help foster confidence in the health insurance system as a preferred mechanism for managing health care, thereby enhancing the effectiveness of efforts to keep vulnerable families enrolled.

**Funding Source(s):** RWJF
**Poster Session and Number:** C, #1038

**Risky Business – The Transition of High Risk Pool Enrollees to Other Coverage in 2014**

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**Presenter:** Elizabeth Lukanen, M.P.H., Senior Research Fellow, State Health Access Reform Evaluation, University of Minnesota, elukanen@umn.edu

**Research Objective:** For millions of Americans with preexisting health conditions, affordable health insurance is only a dream. These individuals often seek coverage, but are either unable to afford the premium, unwilling to settle for coverage with condition exclusions or are rejected outright. The Affordable Care Act (ACA) provided $5 billion dollars to develop high risk pools in all states. This temporary measure was designed as a bridge to cover people until the more sweeping “guarantee issue” provision went into effect in 2014. More than 95,000 individuals are currently covered through the federal Pre-Existing Condition Insurance Plan (PCIP) and more than 220,000 are covered by state-only pools. It is generally assumed that the majority of these high risk pool enrollees will gain coverage through the exchange once it is in place. It is unclear, however, how smooth this transition will be, where these individuals will ultimately seek and gain coverage, and what impact this transition will have on Medicaid, the exchange and the affected individuals. This paper seeks to answer these questions by studying the longest running and largest high risk pool in the country – The Minnesota Comprehensive Health Association (MCHA).
**Study Design:** Mail survey of 4,800 randomly selected MCHA enrollees with a low-income over-sample, conducted from November through December, 2012. 63% response rate weighted to reflect general characteristics of the enrolled population. Survey collects descriptive data on characteristics of the MCHA enrollees including potential eligibility for Medicaid or exchange subsidies (post-2014), current health and disability status, health care use and demographics, enrollee coverage priorities, knowledge of the ACA, and preference for outreach enrollment information.

**Population Studied:** Enrollees from the largest and longest running risk pool in the county – the Minnesota Comprehensive Health Association.

**Principal Findings:** Preliminary analysis (using unweighted data) indicates that more than three quarters of the population reports fair or poor health, a quarter had four hospital visits in the last year and 85% had multiple trips to the ER. Income data indicates that a large proportion of the enrollees may be eligible for Medicaid post-2014. In addition, the vast majority have only a high school education and have fairly poor awareness of the ACA and the new coverage options that will be available.

**Conclusions:** States and the federal government must be prepared to transition high risk pool enrollees in 2014. This study indicates that enrollees will likely end up in both the exchange and Medicaid. They are likely to be sicker than the general population and have relatively low awareness that these changes are coming.

**Implications for Policy, Delivery, or Practice:** It has long been assumed that high risk pool enrollees would simply transition into Medicaid or the exchange in 2014. By examining Minnesota’s high risk pool enrollees, states and the federal government can get a sense for where these individuals might transition, how this might impact existing risk pools, how smooth the transition will be and how best to communicate and provide outreach to these enrollees.

**Funding Source(s):** RWJF

**Poster Session and Number:** C, #1039

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**Impact of Primary Care Availability on Hospital Inpatient Use by Insurance Status**

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**Presenters:** Jared Lane Maeda, Ph.D., M.P.H., Research Scientist, Kaiser Permanente Research Institute, Kaiser Permanente, jared.l.maeda@kp.org

**Research Objective:** Reducing avoidable hospitalizations is a major target of recent health care reform efforts. Increasing the supply of primary care providers has been proposed as one way to reduce hospitalizations because primary care emphasizes prevention, detection, and early treatment. However, there is little empirical evidence that has linked increased availability of primary care to reduced hospitalizations. Further, it is unknown if primary care availability has the same effect on hospitalization rates for the uninsured as the insured. The uninsured may still have financial, cultural, and/or logistical barriers towards accessing primary care despite efforts to enhance primary care availability. The purpose of this study is to examine the association between primary care availability, all-cause hospitalizations, and admissions for three common types among nonelderly adults (ambulatory care sensitive conditions, mental health and substance abuse, and mandatory admissions). We also examine whether the association between primary care availability and hospital use holds for the uninsured.

**Study Design:** We examined variations in inpatient hospitalizations between the insured and uninsured across Core Based Statistical Areas (CBSAs) in 44 states. We also explored the association between primary care availability and hospital use by insurance status while controlling for patient, population and market factors using a broad definition of primary care. Poisson regression models were used to estimate the relationship between primary care availability and the rate of hospitalizations by insurance status.

**Population Studied:** We used the 2009 Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID) from 44 states. The SID were linked with the Area Resource File, American Hospital Association Annual Survey, and U.S. Census Bureau data files. We included all discharges in CBSAs where the patient was between 18 to 64 years old.

**Principal Findings:** Primary care supply is generally linked to lower hospitalizations across
Department visits increased in MA, but which services and by how much are unknown. The objectives of this study were to examine the effects of health care reform on inpatient services and emergency department visits in MA.

**Research Objective:** The Commonwealth of Massachusetts implemented the first phase of a broad health care reform program from 2006 through 2008. This reform is widely viewed as the model for the Patient Protection and Affordable Care Act (ACA). The Massachusetts (MA) reform has increased insurance coverage and improved access to care. How the ACA will affect the hospital sector is undefined. Covering the uninsured will increase demand for health care services, but which services and by how much are unknown. The objectives of this study were to examine the effects of health care reform on inpatient services and emergency department visits in MA.

**Study Design:** We used data from the Agency for Healthcare Research and Quality Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID) and the State Emergency Department Databases (SEDD). We implemented a difference-in-difference model to estimate the impact of the legislation and examined the changes between 2005 and 2009 in both MA and control hospitals for a limited number of high-level indicators: discharges (overall and in selected categories); length of stay; cost per discharge; and emergency department (ED) visits and charges. We also examined trends in inpatient admissions for acute and chronic ambulatory care sensitive conditions. We also estimated regression models that controlled for the hospital's competitive environment for both the inpatient and ED variables.

**Population Studied:** We examined hospitals in states that provided data both during a calendar year prior to the MA reform (2005) and the second full year after implementation (2009): 37 and 24 states in the SID and SEDD, respectively. There were 64 MA hospitals with nonmissing values for all of the variables used in this study (62 with EDs). The control populations were propensity-score matched samples of hospitals drawn separately from the SID and the SEDD. We matched on 2005 characteristics of the institutions, including the volume of services delivered and the demographic characteristics of the patients. Given the greater number of states reporting in the SID, we were able to match 5 control hospitals in other states for each MA hospital for the inpatient analyses and 3 EDs outside MA for each ED within the state.

**Principal Findings:** Changes in inpatient utilization in MA were similar to those in other states. Length of stay declined more rapidly relative to the control sample (−6.0% versus −0.4%, respectively. The number of preventable hospitalizations for acute conditions declined in MA and the rest of the country. Hospitalizations associated with chronic conditions increased overall; results are at least suggestive that they rose faster in MA (0.05 < p < 0.10). ED utilization grew in both groups, but ED charges per visit grew more slowly over the 5-year period in MA (36.4% compared to 60.7% in the matched control hospitals).

**Conclusions:** Overall, the Massachusetts reform had modest effects on the hospital sector.

**Implications for Policy, Delivery, or Practice:** The results of this study are of direct policy relevance.

**Funding Source(s):** AHRQ

**Poster Session and Number:** C, #1040
Interest in Massachusetts and also provide suggestive evidence on the potential impact of national healthcare reform.

**Funding Source(s):** AHRQ

**Poster Session and Number:** C, #1040

**Impact of Massachusetts Health Care Reform on Insurance Coverage, Access to and Receipt of Care and Health Status among Patients with Cardiovascular Disease or Risk Factors**

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**Presenter:** Danny McCormick, M.D., M.P.H., Assistant Professor, Harvard Medical School / Cambridge Health Alliance, danny_mccormick@hms.harvard.edu

**Research Objective:** Cardiovascular disease (CVD) is the leading cause of morbidity and mortality in the US, and racial and ethnic disparities in CVD prevalence and treatment disproportionately shorten life expectancy for minorities. We sought to determine the impact of the Massachusetts (MA) health care reform, the model for US national health care reform, on coverage, access to care and health status among patients with known CVD or cardiovascular risk factors (CVRF) and racial disparities in these outcomes.

**Study Design:** We estimated pre- to post-reform absolute differences (AD) and 95% confidence intervals in MA in the proportion of individuals having insurance coverage, access to care, utilization of care and good/excellent health status using a difference-in-differences approach that accounted for secular trends in control states and patient demographic characteristics using linear probability models. We also examined changes in racial and ethnic disparities in these outcomes following reform.

**Population Studied:** We analyzed data from the Behavioral Risk Factor Surveillance System (BRFSS), representative statewide cross-sectional adult surveys from MA and seven control states that did not undergo health reform (RI, VT, NH, CT, NY, NJ and PA), before (2005) and after (2009) MA health reform implementation. The survey sample (n=6,698 in MA, and 28,455 in control states) consisted of adults age 18-64 (those targeted by the reform) who reported having CVD (history of myocardial infarction or stroke) or 2 or more CVRFs (current cigarette smoking, hypertension, hyperlipidemia, obesity [BMI>30] and age>50 for men and >55 for women).

**Principal Findings:** We found increases in the proportion of MA respondents reporting having insurance (89.9 to 94.7%; adjusted AD (aAD), 4.2% [2.2, 6.2]), a personal doctor (90.6 to 94.2%; aAD, 2.2; [0.37, 4.0]) and no financial barriers to seeing a doctor (89.1 to 91.4%; aAD, 3.8 [1.6, 6.0]). We found no statistically significant changes in the proportion reporting a routine check up in the last year (79.9 to 83.4%; aAD, -0.7% [-2.8, 2.6]), taking a blood pressure medication among patients with hypertension (69.5 to 73.3%; aAD, 0.7%; [-2.8, 4.2]), taking a lipid lowering medication among patients with hyperlipidemia (85.2 to 87.2; aAD; 0.35 [-2.6, 3.3]), having excellent/good health (80.0 to 79.8%; aAD, -1.6 [-4.3, 1.0]), having no activity limitations due to health (75.0 to 73.7%, aAD, 2.0 [-0.8, 4.8]) and not currently smoking cigarettes (46.1 to 42.3, aAD, -2.5 [1.3, -6.3]). There were no statistically significant changes or consistent trends in black-white or Hispanic-white disparities in insurance coverage (aAD, -4.0 [-13.2, 5.1] and 4.4 [-2.9, 11.7], respectively) or having no financial barriers to seeing a doctor (aAD, 2.7 [-5.3, 10.7] and -4.3 [-15.4, 6.7], respectively).

**Conclusions:** For patients with known CVD or CVRFs, MA health reform was associated with modest to small improvements in insurance coverage and access to care but no improvement in receipt of care or health status or in racial and ethnic disparities in coverage or access.

**Implications for Policy, Delivery, or Practice:** Additional health care reform measures may be required to more substantially improve these outcomes for patients who are at high risk for or have CVD.

**Funding Source(s):** N/A

**Poster Session and Number:** C, #1042
Assessing Pent-Up Demand in California’s Uninsured Population

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Research Objective: Explore potential changes in healthcare use and demand for services by quantifying the healthcare needs of uninsured adults gaining access to new coverage options via Medicaid expansion and Health Insurance Exchanges due to the Affordable Care Act.

Study Design: Using data from California’s 2007-2010 Medicaid waiver, we followed enrollees’ transition from being uninsured to insured and the effects of demographic and geographic characteristics on utilization over a maximum of four years. To estimate expected levels and rates of increase in use across uninsured and safety net user populations, we performed a two-part analysis with binomial logit and Poisson-logit hurdle regression models. Estimates of primary care, inpatient, emergency room, and specialty services use for different categories of newly insured adults are based upon utilization data prior to and after enrollment in California’s Health Care Coverage Initiatives (HCCI). We then applied the HCCI-based models to 2009 California Health Interview Survey data on the uninsured.

Population Studied: Non-Elderly (18-64 year old) Medicaid and Exchange beneficiaries eligible to enroll in ACA coverage options in 2014. The HCCI population is made up of authorized California residents or citizens who will qualify for Medicaid or Exchange subsidies in 2014.

Principal Findings: Predicted primary care service use proportions remained stable even after obtaining new coverage, increasing by 3% from year 1 to year 3 (42.2% to 43.3%) among non-users of indigent care prior to HCCI program enrollment and 1% (59.1% to 59.4%) among existing users.

Temporary predicted increases in use of inpatient, emergency room and specialty care services stabilize in subsequent years. A slightly larger proportion of non-users (22.7%) utilize ER services in year 1 than their existing user counterparts (21.2%), but users only exhibit a 2.1% decrease in ER use by year 2 while non-users exhibit a decrease of 9.5%.

Specialty care use in the first year of enrollment is substantially lower for non-users (15.1%) than existing users (24.8%). Though use proportions were stable over time, actual numbers of visits per year exhibit a leveling out of pent-up demand with year 1 to year 3 decreasing from 0.9 to 0.43 visits per year (52%) among users and 0.54 to 0.29 (46%) among non-users.

Conclusions: The general stability in predicted services utilization suggests concern about pent-up demand among future Medicaid or Exchange eligibles may be unfounded. In California, approximately 500,000 people likely to enter Medicaid and the Exchange via transition from county Low-Income Health Programs have been provided with significant care and appear to have stable health services use.

Implications for Policy, Delivery, or Practice: Analysis informs California’s planning for the expansion of Medi-Cal and the Covered California Exchange. Actionable estimates of pent-up demand enable pragmatic workforce and facility planning by informing necessary primary care and specialty care staffing levels and supply. Estimates also facilitate Exchange implementation by helping understand use patterns of the enrolled population and assessing the sustainability of the risk pool in the Exchange. Lastly, estimates allow leadership to prepare for new enrollees into Medi-Cal through evidence-based estimates of predicted use.

Funding Source(s): Other, UC Berkeley California Program on Access to Care

Poster Session and Number: C, #1043

Thirty Day Readmission and the Use of Follow-up Care among Non- Elderly Adult Medicaid Enrollees

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Presenter: Chima Ndumele, M.P.H., Student, Department of Community Health, Brown University, chima_ndumele@brown.edu
Research Objective: Unplanned 30-day readmissions to hospitals are a growing concern for the Centers for Medicare & Medicaid Services (CMS). While rates and determinants of readmissions have been studied extensively in the Medicare population, little is known about the burden of readmissions among Medicaid enrollees. We calculated the rates of 30-day readmissions for non-elderly adult Medicaid enrollees and examined whether rates are mediated by the use of outpatient care in the period following discharge.

Study Design: We used multivariable logistic regression to examine the prevalence of 30-day all cause readmissions following hospitalization for congestive heart failure (CHF), acute myocardial infarction (AMI), or pneumonia among a sample of Medicaid managed care enrollees. Models accounted for demographic and clinical characteristics of enrollees and used generalized estimating equations to account for repeat observations from enrollees over time and enrollees discharged from the same hospital. The primary independent variable was the use and source of follow-up care in the 7 days following discharge (no care, primary care physician only, cardiologist and primary care physician).


Principal Findings: Of 2,331 discharges, 616 (26%) resulted in a readmission to the hospital within 30 days. Within specific diagnoses, readmission rates ranged from 23% for AMI to 32% for CHF. 36% of enrollees were readmitted within 7 days of discharge. Among enrollees discharged with cardiovascular conditions (CHF/AMI), approximately 8% received follow-up care from a cardiologist within 7 days of discharge, 41% received follow-up care from a primary care physician only, and 51% did not receive follow up care at all. Among enrollees hospitalized with pneumonia, 45% did not receive follow up care in the 7 days following discharge. After adjustment for demographic and clinical characteristics, enrollees with cardiovascular conditions who sought care from a PCP and specialist had 0.56 the odds of 30-day readmission relative to enrollees who did not seek follow up care (95% CI 0.33, 0.78). Enrollees receiving follow up care from a primary care physician alone had 0.83 the odds of 30-day readmission relative to enrollees who did not seek follow up care (95% CI 0.64, 1.04). There were no significant differences in the odds of 30-day readmissions between enrollees discharged with pneumonia based on their receipt of follow up care (p = .78). Results were qualitatively similar when limited to one discharge per enrollee.

Conclusions: All-cause readmissions occur with striking frequency in the adult Medicaid population and a considerable proportion of these readmissions occur within 7 days of discharge. Approximately half of Medicaid enrollees do not receive any care in the period following discharge and few have access to specialty care. For enrollees discharged after severe cardiovascular events, accessing both primary and specialty care is associated with the lowest odds of readmission.

Implications for Policy, Delivery, or Practice: Access to primary and specialty care may mediate the risk of readmission among Medicaid enrollees. State Medicaid programs should consider improving continuity of care to reduce unplanned readmission rates among non-elderly Medicaid enrollees.

Funding Source(s): No Funding

Poster Session and Number: C, #1044

Understanding the Impact of the Affordable Care Act on Health Insurance and Medical Care Utilization among Young Adults Aged 19-25

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Presenter: Helen Parsons, Ph.D., M.P.H., Assistant Professor, University of Texas Health Science Center at San Antonio, parsonsh@uthscsa.edu

Research Objective: The Affordable Care Act (ACA) extended dependent healthcare coverage up to the age of 26, allowing young adults to stay on their parents’ or relatives’ insurance longer. This research examines trends in insurance coverage in the young adult (aged 19-25) population before and after the policy took effect for plan renewals beginning in September 2010. Further, it examines the role that changes in insurance coverage have played in the use of preventative and emergency medical care over time.

Study Design: We used the 2008-2011 National Health Interview Survey (NHIS) to examine trends in insurance over time. Logistic regression models adjusted for survey design...
were then computed to estimate the effect of time, health insurance, demographic, socioeconomic, and health characteristics on 1) receipt of a flu shot, 2) doctor visit, 3) dentist visit and 4) emergency room visit in the past 12 months.

**Population Studied:** Young adults aged 19 to 25 (n=11,669) who participated in the 2008-2011 NHIS.

**Principal Findings:** Insurance rates increased significantly among young adults from 2008 to 2011. While rates of insurance were decreasing from the first quarter of 2008 (70.8% insured) until the third quarter of 2010 (64.5% insured) when the ACA expansion went into effect, rates have steadily increased since the expansion of dependent coverage (64.5%; Q3 2010 to 74.1%; Q4 2011). However, in 2011, only a small proportion (1.0%) of individuals reported receiving insurance coverage through their parents/relatives, while the majority of those with private insurance received benefits through their workplace (86.5%). Multivariate regression demonstrated that young adults were more likely to receive a flu shot (OR [95% CI]: 1.70 [1.41-2.06]) and visit the dentist (OR [95% CI]: 1.20 [1.04-1.38]) over time after adjusting for individuals’ demographic, socioeconomic and health characteristics. However, we saw no increase in the likelihood of visiting a doctor (OR [95% CI]: 1.05 [0.90-1.22]) or the emergency room (OR [95% CI]: 1.05 [0.90-1.22]) over time. Further, despite the increases in insurance coverage over time, uninsured young adults continue to be less likely to receive a flu shot, visit the dentist, or visit the doctor after accounting for survey year (p<0.05 for all). Interestingly, no significant differences remain between privately insured and uninsured individuals in use of ER care after accounting for survey year and other demographic, socioeconomic, and health characteristics.

**Conclusions:** While insurance rates have increased for 19-25 year old young adults since the implementation of expanded dependent coverage under the ACA, insurance rates are still low. However, the proportion of young adults receiving insurance through their parent/relative was minimal in 2011. Further, as insurance rates increased, the likelihood that young adults would utilize preventative healthcare (i.e., flu shot, dentist visit) also increased, while use of emergency care remained stable.

**Implications for Policy, Delivery, or Practice:** Our research contributes to knowledge of the early implications of the ACA on insurance coverage and healthcare utilization among young adults in the US, demonstrating that while insurance rates are increasing, few young adults obtained coverage through their parent/relative in 2011. Future research should examine knowledge of and barriers to dependent coverage under the ACA.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #1045

**Healthcare Reform: Closing the Health Disparities Gap. Where does Patient Navigation Belong?**

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**Presenter:** Michael Preston, M.P.H., Ph.d.c, Director, Cancer Control, University of Arkansas for Medical Sciences, mapreston@uams.edu

**Research Objective:** Prostate cancer is the most commonly diagnosed cancer and second leading cause of cancer death in the US among men. Although overall incidence and mortality has decreased over time, disparities still exist among racial/ethnic groups. Strategies to reduce disparities in cancer detection, treatment, and outcomes among racial/ethnic minorities and low-income patients have been gathering momentum with the introduction of patient navigation (PN) initiatives. The current advancement of medical knowledge and technology spurs a widening gap in healthcare delivery for racial/ethnic minorities and medically underserved populations for certain emerging state-of-the-art treatments. The controversy around the effectiveness of prostate-specific antigen (PSA) and digital rectal exam (DRE) as screening tools was cited as a possible reason for this information void, but research suggests that African American males rely on their physicians to recommend all needed tests/screenings. The study examined the current and potential roles of PN in the improvement of prostate cancer screenings among disadvantaged populations.

**Study Design:** A Longitudinal study design was conducted on males over 35 years of age to examine the role of patient navigation on equity of access to prostate cancer screening among
disadvantaged populations since 2008 (n=1602). Patient’s demographics, geographical location, PSA scores, and DRE scores, and the array of event types in which community engagement occurred were collected. Data were analyzed using comparison analyses.

**Population Studied:** Males over 35 years of age from disadvantaged populations since 2008.

**Principal Findings:** Patient navigation allowed for greater utilization of health services among populations of rural origins (Urban: n=747; Rural: n=833). Mean PSA scores were within normal range, although mean PSA scores for non-whites residing in rural areas (1.45ng/mL) was slightly higher than non-whites in urban areas of the state (1.36ng/mL; p=0.03). The mean age was 54 years (Urban: 51 years; Rural: 56 years; p=0.001).

**Conclusions:** Equity of access to cancer screenings among disadvantaged populations may be achieved with the utilization of patient navigation programs. Access to the health care system is a strong barrier which fosters disparities among disadvantaged populations.

**Implications for Policy, Delivery, or Practice:** PN allows rural disadvantaged populations entry into the health care system at earlier stages, considering PSA as a proxy for disease. Health care reform lays the foundation for preventative programs such as patient navigation.

**Funding Source(s):** NIH

**Poster Session and Number:** C, #1046

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**Defining Service Areas for Federally-Funded Community Health Centers in the United States**

Jennifer Rankin, Robert Graham Center of the American Academy of Family Physicians; Carolyn Fahey, Robert Graham Center of the American Academy of Family Physicians; Andrew Bazemore, Robert Graham Center of the American Academy of Family Physicians

**Presenter:** Jennifer Rankin, Ph.D., Geospatial Informatics Senior Analyst, Robert Graham Center of the American Academy of Family Physicians, jrankin@aafp.org

**Research Objective:** To construct individual Community Health Center Service Areas (CHCSAs) based on 2011 utilization data that permit the better identification of areas and populations unserved by health centers.

**Study Design:** Secondary data analysis using a modified Griffith Commitment Index, data from the 2011 Uniform Data System were used to create service areas based on where the most patients live who come to each health center (Actual service areas or CHCSAs). CHCSAs were compared to the service areas that were funded (funded service areas) for each health center and service area demographics were compared.

**Population Studied:** United States Federally Funded Community Health Centers. Patient data were aggregated by ZIP Code by the reporting entity and converted to counts by ZIP Code Tabulation Area (ZCTA). ZCTAs with fewer than 11 patients were excluded from the data provided.

**Principal Findings:** Funded service areas and CHCSAs are quite different, with actual CHCSAs being larger, on average, than the areas that health centers are funded to serve. While the areas differ, population demographics within the areas are strikingly similar.

**Conclusions:** CHCSAs allow planners and policy makers to better understand gaps and overlaps in the safety net. Assessing unmet need in areas of perceived overlapping service, and potential population disparities, may avoid assumption pitfalls and identify populations needing targeted services.

**Implications for Policy, Delivery, or Practice:** This is the first step to understanding funded versus actual service areas. Federally-funded community health centers receive funding to provide primary medical, dental, and behavioral health services to underserved communities. Despite best efforts to prevent federal funding of multiple health centers serving the same geographies, service areas often overlap. Current “overlap” discussions are based on funded service areas rather than actual service areas. Furthermore, it is inappropriate to assume that because an area is being served by one or more health centers that the population is well served. Understanding the actual service area of federally funded community health centers is essential to planners hoping to evaluate access for underserved populations and for identifying areas where the need for federal resources remains.

**Funding Source(s):** HRSA

**Poster Session and Number:** C, #1047

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**Comparing Primary Care Service Areas to Estimated Drive Times: An Evaluation of Geographic Accessibility to Primary Health Care**

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Presenter: Jennifer Rankin, Director, Robert Graham Center, American Academy of Family Physicians, jrankin@aafp.org

Research Objective: Healthcare service areas allow for the measurement of health outcomes, assessment of health care services utilization and healthcare shortage area designation that are at the center of policy decisions. Generally these services areas are created out of predefined census geographies, but some policy decisions are made based on geographic accessibility in regards to the distance, or travel time to healthcare providers.

Study Design: This research evaluates the geographic accessibility of populations in rural areas of Missouri, Oregon and North Carolina to primary care physicians within Primary Care Service Areas (PCSAs). This is accomplished by comparing PCSAs to 30-minute drive-time polygons calculated in ArcMap centered on primary care physician locations. Population from the 2010 Census at the block level was used to calculate the coverage of the PCSA and the estimated drive-times. A quantitative comparison was made based on the difference in area and population coverage by each corresponding drive-time and PCSA and the percent of population that was included in each PCSA, but outside of an estimated 30-minute drive time.

Population Studied: The study focused on areas and populations that are within PCSAs of North Carolina, Missouri and Oregon that were classified as small rural, or isolated, according to the Rural Urban Commuting Codes and that contained a single primary care provider as listed in the National Plan and Provider Enumeration System.

Principal Findings: 72 percent of the PCSAs in the sample contained people that live outside of the 30-minute estimated drive-time polygon accounting for 14 percent of the total population living in the sample PCSAs. When considering the PCSAs that had the most people living outside the 30-minute drive-time polygon, 42.4 percent of the population lived outside of that drive-time polygon.

Conclusions: The utilization of estimated drive, or travel, times is an effective addition to the creation process for PCSAs and the evaluation of geographic access to primary health care, utilization and health outcomes. Some PCSAs in the study areas should be reconsidered with these travel time considerations for more effective policy decisions.

Implications for Policy, Delivery, or Practice: Health care service areas, such as Primary Care Service Areas, should consider travel time, or travel distance, such as estimated drive times along road networks as they are a realistic measure of who can access health care services.

Funding Source(s): No Funding
Poster Session and Number: C, #1048

Access to Primary Care on the Eve of ACA Implementation
Karin Rhodes, University of Pennsylvania, School of Medicine; Genevieve Kenney, The Urban Institute; Ari B Friedman, University of Pennsylvania; Doug Wissoker, The Urban Institute; David Chearo, The University of Chicago Survey Lab; Charlotte C Lawson, University of Pennsylvania; Brendan Saloner, University of Pennsylvania; Daniel Polsky, University of Pennsylvania

Presenter: Karin Rhodes, M.D., M.S., Director, Emergency Care Policy Research, University of Pennsylvania, School of Medicine, kvr@sp2.upenn.edu

Research Objective: The goals of this study are to provide valid estimates of baseline primary care capacity and to assess variation in access for both urgent and routine appointments by insurance status, prior to the implementation of the major coverage provisions of the Affordable Care Act (ACA). We estimate how the proportion of physician offices accepting new patients and average wait times for appointments vary across 10 states (AR, GA, IA, IL, MA, MT, NJ, OR, PA, and TX) for non-elderly adults, overall and by insurance status. The states have been selected to be diverse in terms of their region, size, population density, primary care provider workforce, reliance on Medicaid Managed Care, generosity of Medicaid payment rates, and projected increase in coverage under the ACA.

Study Design: This study uses a simulated patient methodology to measure the extent to which trained field staff, using piloted scripts and posing as patients, are able to schedule actual appointments with a primary care provider for either a routine or an urgent health care concern
– a new diagnosis of hypertension. Callers with each condition were assigned to either Medicaid, commercial, or no insurance coverage. Each caller stated a specific insurance plan that data suggested the provider accepted. All appointments were cancelled at the end of the call.

**Population Studied:** We selected a stratified random sample of practices at the county level to produce representative samples in each state. Each practice (the unit of analysis), defined as a unique primary care site address and phone number, was identified from a comprehensive list of primary care providers and confirmed through a ‘call through’ of the entire sample.

**Principal Findings:** The screening calls revealed a total of 9,799 eligible primary care practices in the 10 study states. The simulated patient calls are currently underway with completion anticipated in late February/early March. Initial results will be available at the June AcademyHealth meeting. To-date, 6,460 cases have been completed. Of these, 53 percent resulted in an appointment being granted, 27 percent resulted in a straightforward “no”; 14 percent resulted in a hypothetical or vague appointment, likely available when they provide their insurance number. In 5 percent, appointment availability could not be ascertained due to appointment system barriers; 1 percent were walk-in clinics only.

**Conclusions:** The study will provide important new information on variation in access to primary care by insurance status for both urgent and routine appointments. Results can be used to monitor access to primary care over time and identify how primary care access varies, within a given insurance status and state.

**Implications for Policy, Delivery, or Practice:** There is a limited window to establish a clear baseline measure of current primary care capacity within each insurance condition prior to the large increase in enrollment expected to begin in 2014. If this is not well documented, it will be very difficult to assess how the ACA has affected primary care access. Results from simulated patient methodology serve to assess the validity of other measures of access, such as traditional provider and patient surveys.

**Funding Source(s):** RWJF

**Poster Session and Number:** C, #1049

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**How Does Primary Care Access Promote Utilization of Preventive Health Care? Evidence from an Experimental Audit Study**

Brendan Saloner, University of Pennsylvania; Karin Rhodes, University of Pennsylvania; Jenny Kenney, Urban Institute; Daniel Polsky, University of Pennsylvania

**Presenter:** Brendan Saloner, Ph.D., RWJ Health And Society Scholar, Health Policy, University of Pennsylvania, bsaloner@gmail.com

**Research Objective:** Primary care is the principal setting in which adults receive routine preventive care such as influenza vaccinations and pap smears. Several studies have identified limited availability of primary care providers as a substantial barrier to receiving preventive care. It is difficult, however, to measure whether barriers to primary care primarily stem from limited supply of providers, versus patient-level factors, such as insurance coverage or preferences for care. Our objective is to measure how much availability of primary care appointments explains variation in utilization of preventative health care by using novel measures from an experimental audit study.

**Study Design:** The audit study provides comparable data on availability of primary care on the eve of health reform in 10 politically and geographically diverse states. Field staff are calling at least 1,000 adult primary care providers in each of 10 states posing as prospective patients. The calls follow a standardized script, except that the reason for the visit and the patient’s insurance status (Medicaid, private, uninsured) are experimentally manipulated. Using the audit study data, we will calculate a county-averaged probability of receiving a visit for different insurance groups, and an average wait time for a visit. County-level measures will be linked to individual-level data from the Behavioral Risk Factor Surveillance System (BRFSS). BRFSS collects data on physical exams, pap smears, prostate exams, and influenza vaccinations. BRFSS releases county identifiers for the most populous counties in the United States. For our 10 states, BRFSS identifies 69 counties covering 50,506 non-elderly adults.

We will estimate the probability that an individual utilizes preventive care based on the average availability of primary care appointments in the individual’s county. Our primary regression
specification will include individual-level demographic and health status covariates. These models will be estimated for the full sample, and for subgroups of interest (sex, race, insurance status). We will also assess whether the relationship between appointment availability and primary care utilization is mediated by county-level variables, such as poverty and uninsured rates.

**Population Studied:** Non-elderly adults (age 18 to 65) residing in 69 populous counties in 10 states.

**Principal Findings:** Data collection for the audit study will be completed in March 2013. These measures will be linked to the BRFSS and preliminary results will be available at the June AcademyHealth meeting. Analysis of the BRFSS reveals substantial variation across counties in our sample in use of preventative health care. For example, the median past-year checkup rate was 71.9 percent, but the range was 48.9 to 85.3 percent. Other measures such as influenza vaccinations and pap tests also exhibited substantial ranges. Rates of screening for all measures was lower for low-income, uninsured, and minority populations.

**Conclusions:** Our study will systematically characterize the relationship between availability of primary care appointments and preventive care at a county level, and highlight particular populations that may be affected by limited provider availability.

**Implications for Policy, Delivery, or Practice:** Findings will help state and local policymakers determine how to strategically invest in expanding provider workforce as they prepare to simultaneously expand health insurance coverage under the Affordable Care Act.

**Funding Source(s):** RWJF

**Poster Session and Number:** C, #1050

**Implication of Immigration Reforms for Children’s Health Insurance Coverage**

Eric Seiber, Ohio State University; Paula Song, Ohio State University; Kelly Balistreri, Bowling Green State University; Karoline Mortensen, University of Maryland

**Presenter:** Eric Seiber, Ph.D., Assistant Professor, Health Services Management and Policy, Ohio State University, seiber.7@osu.edu

**Research Objective:** U.S. health policy greatly favors health insurance coverage for children, although significant gaps in coverage exist among children in immigrant families. Although the ACA expands health insurance coverage for both adults and children, it fails to address insurance coverage for immigrants. Adding to the complexity of immigrant health policy is the mixed composition of immigrant families, where children often have U.S. citizenship while their parents do not. This paper examines the role of immigration in coverage gaps for children.

Specifically, this paper (1) identifies the share of uninsured children living in immigrant families, (2) demonstrates the role of the child’s citizenship in obtaining coverage, and (3) uses decomposition techniques to identify an upper bound reduction in the child uninsured rate if these children gain citizenship through legislative action.

**Study Design:** This study uses the 2008-2011 American Community Surveys to estimate probit models of insurance status. Since US Census data does not collect information on immigration status (i.e., legal residency), a Fairlie decomposition reveals the potential reduction in the uninsured rate for children from extending citizenship to undocumented children.

**Population Studied:** The American Community Survey’s representative sample of all children under age 18 includes 2.5 million children from 2008-2011, including over 600,000 children with immigrant parents.

**Principal Findings:** Having an immigrant parent is a defining characteristic of uninsured children. While children in immigrant families are only 24.1% of all children in the United States, they comprise almost half (42%) of all uninsured children in the US. These children live in immigrant families and have at least one immigrant parent, but 69% of those uninsured immigrant children already hold US citizenship. The decomposition analysis demonstrates that citizenship of the parent explains the largest difference in the uninsured rate for these children.

**Conclusions:** Children with immigrant parents are almost half of all uninsured children in the United States. The high percentage of uninsured children in immigrant families is not due to the child’s immigration status since 2/3 are already US citizens. If immigrant children gain citizenship, most of these children will remain uninsured unless the immigration status of their parents also changes.

**Implications for Policy, Delivery, or Practice:** While a child’s immigration status determines their eligibility for Medicaid and other public benefits, parents must be willing to enroll the child. This paper shows that immigration
reforms that only extend citizenship to children will have little spillover benefits in reducing the number of uninsured children in the United States. Children in immigrant families will remain disproportionately uninsured if immigration reform does not extend to their adult parents.

**Funding Source(s):** Other, Foundation for Child Development

**Poster Session and Number:** C, #1051

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**Emergency Department Utilization and the Uninsured: Does Length of Coverage Gap Matter?**

Dan Shane, University of Iowa

**Presenter:** Dan Shane, Ph.D., M.A., Assistant Professor, Health Management and Policy, University of Iowa, dan-shane@uiowa.edu

**Research Objective:** In this paper, we tie together two important issues related to ACA health insurance reforms: coverage dynamics and emergency department utilization. We take aim at a group of people often overlooked in analyses of the uninsured and studies examining the impact of health insurance coverage on emergency department utilization: the temporarily uninsured. Can we expect significant changes in emergency department utilization for people gaining full insurance coverage after suffering a temporary gap in coverage? How do these changes compare to the long-term uninsured gaining full coverage?

**Study Design:** We evaluate the demographic and socioeconomic makeup of the temporarily uninsured and assess whether they can be meaningfully referred to as frictionally uninsured. Frictionally uninsured refers to the status of individuals that are temporarily without insurance coverage due to a job transition. In that context, we seek to understand whether overall macroeconomic trends impact this group differently than individuals continuously without coverage. Using MEPS data we further address the idiosyncrasies of this group as they relate to emergency department usage. By incorporating a treatment-effects specification that controls for self-selection into health insurance we pinpoint how partial coverage gaps impact emergency department utilization, both emergency and non-emergency visits.

**Population Studied:** Nationally representative population of 18-64 year-olds divided into three groups: insured, temporary coverage gap, continuously uninsured.

**Principal Findings:** Our findings suggest that virtually all the meaningful decreases in emergency department utilization that occur due to expanding health insurance accrue from fewer visits by people that suffered only temporary gaps in coverage. We further find that temporary lack of coverage leads to significantly more ED visits tagged as non-urgent.

**Conclusions:** Temporary gaps in insurance coverage appear to result in significantly more trips to the emergency department and often for non-urgent reasons. Our results suggest that meaningful reductions in ED usage from expanding insurance will largely come from eliminating temporary gaps in coverage rather than from expanding coverage to the long-term uninsured.

**Implications for Policy, Delivery, or Practice:** We explore the mechanisms for the aforementioned utilization patterns and discuss the policy implications for these important findings. Outreach to groups experiencing job transitions to prevent gaps in insurance coverage may be critical to reducing reliance on emergency departments, particularly for non-urgent uses.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #1052

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**A New Data Source for Health Services Research: Evaluating the Gallup-Healthways Well-Being Index**

Laura Skopec, US Department of Health and Human Services; Thomas Musco, Office of the Assistant Secretary for Planning and Evaluation, US Department of Health and Human Services; Benjamin D. Sommers, Harvard School of Public Health

**Presenter:** Laura Skopec, M.P.P., Program Analyst, Office of the Assistant Secretary for Planning and Evaluation, US Department of Health and Human Services, lauraskopec@yahoo.com

**Research Objective:** This analysis describes the Gallup-Healthways Well-Being Index (WBI), a daily national phone survey of adults focused on health and wellness. Our objective was to compare Gallup’s health-related estimates to other established national surveys and identify potential areas where the WBI might be particularly useful for policy research.

**Study Design:** We compared several years of Gallup survey data for adults ages 18 and over to established national surveys in several
domains. The surveys used for comparison were the Current Population Survey (CPS), the American Community Survey (ACS), the Medical Expenditure Panel Survey (MEPS), the National Health Interview Survey (NHIS), and the Behavioral Risk Factor Surveillance System (BRFSS). We compared demographic characteristics of Gallup’s sample to those in the CPS, ACS, and NHIS; health insurance information by type of coverage, year, and state to the CPS, ACS, and NHIS; measures of access to care to the NHIS, MEPS, and BRFSS; and health status measures to the CPS, NHIS, and MEPS. For insurance coverage rates by state and over time, we used Pearson correlation coefficients to describe the relationship between Gallup estimates and other datasets. All analyses accounted for each survey’s design and were weighted to produce nationally-representative estimates.

Population Studied: Nationally-representative samples from 6 different surveys, containing all adults ages 18 and over, for the years 2008-2012.

Principal Findings: Gallup’s post-weighted sample is similar in age, race/ethnicity, and education to the CPS, ACS, and NHIS. Income is more frequently not reported in Gallup data than in the CPS, ACS, and NHIS, which use imputation for missing values. Gallup’s survey produces similar national, state, and time-trend estimates on overall rates of insurance coverage as other surveys, with correlation coefficients between Gallup estimates and other surveys ranging from 0.70 to 0.87 for annual uninsured rates, and 0.89 to 0.95 for state-level estimates. Gallup differs in its coverage question (allowing only one type of insurance per person), and produces much lower rates of Medicare and Medicaid coverage than other surveys. Access to care, self-reported prevalence of several chronic diseases, and overall health status estimates were similar in Gallup and other surveys.

Conclusions: The Gallup WBI is a potentially valuable complement to existing data sources for health services research. Gallup WBI measures numerous outcomes related to health policy and has the advantages of allowing for national and state-specific estimates with a rapid turnaround time (less than a week from survey administration to data availability). For population demographics, overall rates of insurance coverage, access to care, and health status, Gallup data are reasonably similar to other well-established national surveys.

Estimates of type of insurance are less comparable, particularly for public coverage.

Implications for Policy, Delivery, or Practice:
The Gallup WBI could serve as an effective data source for tracking population changes in coverage over time and within states, before data from the other national surveys are released. The WBI could be particularly useful as an early indicator of the effectiveness of major coverage expansions such as those planned for 2014 under the Affordable Care Act.

Funding Source(s): Other

Commercial Health Insurance Markets: Concentration, Cost Trends and Policy Implications

Kristof Stremikis, The Commonwealth Fund; Cathy Schoen, The Commonwealth Fund; David Radley, The Commonwealth Fund; Jacob Lippa, The Commonwealth Fund

Presenter: Kristof Stremikis, Senior Researcher, The Commonwealth Fund, ks@cwf.org

Research Objective: To update previous analysis of health insurance enrollment in the United States and determine the level of concentration in national, state, and local health insurance markets. Additionally, uncover recent trends in the financial performance of the five major for-profit carriers and review related research on the impact of enrollment concentration on profit and market dynamics.

Study Design: Calculation of insurer market share is based on Health Leaders Interstudy data of commercial health insurance enrollment in HMO and PPO markets in 2011. Insurance firm financial data is derived from publicly reported tax filings.

Population Studied: Commercially insured (employer-sponsored and individual) adults with HMO and PPO coverage throughout the United States. Financial data are from the five largest commercial health insurers in the country—UnitedHealth Group, WellPoint, Aetna, CIGNA, and Humana.

Principal Findings: Analysis of health insurance enrollment in 2011 shows that the majority of U.S. health insurance markets are highly concentrated, with the three largest carriers comprising 70 percent or more of commercial enrollment in nearly 30 states and a single dominant insurer enrolling more than 50 percent of commercially insured lives in eight
Institutes
Epidemiology
Research Scientist
Presenter: John McKinlay, Susan Hall, Liane
for the Working Poor?
Has the 'Massachusetts Experiment' Worked
Poster Session and N
Funding Source(s):
leverage existing dynamics to better serve the
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their market position to deploy innovative
payment arrangements in support of high-value
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contained within Affordable Care Act provide the
opportunity to magnify these initiatives and
leverage existing dynamics to better serve the
public interest.
Funding Source(s): CWF
Poster Session and Number: C, #1054

Has the 'Massachusetts Experiment' Worked for the Working Poor?
Liane Tinsley, New England Research Institutes; Susan Hall, New England Research Institutes; John McKinlay, New England Research Institutes

Presenter: Liane Tinsley, M.P.H., Associate Research Scientist, Department of Epidemiology, New England Research Institutes; ltinsley@neriscience.com

Research Objective: To examine whether the 2007 implementation of a health insurance mandate, with available subsidized health insurance, resulted in increased coverage levels and increased health care access among persons defined as 'working poor' (WP) in Boston, Massachusetts. Data for an epidemiologic cohort study were collected before (2002-2006) and after the mandate (2007-2010), creating the conditions for a natural experiment.

Study Design: The Boston Area Community Health (BACH) Survey is a prospective study conducted in a representative sample of 4,144 Boston, MA residents aged 30-79 at baseline (T1, 2002-2005); follow-up data were collected during 2006-2010 (T2). The latter period was further stratified as pre- and during-mandate (July 1, 2006 - December 31, 2008) and post-mandate (January 1, 2009 - October 7, 2010). Information on household income, health insurance coverage, and health care provider (HCP) visits was obtained using in-person interviews. To avoid confounding by new eligibility for Medicare, persons aged >65 at T2 were excluded, as were those no longer residing in MA (resulting N=3,052: 996 black participants; 1,087 Hispanic; 969 white). WP were defined as those 'currently working for pay' with a household income <200% of the federal poverty threshold; non-working poor (NWP) as those reporting any work status other than "working for pay" with a household income <200% of the federal poverty threshold; and not poor (NP) as those reporting a total annual household income >=200% of the US federal poverty threshold.

Population Studied: A community-based sample of men and women living in Boston and participating in the T1 and T2 surveys.

Principal Findings: At T1 and T2, 18.5% and 17.7% of participants, respectively, met the definition of WP. At T1, 26.5% of WP reported no health insurance, compared to 15.7% of NWP and 8.4% of NP. The proportion of WP reporting no insurance was greatly reduced at T2, especially among those whose interviews were conducted post-mandate. Among WP interviewed pre- and during-mandate, 15.5% reported no health insurance compared to 10.0% interviewed post-mandate; corresponding proportions among NWP were 4.4% and 5.0%, and 9.0% and 0.9% among NP. HCP visits among all three groups improved following reform implementation, but gaps in health care access between WP and others were not entirely ameliorated.

states. At the local level, three dominant plans control more than 70 percent of the market in more than three-fourths of the nation's 366 metropolitan statistical areas. Meanwhile, the health insurance industry as a whole continues to enjoy strong financial performance, despite continual increases in underlying medical costs and declining enrollment in employer-sponsored coverage products.

Conclusions: Oligopoly is the norm rather than the exception in health insurance markets at both the state and local level. Coincident to the trend toward consolidation, the health insurance industry as a whole has enjoyed a sustained period of strong financial performance despite continual increases in underlying medical costs and declining enrollment in employer-sponsored coverage products throughout the past decade.

Implications for Policy, Delivery, or Practice: Excessive market concentration is typically harmful when viewed through the lens of consumer welfare, and may auger for public regulation in some circumstances. However, the consolidation of purchasing power among dominant payers could also be used to effectively offset bargaining power among concentrated hospitals and physician groups, leading to lower reimbursement rates and increased pressure to slow the overall rate of medical cost growth. Related research and several recent private sector initiatives provide some evidence to this effect, and demonstrate that powerful carriers can constructively utilize their market position to deploy innovative payment arrangements in support of high-value health care. Specific insurance market reforms contained within Affordable Care Act provide the opportunity to magnify these initiatives and leverage existing dynamics to better serve the public interest.
Conclusions: Comparing T1 and the post-mandate period, the implementation of a subsidized health insurance program and a health insurance mandate was associated with substantial gains in health insurance coverage and a reduction by more than half in the proportion of WP who were uninsured. Health care utilization also appeared to increase among all three groups. Despite these gains, the WP in our study were more likely to remain uninsured post-mandate (10.0% WP vs. 5.0% NWP vs. 0.9% NP), suggesting that its reach was not universal. Strengths of our study include race/ethnic and socioeconomic diversity and the ability to stratify follow-up into pre-/during-implementation vs. post-implementation periods, which helps rule out the potential influence of secular trends that may have been operating independently of the policy change.

Implications for Policy, Delivery, or Practice: Our study suggests that both the WP and others in MA benefitted from the implementation of state health care reform.

Funding Source(s): NIH

Poster Session and Number: C, #1055

Implementation Findings of the Children’s Health Insurance Program Outreach and Enrollment Grant Program among American Indian and Alaskan Native Organizations

Nathan West, RTI International; Kathleen Farrell, RTI International; Melissa Farrell, RTI International; Rebecca Perry, RTI International

Presenter: Nathan West, M.P.A., Research Health Analyst, Department of Health Economics Research, RTI International, nathanwest@rti.org

Research Objective: Evaluate the CHIP Outreach and Enrollment Grant program as implemented by American Indian/Alaskan Native (AI/AN) grantee organizations. Determine effective strategies to enroll and retain eligible AI/AN children, identify major challenges and how to address them, and identify key lessons learned that can be used to inform other initiatives.

Study Design: Reviewed grant applications and quarterly and annual reports on grant activities and outcomes. Collected additional information from grantees through telephone interviews and e-mail communications. Synthesized information from reports and interviews into standardized annual report summaries. Study results cover two years of a three-year grant period.

Population Studied: 41 AI/AN grantees, which include health programs operated by tribes/tribal organizations, Indian Health Services (IHS) providers, and urban Indian organizations.

Principal Findings: Strategies employed fell into three broad categories: 1) application assistance, 2) outreach, and 3) partnerships with other organizations. More than half of the grantees implemented strategies in all three categories. Many grantees were able to use the IHS Resource and Patient Management System (RPMS) to generate client lists, which they used as a starting point to identify uninsured children and offer application assistance. Other grantees obtained lists from state agencies or other tribal needs-based programs. Grantees provided application assistance in easily accessible venues, including schools, residential group homes, and health care centers within their geographic area. Twelve new application sites were established and 30 new outreach workers were hired by grantees using grant funds during Year One. Primary outreach strategies included disseminating information (e.g. brochures, letters) about CHIP/Medicaid at community events such as tribal-sponsored pow-wows and health fairs, and through social workers in other needs-based programs. Nearly all grantees mailed letters, notices and applications to families with uninsured children or enrolled children who were approaching their renewal dates. Grantees often partnered with other needs-based programs within their tribes to identify eligible children, but some also formed nontribal partnerships with community organizations and health care providers that provide services to the target population. The most significant challenge faced by nearly all grantees is counting the belief among AI/AN families that their children do not need CHIP/Medicaid because they receive health care through IHS providers, or that enrolling in CHIP/Medicaid will result in a loss of other tribal-based benefits. In addition, AI/AN families are reluctant to disclose personal information that they consider private or embarrassing. Finally, geographic barriers are significant among many AI/AN families since most tribal members live in remote areas that are rural or frontier, requiring long travel distances to seek medical care and other basic services.

Conclusions: Tribal organizations are in a unique position to provide outreach and enrollment assistance to AI/AN families because they have credibility with the target population.
Implications for Policy, Delivery, or Practice:
Recent U.S. Census data show that 23 percent of AI/AN children are uninsured. The findings provide policymakers, state officials, and other stakeholders with important insights into effective approaches for reaching AI/AN children, an important subgroup that CMS and states should continue to focus on as the ACA is implemented.

Funding Source(s): CMS
Poster Session and Number: C, #1056

State-Level Immigration Laws and Immigrants’ Access to Health Care: Implications for National Reform
Kari White, University of Alabama at Birmingham; Valerie A. Yeager, Tulane University; Nir Menachemi, University of Alabama at Birmingham; Isabel C. Scarinci, University of Alabama at Birmingham

Research Objective: In the absence of national immigration reform, state legislatures have increasingly proposed measures to address local immigration issues. In 2011, Alabama became one of five states to pass omnibus legislation requiring verification of lawful US residence for individuals seeking public benefits, such as health care, from state and local agencies. There has been little systematic study of the impact these state-level initiatives have had on access to health care. We assess how Alabama’s law, HB56, has affected Latino immigrants’ use of health services across several dimensions of access to care.

Study Design: Between May and July 2012, we conducted in-depth interviews with Latina immigrant women, recruited through snowball sampling. We used theoretical sampling to capture experiences across subgroups whose characteristics were most likely to influence access: women with a current or recent pregnancy (since prenatal care is exempt from HB56’s documentation requirements) and children’s country of birth. We analyzed interview transcripts by coding emerging themes in women’s responses about getting health care since HB56 was passed and categorizing themes according to five dimensions of access: availability, accessibility, affordability, accommodation, and acceptability. We then compared themes across subgroups based on women’s pregnancy status and their children’s country of birth.

Population Studied: Thirty Latina immigrants between 19 and 49 years of age with children less than 18 years old; resided in Jefferson County, Alabama; and were living in Alabama when HB56 was passed. Our subgroups included 15 women with US-born children, 15 with at least one foreign-born child, 20 non-pregnant women and 10 pregnant/postpartum women.

Principal Findings: The most common way that HB56 impacted access was by affecting the availability of health services. Women frequently stated they were afraid that local clinics and hospitals would no longer see them or their children if they presented for care, leading some to rely on home remedies or over-the-counter medications instead of seeking care in the formal health sector. Additionally, there were several cases in which women and children were eligible but denied services because administrative staff seemed unaware of exemptions under the law. Many women reported being worried about being able to afford health care because they are now forced to seek services in the private sector where costs are substantially higher, and have experienced financial insecurity following the law. Women’s perceptions of local clinics’ abilities to meet their needs were also affected due to perceived discriminatory treatment by clinic staff and fears that they would be reported to authorities for seeking services. Accessibility to care due to fears of driving without documentation of lawful US residency was not a common barrier to use of health services, but remained a concern for women who continued to make medical visits. Overall, non-pregnant women and those with foreign-born children more frequently experienced barriers preventing them from obtaining care.

Conclusions: Alabama’s immigration law has adversely affected Latino immigrants’ use of health services by impacting several dimensions of access, which may increase health disparities.

Implications for Policy, Delivery, or Practice: HB56 and similar laws may have unintended consequences for public health if immigrants are prevented from accessing preventive and primary care.

Funding Source(s): No Funding
Poster Session and Number: C, #1057
Trust Me, I’m Medicaid: Physician Uptake of New Medicaid Patients in the Face of Varying Fees
Adam Wilk, University of Michigan School of Public Health; Jodyn Platt, University of Michigan School of Public Health

Presenter: Adam Wilk, A.B., PhD Student, Health Management and Policy, University of Michigan School of Public Health, awilk@umich.edu

Research Objective: Increasingly primary care providers (PCPs) indicate they will not accept new Medicaid patients. Yet, largely due to the Affordable Care Act (ACA), there may be as many as 21 million new Medicaid enrollees by 2022. To help incentivize PCPs to meet the growing demand, the ACA increases Medicaid fees for primary care services to 100% of Medicare fees during 2013 and 2014, after which federal subsidies go away. We explore whether PCPs refrain from accepting new Medicaid patients because fees are insufficient or because of waning trust in Medicaid to maintain or increase fees moving forward. We develop a dynamic Markov model of PCP decisions to accept new Medicaid patients and examine the importance of trust between PCPs and Medicaid in these decisions. Interaction effects provide additional insights into how physicians may respond to varying fees, suggesting new strategies Medicaid agencies may undertake to more effectively engage physicians.

Study Design: Using an interdisciplinary framework, we parameterize six dimensions of trust relevant to the PCP-Medicaid relationship: Medicaid’s reputation, commitment to an ongoing relationship, moral imperative to act on behalf of Medicaid beneficiaries rather than in self-interest, the PCP’s past experience with Medicaid, Medicaid’s demonstrated reliability, and contextual factors. We use flexibly-specified linear and non-linear panel data models to investigate how these parameters affect the probability that a PCP accepts new Medicaid patients. Interactions between trust parameters and a proxy variable for Medicaid fee generosity help predict how trust affects physician responses to elevated or reduced fees.


Principal Findings: We observe that multiple dimensions of trust – Medicaid’s reputation and PCPs prior experience, in particular – have modest, positive, and significant effects on PCP choices to accept new Medicaid patients. Moreover, our analysis of interaction effects reveals that the state’s commitment to the Medicaid program, among other dimensions, may substitute for higher fees in motivating PCPs to accept new Medicaid patients. Controlling for dimensions of trust and other factors, the effects of Medicaid fee generosity on the PCP’s propensity to accept new Medicaid patients are distinguishable from zero in only half of the evaluated specifications.

Conclusions: PCPs’ trust of their state Medicaid agencies is likely to affect their willingness to accept new Medicaid patients both when fees are relatively high, as they will be during 2013 and 2014, and after they (potentially) decline in 2015. For many PCPs, the level of trust in Medicaid may be more important than Medicaid fee generosity when deciding to accept Medicaid patients.

Implications for Policy, Delivery, or Practice: Medicaid should seek to instill greater trust among PCPs (e.g., through transparency, follow-through on commitments, and policy consistency) to encourage them to accept new Medicaid patients during the coming years.

Funding Source(s): No Funding
Poster Session and Number: C, #1058

Charges and Expenditures from Ambulatory Care Sensitive Emergency Room and Inpatient Visits Predicted by Past Year Unmet Healthcare Need among Children in the United States
Lauren Wisk, University of Wisconsin Madison

Presenter: Lauren Wisk, B.S., Doctoral Candidate, Department of Population Health Sciences, University of Wisconsin Madison, wisk@wisc.edu

Research Objective: We sought to determine if unmet healthcare need was associated with
ambulatory care sensitive (ACS) emergency room and inpatient charges and expenditures among children in the US, using a nationally representative, population-based sample. **Study Design:** We examined data on 22,581 children from the 2002-2007 Medical Expenditure Panel Survey. Unmet need was defined as delayed or forgone healthcare during the first survey year. Charges, expenditures and out-of-pocket (OOP) costs associated with ACS utilization were evaluated during the second survey year. Expenditures for non-ACS utilization during the second year were also evaluated as a comparison. Multivariable two-part models were used to determine if children who experienced past year unmet healthcare need had higher ACS expenditures in the following year, adjusting for relevant covariates (including: child age, gender, race/ethnicity, health insurance, activity limitation status, usual source of care, parental education, family composition, family income, US region of residence, urbanicity, and time). **Population Studied:** US children aged 0 to 17 years. **Principal Findings:** 4.77% of children with unmet need experienced any costs associated with ACS visits, compared to 3.02% for those without unmet need (p<0.01); while 11.57% of children with unmet need experienced any costs associated with non-ACS visits, compared to 12.23% for those without unmet need (p=0.03). Multivariable analyses revealed that children with unmet need were 1.69 times more likely to have any ACS charges than children without unmet need (95% CI: 1.15-2.49), but there were no significant difference in the odds of experiencing any non-ACS charges for children with and without unmet need (OR 1.19, 95% CI: 0.97-1.45). Non-ACS expenditures and OOP costs were not significantly different for those children with and without unmet need. Children with unmet need were more like to have any ACS expenditures than children without unmet need; while among those with any ACS costs, children with unmet need had significantly lower charges and expenditures but significantly higher OOP costs. **Conclusions:** As unmet need was associated with increased ACS costs but not non-ACS costs, it is less likely that the difference in ACS costs were driven by a general preference to receive care in a hospital. Instead, families may be substituting prior delayed or forgone ambulatory care with emergency room and inpatient care. Charges and expenditures for children with unmet need and any ACS costs may be lower because their conditions are less severe, while co-occurring OOP costs may be higher due to less generous insurance coverage. Ironically, families may be seeking care in the ER instead of a clinic because of their less generous insurance coverage. Alternatively, charges and expenditures may be lower because families are refusing expensive services because the associated OOP costs are too great, possibly also due to less generous insurance coverage. **Implications for Policy, Delivery, or Practice:** Regardless of the mechanism, children with unmet need and high ACS costs reflect families with clear barriers to accessing appropriate preventive care. Ensuring that families understand their insurance benefits may help to ensure appropriate utilization while simultaneous decreasing their OOP costs. Both insurers and providers can play a role in ensuring appropriate utilization by preventing unmet need. **Funding Source(s):** Other, RWJF Dissertation Grant **Poster Session and Number:** C, #1059 **Medicaid and CHIP Retention among Children in Nine States** Angie Wong, Stony Brook University and Stony Brook Long Island Children's Hospital; Susmita Pati, Stony Brook University and Stony Brook Long Island Children's Hospital; Ashley Zeigler, The Children's Hospital of Philadelphia; Rose E. Calixte, Stony Brook University and Stony Brook Long Island Children's Hospital; Justin Ludwig, The Children's Hospital of Philadelphia; A. Russell Localio, The University of Pennsylvania Perelman School of Medicine; Jeanhee H. Moon, The Children's Hospital of Philadelphia; Jeffrey H. Silber, The Children's Hospital of Philadelphia **Presenter:** Angie Wong, MHS, Research Coordinator, Pediatrics, Stony Brook University and Stony Brook Long Island Children's Hospital, angie.wong@stonybrookmedicine.edu **Research Objective:** Despite federal mandates, states control many aspects of public health insurance program implementation that may result in differences in public insurance retention rates between states. Understanding differences between metrics used to assess public insurance retention rates is a critical first step for policy decision-makers.
Study Design: Three metrics were used to measure public insurance retention: (1) Duration metric – a prospective metric that quantifies the number of newly enrolled children continuously enrolled in public insurance coverage after initial enrollment during a pre-specified observation period; (2) Newborn duration metric – a similar measure to Duration but focusing only on newly enrolled newborns; (3) Coverage metric – a prospective metric that quantifies the ratio of time an individual is enrolled over an 18 month interval.

Population Studied: Data from the 2006-2008 Medicaid Analytic Extract were used to examine these three metrics in nine selected states: Illinois, Louisiana, Montana, New Hampshire, New York, North Carolina, Ohio, Oregon, and Utah.

Principal Findings: Public insurance retention rates vary greatly among states and with using different metrics. For the duration metric, the retention rate ranges from 26.3 percent of children continuously enrolled for 18 months in Utah to 71.2 percent in Illinois. The retention rates for the newborn 18-month duration metric are slightly higher, ranging from 29.0 percent in Utah to 81.8 percent in Illinois. In contrast, using the duration metric, a child is covered by insurance 54.4 percent of an 18 month period in Utah to 80.1 percent of an 18 month period in Illinois.

Conclusions: Variation in public insurance retention rates between states and with using different metrics raises concerns about existing practices to support continuous public health insurance for eligible children.

Implications for Policy, Delivery, or Practice: As healthcare reform unfolds, multi-pronged and multi-level strategies to retain eligible children merit serious consideration.

Funding Source(s): AHRQ
Poster Session and Number: C, #1060

Association of Ambulatory Care Sensitive Conditions with Public Insurance Coverage
Angie Wong, Stony Brook University and Stony Brook Long Island Children's Hospital; Susmita Pati, Stony Brook University and Stony Brook Long Island Children's Hospital; Ashley Zeigler, The Children's Hospital of Philadelphia; Rose E. Calixte, Stony Brook University and Stony Brook Long Island Children's Hospital; Justin Ludwig, The Children's Hospital of Philadelphia; A. Russell Localio, The University of Pennsylvania Perelman School of Medicine; Jeanhee H. Moon, The Children's Hospital of Philadelphia; Jeffrey H. Silber, The Children's Hospital of Philadelphia

Presenter: Angie Wong, MHS, Research Coordinator, Pediatrics, Stony Brook University and Stony Brook Long Island Children's Hospital, angie.wong@stonybrookmedicine.edu

Research Objective: Though conventional wisdom holds that stable continuous insurance coverage is associated with increased preventive care and, in turn, decreased likelihood of hospitalization, limited literature has quantified the relationship between public insurance retention and pediatric hospitalizations for ambulatory care-sensitive conditions (ACSCs). This study aims to determine the association between public insurance retention and hospitalizations for ACSCs for children.

Study Design: The average insurance retention in a given child's county of residence was calculated using two different insurance metrics: 1) Duration: percentage of newly enrolled children continuously enrolled for 18 months after initial enrollment; 2) Coverage: the ratio of time a child is enrolled over an 18 month interval. Multivariable regression models including gender, age, race/ethnicity, presence of chronic conditions, and geography were created to determine the association of insurance retention with a child's odds of ACSC hospitalization.

Population Studied: The 2006-2008 Medicaid Analytic Extract data from nine states were used: Illinois, Louisiana, Montana, New Hampshire, New York, North Carolina, Ohio, Oregon, and Utah.

Principal Findings: ACSC hospitalization rates ranged from 0.29 percent in Oregon to 2.41 percent in Illinois using the duration metric and 0.22 percent in Oregon to 1.39 percent in Illinois using the coverage metric. In general, both Coverage and Duration insurance retention measures showed a significant association with ACSC hospitalizations, but in the direction of increased insurance retention leading to increased likelihood of hospitalization. The fully adjusted models demonstrated that a 10 percent increase in the average county-level coverage at 18 months was significantly associated with an increase in a child's odds of an ACSC hospitalization in 7 of 9 states (Illinois 15 percent, Louisiana 32 percent, Montana 89 percent, New Hampshire 45 percent, New York 32 percent, Oregon 36 percent, Utah 68 percent).
percent) as well as the average county-level duration of enrollment in 6 of 9 states (Illinois 12 percent, Louisiana 58 percent, Montana 5 percent, New York 16 percent, Ohio 9 percent, Oregon 44 percent).

**Conclusions:** Contrary to expectations, greater insurance retention is associated with higher likelihood of hospitalization for ACSCs.

**Implications for Policy, Delivery, or Practice:**

Children in this study sample were selected based on Medicaid eligibility files and have a higher ACSC rate than the national average, thus other unmeasured characteristics may be confounding the result. Further study will be required to confirm the results.

**Funding Source(s):** AHRQ

**Poster Session and Number:** C, #1061

**Disparities in Continuity of Public Health Insurance Coverage among Vulnerable Children**

Angie Wong, Stony Brook University and Stony Brook Long Island Children's Hospital; Susmita Pati, Stony Brook University and Stony Brook Long Island Children's Hospital; Ashley Zeigler, The Children's Hospital of Philadelphia; Rose E. Calixte, Stony Brook University and Stony Brook Long Island Children's Hospital; Justin Ludwig, The Children's Hospital of Philadelphia; A. Russell Localio, The University of Pennsylvania Perelman School of Medicine; Jeanhee H. Moon, The Children's Hospital of Philadelphia; Jeffrey H. Silber, The Children's Hospital of Philadelphia

**Research Objective:** Without stable insurance coverage, children -- especially those from vulnerable groups -- are more likely to experience delayed care, have unmet medical needs and do not have a usual source of care. This study aims to determine the disparities in public health insurance retention rates among children.

**Study Design:** The health insurance retention rates among the vulnerable groups of children were quantified using two different metrics: 1) Duration: percentage of newly enrolled children continuously enrolled for 6, 12, and 18 months after initial enrollment; 2) Coverage: the ratio of time a child is enrolled over an 18 month interval. Multivariable logistic regression models were used to further determine differences in public health insurance retention rates between vulnerable groups of children.

**Population Studied:** Using 2006-2008 Medicaid Analytic Extract data from nine selected states, insurance retention was compared for two vulnerable groups: racial/ethnic minorities and children with special health care needs (CSHCN). Race/ethnicity was classified based on Office of Management and Budget guidelines. CSHCN were identified using a list of pediatric chronic conditions compiled based on published peer-reviewed literature.

**Principal Findings:** Compared to non-Hispanic white children, non-Hispanic black children in most states were most likely to retain coverage at 18 months. Using the duration metric, retention rates for 18 months among non-Hispanic white children ranged from 26.6 - 67.3 percent vs. 31.6 - 72.5 percent among non-Hispanic black children. Using the coverage metric, retention rates among non-Hispanic white children ranged from 53.9- 80.2 percent of the 18 month observation period, 60.7 - 83.2 percent among non-Hispanic black children, and 54.6- 81.9 percent among Hispanic children. In all states except Louisiana, CSHCN were more likely than their healthy peers to retain coverage at 6, 12, and 18 months. Duration at 6 months ranged from 81.8- 96.4 percent among CSHCN vs. 70.6- 95.4 percent among non-CSHCN. Duration at 12 months ranged from 60.9- 91.0 percent among CSHCN vs. 49.4- 82.8 percent among non-CSHCN. Duration at 18 months ranged from 36.1- 84.6 percent among CSHCN vs. 25.2- 66.1 percent among non-CSHCN. Using the coverage metric, CSHCN were insured 66.5- 88.9 percent of the 18 month observation period vs. 53.0- 80.8 percent among non-CSHCN. These disparities persisted in multivariate models including gender, age, race/ethnicity, presence of chronic conditions, and rural/urban residency.

**Conclusions:** Children from vulnerable populations are more likely to retain public health insurance coverage than their peers, but relatively low retention rates for vulnerable groups are cause for concern.

**Implications for Policy, Delivery, or Practice:** Strategies to increase public insurance coverage retention for vulnerable groups of children warrant attention.

**Funding Source(s):** AHRQ

**Poster Session and Number:** C, #1062
State Mandated Insurance Benefits and Preventive Cancer Screenings
Wendy Xu, University of Minnesota; Bryan Dowd, University of Minnesota; Jean Abraham, University of Minnesota

Presenter: Wendy Xu, M.S., Ph.D candidate, Student, Health Policy and Management, University of Minnesota, wendyumn@gmail.com

Research Objective: This paper seeks to understand the association between state insurance mandates and utilization of several preventive cancer screenings, and the induced redistributive effects among consumers. The specific aims are: (1) to estimate the effect of state mandated benefits of preventive care on use of cancer screenings; (2) to estimate how non-price barriers relate to compliance with screenings; (3) to quantify the re-distributive effects of mandated coverage.

Study Design: Substantial variations with respect to the timing of state mandates that went into effect provided a natural experimental design for the study. A Difference-in-Difference model is paired with this design to estimate the change in utilization of preventive screenings because of state mandated benefits. The primary data comes from the 1997-2008 Medical Expenditure Panel Survey (MEPS). It is supplemented by the Area Resource Files (ARF) and the hand-collected state preventive mandates. The price of preventive cancer screenings paid by insurance plans is taken to be the national averaged insurer paid price listed on Healthcare Blue Book.com as the price of the interested services.

Population Studied: The analysis sample consists of privately insured adults with age and gender specific to the American Cancer Society (ACS) guidelines. The sample excludes people who are enrolled in Medicare or Medicaid any month during the survey year, as mandated benefits generally aim at private insurance. Those who reported a diagnosis of cervical, colon and prostate cancers are excluded from the respective sample.

Principal Findings: Overall, the findings suggest that mandated coverage does not increase consumption of preventive care either in aggregate or for different demographic subgroups. The findings are robust to a variety of sensitivity analyses. Some non-price social determinants are associated with large redistributive effects, including being an Asian, less educated, lack of English proficiency and lack of usual source of care, and living in isolated areas without adequate physician supply. It is shown that each individual who is eligible to use the service but have forgone it due to other barriers, potentially subsidize the users by $403.

Conclusions: While coverage mandates are ineffective in achieving increased cancer screening, mandates do result in income transfers from non-users to users of preventive care, and those transfers appear to be regressive – moving income from disadvantaged non-users to relatively well-off users.

Implications for Policy, Delivery, or Practice: This study reveals if mandatory coverage of preventive care is a wise use of limited resources that results in positive net benefits to consumers. Although reducing the out-of-pocket cost of preventive care has become a widely accepted public policy, state and federal governments should consider both the price effects and the distributional effects of mandate coverage with the essential health benefits of the reform. Mandated coverage has redistributive effects that may exacerbate the inequalities among individuals. Public policies that focus on the non-price factors affecting consumption of preventive care, such as increasing access to regular sources of care, education programs that target on people with poor health literacy, subsidies to language services for those difficult with English, and increasing physician availabilities in rural areas, might be both more efficient and more equitable, as well.

Funding Source(s): No Funding
Poster Session and Number: C, #1063
DISPARITIES AND HEALTH EQUITY

Health Disparities-Focused Health Services Research: Trends and Search Methodology
Philip Alberti, Association of American Medical Colleges; Nisha Shah, AcademyHealth; Beth Johnson, AcademyHealth; Erin Holve, AcademyHealth; Karey Sutton, Association of American Medical Colleges

Presenter: Philip Alberti, Senior Director, Health Equity Research And Policy, Association of American Medical Colleges, palberti@aamc.org

Research Objective: The federal government has made a clear commitment to reducing and eliminating health and healthcare inequities. However, there is no clear guidance for researchers on how to find relevant funded projects to identify current trends and gaps. This study aims to:
1. Define what disparities and equity research is with respect to Medical Subject Headings (MeSH) terms.
2. Analyze trends (2005-2011) in the funding, research focus (e.g. detect disparity, understand a disparity, or reduce/eliminate a disparity), population studied, health outcome investigated, and grantees institution of health disparities-focused HSR.
3. Develop search methods to validly ascertain the universe of funded, health-disparities focused HSR using the National Library of Medicine’s Health Services Research Projects in Progress (HSRProj) database.

Study Design: Based on an iteratively developed definition of ‘health disparities research’, queries were developed by delineating salient MeSH terms and keywords across relevant domains (e.g. “disparity”, “identity”, “methodology”, etc.), de-duplicating search results, and assessing the number of additional, unique records added by including additional terms.

Based on the results of this process, a query was developed that culled projects from the “disparity” and “identity” domains. This query was applied to the HSRProj database to identify the subset of health disparities-focused HSR projects newly funded between 2005 and 2011.

Principal Findings: Search methods for validly classifying HSR projects should be based on an a priori set of inclusion criteria derived from an explicit definition of the targeted research. Even with this grounding, though, we expect to discover that terms and keywords are not always consistently applied making conclusions difficult.

We hypothesize that despite the methodological challenges, there has been a consistent increase in the number of disparities-focused HSR projects between 2005 and 2011. Certain populations and health outcomes will be underrepresented in this research. Furthermore, the majority of projects still focus on documenting inequities or identifying their sources as opposed to developing and testing solutions.

Conclusions: As recent reports by the Centers for Disease Control (CDC 2011) and the Agency for Healthcare Research and Quality (AHRQ 2012) note, health and healthcare inequities exist across a wide array of outcomes and affect various population groups. Results of this current gap analysis will suggest specific areas and groups on which future health disparities HSR should focus.

Implications for Policy, Delivery, or Practice: The federal government, via both policy statements (e.g. Healthy People 2020) and funding mechanisms (e.g. NIH funded Health Disparities Centers of Excellence) has set the reduction and elimination of health and healthcare inequities as a major goal. The Affordable Care Act has furthered this work by setting demographic data collection standards, supporting community-based healthcare, and incorporating value-based healthcare metrics. Results of this research can guide federal and other funders so that resources are allocated to health outcomes and population groups currently underrepresented in disparities-focused HSR, as well as to projects that aim to build the evidence base for solutions to these gaps. Lessons learned from developing queries can also help refine NLM coding processes to more accurately tag research as health disparity-related research.

Funding Source(s): Other, This work is a joint effort between AcademyHealth and the American Association of Medical Colleges (AAMC). The analysis was provided under the auspices of the HSRProj program, funded by the National Library of Medicine, National Institutes of Health, Depa

Poster Session and Number: A, #205
Is Patient English Language Proficiency Related to Hospital Inpatient Quality?
Roxanne Andrews, Agency for Healthcare Research and Quality; Anika Hines, Truven Health Analytics; Ernest Moy, MD, MPH, Agency for Healthcare Research and Quality; Marguerite L. Barrett, MS, M.L. Barrett, Inc; Rosanna Coffey, PhD, Truven Health Analytics

Presenter: Roxanne Andrews, Ph.D., Center for Delivery, Organization, and Markets, Agency for Healthcare Research and Quality, roxanne.andrews@ahrq.hhs.gov

Research Objective: The role of primary language in access to health care has been well-documented. Fewer studies have examined the association of language barriers with quality and outcomes of care once access to healthcare is achieved. In the few studies that have been done, results are inconsistent. This study examines hospital care quality across language groups—English, Spanish, or languages of Asia and the Pacific Islands.

Study Design: We performed a cross-sectional analysis of hospital discharge records using data from the 2009 Healthcare Cost and Utilization Project’s (HCUP) California State Inpatient Databases (SID). The SID includes discharge abstracts with demographic and clinical information for all inpatient stays, regardless of payer. We included patients admitted to community, non-rehabilitative hospitals who self-reported their principal language. Using the Agency for Healthcare Research and Quality (AHRQ) Inpatient Quality Indicators (IQIs) and Patient Safety Indicators (PSIs), we calculated risk-adjusted inpatient mortality per 1,000 admissions for acute myocardial infarction (AMI), congestive heart failure (CHF), gastrointestinal (GI) hemorrhage, and stroke as well as obstetric traumas per 1,000 vaginal deliveries. We focused on IQIs and PSIs with the largest sample size to assure sufficient statistical power and reliability. We adjusted inpatient mortality for age, gender, age-gender interactions, severity, and mortality risk. Rates of obstetric trauma are age-adjusted. We compared rates across race/ethnicity, principal language, and race/ethnicity-language groups using two-sided t-tests.

Population Studied: 3,757,218 inpatients admitted to California’s hospitals in 2009, including 3,211,939 (85.5%) English-speaking patients; 474,267 (12.6%) Spanish-speaking patients; and 71,495 (1.9%) patients speaking languages of Asia or the Pacific Islands (API)

Principal Findings: Spanish-speaking inpatients had lower rates of mortality for CHF (18.47 versus 25.50; p<0.01), stroke (75.50 versus 82.30; p<0.05), and pneumonia (28.11 versus 33.68; p<0.01) as well as rates of obstetric trauma with (98.84 versus 120.91; p<0.01) and without instrumentation (18.71 versus 21.04; p<0.01) compared to English-speakers. Asian language speakers (19.20 versus 25.50; p<0.05) had lower rates of CHF inpatient mortality and higher rates of obstetric trauma (165.52 versus 120.91 with instrumentation; p<0.01 and 48.59 versus 21.04; p<0.01 without instrumentation) than English-speakers. Within ethnic groups, Spanish-speaking Hispanics had lower rates of pneumonia inpatient mortality than their English-speaking counterparts (28.19 versus 34.37; p<0.05), and higher rates of obstetric trauma among vaginal deliveries without instrumentation (18.59 versus 14.98; p<0.01).

Conclusions: In this study of California inpatients, non-English speakers were not at a higher risk for inpatient mortality for the selected study conditions compared to English-speakers. There were some apparent differences in pneumonia mortality and obstetric trauma between English and non-English speakers within ethnic groups. There are limitations of the findings that should be considered in future research including that discharge data have limited clinical content which could affect the accuracy of the risk adjustment.

Implications for Policy, Delivery, or Practice: Collection of "Preferred Language" in the electronic healthcare record is a requirement for the "Meaningful Use" incentive reimbursement set by CMS. Subsequently, more widespread collection of this information in hospital records is expected. The collection of patient language data may be particularly important for highlighting intra-ethnic group differences in inpatient mortality and adverse events and targeting interventions to address language barriers.

Funding Source(s): AHRQ
Poster Session and Number: A, #206

Racial and Rural Differences in Cervical Cancer Prevention and Control Practices
Swann Arp Adams, University of South Carolina; Jessica Bellinger, University of South Carolina; Alexa Gallagher, University of South Carolina; Jan Probst, University of South Carolina
**Presenters:** Jessica Bellinger, Ph.D., M.P.H., Postdoctoral Fellow, South Carolina Rural Health Research Center, University of South Carolina, bellingj@mailbox.sc.edu

**Research Objective:** Access to preventive services contributes to differences in cervical cancer screening, treatment, and survival. We examined access to advanced cervical cancer prevention technologies, including liquid-based Pap test cytology, HPV vaccination, and DNA testing among rural versus urban women.

**Study Design:** We conducted a cross-sectional study of 2006 - 2008 visit-level data from National Ambulatory Medical Care Survey (NAMCS) and National Hospital Ambulatory Medical Care Survey (NHAMCS). Data were linked to the 2009 Area Resource File (ARF) based on both provider and patient/visit location. Patient/visit and provider location were linked using state and county FIPS codes.

**Population Studied:** To examine the likelihood of receiving a liquid-based Pap test, the study population was limited to visits by female white and African American patients (9 – 70 years of age) with record of a Pap test. To examine the likelihood of receiving HPV DNA test, the study population was limited to visits for preventive screening or routine general exams rather than visits for new problems or pre/post-surgery. Records with missing information were excluded.

To examine cervical cancer screening practices, patients were categorized by Pap test cytology (liquid-based, conventional, or unspecified) and an HPV DNA test during their visit (yes/no). Race/ethnicity was classified as white or black/African American. Location was examined based on patient’s county of residence and physician practice site.

SAS-callable SUDAAN was used to account for complex sampling required weighted analysis. Descriptive statistics and bivariate comparisons were computed using chi square tests. Analyses incorporating restricted data (environmental and geographic variables and physician characteristics) were conducted at the National Center for Health Statistics Research Data Center.

**Principal Findings:** No significant differences were observed for Pap test cytology by patient residence (urban versus rural; p=0.21) or for receipt of liquid Pap testing between white and African-American women residing in urban or rural counties (p=0.35).

A significantly higher proportion of women living in rural counties (69.6%) received liquid based Pap testing in hospital outpatient settings than women in urban counties (39%; p=0.02). A significantly higher proportion of women residing in urban counties received HPV DNA testing versus women residing in rural counties (10% versus 3.3%, respectively). Report of HPV vaccination was too low during the study period to permit stable estimates for rural women, so no rural-urban comparisons can be offered. Differences in provider reimbursement were noted with higher proportions of publicly insured patients in rural practices than urban practices (p<0.01).

**Conclusions:** Women residing in rural counties did not differ from urban in conventional or liquid-based Pap test cytology; however, rural women were less likely to receive HPV DNA testing. No racial differences were detected. More research is needed to determine if observed differences are the result of provider or patient barriers and acceptability.

**Implications for Policy, Delivery, or Practice:** The proportion of visits by rural residents for preventive services was lower than among their urban counterparts. Increased coverage and expanded access to cervical cancer preventive services may increase uptake of innovative preventive services, particularly liquid-based cytology and HPV DNA testing.

**Funding Source(s):** HRSA

**Poster Session and Number:** A, #207

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**Decreasing Colorectal Cancer Screening Inequity? The Effect of an Advanced Population Management System**

Seth Berkowitz, Massachusetts General Hospital; Jeffrey M. Ashburner, MPH, Massachusetts General Hospital; Yuchiao Chang, PhD, Massachusetts General Hospital; Adrian H. Zai, MD PhD MPH, Massachusetts General Hospital; Sanja Percac-Lima, MD PhD, Massachusetts General Hospital; Steven J. Atlas, MD MPH, Massachusetts General Hospital

**Presenter:** Seth Berkowitz, M.D., Fellow in General Medicine and Primary Care, General Medicine, Massachusetts General Hospital, saberkowitz@partners.org

**Research Objective:** Compared to patients with greater than high school (>HS) educational attainment, patients with a high school diploma or less (=HS) have lower colorectal cancer screening rates. A significantly higher proportion of patients with education level (9%) were observed to receive liquid-based Pap testing in hospital outpatient settings than women in urban counties (39%; p=0.02). A significantly higher proportion of women residing in urban counties received HPV DNA testing versus women residing in rural counties (10% versus 3.3%, respectively). Report of HPV vaccination was too low during the study period to permit stable estimates for rural women, so no rural-urban comparisons can be offered. Differences in provider reimbursement were noted with higher proportions of publicly insured patients in rural practices than urban practices (p<0.01).

**Conclusions:** Women residing in rural counties did not differ from urban in conventional or liquid-based Pap test cytology; however, rural women were less likely to receive HPV DNA testing. No racial differences were detected. More research is needed to determine if observed differences are the result of provider or patient barriers and acceptability.

**Implications for Policy, Delivery, or Practice:** The proportion of visits by rural residents for preventive services was lower than among their urban counterparts. Increased coverage and expanded access to cervical cancer preventive services may increase uptake of innovative preventive services, particularly liquid-based cytology and HPV DNA testing.

**Funding Source(s):** HRSA

**Poster Session and Number:** A, #207
(CRC) screening rates and 50% greater risk of CRC mortality. Population management strategies, facilitated by advanced health information technology, are increasingly used to improve screening rates, but often do not specifically target health inequities. We evaluated whether such a system might still decrease educational disparities in CRC screening.

**Study Design:** From June 15, 2011 to June 14, 2012 we utilized TopCare (Technology for Optimizing Population Care in a Resource-limited Environment) to identify and manage all patients eligible for CRC screening within an 18-practice academic primary care network. Patients overdue for screening received interventions to promote completion including notification of primary care providers, reminder letters, and listing with practice delegates who could schedule tests and visits. Practices were randomized to one of two versions of TopCare, but because there was not a differential effect on outcomes by version (test for interaction was non-significant), we report pooled results. Our primary outcome was CRC screening completion, stratified by patient educational attainment (=HS vs. >HS), a correlate of low socioeconomic status. We performed unadjusted comparisons using chi-square and McNemar’s tests. A logistic regression model was used to compare CRC screening completion among patients with complete follow-up. A Cox regression model was used to evaluate time-to-screening completion among all patients overdue for screening at any time during the study period.

**Population Studied:** Men and women age 52-75 without prior total colectomy.

**Principal Findings:** Among 40,454 patients in 18 practice sites eligible for CRC screening over the study period, 75% had >HS educational attainment. =HS patients were more likely to be non-white, non-English speaking, and have Medicare, Medicaid, or no insurance (p <.001 for all comparisons). Prior to TopCare implementation, 73.0% of =HS patients had completed CRC screening, compared to 80.6% of >HS (p <.001). At the end of the study period, screening completion increased for both groups (+3.2% for =HS, p <.001; + 2.5% for >HS, p <.001). However, a significant disparity in screening completion between =HS and >HS remained (76.2% vs. 83.1%, p <.001). In a logistic regression model accounting for physician/practice clustering and adjusting for age, gender, race/ethnicity, language, insurance, and TopCare version, =HS was significantly associated with lower CRC screening completion (adjusted completion rate 76.8% in =HS vs. 79.0% in >HS, p <.001). In a multivariable Cox regression model among 11,976 patients overdue for screening, =HS was associated with prolonged time to screening completion (HR 0.89, 95% CI 0.81-0.98, adjusted for same covariates as above).

**Conclusions:** Despite the promise of population management systems to increase the overall use of preventive services, CRC screening disparities did not decrease over a 1-year follow-up period among patients with low educational attainment.

**Implications for Policy, Delivery, or Practice:** Population management approaches that do not specifically address disparities may not improve them, and if less effective in low education patients, may instead widen disparities over time. Future strategies should specifically address causes of CRC screening disparities in order to improve health equity.

**Funding Source(s):** AHRQ

**Poster Session and Number:** A, #208

**The Distribution of Public Spending for Health Care in the United States**

Didem Bernard, Agency for Healthcare Research and Quality; Thomas Selden, AHRQ; Yuri Pylypchuk, Social & Scientific Systems, INC

**Presenter:** Didem Bernard, Ph.D., Senior Economist, Center for Financing, Access, and Cost Trends, Agency for Healthcare Research and Quality, didem.bernard@ahrq.hhs.gov

**Research Objective:** U.S. health care spending in 2011 was $2.7 trillion or 17.9% of GDP. This study informs the debate over public spending on health care by combining estimates from the National Health Expenditure Accounts and data from the Medical Expenditure Panel Survey to answer two questions. First, what is the overall percentage of health care paid for by the public sector and how has this changed over time? Second, what is the current incidence of public spending by age, income, and health status?

**Study Design:** Because no single data source provides all of this information, we use household and employer survey data, national expenditure benchmarks, and microsimulation modeling. For the detailed incidence analysis, we align MEPS by type of service and source of payment with 2007 NHEA benchmarks. (Bernard, Cowan, Selden, Liming, Catlin &
Heffler, 2012, MMRR). Next, we allocate amounts in NHEA that were outside the scope of MEPS such as administrative costs, DSH payments, research and investment. Finally, we estimate a comprehensive array of tax expenditures. (Bernard, Selden and Plypchuk, 2013)

**Population Studied:** US population in 2007

**Principal Findings:** Combining public outlays with implicit public spending through tax expenditures, the public share of total health spending increased from 31.2% in 1960 to 58.7% in 2007 (the year of our incidence analysis) and to 63.0% in 2012 (projected). Tax expenditures as a percentage of health care spending are approximately 13% at present. Among the non-institutionalized population in 2007, the public sector’s role is largest for seniors for whom 68.0% of total spending was paid for by the public, versus 59.3% for children and 49.2% for adults age 19-64. Not only do adults 19-64 have the smallest public percentage, but also public outlays in this group are highly concentrated. Non-elderly adults with disabilities consumed 81.1% of all Medicaid/CHIP and Medicare, despite comprising only 10.3% of the 19-64 age group. With respect to incidence of public expenditures by income level, lower income groups benefited most from Medicaid/CHIP spending. In contrast, the remaining categories of public health care outlays were somewhat more evenly distributed, and tax subsidies strongly favored high-income families. Overall, public spending accounted for 81.8% of total health care spending among those under 100 percent of FPL and for 42.3% of total spending among those over 400 percent of FPL. However, we find that all poverty groups continue to share in the benefits of public spending. Even among families with incomes above 400% of FPL, public spending accounted for over two-fifths of total spending.

**Conclusions:** Seniors benefit most from public spending. When tax expenditures are taken into account, all poverty groups benefit from public spending.

**Implications for Policy, Delivery, or Practice:** Our findings offer a useful backdrop for the ongoing debates over the ACA’s likely impacts on the level and incidence of outlays (Medicaid/CHIP and Medicare), exchange subsidies, and tax expenditures. Our findings also offer a useful baseline for further steps the country might take on entitlements and tax policy to ensure long-term fiscal stability.

**Funding Source(s):** AHRQ

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**Poster Session and Number:** A, #209

**Moderators of Access and Mammography Utilization in Black and White Women Responding to the 2008 Behavioral Risk Factor Surveillance Survey**

Parker McDill, Graduate School of Nursing, Uniformed Services University; Sandra Bibb, Uniformed Services University of the Health Sciences; Cara Olsen, Biostatistics Consulting Center, Uniformed Services University

**Presenter:** Sandra Bibb, D.N.Sc., Associate Professor, School of Nursing, Uniformed Services University of the Health Sciences, sbibb@usuhs.mil

**Research Objective:** To determine the extent to which multiple determinants of health, grouped as population characteristics, health status, and health risks and behaviors, moderate access to care and impact utilization of mammography in black and white women age 40 years and older, responding to the 2008 Behavioral Risk Factor Surveillance System (BRFSS ) Survey.

**Study Design:** The research design was descriptive, exploratory. Analyses were conducted on the created sample and on subsets of the sample to include black women, white women, and women age 50 to 74. Hierarchical logistic regression was used to explore the extent to which the independent variables and the hypothesized moderating factors effected utilization of mammography in black and white women. All moderator variables determined to have a statistically significant relationship (p < .05) with the dependent variable (mammography utilization) were included in the moderator models. A total of three hierarchical logistic regressions were conducted for the main analysis and each subgroup; access-population characteristics; access-health status; and access-health risks and behaviors. When a statistically significant improvement in the fit of the regression model was achieved by adding the interaction terms, an overall moderator effect was determined to be present. Individual moderating factors were identified by their statistically significant interactions with one or more access variables.

**Population Studied:** Existing data from women 40 and older who self-identified their preferred race as black or white on the 2008 BRFSS survey.

**Principal Findings:** In both the main (40 and older) and subgroup (age 50 to 74) analyses for
Principal Findings: Participants were inner-city Blacks living in a midsize city in a Midwestern state and were recruited through a community-based organization that addresses health and social needs of African Americans.

Principal Findings: Participants ranged in age from 19 to 95 years (M=43.04, SD=6.14). Fifty-four percent were female; 79%
had less than a college degree; the median income was $20,000 to $29,000 and 27% were unemployed. Forty-three percent had a chronic disease. The most prevalent health conditions were hypertension, obesity, asthma, diabetes, and heart disease. The participants displayed a moderate knowledge level of genetics (Mean score=74%). Participants expected genetics information to be stored on computers but anticipated that the government will be unable to protect the privacy of citizens given collection of such sensitive data. Three-quarters anticipated that insurance companies will want to see genetic tests results before the cost for insurance is set. Most had high expectations about the increasing use of genetics in identifying risks, prevention, treatment and personalized healthcare. In multivariate analyses, knowledge and concerns for abuse of genetic information were significantly associated with negative attitudes towards genetic testing and research. 

Conclusions: Although participants in this study anticipated negative consequences of genetics developments, an increase in their knowledge of medical genetics could decrease the negative attitude when participants are assured there will be no abuse of the genetic information. These findings suggest that recruitment and retention of African Americans in genetics studies should address potential concerns about their knowledge, expectations, and use of genetic information.

Implications for Policy, Delivery, or Practice: Geneticists, public health professionals and policy makers can fill the gaps by developing educational programs about genetics innovations in medicine taking into account pre-existing lay knowledge, views and expectations and attitudes of Blacks. Further, there is critical need to sustain engagement with inner-city Black communities with educational programs about genetics and chronic diseases.

Funding Source(s): Other, Funding for this research was made possible through a grant from Wisconsin Genomics Initiative and the University of Wisconsin-Milwaukee Graduate School, Grant Number 133PRJ32GR. The authors gratefully acknowledge the support from the State of Wisconsin

Negotiating and Managing Disclosure: Privacy Protection and Self-disclosure Patterns of HIV Positive Status among Urban HIV-infected African American Men

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Presenter: Aaron Buseh, Ph.D., M.P.H., Associate Professor, College of Nursing, University of Wisconsin, Milwaukee, aaronbg@uwm.edu

Research Objective: African Americans continue to bear a disproportionate burden of HIV/AIDS. Black men represent almost one-third of all new HIV infections in the U.S. Understanding their experiences with disclosure of HIV status will inform both prevention and treatment interventions in the African American community. The purpose of this qualitative study was to explore the issue of disclosure with HIV positive African American men residing in a mid-sized Midwestern city.

Study Design: Fifty African American men (n = 50) participated in in-depth interviews about their experiences living with HIV. Participants ranged in age from 24 - 57 years; mean age = 43.98, SD = 7.59. Time since HIV diagnosis ranged from 3 months to 26 years; mean time = 12.5 years, SD = 7.2. Data were analyzed thematically.

Population Studied: Participants were recruited through a community-based organization in an urban setting from a Midwestern state. A snowball sampling technique was used to obtain a sample of African American men (18 years or older) who self-reported as being HIV-infected.

Principal Findings: Disclosure of HIV status posed a major dialectical struggle between the need to "unburden" the HIV, and the need to protect essential economic and social resources. Balancing such opposing needs cost men energy, peace, authenticity, happiness, and access to health care. For those who were able to disclose widely, the emancipation they experienced fueled public activism to decrease HIV stigma.

Conclusions: In this era of test and treat, disclosure of HIV status is even more important
for individual health and for broader societal prevention through early treatment efforts. Yet, disclosure remains problematic for HIV-infected African American men. It is imperative that community, family, and work environments be made safer so that HIV positive status holds no power over dignity, confidence and belonging.

**Implications for Policy, Delivery, or Practice:**
Results from this study have implications for healthcare providers working with urban HIV-infected Black males. Eliciting illness experiences of African American men living with HIV/AIDS, from their point of view, is an excellent starting point for health professionals as they try to gain a comprehensive history of what their patients deal with every day. Subjective illness as gathered from participants in this study can be used in psychology and psychiatric settings, medical, nursing, and other healthcare academic/educational settings and disciplines with the goal of training future healthcare professionals to provide care with empathy using a humanistic approach.

**Funding Source(s):** N/A, Funding for this project was made possible through the University of Wisconsin-Milwaukee, Graduate School Research Growth Initiative (RGI) Research Award, Proposal No. 01-075

**Poster Session and Number:** A, #213

**Censored Mental Health Disparities: Methodology’s Influence on Estimating of Disparities in the Adequacy Mental Health**

Adam Carle, Cincinnati Children's Hospital Medical Center; Kellana Hindert, M.A., Cincinnati Children's Hospital Medical Center; Ben Le Cook, Ph.D., Harvard University; Chih-Nan Chen, Ph.D., Harvard University

**Presenter:** Adam Carle, Ph.D., M.A., Assistant Professor of Pediatrics, University of Cincinnati School of Medicine, Cincinnati Children's Hospital Medical Center, adam.carle@cchmc.org

**Research Objective:** A critical need exists to address disparities in the persistence, severity, and disease burden of mental health disorders among Blacks, Hispanics and Whites. Mental health service use is more disparate among minorities than in many other areas of care. The ability to understand and detect what drives these disparities will allow policymakers to take action to reduce gaps and make informed, rational planning decisions. Differences in the quality of care (e.g., adequacy) minorities receive may account for some disparities. Adequate care in the mental health area has been defined as eight or more mental health care visits or four or more visits with a prescription fill. Given the definition's longitudinal nature, one would ideally observe individuals across time. However, methodological challenges exist when analyzing adequacy of care. Individuals may have begun receiving care before the study's start and (similarly) may continue to receive care following the study's end. This “censoring” may result in apparent poor care, rather than truly poor care. To date, little research has addressed how to best handle censoring of this sort. Thus, we sought to assess different methods of handling censored data on conclusions regarding disparities in adequate care in mental health service usage.

**Study Design:** The Medical Expenditure Panel Survey (MEPS) constitutes a set of large-scale surveys of families and individuals, their medical providers, and employers across the United States. The MEPS is the most complete source of data on the cost and use of health care and health insurance coverage in the US. We used two year longitudinal panel data from 2004-2008. We evaluated differences in conclusions when implementing a two-part negative binomial model and a naïve method that does not account for censoring, and a naïve method that dropped censored cases. In addition, we examined the impact of different ways of coding censoring.

**Population Studied:** Adults with probable depressive disorder identified using the PHQ-2 checklist (score >2) and adults with severe psychological distress identified using the K6 survey (score >13).

**Principal Findings:** Though technique impacted estimates, generally across methods Blacks and Latinos had less initiation and adequacy of care (compared to Whites). Black and Latino episodes were shorter and had fewer psychotropic drug fills. Black episodes had a greater proportion of specialist visits while Latino episodes had a greater proportion of PCP visits. Blacks terminated care more frequently in acute care settings. There is also evidence that adequate care varies by income. However, despite similarity in the direction of conclusion, the size of the conclusion differed across methods.

**Conclusions:** Estimation technique influences disparities conclusions. We discuss how the specific estimation technique that one chooses depends on aspects of the studied predictors.
and outcomes. We also discuss our work’s substantive implications.

**Implications for Policy, Delivery, or Practice:** Differences in initiation influenced disparities in adequate care, supporting the need for policies that improve access. Many episodes consisted only of psychotropic drug fills, indicating inadequate medication guidance. Blacks’ greater termination in acute care settings raises concern of inadequate monitoring. Blacks’ higher rate of specialist use opposes previous research and requires future investigation.

**Funding Source(s):**

**Poster Session and Number: A, #214**

**Racial and Ethnic Disparities in Utilization of Physical Therapy among Working Age Adults with Chronic Low Back Pain**

Olivia Carter- Pokras, School of Public Health; Jie Chen, Department of Health Services Administration, School of Public Health, University of Maryland College Park

**Presenter:** Olivia Carter- Pokras, MHS, PhD, Associate Professor, Department of Epidemiology and Biostatistics, School of Public Health, opokras@umd.edu

**Research Objective:** To examine cost-effectiveness of physical therapy among working age adults with chronic low back pain, and identify racial and ethnic disparities in utilization of physical therapy.

**Study Design:** We used data from the 2000-2010 Medical Expenditure Panel Survey. An initial analysis implemented a means comparison of the likelihood of receiving any physical therapy by race and ethnicity (Whites, African Americans, and Latinos). Subsequently we implemented the Blinder-Oaxaca decomposition technique to identify factors associated with the racial and ethnic disparities in receiving the physical therapy. Longitudinal analyses were employed to estimate the impact of physical therapy on other health care utilization.

**Population Studied:** Working age adults (18-64 years old), with diagnosis of back pain (ICD9=724), who self-reported having pain for more than 12 months. Our sample included 5,019 Whites, 1,085 African Americans, and 1,288 Latinos.

**Principal Findings:** Descriptive statistics showed that on average, 16% of working age Whites with chronic low back pain had received physical therapy. This percentage was significantly higher than that for African Americans (12%), and Latinos (14%). The decomposition results showed that poverty (measured by lower family income) was the major reason associated with disparities among Whites vs. African Americans. Fewer years of education and less health insurance coverage were the two main reasons associated with disparities among Whites vs. Latinos. Longitudinal analyses suggest that receipt of physical therapy can reduce prescription drug use for low back pain.

**Conclusions:** These findings directly address gaps in the literature identified by the Institute of Medicine’s report “Relieving Pain in America,” and add disparities in referrals to physical therapy to the existing literature regarding persistent disparities in pain treatment.

**Implications for Policy, Delivery, or Practice:** These findings have important cost-saving implications for implementation of the Affordable Care Act, particularly treatment of workers with low back pain. In addition to reducing prescription drug use found in our study, moderate evidence exists that post-treatment exercises can reduce both number and rate of back pain recurrences (Choi, Verbeek, Tam, Jiang, 2011). Disparities in physical therapy referrals may therefore partly explain higher levels of occupational disability for African-American worker’s compensation claimants with low back pain compared to whites (Chibnall & Tait 2009).

**Funding Source(s):** CDC

**Poster Session and Number: A, #215**

**Patient Navigation for Asian Americans: A Systematic Review**

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**Presenter:** Mei Chung, PhD, MPH, Assistant Professor of Medicine, Institute for Clinical Research and Health Policy Studies, Tufts
Research Objective: To evaluate the published literature on patient navigation programs serving Asian communities in the U.S. regarding program activities, navigator roles, barriers to care, and program effectiveness outcomes.

Study Design: A systematic review was conducted and a comprehensive search strategy was developed through an iterative process. The database search was conducted on MEDLINE® (through January 2012), Cochrane Central Register of Controlled Trials (through last quarter of 2011), and Global Health (1973 to December 2011). We operationalized the definition of a PN intervention to establish our study eligibility criteria. Studies were included if the program provided an active navigation component, and were excluded if the programs only provided education support or group-based support.

Population Studied: Our search was not restricted to specific Asian population, disease or cancer type. Qualifying studies in this systematic review enrolled Asian Americans of Chinese, Vietnamese, Korean, Cambodian, or Laotian origin.

Principal Findings: The search identified 1,701 citations, and 98 full-text articles were evaluated by 2 investigators for eligibility. Only 12 unique PN programs met our criteria to be included. The majority of rejected articles were not relevant, only included background information or consisted of an education only intervention. The 12 articles reporting results of PN programs focused on breast, cervical, or colorectal cancer screening and detection, and enrolled more than 4,000 Asian Americans in total. All 12 programs documented positive changes, including improved uptake of screening tests, examinations, or other appropriate preventive behavior. Patient navigator job titles varied; the most commonly used were lay health worker, patient navigator, and outreach worker. Navigators assisted patients through scheduling, interpretation, transportation, counseling, and educational activities. Barriers identified during formative research from the programs included cancer knowledge, socioeconomic status, culture, language, gender, and medical systems. Four studies identified residual barriers of cost, gender, cancer knowledge, and medical process despite PN programs. Improvements in cancer screening rates ranged from 7% to 64% after the implementation of the PN programs with greater increases in breast or cervical cancer screening than colorectal screening (reported in 8 studies). Of these, five studies showed that each PN program was effective in increasing the cancer screening rate as compared to the control group (s) (RR [95%CI] ranged from 1.31 [0.99, 1.74] to 53 [7.56, 376]).

Conclusions: Only a limited number of studies were identified to address the impact of PN in Asian Americans, and these focused on cancer screening. Nevertheless, the success of the 12 programs illustrates the value of a multimodal approach to navigation, combining education, logistical support, and counseling. Further, these programs were culturally sensitive, as reflected in the choice of gender, ethnicity, and language of program personnel to overcome barriers to care that have caused health disparities in Asian populations.

Implications for Policy, Delivery, or Practice: This systematic review identified only 12 published studies of successful PN programs for Asian Americans. Further research is needed to understand how culturally sensitive PN programs can be used to enhance cancer care across the entire continuum from detection to treatment to survivorship for this vulnerable population.

Funding Source(s): Other, Yawkey Foundation

Poster Session and Number: A, #217

Socioeconomic Status and Demographic Disparities in Utilizing Dilated Eye Exams
Delawnia Comer-Hagans, Governors State University; Dr. Ning Lu, Governors State University; Dr. Zo Ramamonjiarivelo, Governors State University

Presenter: Delawnia Comer-Hagans, Ph.D., Assistant Professor, Health Administration, Governors State University, dcomer-hagans@govst.edu

Research Objective: As the number of people with diabetes rises in the U.S., the CDC projects that the number of adults with diabetic retinopathy will double by the year 2050. National Eye Institute recommends that diabetics be monitored regularly by their ophthalmologist to prevent vision loss. The purpose of our study is to determine the rates of dilated eye exam use among diabetics, to examine the trend of dilated eye exam use in the past 10 years between 2000 and 2010, and to identify differences in dilated eye exam use by medical center.
demographic, socioeconomic, and healthcare access related factors.

**Study Design:** Secondary data analysis of the 2000 and 2010 Behavioral Risk Factor Surveillance System (BRFSS) of diabetic individuals. Univariate analysis was used to describe the demographic, socioeconomic, and healthcare access related variables in the study followed by binary logistic regressions. The dependent variable is utilization of dilated eye exams within the past year (1=yes, 0=no). The independent variable of interest, race, is categorical (White, Black, and other).

**Population Studied:** Diabetic adults who are 18 years of age and older for the years 2000 (N=11,647) and 2010 (N=57,480).

**Principal Findings:** The target of 70% of diabetics receiving dilated eye exams was reached for Whites (73%, N=4,935), and Blacks (72%, N=1,013), but not for other races (61% of other races, N=1,220) in 2000. The target of 76% of diabetics receiving dilated eye exams was not reach for Whites (70%, N=17,387), Blacks (71%, N=4,084), or other races (63%, N=3,327) in 2010. The results of logistic regression analysis of both years 2000 and 2010 data revealed that individuals who were told by a healthcare provider that diabetes affected their eyes, had health insurance, had a checkup within the past year, and had diabetes education are significantly more likely to receive a dilated eye exam than their counterparts at p<0.05. In addition, age is significantly related to the receipt of a dilated eye exam. Those who are older than 45, are more likely to receive a dilated eye exam than younger individuals. Those who reported that they were unable to see a doctor due to cost were significantly less likely to receive a dilated eye exam.

**Conclusions:** The target set in 2010 for diabetics receiving dilated eye exams was not reached by any race group. Our study indicated that individuals who had limited access to healthcare due to cost are less likely to receive dilated eye exams. Being told that diabetes can impact an eye condition, a yearly health checkup, diabetes education, health insurance as well as higher education and higher income, increase the odds of receiving a dilated eye exam.

**Implications for Policy, Delivery, or Practice:** Identifying individuals at risk by SES and demographics will help policy makers and health professionals to develop policy or programs promoting dilated eye exams among the population at risk. Removing financial barriers might be helpful in promoting utilization in dilated eye exams, one of the major preventive measures of diabetes complications.

**Funding Source(s):** No Funding

**Poster Session and Number:** A. #218

**Relationship between Self-Assessed and Tested Non-English Language Proficiency among Primary Care Providers**

Lisa Diamond, Memorial Sloan-Kettering Cancer Center; Sukyung Chung, Palo Alto Medical Foundation Research Institute; Warren Ferguson, University of Massachusetts Medical School; Elizabeth Jacobs, University of Wisconsin - Madison; Francesca Gany, Memorial Sloan-Kettering Cancer Center

**Presenter:** Lisa Diamond, MD, MPH, Assistant Attending Physician, Immigrant Health and Cancer Disparities, Memorial Sloan-Kettering Cancer Center; diamondl@mskcc.org

**Research Objective:** To evaluate the accuracy of a structured self-assessment of non-English language proficiency compared to a validated oral proficiency interview for clinicians.

**Study Design:** We asked clinicians with varying self-reported levels of proficiency in Cantonese, Mandarin, French, Portuguese, Spanish, and Vietnamese (the most common languages spoken by clinicians and patients at the study sites) to participate. Clinicians were recruited via email invitation. Participants completed a brief survey which asked them to self-assess their language proficiencies, followed by instructions on accessing a validated method for assessing their oral proficiency. Upon completion of the oral proficiency interview, participants were given a $50 gift card.

**Population Studied:** The study was conducted with clinicians in two settings, the Palo Alto Medical Foundation (PAMF) and several Massachusetts Community Health Centers (MA CHC).

**Principal Findings:** Sixteen PCPs in California and 51 in Massachusetts participated in the study. Spanish was the most common language tested (79%), followed by Cantonese, Mandarin, French, Portuguese, and Vietnamese. The respondents self-reported their proficiency level as “Excellent” 9% of the time, 24% rated “Very Good,” 46% “Good,” 18% “Fair,” and 3% rated “Poor” proficiency. The average CCLA score was 76/100. There was a positive correlation between self-reported ILR scale and CCLA score (rho=0.49, p<0.001). Respondents who
self-reported “Excellent” on the ILR scored an average of 87 on the CCLA. Respondents who self-reported “Poor” scored an average of 34 and those who self-reported “Fair” scored an average of 64. Scores for participants who self-rated as “Good” or “Very Good” were similar (78 vs. 80). The variance in CCLA scores was wider in the middle categories (“Good” or “Very good”) than in the low or high ILR categories (p=0.003).

**Conclusions:** Self-reporting of non-English language proficiency using the ILR correlates to tested language proficiency, particularly on the low and high ends of the self-rating scale. Participants who self-report in the middle of the scale may require additional testing. Further research needs to be done to identify the characteristics of PCP whose self-reported non-English proficiency levels are inaccurate and, thus, require proficiency testing.

**Implications for Policy, Delivery, or Practice:**
As language concordance has been shown to improve healthcare quality, it is essential that health care organizations and providers know how to accurately measure clinicians’ non-English language proficiency. There is a need for further research to identify the characteristics of PCPs whose self-assessed non-English proficiency levels are inaccurate and proficiency levels are inaccurate and, thus, require proficiency testing. It makes sense that true language concordance between LEP patients and clinicians would be beneficial but it is not known what level of non-English language proficiency is sufficient or necessary to provide safe and effective care.

**Funding Source(s):** NIH

**Poster Session and Number:** A, #219

**Geographic Distribution of Radical Hysterectomies and Gynecologic Oncologists in the United States**
Michaela Dinan, Duke Clinical Research Institute; Lesley Curtis, Duke Clinical Research Institute; Evan Meyers, Duke University Medical Center; Laura Havrilsky, Duke University Medical Center

**Presenter:** Michaela Dinan, Ph.D., B.S., Fellow, Center for Clinical and Genetic Economics, Duke Clinical Research Institute, michaela.dinan@duke.edu

**Research Objective:** Investigate the geographic distribution of gynecologic oncologist practice locations in relation to a surgical procedure recommended to be performed by gynecologic oncologists, specifically oophorectomy for women with a diagnosis of ovarian cancer.

**Study Design:** Retrospective cross-sectional study of state-based rates of inpatient oophorectomy performed on women with a diagnosis of ovarian cancer between 2000-2007 compared to 2007 practice locations of gynecologic oncologists provided by the Society of Clinical Gynecologic Oncologists.

**Population Studied:** Women with a diagnosis of ovarian cancer within the 2000-2007 Nationwide Inpatient Sample (NIS) who hand an oophorectomy and the 2007 practice locations of gynecologic oncologists provided by the Society of Clinical Gynecologic Oncologists.

**Principal Findings:** A total 26438 oncologic oophorectomy cases during the 8 year study period were identified for analysis. Gynecologic oncologist practice locations were concentrated in California, Texas, Florida, and in the Northeast and East (Ohio, Pennsylvania, New York, Virginia, and North Carolina). The highest ratio of oophorectomy volume to gynecologic oncologist availability was observed in the west (Utah, California, and Oregon), whereas the lowest volume per specialist was found in the Northeast (Maine, PA, Vermont). Rates of gynecologic oncologists relative to the population were highest in the Northeast. Overall rates of oophorectomy and gynecologic oncologists were highly correlated with the number of adult females within a state, but also exhibited significant regional variation.

**Conclusions:** Previous studies have documented substantial disparities in women who undergo initial surgical management by gynecologic oncologists as compared with general gynecologists or surgeons. In this study, we found that substantial geographic variability exists in the rate of state-based gynecologic oncologist surgical demand as compared to gynecologic oncologist availability. Future research is warranted to characterize the relationship between specialist supply and demand for specialist services and its potential to impact health disparities in ovarian cancer.

**Implications for Policy, Delivery, or Practice:** Ovarian cancer is the 5th leading cause of mortality from cancer in American women. For women diagnosed with ovarian cancer, initial surgical management by a gynecologic oncologist has been associated with increased survival and reduced morbidity. Geographic distribution of gynecologic oncologists in relation...
to women requiring gynecologic oncologic services may impact access to optimal ovarian cancer care.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #220

**Dual Eligibility With Medicare: A Dual Problem For Veterans With Traumatic Brain Injury?**

Clara Dismuke, US Department of Veterans Affairs; Leonard E. Egede MD MS, Ralph H. Johnson VAMC and Medical University of South Carolina

**Presenter:** Clara Dismuke, Ph.D., Research Health Scientist, DHAP, US Department of Veterans Affairs, dismuke@musc.edu

**Research Objective:** There is evidence that dual eligibility (VA and Medicare beneficiary status) is associated with higher mortality rates among Veterans with colon cancer, stroke and multiple disease conditions. There is also evidence that the federal government is spending a substantial and increasing amount of potentially duplicative funds in the VA and Medicare. Traumatic Brain Injury (TBI) is a priority diagnosis in the VA. We examined the association of dual eligibility (VA and Medicare beneficiary status) with clinical (mortality) and economic (outpatient visit utilization) outcomes among Veterans diagnosed with Traumatic Brain Injury (TBI).

**Study Design:** We estimated the association of dual eligibility with mortality and VA outpatient visit utilization based on a national sample of 14,686 Veterans clinically diagnosed with TBI as of January 1, 2006 and followed for mortality until December 31, 2010 or death. We estimated a Cox model to examine the association of dual eligibility with mortality. We estimated a Poisson count model to examine the association of dual eligibility with the number of VA outpatient visits utilized in 2006. We adjusted for age, gender, race, marital status, rural residence, percent service connectedness, co-pay status, qualifying diagnosis code, and individual VA facility effect in both models and for months of survival in the Poisson model.

**Population Studied:** We identified all Veterans clinically diagnosed with TBI in 2006 based on VA criteria for ICD-9-CM codes: 800.xx — Fracture of the vault of skull, 801.xx — Fracture of the base of skull, 803.xx — Other and unqualified skull fractures, 804.xx — Multiple fractures involving skull or face with other bones, 850.xx — Concussion including commotio cerebri, 851.xx—Cerebral laceration and contusion, 852.xx — Subarachnoid, subdural, epidural, and extramural hemorrhage following injury, 853.xx 853.1 — Other unspecified intracranial hemorrhage following injury, 854.xx — Intracranial injury of other unspecified nature, or a patient episode with a V57.xx and TBI secondary diagnosis code from the list above or 310.2-Post-Concussion Syndrome, 905.0- Late Effect of fracture of skull and face bones, 907.0- Late effect of intracranial injury without mention of skull fracture.

**Principal Findings:** In a fully adjusted Cox survival model, we found that dual eligibility was associated with 53% (P<0.05) higher mortality relative to not having dual eligibility. In a fully adjusted Poisson model which included the clinical outcome (survival), we also found that dual eligibility was associated with a 5.2% higher rate of outpatient visit utilization.

**Conclusions:** We provide preliminary evidence that dual eligibility of VA and Medicare is associated with both worse clinical and economic outcomes among Veterans diagnosed with TBI. Possible explanations may include a lack of care coordination among VA and Medicare financed civilian providers, especially in a cognitively impaired population.

**Implications for Policy, Delivery, or Practice:** Our results suggest the need for further study to confirm whether these findings are short term or long term. Whatever the time frame may be, our results certainly highlight the need for interventions to improve care coordination between the VA and Medicare financed civilian providers for this cognitively impaired population of Veterans.

**Funding Source(s):** VA

**Poster Session and Number:** A, #221

**Latest USPSTF Updates in Screening Mammography Guidelines have had Minimal Impacts on Practice**

Martey Dodoo, Harvey L Neiman Health Policy Institute; Richard Duszak Jr, Harvey L Neiman Health Policy Institute; Geraldine B McGinty, NRAD Medical Associates, PC; Danny R. Hughes, Harvey L Neiman Health Policy Institute

**Presenter:** Martey Dodoo, Ph.D., Senior Research Fellow, Harvey L Neiman Health Policy Institute, mdodoo@acr.org
**Research Objective:** Based on a recently published comprehensive classification scheme for investigating “repeat testing” in medical imaging, we did the following: (1) Studied screening mammography rates (example of repeat testing) for Medicare beneficiaries; (2) Determined if the much heralded 2009 revisions in USPSTF breast screening guidelines have had any impacts on screening intervals; and (3) Investigated any variations in screening mammography rates and intervals due to geography of beneficiaries’ residence, age, race or ethnicity.

**Study Design:** Used the 5% national sample of Medicare beneficiary claims data (Limited Data Set) for the population of female elderly beneficiaries, 66 to 97 years old, (excluding new enrollees 65 years old and those above 97 years old). We selected beneficiaries enrolled continuously in Medicare and alive all 3 years in each of 2 periods: 2004–2006, and 2009–2011. These periods are approximately pre-post of the 2009 USPSTF breast screening guidelines which revised screening intervals from 12 to 24 months.

We compared average screening rates and screening intervals in the 2 periods for two cohorts defined as those that had screening mammograms in 2004 and 2009 respectively using interrupted time-series analysis methods. Screening mammography was identified as: HPCSC codes = "76092" (in 2004) or "77057" (in 2009-2011) or "G0202", and CPT diagnosis code = "V76.12". We undertook the analysis using SAS/ETS and JMP software.


**Principal Findings:** There were 1,074,781 beneficiaries in our 2004-2006 study population, and 860,846 in our 2009-2011 population. Average screening mammography rates were 51.1% in 2004-2006 and did not improve significantly in 2009-2011 (52.3%). Repeat screening intervals which were uni-modal in 2004-2005 and averaged 15.7 months, became mostly bi-modal but averaged 14.9 months in 2009-2010. During both time periods, screening intervals were uni-modal for whites and 66-69 year olds, but bi-modal for blacks and 70-97 year olds, and did not vary significantly between the 2 periods and by geography.

Preliminary findings from the interrupted time series analysis identified some seasonality in screening and confirmed that the latest USPSTF guidelines had minimal impact on screening intervals.

**Conclusions:** Screening mammography practice did not change significantly after the changes in the 2009 USPSTF breast screening guidelines. Screening intervals are still mostly 12 months and screening rates are 51 to 52%.

**Implications for Policy, Delivery, or Practice:** The 2009 USPSTF breast cancer screening guidelines disquieted and confused many patients and clinicians. Many clinician societies did not accept the revisions. As a result, patient and clinician practice has remained practically unchanged. These guidelines have focused on intervals while rates have remained inconceivable low. A focus on raising screening rates is long overdue.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #222

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**An Immigrant Diabetes Disadvantage? Diabetes among US Versus Foreign Born Immigrants in East Harlem, New York**

Ashley M. Fox, Mount Sinai School of Medicine; Ashley Fox, Mount Sinai School of Medicine; Euny Lee, Mount Sinai School of Medicine; Kezhen Fei, Mount Sinai School of Medicine; Janice Scobie, Mount Sinai School of Medicine; Carol R. Horowitz, Mount Sinai School of Medicine

**Presenter:** Ashley Fox, Ph.D., M.A., Assistant Professor, Health Evidence and Policy, Mount Sinai School of Medicine, ashley.fox@mountsinai.org

**Research Objective:** Results across a variety of health conditions generally show an immigrant health advantage. One potential exception to this immigrant health advantage is diabetes, which is high among both U.S. born Hispanics and Hispanics born in Latin America. The lack of a diabetes advantage may be because obesity rates are rapidly increasing in Latin American countries, especially Mexico or because diabetes may only be detected once people arrive in the US. Most studies rely on self-reported measures of diabetes, which may be biased. This study draws on a unique cohort of overweight residents of East Harlem, New York, an epicenter of the Hispanic diabetes epidemic in the U.S., which collected biomarker information on respondents’ fasting blood glucose over a period of 2 years to assess whether foreign born residents had higher or
lower rates of diabetes and potential explanatory mechanisms.

**Study Design:** Oral glucose tolerance test (OGTT) were administered to assess prevalence of diabetes and pre-diabetes and biological data on height and weight were collected to measure BMI. Respondents were asked about whether they were born in the US, how long they had been in the US, their race, ethnicity and nationality, and a series of questions about health related behaviors. Respondents were followed up at 6, 12 and 24 months. This study reports on data from their baseline and 6 month follow up assessments and compares rates of diabetes between foreign born and US born respondents controlling for race, gender, bmi, employment, education, income and insurance status. The study compares both foreign born to US born generally and between specific groups (i.e., Puerto Ricans born on the US mainland to Puerto Ricans born on the Island).

**Population Studied:** 646 overweight (BMI 25+) English and Spanish speaking adult (18+) residents of East Harlem.

**Principal Findings:** Sixty-three percent of the sample was foreign born, 22% were black, 74% were Hispanic. Thirty-three percent identified as Mexican, 22% were Puerto Rican, 11% were Dominican and the rest identified as Other. Unadjusted and adjusted logistic regression results showed that foreign born had were two times more likely be diabetic compared with individuals born in the U.S. Surprisingly, most of this immigrant health disadvantage was explained by being born in Puerto Rico whereas being born in Mexico and the Dominican Republic was protective. When compared with Puerto Ricans born in the U.S., Puerto Ricans born on the island had 5 times higher odds of being diabetic (p<0.05). Foreign born were no more likely than US born individuals to progress to diabetes over the study period. Few differences between Puerto Ricans born on the U.S. mainland and in Puerto Rico were found that could explain their higher diabetes risk and Puerto Ricans born in the U.S. had a significantly higher BMI than Puerto Ricans born on the island.

**Conclusions:** A immigrant health disadvantage exists for diabetes among Puerto Rican immigrants born on the island compared with U.S. born, but a diabetes advantage exists for other groups.

**Implications for Policy, Delivery, or Practice:** More research needs to explore the mechanisms, including the island food environment that may create a higher risk for diabetes among Puerto Rican immigrants.

**Funding Source(s):** Other, NIMHD

**Poster Session and Number:** A, #223

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**Is the Quality of Surgical and Pneumonia Care Lower in Minority Serving Hospitals?**

Darrell Gaskin, Johns Hopkins Bloomberg School of Public Health; Hossein Zare, Johns Hopkins Bloomberg School of Public Health

**Presenter:** Darrell Gaskin, Ph.D., Associate Professor Of Health Economics, Health Policy and Management, Johns Hopkins Bloomberg School of Public Health, dgaskin@jhsph.edu

**Research Objective:** Prior studies have found that racial and ethnic disparities in hospital quality are due to differences across hospitals rather than differences within hospitals. This calls into question the quality of care provided by hospitals serving minority patients. These studies imply that minority serving hospitals generally perform lower on quality indicators possibly due to a lack of resources, inadequate budgets, the inability to attract and retain clinical expertise, and a culture of high quality, and inadequate risk adjustment that fails to account for unobservable risk factors associated with their patient populations. This study used Medicare Compare data to explore the relationship between quality of care for surgical and pneumonia patients and the racial/ethnic composition of the hospitals’ patients.

**Study Design:** This is a observational study of a cross section of US hospitals from selected states. We estimated the association between the race/ethnic composition of patient population and quality using linear and conditional quantile regression models controlling for bed size, ownership, teaching status, percentage of discharge for Medicare and Medicaid patients, urban-rural location, median household income, specialty services index, Electronic Medical Record indicators, case mix index, FTE per adjusted admission, market share index (Herfindahl Index), hospital efficiency index and state fixed effects.

**Population Studied:** In this study we focused on acute care general hospitals from 11 states: AZ, CA, FL, IA, MA, MD, NC, NJ, NY, WA and WI. We selected these states because we could use their state inpatient discharge data to measure the racial and ethnic composition of their hospitals’ patients. We combined this information with 2012 data from Medicare
Hospital Compare. Specifically, we look at 18 indicators of timely and effective care measures: 12 surgical care indicators and 6 quality process indicators for pneumonia. We estimated the association between percentage of hospital quality indicators (for each indicator) and percentage of hospital discharges for Black, Hispanic, Asian and all other minority patients. We defined minority serving hospitals as those whose minority census was 65% or more, integrated hospitals as those with minority census between 35%-65% and majority white hospitals as those with fewer than 35% minority patients.

**Principal Findings:** We found that compared to majority white hospitals, minority serving and integrated hospitals were more likely to be larger, publicly-owned, investor-owned, teaching facilities, and located in urban areas. They offer more specialized services, served more Medicaid patients, fewer Medicare patients and had fewer decision support systems and with less efficiency index. The linear regressions showed minority serving hospitals scored lower on 6 of the 12 surgical indicators and 4 of the 6 pneumonia indicators. However, the quintile regressions should that the differences were really between the lowest performing minority serving/integrated hospitals and majority white hospitals. As we moved from 10th to 90th percentile the quality differences between hospitals by racial composition disappears.

**Conclusions:** In conclusion, the best minority serving/integrated hospitals perform as well as the best majority white hospitals. However, below average minority serving/integrated hospitals were worst than below average majority white hospitals.

**Implications for Policy, Delivery, or Practice:** Efforts to improve care for patients in minority serving/integrated hospitals should focus on the lowest performers. Special attention should be paid to these hospitals because they are significantly worse than other below average hospitals.

**Funding Source(s):** N/A

**Poster Session and Number:** A, #224

**Compliance with CLAS National Standards (Culturally and Linguistically Appropriate Services) in a Southern State: Kentucky’s Local Health Departments**

Maria Gomez, University of Kentucky College of Nursing; Torrie Harris, DrPH, Kentucky Office of Health Equity; Richard Charnigo, PhD, University of Kentucky College of Public Health

**Presenter:** Maria Gomez, Dr.P.H., M.P.H., Program Manager Public Health, Minority Health Research, University of Kentucky College of Nursing, maria.gomez@uky.edu

**Research Objective:** Main objectives were to: (1) Measure the extent to which local health departments (LHDs) in Kentucky comply with the National Standards for Culturally and Linguistically Appropriate Services (CLAS Standards, USDHHS); (2) Provide health policy recommendations for program development by LHDs based on the research findings.

**Study Design:** This is a cross-sectional survey administered to LHDs’ administrators from 56 counties in Kentucky. Instrument: Self-Assessment Tool for CLAS Standards in Local Public Health Agencies (USDHHS). Eight (8) CLAS assessment domains were utilized as measurements. Data Analysis: Scores were determined by CLAS domain. Statistical techniques included: descriptive statistics, 2 sample T-test, linear and logistic regression.

**Population Studied:** Public health directors, nurses, and program managers serving local health departments in Kentucky.

**Principal Findings:** A total of 159 Kentucky LHDs’ administrators received the survey, and 123 (77%) were returned. Responses were obtained from 40 rural counties and 16 urban counties. Findings suggest that rural and urban LHDs comply at moderate levels on the following domains: Plans and Policies; Quality Monitoring and Improving; Management Information Systems for Clients; and Staff Training and Development. Rural and urban LHDs comply at minimum levels on CLAS domains: Organizational Governance; Culturally Inclusive Health Care Environment for Educational Materials; and Staff Recruitment. Staff Training on cultural competency alone reflects a range from moderate to strong level of compliance with CLAS in both groups. The role of the public health nurse was more frequently associated with the implementation of CLAS practices in general.

**Conclusions:** Local health departments in Kentucky have implemented policies that comply with CLAS National Standards to moderate and minimum levels. Areas that need more development include: Organizational Governance; Culturally Inclusive Health Care Environment for Educational Materials; and Policies to Recruit Diverse Personnel.
This is the first study to present findings of levels of compliance with CLAS National Standards in a quantitative manner within an entire local public health system. This study may set the grounds for other states to follow, specifically states situated in the Southern area and Appalachian region in the United States.

Implications for Policy, Delivery, or Practice:
A cultural and linguistic competency organizational assessment is an overarching strategy for health organizations to achieve higher levels of quality of care which in turn will improve the quality of life, improve health outcomes, and eliminate health disparities. In addition, the practices of CLAS Standards may allow state and local health departments to adhere to the National Public Health Accreditation Board (PHAB) Standards for ensuring a culturally and linguistically competent public health system.

Funding Source(s): Other, Kentucky State Health Department

Poster Session and Number: A, #225

The Health Transportation Shortage Index and Geomapping to Assess Risk of Transportation Barriers to Health Care Access
Roy Grant, Children's Health Fund; Grifin Goldsmith MPH, Children's Health Fund; Stephen Borders PhD, Grand Valley State University, Allendale Michigan; Delaney Gracy MD, MPH, Children's Health Fund; Tracy Rostholder MPH, Children's Health Fund; Dennis Johnson MPA, Children's Health Fund

Presenter: Roy Grant, M.A., Senior Director Of Research, Medical Affairs, Children's Health Fund, rgrant@chfund.org

Research Objective: Geospatial access and availability of transportation are important factors in a child’s access to timely health care services. Nationwide, 4% of children (9% with household income <$50,000) missed at least one health care appointment each year because transportation was not available. One-third later used a hospital emergency department. Rural areas have less available public transit and higher poverty rates than metropolitan areas, making personal vehicle ownership essential and potentially unaffordable. Using multiple data sets including original survey data, census demographics and hospital discharge data, we developed and validated a tool, the Health Transportation Shortage Index (HTSI), designed to help health planners identify areas where transportation is a significant access barrier to child health services. In this study we applied the HTSI to each county in two diverse states, Mississippi and Michigan, to test its utility in identifying and ranking counties in which transportation may be an access barrier.

Study Design: We computed a HTSI score for each county in Mississippi and Michigan to quantify risk and mapped each county using ArcGIS, locating every federally qualified health center and rural health clinic (“clinic”) within the county. Euclidian distances to nearest clinic (including those in contiguous counties) were computed using geographic- and population-weighted centroids as starting points. Data were analyzed in SAS (version 10.0).

Population Studied: County populations in two diverse states.

Principal Findings: A HTSI cut score (8) was determined that correctly identified 75.2% of counties with 1 or 0 pediatricians and correspondingly few family practitioners (p<0.01); 87.0% of these counties had populations <30,000 (p<0.01); 78.8% had the highest poverty rates in their state (p<0.01); 76.4% had no fixed route transit system including 17.6% with no public transit resources at all (p<0.01). The mean HTSI score of these counties was 8.4; for the 24.7% of counties with 1 or 0 clinics the mean score was 9.2. These results correlated with HPSA (health professional shortage area) designation (p<0.01); 83.5% were full and 14.1% partial county HPSAs. The results suggest the HTSI score supplements HPSA designation to facilitate more sensitive risk ranking. Population-weighted analysis seems to best reflect travel distances for the majority of county populations. Geomapping revealed that clinic resources are well located relative to population centers, with mean travel distances generally <7 miles for the county. The longest travel distances were in the least populous (most rural) counties (p<0.01). For rural residential areas distant from population centers, travel distances to nearest clinic often ranged from 20 to 34 miles. HTSI scores reflect county populations, not population distributions. Supplementing HTSI scores with geomapping allows for further recognition of high-risk counties based on population distribution.

Conclusions: The Health Transportation Shortage Index is useful in assessing the relative need for additional resources to facilitate child health access and can help planners
prioritize among medically underserved counties.

Implications for Policy, Delivery, or Practice: Some families, especially in rural areas, have long travel distances and limited resources. Transportation availability should be assessed when scheduling appointments so assistance to facilitate adherence can be offered if needed.

Funding Source(s): Other, W. K. Kellogg Foundation

Poster Session and Number: A, #226

Barriers to Psychosocial Services among Women Veterans Who Were Homeless
Alison Hamilton, VA Greater Los Angeles; Ines Poza, PhD, Poza Consulting; Vivian Hines, MSW, VA Greater Los Angeles; Donna L. Washington, MD, MPH, VA Greater Los Angeles & UCLA

Presenter: Alison Hamilton, Ph.D., M.P.H., Research Health Scientist, Desert Pacific MIRECC, VA Greater Los Angeles, alison.hamilton@va.gov

Research Objective: To provide a grounded description of barriers to psychosocial services among women veterans who were homeless.

Study Design: Focus group interviews subsequent to surveys.

Population Studied: 29 women veterans who had spent at least one night of the prior 30 in a shelter or transitional residential facility, a hotel paid for with a voucher, a car, an abandoned building, a nonresidential building, or another non-dwelling, or on the street.

Principal Findings: Participants described three main barriers to social and psychosocial services: (1) lack of information about services available to them, (2) limited access to services, and (3) lack of coordination across services. A sense of isolation and abandonment permeated women’s descriptions of their experiences of seeking and receiving services that were inappropriate or uncomfortable. Substance abuse was often a factor contributing not only to prolonged homelessness but also to utilization of services: many women found that they could only access services if they had—or claimed they had—substance abuse problems. Several participants who received appropriate and effective services were eager to share their experiences and concrete information about which services were worth utilizing. Participants enthusiastically endorsed the idea of women helping one another through the challenges of homelessness.

Conclusions: Homeless women deserve consideration as a distinct group within the homeless population, a group that perhaps exhibits unique ways of becoming homeless, responses to being homeless, and needs to prevent cycling in and out of homelessness. Furthermore, women veterans should be considered as a distinct subgroup of homeless women, especially considering their pathways into homelessness, including experiences specific to their military service. Our findings suggest the need for: (1) safe and stable housing for women veterans; (2) greater geographic availability of women-only treatment programs; (3) tailoring of mixed-gender programs to address safety concerns of women veterans and to improve coordination of care; (4) greater attention to the needs of women veterans without substance abuse and/or other mental health problems, and women veterans without children; and (5) interventions that incorporate a peer support and strengths-based or empowerment-oriented approach.

Implications for Policy, Delivery, or Practice: Understanding women veterans’ service needs and experiences related to homelessness, and the phenomenological underpinnings of those experiences, is critical to the development of relevant and appropriate services that move women away from vulnerability, into safety. Findings from this study improve our understanding of these issues, and inform actions to begin to address these needs. Future research should be directed toward identifying best practices for implementing these actions in VA clinical settings as well as settings outside the VA where homeless women veterans may seek care.

Funding Source(s): VA

Poster Session and Number: A, #227

Impact of Massachusetts Health Reform on Hospitalizations, Length of Stay and Costs of Inpatient Care: Does Safety-Net Status Matter?
Amresh Hanchate, VA Boston Healthcare System/Boston Medical Center/Boston University School of Med.; Danny McCormick, Cambridge Health Alliance/Harvard Medical School; Chen Feng, Boston Medical Center/Boston University School of Medicine; Karen Lasser, Boston Medical Center/Boston University School of Medicine; Nancy R. Kressin, VA Boston Healthcare System/Boston
Medical Center/Boston University School of Med.

**Research Objective:** There is widespread concern that large-scale insurance expansion—such as that anticipated from the Affordable Care Act—has the potential to cause sharp increases in health care utilization and costs. In the setting of Massachusetts' landmark 2006 health care reform, we estimated pre-reform to post-reform changes in inpatient care volumes and costs, contrasting the experience of safety-net hospitals (SNH) as the predominant providers of care for targeted reform beneficiaries, with that of non-SNH.

**Study Design:** We analyzed MA Hospital Inpatient Discharge Data on all non-federal MA hospital discharges from 2004-2010 for 2,636,326 non-elderly patients (age 18-64) across all 66 short-term acute care hospitals. Safety-net hospitals were identified as those in the top quartile of hospitals (N=16) in the proportion of hospital admissions with Medicaid, Free Care (state-funded program for uninsured) and self-pay as the primary payer. Using the quarter as the unit of time, we examined longitudinal hospital-level changes in (a) number of admissions, (b) average length of stay (LOS; days), (c) average charge per day ($) and (d) average charge per stay ($), separately for SNH and non-SNH. We also examined changes for acute and non-acute admissions, and for subpopulations by race/ethnicity and socioeconomic status (SES; defined using patient zip code median income). We used linear regression models to estimate the average change between pre-reform (1/2004 to 6/2006) and post-reform (1/2008 to 6/2010) periods, adjusting for longitudinal changes in patient demographics and comorbidities. To better isolate the impact of reform from secular state-wide trends, we treated the elderly as the “control” population and used a difference-in-differences model specification.

**Population Studied:** MA-residing patients aged ≥18 and discharged from all non-federal MA hospital (2004-10).

**Principal Findings:** There was no significant post-reform change in the number of admissions; quarterly number of admissions per hospital were 1,480 pre-reform and 1,520 post-reform (p=0.68). A similar pattern was found for admissions at hospitals by safety-net status, for acute and non-acute admissions, and for minority and low-income subpopulations.

Average LOS increased by a smaller amount among SNH (0.20 days; 95% CI=[0.15, 0.25]) than among non-SNH (0.30 days; 95% CI=[0.27, 0.33]). Average charges per day decreased among SNH ($198; 95%CI=[$251, $145]) and increased among non-SNH ($249; 95%CI=[$215, $284]). A similar trend with a larger difference was found for average charges per stay (SNH=$477; 95%CI=[$768, $187]) and non-SNH=$1,442; 95%CI=[$1,248, $1,635]). Similar trends were found for both acute and non-acute admissions. Among blacks and Hispanics, none of the measures indicated larger increase in SNH compared to that in non-SNH; for low-income patients, increases in LOS and charges were smaller in SNH.

**Conclusions:** Following MA health reform, utilization of inpatient care did not increase at SNH, the predominant providers of inpatient care for populations targeted by the reform, compared to non-SNH. A similar trend was found for acute and non-acute admissions, and for minority and low-income subpopulations. Future analyses in the coming months will test robustness of these findings using the non-elderly patients from comparison states as the control population.

**Implications for Policy, Delivery, or Practice:** Insurance coverage expansion in MA may not have increased overall use of inpatient use and costs.

**Funding Source(s):** NIH

**Poster Session and Number:** A, #228

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**Understanding Perceived Barriers to Fruit and Vegetable Consumption among Low-Income Individuals: A Qualitative Study**

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**Presenter:** Lindsey Haynes-Maslow, M.H.A., B.S.P.H., Doctoral Student, Health Police and Management, University of North Carolina Gillings School of Global Public Health, lhaynes5@email.unc.edu
Research Objective: Obesity is the leading preventable cause of illness and a major contributor to chronic disease. Consuming fresh fruits and vegetables can help manage and prevent weight gain and reduce the risk of chronic diseases. Low-income individuals often lack access to stores that sell fresh fruit and vegetables and live closer to stores that sell low nutritional value foods. The purpose of this study is to understand perceived community-level barriers to fruit and vegetable consumption among low-income individuals.

Study Design: We used a qualitative approach to examine barriers to fruit and vegetable consumption. We conducted eight focus groups involving 68 low-income participants in two North Carolina counties from May 2011-August 2011. The socio-ecological model of health guided data analysis and two trained researchers coded the transcripts and used memo writing.

Population Studied: North Carolina is the 14th most overweight state in the nation (1). Orange and Durham County are a mix of urban and suburban communities. Approximately 25% of adults are obese, 16% are living in poverty; and 30% of residents of these counties lack access to healthy foods. Four focus groups were conducted in each county; one was all-male, five all-female, and two mixed-sex. Most participants were African American, female, and had a high school education or less.

Principal Findings: Five of the focus groups were predominately African American, two focus groups were elderly, and one was Latina. Almost half received either Supplemental Nutrition Assistance Program or another government assistance program. We identified six major community-level barriers affecting fruit and vegetable access: cost, transportation, quality, variety, changing food environment, and changing societal norms around food.

Conclusions: Participants identified six main barriers to eating fruit and vegetables: cost, transportation, lack of quality and variety, changing food environment, and changing societal norms. Cost was the most commonly and extensively described barrier to purchasing F&V. Across all focus groups, participants expressed a desire for increased quality and variety of fresh fruit and vegetables in the community. There also seemed to be an unmet demand for convenient locations to purchase high quality, fresh fruit and vegetables in low-income communities is an important finding.

Implications for Policy, Delivery, or Practice: Our study increases understanding of low-income individuals’ experiences in NC that may be relevant to other settings. Improving cost, quality, variety, and convenience of fresh fruit and vegetables are important issues in reducing chronic diseases. Policymakers should consider supporting programs that decrease cost and increase the supply of high quality fruit and vegetables in low-income communities. This may be done by encouraging grocery stores to locate into these communities, incentivizing convenience stores to carry more produce, or restricting the number of fast food restaurants that can locate into these communities. Additionally, policymakers should consider decreasing fruit and vegetable prices, either through subsidies or vouchers to address cost barriers. Lastly, policymakers should invest in culturally-appropriate nutrition programs that focus on increasing fruit and vegetable consumption among low-income individuals.

Funding Source(s): NIH

Poster Session and Number: A, #230

The PCMH Effect on Racial/Ethnic Minorities

Susan Hernandez, University of Washington;
Paul L. Hebert, PhD, Department of Veterans Affairs; Edwin S. Wong, PHD, Department of Veterans Affairs; Chuan-Fen Liu, PhD, Department of Veterans Affairs; Adam J. Battan, Department of Veterans Affairs; Jaclyn Lemon, Department of Veterans Affairs

Presenter: Susan Hernandez, MPA, Research Assistant, Health Services, University of Washington, seh315@uw.edu

Research Objective: In 2010 the Veteran Health Administration (VHA) began implementing a patient-centered medical home model system wide, the Patient Aligned Care Teams (PACT), to transform primary care into team-based care. Similar to other settings, within the VHA healthcare for minorities is concentrated among few providers, with 28% of all VHA hospitals caring for 75% of Black veterans. Disparities are also prevalent within the VHA system and across VHA facilities. This study tests whether the national PACT differentially affects facility level rates of hospitalizations for ambulatory care sensitive conditions (ACSCs) depending on the percent minority.
Study Design: We use an interrupted time series design, a mixed effects model, and the US Agency for Healthcare Research and Quality (AHRQ) definition of hospitalizations for ambulatory care sensitive conditions, which consist primarily of hospitalizations for heart failure, pneumonia, COPD, and diabetes. We adjust for clinic characteristics, and patient population characteristics, and the market level unemployment rate. Changes in hospitalizations for ACSC trends were assessed by incorporating separate intercepts and time trend slopes for the pre- and post-PACT periods. Wald tests were used to assess statistically significant differences between the pre- and post-PACT parameters. Using the estimated models, we compared the estimated post-PACT utilization trend with the projected hospitalization for ACSCs trend in the absence of PACT. We limit the analyses to veterans under 65 because nearly half of all healthcare utilization by Medicare-eligible Veterans occurs outside the VA, and these data are available to us only with a significant time lag. Clinics were categorized as low (<5%), medium (5%-15%), and high (>15%) based on the percent of black patients comprising their patient population.

Population Studied: The study sample included veterans who were under 65 and were assigned to a primary care provider from 2003 through 2012. The total number of facilities was 972, although 65 did not have unemployment rate data and were excluded from the main analyses. All patients were included regardless of whether they survived or remained a primary care patient through the PACT initiation period. Thus, patients who appeared only in the pre-PACT period contributed observations to estimate the trend in utilization pre-PACT. We aggregate individual level observations to facility level, so the unit of analysis was the facility-quarter.

Principal Findings: Overall, blacks represented less than 5% of patients in 49% of facilities; 5-15% in 28% of facilities, and more than 15% in 23% of facilities. Preliminary results based on collapsed pre- and post-PACT time periods indicate ACSCs rates increase with increase percent of blacks in a facilities.

Conclusions: Datasets are ready for the next steps including incorporating other racial/ethnic groups and incorporating other utilization categories. In addition, we will conduct the full time-series and veteran level analyses to calculate facility level ACSC rates for racial/ethnic groups.

Implications for Policy, Delivery, or Practice:
The VHA presents a unique opportunity to test whether the PCMH differentially affects rates of hospitalizations for ACSC within an integrated delivery system among varying levels of racial diversity in medical facilities. This study contributes to the growing evidence regarding the effectiveness of the PCMH and is the first to look at its effect on racial/ethnic groups.

Funding Source(s): VA
Poster Session and Number: A, #231

Disparities in Evaluation of Regional Lymph Nodes among Black and White Women with Non-Disseminated Breast Cancer and Subsequent Outcome
Marianne Hillemeier, Penn State University; Weihong Kong, Penn State University

Presenter: Marianne Hillemeier, Ph.D., Penn State University, mmh18@psu.edu

Research Objective: One in three cancers diagnosed among women is breast cancer. Despite the fact that research has advanced breast cancer diagnosis and treatment dramatically over the past decades, black-white gaps in breast cancer-related mortality persist. In this paper, we examine whether race is significantly associated with the likelihood of lymph node evaluation among black and white women with non-disseminated breast cancer, and whether lymph node evaluation is independently associated with risk of dying within the follow-up period, controlling for race. We also assess whether the odds of having lymph node examination have improved since 2004, overall and by race.

Study Design: Data were drawn from 2012 Surveillance, Epidemiology, and End Results Data –linked to county attributes. Multivariate logistic regression models predicting lymph node evaluation among women with non-disseminated breast cancer were estimated controlling for explanatory variables including individual factors (race, age, stage at diagnosis, tumor grade, and marital status), treatment factors (surgery, radiation), and county-level factors (metropolitan county or not, median household income, percentage of the population with at least a college degree, and percentage of the female population aged 40+ receiving mammography within the previous two years). We also conducted Kaplan-Meier survival analyses and Cox proportional hazard
disparities in care have changed overtime. We examined whether quality of care differs for black, Latino, and white Medicaid beneficiaries with schizophrenia, and whether quality and disparities in care have changed overtime. We focused on Medicaid because Medicaid is the largest payer for this population.

Study Design: We used 2002-2008 inpatient, outpatient, and pharmacy data from the Medicaid Analytic Xtract database for a large and diverse state program. We created cohorts of continuously enrolled adults aged 18-64 years with at least two outpatient or one inpatient claim with a schizophrenia diagnosis. Subjects’ service use information was assembled into treatment episodes. We used 15 quality measures adapted from the schizophrenia PORT and generic chronic care standards to characterize quality of care. The measures covered pharmacological and psychosocial practices as well as indicators of appropriateness of care. We created a composite quality score for each treatment episode using the individual measures via item response theory [IRT] modeling. Using this composite score as our primary outcome, we estimated random regression models to quantify the association of race/ethnicity and time on quality, accounting for between-county variation.

Population Studied: 119,178 schizophrenia treatment episodes (29% black, 17% Latino, 54% white) for 48,225 beneficiaries across 58 counties.

Principal Findings: Although 83% of episodes had filled at least 1 antipsychotic prescription and 67% were fully adherent, rates of routine psychiatric care and timely follow-up following discharge were modest (both at 55%). Measures most discriminating of quality in the IRT model were routine psychotherapy, routine psychiatric care, and timely follow-up. The mean composite quality score for the state was 0.06 [SD = 1.26], ranging from -2.19 (low quality) to 2.38 (high quality).
quality) across the episodes. Statewide, in 2002 and compared to whites, blacks had lower quality (0.16 units lower [SE = 0.026]) and so did Latinos (0.07 units lower [SE = 0.027]). Annual rates of quality improvement were 0.057 [SE = 0.012] per year for whites, but improvement grew slower, by 0.015 annual units, for both blacks and Latinos.

Conclusions: Using a composite measure of quality of schizophrenia care encompassing a broad spectrum of treatment practices, we found evidence of disparities in quality, larger for blacks than Latinos, among Medicaid beneficiaries residing in a state where counties finance and administer health and mental health services. Although quality of care improved over the study period, it improved more for whites and hence, disparities grew.

Implications for Policy, Delivery, or Practice: Our findings have important implications for efforts to improve quality while also reducing disparities among vulnerable populations. Quality improvement efforts need to be designed to target all racial/ethnic groups equally, thus effecting progress in both quality and equity of care. Further research is needed to understand county-level policy and other contextual factors that may be associated with gains in both dimensions.

Funding Source(s): NIH
Poster Session and Number: A, #233

An Intervention to Extend Breastfeeding among Black and Latina Postpartum Mothers
Elizabeth Howell, Mount Sinai School of Medicine; Susan Bodnar-Deren, Department of Sociology, L. Douglas Wilder School of Government and Public Affairs, Virginia Commonwealth University; Amy Balbierz, Mount Sinai School of Medicine; Nina Bickell, Mount Sinai School of Medicine

Presenter: Elizabeth Howell, M.D., M.P.P., Associate Professor, Department of Health Evidence & Policy and Obstetrics, Gynecology, and Reproductive Science, Mount Sinai School of Medicine, elizabeth.howell@mountsinai.org

Research Objective: To evaluate the effectiveness of a randomized controlled trial with the secondary aim to test whether a behavioral educational intervention increased breastfeeding duration among low-income, self-identified black and Latina postpartum mothers.

Study Design: Randomized controlled trial at a large inner-city urban hospital. Participants were randomized to intervention or enhanced usual care groups. Participants randomized to the intervention arm received a culturally-tailored 2-step intervention that prepares and educates mothers about postpartum symptoms and experiences (including tips on breastfeeding and breast/nipple pain), bolstered social support and self-management skills, and included an in-hospital educational session with a social worker, educational materials, and a 2-week follow-up call. Mothers in both trial arms were interviewed prior to randomization (during their postpartum hospital stay), 3-weeks, 3-months, and 6-months postpartum and asked a series of questions about breastfeeding, (including how long they breastfed), physical and emotional symptoms, social support, and healthcare factors. Data were collected by bilingual research coordinators blinded to intervention status. Enhanced usual care participants received a list of community resources and a 2-week control call. We conducted intention-to-treat analyses examining breastfeeding duration (measured in weeks) at 3-weeks and 3-months postpartum. Intervention status was the key independent variable in our analysis. Bivariate analysis was conducted to assess any demographic, clinical and breastfeeding characteristics of study participants. Among women who initiated breastfeeding, Kaplan Meier analysis was used to test the effect of the intervention on breastfeeding duration for up to 3-months of follow-up.

Population Studied: 540 self-identified black and Latina postpartum women were recruited during their postpartum hospital stay. Eligible subjects were women >18 years of age, English or Spanish Speaking, had working telephones, and had infants whose birthweights were > 2500 grams and 5-minute Apgar scores >6.

Principal Findings: Mean age was 28 (range 18-46); 62% were Latina and 38% were black. Sixty-three percent had Medicaid insurance, 56% earned < $30,000 annually, 35% were foreign born, and 21% spoke Spanish. Among the 540 mothers enrolled, rates for follow-up interviews were 87% at 3-weeks, and 89% at 3. Of the 540 participants, 425 women (79%) initiated breastfeeding. There were no important differences between intervention and control groups in baseline sociodemographic, clinical, psycho-social, and breastfeeding characteristics including rates of initiating breastfeeding. Among 425 women who initiated breastfeeding, women in the intervention group versus controls breastfed for longer (mean of 14.6 vs. 12.5
weeks p=.02) and were more likely to breastfeed at 3-weeks (84% vs. 75%, p=.04) and at 3-months postpartum (60% vs. 48%, p<.02). Kaplan Meier analysis revealed a statistically significant difference in time to cessation between the intervention and control group (log rank test, p=0.02).

Conclusions: A behavioral educational intervention increased breastfeeding duration among low-income, self-identified black and Latina women during the three-month postpartum period.

Implications for Policy, Delivery, or Practice: A simple, inexpensive culturally tailored intervention increased duration of breastfeeding among low-income, black and Latina mothers. More research is needed to determine whether this intervention is effective in other settings.

Funding Source(s): NIH

Poster Session and Number: A, #234

Guideline-Concordant Cancer Care among American Indian/Alaskan Native Patients with Cancer

Sara Javid, University of Washington; Thomas Varghese, MD, MS, University of Washington Department of Surgery; Arden Morris, MD, University of Michigan Department of Surgery; Michael Porter, MD, MS, University of Washington Department of Surgery; Dedra Buchwald, MD, University of Washington Division of General Internal Medicine; David Flum, MD, MPH, University of Washington Department of Surgery

Presenter: Sara Javid, M.D., Assistant Professor Of Surgery, Surgery, University of Washington, sjavid@uw.edu

Research Objective: American Indians/Alaskan Natives (AI/ANs) have the worst 5-year cancer survival among all racial/ethnic groups in the United States. Improved cancer survival is linked to the receipt of guideline-concordant care. We sought to compare the receipt of guideline-concordant cancer care among AI/AN patients to White patients.

Study Design: Nationally accepted guidelines for surgical therapy, adjuvant (chemoradiation) therapy, and post-therapy surveillance were selected as metrics of optimal, or guideline-concordant, care. The proportion of patients receiving optimal care was compared across subgroups. Analyses comparing AI/AN patients to Whites utilized random sampling and bootstrapping methods along with matching for defined covariates. To analyze the association between receipt of each optimal care metric and survival among AI/AN and Whites, we performed Cox proportional hazards regression analyses.

Population Studied: Using Surveillance, Epidemiology, and End Results (SEER) registry data linked to Medicare claims, we identified 338,204 patients diagnosed at age 65 or older with the four most common solid tumors (breast, colon, lung, prostate) between January 1, 1996 and December 31, 2005. In order to ensure complete claims data, we required continuous enrollment in both Medicare Parts A and B, with no health maintenance organization (HMO) coverage for the entire or partial study period as defined for each metric.

Principal Findings: Across cancer types and points of care, AI/AN patients received less optimal care than White patients. AI/AN patients were universally less likely to have a curative surgical resection (p less than 0.02 across all cancer types). Adjuvant therapy rates were significantly lower for AI/AN patients with breast (p less than .0001) and colon cancer (p=.004). Rates of post-treatment surveillance were also lower among AI/AN patients across cancer types, and statistically significant for breast (p=.002) and prostate (p less than .001) cancer. Non-receipt of optimal cancer treatment was associated with significantly worse survival across cancer types. Survival hazard ratios for those who did not undergo surgery versus those who did were significantly lower for breast (HR 0.58), colon (HR 0.68), prostate (HR 0.6), and lung (HR 0.34) cancer. Survival rates were also significantly lower for those patients who did not receive adjuvant therapy for breast (HR 0.52) or colon cancer (HR 0.56).

Conclusions: AI/AN patients received lower quality care than White patients across the four most common cancer types and across the continuum of cancer care, including surgery, receipt of adjuvant therapy, and surveillance.

Implications for Policy, Delivery, or Practice: Efforts to explain these differences, including the associated geopolitical, community, and individual factors, are critical to advancing the delivery of optimal cancer care for AI/AN patients. Ongoing CINCO collaborative efforts will focus on more micro level analyses in collaboration with AI/AN communities, including key informant interviews and patient-provider dyad surveys, to elucidate the barriers to receiving cancer treatment and inform appropriate targets for intervention.
**Funding Source(s):** NIH  
**Poster Session and Number:** A, #235

**Differential Response Rates Explain Disparities in Hospital Performance on HCAHPS**

Karen Joynt, Harvard School of Public Health; Sidney T. Le, Harvard School of Public Health; E. John Orav, Harvard School of Public Health; Ashish K. Jha, Harvard School of Public Health

**Research Objective:** Patient experience is an important metric of the quality of care delivered by a hospital, and is increasingly being used to rate hospitals’ performance and to determine reimbursement. Prior studies have shown that hospitals that serve a high proportion of poor and minority patients perform worse on the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey. However, some have raised concerns that response rate may impact these differences, since disadvantaged patients may be less likely to respond to surveys. Therefore, our objective was to determine if response rate differed between safety-net or minority-serving hospitals and their peers, and to determine if these differences impacted HCAHPS scores.

**Study Design:** We used national hospital-level HCAHPS survey data from 2010. We linked this data to the 2010 American Hospital Association (AHA) survey to obtain hospital characteristics including size, ownership, location, teaching status, region, and Disproportionate Share (DSH) Index, a measure of the proportion of care that is provided to the poor. We used national Medicare data from 2010 to calculate the proportion of Medicare patients at each hospital that were black. We first calculated the performance on each HCAHPS domain across quartiles of DSH Index and across quartiles of the proportion of black patients served. We then repeated these calculations adjusting for the hospital characteristics listed above, and finally adjusting for response rate.  

**Population Studied:** 3,651 acute care US hospitals that reported in the HCAHPS and AHA surveys in 2010.  

**Principal Findings:** Prior to adjusting for response rate, we found that hospitals in the highest quartile of DSH Index, commonly referred to as safety-net hospitals, scored significantly worse on overall measures of patient experience. For example, 63.3% of patients at safety-net hospitals rated the hospital as a 9 or 10, compared with 71.6% at hospitals in the lowest quartile of DSH Index (difference 8.3%, p<0.001). Similarly, hospitals in the highest quartile of the proportion of black patients served scored significantly worse on patient experience, with 65.2% of patients rating the hospital a 9 or 10 compared with 70.9% at hospitals with the lowest proportion of black patients (difference 5.7%, p<0.001). However, after adjusting for response rate, these findings changed. For safety-net hospitals versus low-DSH hospitals the difference shrank (66.5% versus 68.6%, difference 2.1%, p<0.001) and for minority-serving versus low-minority hospitals the difference vanished (67.6% versus 68.2%, difference 0.6%, p=0.17). These patterns were very similar for each of the 10 HCAHPS domains examined.

**Conclusions:** Accounting for differential response rates attenuates or eliminates differences in patient experience ratings between safety-net and non-safety-net or minority-serving versus non-minority-serving hospitals.

**Implications for Policy, Delivery, or Practice:** Response rates may explain a large amount of the perceived difference in performance between hospitals on metrics of patient experience, particularly for hospitals with vulnerable patient populations. Given that these metrics are being used for hospital reimbursement, the consequences of failing to account for response rate may include worsening disparities in care.

**Funding Source(s):** Other, Internal departmental funds  
**Poster Session and Number:** A, #236

**Racial Disparity in Duration of Patients’ Visits to the Emergency Department: Teaching vs. Non-Teaching Hospitals**

Zeynal Karaca, Social and Scientific Systems, Incorporated; Herbert S. Wong, Agency for Healthcare Research and Quality

**Presenter:** Zeynal Karaca, Ph.D., Health Economist, Center for Delivery, Organization, and Markets, Social and Scientific Systems, Incorporated, zeynal.karaca@ahrq.hhs.gov

**Research Objective:** The sources of racial disparity in duration of patients’ visits to emergency departments (EDs) have not been
documented well enough for policymakers to distinguish patient-related factors from hospital- or area-related factors. This study explores the racial disparity in duration of routine visits to EDs at teaching and non-teaching hospitals.

**Study Design:** Retrospective data analyses and multivariate regression analyses were performed to investigate the racial disparity in duration of routine ED visits at teaching and non-teaching hospitals. Duration for each visit was computed by taking the difference between admission and discharge times.

**Population Studied:** The Healthcare Cost and Utilization Project (HCUP) State Emergency Department Databases (SEDD) were used in the analyses. The data include 4.3 million routine ED visits encountered in Arizona, Massachusetts, and Utah during 2008. In general, the SEDD provide detailed diagnoses, procedures, total charges, and patient demographics. Demographics include gender, age, race, and insurance coverage (i.e., Medicare, Medicaid, private insurance, other insurance, and uninsured). However, the SEDD from these three states also provide admission and discharge time for each visit, from which duration may be calculated. We obtained information about hospital characteristics (i.e., urban versus rural, ownership status, teaching status, bed size, and system membership) from the 2008 American Hospital Association Annual Survey Database. In addition, we obtained information about the trauma level of the hospital using the Trauma Information Exchange Program database, collected by the American Trauma Society and the Johns Hopkins Center for Injury Research and Policy. Finally, we used the 2008 Area Resource File to obtain county-level income information.

**Principal Findings:** The mean duration for a routine ED visit was 238 minutes at teaching hospitals and 175 minutes at non-teaching hospitals. There were significant variations in duration of routine ED visits across race groups at teaching and non-teaching hospitals. The risk-adjusted results show that the mean duration of routine ED visits for black/African American and Asian patients when compared to visits for white patients was shorter by 10.0 and 3.4 percent, respectively, at teaching hospitals; and longer by 3.6 and 13.8 percent, respectively, at non-teaching hospitals. Hispanic patients, on average, experienced 8.7 percent longer ED stays when compared to white patients at non-teaching hospitals.

**Conclusions:** There is significant racial disparity in the duration of routine ED visits, especially in non-teaching hospitals where non-white patients experience longer ED stays compared to white patients. The variation in duration of routine ED visits at teaching hospitals when compared to non-teaching hospitals was smaller across race groups.

**Implications for Policy, Delivery, or Practice:** Our findings inform public and private policymakers on a broad range of issues including, but not limited to, admission day of the week, hospital volume, and the impact of hospital bed size on the mean duration of ED visits.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #237

**Racial Disparity in Hospital Inpatient Cost: Homeless vs. Non-Homeless Patients**

Herbert S. Wong, Agency for Healthcare Research and Quality; Zeynal Karaca, Social and Scientific Systems, Incorporated

**Presenter:** Zeynal Karaca, Ph.D., Health Economist, Center for Delivery, Organization, and Markets, Social and Scientific Systems, Incorporated, zeynal.karaca@ahrq.hhs.gov

**Research Objective:** There is limited literature addressing the racial disparity in hospital inpatient services among homeless patients. However, there is no study empirically comparing the racial disparity in hospital inpatient cost between homeless and non-homeless patients. This paper compares hospital inpatient costs between homeless and non-homeless patients across race groups using novel methodological approaches involving propensity score matching techniques. This study also provides comprehensive descriptive information on patient characteristics, insurance coverage, disease prevalence, and severity of illness for homeless patients and non-homeless patients by race groups.

**Study Design:** We employed propensity score matching to create two cohorts, where inpatient hospital visits between homeless and non-homeless patients were matched based on patients’ demographics and clinical information, and hospital types. These new similar cohorts were then used to compare the cost per hospital visit between homeless and non-homeless patients through multivariate regression analysis. We further verified our matching algorithm by testing the mean values of
covariates on our individuals where inpatient hospital visits encountered by homeless patients were paired with inpatient hospital visits encountered by non-homeless patients. **Population Studied:** The Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID) for 2009 were used. Data were drawn from 579 hospitals reporting data on homelessness in Arizona, California, Colorado, Florida, Georgia, Massachusetts, Missouri, New York, Pennsylvania, and Wisconsin. SID provide detailed diagnoses, procedures, total charges and patient demographics including homelessness. We linked SID files with American Hospital Association Annual Survey Database and Area Resource File to obtain hospital and area level characteristics. **Principal Findings:** Our risk adjusted results show that homeless patients generally have lower inpatient costs when compared to non-homeless patients. We find that homeless white patients have higher inpatient costs and non-homeless white patients have lower inpatient costs when compared to their homeless non-white and non-homeless non-white counterparts respectively. We also find that the majority of homeless children at hospital inpatient departments are non-white. In addition, about a third of all inpatient hospital visits by white homeless patients are for female individuals. We further found that about 29 percent of hospitalized homeless patients were uninsured, and that rate was dramatically lower for their non-homeless counterparts. Nearly half of inpatient hospital visits by homeless patients and about a quarter of inpatient hospital visits by non-homeless patients were covered by Medicaid. We observed a disproportionally higher prevalence of mental disorders relative to other disease groups within homeless patient populations in inpatient hospitals. Finally, we found that about 21 percent of all inpatient hospital visits by homeless individuals were related to mental disorders—mostly alcohol-related disorders, mood disorders, and schizophrenia and other psychotic disorders. **Conclusions:** We find significant variations in inpatient costs between homeless and non-homeless patients across race groups. While the majority of our results confirm the findings of previous research, we make several important new observations regarding hospital admission rates through emergency departments and substantial differences in racial composition across several categories, including age, gender, insurance coverage, and prevalence of major disease groups. **Implications for Policy, Delivery, or Practice:** This study provides comprehensive empirical evidence for racial disparity in hospital inpatient costs between homeless and non-homeless patients. **Funding Source(s):** No Funding **Poster Session and Number:** A, #238 **Racial and Diagnostic Disparities in Hospice Use and Effects of Hospice on Use of Acute Care Services at the End-of-Life** Pauline Karikari-Martin, Rush University; Judith J. McCann, PhD, RN, Rush University, CON & Rush Institute for Healthy Aging; Carol J. Farran, DNSSc., RN, Rush University, CON; Liesi Hebert, ScD, Rush Institute for Healthy Aging; Samuel C. Haffer, PhD, Centers for Medicare & Medicaid Services; Marcia Phillips, PhD, RN, Rush University, CON **Presenter:** Pauline Karikari-Martin, Ph.D(c), M.P.H., M.S.N., Nurse Officer, College of Nursing(CON), Rush University, pauline_karikari-martin@rush.edu **Research Objective:** This study examined racial and diagnostic differences associated with hospice use and duration of hospice use among individuals aged 65 years or older at the end-of-life (EOL). Secondly we examined the effect of race, diagnosis, and hospice use on acute care services: hospitalizations, intensive care unit/coronary care unit (ICU/CCU) admissions, and emergency room (ER) visits. **Study Design:** The Hospice Use Model guided this secondary analysis. Existing interview data from the Chicago Health and Aging Project (CHAP), a NIH-funded longitudinal community study of more than 10,000 people age 65 or older, were merged with Medicare claims information. Data were analyzed using logistic and Poisson regression using forward stepwise selection. **Population Studied:** CHAP participants who died as of December 31, 2009 and were enrolled in Medicare for at least one year before death (n=2,954) were included in the analytic sample. **Principal Findings:** Compared to Whites (45%), Blacks (55%) were less likely to use hospice (OR = .54; CI .38, .77). Compared to individuals with a non cancer diagnosis (61%), individuals with a cancer diagnosis (39%) were more likely to use hospice (OR=2.22; CI 1.79,
2.70). There were no racial or diagnostic differences in duration of hospice use. In models that considered race and diagnosis, hospice users (34%) were less likely than non-users (66%) to be hospitalized (RR=.53; CI .40, .69), have an ICU/CCU admission (RR=.38; CI .20, .71), or an ER visit (RR=.15; CI .11, .22) at the EOL.

**Conclusions:** Disparity in hospice use exists by race (Blacks vs. Whites) and by diagnosis (cancer vs. non-cancer) at the EOL. The effect of hospice use on hospitalizations, ICU/CCU admissions, and ER visits is statistically and clinically significant. In multivariate models, hospice use had a more powerful effect on use of acute care services than any other variables and it eliminated racial and diagnostic disparities in ER visits at the EOL. Overall, hospice use is more influential on use of acute care services at the EOL than race, diagnosis, age, education, physical function activities of daily living, and change in cognitive function.

**Implications for Policy, Delivery, or Practice:** Appropriate use of hospice services at the EOL can reduce the use of aggressive interventions and conserve health care resources. Efforts to disseminate and increase awareness of benefits of hospice should employ innovative educational strategies targeting minorities (Blacks) and individuals with a non-cancer diagnosis using a three-pronged approach: 1) Community – faith-based organizations, community leaders, family/caregivers, patient advocates, Medicare beneficiaries, and lay patient navigators; 2) Providers – nurse practitioner/physician residency programs, annual continuing education training, certification/seminar in palliative care, and medical encounter checklist that includes hospice benefit information; and 3) Payors – include hospice benefit information for enrollees during enrollment and re-enrollment periods.

**Funding Source(s):** NIH

**Poster Session and Number:** A, #239

**Survivors Foregoing or Delaying Care: A Lasting Effect of Cancer-Related Financial Problems?**

Erin Kent, National Cancer Institute; Laura P. Forsythe, Patient-Centered Outcomes Research Institute; K. Robin Yabroff, National Cancer Institute; Kathryn E. Weaver, Wake Forest School of Medicine; Janet S. de Moor, National Cancer Institute; Juan L. Rodriguez, Centers for Disease Control and Prevention; Julia H. Rowland, National Cancer Institute

**Presenter:** Erin Kent, Epidemiologist, National Cancer Institute, erin.kent@nih.gov

**Research Objective:** Financial problems caused by cancer and its treatment can substantially affect survivors and their families and create barriers to seeking healthcare. Little research has examined the effects of self-reported financial problems among cancer survivors. Our research objective was to identify factors associated with cancer-related financial problems in survivors and examine whether having financial problems was associated with delaying or foregoing medical care over the past 12 months.

**Study Design:** We used data from the cancer control supplement of the 2010 National Health Interview Survey (NHIS), a nationally representative, population-based cross sectional survey, which included the following question and responses: “to what degree has cancer caused financial problems for you and your family – a lot, some, a little, or not at all.” Using multivariable logistic regression analyses, we report sociodemographic, clinical, and treatment-related factors associated with perceived cancer-related financial problems and the association between financial problems and foregoing or delaying healthcare because of cost. We report adjusted percentages using the predicted margins method and incorporated sampling weights in the analyses to account for the complex sampling design.

**Population Studied:** Individuals with a self-reported history of cancer (excluding non-melanoma skin cancer) in adulthood from the 2010 NHIS study were included in the analyses (n= 1,556).

**Principal Findings:** Cancer-related financial problems were reported by 31.8% (CI 29.3-34.5%) of survivors. Factors significantly associated with cancer-related financial problems in survivors included younger age at diagnosis, minority race/ethnicity, history of chemotherapy or radiation treatment, recurrence or multiple cancers, and shorter time from diagnosis. After adjustment for covariates, respondents who reported financial problems were more likely to report delaying (14.6% vs. 7.5%) or foregoing overall medical care (11.2% vs. 5.0%), prescription medications (14.3% vs. 7.4%), dental care (18.5% vs.9.1%), eyeglasses (11.7% vs. 6.1%), and mental health care (3.5% vs. 1.5%) than their counterparts without financial problems (all p<0.05).
Conclusions: Almost one third of individuals with a history of cancer report cancer-related financial problems. Cancer-related financial problems are not only disproportionately represented in survivors who are younger, minority, and have a higher treatment burden, but may also contribute to poor healthcare access after cancer, which may have important implications for the health status of many cancer survivors.

Implications for Policy, Delivery, or Practice: Future research should utilize longitudinal study designs, such as those found in the Medical Expenditure Panel Survey, to examine economic trajectories of cancer survivors and their caregivers and whether cancer survivors who delay or forego care because of cost experience worse health outcomes. Questions about financial burden could also be added to existing, longitudinal survivor cohort studies. Findings also suggest the need for system and environmental-level solutions to minimize financial barriers to healthcare access for the growing population of cancer survivors.

Funding Source(s): NIH

Concluding Remarks: The targeted population of this study was congregants and churches that comprised a voluntary church network established to engage churches in collaborative research and education. This analysis includes a total of 1,194 African American congregants from 11 participating churches.

Principal Findings: Using Generalized Estimating Equations (GEE) models with a logistic link function, results suggest that, according to the multivariate models, congregants who reported having two or more health conditions, participated in a research project in the past two years, and were trying to lose weight were more likely to actively help in their church’s health ministry.

Conclusions: These findings suggest that congregants may be potentially driven to promote healthy behavior because of their own health challenges. Further, in looking at our original hypothesis, the findings highlight the need for further research to explore levels of active participation in health promotion and the variability between different ethnicities with regard to motivating factors such as personal health and research participation.

Implications for Policy, Delivery, or Practice: Identification of specific characteristics can significantly inform and enhance the design of future interventions that more effectively target
agents of change with the objective of furthering health promotion in church communities.

**Funding Source(s):** NIH

**Poster Session and Number:** A, #241

**Cardiovascular Disease Among African American Men: Partnering with the Church to Promote Better Health and the Value of Participant Observations**

Mimi Kim, University of North Carolina at Chapel Hill; Keon Gilbert, University of St Louis; Geni Eng, University of North Carolina at Chapel Hill; Daniel Howard, The Robert Wood Johnson Foundation for Health Policy at Meharry Medical College; Giselle Corbie-Smith, University of North Carolina at Chapel Hill; Paul Godley, University of North Carolina at Chapel Hill

**Presenter:** Mimi Kim, PhD, Investigator, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill, mimi@unc.edu

**Research Objective:** American men have the highest mortality rate from cardiovascular disease (CVD) in this nation. Researchers have found that behaviors associated with managing and controlling CVD, such as seeking treatment, controlling diet, and exercising, may be significantly influenced not only by a man’s awareness and knowledge, but also by his racial/ethnic identity, gender role socialization, and culture, among other influences. Further, religious involvement and social support have been positively associated with a range of health outcomes, including cardiovascular functioning. However, efforts to translate this research to church-based, social support interventions that benefit African-American men have been rare and largely unsuccessful. In order to better bridge effective, research-based interventions with positive change for African-American men, this study initially examined the African-American church contexts through participant observation.

**Study Design:** Participant observations were used as an effective method for data collection to familiarize the research team with the participating churches; to observe the culture within the various churches; to observe any potentially significant cultural tools; to begin to build rapport with the congregation and broader community; and to encourage the insight of the research team.

**Population Studied:** A total of 20 participant observations were conducted in a variety of contexts across 4 southern, rural African-American churches including: Sunday service, Bible study, fellowship hour, men’s meetings, NAACP Chapter Meeting, Sunday school, and intercessory prayer.

**Principal Findings:** These observations proved to be an effective strategy for accessing hard-to-reach African-American men within a religious setting. These findings identify specific themes related to ethnicity, culture, religion, and other personal and social characteristics that provide insight into the lives of these men who have historically dealt with CVD. Further, the findings also identify specific elements of our particularly rigorous participant observation process and subsequent analysis that may assist future researchers to conduct effective and ethical observations in other hard-to-reach populations and/or settings.

These results provide evidence about the spaces and places men gather to express themselves and how they build community among themselves separate and in tandem with the rest of the community.

**Conclusions:** The process of conducting participant observations provided a rich and valuable picture of the cultural context in these rural African American churches. The data also provides a good balance of the strengths and areas to improve on for reaching African American men’s awareness of the importance of cardiovascular disease and health in general. Finally, this study and the observations in particular provide a strong foundation for how future studies can build a partnership with churches to promote health behaviors from a peer based model.

**Implications for Policy, Delivery, or Practice:** Identifying cultural contexts is critical to community based participatory research and enriches the positive impact of health interventions delivered in faith-based contexts. Participant observations are one method that can invaluably inform intervention design and subsequent clinical practices for promoting positive cardiovascular health in African American churches.

**Funding Source(s):** NIH

**Poster Session and Number:** A, #242

**Examining Characteristics of Individuals Who have Previously Participated in Research to Address Disparities in Minority Study Recruitment**

Mimi Kim, University of North Carolina at Chapel Hill; Adebowale Odulana, University of North
Research Objective: There is a well-established understanding that African American churches can serve as a significant portal to promote healthy living. As a result, it is important to identify the characteristics of individuals who have participated in research in the past for the following several reasons: provides a measure of the congregations “readiness” for participation in community based participatory research; informs the tailoring of health interventions that speak to the needs and experiences of the members of that specific church community; inform pastors of various ways to partner with research entities to address relevant health behaviors and conditions for their congregation members; and allow community academic research partners to understand what has successfully engaged congregation members in the past that may potentially motivate them and their peers to engage in future research. This analysis measured the odds of congregation members having participated in research in the past when controlling for various basic demographics, health factors, beliefs on the role of the church in health, lifestyle & environmental issues, and other variables related to participation in church based research.

Study Design: This analysis tests the hypothesis that individuals who have previously participated in research are more likely to be individuals who have had a family member or loved one who has been diagnosed with a health condition but maintain good health and wellness for themselves. The outcome variable was based on the following item: “In the past two years, I have participated through my church in a research project that promotes health”. The independent variables included variables across the following domains of determinants: personal, health factors, beliefs about the role of the church, and lifestyle & environmental issues.

Population Studied: The target population in this study was congregants and churches that were predominately African American in North Carolina that comprised a voluntary church network established to engage churches in collaborative research and education. The analysis included a total of 1,194 African American congregants from 11 participating churches.

Principal Findings: Using Generalized Estimating Equations (GEE) models with a logistic link function. According to the multivariate model results, physical activity was significantly associated with increased odds of prior research participation, as did readiness to participate and willingness to use computer to find health information. Smoking and physical inactivity in neighborhood were associated with lower odds of prior research participation.

Conclusions: These findings suggest that congregants who are physically active and proactively seek relevant health information via web-based technology are more likely to have prior research participation. Further, the findings highlight the need for further research to explore motivating factors such as personal health, technological expertise and their association to research participation and the variability between different ethnicities with regard to these kinds of factors.

Implications for Policy, Delivery, or Practice: Identification of specific characteristics can significantly inform and enhance the design of future interventions that more effectively target individuals who have previously participated in research with the objective of furthering identifying ways to ensuring the continued participation of those individuals in addition to increased minority recruitment via strategies that are informed by findings such as ours.

Funding Source(s): NIH

Poster Session and Number: A, #243

Racial/Ethnic Differences in Medical Care Access among Adult Cancer Survivors
Christopher King, MedStar Heath; Jie Chen, PhD, University of Maryland

Presenter: Christopher King, M.H.S., Assistant Vice President, Health Services Administration, MedStar Heath, cking@umd.edu

Research Objective: To investigate differences in the likelihood of having health care access barriers among white, African American and Hispanic cancer survivors and to quantify factors that can explain the differences.

Study Design: Logistic regressions were applied to examine the likelihood of reporting
each barrier, while controlling for demographic and socioeconomic variables. The Fairlie decomposition technique was applied to explore contributing factors that contribute to disparities in accessing medical care and treatment.

**Population Studied:** Data were merged from the 2000-2011 National Health Interview Survey (NHIS) to identify 12,148 adult cancer survivors who reported one or more of the following barriers to care: 1) delay or forgo medical care or treatment because of cost; 2) delay medical care because of organizational barriers; and 3) delay medical care because of transportation.

**Principal Findings:** Compared to whites, African Americans were more likely to delay medical care due to organizational barriers in the adjusted model (OR: 1.72; 1.43-2.06). The predicted probability of delaying medical care or treatment because of cost was higher for Hispanic (.38) and African American (.35) survivors than whites (.29). The predicted probability of delaying care due to organizational barriers was .14 for whites, .18 for African Americans and .21 for Hispanics. For delaying care due to transportation barriers, the probability was .04 for whites, .09 for African Americans and .06 for Hispanics. Age, marital status, insurance, perceived health, source of care, and language were identified as leading covariates that contribute to access-to-care disparities among minority cancer survivors.

**Conclusions:** Affordability, organizational and transportation barriers negatively impact survivors’ ability to obtain timely medical care and treatment. While expanded coverage under the Patient ProtecToin and Affordable Care Act may increase the percentage of Americans with medical coverage, socio-cultural factors may still contribute to disparities in access.

**Implications for Policy, Delivery, or Practice:** Health services leaders and cancer care providers should integrate culturally and linguistically tailored best practices in their day to day operations. Incentives should be offered for organizations that adopt national standards, such as the Office of Minority Health’s Culturally and Linguistically Appropriate Standards.

**Funding Source(s):** No Funding.

**Poster Session and Number:** A, #244

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**Health Care Access Barriers among Cancer Survivors by Race/Ethnicity**

Christopher King, MedStar Heath; Rada K. Dagher, PhD, University of Maryland

**Presenter:** Christopher King, M.H.S., Assistant Vice President, Health Services Administration, MedStar Heath, cking@umd.edu

**Research Objective:** To examine the prevalence of three common access-to-care barriers and determine whether cancer history and race/ethnicity are associated with the likelihood of reporting barriers.

**Study Design:** Data from the National Health Interview Survey (NHIS) from 2006-2010 were used to identify 2,281 adult cancer survivors (ages 18-64) and 243,925 adults without a history of cancer. Self-reported barriers for delaying medical care because of costs, organizational barriers and transportation were explored by race/ethnicity and cancer history using multivariate logistic regression.

**Population Studied:** Data from the National Health Interview Survey (NHIS) from 2006-2010 were used to identify 2,281 adult cancer survivors (ages 18-64) and 243,925 adults without a history of cancer.

**Principal Findings:** Overall, 31% of cancer survivors reported at least one of the three barriers to medical care, compared to 15% of the general population. Eighteen-percent of survivors reported cost barriers, 14% reported organizational barriers and 3% reported transportation barriers. Cancer survivors who were African American or Hispanic were more likely to report cost barriers, compared to Whites in logistic regression models. Survivors with a history of cancer were more likely to report organizational barriers compared to the general population.

**Conclusions:** As cancer survivorship increases in the United States, findings suggest that survivors are less likely to receive routine and timely medical care than the general population. Specialized interventions aimed to reduce or eliminate access to care barriers for cancer survivors should be tested and implemented. Moreover, disparities in reported barriers by race/ethnicity underscore the need for additional research to examine socio-cultural factors that impede access.

**Implications for Policy, Delivery, or Practice:** Incentives should be provided for organizations that adopt local or national standards around culturally and linguistically appropriate care. Due to the effectiveness of patient navigators, reimbursement or payment should be considered for providers that offer such services.

**Funding Source(s):** N/A

**Poster Session and Number:** A, #245
Healthcare Disparities in the Developing Context: Hospital Childbirths in Northern Thailand

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Presenter: Stephanie Koning, B.S., Doctoral Student, Population Health Sciences, University of Wisconsin-Madison School of Medicine and Public Health, smgay@wisc.edu

Research Objective: Despite many health campaigns, childbirth remains a dangerous experience for women and infants in many developing countries. Childbirths are considered safest at a hospital; however, many women still give birth at home. Our study examines the socio-demographic characteristics that contribute to the likelihood of women giving birth at hospitals in northern Thailand.

Study Design: We used a hierarchical logistic regression to model the odds of women giving birth to their children in a hospital as related to certain socio-demographic characteristics—including ethnicity, education level and languages spoken at home—while controlling for age, wealth, village-level, and district-level effects.

Population Studied: Our study uses cross-sectional data from the United Nations Educational, Scientific and Cultural Organization Highland Peoples Survey (HPS) of 13,534 ethnic Thai and minority women living in highland villages near the Thai-Burma border.

Principal Findings: Women’s odds of giving birth in a hospital are lowered by 90% when they do not have citizenship (p<0.001), 39% when they are of a minority ethnicity (p<0.01), 50% when they have not had any schooling—compared to having finished upper secondary school (p<0.001), 30% if Thai language is not spoken at home, and 49% if a minority language is spoken at home (p<0.001).

Conclusions: Maternal and child health disparities exist in Thailand, likely due to unequal access to and unequal utilization of obstetric care services between women of different ethnicities, legal statuses, education levels, and language abilities.

Implications for Policy, Delivery, or Practice: Cultural competence and language services in hospitals must improve. Additionally, policies improving education access, healthcare coverage, and citizenship are important for addressing healthcare disparities.

Funding Source(s): NIH

Poster Session and Number: A, #246

Correlates of Advanced-Stage Breast Cancer Diagnosis in Ohio: A Multi-Level Analysis

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Presenter: Siran Koroukian, Ph.D., M.H.A., M.S.N., Associate Professor, Department of Epidemiology and Biostatistics, Case Western Reserve University, skoroukian@case.edu

Research Objective: Although breast cancer is amenable to screening, many women are diagnosed at advanced stages, when prognosis is least favorable. We examine the occurrence of advanced stage cancer in Ohio, in a multi-level context. We hypothesize that 1) area-level attributes are associated with advanced-stage breast cancer diagnosis, even after adjusting for individual-level characteristics; and 2) there are significant cross-level (individual- by area-level socioeconomic measures) interactions.

Study Design: We used 2005-2009 data from the Ohio Cancer Incidence Surveillance System (OCISS). Demographic characteristics (age, race, and marital status), as well as cancer stage (local, regional, distant, and unknown-stage/unstaged (U/U) cancer) were retrieved from the OCISS. Using geocoded patient’s residence address, we obtained data from the 2005-2009 American Community Survey on poverty, educational attainment, employment, and female-headed households at each of the census block group and census tract levels. Because we approximated the census block group-level measures to that of the individual, we referred to them as individual-level socioeconomic measures. We used census tract-level measures to reflect area-level measures. Furthermore, we identified patients according to their residence in various types of county (Appalachian/Rural, Metro, and non-
Metro counties) and in areas/populations that are federally-designated as Medically Underserved Areas/Populations (MUA/MUP). Our outcome of interest was the occurrence of advanced-stage cancer (regional- or distant-stage, excluding the U/U cases). In addition to descriptive analysis, we conducted multivariable logistic regression models to identify individual- and area-level correlates of advanced-stage cancer after excluding U/U cancers. We employed multi-level logistic models using the HLM software (Scientific Software International, Inc., version 7) to account for the clustering of patients within census tracts.

**Population Studied:** Women residing in Ohio and diagnosed with incident breast cancer.

**Principal Findings:** Our study population included 40,112 women. The mean and median age were 62.8 years and 62, respectively. Nearly 60% were diagnosed with localized disease, while 4.38% had U/U cancer. Thirty six percent were diagnosed with advanced-stage cancer. The highest proportion of advanced-staged cancers was observed in women younger than 45 (47.4%) and the lowest proportion was observed in women 75-84 years of age (30.9%). Results from the multivariable models indicated that after excluding U/U cases, and compared to women 55-64 years of age, women younger than 45 years were 45% more likely to be diagnosed with advanced-stage cancer (adjusted odds ratio: 1.45, 95% Confidence Interval [CI]: 1.35, 1.58). Advanced-stage cancer was also significantly independently associated with African-American race (1.29 (1.17, 1.44)); being married (0.90 (0.86, 0.95)); being in the highest poverty quartile both at the individual- and the area-level (1.12 (1.02, 1.23), and 1.20 (1.12, 1.30), respectively)); and with residing in MUA/MUPs (1.13 (1.07, 1.20)). Similarly, lower area-level education and employment, as well as higher proportions of female-headed households were positively associated with advanced cancer stage. We detected no cross-level interactions, however.

**Conclusions:** Area-level attributes accounted for in this study are significantly associated with advanced-stage breast cancer at diagnosis, even after adjusting for individual-level characteristics.

**Implications for Policy, Delivery, or Practice:** The findings highlight the importance of the place of residence relative to cancer stage and carry significant implications for targeted screening efforts.

**Funding Source(s):** Other, American Cancer Society

**Poster Session and Number:** A, #247

**Political Ideology and Health: An Investigation into the Nature of Political Endorsement of Healthy Individuals**

Sanjeev Kumar, Yale School of Public Health; Jason Fletcher, Yale School of Public Health; Elizabeth Bradley, Yale School of Public Health

**Presenter:** Sanjeev Kumar, Ph.D., Postdoctoral Fellow, Department of Health Policy and Management, Yale School of Public Health, sanjeev.kumar@yale.edu

**Research Objective:** The aim of this study was to examine the association between self assessed health (SAH) and endorsement of conservative political ideology. Although previous research has identified many correlates of political ideology, we could find no study that has evaluated the association between self-assessed health (SAH) and political ideology. Information from this study could be useful to understand how health could be a factor in inducing policy volatility over time in social welfare and health promoting programs, through its impact on citizen’s political ideology.

**Study Design:** We used the National Longitudinal Study of Adolescent Health dataset, a longitudinal study of a nationally representative sample of 7th-12th grade students (N=20,745) surveyed through their 30s (N=15,701). We used data on SAH from Wave 1 (1994-1995) and changes in SAH from Wave 1 to Wave 3 (2001-2002). Our outcome was reported political ideology in Wave 4 (2008). We measured change in SAH using a 3-level variable indicating positive change (from not excellent to excellent health), no change, or negative change (from excellent to not excellent health). Political ideology was measured with an item with 5-point scale, which we dichotomized into very conservative (=1) versus other (=0). We used multivariate logistic regression to estimate the adjusted association between SAH (and change in SAH) and subsequent political ideology after controlling for state and cohort fixed effects, sex, race, income, assets, education, home ownership, weight at birth, cognitive score, health insurance status, and education and working status of mother.

**Population Studied:** A total of 13,034 had complete data in Waves 1, 3, and 4. Of these, 46 were eliminated due to missing sampling
weights and 227 were eliminated due to missing information on the state of residence, resulting in a final analytic sample of 12,061 individuals. **Principal Findings:** In a multivariate analysis, having excellent SAH in Wave 3 was significantly associated with endorsement of very conservative political ideology in Wave 4 (adjusted odds ratio (AOR) 1.37, P-value (P) 0.03). Similarly, people who experienced a positive change in SAH between Waves 1 and 3 were more likely to endorse a very conservative ideology by Wave 4 (AOR 1.44, P 0.02). Women and people of Asian background were less likely to report being very conservative (Ps<0.05); home ownership, household income, religion, and health insurance status were not significantly associated with reported political ideology. **Conclusions:** People reporting excellent (compared with poorer) SAH status in their adolescence were more likely to have strongly conservative political ideology in their adulthood. People in excellent health during formative years may attribute their wellbeing to their own efforts rather than publicly financed social and health programs, a narrative which is consistent with more conservative ideology. **Implications for Policy, Delivery, or Practice:** The findings highlight that support for expansive social welfare and health promoting programs are more likely to be centered among people who have suffered from health problems as adolescents than people who considered themselves in excellent health during their formative years. A challenge for public policy is to engage people in excellent health in fostering political support for social welfare and health promotion programs. **Funding Source(s):** AHRQ  
**Poster Session and Number:** A, #248

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**Health Benefits Mandates and Their Potential Effects by Racial and Ethnic Groups: Measuring Disproportionalities among Insured Populations**

Shana Lavarrada, University of California, Los Angeles; Joy Melnikow, UC Davis; Jenny Kempser, UC San Diego; Ninez Ponce, UCLA; Sylvia Guendelman, UC Berkeley; Dominique Ritley, UC Davis; John Lewis, California Health Benefits Review Program

**Presenter:** Shana Lavarrada, Ph.D., M.P.P., Research Scientist and Director of Health Insurance Studies, Center for Health Policy Research, University of California, Los Angeles, shana@ucla.edu

**Research Objective:** The effect of mandated health benefits coverage on racial/ethnic (R/E) health disparities is generally unknown, due to the lack of reliable R/E data in the insured population. We present our method for estimating California’s R/E distribution in the insured population and examine the potential implications of health insurance benefit mandates on access to care for different racial/ethnic groups. **Study Design:** We applied R/E information about the insured population from the 2009 California Health Interview Survey (CHIS) to the California Health Benefits Review Program (CHBRP) Costa and Coverage Model, which identifies the market segments that comprise the California health insurance market. The CHBRP model distinguishes segments in the private sector by regulator (the Departments of Insurance and Managed Health Care) and group size (large, small or individual plans); and in the public sector by type coverage (CalPERS, Medicaid, CHIP). For each R/E group (Latinos, non-Latino whites, Asian Americans and Native Hawaiian /Pacific Islanders, African Americans, and Other single or multiple races), we constructed age- and gender-specific disproportionality measures by dividing the R/E distribution within each insurance market segment by the R/E distribution of the entire market. Coverage may vary considerably between these segments, thus mandates may affect segments differently. Mandated coverage for tobacco cessation treatment was used as an example. **Population Studied:** California’s insured population, including those enrolled in large and small group plans and policies, individual plans and policies, Medicaid, and CalPERS plans. **Principal Findings:** Within California’s insured population, R/E group representation is disproportional among the different market segments. Latinos constitute 31% of large group HMO plans, and 33% of the small group plans, but comprise 66% of nonelderly enrollees in Medi-Cal managed care (California’s Medicaid program). Non-Latino whites constitute 66% of the non-HMO individual policies, but only 45% of the large group HMO population, and 14% of the nonelderly Medi-Cal managed care group. Males (both Latino and non-Latino white) were overrepresented in large group non-HMO plans. African Americans comprised 11% of Medi-Cal
managed care, but 2% of large group non-HMO plans. A public health impact analysis of a bill mandating tobacco cessation coverage illustrated that these disproportionalities have differential impacts by R/E group depending on the level of coverage already existing in that market segment. Since the individual market had the lowest rate of pre-existing coverage for tobacco cessation treatment, the projected impact of the mandate would disproportionately benefit non-Latino whites by providing more coverage that brings their insurance benefits up to par with the other market segments.

**Conclusions:** The disproportional effects of health insurance benefit mandates on access to care by R/E can be evaluated using available demographic and health insurance market data. For the specific bill examined, the largest gains accrued to the mostly non-Latino white individual market.

**Implications for Policy, Delivery, or Practice:** Because of R/E disproportionality by market segment, policymakers should be aware that benefit mandates will likely affect some market segments more than others and may have unintended consequences (both positive and negative) on R/E disparities.

**Funding Source(s):** Other, California Health Benefits Review Program

**Poster Session and Number:** A, #249

**Racial, Ethnic, and Linguistic Disparities in Patients' Experiences and Diabetes Control in Community Health Centers**

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**Presenter:** Lucinda Leung, MD, MPH, Resident, Pgy-2, Internal Medicine, UCLA Ronald Reagan Hospital, lleung@mednet.ucla.edu

**Research Objective:** Racial, ethnic and linguistic disparities are known to exist in diabetes control and patient experience of care in the insured patient population. Few research studies, however, have examined racial, ethnic and linguistic disparities in patient experiences of care and diabetes control exclusively in safety net clinics. Community health centers (CHCs) primarily serve low-income and racial/ethnic minority patients with high incidence of diabetes; they often face resource constraints and lack the infrastructure to measure clinical quality of care. We aim to examine racial, ethnic and language disparities in patients' experiences of care and glycemic control among CHC patients.

**Study Design:** Observational cross sectional study. We analyzed early intervention patient survey data in fourteen clinics participating in a comparative effectiveness demonstration project in CHCs. Patients' experiences of care were assessed using the Clinician and Group CAHPS survey core composites: clinician-patient communication and access to care. Patient-reported diabetes control using HA1c and a hypoglycemia measure and self-management support using the PACIC-11 were also assessed. Patient covariates include socioeconomic and demographic characteristics (age, gender, education, race/ethnicity, language, health status, comorbidities). We conducted multivariable analyses, including controlling for patient sociodemographic and clinical characteristics and cluster adjustment by clinic. In order to understand the extent to which disparities between groups can be explained by modifiable factors, decomposition technique was used to parse out differences into observed and unobserved components.

**Population Studied:** Patients with type II diabetes mellitus (n=1203) from California CHCs.

**Principal Findings:** HA1cs were the following: 7.3 (5.7 to 10.8) for non-Latino Whites; 6.9 (5.5 to 11.9) for Chinese-speaking Asians; 7.7 (5.8 to 11.8) for English-speaking Latinos. Unadjusted scores (0-100 scale) on CG-CAHPS communication, CG-CAHPS access, PACIC, and hypoglycemia measures were respectively the following: 67.0, 51.9, 39.8, 72.9 for non-Latino Whites; 61.8, 51.4, 36.2, 80.3 Chinese-speaking Asians; 76.3, 57.5, 55.8, 72.1 English-speaking Latinos. Compared to English-speaking Latino patients, Chinese-speaking Asians patients in CHCs are more likely to have a lower HA1c (p<0.01, r^2=0.15); however, Chinese-speaking Asians are more likely to report worse experiences of clinician communication (p<0.001, r^2=0.11), worse access to care (p<0.01, r^2=0.23), and less receipt of patient-centered care and diabetes self-management support (p<0.02, r^2=0.13). Interestingly, non-Latino White patients in CHCs are also more likely to report lower satisfaction, particularly with provider communication (p<0.02, r^2=0.13) and diabetes patient-centered care (p<0.02, r^2=0.14). There were no disparities in hypoglycemic events after...
The Availability of Medical Oncologists and Timely Access to Adjuvant Chemotherapy for Patients with Stage III Colon Cancer

Anna Lin, American Cancer Society; Ahmedin Jemal, DVM, PhD, American Cancer Society; Elizabeth Ward, PhD, American Cancer Society

Implications for Policy, Delivery, or Practice: Given that decomposition analyses did not reveal many observable factors that explain disparities, more research on developing culturally and linguistically appropriate interventions for Chinese-speaking Asians are needed. Further inquiry is warranted to clarify the determinants of disparities seen between non-Latino Whites and Latinos in CHCs.

Funding Source(s): AHRQ

Poster Session and Number: A, #250

Research Objective: Timely access to adjuvant chemotherapy after resection improves overall survival for stage III colon cancer patients. Previous studies found that colon cancer patients who were older, with comorbid conditions, not currently married, and with poorly differentiated tumor were less likely to receive timely access to adjuvant chemotherapy. However, to date, no study has examined whether uneven geographic distribution of medical oncologists may contribute to delay treatment. In this study, we explore the association between the availability of medical oncologists within the health service area (HSA) in which the patient resides and time to initiate adjuvant chemotherapy treatment.

Study Design: A retrospective analysis of linked Surveillance, Epidemiology, and End results (SEER) – Medicare database. Medical oncologists were identified by physician specialty code. HSAs are geographic areas where medical resources were distributed and used based on the analysis of travel patterns between counties for routine hospital care. Time to initiate chemotherapy is calculated from the date of curative surgery to the date of initiation of chemotherapy. Generalized estimating equations (GEE) analysis clustered by HSA was used to investigate the association between the availability of medical oncologists and time to initiate chemotherapy after adjusting for clinical and patient characteristics.

Population Studied: Patients diagnosed with first primary stage III nodes positive colon cancer between 2000 and 2005, aged 66 and older, with continuous, non-HMO, Medicare part A and B benefits, survived six months or more, underwent colectomy within three months of diagnosis and initiated adjuvant chemotherapy within six months.

Principal Findings: There were 5,805 stage III colon cancer patients who underwent colectomy and initiate chemotherapy during study period. 74.8% patients initiated chemotherapy within 56 days after surgery. 6.39% of the cohort resided in a HSA with no medical oncologists; 9.84% with one to three oncologists; 18.35% with four to eight oncologists; 65.43% with nine or more oncologists. After controlling for clinical and patient characteristics, the results of GEE analysis showed that the availability of medical oncologists was not statistically significant associated with timely access to adjuvant chemotherapy. Patients who were older than 70 years (p<.001), African American (p<.05), currently not married (p<.05), dually eligible for Medicare and Medicaid (p<.05), with more comorbid conditions (p<.01), diagnosed later than 2001 (p<.01), and residing in Northeast region (p<.05) had a decreased likelihood of receiving chemotherapy within 56 days.

Conclusions: Timely access to adjuvant chemotherapy for patients with stage III colorectal cancer was not associated with the geographic availability of medical oncologists.

Implications for Policy, Delivery, or Practice: Since this study did not find greater availability of medical oncologists could shorten time to access treatment, future researches are needed.
to determine other factors related to delay
treatment.

**Funding Source(s):** Other, American Cancer
Society Intramural Research

**Poster Session and Number:** A, #251

**Educational Attainment and Premature Mortality: An Analysis of Disparities in the United States and Implications for Health Care Policy**

Jacob Lippa, Institute for Healthcare Improvement; David Radley, PhD, MPH, Institute for Healthcare Improvement; Pamela Riley, MD, MPH, The Commonwealth Fund; Cathy Schoen, MS, The Commonwealth Fund

**Presenter:** Jacob Lippa, MPH, Senior Research Associate, Commonwealth Fund Health System Scorecard Project, Institute for Healthcare Improvement, jal@cmwf.org

**Research Objective:** The objective of this study was to measure disparities and geographic variation in premature mortality by educational attainment, using years of potential life lost (YPLL) as the main outcome measure.

**Study Design:** Using mortality data from the national vital statistics system (NVSS), we calculated national and state-level age-standardized rates (per 100,000) of YPLL before age 75 for the time period 2007 to 2009. We stratified our analysis by education and cause of death, both recorded on the death certificate, comparing rates among adults with a high school education or less to those having completed at least a four-year college degree.

**Population Studied:** Adults over age 25 in the United States.

**Principal Findings:** The rate of YPLL per 100,000 for the United States was 8,100. We found a threefold difference, however, between adults with a four-year college degree (3,951) and those with, at most, a high school education (12,846). In all states, the rate of YPLL among the less-educated group is at least twice that of the college-educated.

Among the college-educated cohort, rates are strikingly similar across states (median 3,922; interquartile range 792). Conversely, rates vary widely among the less-educated group, ranging from 8,561 to 17,892 across states; rates are lowest in the Northeast and upper Midwest and highest in the South. In 27 states, YPLL for the less-educated group is more than 50 percent higher than the lowest state.

Cancers (27%) and cardiovascular disease (24%) account for the greatest share of total YPLL, followed by external causes (20%) such as motor vehicle accidents, assaults, and suicides. Comparing the two education groups, we found a two to fourfold difference within each of these causes of death; no one source accounted for the disparities by education.

**Conclusions:** A strong association exists between educational attainment and risk of premature mortality, as measured by YPLL. No one cause of death accounts for the disparity. Looking across states, premature mortality rates are strikingly similar for college-educated populations but vary widely for those with a high school education or less. Indeed, most of the variation in YPLL across states is driven by differences in years of life lost among the latter, less-educated, group.

**Implications for Policy, Delivery, or Practice:** Our findings indicate that reducing premature mortality and improving population health will require a particular focus on those at risk due to lower socio-economic status, as measured by education. The scheduled health insurance expansions, including the Medicaid expansions, offer a historic opportunity to reduce the observed disparities across and within states by improving access to primary care and holding care systems accountable for better health and care experiences for vulnerable populations. However, improving population health will likely require a community and population health approach, given the pervasive underlying disparities in causes of death. The state variation among vulnerable populations indicates substantial opportunity to improve with such a strategic approach.

**Funding Source(s):** CWF

**Poster Session and Number:** A, #252

**Racial/Ethnic Disparities in Preventive Care Practice**

Huabin Luo, Mount Olive College; Xinzhi Zhang, MD, PhD, University of Alabama at Birmingham; Bei Wu, PhD, Duke University

**Presenter:** Huabin Luo, Ph.D., Associate Professor, Management/Health Care, Mount Olive College, hluo@moc.edu

**Research Objective:** The 2003 Institute of Medicine (IOM) report defines a disparity as a difference in treatment provided to members of different racial or ethnic groups that is not justified by the underlying health conditions or
treatment preferences of patients. To implement IOM definition of disparity, the objectives of this study were: 1) To assess racial/ethnic disparities in use of eight preventive care practices among U.S. nursing home residents in 2004. 2) To evaluate the trends of disparity in pneumococcal and influenza vaccination in the past decades.

**Study Design:** Data used in this study are from the National Nursing Home Survey (NNHS) in 1995, 1997, 1999, and 2004. First, using 2004 NNHS data, we assessed use of eight preventive care services among white, black and other race/ethnicity residents, including influenza and pneumococcal vaccination, scheduled toilet plan/bladder retraining, pain management, behavioral problem management, skin/wound care, continence management, and restorative care. Second, we evaluated the trend of disparity in having influenza and pneumococcal vaccination (available in all the four NNHS). We implemented the IOM definition of disparity of care and used the rank-and-replace adjustment method (Cooks et al. 2012, HRS, 47(3):1232-54) to create a counterfactual resident population of black or other races/ethnicities to approximate the distribution of health status of the white residents. Data were analyzed using Stata 11.

**Population Studied:** National representative samples of nursing home residents in 1995, 1997, 1999, and 2004 NNHS.

**Principal Findings:** The 2004 NNHS data show significant differences in receipts of four of the eight preventive care practices examined. White residents were more likely to have pain management (6.71% vs. 3.53%, p<0.001), scheduled toilet plan/bladder retraining (34.26% vs. 25.03%), influenza vaccination (77.09% vs. 67.95%, p<0.001), and pneumococcal vaccination (56.31% vs. 43.31%, p<0.001) than black residents. White residents were also more likely to have scheduled toilet plan/bladder retraining (34.26% vs. 21.94%, p<0.001) than residents of other race/ethnicity. The overall trends of disparity in receipt of influenza vaccination and pneumococcal vaccination were not significant from 1995 to 2004. However, significant white-black disparity in receipt of influenza vaccination was found in 1997 and 2004 NNHS (p<0.01), and significant white-black disparity in pneumococcal vaccination was found in 1997, 1999, and 2004 NNHS (p<0.001).

**Conclusions:** Racial/ethnic disparities in preventive care among nursing home residents are still persistent.

**Implications for Policy, Delivery, or Practice:** It is critical to developed targeted interventions to improve quality of preventive care for minority residents in nursing home.

**Funding Source(s):** N/A

**Poster Session and Number:** A, #253

### Impact of Medical and Psychiatric Comorbidity Burden and Mortality in Veterans with Type 2 Diabetes

Cheryl Lynch, Ralph H Johnson Veterans Affairs Medical Center; Mulugeta Gebregziabher, PhD, Medical University of South Carolina; Kelly J Hunt, PhD, Medical University of South Carolina; Yumin Zhao MS, Ralph H Johnson Veterans Affairs Medical Center; Leonard E Egede, MD, MS, Ralph H Johnson Veterans Affairs Medical Center

**Presenter:** Cheryl Lynch, M.D., M.P.H., Assistant Professor Of Medicine, Medicine, Ralph H Johnson Veterans Affairs Medical Center, cheryl.lynch@va.gov

**Research Objective:** Multimorbidity, or the presence of multiple chronic diseases, is a major problem in clinical care with burdens such as higher risk of depression, lower quality of life, poorer physical functioning, and higher healthcare utilization and costs. Studies have shown greater disease burden measured by number of comorbid conditions is associated with poor clinical outcomes and increased morbidity for a variety of chronic diseases. However, few studies have examined the incremental effect of medical and psychiatric comorbidity burden on mortality in adults with type 2 diabetes. Therefore, we examined the specific question of which types of comorbidities, medical or psychiatric, drives differences in outcomes as well as the impact of individual comorbidities.

**Study Design:** Cox regression methods were used to analyze data from a linked database of multiple patient and administrative files. Diabetes and medical and psychiatric comorbidities were defined using ICD-9 codes based on validated algorithms.

**Population Studied:** A national cohort of 629,563 veterans with type 2 diabetes followed until death, loss of follow up, or study end.

**Principal Findings:** Hypertension (78%) and depression (13%) were the most prevalent medical and psychiatric comorbidities, respectively. Of the medical and psychiatric comorbidities examined, congestive heart failure...
(sample prevalence of 11.2%) and substance abuse (sample prevalence of 3.9%) carried the greatest mortality risks (HR=1.92; 95% CI 1.89-1.95 and HR=1.50; 95% CI 1.46-1.54, respectively). In unadjusted Kaplan-Meier survival curves, within each strata of psychiatric comorbidity burden the probability of survival was highest in those with no medical comorbidity. However, within each strata of medical comorbidity similar probabilities of survival were shown across different levels of psychiatric comorbidity. In adjusted regression analyses, the mortality hazard associated with having a single psychiatric comorbidity, compared to zero comorbidities, remains constant across all levels of medical comorbidities (respective HR 1.23, 95% CI 1.14-1.32 and HR 1.24, 95% CI 1.22-1.27) in veterans from zero up to 3+ medical comorbidities. In contrast, compared to zero psychiatric comorbidities, the mortality hazard associated with having 2+ psychiatric comorbidities decreases from 1.69 (95% CI 1.47-1.94) in veterans with zero medical comorbidities to 1.38 (95% CI 1.32-1.43) in veterans with 3+ medical comorbidities.

**Conclusions:** Multi-morbidity with respect to medical as well as psychiatric disorders is a significant predictor of mortality among veterans with type 2 diabetes. After adjusting for demographic factors, there is a clear graded relationship between an increasing number of medical and an increasing number of psychiatric comorbidities and increased mortality risk. However, the threshold at which the comorbidity burden becomes significant occurs at having two medical comorbidities or a single psychiatric comorbidity.

**Implications for Policy, Delivery, or Practice:** These findings suggest greater emphasis is needed on recognizing mental health issues earlier in the course of chronic physical conditions and of targeting psychiatric comorbidities in patients with a lower burden of medical comorbidity.

**Funding Source(s):** VA

**Poster Session and Number:** A, #254

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**Presenter:** Lisa Marceau, MPH, Vice President, Media and Communications, , New England Research Institutes, lmarceau@neriscience.com

**Research Objective:** Disparities in access to traditional health care have been extensively documented: some 90 million lack ready access to health care (45 million are uninsured, as many again underinsured). Disparities have traditionally reflected inability to access a physical entity (doctor’s office, clinic, hospital) by selected population groups lacking adequate health insurance. With increased availability of high-speed internet, many can go online for their health care: 65% of adults seek health information online and 35% use the internet for diagnosis. Some suggest a new era of electronic or digital medicine is emerging (ubiquitous smartphones, bandwidth, connectivity, social-networking) providing easier web access to a virtual health care system, promising a reduction of pervasive health care disparities. While some gaps in internet connectedness have narrowed over the past decade, demographic disparities still exist, particularly for the elderly, Hispanics and lower SES. We identify disparities in digital connectivity, and question whether a new era of electronic medicine will bring the promised reduction in health care disparities.

**Study Design:** The BACH Survey is a community-based random sample survey of men and women from Boston, Massachusetts. Participants aged 30-79 at baseline (2002-2005) were followed approximately 5- (2006-2010) and 7- (2010-2012) years later.

**Population Studied:** BACH is racially/ethnically diverse with distribution of race/ethnicities at the second follow-up of: Black: 1,026; Hispanic: 1,036; White: 1,093. Sociodemographics, healthcare access/utilization, lifestyle/behavior, health status, internet connectivity, and other measures were collected.

**Principal Findings:** Having a home computer, home internet connection, and access to a computer somewhere other than home differed significantly by race/ethnicity (p<.001 for all). Whites (84.7%) were more likely than Blacks (72.1%) or Hispanics (65.2%) to have a desktop or laptop computer. Whites (82.4%) were more likely to have an internet connection at home than Blacks (65.3%) and Hispanics (58.9%). Hispanic participants were least likely to access a computer outside their home (30%), compared with Black (64.0%) and White (64.6%) subjects. There were racial/ethnic differences in whether
Participants had a smartphone (p=0.02) with Black participants more likely to report that they had one than White participants (35.2% vs. 33.1%) and Hispanics (21.9%). Males (36.5%) were more likely to report having access to a smartphone than females (28.6%) (p=0.012), and were more likely to access a computer at work (p=0.005).

**Conclusions:** These results suggest internet connectedness mirrors existing patterns of racial/ethnic and SES disparities in access to the traditional health care system. It therefore appears the emerging era of electronic medicine and digital access may not achieve the promised reduction in health care disparities.

**Implications for Policy, Delivery, or Practice:** Efforts over several decades to reduce worrisome disparities in accessing traditional medical care have had limited success. Providing wider population coverage with health insurance may not reduce disparities in an era of electronic medicine. Persistent health care disparities in the era of electronic medicine will almost certainly require novel new models to explain utilization behavior, and innovative approaches to reach the underserved. The imminence of electronic medicine is not widely recognized by researchers and planners, and health services research will need to employ different intervention strategies and adaptive methods to measure their effectiveness.

**Funding Source(s):** NIH

**Poster Session and Number:** A, #255

**Variations in the Diagnosis and Quality of Care for Pain by Primary Care Physicians: Results from a Factorial Experiment**

Nancy Maserejian, New England Research Institutes; Felicia Trachtenberg, PhD, New England Research Institutes; Michael Fischer, MD, Brigham and Women's Hospital; Jeffrey Katz, MD, MSc, Harvard Medical School and Brigham and Women's Hospital; Jing Yu, MS, New England Research Institutes; Lisa Marceau, MPH, New England Research Institutes; John McKinlay, PhD, New England Research Institutes

**Presenter:** Nancy Maserejian, Sc.D., Senior Research Scientist and Associate Director, Epidemiology, Department of Epidemiology, New England Research Institutes, nmaserejian@neriscience.com

**Research Objective:** Pain management decisions have been shown to vary by sociodemographic characteristics of patients and providers, and differences exist in the prevalence of diagnosed pain conditions by patient race/ethnicity, sex, age, and socioeconomic status (SES). The objective of this experiment was to disentangle characteristics such as patient SES and race to test the hypothesis that patient, physician, and practice organizational factors influence clinical decision-making for pain conditions.

**Study Design:** Randomized factorial experiment. Physician subjects viewed two clinically-authentic videos of patients (actors) presenting with pain either as undiagnosed sciatica symptoms or diagnosed knee osteoarthritis. Patient gender, SES, and race (white, black, Hispanic), and physician gender and experience (<10 years vs. => 10 years in practice) systematically varied, permitting estimation of unconfounded effects. Analysis of variance was used for outcomes of physician decision-making, including diagnosis of sciatica and pain management (test ordering, behavioral counseling, prescriptions, referrals).

**Population Studied:** Purposeful sample of 192 U.S. primary care physicians from 2010-2012 to fill design cells of gender and experience.

**Principal Findings:** Most (93.7%) physicians appropriately diagnosed sciatica, but there was considerable variation in pain treatment decisions largely unexplained by patient race, gender or provider gender. The treatment of lower vs. higher SES patients with sciatica symptoms were generally similar, e.g., x-ray (55% vs. 49%, P=0.4), MRI (32% vs. 35%, P=0.7), exercise counseling (33% vs. 32%, P=0.9), and referrals (20 vs. 23%, P=0.6). However, lower SES patients less frequently received narcotics for sciatica (52.1% vs. SES 68.7%, P=0.01). Patient race had no impact on management of the sciatica patient, yet for the osteoarthritis patient, whites were more likely to receive narcotics (47%, vs. blacks 27%, Hispanics 33%; P=0.03), with no significant interaction with SES. Findings were also similar by gender (e.g., narcotics for 63% of females, 57% males, P=0.3), with the exception of muscle relaxants, which were more frequently prescribed for females (57% vs. 36%, P=0.002). Physicians in practice <10 years (vs. =>10 years) ordered fewer tests, particularly basic lab work or urinalysis, were more likely to prescribe NSAIDs for pain relief, and to provide advice on lifestyle, particularly exercise (P<=0.01). MRI for osteoarthritis pain was more commonly used by physicians who reported not using clinical...
practice guidelines (21% vs. 13%, P=0.04). Overall test ordering decreased as organizational emphasis on business or profits increased.

Conclusions: We observed inconsistent results between the two pain conditions regarding whether prescription of narcotics was affected by race or SES. Since the same physicians viewed both scenarios, physicians may be differentially influenced by race vs. SES depending on the situation. Additional research is warranted to identify cognitive processes underlying physician variations in pain management.

Implications for Policy, Delivery, or Practice: The finding that physicians' length of time in practice, as well as organization emphasis on business, influences pain management decisions indicates a need for the systematic implementation of quality measures. Policy-makers should also develop methods to assure that narcotic analgesics, when appropriate, are prescribed and monitored for patients of various races and socioeconomic levels.

Funding Source(s): NIH

Poster Session and Number: A, #256

Pregnancy Intention and Use of Birth Control among Hispanic Women in the United States: Data from the National Survey of Family Growth, 2006-2010
Melissa A. Simon, Department of Obstetrics and Gynecology and Preventive Medicine, Northwestern University; Lisa Masinter, Northwestern University; Joe Feinglass, Department of General Internal Medicine, Northwestern University

Presenter: Lisa Masinter, M.D., M.P.H., Fellow, Center for Healthcare Studies, Northwestern University, lisa.masinter@northwestern.edu

Research Objective: Hispanic women have the highest fertility rate, the highest unintended birth rate and the highest teenage birth rate in the United States. The goal of this study is to further characterize the rates of pregnancy, childbearing and contraceptive use in this population.

Study Design: We performed a cross sectional analysis of the 2006-2010 National Survey of Family Growth (NSFG). In self-identified Hispanic respondents, we assessed the relationship between ever having a pregnancy or live birth and social, demographic and cultural characteristics, including age, education, income, marital status, immigration status, preferred language and country of origin. We obtained the proportion of pregnancies from those respondents that were identified as intended or unintended as well as the outcomes of those pregnancies. We also determined the proportion of unintended pregnancies associated with contraceptive use during the month of conception, specific contraceptive methods employed, and reasons expressed for having had an unintended pregnancy. Descriptive statistics were obtained with Stata Version 12 (College Station, TX) and findings are nationally representative estimates based on weights provided by the NSFG.

Population Studied: A total of 2723 self-identified Hispanic women, aged 15-44, were included and 983 of their pregnancies were examined. The NSFG only asked questions about contraceptive use prior to unintended pregnancy for pregnancies within three years of the interview. Therefore, we limited our pregnancy analysis to the same time period.

Principal Findings: Almost 70% of Hispanic women reported ever having been pregnant, including 96% of women over the age of 35. Among teenagers, ages 15-19, approximately 18% reported having had at least one pregnancy. Being married, Catholic or an immigrant, having a lower socioeconomic status, and speaking Spanish were associated with a higher likelihood of pregnancy or live birth (p.<0.05). Mexican women did not differ from other Hispanic subgroups. Half (51%) of Hispanic pregnancies were described as unintended, including 81% among teenagers. Of those, 15% ended in elective abortion and 53% ended in live birth, although abortions are likely underreported. Contraceptive use during the month of conception occurred in 50% of unintended pregnancies with no differences noted among the different socio-cultural variables. The most common methods used were oral contraceptives, patch, or ring (22%), condoms (21%) and withdrawal (16%). The most frequent reason for unintended pregnancy despite contraception was “improper use” (45%). and the leading reason for not utilizing contraception prior to an unintended pregnancy was “I did not think I could get pregnant.” (37%).

Conclusions: In Hispanic women, half of all pregnancies are unintended and over 80% of teenage pregnancies are unintended. Over 40% of unintended pregnancies that occurred while using contraception were due to improper use and almost 40% of pregnancies with no
Implications for Policy, Delivery, or Practice: These findings demonstrate the critical need for improved education and counseling strategies about reproductive health and contraception in the Hispanic population.

Funding Source(s): No Funding

Poster Session and Number: A, #257

The Effects of Patient Medication Requests on Physician Prescribing Behavior: Results from a Factorial Experiment

John McKinlay, New England Research Institutes; Felicia Trachtenberg, PhD, New England Research Institutes; Lisa Marceau, MPH, New England Research Institutes; Jeffrey Katz, MD, MSc, Harvard Medical School and Brigham and Women's Hospital; Michael Fischer, MD, Brigham and Women's Hospital

Research Objective: Because of exposure to pharmaceutical advertising in different media outlets, especially direct to consumer advertising (DTCA), as well as suggestions from family and friends, patients are increasingly activated to request a specific medication during an encounter with a physician. To estimate the effect of patient requests for specific medications on physician prescribing behavior, unconfounded by selected patient attributes (age, race/ethnicity, SES), physician characteristics (gender, experience) and many practice setting factors.

Study Design: Balanced factorial experiment using two clinically authentic video-based scenarios; an undiagnosed “patient” with symptoms strongly suggesting sciatica, and a “patient” with already diagnosed chronic osteoarthritis of the knee. Half of the patients with sciatic symptoms specifically requested oxycodone, while the other half simply requested something to help with pain. Similarly, half of those with knee osteoarthritis specifically requested Celebrex.

Population Studied: Community-based primary care physicians from several different U.S. states were recruited as experimental subjects (n=192)

Principal Findings: The primary outcome was whether physicians would accede to a patient request for a specific medication. Alternative pain medications that would be prescribed were secondary outcomes. 19.8% of the sciatic patients specifically requesting oxycodone would receive a prescription, compared with just 1% of those making no request (p=0.001). 53% of patients with knee osteoarthritis requesting celebrex would receive it, compared with 24% of patients making no specific request (p=0.001). Assertive patients requesting oxycodone were more likely to receive a strong narcotic (p=0.001) and less likely to receive a weak narcotic (p=0.01), or an NSAID. Assertive patients requesting celebrex were much less likely to receive a narcotic (p=0.008), or an NSAID. None of the patient attributes, the physician characteristics or the organizational factors influenced a physician’s willingness to accede to a patient request for a specific medication.

Conclusions: Patients making a request for a specific medication are highly likely to have it prescribed, with the high likelihood of receiving the requested medication consistent across the two scenarios. Who the patient and physician are, and numerous features of the practice setting in which the encounter occurs, have no effect on the success of a medication request.

Implications for Policy, Delivery, or Practice: This study suggests that the impact of activated patients on physician decisions potentially increases the total number of patients who become activated and make specific requests of their physicians. Our findings indicate that these requests are often likely to succeed. Since DTCA is used exclusively for expensive medications, generally those like celecoxib that are still available only in branded forms, this effect is likely to increase medication costs.

Funding Source(s): NIH

Poster Session and Number: A, #258

Nonsteroidal Anti-inflammatory Drug [NSAID] Risk Awareness: Results of a Shared Decision-Making Intervention

Michael J. Miller, The University of Oklahoma College of Pharmacy; Michael Miller, The University of Oklahoma; Jeroan J. Allison, University of Massachusetts Medical School; Daniel J. Cobaugh, American Society of Health-System Pharmacists Research and Education Foundation; Midge N. Ray, The University of Alabama at Birmingham Department of Health Services Administration; Kenneth G. Saag, The University of Alabama at Birmingham Center for Education & Research on Therapeutics of Musculoskeletal Disorders

Nonsteroidal Anti-inflammatory Drug [NSAID] Risk Awareness: Results of a Shared Decision-Making Intervention

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**Presenter:** Michael Miller, Dr.P.H., M.Pharm., B.S.Pharm., Associate Professor, College of Pharmacy, The University of Oklahoma, michael-miller@ouhsc.edu

**Research Objective:** Although NSAID risks are well-appreciated in the medical community, improving patient risk awareness remains a challenge. Isolated patient-based or provider-based interventions may produce, at best, modest change. The partial success of single-focus interventions has led to interest in combined approaches that include patient activation and shared decision-making between patient and physician. While the literature is replete with complex, multi-modal interventions aimed at changing patient behavior, there is little to guide researchers on the incremental impact of simple, direct interventions to improve patient risk awareness and safety. Few studies have focused on direct-to-patient approaches to improve patient safety. Therefore, the objective of this research was to test whether a combined patient- and physician-based intervention contributed to increased patient-reported awareness of any prescription or over-the-counter (OTC) NSAID risk.

**Study Design:** A group randomized trial was used to promote patient-physician communication about NSAID risks between June 2005 and February 2007. Cross-sectional data were collected from different patients at baseline and after the intervention. Intervention physician practices were randomly assigned to receive a combination of continuing medical education (CME) about NSAIDs and patient activation tools designed to promote personal risk assessment and communication during the clinical encounter. Control physician practices received only CME about NSAIDs. The primary outcome measure was self-reported patient awareness of any problems or risks with either prescription or OTC NSAIDs. A multivariable logistic Generalized Linear Latent and Mixed Model was used to collectively test the relationship between the intervention, study phase, intervention study phase interaction, and primary study endpoint while controlling for differences in patient characteristics in the baseline and follow-up phases.

**Population Studied:** 347 eligible adult patients 65 years or older at baseline and 355 eligible adult patients 50 years or older at follow-up were recruited from 39 physician practices in the Alabama Practice-Based Network. The age criterion was relaxed at follow-up to ensure adequate enrollment.

**Principal Findings:** In multivariable analyses, the intervention was not associated with patients reporting awareness of any prescription NSAID risk [(Adjusted Odds Ratio [AOR]=0.74, p=0.100]. Whereas, patients participating in the follow-up study phase had significantly higher odds of reporting awareness of any prescription NSAID risk [(AOR=1.52, p=0.053] as did those patients with at least some college education [(AOR=1.78, p=0.001]. Patients reporting black race had significantly lower odds of reporting awareness of any prescription NSAID risk [(AOR=0.59, p=0.008]. A similar pattern of relationships was observed for the endpoint defined as patients reporting awareness of any OTC NSAID risk. The intervention study phase interaction term was not significant and removed from final analysis.

**Conclusions:** While the point of care intervention encouraging patient activation and shared decision-making did not have an observed effect, there was an increase in the percentage of patients from physicians in private, community-based practice in Alabama self-reporting awareness of any prescription or OTC NSAID risk during the study period. Significant racial and educational disparities in NSAID risk awareness were observed.

**Implications for Policy, Delivery, or Practice:** Future interventions should be designed to target racial and educational disparities related to NSAID risk awareness observed in this research.

**Funding Source(s):** AHRQ

**Poster Session and Number:** A, #259

**Patient Risk Knowledge about Nonsteroidal Anti-inflammatory Drugs [NSAIDs]: Evaluating the Impact of a Patient Storytelling Intervention**

Michael J. Miller, The University of Oklahoma College of Pharmacy; Michael Miller, The University of Oklahoma; Robert Weech-Maldonado, The University of Alabama at Birmingham Department of Health Services Administration; Ryan C. Outman, The University of Alabama at Birmingham Center for Outcomes and Effectiveness Research (COERE); Daniel J. Cobaugh, American Society of Health-System Pharmacists Research and Education Foundation; Lang Chen, The University of Alabama at Birmingham Center for Education & Research on Therapeutics of Musculoskeletal Disorders; Midge N. ray, The University of
Colon cancer was included because NSAIDs are associated with significant toxicity. Previous research has identified suboptimal as well as racial and ethnic differences in NSAID risk awareness, behavior, and communication with NSAID users. Given this understanding, practical interventions are needed to strengthen patient skills for medication self-management and communication to ensure optimal understanding of NSAID risks in vulnerable populations. Therefore, this research sought to evaluate the impact of a culturally-sensitive patient storytelling intervention for enhancing patient NSAID risk knowledge.

**Research Objective:** Despite common and frequent use, NSAIDs are associated with significant toxicity. Previous research has identified suboptimal as well as racial and ethnic differences in NSAID risk awareness, behavior, and communication with NSAID users. Given this understanding, practical interventions are needed to strengthen patient skills for medication self-management and communication to ensure optimal understanding of NSAID risks in vulnerable populations. Therefore, this research sought to evaluate the impact of a culturally-sensitive patient storytelling intervention for enhancing patient NSAID risk knowledge.

**Study Design:** A group randomized trial tested the effectiveness of a patient storytelling intervention in promoting NSAID risk knowledge among patients between March 2011 and March 2012. Thirty-six physician practices from the Alabama Practice-Based Continuing Medical Education network were randomly assigned to an intervention or control arm. Patients from the 18 practices in the intervention arm received an educational DVD with the intervention while the 18 practices in the control arm received usual care. All patients participated in a baseline and follow-up telephone interview 4 months after assignment. The 10-minute DVD included patient interviews and stories related to their experiences with NSAIDs, NSAID-related adverse effects, importance of communication with healthcare providers, and use of a medication list. Health educator informational segments were integrated to reinforce important points. Prior to deployment, the DVD was reviewed by an expert multidisciplinary panel of healthcare providers and pilot-tested with actual patients. The primary outcome was a composite measure of knowledge as to how the use of NSAIDs may affect 5 conditions (i.e., colon cancer, high blood pressure, kidney disease, stomach/intestinal disease, and heart attack). Colon cancer was included because NSAIDs are associated with a protective effect while increasing the risk of the 4 other conditions.

**Population Studied:** A total of 259 patients [124 in the intervention and 135 in the control arm] were enrolled in the study and 233 remained at follow-up. Forty percent of the sample was African-American. Eligibility was determined from exit cards at the physician practice and included patients 19 years or older currently taking a prescription NSAID or over-the-counter ibuprofen or naproxen as recommended by their physician. NSAID use was verified at the time of interview.

**Principal Findings:** Intervention and control groups were comparable at baseline. Bivariable logistic regression analyses accounting for clustering of patients within physician practices revealed higher, but statistically nonsignificant, odds of overall or any improvement in NSAID risk knowledge for those who received and watched the educational DVD compared to the control group (Odds Ratio [OR]=1.45, p=0.29; OR=1.35, p=0.40, respectively). Whereas, those who received the DVD and did not watch the DVD had nearly identical odds of overall or any improvement in NSAID risk knowledge compared to the control group (OR=1.01, p=0.97; OR=0.96, p=0.92, respectively).

**Conclusions:** While showing promise, if watched, the educational patient storytelling intervention did not significantly improve NSAID risk knowledge.

**Implications for Policy, Delivery, or Practice:** Although simple and practical, the use of an educational DVD for the patient storytelling intervention may not realize it is full potential without more active encouragement of use from healthcare providers.

**Funding Source(s):** AHRQ

**Poster Session and Number:** A, #260

**The Quality of Surgical Care in Safety Net Hospitals: A Systematic Review**

Charles A. Mouch, BS, University of Michigan; Arden Morris, University of Michigan; Christy H. Lemak, PhD, University of Michigan; Scott E. Regebogen, MD, MPH, University of Michigan; Sandra L. Wong, MD, MPH, University of Michigan; Arden M. Morris, University of Michigan

**Presenter:** Arden Morris, M.D., M.P.H., Associate Professor, Surgery, University of Michigan, ammsurg@umich.edu
Research Objective: The quality of care in safety net hospitals (SNHs) is subject to frequent speculation based on conflicting data and small studies. We hypothesized that, on average, SNHs provide lower quality of care for surgery patients than non-SNHs.

Study Design: We performed a systematic review of the literature using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines with the PubMed, CINAHL, and Scopus online databases. Inclusion criteria were English language, publication in a peer-reviewed scientific journal between 1995-2012, analysis of primary or secondary data, study of surgical care in a hospital or system that met the Institute of Medicine (IOM) definition of a safety net hospital, location in the United States, and measurement of at least one of the IOM-designated domains of quality (Safety, Effectiveness, Efficiency, Timeliness, Patient Centeredness, and Equity). Studies of trauma care and rural hospitals were excluded. Each article was independently reviewed by at least two co-investigators. A data abstraction tool was used to record the eligibility, purpose, design, results, conclusion, and overall quality of each reviewed article. Disagreements over eligibility and data were resolved by group discussion. The main results and conclusions abstracted from the included articles were then analyzed and presented according to the quality domains most clearly addressed by each article.

Population Studied:

Principal Findings: Our initial search identified 1556 articles and resulted in a total of 18 studies that met all inclusion criteria. Articles that addressed Safety revealed conflicting data regarding the safety of surgical care in SNHs compared to non-SNHs. SNHs performed significantly lower in measures of Timeliness and Patient-centeredness within single institutions and when compared to non-SNHs. Several papers indicated statistically significant differences in Equity, both within individual SNHs and between SNHs and non-SNHs.

Conclusions: Although our results were mixed, many papers suggested a clear need for improvement in the quality of surgical care provided by SNHs. Given these data, SNHs may provide excellent testing sites for future quality improvement measures. Not only would improvements in quality be more readily appreciated in a SNH setting, but these measures would also provide a direct means of addressing health care disparities among the poorest, most underserved, and most vulnerable populations in the United States.

Implications for Policy, Delivery, or Practice:

Funding Source(s): No Funding

Poster Session and Number: A, #261

Disparities in Hypertension control among African-American Men: Do Demographics, Disease Characteristics and Medication Adherence Explain Differences?

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Presenter: David Mosen, Ph.D., M.P.H., Senior Program Evaluation Consultant, Center for Health Research, Kaiser Permanente Northwest, david.m.mosen@kpchr.org

Research Objective: Poor blood pressure control is associated with increased morbidity and mortality. Previous research has found significant disparities in blood pressure control among African-American men, compared to white men. Little is known about what factors explain these disparities. The objective of this work was to determine: 1) whether disparities in blood pressure control exist among African-American men vs. white men and 2) whether demographics, disease characteristics, primary care utilization, use of hypertension medications and medication adherence explain differences in blood pressure control.

Study Design: Using an observational study design, we studied African-American (n=686) and white men (15,055) ages 45-85, with a diagnosis of hypertension (HTN) and a valid blood pressure (BP) measurement between 12/1/2010 and 11/30/2011. Patients received care in Kaiser Permanente Northwest (KPNW), a group model health plan, and maintained continuous enrollment in the 12 months prior to the BP measurement. Good BP control was defined as: 1) systolic value < 140 and 2) diastolic value < 90. We constructed a series of logistic regression models to assess the independent association of race (white vs. African-American) with blood pressure control,
adjusting for covariate measures assessed in the 12 months prior to BP measurement. These covariates include: age (45-64 vs. 65-85; as of BP date), income (continuous), body mass index (BMI), diabetes status (yes vs. no), chronic kidney disease (CKD) status (yes vs. no), primary care utilization (>= 1 visits vs. none), use of HTN medications (>= 1 dispensings vs. none) and medication adherence (>= 80% of HTN medication coverage in 12 months prior to BP date vs. < 80%). Seven logistic models were constructed: model 1 (race) + model 2 (model 1+ race and demographics [income, age]), model 3 (model 2 + BMI), model 4 (model 3 + diabetes status, CKD status), model 5 (model 4 + primary care utilization), model 6 (model 5 + use of HTN medications) and model 7 (model 6 + medication adherence).

**Population Studied:** African-American and white men (ages 45-85) with HTN diagnosis and valid BP measurement.

**Principal Findings:** Whites were more likely to have good BP control in unadjusted models (OR=1.70, 95% CI = 1.44-2.00; p < .0001). This point estimate remained consistent across all logistic models examined; even after adjusting for all covariate measures: demographics, disease status, primary care utilization, use of HTN medications and medication adherence (OR= 1.80, 95% CI = 1.50-2.15; p < .0001).

**Conclusions:** Our findings suggest that disparities in BP control among African-American men remain when compared to white men, even after adjusting for the influence of demographics, key comorbidities, and clinical and medication utilization.

**Implications for Policy, Delivery, or Practice:** Our results suggest further research is needed to explain disparities in BP control among African-American men v. white men. More work is needed to understand whether lifestyle choices, biological and other factors explain differences in BP control and whether targeted interventions can reduce these disparities.

**Funding Source(s):** Other, Kaiser Permanente

**Poster Session and Number:** A, #262

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**Has the VA Found a Way to Reduce Racial Disparities in Kidney Transplant Evaluation? Preliminary Results from the National VA Kidney Transplant Study**

Larissa Myaskovsky, VA Pittsburgh Healthcare System; John Pleis, VA Pittsburgh Healthcare System, Pittsburgh, PA; Mohan Ramkumar, VA Pittsburgh Healthcare System, Pittsburgh, PA; Anthony Langone, VA Tennessee Valley Healthcare System, Nashville, TN; Somnath Saha, Portland VA Medical Center, Portland, OR; Christie Thomas, Iowa City VA Healthcare System, Iowa City, IA

**Presenter:** Larissa Myaskovsky, Ph.D., Associate Professor, Center for Health Equity Research and Promotion, VA Pittsburgh Healthcare System, larissa.myaskovsky@va.gov

**Research Objective:** End-stage kidney disease is more common in African Americans (AA) and other minorities (OM) (e.g., Hispanic/Latinos) than Whites (WH). Reports from national data indicate that AA & OM are less likely to be evaluated for kidney transplant (KT), and when they do get evaluated, take significantly longer to complete evaluation than WH. Race disparities persist even after controlling for medical factors, and non-medical reasons for race disparities are poorly understood. Ours is the first multi-site, prospective study to recruit the majority of Veterans evaluated for KT within the National VA KT System. Preliminary results from our ongoing longitudinal study will (a) compare rates of evaluation and time to evaluation between AA, OM, and WH Veterans; and (b) show how cultural factors (e.g., perceived discrimination, medical mistrust), psychosocial characteristics (e.g., anxiety, depression), and transplant knowledge are related to time to complete transplant evaluation.

**Study Design:** Longitudinal study, in which patients completed telephone interviews after their first clinic appointment, and again after they were accepted or found ineligible for KT.

**Population Studied:** AA, OM, and WH end-stage kidney disease patients being evaluated for KT.

**Principal Findings:** AA (n=200) and OM (n=149) Veterans were younger, less educated, and less likely to be married than WH (n=272). AA and OM experienced significantly more healthcare discrimination, perceived more overall healthcare racism, had higher levels of medical mistrust, greater family loyalty, and more religious objections to KT than WH (all ps less than .05). WH had higher levels of KT knowledge, but were less likely to endorse external health beliefs than AA and OM. Despite these differences, we found no significant difference between groups in any other predictors or outcomes, including time to complete evaluation or proportion accepted for transplant. Age, preference for a living donor KT, education, private health insurance, and having
a potential living donor, predicted time to complete evaluation independently of race.  

Conclusions: We found expected race differences on demographic, cultural and psychosocial factors, but not in outcomes, across all 4 VA kidney transplant centers in the US (Iowa, Nashville, Pittsburgh, and Portland).

Implications for Policy, Delivery, or Practice: Because the procedures for KT evaluation in the VA are markedly different than those in non-VA settings, we believe that healthcare system factors may have contributed to reduced disparities in outcomes. Interventions to reduce disparities in kidney transplant should thus focus on system-level factors, such as altering transplant clinic procedures or methods of processing patients through the transplant evaluation process.

Funding Source(s): VA  
Poster Session and Number: A, #263

Cultural and Psychosocial Factors Predict Racial Disparities in Kidney Transplant Evaluation  
Larissa Myaskovsky, University of Pittsburgh, School of Medicine; John Pleis, VA Pittsburgh Healthcare System and University of Pittsburgh, Graduate School of Public Health; Mary Amanda Dew, University of Pittsburgh, School of Medicine; Galen E. Switzer, VA Pittsburgh Healthcare System and University of Pittsburgh, School of Medicine; Ron Shapiro, University of Pittsburgh, School of Medicine

Presenter: Larissa Myaskovsky, Ph.D., Associate Professor, Medicine, University of Pittsburgh, School of Medicine, larissa.myaskovsky@va.gov

Research Objective: African Americans (AA) wait significantly longer for, and are less likely to receive, a kidney transplant (KT) than Whites (WH). Race disparities persist even after controlling for medical factors, and non-medical reasons for race disparities are poorly understood. Data from our ongoing longitudinal study will show how cultural (e.g., perceived discrimination, medical mistrust) and psychosocial factors (e.g., anxiety, depression), and transplant knowledge contribute to race disparities in KT.

Study Design: Longitudinal study, in which patients completed telephone interviews after their first clinic appointment, and again after they were accepted or found ineligible for KT.

Population Studied: AA and WH end-stage kidney disease patients being evaluated for KT.

Principal Findings: AA (n=257) were younger, had lower incomes, were more likely to be on public insurance, and less likely to be married than WH (n=776). AA reported experiencing significantly more healthcare discrimination, perceived more overall healthcare racism, had higher levels of medical mistrust, greater family loyalty, and more religious objections to KT than WH (ps less than .01). WH had higher KT knowledge (p less than .001), engaged in more learning activities (p less than .01), and spent more time learning about KT than AA (p less than .05). While WH were more likely to accept a living donor volunteer (p less than .01), AA were more willing to ask for a live kidney donation (p less than .001). AA took 58% longer to complete transplant evaluation (p less than 0.001), were less likely to be accepted for transplant (p less than .001), and took significantly longer to be accepted for transplant (p less than .001) than WH. Demographics, cultural and psychosocial factors, and transplant knowledge predicted time to complete evaluation independently of race.

Conclusions: Interventions to address racial disparities in KT should incorporate non-medical risk factors in patients.

Implications for Policy, Delivery, or Practice: Suggestions for interventions include: fast-track evaluation for at-risk patients, increase contact with patients to ensure follow-through with necessary testing, facilitate scheduling of appointments, recruit former recipients as peer mentors, and enhance the cultural competency of transplant teams to learn about the reasons that patients may take longer to complete evaluation.

Funding Source(s): NIH  
Poster Session and Number: A, #264

Effectiveness of Multicomponent Asthma Intervention for Children with Asthma from Low Income Families Living in East Harlem, New York City

Tursynbek Nurmaganbetov, Centers for Disease Control and Prevention; Veronica Uzoebo, NYC Department of Health and Human Hygiene; Roger Hayes, NYC Department of Health and Human Hygiene

Presenter: Tursynbek Nurmaganbetov, MS, MA, PhD, Senior Science Fellow, National Center for Environmental Health, Centers for Disease Control and Prevention, ten7@cdc.gov
Research Objective: To analyze the effectiveness of a multicomponent home environmental asthma intervention targeting children from low-income families in East Harlem, New York City.

Study Design: Three hundred eighty children with persistent asthma participated in the study. All families were assessed for baseline characteristics including asthma symptoms and health care utilization experienced by a child; presence of home environmental triggers; and parents’ knowledge and skills in managing the child’s asthma. Based on baseline characteristics and their consent, families were divided between intervention (200) and control (180) groups. Families were assigned a licensed asthma counselor who coordinated all specialized services as part of the intervention; services included asthma case management, home environmental assessment, and assistance with remediation of asthma triggers. The main asthma outcomes included in the study were the rates of emergency department visits (edv), hospitalizations (hsp), asthma symptom days (asd), school days missed (sdm), and work days missed (wdm) due to asthma. Observable baseline variables included age, gender, race, and baseline rates of edv, hsp, asd, sdm, and wdm. The effect of the intervention was measured as the difference in the main asthma outcomes at the baseline and at a post-intervention assessment. This was not a randomized control study. To reduce the influence of confounding factors we applied the propensity score method to estimate the effect of the intervention on the primary asthma outcomes.

Population Studied: Children aged 17 years or younger were referred to the study by hospitals or clinics following an emergency room visit or hospitalization, by school based clinics, or by day care centers. Families were included in this study if they completed an initial assessment to establish their baseline status and at least one follow-up questionnaire. All families were enrolled in the study between January 2008 and December 2010. All resided in East Harlem of NYC and had combined household incomes of $20,000 or less; about 63 percent of the sample lived in public housing. A majority of the families were Hispanic (55%) and Black (33%).

Principal Findings: Baseline main asthma outcomes were: 2.56 (intervention group) and 2.64 (control group) for edv, 0.44 and 0.62 for hsp, 7.35 and 5.86 for asd, 5.38 and 6.96 for sdm, and 6.95 and 3.57 for wdm. Based on the propensity score method, the average treatment effect of the intervention was 2.13 for edv, 0.92 for hsp, 2.67 for asd, 1.95 for sdm, and 1.89 for wdm. All estimates, except hospitalizations, were significant. The unmatched outcomes for the same outcomes were 3.36, -0.17, 3.80, 1.66, and 1.48 respectively.

Conclusions: The results of the study suggest that low-income families can benefit from the intervention by significantly reducing emergency department visits, asthma symptom days, and missed school and work days.

Implications for Policy, Delivery, or Practice: Asthma interventions that include a home environmental assessment and assistance with remediation of in-door asthma triggers in combination with asthma counseling can be very effective, especially for low-income, inner-city families. Insurance organizations should develop policies to reimburse the cost of these interventions.

Funding Source(s): N/A

Poster Session and Number: A, #265

Racial Disparities in Physical and Mental Health-Related Quality of Life among Medicare Managed Care Cancer Patients

Chintan Pandya, University of Rochester Medical Center; Yue Li, PhD, Department of Public Health Sciences, University of Rochester Medical Center; Chunkit Fung, MD MSCE, James P. Wilmot Cancer Center, University of Rochester Medical Center; Supriya Mohile, MD MPH, James P. Wilmot Cancer Center, University of Rochester Medical Center

Presenter: Chintan Pandya, MD MPH, Graduate Student, Department of Public Health Sciences, University of Rochester Medical Center, chintan_pandya@urmc.rochester.edu

Research Objective: Over 50 percent of newly diagnosed malignancies are found in people aged 65 years and older and over 60 percent of the cancer survivors are in this age range. Under-representation of older and minority patients in cancer clinical trials have resulted in disparities in their treatment and outcomes. The study aims to examine racial differences in health-related quality of life (HRQOL) outcomes and assess the association of sociodemographic, cancer-specific and general health characteristics with these outcomes among Black and White Medicare managed care patients diagnosed with cancer.
**Study Design:** We used the Surveillance, Epidemiology, and End Results-Medicare Health Outcomes Survey (SEER-MHOS) linkage population-based database developed by National Cancer Institute (NCI) and Center for Medicare & Medicaid Services (CMS) collaboration for this analysis. The MHOS assesses measures of HRQOL through SF-36, a valid and reliable instrument, which has eight scales representing separate constructs of HRQOL. The physical component summary (PCS) score of SF-36 incorporates physical functioning, role limitation-physical, bodily pain, and the general health scales and mental component summary (MCS) score of SF-36 includes the mental health, role limitation-emotional, social functioning, and vitality scales. Difference in median PCS and MCS scores (range from 0-100) among Black and White patients were tested using Wilcoxon rank-sum test. Multivariable linear regression analysis was performed to assess the association between race and HRQOL after controlling for socio-demographic variables including age, gender, marital status, education, and income; cancer-specific variables including time since diagnosis, stage of cancer, and treatment; and general health related variables including non-cancer comorbidities, depression and activities of daily living (ADL) deficits.

**Population Studied:** We conduct cross-sectional analysis on 13,091 (9.1% Black vs. 90.9% White) 65 years or older patients diagnosed with breast, colorectal or prostate cancer included in 8 MHOS cohorts (1998-2007). The first available survey after cancer diagnosis was used.

**Principal Findings:** The median PCS and MCS scores for all cancer patients were 39 and 54 respectively. Black cancer patients had lower median PCS (36.7 vs. 38.9, p<0.001) and MCS (48.7 vs. 51.3, p<0.001) scores compared to their White counterparts. After controlling for socio-demographic, cancer-specific and general health variables, PCS scores were lower (least-square mean: 38 vs. 40; p=0.003) for Black compared to White patients; MCS scores were not statistically different between the two racial groups. The interaction term between race and non-cancer comorbidities categories was significant (F-ratio=3.09, p=0.04). Factors associated with lower PCS scores include being female, older age, lower household income, lower education, advanced cancer stage, recent cancer diagnosis, having comorbidities, depressed and having ADL deficits (all p<0.05).

Similarly, factors associated with lower MCS scores include older age, low income, lower education, depressed and having ADL deficits (all p<0.05).

**Conclusions:** Overall HRQOL for older Medicare cancer patients is very low in this study population. PCS scores are lower for Black compared to White patients. The racial disparities in HRQOL are likely to be moderated by number of non-cancer comorbidities present.

**Implications for Policy, Delivery, or Practice:** The SEER-MHOS data suggest worse HRQOL for Black compared to White cancer patients among Medicare managed care beneficiaries that require targeted action plan by health care delivery system.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #266

**Risky Business: Understanding the Role of Health Behaviors, Race and Insurance on Human Papilloma Virus Initiation and Completion in U.S. Women Aged 18-26**

Susanne Schmidt, University of Texas Health Science Center at San Antonio; Helen Parsons, University of Texas Health Science Center at San Antonio

**Presenter:** Helen Parsons, Ph.D., M.P.H., Assistant Professor, University of Texas Health Science Center at San Antonio, parsonsh@uthscsa.edu

**Research Objective:** To investigate disparities in Human Papilloma Virus (HPV) vaccination initiation and completion among young U.S. women, estimating time trends and variation in vaccination as well as identifying reasons why young females forgo vaccination.

**Study Design:** We used the 2008-2011 National Health Interview Survey (NHIS). Logistic regression models adjusted for survey design were computed to estimate the effect of demographic, socioeconomic, health status and behavior, and other vaccination behavior characteristics on HPV initiation (i.e., >=1 dose) and completion (i.e. >=3 doses). Logistic regression was also used to investigate factors significantly associated with choosing to forgo vaccination.

**Population Studied:** Females aged 18 to 26 (n=7,957) who participated in the 2008-2011 NHIS. A subsample of females who chose to forgo the vaccine (n=1,770) in 2008 and 2010 was also analyzed.
**Principal Findings:** HPV vaccination increased significantly among young women from 2008 to 2011. Vaccine initiation increased from 11.3% to 27.7% of young women, while vaccine completion increased from 5.9% to 14.9% over the study period. Multivariate regression demonstrated that women who were insured, had more than a High School education, exhibited moderate to heavy alcohol consumption, and those who participated in other health-seeking behavior (e.g., doctor visit in last 12 months, had flu shot in past year) had higher odds of both initiating and completing HPV vaccination (p<0.05 for all). Interestingly, neither poverty status nor financial hardships (defined as having delayed or forgone medical care because of associated costs) were significantly associated with vaccination. While we identified no significant association between race/ethnicity and vaccination initiation, Non-Hispanic blacks (OR[95% CI]: 0.48[0.35-0.66]) and Hispanics (OR[95% CI]: 0.75[0.57-0.99]) were both less likely to complete vaccination than non-Hispanic Whites respectively. Among women who chose to forgo vaccination, the most common reasons women identified included not needing vaccine (38.3%), not knowing enough about the vaccine (14.5%), and concern about the safety of the vaccine (12.5%). Further, among the non-vaccinated, multivariate regression demonstrated that minorities were more likely to identify lack of knowledge as the main reason for non-vaccination compared to non-Hispanic Whites.

**Conclusions:** While HPV vaccination rates are increasing for 18-26 year old women, vaccination rates are still low. Factors including minority status, insurance and health behaviors continue to play an important role in both vaccination uptake and completion. Additionally, minorities are more likely to state that they do not know enough about the HPV vaccine, which may contribute to their lower levels of vaccine completion.

**Implications for Policy, Delivery, or Practice:** Our research contributes to knowledge of the determinants and continued disparities in HPV vaccination in young women. Future implementation research should focus on improving vaccination among high-risk subgroups, particularly among the uninsured, minorities and those with high-risk behaviors. Specifically, the role of educational strategies in minorities and the role of insurance as the Affordable Care Act is implemented should be evaluated for determining best-practices to reduce disparities, improving overall vaccination rates in the population.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #267

**The Role of Neighborhood Socioeconomic Status in Racial/Ethnic Disparities in Type 2 Diabetes**
Rebecca Piccolo, New England Research Institutes; Andre Araujo, New England Research Institutes; John McKinlay, New England Research Institutes

**Presenter:** Rebecca Piccolo, Sc.M., Project Manager/Biostatistician, Health Services and Disparities Research, New England Research Institutes, rpiccolo@neriscience.com

**Research Objective:** Racial/ethnic disparities in type 2 diabetes (T2D) are a major public health problem in the US, with African Americans (AA) and Hispanic Americans (HA) at a greater risk relative to Caucasians (CA). The search for contributors to disparities in T2D tends to focus on three major areas of research: (1) lifestyle and behavioral risk factors, (2) early biochemical changes, and (3) genetics. We hypothesize two additional, complementary contributors to racial/ethnic disparities: (4) individual and (5) neighborhood level socioeconomic factors.

**Study Design:** Participants were drawn from the Boston Area Community Health (BACH) Survey, a racially/ethnically diverse, (AA: 866; HA: 871; CA: 995) longitudinal cohort study of community-dwelling residents of Boston. Participants’ residential addresses were geocoded and merged with neighborhood-level data obtained from the US Census. Within this cohort, we identified 2,732 subjects without diabetes at baseline who were followed for diabetes incidence. The in-person interview included validated questionnaires on demographics, health care access/utilization, lifestyles, health status and behaviors, physical measures, and biochemical parameters.

**Population Studied:** The BACH Survey is a racially/ethnically diverse, prospective, longitudinal cohort study of Boston Massachusetts residents aged 30-79 at baseline. Non-diabetic participants (n=2,732) were followed for an average of 7.2 years for T2D incidence.

**Principal Findings:** In age-, gender-, and BMI-adjusted models, black and Hispanic participants were twice as likely to develop T2D over the 7.2 year study period (AA: OR=2.27,
adjusting for known risk factors including socioeconomic status (SES), suggesting that genetic factors may explain some of this population difference in risk. However, recent genetic studies examining the association of genetic ancestry (as measured by Ancestry Informative Markers (AIMs)) and T2D have been inconclusive with results of genetic ancestry being attenuated, or completely eliminated, when adjusting for SES. Therefore, the Boston Area Community Health (BACH) Survey performed an admixture analysis in a racially/ethnically diverse population in order to determine the association between genetic ancestry, socioeconomic factors, and incident T2D.

**Study Design:** The BACH Survey is a racially/ethnically diverse, (AA: 866; HA: 871; CA: 995) longitudinal cohort study of men and women from Boston, Massachusetts. Participants aged 30-79 at baseline (2002-2005) were followed approximately 5- (2006-2010) and 7- (2010-2012) years later. A panel of 63 AIMs designed to discriminate percent African, Native American, and European ancestry were collected from 2,732 non-diabetic participants, along with a breadth of measures including: sociodemographics, health care access/utilization, lifestyle/behavior, health status, physical measures, and biochemical parameters.

**Population Studied:** The BACH Survey is a racially/ethnically diverse, prospective, longitudinal cohort study of Boston Massachusetts residents aged 30-79 at baseline. Non-diabetic participants (n=2,732) were followed for an average of 7.2 years for T2D incidence.

**Principal Findings:** We examined the relationship between % African and % Native American ancestry on incident T2D. In age- and gender-adjusted models, the odds of developing T2D were 14% higher (Odds Ratio (OR)= 1.14, 95% CI [1.07-1.22]) for every 10% increase in African ancestry, relative to European ancestry. Results were similar for Native American ancestry although not statistically significant (OR=1.14 [0.97-1.33]). As in previous studies, these results were attenuated with further adjustment for socioeconomic factors (African ancestry: OR=1.07, [0.99-1.15]; Native American ancestry: OR=0.99, [0.83-1.18]). Further, genetic ancestry only accounted for 0.3% of the variation in T2D incidence (by comparison, income, education, and occupation combined accounted for 1.4% and body mass index 1.6%).
Conclusions: We conclude that while African and Native American genetic ancestry are associated with incidence of T2D in minimally adjusted models, the effect of genetic ancestry on T2D is likely explained by differences in socioeconomic factors.

Implications for Policy, Delivery, or Practice: Genetic ancestry appears to have little association with T2D beyond its association with socioeconomic factors. Furthermore, genetic studies have failed to identify genes that can explain a large portion of the observed population difference in risk of T2D. It is likely that non-genetic factors, namely socioeconomic factors, lead to the observed racial/ethnic disparities in T2D incidence.

Funding Source(s): NIH

Poster Session and Number: A, #269

Are There Racial Disparities in Psychotropic Drug Use and Expenditures in a Nationally Representative Sample of Men in the United States? Evidence from the Medical Expenditure Panel Survey

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Presenter: Geraldine Pierre, MSPH, PhD Candidate, Department of Health Policy and Management, Hopkins Center for Health Disparities Solutions, Johns Hopkins Bloomberg School of Public Health, gpierre@jhsph.edu

Research Objective: To determine whether racial disparities exist in psychotropic drug use and expenditures in a nationally representative sample of men 18-64 who access the health care system in the United States.

Study Design: We employed a pooled cross-sectional design for this study and used a two-part probit-GLM model for analyses. First, a probit model was run to determine the likelihood of drug use by race. Second, generalized linear modeling (GLM) assessed differences in expenditures, by race, among individuals who reported use of one or more psychotropic drugs.

Population Studied: Data was extracted from the 2000-2009 Medical Expenditure Panel Survey (MEPS), a longitudinal survey that covers the U.S. civilian non-institutionalized population. Full Year Consolidated, Medical Conditions, and Prescribed Medicines data files were merged across 10 years of pooled data. Only individuals who were interviewed across all three components were included in the final analyses. The sample of interest was limited to adult males 18-64, who reported their race as White, Black, Hispanic, or Asian. Appropriate survey weighting techniques were applied according to MEPS documentation.

Principal Findings: We found minority men had a lower probability of psychotropic drug use (Black = -4.3%, 95% Confidence Interval [CI] = -5.5, -3.0; Hispanic = -3.8%, 95% CI = -5.1, -2.6; Asian = -4.5%, 95% CI = -6.2, -2.7) compared to White men. While average spending varied by race (White: $664.59, Black: $990.87, Hispanic: $725.80, Asian: $932.96), after controlling for demographic and health status variables, there were no statistically significant race differences in expenditures.

Conclusions: This paper reveals that racial and ethnic disparities exist in the use of psychotropic drugs for men, presenting problems of access to mental health care and services.

Implications for Policy, Delivery, or Practice: Implications of our findings suggest public health interventions must ensure equitable access to psychotropic drugs for men. Practical solutions to addressing this access problem include greater community outreach and cultural sensitivity training for practitioners. Policymakers also play a role in passing and enforcing legislation that promotes safe and necessary psychotropic drug access.

Funding Source(s): NIH, NCMHD

Poster Session and Number: A, #270

Do Discontented Physicians Provide Poorer Quality Medical Care?

David Pober, New England Research Institutes; Felicia L Trachtenberg, New England Research Institutes; Lisa D Marceau, New England Research Institutes; John B McKinlay, New England Research Institutes

Presenter: David Pober, Ph.D., Senior Research Scientist / Biostatistician, New England Research Institutes, dpober@neriscience.com
Research Objective: Surveys of primary care physicians report alarming levels of dissatisfaction within the evolving medical workplace. Reports suggest physician discontent adversely affects the content and quality of medical care, and possibly patient outcomes. We examine the relationship between physician discontent and clinical decision making for two commonly encountered pain conditions.

Study Design: A balanced factorial experiment was conducted with primary care physicians who viewed two clinically authentic videos of “patients” with symptoms suggesting either undiagnosed sciatica, or diagnosed symptomatic knee osteoarthritis (OA). Half of the patients with sciatic symptoms assertively requested oxycodone, while half of those with OA requested Celebrex. The other half of each cohort simply requested pain relief. The “patients” were professional actors, differing by gender, race/ethnicity and socioeconomic status. The well-validated Physician Worklife Survey (Williams et al., 1999) was employed to measure physician discontent. We differentiated actions any physician should or should not take when encountering the two conditions. Physician actions were modeled as a function of physician discontent using logistic regression models controlled for all patient and physician design factors, as well as any significant interactions between physician discontent and the style of the patient request.

Population Studied: 192 eligible physicians, stratified by years of clinical experience and gender, were recruited to participate.

Principal Findings: Results were generally consistent across the two scenarios. Regarding actions physicians “should” take (e.g. prescribe non-COX-2 NSAIDs, provide advice on health behaviors) there were no significant main effects of physician discontent on these outcomes. However, there were interactive effects such that assertive patients received more advice about ergonomics (Odds Ratio (OR) = 2.88, p = 0.04 for the interaction) and more advice about changing exercise habits (OR = 2.24, p = 0.05) with increasing physician discontent. OA patients assertively requesting medication received more advice about structured physical therapy and stretching (Odds Ratio (OR) = 6.54, p = 0.007) with increasing physician discontent. Among actions that physicians “should not” take, the probability of ordering an MRI in sciatica cases with assertive requests was lower with increasing physician discontent (OR = 0.44, p = 0.08), while OA cases exhibited a simple main effect of physician discontent with increasing probability of having an MRI ordered (OR = 1.66, p = 0.08). In sciatica cases, the probability of being prescribed narcotic analgesics increased with physician discontent (OR = 1.48, p = 0.04).

Conclusions: Physician discontent appears to result in some significantly different clinical decisions for “patients” with symptoms of two common conditions. There is noteworthy consistency across the two scenarios. Physicians prescribed appropriate NSAIDs equivalently, regardless of discontent. However, discontented physicians may not wish to take the time to offer advice, and may somewhat dismissively prescribe narcotic analgesics and order MRIs inappropriately.

Implications for Policy, Delivery, or Practice: Consistent with related research, we find patient assertiveness appears to modify usual patterns of clinical decision making. More assertive patients may receive improved medical care, reducing healthcare disparities associated with physician discontent.

Funding Source(s): NIH

Poster Session and Number: A, #271

Changes in Patient Activation and Self-Management: Are There Racial and Ethnic Disparities?

Javiera Pumarino, Northwestern University; Raymond H. Kang, Northwestern University; Megan C. McHugh, Northwestern University

Presenter: Javiera Pumarino, B.A., Research Assistant, Feinberg School of Medicine, Center for Healthcare Studies, Northwestern University, j-pumarino@northwestern.edu

Research Objective: Chronically ill patients are frequently expected to make behavioral changes in order to improve their health status and quality of life. Highly activated patients—or those who have the ability and disposition to manage their health—are more likely to engage in self-management behaviors. Thus, successful management of a chronic condition is intimately related to high levels of patient activation. Race and ethnicity have been widely recognized as drivers of health care disparities. Relative to whites, racial and ethnic minorities have lower levels of activation, higher prevalence of chronic conditions, and poor self-management.

Our objective was to assess whether changes in patient activation were associated with changes...
in self-management behaviors for chronically ill patients, and to explore the influence of patients’ race and ethnicity on this association.

**Study Design:** We used panel data from two rounds (2007-2008 and 2011-2012) of the Aligning Forces for Quality Consumer Survey. The first round was a random digit dial telephone survey of adults (18 years or older) with at least one chronic condition. The response rate was 48%. The second round had a retention rate of 60%.

Patient activation was measured using the 13-item Patient Activation Measure. Self-management behaviors were assessed through questions about patients’ diet and exercise. Race (African American or white), ethnicity (Hispanic), sex, age, number of chronic conditions, insurance status, education level, and usual source of care were included in the models as control variables.

All health behavior measures were analyzed using a random-effects (RE) logistic. Interaction terms for Black race and Hispanic ethnicity with patient activation were also included.

**Population Studied:** 4,792 individuals completed both rounds of the survey. 24% self-identified as African American, 6% as Hispanic, and 66% as Caucasian. All participants reported having at least one of the following chronic conditions: diabetes, hypertension, heart disease, asthma, or depression.

**Principal Findings:** Increases in patient activation were associated with positive changes on all self-management behaviors (p<0.001).

Analyzing the interaction terms for Black race and Hispanic ethnicity with patient activation, we found that, relative to whites, changes in patient activation had a weaker association with self-management for Hispanics (eating 5 servings of fruits and vegetables most days of the week OR=0.98, p<0.05) and for African Americans (maintaining low fat diet OR=0.99, p<0.05; exercising on a regular basis OR=0.99, p<0.05).

**Conclusions:** Our findings suggest that, for the chronically ill, improved patient activation has a positive effect on self-management behaviors. However, patient activation has a lower effect on improving self-management behaviors for racial and ethnic minorities.

**Implications for Policy, Delivery, or Practice:** Interventions aimed at improving the health of chronically ill patients should include efforts to increase patient activation. However, this may not be enough to successfully improve the self-management behavior of racial and ethnic minority patients. Future research should focus on components that may complement interventions based on patient activation.

**Funding Source(s):** RWJF

**Poster Session and Number:** A, #272

**Does Dual-Eligibility Affect Post-Acute Nursing Home Care Outcomes?**

Momotazur Rahman, Brown University; Kali Thomas, Brown University; Denise Tyler, Brown University; David C Grabowski, Harvard University; Vincent Mor, Brown University

**Presenter:** Momotazur Rahman, Ph.D., Investigator, Community Health, Brown University, momotazur_rahman@brown.edu

**Research Objective:** Dual-eligibles (Medicaid-eligible Medicare beneficiaries) are a particularly vulnerable group: they tend to be poor, report lower health status and utilize more health care services than other beneficiaries. This paper has two goals. The first is to examine whether dual eligibility affects health and utilization outcomes following skilled nursing facility admission. The second is to examine whether such dual-non-dual differences in outcomes are associated with state policies regarding long-term care.

**Study Design:** We used four outcome measures: becoming a long-stay resident (i.e. stayed more than 100 days following nursing home admission), discharge to home within 30 days of nursing home admission without any adverse event like hospitalization or death in following 30 days, 30-day re-hospitalization and 180 day mortality. We estimated dual-non-dual difference in outcomes controlling for patients’ clinical and neighborhood characteristics and nursing home fixed effects among groups patients with same primary diagnosis (hip fracture, heart failure and stroke) and similar Elix-Hauser co-morbidity index and. We also estimated such difference in outcome measure within groups of patients with same likelihood (propensity score) of being dually eligible. To examine the role of state policies, we estimated logit models with four different outcomes onto patients’ clinical and neighborhood characteristics, state fixed effects, and interactions of state variables with the dual-eligibility dummy variable. These interactions demonstrate how state policies affect the outcomes differently for the dual-eligibles compared to the non-duals.

**Population Studied:** 690,596 Medicare fee-for-service beneficiaries residing in the contiguous 48 states who had not had a previous nursing
home stay who were discharged to skilled nursing facility from a general hospital following acute stay between July 2004 and June 2005. **Principal Findings:** Dually eligible individuals comprised 22.2% of our cohort. Duals were two times more likely to become long-stay nursing home residents than the non-duals and there was no significant difference in re-hospitalization and mortality. These findings are very robust to alternative sample or method specification. Higher Medicaid reimbursement rates were associated with increased difference in length-of-stay between duals and non-duals and higher assisted living penetration in states was found to increase such differences in terms of re-hospitalization and mortality. Compared to the rest, the four states that pay SNF copayments for duals have smaller dual-non-dual difference in length of stay. **Conclusions:** Health conditions, residential neighborhood characteristics and treating nursing facility explained most of the observed difference in mortality and re-hospitalization, but only a very small fraction of the observed difference in likelihood of becoming a long-stay resident. **Implications for Policy, Delivery, or Practice:** Duals are being kept at nursing for relatively longer time because they have lower incentives (no cost sharing, poor quality home) to go back to community. This suggests that these patients could have been discharged from the SNFs quickly and kept in relatively less expensive settings without increasing health risk. Assisted living has the potential to serve as a cost-effective substitute for higher-intensity nursing home care for some people. Higher Medicaid payment rates potentially provide additional incentive to keep the dual-eligibles in the nursing home for longer periods of time. **Funding Source(s):** NIH  **Poster Session and Number:** A, #273  

**Tackling Disparities with the Patient-Centered Medical Home: A Mixed Methods Study**  
Nadine Reibling, Harvard School of Public Health; Meredith Rosenthal, Harvard School of Public Health

Poster: Nadine Reibling, Harkness Fellow in Healthcare Policy and Practice, Health Policy and Management, Harvard School of Public Health, nreiblin@hsph.harvard.edu

**Research Objective:** Persistent disparities in health and healthcare utilization are identified as one of the big challenges of healthcare policy. A strong primary care system is often put forward as a remedy for disparities in the receipt of healthcare services. Thus recent initiatives promoting the patient-centered medical home (PCMH) promise to enhance equity in healthcare utilization. The aim of this study is to find out if patient-centered medical homes have the potential to reduce racial/ethnic and socioeconomic disparities in healthcare services. Moreover, we investigate the role disparities play in existing medical home pilots and how this might affect outcomes.  

**Study Design:** The study uses a mixed methods design. A quantitative analysis based on the 2010 Medical Expenditure Panel Survey investigates to what extent having a medical home reduces disparities in preventive care use between racial/ethnic and socioeconomic groups. The second part of the study includes an extended document analysis and 30 qualitative interviews with key actors in five medical home initiatives (Colorado, Massachusetts, Pennsylvania, Rhode Island, and New Orleans).  

**Population Studied:** The quantitative analysis covers a nationally representative sample of civilian, non-institutionalized persons in the United States. The medical home initiatives studied cover pilots in different parts of the country which vary on a number of crucial characteristics (start date, number of practices included, physician payment, size of the minority population, policy process/initiation).  

**Principal Findings:** In line with earlier research, the study finds that medical homes have the potential to improve quality of care. Having a medical home also reduces socioeconomic disparities in care utilization but this effect is mainly based on persons having a usual care provider. Although mostly motivated by cost and quality considerations, existing medical home pilots often focus on providers of vulnerable populations such as Community Health Centers. By increasing resources and quality for those providers, existing between-provider disparities might be reduced. On the other hand, Community Health Centers seem to struggle more with the implementation of PCMH principles so that disparities might increase; at least temporarily. The low priority given to disparities compared to quality and cost outcomes might undermine the potential of
We used logistic regression to evaluate the claims data from California's Medicaid program. The study examined 12 months of administrative data among HIV-positive beneficiaries. This study examines whether disparities in receipt of CD4 monitoring are likely to adhere to treatment guidelines. The analysis was conditional on continuous enrollment and at least one outpatient healthcare encounter during the 12-month study period.

**Research Objective:** CD4 tests are an essential service for people with Human Immunodeficiency Virus (HIV). Treatment decisions related to lifesaving antiretroviral (ARV) medications are contingent on CD4 cell count. Patients who do not receive recommended CD4 monitoring are unlikely to receive ARVs when indicated. This study examines whether disparities in receipt of CD4 tests exist among HIV-positive Medicaid beneficiaries.

**Study Design:** This retrospective observational study examined 12 months of administrative claims data from California's Medicaid program. We used logistic regression to evaluate the association of patient demographics (age, gender, race/ethnicity, and language), mental health status, use of ARV medications, and provider volume with receipt of at least one CD4 test over a 12 month period from March 2008 through February 2009.

**Population Studied:** The study population included 3,310 HIV-positive Medicaid beneficiaries in Southern California. The analysis was conditional on continuous enrollment and at least one outpatient healthcare encounter during the 12-month study period.

**Principal Findings:** Descriptive analysis showed that only 64% of the study population received any CD4 test during the study year despite having continuous enrollment in coverage and at least one outpatient medical encounter. Appropriate (at least once per year) CD4 testing was significantly associated with being younger, white, speaking English as primary language, a history of mental illness or substance abuse, using ARV medications, and having a primary treating provider more experienced with HIV patients.

**Conclusions:** Substantial disparities in receipt of CD4 tests between racial/ethnic, age and language groups indicate differential treatment that may result from cultural norms, self-efficacy, perceived stigma, knowledge of clinical guidelines, or provider discrimination. The association of CD4 screening with provider experience or volume suggests that providers with fewer HIV-positive patients may be less likely to adhere to treatment guidelines.

**Implications for Policy, Delivery, or Practice:** Because ARV treatment is predicated on CD4 cell count, identification of disparities in receipt of CD4 testing elucidates one important potential pathway for previously reported disparities in ARV treatment, which may be susceptible to intervention at the provider and patient level. Further research is needed to better understand the specific factors driving observed disparities and potential mechanisms to improve equity of care for HIV-positive Medicaid beneficiaries.

**Funding Source(s):** CWF

**Poster Session and Number:** A, #274

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Disparities in CD4 Monitoring among HIV-Positive Medi-Cal Beneficiaries: Evidence of Differential Treatment at the Point of Care

Dylan Roby, University of California at Los Angeles, Fielding School of Public Health; Greg Watson, University of California at Los Angeles, Center for Health Policy Research; Anna Davis, University of California at Los Angeles, Fielding School of Public Health

**Research Objective:** CD4 tests are an essential service for people with Human Immunodeficiency Virus (HIV). Treatment decisions related to lifesaving antiretroviral (ARV) medications are contingent on CD4 cell count. Patients who do not receive recommended CD4 monitoring are unlikely to receive ARVs when indicated. This study examines whether disparities in receipt of CD4 tests exist among HIV-positive Medicaid beneficiaries.

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**Principal Findings:** Descriptive analysis showed that only 64% of the study population received any CD4 test during the study year despite having continuous enrollment in coverage and at least one outpatient medical encounter. Appropriate (at least once per year) CD4 testing was significantly associated with being younger, white, speaking English as primary language, a history of mental illness or substance abuse, using ARV medications, and having a primary treating provider more experienced with HIV patients.

**Conclusions:** Substantial disparities in receipt of CD4 tests between racial/ethnic, age and language groups indicate differential treatment that may result from cultural norms, self-efficacy, perceived stigma, knowledge of clinical guidelines, or provider discrimination. The association of CD4 screening with provider experience or volume suggests that providers with fewer HIV-positive patients may be less likely to adhere to treatment guidelines.

**Implications for Policy, Delivery, or Practice:** Because ARV treatment is predicated on CD4 cell count, identification of disparities in receipt of CD4 testing elucidates one important potential pathway for previously reported disparities in ARV treatment, which may be susceptible to intervention at the provider and patient level. Further research is needed to better understand the specific factors driving observed disparities and potential mechanisms to improve equity of care for HIV-positive Medicaid beneficiaries.

**Funding Source(s):** Other, National Center for Advancing Translational Science Grant TL1TR000121

**Poster Session and Number:** A, #275

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Comparing AHRQ Maternal Quality and Safety Indicators for Asian and Pacific Islander Subgroups in Hawaii

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Hospitalizations for this indicator were significantly across racial/ethnic groups. From Cesarean delivery, which did not vary
safety indicators except for obstetric trauma rate
significant differences were seen across
Principal Findings: In unadjusted analyses,
significant differences were seen across racial/ethnic groups for all maternal quality and safety indicators except for obstetric trauma rate from Cesarean delivery, which did not vary significantly across racial/ethnic groups. (Hospitalizations for this indicator were extremely low (less than 10 total) across all groups and were not considered in further analyses). Differences were seen specifically between Asian and Pacific Islander subgroups. For instance, Chinese had the lowest unadjusted percentage (23.95) of Cesarean deliveries, while Filipino women had the highest percentage (29.11). Chinese (7.69) and Japanese (5.65) had high percentage of obstetric trauma from vaginal deliveries with instruments while Hawaiians had the lowest percentages (2.07).

Significant differences by race/ethnicity overall and among Asian and Pacific Islander subgroups specifically remained in multivariable models. In particular, both Chinese (RR: 1.84; CI: 1.45-2.27) and Japanese (RR: 1.31; CI: 1.12-1.54) retained higher rates of obstetric trauma for vaginal deliveries compared to Whites, while Native Hawaiians (RR: 0.57; CI: 0.48-0.67) had significantly lower rates and other racial/ethnic comparisons were not significantly different. Similarly, Filipino (RR: 1.11; 95% CI: 1.06-1.16) and other Pacific Islander women (RR: 1.20; CI: 1.13-1.27) had significantly higher rates of Cesarean deliveries compared to White women, while other racial/ethnic groups did not differ significantly.

Conclusions: Significant variation was seen for Asian and Pacific Islander subgroups across AHRQ maternal quality and safety indicators. Notably, high rates of obstetric trauma were seen among Chinese and Japanese women with vaginal deliveries and high rates of Cesarean deliveries were seen among Filipino and other Pacific Islander women.

Implications for Policy, Delivery, or Practice: Asian and Pacific Islanders subgroups must be disaggregated to understand patterns, to identify possible disparities, and to design effective interventions. This is particularly important to consider in childbirth, which is the most common reason for hospital admission among women.

Funding Source(s): AHRQ
Poster Session and Number: A, #276

The Promotora Explained Everything:
Participant Experiences During a Household-Level Diabetes Education Program for Rural Hispanics Living in Washington State
Megan Shepherd-Banigan, University of Washington; Sarah Hohl, Fred Hutchinson Cancer Reserach Center; Catalina Vaughn, Fred Hutchinson Cancer Reserach Center; Beti Thompson, Fred Hutchinson Cancer Reserach Center
**Presenter:** Megan Shepherd-Banigan, MPH, Student, Health Services, University of Washington, msb23@uw.edu

**Research Objective:** In the United States Hispanics, particularly those living in rural areas, are at higher risk for diabetes than non-Hispanic whites. There is a need to design and evaluate community-based, culturally-relevant interventions targeting diabetes education, prevention and self-management for this vulnerable population. This study describes participant experiences of a household-level, community health worker-led intervention to increase social support, behavioral skills, and self-efficacy in an effort to improve diabetes-related health behaviors and outcomes.

**Study Design:** The Home Health Party (HHP) intervention, a component of the Hispanic Diabetes Education and Prevention Project, employed constructs of the Social Cognitive Theory and used trained promotores (community health workers) to deliver a series of household-level education sessions and distribute incentives to support diabetes-related behavior change. Forty open-ended, structured interviews were administered to a randomly selected sample of 430 intervention participants. Qualitative methods were used to code and analyze the interview transcripts.

**Population Studied:** Diabetic and pre-diabetic Hispanics living in a rural, agricultural area in Washington State.

**Principal Findings:** Four primary themes emerged from interviews: 1. participants desire for and the process of improving knowledge about diabetes; 2. experiences of building skills for diabetes management; 3. developing social support and 4. embracing change. Respondents viewed the HHPs as an opportunity to gain new knowledge about diabetes and diabetes management. Participants regarded the promotor as a credible role model who imparted advice, skills demonstrations, and social support to help them achieve positive lifestyle changes. Incentives, such as a Mexican cookbook and pedometer, provided instant gratification and motivation to achieve behavior change by allowing participants to tangibly gauge their progress. Almost all participants articulated at least one detail about specific behavior changes they had made, particularly in regards to diet and physical activity. Several participants reported positive impacts on family-level behaviors, generally in the area of improved nutrition. Further, respondents reported reduced HbA1C levels, weight loss, and a general sense of improved well-being.

**Conclusions:** This intervention is a promising, culturally and linguistically relevant strategy for addressing diabetes among this underserved, vulnerable population and this study suggests how the intervention and other similar programs might be strengthened to achieve greater impact.

**Implications for Policy, Delivery, or Practice:** Interventions that involve family members and aim to improve social support may be an effective strategy for improving health behaviors and chronic health outcomes among vulnerable Hispanic populations. Despite this, many behavior change interventions continue to target individuals. This intervention builds on theory-based behavior change approaches and extends the emphasis from the individual to the household. Our study highlights several important considerations regarding the design of diabetes management interventions for rural Hispanic populations. Promotores, trusted members of the community, are a critical component for any intervention as they provide social support and encourage behavior change by building relationships based on trust and cultural understanding. Well-designed tools that provide step by step examples of behaviors, such as cookbooks, and that aid participants to monitor behavior change and behavioral outcomes, such as pedometers and glucose monitors, serve to build skills and improve confidence to achieve behavior change goals. Finally, targeting households is a promising strategy for creating a supportive environment for individual and family lifestyle changes that benefit the entire family unit.

**Funding Source(s):** NIH, CDC

**Poster Session and Number:** A, #277

**Friends, Families, and Schools: What Matters Most in Latino Youth Violence?**

Rashmi Shetgiri, University of Texas Southwestern Medical Center and Children’s Medical Center; Hua Lin, PhD, University of Texas Southwestern Medical Center; Glenn Flores, MD, University of Texas Southwestern Medical Center and Children's Medical Center

**Presenter:** Rashmi Shetgiri, M.D., M.S.H.S., Assistant Professor of Pediatrics, Pediatrics, University of Texas Southwestern Medical Center and Children's Medical Center, rashmi.shetgiri@utsouthwestern.edu
Research Objective: Violence among adolescents is a significant public-health problem, and disproportionately affects Latinos. Little is known about contextual risk and protective factors for Latino youth violence. The study objective was to identify individual, family, peer, and school risk and protective factors that predict violence involvement among Latinos.

Study Design: The National Longitudinal Study of Adolescent Health is a longitudinal survey of a nationally representative sample of 7th-12th grade students, using a school-based clustered sampling design, and consisting of interviews with youth, parents, and school administrators. Predictors at Wave 1, and the outcome at Wave 2, were analyzed among Latinos. The outcome was child involvement in violence (physical fighting/weapon use/violent injury) in the past 12 months. A continuous violence-involvement scale was created using 8 items, and dichotomized at the 80th percentile. Bivariate and stepwise multivariable logistic regression analyses examined associations of individual, peer, family, and school characteristics with violence involvement among Latino adolescents.


Principal Findings: 25% of the 3,349 Latino adolescents in this sample were involved in violence. In bivariate analyses, male gender (79% vs. 58%), past violent victimization (34% vs. 13%), violence exposure (54% vs. 32%), smoking (58% vs. 40%), drug use (69% vs. 39%), emotional distress, peer delinquency, and low family and school connectedness were significantly (p-value less than .01) associated with higher likelihood of violence involvement. Violence involvement was 30% for those in the highest tertile on the emotional distress scale vs. 19% for the lowest tertile (p=.02), and 32% for those in the highest tertile on the peer delinquency scale vs. 14% for the lowest tertile (p=.01). Eighteen percent of adolescents in the highest tertile on the family connectedness scale were involved in violence vs. 34% in the lowest tertile (p=.01), and 14% of adolescents in the highest tertile on the school connectedness scale were involved in violence vs. 42% in the lowest tertile (p=.01). In multivariable analyses, male gender (OR, 3.2; 95% CI, 1.6-6.3), drug use (OR, 2.6; 95% CI, 1.3-5), past violent victimization (OR, 2.4; 95% CI, 1.5-3.8), and violence exposure (OR 1.9; 95% CI, 1.1-3.4) predicted violence involvement, whereas higher school connectedness (OR 0.5; 95% CI, 0.3-0.7) and increasing age (OR 0.7; 95% CI, 0.6-0.7) were protective. Peer and family factors were not associated with violence involvement.

Conclusions: One in four Latino youth is involved in violence. Male gender, drug use, past violent victimization, and violence exposure are important risk factors, and school connectedness and older age may be protective. Peer and family factors are not associated with violence involvement, after adjusting for individual and school factors.

Implications for Policy, Delivery, or Practice: The study findings suggest that interventions to reduce Latino youth violence may need to address drug use and victimization from and exposure to violence. Enhancing school connectedness may prove to be a particularly effective violence prevention-strategy for Latino youth.

Funding Source(s): NIH
Poster Session and Number: A, #278

Patient Responses to a Brief Patient Health Assessment: Is Non-Response a Clinical Concern?
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Presenter: Stephanie Shimada, Ph.D., Research Health Scientist, Center for Health Quality, Outcomes, and Economic Research, Bedford VA Medical Center, stephanie.shimada@va.gov

Research Objective: Routine collection of patient-reported data to assess patient behavioral risk factors has the potential to assist patients and their providers with improved health management. Patient responses can help flag problem behaviors and alert clinicians to the need for further psychological screening. Non-response to all or specific items is potentially problematic in that it may prevent an existing problem from being addressed – especially if
that non-response has the potential to widen disparities in the quality of care.

**Study Design:** A brief patient health assessment covering behavioral health domains relevant to primary care (diet, exercise, stress, mood, sleep apnea, tobacco, alcohol, and drug use) and patient demographic data was piloted with patients in 9 primary care practices (N=463). Data from the returned health assessments was analyzed with univariate and bivariate statistics and logistic regression to determine demographic characteristics associated with complete (all items answered) versus incomplete (some items left missing) health assessments.

**Population Studied:** Patients arriving for non-urgent primary care visits at one of nine primary care practices during the 1-3 week pilot implementation period were invited to participate. The practices included 4 federally-qualified health centers (FQHCs) in California, 4 primary care practices affiliated with practice-based research networks (PBRNs) in Vermont and Virginia, and a primary care clinic at a Veterans' hospital in Massachusetts.

**Principal Findings:** Overall, forty-six percent of health assessments were missing responses to one or more items, ranging from 28.5% incomplete at the FQHCs to 84.4% at the PBRNs. Health assessments with all items complete had a higher number of positive screens than those which were incomplete (4.1 vs 3.4 positive screens, respectively). Rates of non-response for individual items ranged from 0.22% for frequency of consuming fast food meals or snacks to 19.22% for minutes of exercise in the past week and 25.7% for frequency of illegal drug or prescription medication use. Younger age, not having completed high school, foreign birth, Hispanic/Latino origin, and membership in a non-African-American minority group were all significantly associated with completing all items. Being an African-American patient was associated with significantly lower odds of having completed all items. In a multivariable model race/ethnicity remained a significant predictor of completeness after adjusting for age, sex, education, and foreign birth.

**Conclusions:** Completeness of the health assessment varied significantly by site and was significantly associated with patient demographic characteristics. Cultural expectations surrounding clinicians’ authority, levels of trust in the medical profession, or the reluctance to answer certain types of questions in writing may be impacting patients’ willingness to complete all items.

**Implications for Policy, Delivery, or Practice:** Future research should correlate patient-reported responses on the health assessment with evidence on health behaviors in the medical record to improve our understanding of the meaning of non-response on items, and to discern whether certain groups are more susceptible to social desirability bias. Providers reviewing self-reported health assessments with patients may want to verbally inquire about incomplete items to ensure that incompleteness does not result in failure to target harmful health behaviors.

**Funding Source(s):** Other, NCI, VA

**Poster Session and Number:** A, #279

**Disparities in the Quality of Adjuvant Treatment for Breast Cancer**

Melony Sorbero, RAND; Andrew W. Dick, RAND Corporation; Ann C. Haas, RAND Corporation; Ann S. Hamilton, University of Southern California; Kendra L. Schwartz, Wayne State University; Jennifer J. Griggs, University of Michigan

**Presenter:** Melony Sorbero, Ph.D., M.P.H., M.S., Policy Researcher, RAND, melony_sorbero@rand.org

**Research Objective:** Black women and women of lower socio-economic status (SES) experience worse breast cancer outcomes than white women, and the differences are not fully accounted for by differences in stage at presentation and tumor biology. The objectives of this study were to assess whether the quality of care (guideline-concordant chemotherapy, radiation therapy, and endocrine therapy), differed by race and neighborhood SES, and whether those differences persisted after controlling for other patient characteristics and disease characteristics.

**Study Design:** Drawing from the universe of women diagnosed with breast cancer in two SEER registries, we selected a random sample stratified by race/ethnicity and vital status. Sampled women were invited by mail to participate in a retrospective study of breast cancer treatment patterns and outcomes. One registry required that family members of deceased women be approached for consent, while the other registry did not. Once consent was obtained, physicians involved in the women’s treatment were contacted to request
access to their medical records for abstraction by trained SEER staff. We abstracted data from surgical, radiation therapy, and oncology charts. We contacted primary care physicians for long-term follow-up information as necessary. Data collected included subject socio-demographic characteristics, type of insurance, tumor characteristics, treatment course, detailed radiation and chemotherapy dosing information, timing of treatments, breast cancer recurrences and vital status in 2012. We developed measures of the quality of adjuvant treatment, including the guideline-concordant receipt of chemotherapy, radiation therapy and endocrine therapy based on guidelines in place at the time of diagnosis. SES was assessed using a composite of 6 measures from the census data at the block group level. Weighted logistic regression models assessed differences in the receipt of guideline concordant chemotherapy, radiation therapy, and endocrine therapy by race/ethnicity and SES controlling for demographic characteristics, tumor characteristics, comorbidities, treatment site, and year of treatment.

**Population Studied:** Women diagnosed with breast cancer 1998-2004 who resided in the catchment area of two SEER registries at the time of their diagnosis.

**Principal Findings:** The analytic sample included 1936 women. Black women were less likely to receive guideline concordant radiation therapy (p=.02) and endocrine therapy (p=.01) than non-Hispanic white women. There were no significant differences in guideline concordant chemotherapy by race. Women in the bottom quartile of SES were less likely to receive guideline concordant endocrine therapy (p<.01) than women in the top quartile of SES, but there were no significant differences in the receipt of guideline concordant chemotherapy or radiation therapy. In multivariate analyses, women in the lowest SES quartile were less likely to receive guideline concordant endocrine therapy, but race was no longer significant. SES did not remain significant for the other measures of guideline concordant care. Type of insurance was associated with guideline concordant endocrine therapy.

**Conclusions:** Observed racial disparities in the receipt of guideline concordant care region specific and are mitigated when controlling for SES and type of insurance. Disparities in the receipt of guideline concordant adjuvant therapy may contribute to documented disparities in outcome.

**Implications for Policy, Delivery, or Practice:** Improved insurance coverage through ACA implementation may reduce regional variation and disparities in breast cancer quality of care.

**Funding Source(s):** NIH

**Poster Session and Number:** A, #280

**Disparities in Outcome Among Women with Breast Cancer: Are They Due to Disparities in Quality of Care?**

Melony Sorbero, RAND Corporation; Andrew W. Dick, RAND Corporation; Hao Yu, RAND Corporation; Ann C. Haas, RAND Corporation; Ann S. Hamilton, University of Southern California; Kendra L. Schwartz, Wayne State University; Jennifer J Griggs, University of Michigan

**Presenter:** Melony Sorbero, Ph.D., M.P.H., M.S., Policy Researcher, RAND Corporation, melony_sorbero@rand.org

**Research Objective:** Black women and women with low SES have worse outcomes after breast cancer than other women, and these differences are not fully accounted for by differences in disease characteristics. The objectives of this study were to assess the role of the quality of adjuvant therapy, defined as the receipt of guideline-concordant adjuvant treatment, in the disparities in outcomes.

**Study Design:** Drawing from the universe of women diagnosed with breast cancer in two SEER registries, we selected a random sample stratified by race/ethnicity and vital status. Sampled women were invited by mail to participate in a retrospective study of breast cancer treatment patterns and outcomes. One registry required that family members of deceased women be approached for consent, while the other registry did not. Once consent was obtained, physicians involved in the women’s treatment were contacted to request access to their medical records for abstraction by trained SEER staff. We abstracted data from surgical, radiation therapy, and oncology charts. We contacted primary care physicians for long-term follow-up information as necessary. Data collected included subject socio-demographic characteristics, type of insurance, tumor characteristics, treatment course, detailed radiation and chemotherapy dosing information, timing of treatments, breast cancer recurrences and vital status in 2012. We developed measures of the quality of adjuvant treatment, including the guideline-concordant receipt of...
Chemotherapy, radiation therapy and endocrine therapy based on guidelines in place at the time of diagnosis. SES was assessed using a composite of 6 measures from the census data at the block group level. Outcomes assessed were recurrence-free survival, event-free survival and overall survival. Weighted Cox proportional hazard models were used to assess whether the observed disparities were reduced when measures of guideline-concordant adjuvant treatment were introduced into the models, controlling for sociodemographic characteristics, tumor characteristics, comorbidities, treatment site, and year of treatment.

**Population Studied:** Women diagnosed with breast cancer 1998-2004 who resided in the catchment area of two SEER registries at the time of their diagnosis.

**Principal Findings:** The analytic sample included 1936 women. Black women experienced worse outcomes than non-Hispanic white women (overall survival HR=1.44 p<.01; event-free survival HR=1.55 p<.001; recurrence-free-survival HR=1.57 p<.001). Race was not significant after controlling for SES, other patient characteristics and disease characteristics. Women in the bottom quartile of SES experienced significantly worse outcomes than women in the highest SES quartile in multivariate analyses (overall survival HR=2.12 p<.001; event-free survival HR=1.90 p<.001; recurrence-free-survival HR=2.07 p<.001). Measures of guideline concordant care were associated with improved outcomes, but did not substantively reduce the association between SES and outcomes.

Conclusion: Observed racial disparities in the receipt of guideline concordant care region specific and are mitigated when controlling for SES and tumor characteristics. Although disparities in the receipt of guideline concordant adjuvant therapy exist, controlling for these do not eliminate disparities in outcome by SES.

**Conclusions:** Observed racial disparities in the receipt of guideline concordant care region specific and are mitigated when controlling for SES and tumor characteristics. Although disparities in the receipt of guideline concordant adjuvant therapy exist, controlling for these do not eliminate disparities in outcome by SES.

**Implications for Policy, Delivery, or Practice:** While efforts to eliminate disparities in the quality of breast cancer treatment may reduce disparities in outcomes among women with breast cancer, these efforts are unlikely to eliminate outcome disparities without broader efforts to improve the health and well-being of low SES women.

**Funding Source(s):** NIH

**Poster Session and Number:** A, #281

**Adverse Patient Safety Events and Complications in Hospital Care: Do Outcomes at the Same Hospital Vary by Payer?**

Christine Spencer, University of Baltimore; Darrell J. Gaskin, Johns Hopkins Bloomberg School of Public Health; Eric T. Roberts, Johns Hopkins Bloomberg School of Public Health

**Presenter:** Christine Spencer, Sc.D., Associate Professor, School of Public Affairs, University of Baltimore, cspencer@ubalt.edu

**Research Objective:** This study uses patient safety quality indicators at the hospital level by payer status and answers the question: do patients at the same hospital receive different quality of care depending on their payer status?

**Study Design:** We conducted a cross-sectional analysis using acute care state inpatient discharge (SID) data from 11 U.S. states. To measure quality, we computed payer specific hospital-level inpatient safety indicators for 15 procedures. The Patient Safety Indicators (PSI) provide information on adverse events and complications experienced after surgery and other procedures. We used version 4.3 of the software provided by the Agency for Health Care Research and Quality to calculate the PSIs. Following AHRQ recommendations to produce stable rates, PSIs were only calculated in hospitals which had at least 30 cases in each payer group. We also used data from the AHA Annual Survey of Hospitals to identify hospital specific characteristics that may impact the quality of care received by payer status. These hospital characteristics included financial well-being of the hospital, safety-net status, teaching status and ownership.

We used t-tests to detect differences in risk-adjusted quality indicators between Private payers and Medicaid, Self-pay, Medicare or other at the individual hospital level. These t-tests were only calculated for hospitals with at least 30 cases for the payer groups being compared. Hospital level regressions were also estimated to identify which hospital characteristics had the most impact on quality of care received by payer status. Using linear regression analysis, we estimated a base model...
using the payer composition of the hospitals’ discharges and a constant term. We then estimated a second model controlling for several hospital characteristics: ownership, bed size, teaching status, patient-to-nurse ratio, health system membership, safety-net status, and percentage of Medicare patients. We also used weighted least squares regression to estimate the association between the percentages of private, Medicare, Medicaid and Lowpay patient discharges and individual PSIs.

**Population Studied:** All inpatient discharges from the following 11 states (AZ, CA, NY, FL, IA, MD, MA, NJ, NC, WA, WI) were obtained for 2006 through 2008. We excluded hospitals with fewer than 100 beds, non-acute care general hospitals and federally owned hospitals.

**Principal Findings:** Preliminary results indicate that there are some differences in risk adjusted adverse events and complications by payer status for certain indicators at the individual hospital level. These differences are especially pronounced for Medicare vs. Private payers and Medicaid vs. Private payers. In both sets of comparisons Medicare and Medicaid patients have worse outcomes than Private patients treated at the same hospital.

**Conclusions:** Our study indicates that within hospital differences in quality exist across payer type. Although the private pay group tends to have lower risk-adjusted mortality on most of the PSI measures, there are several indicators in which private patients do notably worse than the other payer groups. Policymakers should pay particular attention to how well patients fare under various insurance plans, since there does appear to be a difference.

**Implications for Policy, Delivery, or Practice:** Given the observed differences in adverse events and complications by payer status at the individual hospital level, payer specific quality improvement efforts may be warranted. Furthermore patient safety quality data should be collected by payer status for display on hospitals’ quality performance scorecards or dashboards as a tool to promote quality of care. These results are especially significant given the PPACA reliance on Medicaid expansions to improve coverage.

**Funding Source(s):** CWF

**Poster Session and Number:** A, #282

**Socioeconomic Status and Hospital Variation in 30-Day AMI Episode-of-Care Payments**

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**Presenter:** Steven Spivack, MPH, Research Project Coordinator, Yale-New Haven Hospital Center for Outcomes Research and Evaluation, steven.spivack@yale.edu

**Research Objective:** Patients of low socioeconomic status (SES) may require greater healthcare resources due to higher disease burden or lack of social support. This could lead to costlier care at hospitals with high proportions of low SES patients. However, studies have also demonstrated that low SES patients are less likely to get expensive invasive procedures for cardiovascular disease, which may shift costs to the outpatient setting. We examined how payments for a 30-day episode-of-care following acute myocardial infarction (AMI) differ for hospitals with higher and lower proportions of Medicaid patients.

**Study Design:** Using Medicare claims, we performed a national study of hospitals with one or more AMI discharges (principal discharge diagnosis of ICD-9 codes 410.xx excluding 410.x2). To create comparable 30-day episode-of-care payments across hospitals, we standardized payments by removing or averaging Medicare-specific geographic and policy payment adjustments associated with each care setting. For each hospital, we calculated a risk-standardized payment (RSP) using hierarchical generalized linear models to isolate any hospital-specific effect and account for clustering of patients within hospitals. We risk-adjusted payments for patient age, history of cardiac procedures, and select comorbidities in the 12 months preceding hospitalization including the index admission, but not
complications of care. Medicaid coverage was used as a proxy for low SES. We limited our analyses to hospitals with 25 or more AMI index admissions and compared RSPs for hospitals with the highest (greater than 30 percent) and lowest (10 percent or less) proportion of Medicaid patients. We also compared the proportion of unadjusted payments attributed to index and post-acute care for these two groups. Data were analyzed using two-sample t-tests (alpha=0.05).

**Population Studied:** Medicare fee-for-service beneficiaries 65 or older hospitalized for AMI in 2008.

**Principal Findings:** Our final sample included 1,864 hospitals. 268 had more than 30 percent of patients with Medicaid coverage and 531 had 10 percent or less. Hospitals with the highest proportion of Medicaid patients had a significantly lower (p less than 0.0001) RSP (mean = 19,962 dollars) than hospitals with the smallest proportion of Medicaid patients (mean RSP = 20,455 dollars). In addition, hospitals with the highest proportion of Medicaid patients spent a significantly lower (p less than 0.0001) proportion of their overall payments during the index admission (mean = 74.5 percent) than hospitals with the lowest proportion of Medicaid patients (mean = 77.4 percent).

**Conclusions:** As a group, hospitals that cared for the highest proportion of Medicaid patients had a lower RSP for a 30-day episode-of-care for AMI. In addition, on average, hospitals that cared for the highest proportion of Medicaid patients spent a lower proportion of 30-day episode-of-care payments for AMI during the index admission but a higher proportion during post-acute care.

**Implications for Policy, Delivery, or Practice:** Lower RSPs for an AMI episode-of-care initiated at hospitals with a greater share of Medicaid patients may be driven by lower rates of invasive procedures. Patients at these hospitals, however, incur greater cost in the immediate post-discharge period. This finding may reflect inherently higher needs for services such as skilled nursing care among low SES patients or may represent compensatory costs for the lower intensity of inpatient care (e.g. follow-up procedures or re-hospitalizations).

**Funding Source(s):** CMS

**Poster Session and Number:** A, #283

Reducing Ethnic Disparities for Colorectal Cancer Screenings
Patricia Stream, UnitedHealth Group; Jack Newsom, ScD, Silverlink Communications

**Presenter:** Patricia Stream, M.S.Ed.,B.S.N., Vice President, Quality Management & Performance, Quality Management & Performance, UnitedHealth Group, patricia_a_stream@uhc.com

**Research Objective:** To identify causes of ethnic disparities in colorectal cancer screening rates and to use these findings to systematically improve preventive care in these hard-to-reach and hard-to-engage populations.

**Study Design:** Through a series of annual communications campaigns starting in 2009 and continuing through today, UnitedHealthcare and Silverlink are working to close gaps in preventive care. Our work reduces health disparities for colorectal cancer screenings and tests the effectiveness of several strategies to motivate behavior. We use predictive algorithms to project ethnicity, and our interventions test voice gender, ethnically framed messaging, barriers, channel sequencing, and cultural beliefs messaging. We are currently evaluating 2012 results to assess the efficacy of technology-assisted care management and gender-specific messaging.

Our campaigns target members who have not participated in recommended screenings. We use engaging, personalized and ethnically framed messages; emphasize the importance of screenings; and help individuals overcome barriers to care. Claims data is used to measure the effectiveness of each strategy in motivating screenings.

**Population Studied:** The population studied includes Caucasians, Asians, Hispanic-Latinos and African Americans, representing 647,440 people. The number studied each year varies. In 2009, we targeted 51,017; in 2010, 23,057; in 2011, 103,553; and in 2012, 469,813. Control groups and comparison groups are used to measure the impact of each intervention.

**Principal Findings:** Use of ethnically framed messaging and voice gender in 2009 improved screening rates by 56% versus a control group. A male voice improved screening rates among Hispanics by 89%, while ethnic-framed messages improved screening rates among Hispanics by 10%.

Our 2010 intervention tested communications sequencing, and our findings show that a call
followed by a letter was 43% more effective in driving screenings across the entire population. In 2010, screenings among Hispanics improved 20% versus a comparison group. In 2011, cultural-beliefs messaging resulted in overall screening rate improvement of 42% versus a comparison group. There was a 5% screening rate improvement for African Americans when a cultural-beliefs message emphasizing self-efficacy was used. If selected for presentation, results from our 2012 intervention will be included in our findings, where we test integration of technology and care management ("high-tech and high-touch") and gender-specific messaging. 

Conclusions: Through a series of test-and-learn interventions, with control and comparison groups, measurable improvements in colorectal cancer screening rates can be achieved across ethnic populations. Predictive algorithms can be used to successfully project ethnicity and subsequently measure the impact of interventions to close gaps in care. Our systematic approach includes leveraging consumer marketing principles such as barrier collection, personalized messaging, and a test-and-learn methodology. By collecting barriers and comparing results across ethnic populations, we also identify insights for each ethnic group, and can use this information to inform future outreach.

Implications for Policy, Delivery, or Practice: As a result of our ongoing research, we have recommendations for how to effectively close ethnic disparities related to colorectal cancer screenings, and on a broader level for preventive care. We also believe our recommendations for motivating health behaviors should be considered when ethnic disparities exist for chronic conditions and associated care.

Funding Source(s): Other, United-Healthcare

Presenter: Deborah Swavely, DNP, RN, Administrator, Community Health and Health Studies, Lehigh Valley Health Network, deborah.swavely@lvh.com

Research Objective: Low health literacy (LHL) is more prevalent in persons with limited education, members of ethnic minorities, and those who speak English as a second language. Multiple studies have linked LHL to adverse health outcomes, increased hospitalizations, and higher utilization of emergency care. This is especially true in the context of chronic disease, such as diabetes, where self-management skills are a critical component of care. Individuals with diabetes and LHL have been shown to have poorer knowledge of disease processes and methods for managing their disease. Studies examining the impact of LHL on diabetes outcomes have shown LHL to be an independent predictor of poor glycemic control, higher rates of retinopathy, and more frequent episodes of hypoglycemia.

The objective of this study was to examine the effectiveness of a LHL and culturally sensitive diabetes education program in improving knowledge, self-care behaviors, self-efficacy, and A1C for economically and socially disadvantaged adult patients with type 2 diabetes.

Study Design: Short term outcomes were observed prospectively over twelve months for patients who completed a culturally sensitive LHL diabetes education program. The program was provided by diabetes educators who received training on LHL education and cultural sensitivity. It consisted of both individualized and group diabetes education in English and Spanish languages for adults with type 2 diabetes, encompassing 13 hours of education over 12 weeks. The U.S. Diabetes Conversation Maps and curriculum were used for group classes, with education on diet and medications offered as individualized sessions. Health literacy was measured using the STOFLHA. Outcome data were collected using patient surveys and clinical lab values.

Population Studied: Adult patients with type 2 diabetes referred to the program from primary or specialty care practices.

Principal Findings: Overall, 77.4 percent of the patients were Hispanic, mostly Puerto Rican, living in the United States for longer than 10 years, and preferred to speak Spanish. The mean age was 56.8; 66 percent were female. Over 87 percent of the patients had Medicare or
Medicaid and 12 percent had no insurance coverage. Most patients were low income and nearly half did not have a High School Diploma. At baseline 63.2 percent of patients had adequate health literacy, with 11.3 percent of patients scoring in the marginal, and 25.5 percent of patients in the inadequate health literacy categories. Over the study period 277 patients were enrolled in the program, with 106 participants completing survey data. At the completion of the program patients had significant improvements in diabetes knowledge (p=0.001), self-efficacy (p=0.001), and three domains of self-care including diet (p=0.001), foot care (p=0.001), and exercise (p=0.001). There were no significant improvements in blood glucose testing (p=0.345). Additionally, A1C values significantly improved three months after completing the program (p=0.007).

**Conclusions:** A diabetes education program designed to be culturally sensitive and meet the needs of individuals with LHL improves short term outcomes.

**Implications for Policy, Delivery, or Practice:** It is essential for diabetes education programs, specifically for patients who are socially and economically disadvantaged, to be culturally sensitive and address LHL needs.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #285

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**Perceptions of Postpartum Traditions, Postpartum Depression, and Help-Seeking among Vietnamese American Mothers**

Van Ta Park, San Jose State University; Deepika Goyal, San Jose State University; Hong Lien, San Jose State University; Ninh Le, San Jose State University; Denise Rosidi, San Jose State University

**Presenter:** Van Ta Park, Ph.D., M.P.H., Assistant Professor, Health Science, San Jose State University, van.ta@sjsu.edu

**Research Objective:** Postpartum depression (PPD) is a leading cause of maternal morbidity affecting 20-65% of mothers worldwide. There is limited representation of Asian Americans (AA), including Vietnamese, in research. This is concerning because research suggests that AA underutilize mental health services. Furthermore, AA are the fastest growing racial minority population in the U.S. and Vietnamese comprise one of the largest AA subgroups. The research objective of this study is to gain insight on Vietnamese American mothers’ perceptions of postpartum traditions, PPD, and help-seeking.

**Study Design:** This mixed methods study was conducted in Northern California. This study comprised of semi-structured interviews and quantitative surveys (demographic survey, health services questionnaire, Edinburgh Postnatal Depression Scale (EPDS)). An EPDS score of 10 or greater suggested PPD. Vietnamese participants were recruited through flyers, emails, and providers. Interviews were conducted in English and Vietnamese. Participants were asked to describe how PPD is viewed in their culture, their postpartum traditions and help-seeking attitudes and behaviors including health services utilization. Quantitative analyses included descriptive statistics. Qualitative analyses were performed using NVIVO, and content analysis was conducted.

**Population Studied:** A convenience sample of 15 Vietnamese mothers who had delivered a single live infant in the past year participated in this study. All mothers were married and the mean age was 32.3 (SD=4.3) years. The number of years mothers said they have been living in the U.S. ranged from 5-35 with a mean of 18 (SD=8.6). Most of the mothers (93%) were born in Vietnam, half (53.3%) reported being employed full-time, 40% were on maternity leave, and 6.7% were unemployed. Four out of five mothers reported college as their highest level of education with the remaining mothers reporting high school education (6.7%) and degree graduate education (13.3%). Nearly half of the interviews were administered in Vietnamese (46.7%).

**Principal Findings:** Total EPDS score ranged from 0-16, and the mean score was 7.2 (SD=5.4). Overall, 33.3% had an EPDS score of 10 or greater, which indicates a high risk of developing PPD. Mothers reported that postpartum traditions played important roles in their well-being as well as maintaining strong cultural values. However, many reported feelings of isolation and desiring experiencing postpartum traditions more frequently. Some mothers reported that PPD is not understood in their culture. However, all reported that they would seek professional help if needed, but only if their sadness/depression was severe and/or as a last resort given the cultural barriers to help-seeking. Many mothers preferred to use other methods to treat sadness/depression such as seeking social support. Mothers also reported...
that there were cultural barriers to help-seeking such as stigma and shame.

**Conclusions:** Findings of this study revealed that one third of the Vietnamese mothers reported experiencing PPD symptoms. Additionally, findings revealed that Vietnamese mothers were more likely to seek alternative help for depressive symptoms and that PPD was not understood or addressed in their culture.

**Implications for Policy, Delivery, or Practice:** Future PPD interventions should consider the importance of postpartum cultural traditions and the presence of cultural barriers to help-seeking as ways to prevent the adverse effects of untreated PPD to the mother and baby.

**Funding Source(s):** Other, SJSU CASA Incentive Grant; SJSU RSCA Grant

**Historical Trend in the Disparity Implications of Applying Medicare MTM Eligibility Criteria among the Non-Medicare Population**

Junling Wang, University of Tennessee; Yanru Qiao, University of Tennessee

**Poster Session and Number:** A, #286

**Research Objective:** Previous studies reported that racial and ethnic minorities would have lower likelihood of meeting the Medicare eligibility criteria for medication therapy management (MTM) services than non-Hispanic Whites (Whites) among the non-Medicare population. This study aims to determine whether the MTM eligibility criteria would perform better in the future by examining the historical trend of MTM disparities from 1996-1997 to 2007-2008.

**Study Design:** Retrospective observational data analysis.

**Population Studied:** This study analyzed the non-Medicare adult population from the Medical Expenditure Panel Survey from 1996-1997 to 2007-2008. Proportions and the odds of meeting MTM eligibility criteria were compared between Whites and two minority population, non-Hispanic Blacks (Blacks) and Hispanics using chi-square test and logistic regression. The trend of disparities was examined by including in regression models interaction terms between the racial and ethnic groups and the latter time period. MTM eligibility criteria used by health plans in 2008 and 2010-2011 were examined. Main and sensitivity analyses were conducted to represent the entire range of the eligibility thresholds used by health plans.

**Principal Findings:** According to the main analysis examining the performance of 2010 eligibility criteria in 1996-1997, the proportions of meeting MTM eligibility criteria among Whites, Blacks, and Hispanics were 5.19%, 3.67%, and 5.43% (p>0.05 for the comparison between Whites and each of the other groups). After adjusting for patient characteristics, Blacks and Hispanics had odds ratios for MTM-eligible of 0.52 (confidence interval: 0.34-0.81) and 0.94 (confidence interval: 0.61-1.44) compared to Whites. No evidence was found to support a change over time in these disparity patterns. Sensitivity analyses and analyses examining 2008 eligibility produced similar findings as above.

**Conclusions:** Racial disparities in meeting MTM eligibility criteria may not decrease over time unless MTM eligibility criteria are changed.

**Implications for Policy, Delivery, or Practice:** Medicare MTM eligibility criteria may not be followed by the non-Medicare population.

**Funding Source(s):** NIH, PhRMA Foundation

**Poster Session and Number:** A, #287

**Does a Physician's Attitude towards a Patient with Mental Illness Affect the Clinical Management of Diabetes? Results from a Mixed Method Study**

David C. Henderson, MD, Massachusetts General Hospital and Harvard Medical School; Lisa Welch, New England Research Institutes; Lisa C. Welch, PhD, New England Research Institutes; Heather J. Litman, PhD, New England Research Institutes; Christina P.C. Borba, PhD, MPH, Massachusetts General Hospital and Harvard Medical School

**Presenter:** Lisa Welch, Ph.D., Director, Center for Qualitative Research, New England Research Institutes, lwelch@neriscience.com

**Research Objective:** To determine whether physician attitudes towards patients vary by mental health comorbidity and whether this affects clinical management of a chronic condition (type 2 diabetes).

**Study Design:** A randomized factorial experiment in which physicians observed video vignettes of an established patient presenting with diagnosed but uncontrolled diabetes. Vignette patients were systematically varied by age, gender, race, and comorbidity type (depression, schizophrenia with normal affect
Verbal presentation was standardized. After viewing the vignette, respondents participated in a structured interview, wrote a chart note, and engaged in a semi-structured qualitative interview. Quantitative measures of physician attitudes towards the patient included four subscales: Ability to Manage Health, Personal Attributes (competence, warmth, etc.), Willingness to be Socially Connected with the Patient, and Patient’s Danger to Self/Others. Quantitative outcomes included number of each clinical action (tests, medications, advice); attention to glycemic control; and screenings for diabetes complications (cardiovascular disease, nephropathy, retinopathy, neuropathy, foot care). ANOVA models tested differences in attitude subscales by comorbidity, adjusting for patient, physician, and organizational characteristics. Linear regression models tested for relationships between attitude subscales and clinical actions. The qualitative interview addressed respondents’ impressions of the vignette patient, additional information they would include in the chart note if time permitted, and what they would discuss with a colleague that they did not include in the chart note. Qualitative thematic analysis was conducted by comorbidity group.

**Population Studied:** 256 primary care physicians

**Principal Findings:** Physicians rated patients with SBA lowest on the Personal Attributes subscale ($F=8.60, p<0.001$) and highest on the Danger subscale ($F=11.79, p<0.001$). Differences in attitudes that were attributable to comorbid mental illness (particularly SBA) did not predict management of diabetes as measured quantitatively, but qualitative data revealed differences in management of patients with SBA. Mental health co-morbidities generally increased engagement with patients about social history; however, physicians appeared to have less trust that patients with SBA would or could give reliable information, leading to more reliance on other sources rather than engaging the patient in his/her care. Additionally, physicians were more likely to tell colleagues about a schizophrenia diagnosis when the patient had a bizarre affect, thereby shaping expectations about the patient before interactions occurred.

**Conclusions:** Results are consistent with common stereotypes about people with serious mental illness, including perceptions of violent behavior. Importantly, comorbidity was the only difference across vignettes, and none of the vignettes included intentional indication of danger or unreliable reporting. Subtle differences in management of patients with comorbid SBA led to reduced engagement with them about their care and heightened risk of stigmatized interactions with staff, potentially leading to disparate quality of care over time. Different management of patients with SNA vs. SBA suggests that affect is an important contributor to variation in care.

**Implications for Policy, Delivery, or Practice:** Despite medical training, physicians are not immune to common stereotypes that can shape behavior, thereby potentially perpetuating these stereotypes. Reducing healthcare disparities requires attention to the more subtle aspects of managing patients—particularly those with an atypical affect—as seemingly slight management differences can engender disparate patient experiences over time.

**Funding Source(s):** NIH

**Poster Session and Number:** A, #288
GENERAL POSTERS

Identifying Barriers and Facilitators of Participation in a Population-Based Hypertension Management Program
Joseph Agostini, Aetna Medicare; Vanessa Flint, Aetna Medicare; Aaron Morel, Lucid Health; Randall Krakauer, MD, Aetna Medicare

Presenter: Joseph Agostini, M.D., Senior Medical Director, Aetna Medicare, agostinij@aetna.com

Research Objective: Less than half of people with hypertension in the U.S. are under adequate control. The Aetna Medicare Advantage Hypertension program identifies Medicare members with hypertension, from a total population of over 600,000. Members are invited to participate voluntarily and receive an automated blood pressure monitor along with monthly interactive voice response (IVR) calls for one year. Members self-report blood pressure measurements over the phone and receive automated feedback on results, and live nurse case management outreach, if indicated. Initial program implementation resulted in a 19% participation rate and statistically significant improvements in systolic and diastolic blood pressure outcomes and transition from inadequate to adequate control. The purpose of this qualitative study was to identify the barriers and facilitators of program participation in order to improve invitation materials and increase future participation rates.

Study Design: Qualitative study with telephonic and in-person focus group interviews to the point of thematic saturation, with Medicare members in Pennsylvania and New Jersey who were either: eligible but chose not to enroll, or currently enrolled hypertensive members.

Population Studied: 17 Medicare members, aged 65 years and older, with hypertension as defined by a claims-based algorithm using data such as pertinent hypertension diagnosis billing codes and recurrent prescription medication use.

Principal Findings: Among enrollees, facilitators of program participation included several themes: the receipt of a blood pressure monitor at no cost; a desire to be healthy; and a desire to live longer to be with family (e.g., grandchildren). Continued participation in the program for enrollees was facilitated by two common themes: the helpfulness of a reminder to check their blood pressure on a regular basis and track it via IVR; and the potential or reality of observing positive improvements in blood pressure measurements over time. Among non-enrollees, a common theme was limited or no recall of the invitation letter. A key barrier to participation was the belief among hypertensive patients that their blood pressure is adequately controlled, and, therefore, the program is not personally relevant or necessary. After reviewing the invitation materials again as part of the interview, non-enrollees cited the following factors that would improve their decision-making on program participation: more information on the free blood pressure monitor, citation of actual program results (e.g., change in blood pressure); the inclusion of motivating quotations from past program participants, with emotional- and rational-centered quotations rated as most compelling; and the presence of pictures included in the written, text-based invitation materials.

Conclusions: Identification of common barriers and facilitators of participation in this scalable, population-based health program for hypertension can be used to iteratively refine invitation and marketing materials.

Implications for Policy, Delivery, or Practice: Given the previously reported improvements in blood pressure outcomes that can occur with program participation, it is imperative to encourage widespread participation in a low cost program for older adults that decreases the risk of adverse cardiovascular outcomes for those with a potentially controllable risk factor.

Funding Source(s): Other, Aetna Medicare

Poster Session and Number: C, #909

Temporal Trends in Lyme Disease Diagnosis Rates by Gender and Health Plan
John Aucott, Johns Hopkins University School of Medicine; Lin Wang, Johns Hopkins HealthCare; Shannon Murphy, Johns Hopkins HealthCare; Jill Marsteller, Johns Hopkins Bloomberg School of Public Health; Maria Uriyo, Johns Hopkins HealthCare; Alyson Schuster, Johns Hopkins HealthCare; Alison Rebman, Lyme Disease Research Foundation; Peter Fagan, Johns Hopkins School of Medicine

Presenter: John Aucott, M.D., Assistant Professor Of Medicine, Medicine, Johns Hopkins University School of Medicine, jaucott2@jhmi.edu

Research Objective: To determine whether rates of first Lyme disease diagnosis vary by
gender, month of diagnosis, and type of health plan among a large sample of patients enrolled in either a Medicaid managed care organization or a commercial health plan.

**Study Design:** This retrospective study selected all members of a Medicaid managed care organization (MMCO) and a commercial health plan (CHP) between 2 and 65 years old who had an ICD-9 diagnosis of Lyme disease between July 1, 2004 and June 30, 2011 (the study period) based on medical claims data. For each study subject, the date of the first record of the Lyme disease diagnosis (FRLDD) in the claims data was recorded. A FRLDD rate was calculated for both health plans, and for each month in the study period. The FRLDD rate was defined as the number of plan members with FRLDD per 100,000. Mean FRLDD rate for each of the 12 months over the study period was calculated for the following strata: type of health plan (MMCO vs. CHP), and male/female groups within a health plan.

**Population Studied:** Medicaid beneficiaries and commercial health plan enrollees who were between 2 and 65 years old were included in the study.

**Principal Findings:** There were 348,445 unique MMCO members (58% female) and 112,057 unique CHP members (57% female) between 2 and 65 years old during the study period. Of the MMCO members, 912 (0.26%) were identified with FRLDD, of which 525 (58%) were women. Of the CHP members, 556 (0.50%) had a FRLDD, and 304 (55%) were women. For both MMCO and CHP, mean FRLDD rate showed an upward trend from January (3.7 and 6.4, respectively) to June (17.8, 35.0), followed by a downward trend to December (3.3, 5.8). The mean FRLDD rate in MMCO appeared lower than that in CHP. In addition to the seasonal pattern, the female group in both MMCO and CHP presented a slower downward trend of mean FRLDD rate than the male group. The FRLDD rate was higher among men during peak summer months, but higher among women in September to December.

**Conclusions:** The known seasonality of acute Lyme exposure is reflected in the upward trend in mean FRLDD rate for both plans during the spring and summer and the downward trend in the fall and winter. The observed difference in overall FRLDD between CHP and MMCO may reflect rural/urban or socioeconomic differences between members of the two groups. The higher FRLDD rate during fall months among women is previously unreported in the literature, and may represent gender-based differences in time to diagnosis, behavioral risk factors, provider bias or false positive diagnoses.

**Implications for Policy, Delivery, or Practice:** Clinical policy and practice have increasingly stressed consideration of gender-based differences for a range of disease settings. Our findings imply a previously unreported gender difference in Lyme disease diagnosis by month. As such, they would have important implications for future guideline development and suggest a need for continued research investigating not only the clinical implications of potential delayed diagnosis among women, but also gender-based patterns in care utilization and cost.

**Funding Source(s):** Other, Lyme Disease Research Foundation

**Poster Session and Number:** C, #910

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**Six-Month Cost Avoidance Analysis Associated with Reducing Hospital Readmissions Using The Care Transitions Intervention**

Rosa Baier, Healthcentric Advisors and Warren Alpert Medical School of Brown University; Qijuan (Emily) Li, MPH, Warren Alpert Medical School of Brown University; Rebekah Gardner, MD, Healthcentric Advisors and Warren Alpert Medical School of Brown University; Kristen Butterfield, MPH, Healthcentric Advisors; Eric Coleman, MD, University of Colorado; Stefan Gravenstein, MD, MPH, Healthcentric Advisors and Warren Alpert Medical School of Brown University

**Presenter:** Rosa Baier, M.P.H., Senior Scientist, Healthcentric Advisors and Warren Alpert Medical School of Brown University, rbaier@healthcentricadvisors.org

**Research Objective:** To evaluate the cost avoidance associated with implementation of the Care Transitions Intervention (CTI) in six hospitals in Rhode Island, and to provide benchmarks for financial outcomes from hospital readmission reduction programs such as the CTI.

**Study Design:** We used Rhode Island Medicare Part A and Part B claims data from January 1, 2009 through December 31, 2011 to evaluate utilization and costs using an episode-based approach, comparing patients who received the CTI (intervention group) to those who were offered the intervention, but declined to participate or were lost to follow-up before completing a central element of the intervention,
the home visit (control group). First, we used a one-to-one matching propensity score to control for differences between the intervention and control groups in the six months prior to hospital discharge (baseline). Key control variables included year, age, sex, race, dual eligible status and pre-existing conditions and comorbidities based on the CMS Hierarchical Condition Category model. Second, we examined episode-based bundled utilization and costs in the six-month period following hospital discharge. Utilization included 30-day readmissions and emergency department visits and observation stays per 1,000 Medicare beneficiaries; costs also included other outpatient visits, professional charges and post-acute care. Finally, we estimated cost avoidance by calculating gross differences between the intervention and control groups and subtracting intervention costs.

**Population Studied:** The CTI was implemented by Healthcentric Advisors, the Medicare Quality Improvement Organization for the state of Rhode Island. Our study population was fee-for-service Medicare patients hospitalized in six Rhode Island hospitals recruited to receive the CTI between 2009 and 2011. Initially, subject eligibility was based primarily on admission diagnoses for specific cardiac and respiratory conditions; after January 2010, increased intervention capacity allowed us to expand eligibility to include all admission diagnoses. We excluded subjects with limited English proficiency, with cognitive impairment (unless a caregiver was able to act as a proxy) and whose discharge plans included a nursing home or hospice.

**Principal Findings:** This study included 357 patients who received the CTI intervention and 1,033 controls who declined or did not complete the intervention. In this analysis, we used multivariate adjustment by subclassification on the propensity score to identify 357 matches from the control group for the 357 cases in the intervention group. Compared with the control group, the intervention group has lower rates of six-month hospital readmissions, emergency department visits and observation stays. The lower rates of emergency department visits and observation stays suggest less cost-shifting occurred in the intervention group. The intervention group also has lower overall costs for all services with the exception of professional costs (e.g., physician costs), which were higher than in the control group. Overall, we estimate the net cost avoidance at $532 per case per month (adjusted) for intervention subjects compared to the matched control subjects.

**Conclusions:** In this real-world implementation of the CTI, the intervention appears to result in avoided costs over the six-month period following discharge for an index hospitalization.

**Implications for Policy, Delivery, or Practice:** The bundled utilization and cost measures used in this analysis not only help to estimate the CTI’s cost avoidance, but also give healthcare providers and policymakers useful information and metrics to evaluate the impact and cost avoidance of hospital readmission reduction programs. These findings are particularly timely given the widespread adoption of readmission interventions, including the CTI; e.g., in Medicare-funded ACA Section 3026 Community-Based Care Transitions Programs, bundled payment approaches and Accountable Care Organizations.

**Funding Source(s):** CMS
**Poster Session and Number:** C, #911

**Patterns of Healthcare and Associated Costs in Medicare Beneficiaries with Schizophrenia: An Opportunity for Improvement?**
Robert Bailey, Janssen Services, LLC; James Muller, The Moran Company; John Fastenau RPh, MPF, Janssen Services, LLC; Rachel L. Feldman MPA, The Moran Company

**Presenter:** Robert Bailey, M.D., Director, Janssen Services, LLC, rbailey5@its.jnj.com

**Research Objective:** To evaluate healthcare patterns and associated costs in Medicare beneficiaries with schizophrenia (MBS) prior to and following a non-psychiatric related emergency room visit (ER) or inpatient hospitalization (IP).

**Study Design:** This retrospective, observational study used the 2009 and 2010 Medicare Standard Analytic Files to evaluate healthcare utilization and associated costs. MBSs with an index non-psychiatric ER or IP encounter from 7/1/2009-6/30/2010 were included. Patterns of healthcare and associated costs prior to and after the index event (3 months for ER/6 months for IP) were evaluated and compared. In MBSs with multiple encounters, the first encounter was used. Healthcare payments included all services except Part D prescription drug costs and were standardized to 2010 US dollars. Healthcare payments were categorized as pre-index, during index, and post-index encounter.
**Population Studied:** Community dwelling Medicare beneficiaries with schizophrenia.

**Principal Findings:** 5,660 MBSs were identified (4,528ER/1,132IP). Mean(SD) age was 49(14), 59% were male, 79% resided in metropolitan areas, and 77% received low income subsidies for Medicare premiums (proxy for dual eligibility). The most common comorbidities for ER were injury, hypertension, tobacco abuse, diabetes, and cardiac disease and for IP were metabolic disorders, hypertension, cardiac disease, diabetes, and injury. The most expensive comorbidities for ER were kidney disease, urinary tract infection, and diabetes; for IP were kidney disease, abdominal pain, pneumonia, and injury. For ER, the mean(SD) per beneficiary month outpatient physician encounters 3 months prior/post index encounter were Medical: 0.66(10.0)/0.83(10.9) representing a 25% increase, and Psychiatric: 0.51(9.6)/0.58(9.8) representing a 13% increase. For IP the mean(SD) per beneficiary month outpatient physician encounters 6 months prior/post index encounter were Medical: 0.81(13.7)/0.98(14.2) representing a 22% increase and Psychiatric 0.48(13.0)/0.53(12.3) representing an 11% increase. The frequency of outpatient physician encounters for both medical and psychiatric encounters approached baseline after 3 months for ER and 6 months for IP. Mean(SD) healthcare payments per beneficiary month for ER were: pre $910($21,578), during $598($543), post $1,163($29,968), during $12,528($15,463), post $3253($127,633) representing an 11% increase. The frequency of outpatient physician encounters for both medical and psychiatric encounters approached baseline after 3 months for ER and 6 months for IP. Mean(SD) healthcare payments per beneficiary month for ER were: pre $910($21,578), during $598($543), post $1,163($29,968), during $12,528($15,463), post $3253($127,633) representing a 180% increase from pre to post.

**Conclusions:** Non-psychiatric Emergency Room and Inpatient Hospital encounters are associated with a significant increase in healthcare resource utilization and associated costs. The pattern of increased outpatient visits approaches baseline within 6 months of the index encounter, suggesting a potential repetitive cycle of disengagement from the healthcare system. Most of the frequent and costly comorbidities are chronic diseases such as hypertension, diabetes, cardiac disease, and kidney disease. Regular contact with the healthcare system may improve outcomes, lessen the need for ER or IP care, and lower costs.

**Implications for Policy, Delivery, or Practice:** Identification of ways to engage Medicare beneficiaries with schizophrenia in healthcare and to maintain regular contact with the healthcare system may offer opportunities to lower healthcare costs.

**Funding Source(s):** Other, Janssen Services, LLC

**Poster Session and Number:** C, #912

**Hospital Utilization in Persons with Down's Syndrome**

Kathy Belk, MedAssets; Chris Craver, MedAssets

**Presenter:** Kathy Belk, Senior Manager, Health Data Analytic, MedAssets, kbelk@medassets.com

**Research Objective:** Down’s syndrome is a genetic disorder affecting approximately one out of every 700 babies born in the US each year. Individuals with Down’s syndrome have a higher risk of heart defects, respiratory illness and other health issues which vary in severity across individuals. The purpose of this analysis is to examine inpatient and outpatient hospital utilization for this patient population.

**Study Design:** Descriptive methods were used to perform a retrospective analysis examining inpatient admissions and outpatient visits as well as patient characteristics for this patient population. One way analysis of variance was used to test for differences between groups for continuous variables.

**Population Studied:** The study population includes 56,025 patients with a diagnosis of Down’s syndrome across 455 hospitals submitting to the MedAssets health system data for the January 2008 to December 2012 timeframe. Patients were limited to hospitals submitting data for 12 months to be included in the analysis for that year.

**Principal Findings:** This patient population had an average of 1.4 inpatient admissions and an average of 3.3 outpatient visits per year. The frequency of hospitalization increased with age with 1.3 admissions per year for patients less than a year old, 1.4 admissions for ages 1-18, 1.4 admissions for ages 19-40, 1.5 visits for ages 41-65, and 1.6 visits per year for those over the age of 65 (p < .0001). This effect was more pronounced in the outpatient setting where individuals over the age of 65 had 4.9 outpatient visits annually compared to 3.9 for those less than a year, 3.3 for age 1-18, 2.7 for age 19-40, and 3.3 for those between 41 and 65 (p < .0001). No differences were found in frequency of hospitalization between males and females.
Most admissions were for medical conditions (81.3%) with more than half of the conditions for patients over the age of 1 being for respiratory disease (25.3%), digestive conditions (10.6%), circulatory disorders (9.1%), and infectious diseases (8.1%). The length of stay for hospitalizations were the highest for patients less than a year in age (12.0 days) and those greater than age 65 (8.4 days) compared to patients between the ages of 1 and 18 (6.6 days), 19 and 40 (6.6 days) and 40-65 (7.3 days).

**Conclusions:** Persons with Down’s syndrome visit the hospital for a multitude of reasons. Frequency of hospital use increases with age in persons with Down’s syndrome. One limitation of the administrative data used for this analysis is that patients could not be tracked across hospitals therefore utilization is limited to same-hospital visits.

**Implications for Policy, Delivery, or Practice:**
Over the last twenty years the life expectancy has greatly increased among individuals with Down’s syndrome. As life expectancy increases so do the medical conditions requiring treatment in the hospital setting. Understanding treatments for these conditions in an aged Down’s syndrome population will become more important over time.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #913

**Payment for Healthcare Services Differs Depending on the Type of Providers:**

**Results from the National Hospital Ambulatory Medical Care Survey**
Joseph Benitez, University of Illinois at Chicago; Bettie Coplan, MPAS, PA-C, College of Health and Human Services, Northern Arizona University Phoenix - Biomedical Campus; Roderick S. Hooker, PhD, PA, The George Washington University School of Public Health and Health Services; Richard Dehn, MPA, PA-C, College of Health and Human Services, Northern Arizona University Phoenix - Biomedical Campus

**Presenter:** Joseph Benitez, MPH, PhD Candidate, Health Policy and Administration, University of Illinois at Chicago, jbenit3@uic.edu

**Research Objective:** The source of payment for health care services depends on a number of factors and varies widely depending on employment and geography. Growing evidence suggests that source of payment may be associated with type of provider. In this study, we examine source of payment by physician, physician assistant (PA), and nurse practitioner (NP).

**Study Design:** A pooled cross-sectional analysis of 132,000 patient visits from the National Hospital Ambulatory and Medical Care Survey (NHAMCS) during the time period. Binary logistic regression models were used to estimate the probability of treatment for each source of payment by provider seen. The sources of payment under observation included 1) Private/Managed Care, 2) Medicare, 3) Medicaid, 4) Worker’s Compensation, 5) Self pay, and 6) No charge (i.e. uncompensated/charity care).

**Population Studied:** A nationally representative sample that represents more than an estimated 36 million outpatient department hospital visits between 2005-2010.

**Principal Findings:** Compared to physicians, PAs were nearly twice as likely to treat patients whose primary source of payment was “Workman’s Comp.” Additionally, PAs and NPs were more likely to treat patients who paid out of pocket than were physicians. Physicians were more likely to be the provider for patients whose primary source of payment was private insurance, Medicaid, or Medicare.

**Conclusions:** Our findings suggest that triage of services to PAs and NPs may be occurring when patients are uninsured.

**Implications for Policy, Delivery, or Practice:**
Even after accounting for patient characteristics including severity of patient health status (proxy measured using number chronic conditions), the relationship remains consistent. These results provide some evidence of a division of labor among health care providers with respect to patients’ primary source of payment.

**Funding Source(s):** Other, Physician Assistant Education Association Research Grants Program

**Poster Session and Number:** C, #914

**The Effects of Geographic Concentration of Insurance Coverage on Access and Health Outcomes – Implications for How the Affordable Care Act’s Insurance Expansions Will Improve Access and Quality of Care**
Julia Berenson, The Commonwealth Fund; Cara Dermody, The Commonwealth Fund

**Presenter:** Julia Berenson, MSc, Senior Research Associate, The Commonwealth Fund, jb@cmwf.org
Research Objective: Currently, more than 48 million people are uninsured in the United States (U.S.), many of whom are low-income, racial and ethnic minorities, and otherwise vulnerable populations. The Patient Protection and Affordable Care Act (Affordable Care Act) will significantly reduce the number of uninsured adults with the expansion of Medicaid eligibility and the creation of new subsidized insurance coverage options through health insurance exchanges. Extending insurance coverage to populations is a critical and necessary step in improving access to quality health care. Recent research has demonstrated that state Medicaid expansions similar to those under the Affordable Care Act were associated with positive changes in access to care, health care use, financial strain, mortality, and other health outcomes for low-income adults. However, evidence regarding the geographic concentration of insurance coverage’s effect on access and health outcomes for populations within a region remains sparse. It will be important to understand the effects of geographic concentration of insurance coverage since states have some flexibility in the design of their exchanges and whether to expand Medicaid eligibility, which may have the unintended consequence of variation in insurance coverage across regions in the U.S. This analysis examines whether geographic areas with a high concentration of insured adults are significantly associated with improved rates of access and health outcomes for populations.

Study Design: The geographical unit of analysis is the hospital referral region (HRR), created by the Dartmouth Atlas of Health Care project. HRRs represent regional markets for tertiary medical care and include a city with at least one medical center that serves as a referral hospital for tertiary care. There are 306 HRRs across the U.S. Using national data from the Behavioral Risk Factor Surveillance System (BRFSS), Community Health Status Indicators (CHSI), and the American Community Survey (ACS), this analysis examines across HRRs the association between the percent of insured adults ages 18-64 (ACS) and various access and health outcomes, including: (1) the percent of adults who reported no cost-related problems with seeing a doctor within the past year (BRFSS); (2) the percent of at-risk adults who visited a doctor for a routine checkup in the past two years (BRFSS); and (3) the percent of live births with low birth weight (CHSI). We define a high concentration of insured adults as HRRs with the percent of insured adults above the national HRR median. Reporting is restricted to statistically significant differences. Using regression analysis, we control for income, race, education, population density, and health status within HRRs.

Population Studied: Data come from the BRFSS, CHSI, and ACS surveys that are based on a random, nationally representative sample of adults living in the U.S. This analysis limits the survey to adult respondents ages 19 to 64 within 306 HRRs.

Principal Findings: HRRs with a high concentration of insured adults are associated with a significantly higher percent of adults who reported no-cost related problems with seeing a doctor within the past year (p<0.05); higher percent of at-risk adults who visited a doctor for a routine checkup in the past two years (p<0.05); and reduced percent of live births with low birth weight (p<0.05). These differences remain statistically significant after controlling for income, race, education, population density, and health status of the HRRs.

Conclusions: Results of this analysis demonstrate that HRRs with a high concentration of insured adults are significantly associated with improved rates of access and health outcomes for populations. Our findings suggest that the geographic concentration of insurance coverage has a significant impact on populations’ health.

Implications for Policy, Delivery, or Practice: Under the Affordable Care Act, 29 million people in the U.S. are expected to gain insurance coverage by 2019. However, there will likely be variation in coverage across geographic areas within the U.S. States have flexibility with regard to the organization of state exchanges and also whether to implement Medicaid eligibility expansions under health reform. State policymakers should be aware that their decisions regarding whether and how to implement such policies concerning insurance coverage expansions will likely have significant effects on the health of populations, particularly low-income and otherwise vulnerable populations.

Funding Source(s): CWF

Poster Session and Number: C, #915

Does Public Reporting Have an Impact on Healthcare Disparities? A Systematic Review
Zackary Berger, Johns Hopkins School of Medicine; Taruja Karmarkar, Johns Hopkins School of Public Health; Emily Boss, Johns
Hypothesized a supply side effect, whereby minorities used the provided information to choose higher-quality providers. Others hypothesized a supply side effect, whereby hospitals would have a greater incentive to improve quality.

Possible negative relationships were frequently mentioned. On the demand side, some claimed that minorities may find PR data less relevant or harder to use, especially if PR is not tailored to them. On the supply side, disparities could be promulgated if health delivery organizations consciously “cherry picked” healthier patients or avoided certain patients subgroups in order to improve their public reporting measures. Finally, providers might avoid minorities, assuming that their increased risk would be incompletely adjusted for in the context of PR.

Conclusions: Empirical evidence relating PR and disparities is scant. Hypothesized mechanisms for the effect of PR on disparities have been documented in the literature and detailed recommendations for future research have been made.

Implications for Policy, Delivery, or Practice: More resources need to be devoted to understanding minorities’ views of PR, the design and testing of PR tailored to these needs, the impact of PR on disparities in access and patient outcomes. The differential effects of PR on vulnerable groups should be documented and the particular information needs of minorities addressed. Healthcare organizations should aim to improve risk adjustment while striving for fair comparisons, establishing guidelines related to PR for relevant subgroups.

Funding Source(s): No Funding

Poster Session and Number: C, #916

Study Design: We conducted a systematic review of all articles of any design related to public and quality reporting published prior to 2013 in PubMed, Scopus, PsycINFO, Sociological Abstracts, Social Science Citation Index (Web of Science), EconLit and Anthropology Plus. Our review found mixed evidence on the effect of PR on health outcomes. We then reviewed all full text articles for any claims regarding the relationship of PR to healthcare disparities.

Population Studied: Of the 1,967 articles identified, 337 were duplicates, 416 were deleted at title review and 312 at abstract review. Twenty articles met the criteria for inclusion in this review. Twelve articles were commentaries, editorials, or recommendations, 2 were systematic reviews, and 6 were original research.

Principal Findings: Two articles empirically assessed the effect of PR on disparities, one showing little influence on access to care by minorities in the hospital, another finding short-term improved patient sorting by risk in nursing homes. Other articles, spanning original research, systematic reviews, commentaries and editorials, speculated about possible associations between PR and disparities. The most-cited potential positive impact of PR on disparities was a conjectured demand-side effect, that PR would improve disparities as minorities used the provided information to choose higher-quality providers. Others hypothesized a supply side effect, whereby

Research Objective: Public reporting (PR) is a systematic effort to inform healthcare consumers about provider performance. Despite little evidence demonstrating a direct relationship between PR and disparities, competing schools of thought exist arguing that PR may either increase or decrease disparities in access or outcomes. We set out to document and classify all published statements about PR pertaining to a possible causal effect on healthcare disparities, to assess their validity, and to summarize research gaps identified in the literature.

Study Design: We conducted a systematic review of all articles of any design related to public and quality reporting published prior to 2013 in PubMed, Scopus, PsycINFO, Sociological Abstracts, Social Science Citation Index (Web of Science), EconLit and Anthropology Plus. Our review found mixed evidence on the effect of PR on health outcomes. We then reviewed all full text articles for any claims regarding the relationship of PR to healthcare disparities.

Population Studied: Of the 1,967 articles identified, 337 were duplicates, 416 were deleted at title review and 312 at abstract review. Twenty articles met the criteria for inclusion in this review. Twelve articles were commentaries, editorials, or recommendations, 2 were systematic reviews, and 6 were original research.

Principal Findings: Two articles empirically assessed the effect of PR on disparities, one showing little influence on access to care by minorities in the hospital, another finding short-term improved patient sorting by risk in nursing homes. Other articles, spanning original research, systematic reviews, commentaries and editorials, speculated about possible associations between PR and disparities. The most-cited potential positive impact of PR on disparities was a conjectured demand-side effect, that PR would improve disparities as minorities used the provided information to choose higher-quality providers. Others hypothesized a supply side effect, whereby

Research Objective: To help inform public health policymakers, we examined the cost-effectiveness (CE) of implementing a barbershop-based screening program for hypertensive Black men living in a large metropolitan area, while exploring the impact of varying (1) the program’s effectiveness and (2) the cost of linking a participant to follow-up primary care.

Study Design: A Markov model was developed to evaluate the CE of a blood pressure
screening program at Black-owned barbershops as program characteristics change. The model was motivated by our ongoing clinical trial of hypertension and colorectal-cancer-screening for Black men. We projected the risk of coronary heart disease (CHD), end stage renal disease (ESRD), congestive heart failure (CHF), myocardial infarction, stroke, and all-cause mortality as a function of systolic blood pressure (SBP) and other risk factors. The New York City-Health and Nutrition Examination Survey informed the distribution of patient characteristics and baseline comorbidities. Healthcare costs and health-related quality of life were estimated using Medicare’s hierarchical-condition-categories model and EQ-5D health utilities. The program’s effectiveness and cost of linking a participant to follow-up were informed through our clinical trial and other sources. A societal perspective was adopted with a lifetime horizon and 3% discount rate.

**Population Studied:** Simulated population of 261,349 Black men over the age of 50 living in New York City, 51% of whom have a self-reported income at or below 200% of the poverty level. Fifty-four percent report a highest education level of high school or less.

**Principal Findings:** The CE of the barbershop-based hypertension-screening program varied from $6284 per quality-adjusted life-year (QALY) to $8482 when the impact of the intervention on SBP fell from a reduction of 20 mmHg to 5 mmHg. Similarly, the CE varied from $5828 per-QALY to $7803 per-QALY when the cost of linking a participant to appropriate care increased from $100 to $1,000. The number needed to screen (NNTS) to prevent one case of incident CAD, ESRD, or CHF was 313, 2500, and 834 respectively. The NNTS to prevent any of these conditions ranged from a low of 148 when SBP fell by 20 mmHg to a high of 715 when SBP fell by 5 mmHg. If this program were adopted in all NYC black-owned barbershops (serving approximately 68,054 hypertensive Black men), 217, 28, and 82 cases of CAD, ESRD, and CHF could be prevented and $161,536,654 healthcare dollars would be saved.

**Conclusions:** The CE of the barbershop-based hypertension screening for Black men is sensitive to changes in the cost of linking participants to care, and the overall effectiveness of hypertension control. However, CE ratios remain favorable over a range of program assumptions.

**Implications for Policy, Delivery, or Practice:** Barbershop-based hypertension screening may reduce health disparities. Because hypertension is a disproportionately significant contributor to morbidity and mortality in Black men, innovative approaches to controlling blood pressure in urban communities should be explored.

**Funding Source(s):** CDC

**Poster Session and Number:** C, #917

**The Relationship Between Electronic Health Record Stage 1 Meaningful Use Objectives and Hospital Quality of Care**

Lori Bilello, University of Florida College of Medicine; Christopher Harle, PhD, University of Florida College of Public Health and Health Professions; Jeffrey Harman, PhD, University of Florida College of Public Health and Health Professions; R. Paul Duncan, PhD, University of Florida College of Public Health and Health Professions; Robert L. Cook, M.D., MPH, University of Florida College of Public Health and Health Professions

**Presenter:** Lori Bilello, Ph.D., M.B.A., M.H.S., Associate Director, Center for Health Equity and Quality Research, University of Florida College of Medicine, lori.bilello@jax.ufl.edu

**Research Objective:** As provisioned by the Health Information Technology for Economic and Clinical Health (HITECH) Act, hospitals can qualify for Medicare and Medicaid Electronic Health Records (EHR) incentive payments by achieving EHR Meaningful Use (MU). That policy reflects an assumption that improved use of information technology generally and electronic medical records specifically will result in improved care. This study assessed the relationship between meeting Stage 1 MU objectives and care quality in hospitals.

**Study Design:** We conducted a cross-sectional observational study by collecting survey data from Florida acute care hospitals in August 2010. The survey elicited hospital’s current EHR functionality according to Stage 1 MU measures. The survey data were augmented with ten CMS Hospital Compare quality measures related to heart failure and pneumonia care processes. We used Generalized Linear Model (GLM) regression with a binomial family and a logit link to relate hospital quality scores to the estimated number of MU objectives met. Also, in two separate regressions, we estimated the relationship between quality scores and two specific elements of Meaningful Use that may
have the greatest impact on care processes -- computerized provider order entry (CPOE), and clinical decision support systems (CDSS).

**Population Studied:** The survey population was all Florida licensed acute care hospitals with 162 of 211 Florida acute care hospitals (76.8%) responding to the survey.

**Principal Findings:** The number of MU objectives hospitals met was positively associated with Pneumococcal Vaccination Status (OR = 1.05, p = 0.05), and marginally positively associated with two other pneumonia measures - Initial Antibiotic Timing (OR = 1.03, p = 0.08) and Smoking Cessation Advice/Counseling (OR = 1.09, p = 0.06). One heart failure measure, Evaluation of Left Ventricular Systolic Function (OR = 1.08, p=0.01), also showed a significant positive association. Further, CPOE use was positively associated with two pneumonia measures: Initial Antibiotic Timing (OR = 1.69, p<0.01) and Initial Antibiotic Selection (OR = 1.52, p= 0.01). CDSS use was negatively associated with Discharge Instructions for heart failure patients (OR = 0.40, p= 0.01).

**Conclusions:** Using EHRs in the manner described by federal MU objectives was associated with higher quality for several hospital care processes. Researchers should continue to examine the relationship between meaningful use of EHRs and care quality as the federal EHR incentive program continues.

**Implications for Policy, Delivery, or Practice:** This study showed a modest positive impact of CMS Stage 1 MU objectives on several hospital quality measures in months leading up to the start of the federal EHR incentive program. As the program continues, stronger evidence of quality improvement will be needed to justify the substantial federal investments in EHR adoption and use. Since this study’s data were collected, thousands of hospitals received MU incentive payments and CMS finalized Stage 2 MU criteria. In the coming years, providers and policymakers should carefully monitor whether these adoption increases and more stringent MU criteria produce a stronger impact on care quality.

**Funding Source(s):** Other, State of Florida

**Poster Session and Number:** C, #918

**Organizational Characteristics Associated with Electronic Health Record “Meaningful Use” in Hospitals**

Lori Bilello, University of Florida College of Medicine; Christopher Harle, PhD, University of Florida College of Public Health and Health Professions; Jeffrey Harman, PhD, University of Florida College of Public Health and Health Professions; R. Paul Duncan, PhD, University of Florida College of Public Health and Health Professions; Robert L Cook, M.D., MPH, University of Florida College of Public Health and Health Professions

**Presenter:** Lori Bilello, Ph.D., M.B.A., M.H.S., Associate Director, Center for Health Equity and Quality Research, University of Florida College of Medicine, lori.bilello@jax.ufl.edu

**Research Objective:** As provisioned by the Health Information Technology for Economic and Clinical Health (HITECH) Act, hospitals can qualify for Medicare and Medicaid Electronic Health Records (EHR) incentive payments by achieving EHR Meaningful Use (MU). This study assessed the impact of having a Chief Medical Information Officer (CMIO) and other organizational characteristics on hospitals’ MU achievement.

**Study Design:** We conducted a cross-sectional observational study by collecting survey data from Florida acute care hospitals in August 2010. The survey elicited hospital’s current EHR functionality according to Stage 1 MU measures. The survey also elicited organizational characteristics including size, ownership status (for-profit versus non-profit), system affiliation, geographical location (rural versus urban), nurse staff to bed ratio, operating margin, CMIO presence, and IT staff to bed ratio. Using Poisson regression, we estimated the relationship between the number of MU objectives met by each hospital and their organizational characteristics.

**Population Studied:** The survey population was all Florida licensed acute care hospitals with 162 of 211 Florida acute care hospitals (76.8%) responding to the survey.

**Principal Findings:** Holding other characteristics constant, hospitals with CMIOs on staff reported achieving 16% or 2.4 more MU objectives than hospitals without a CMIO (IRR = 1.16, p<0.01). Also, urban hospitals met 32% or 4.7 more MU objectives than rural hospitals (IRR= 1.32, p<0.01). Finally, hospitals affiliated with a hospital or healthcare system met 22% or 3.2 more MU objectives than non-affiliated hospitals (IRR = 1.22, p<0.01).

**Conclusions:** This study shows the potential positive impact of a CMIO on hospital MU achievement. While other researchers have
identified organizational factors that are important for health information technology (HIT) adoption, we believe this is the first study to examine the impact of CMIOs on MU achievement across hospitals.

**Implications for Policy, Delivery, or Practice:**
From a policy perspective, hospitals should consider the value of having a CMIO to enhance the successful adoption and meaningful use of HIT systems. CMIOs can provide first-hand knowledge of clinical workflows, informatics skills, and IT expertise to effectively lead complex and challenging EHR implementations.

**Funding Source(s):** Other, State of Florida

**Poster Session and Number:** C, #919

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**Examining the Offer Rates Rates for Retiree Health Benefits**
Nathan Bostick, Health Research & Educational Trust; Matthew Rae, Kaiser Family Foundation; Kevin Kenward, Health Research & Educational Trust

**Presenter:** Nathan Bostick, M.A., M.P.P., Senior Researcher, Health Research & Educational Trust, andybostick@gmail.com

**Research Objective:** The Kaiser Family Foundation and The Health Research & Educational Trust Employer Health Benefits survey assesses annual trends in employer-sponsored health benefits. The survey includes questions about health coverage, premiums, employee contributions, and retiree benefits. This analysis sought to examine the offer rate for retiree health benefits and to determine if employers within the health care industry are more likely to offer health benefits to retirees, as compared to employers within other industries.

**Study Design:** The 2012 survey included 3,326 randomly selected public and private firms with three or more employees. This survey was fielded from January to May 2012 and ultimately attained an overall response rate of 47%. Survey weights were then created to render this sample more nationally representative of all national employers.

**Population Studied:** The weighted population examined within this study consisted of the 48,351 employers with two hundred or more employees who responded to questions as to whether or not they offered retiree health benefits. Employers in this population belonged to the following industries: agriculture, mining and construction (n=1320, 2.7%); manufacturing (n=4575, 9.5%); transportation, communications and utilities (n=2271, 4.7%); wholesale (n=1658, 3.4%); retail (n=1676, 3.5%); finance (n=4642, 9.6%); service (n=24,841, 51.4%); state/local government (n=1860, 3.8%); and health care (n=5507, 11.3%).

**Principal Findings:** Approximately 17.6% of employers within the health care industry reported providing health benefits to their retirees. This proportion was nearly the lowest across all industries, with the exception of the 9.4% offer rate observed within the retail industry. Offer rates for other industries were as follows: agriculture, mining and construction (19.3%); manufacturing (23.7%); transportation, communications and utilities (40.3%); wholesale (24.8%); finance (40.3%); service (19.4%); and state/local government (77.1%). The overall average offer rate across all industries was 24.6%.

However, when controlling for factors such as firm size, location and the presence of union workers, the percentage of part-time workers, the percentage of workers over age 50% and the percentage of low-wage workers (earning less than $24,000 annually), the health care industry was shown to offer health care benefits to retirees at a slightly higher than average rate (p<0.000).

**Conclusions:** The offer rate for retiree benefits appears to vary substantially across different industries, with the rate for the health care industry being comparatively low in absolute terms. However, other organizational and demographic factors are also statistically significant predictors of employers’ offer rates for retiree health benefits. When these factors are taken into consideration, the health care industry appears to offer benefits at a relatively high rate.

**Implications for Policy, Delivery, or Practice:** These findings are significant as health care coverage is strongly associated with health outcomes among patients. However, the availability of retiree health benefits is not uniform across all employers. In view of these significant variations in the offer rates between employers, it would appear that the presence of programs such as Medicare remain essential in providing coverage to individuals who may not otherwise have access to such a benefit.

**Funding Source(s):** Other, Kaiser Family Foundation

**Poster Session and Number:** C, #920
Operationalizing Asthma Analytic Plan using OMOP Common Data Model
Elias Brandt, American Academy of Family Physicians; Bethany Kwan PhD, MSPH, University of Colorado School of Medicine; Marion Sills MD, Children's Hospital Colorado; Barbara Yawn MD, MSc, FAAFP, Olmsted Medical Center; Monica Federico MD, Children's Hospital Colorado; Lisa Schilling MD, MSPH, University of Colorado School of Medicine

**Presenter:** Elias Brandt, BS, BA, Research Systems Analyst, National Research Network, American Academy of Family Physicians, ebrandt@aafp.org

**Research Objective:** To operationalize an analytic plan designed to model the association between practices’ medical home characteristics and asthma control in children and adults using a database of existing electronic health data structured according to the OMOP V4 Common Data Model.

**Study Design:** The Scalable Architecture for Federated Translational Inquiries Network (SAFTINet) was designed to federate electronic health data to support quality improvement and comparative effectiveness research (CER). Federated databases include existing administrative, clinical (e.g., from electronic health records; EHRs), Medicaid claims and enrollment data, and patient-reported data collected during routine clinical care, which have been harmonized to the Observational Medical Outcomes Partnership (OMOP) common data model (CDM) Version 4. The SAFTINet asthma study is a prospective, longitudinal cohort study, utilizing survey methodologies and secondary use of structured clinical, administrative, and claims data. Variables in the asthma protocol were operationalized using data elements available in an OMOP CDM V4 database.

**Population Studied:** The population consisted of adults and children with asthma cared for in participating primary care practices in SAFTINet. Participating practices are federally qualified health centers representing ~260,000 patients (30% covered by Medicaid), 500 providers, and four safety net healthcare organizations.

**Principal Findings:** To meet the needs of the SAFTINet CER protocols, we collaborated with OMOP to expand the OMOP V2 CDM to include care site, organization, and financial tables, resulting in OMOP CDM V4. OMOP CDM V4 is a person-centered common data model that contains and links data from various sources including EHR and claims databases. The tables in OMOP include person, condition occurrence, drug exposure, visit occurrence, and care site, among others. It was specifically designed to maintain relationships among patients, associated diagnoses, encounters, medications and procedures. The asthma protocol specifies the use of existing EHR and claims data to operationalize key variables in the analysis. The identification of a cohort of children and adults with asthma is based on diagnosis codes available in the condition occurrence table, as well as patient demographics. The primary outcome, evidence of asthma exacerbations, is determined using clusters of “asthma encounters” (condition occurrence and visit occurrence tables), prescribing patterns (drug exposure table), and asthma-related hospitalizations and emergency department visits (visit occurrence and care site tables, available from claims). Suspected confounders, such as race/ethnicity and asthma severity, are operationalized using the person table and the drug exposure table.

**Conclusions:** A critical step in using existing electronic health data from disparate healthcare organization with different EHRs for research is harmonization with a common data model. We worked with each of the partners to ensure that their data could conform to the OMOP V4 CDM and that the data required for the study was available in some form before outputting data to the federated database. Data conforming to the OMOP CDM V4 can be using to operationalize observational CER studies.

**Implications for Policy, Delivery, or Practice:** Even though EHRs all use different backend databases, they can be harmonized to a CDM for research purposes. We recommend that the EHR industry move toward having a standard data model so that the initial harmonization step is less cumbersome.

**Funding Source(s):** AHRQ

**Poster Session and Number:** C, #921

National Patterns of Pediatric Bipolar Disorder and Treatment in Relation to Comorbid Behavioral Conditions
Mehmet Burcu, University of Maryland; Rajakannan Thiyagu, Pharmaceutical Health Services Research Department, University of Maryland; Julie M. Zito, Ph.D., Pharmaceutical Health Services Research Department, University of Maryland; Daniel J. Safer, M.D., Departments of Psychiatry and Pediatrics, Johns Hopkins University
**Presenter:** Mehmet Burcu, M.S., Graduate Student, Pharmaceutical Health Services Research Department, University of Maryland, mburc001@umaryland.edu

**Research Objective:** Pediatric bipolar disorder (PBD) has drawn attention in recent years from published studies showing that the rate of clinician-reported diagnosis of bipolar disorder has increased dramatically among youth in the United States (1994 – 2003), with a corresponding increase in medications to treat it. Despite the high visibility of this topic, information is lacking on more recent pediatric bipolar visit patterns in terms of demographic and clinical characteristics, psychotropic medication use and the impact of comorbid conditions on its treatment. The objective of this study was to identify these patterns and, specifically, to assess the impact of comorbid behavior disorders on visit rates and psychotropic medication treatment in a nationally representative sample of ambulatory youth visits.

**Study Design:** In a cross-sectional study, PBD visits and total youth visits were extracted, analyzed at the visit level and assessed with population-weighted bivariate and multivariable methods. The main dependent variables are PBD visit rate and psychotropic medication use [total psychotropics (all 7 classes) and separately, antipsychotics, antidepressants, anticonvulsant-mood stabilizers, stimulants, lithium, anxiolytics and hypnotics, and alpha-agonists]. Other covariates included gender, age group (2-9; 10-14; 15-19), race/ethnicity, physician practice type, payment type, region of visit and comorbid psychiatric conditions.

**Population Studied:** The analysis draws on a nationally representative sample of pediatric outpatient visits to office-based physicians between 2003 and 2010, as captured in the National Ambulatory Medical Care Survey (NAMCS). There were 32,941 pediatric visits, of which 318 included the diagnosis of pediatric bipolar disorder.

**Principal Findings:** PBD visits were compared with total pediatric visits: Administrative differences showed that more PBD visits involved treatment by psychiatrists than by other practitioners (p=0.0001) and were privately insured (p=0.018). More PBD visits were associated with comorbid behavior disorders (73.22%) than without behavioral disorders. The rank order of psychotropic medication use was: antipsychotics (64.26%) followed by anticonvulsant-mood stabilizers (45.02%), stimulants (38.63%) and antidepressants (34.22%). Most of the PBD visits had prescribed antipsychotics in combination with one or more other drug classes (68.84%). When PBD visits were stratified by comorbid behavioral disorders, males, 2-9 year-olds, and those with non-private insurance had greater proportions of visits with comorbid behavioral disorders. While antidepressants were less common in PBD visits with comorbid behavioral disorders, stimulants and anxiolytics/hypnotics were significantly more commonly prescribed. The adjusted odds of PBD youth having a comorbid behavioral disorder compared with their non-behavioral counterparts was 3.7 (95% CI=2.1, 6.3) times greater during 2007-2010 compared with 2003-2006; 5.6 (95% CI=2.8, 11.1) times greater in 2-9 year olds compared with older youth; and 2.9 (95% CI=1.7, 5.0) times greater among males compared with females.

**Conclusions:** Behavioral conditions accompanying bipolar disorder are prominent in youth and recent patterns reflect complex medication regimens that warrant benefit-risk assessment in community populations.

**Implications for Policy, Delivery, or Practice:** Studies to evaluate evidence for the effectiveness, safety and tolerability of psychotropic combinations, particularly antipsychotics with stimulants, in the community treatment of pediatric bipolar disorder is warranted.

**Funding Source(s):** Other, UM-PHSR Department

**Poster Session and Number:** A, #90

**Concordance with Antibiotic Treatment Guidelines: Variations by Community Health Center and Private Physician Practices**

Craig Burns, The University of Oklahoma; Michael J. Miller, The University of Oklahoma College of Pharmacy; Donald L. Harrison, The University of Oklahoma College of Pharmacy; Michael J. Smith, The University of Oklahoma College of Pharmacy; Ari K. Mwachofi, The University of Oklahoma College of Public Health; Ann E. Lloyd, The University of Oklahoma College of Pharmacy

**Presenter:** Craig Burns, MS, College of Pharmacy, The University of Oklahoma, Craig-Burns@ouhsc.edu
Research Objective: Antibiotic-resistant infections are estimated to cost over 20 billion dollars annually in the US. In 2004, guidelines for the diagnosis and management of acute otitis media [AOM] in children were established to promote antibiotic stewardship. While prior research has demonstrated suboptimal adherence to treatment guidelines, little is known about whether physician practice setting is associated with guideline concordance. In particular, this study evaluated variations in the treatment of children, with AOM, seen at a Private Physician Practice [PPP] or a Community Health Center [CHC].

Study Design: This cross-sectional study utilized data from the National Ambulatory Medical Care Survey [NAMCS], a national survey of the use of ambulatory medical care services. Physician visits for patients between the ages of 6-months and 12 years old, diagnosed with AOM only, between 2006 and 2010, were included. Visits from patients with comorbid conditions that might involve the prescription of an antibiotic were excluded. A two-level practice setting variable, [Private Practice vs. Community Health Center], was created and served as the independent variable of interest. Consistent with the 2004 AOM treatment guideline, an indicator variable representing guideline concordance was created using age, febrile status, and type of antibiotic prescribed. In addition, cases were classified as guideline discordant if the temperature was not taken. Patient characteristics and antibiotic prescribing were summarized using descriptive statistics for each setting. Bivariable associations between practice setting and guideline concordance were evaluated using the design-based F statistic. A multivariable logistic regression model was used to evaluate the association between practice setting and guideline concordance while controlling for the covariates: sex; race/ethnicity; payment method; and geographic region. All analyses were performed using complex survey commands, which included weighting and sampling design variables to enable accurate population point estimates and standard errors.

Population Studied: 897 office visits for children aged 6-months to 12 years, diagnosed with AOM from 2006-2010, were identified. Of these, 802 visits occurred at PPPs and 95 occurred at CHCs. The sample was balanced for age, sex, and febrile status; however, significant differences were observed for race/ethnicity, payment method, and geographic region. More than seventy-five percent of patients received an antibiotic prescription, regardless of practice site.

Principal Findings: The percentages of guideline concordant visits were not significantly different between the PPP and CHC settings (27.44 vs. 24.73, p=0.7788) in bivariable analysis. When adjusted for sex, race/ethnicity, payment method, and geographic region, children seen at CHCs were equally likely to receive guideline concordant care compared to their peers at PPPs [AOR=0.69, p=0.421]. The observed relationship did not change regardless of whether the patient’s temperature was taken.

Conclusions: Although patients seen at CHCs were equally likely to receive guideline concordant care, overall concordance with AOM treatment guidelines is suboptimal, regardless of practice site.

Implications for Policy, Delivery, or Practice: This initial, descriptive study highlights the need for further research into the factors associated with guideline discordant care.

Funding Source(s): No Funding

Poster Session and Number: B, #497

The Agency for Healthcare Research and Quality Health Care Innovations Exchange: Sharing Innovative Solutions to Improve Quality and Reduce Disparities

Deborah Carpenter, Westat, Inc.; Judi Consalvo, Agency for Healthcare Research and Quality; Veronica Nieva, Westat; Susan Hassell, Westat

Presenter: Deborah Carpenter, RN, MSN, CPHQ, PMP, Senior Study Director, Westat, Inc.; deborahcarpenter@westat.com

Research Objective: Every day, health care professionals find novel ways of improving health care delivery and reducing disparities. However, the diffusion of innovative ideas and policies is slow and rarely reaches beyond institutional walls or across health care settings. As a result, providers often are not able to benefit from effective, already available solutions to improve care, enhance patient safety, and reduce disparities. The AHRQ Health Care Innovations Exchange addresses this challenge by providing readily accessible, evidence-based information to the health care community, with an aim to increase awareness, implementation, and uptake of innovative health care delivery strategies and policies in order to improve health care quality and reduce disparities. The target audience includes health practitioners and
administrators, quality improvement professionals, researchers, and policymakers. **Study Design:** To achieve this aim, the Innovations Exchange provides a rich, publicly available Web site (www.innovations.ahrq.gov) that offers free access to searchable descriptions of health care service delivery and policy innovations, in addition to tools to help users measure and improve health care quality. Health care professionals can learn about the processes of innovation, implementation, and spread through articles, expert commentaries, and adoption guides. Interactive learning and networking events include Web seminars, discussion forums, online chats, and in-person meetings. The Innovations Exchange encourages the exchange of information about creative strategies and policies by connecting innovators and potential adopters. Users can exchange ideas, experiences, and information about specific topics; learn from their peers about what works and what doesn’t; and collaborate to resolve common problems. Innovation profiles also provide information on contextual factors surrounding adoption and implementation successes to foster the spread of innovations across organizations and settings.

**Population Studied:** N/A

**Principal Findings:** N/A

**Conclusions:** Since its launch in 2008, the Innovations Exchange collection has grown to include over 750 innovations and 1,500 QualityTools. It is one of the federal government’s most highly rated Web sites, with more than 42,000 subscribers and 35,000 average monthly visits. Over 4,000 clinicians, health administrators, and researchers have participated in various Innovations Exchange events. Innovators and adopters report that the Innovations Exchange enhances their efforts to improve health care and ensure patient safety.

**Implications for Policy, Delivery, or Practice:**

As a national resource, the Innovations Exchange continues to evolve to capture new developments in a rapidly changing health care environment, providing information about cutting edge practices and policies at the forefront of health care. In 2012 the program expanded its scope beyond health care service delivery to include innovative health care policies at the organizational, system, and state levels that have important implications for the delivery of patient care. These profiles describe creative implementations of new or altered governmental or private initiatives that aim to improve health care quality by changing behavior through regulatory mechanisms, incentives, or other means to ensure accountability. As part of this effort, the program developed a comprehensive set of inclusion criteria that characterize the notion of health care policy innovation, establishing a precedent that enables the sharing of knowledge about innovative health care polices on a national level.

**Funding Source(s):** AHRQ

**Poster Session and Number:** C, #922

The Associations among Physician Volume, Processes, and Outcomes of Care for Acute Myocardial Infarction and Stroke

Guann-Ming Chang, Cardinal Tien Hospital; Yu-Chi Tung, Ph.D., National Taiwan University

**Presenter:** Guann-Ming Chang, MD., MS., Attending Physician, Department of Family Medicine, Cardinal Tien Hospital, ruri2elf@yahoo.com.tw

**Research Objective:** Volume-outcome relations have been found for acute myocardial infarction and stroke; however, the associations between physician volume and processes of care remain unclear. It is also not known whether processes of care are mediators of volume-outcome relations; that is, whether the mechanisms underlying volume-outcome relations are through processes of care.

**Study Design:** We used nationwide population-based data from Taiwan’s National Health Insurance Research Database. Using multilevel logistic regression models for each condition, we estimated the change in the odds of use of processes of care associated with an increase of 100 patients in the previous annual physician volume. Analyses were adjusted for patient, physician, and hospital characteristics. Multilevel mediational models were used to examine the mediating effects of processes of care on the association between physician volume and 30-day mortality.

**Population Studied:** All beneficiaries who were hospitalized in 2008 in acute care hospitals for acute myocardial infarction or ischemic stroke.

**Principal Findings:** There were 10,436 hospitalizations for acute myocardial infarction and 28,380 for ischemic stroke. For acute myocardial infarction, higher physician volume was associated with increased use of aspirin, angiotensin-converting enzyme inhibitor/angiotensin-receptor blocker, beta blocker, and percutaneous coronary intervention
therapy. For ischemic stroke, higher physician volume was associated with increased use of physiotherapy and occupational therapy assessment. The processes of care partly explain the associations between physician volume and mortality for acute myocardial infarction and ischemic stroke.

**Conclusions:** Admission to higher-volume physicians was associated with an increase in the use of certain processes of care, which was in turn related to a reduction in mortality for acute myocardial infarction and stroke.

**Implications for Policy, Delivery, or Practice:** The current findings may provide good evidence supporting centralization or regionalization to treat patients or train physicians or may contribute to the formation of health policy, for instance by introducing centralization or steering patients toward physicians who are more compliant with processes of care.

**Funding Source(s):** Other, National Science Council in Taiwan

**Poster Session and Number:** A, #91

**Variations in the Use of Cardiovascular Disease Preventive Services among Hispanic and Asian Americans in California**

Eva Chang, Johns Hopkins Bloomberg School of Public Health; Ernest Moy, Agency for Healthcare Research and Quality

**Presenters:** Eva Chang, Ph.D. Candidate, Johns Hopkins Bloomberg School of Public Health, echang@jhsph.edu

**Research Objective:** Cardiovascular diseases (CVD) are among the leading causes of death for Hispanic American (HA) and Asian American (AA) adults, and several campaigns, like Million Hearts, were implemented to reduce CVD risk by using effective, clinical preventive services. Understanding of current levels and factors associate with primary and secondary preventive services use for CVD among HA and AA ethnicities is needed.

**Study Design:** Data were aggregated from the 2005, 2007, and 2009 California Health Interview Survey, when possible. Logistic regression was used to assess primary prevention (aspirin use at least 3 times/week, cholesterol screening in the last five years) and secondary prevention (treatment for high blood pressure (BP)). Three sets of models were run, including all race/ethnicities, non-Hispanic AAs only (Chinese, Filipino, Japanese, Korean, Vietnamese, Other Asian), and HAs only (Mexican, Puerto Rican, Central American, South American, Other Hispanic), with non-Hispanic Whites (NHWs), Chinese, and Mexicans, respectively, as reference categories. Models were survey-weighted and adjusted for English proficiency, insurance, education, citizenship, duration in US, age, gender, poverty level, health status, and survey year. Models for BP treatment also adjusted for diagnosis of any heart disease. All reported odds ratios had a p-value less than 0.05.

**Population Studied:** The sample used to assess primary prevention included 1. males between 45-79 years and females between 55-79 years for aspirin use (2005, n=18,726), and 2. all adults 18 years or older for cholesterol screenings (2005, n=43,020). The sample used to assess secondary prevention (BP treatment) included all adults 18 years or older with high BP (all years, n=47,992).

**Principal Findings:** Percentages of regular aspirin use, cholesterol screening in the last 5 years and treatment for high BP were 34.9, 86.7, 73.2 for NHWs, 25.4, 84.4, 57.9 for HAs, and 23.0, 83.2, 77.1 for AAs, respectively, with significant within subgroup heterogeneity. Compared to NHWs, Mexicans and Central Americans had 53-88 percent increased odds of cholesterol screening, Mexicans had 19% decreased odds of aspirin use, and HAs had no significant differences in BP treatment. Chinese, Japanese, and Koreans had 38-57 percent decreased odds of cholesterol screening, Chinese and Japanese had 50-57 percent decreased odds of aspirin use, while Chinese, Filipino, and Vietnamese had 69-111 percent increased odds of BP treatment compared to NHWs. Compared to Chinese, Japanese had decreased odds of cholesterol screening (OR=0.52) while Vietnamese had increased odds (OR=1.65). Filipinos (OR=1.9) and Other Asians (OR= 2.21) had increased odds of aspirin use. No significant differences were observed in BP treatment among AA ethnicities. No significant differences in prevention were observed among HA ethnicities.

**Conclusions:** Compared to NHWs, AAs had worse primary prevention service use but better secondary prevention service use; HAs had mixed use of primary prevention services and were similar in secondary preventive service use. Heterogeneity was found in primary prevention use among AAs. No differences were found among HAs, but ethnicity classifications were limited by sample sizes.
Implications for Policy, Delivery, or Practice: Use of recommended CVD preventive services varies by race/ethnicity and service type. Policies and interventions for AAs should target primary preventive services while those for HAs should focus on some primary preventive services.

Funding Source(s): AHRQ
Poster Session and Number: C, #923

Variations in Cardiovascular Disease Risk among Hispanic and Asian Americans in California
Eva Chang, Johns Hopkins Bloomberg School of Public Health; Ernest Moy, Agency for Healthcare Research and Quality

Presenter: Eva Chang, Ph.d. Candidate, Johns Hopkins Bloomberg School of Public Health, echang@jhsph.edu

Research Objective: Cardiovascular diseases (CVD) are among the top leading causes of death for Hispanic American (HA) and Asian American (AA) adults, with distinct heterogeneity found within the ethnic subgroups. However, few studies have examined variations in cardiovascular health among Hispanic and Asian Americans ethnicities.

Study Design: Data were aggregated from the 2005, 2007, and 2009 California Health Interview Survey. Logistic regression analyses were used to assess the odds of having 1, 2, or 3 or more CVD risk factors. Possible CVD risk factors included high blood pressure, diabetes, obesity, current smoking, and no moderate/hard exercise within the past 7 days. Three sets of models were run, including all race/ethnicities, non-Hispanic AAs only, and HAs only, with non-Hispanic Whites (NHWs), Chinese, and Mexicans, respectively, as reference groups. Models were survey-weighted and adjusted for English proficiency, insurance, education, citizenship, duration in US, age, gender, poverty level, health status, and survey year. All reported odds ratios had a p-value less than 0.05.

Population Studied: The total sample included all adults (18 years and older) sampled in the 3 years, representing over 80 million individuals from California. The sample included 92,189 NHW, 13,080 non-Hispanic AAs (3,349 Chinese, 1,648 Filipinos, 1,177 Japanese, 2,208 Koreans, 2,394 Vietnamese, 2,304 Other Asians), and 25,420 HAs (19,585 Mexicans, 394 Puerto Ricans, 1,080 Salvadorans, 1,090 Other Central Americans, 971 Latino Europeans, 801 South Americans, 1,499 Other Hispanics).

Principal Findings: Percentages of having 1, 2, and 3 or more CVD risk factors were 34.0, 17.7, 8.2 for NHWs, 35.6, 19.2, 9.0 for HAs, and 39.0, 14.2, 4.5 for AAs, respectively. Significant within subgroup heterogeneity was observed. Compared to NHWs, Chinese, Filipinos, and Koreans had 26-33 percent increased odds of having 1 CVD risk factor while Other Hispanics had 19 percent decreased odds. Mexicans, Other Hispanics, and Filipinos had 13-28 percent increased odds of having 2 CVD risk factors compared to NHWs while Chinese and Other Asians had 20 percent decreased odds. Chinese, Vietnamese, and Other Asians all had decreased odds of having 3 or more CVD risk factors compared to NHWs. Among AAs, Vietnamese had lower odds of having 1 CVD risk factor compared to Chinese (OR=0.69), but Filipinos and Japanese had 62-76 percent increased odds of having 2 risk factors and Filipinos, Koreans, and Other Asians had significantly increased odds of having 3 or more risk factors. Among HAs, no significant differences were observed by subgroup. For both HAs and AAs, odds of having 3 or more risk factors were reduced significantly among immigrants (15 or more years in the US).

Conclusions: This study observed distinct heterogeneity in CVD risk factors among AAs compared to NHWs and within AA ethnicities in California. While fewer differences were observed among HAs, ethnicity classifications were limited by sample sizes.

Implications for Policy, Delivery, or Practice: Policies and interventions that target CVD risk among AAs should focus on specific ethnicities while programs for HAs may need to focus on other barriers to health. Survey data collection should increase efforts to oversample among subgroups, especially among HAs, for tracking and understanding variations in CVD risk among minority groups.

Funding Source(s): AHRQ
Poster Session and Number: C, #924

The Relationship between Nurse Staffing and Unit-acquired Pressure Ulcers: Which Nurse Staffing Measures Matter?
Jisun Choi, University of Kansas School of Nursing; Boyle, D. K., University of Kansas School of Nursing
Research Objective: A large body of literature has demonstrated that higher nurse staffing is significantly related to better patient outcomes. In these studies, a variety of nurse staffing measures have been used, including administrative data and RN self-report measures. Yet, little has been studied regarding which specific measures of nurse staffing have the strongest relationship with patient outcomes. Our study, therefore, examined the correlations among selected nurse staffing measures and compared the relationship between unit-level nurse staffing and unit-acquired pressure ulcers (UAPUs) on six types of acute care hospital units. Staffing measures included administratively derived nursing hours per patient day (HPPD), registered nurse (RN) skill mix, RN-reported number of patients assigned, and RN-reported perception of staffing adequacy.

Study Design: A descriptive correlational design was used to conduct a secondary analysis of 2011 linked data from two sources: the National Database of Nursing Quality Indicators® (NDNQI®) and the NDNQI RN survey. Random-intercept logistic regression analyses were performed to examine the relationship between nurse staffing and UAPU while accounting for unit and hospital characteristics for each of nurse staffing measures.

Population Studied: The final analytical sample included 2,346 units within 411 NDNQI member hospitals in the United States that reported data on nurse staffing and patient pressure ulcers as well as participated in the RN survey. Included unit types were critical care, step-down, medical, surgical, combined medical-surgical, and rehabilitation units.

Principal Findings: The RN-reported number of patients and HPPD were significantly correlated ($r = .80$). RN perception of staffing adequacy and HPPD were also significantly correlated ($r = .23$). Controlling for unit (RN education level and RN unit tenure) and hospital (bed size, teaching status, and case mix index) characteristics, RN perception of staffing adequacy and RN skill mix were significantly related to UAPU rates. Lower UAPU rates was related to higher RN perception of staffing adequacy ($OR = .77$) and a higher percentage of nursing hours provided by RNs (RN skill mix, $OR = .99$). No significant relationship of other nurse staffing measures (HPPD and RN-reported number of patients) to UAPU rates was found.

Conclusions: Findings showed that administratively derived HPPD and RN self-reported number of patients were highly correlated, whereas other administrative and perceptual measures of nurse staffing were not highly correlated. Also, the relationship between nurse staffing and UAPUs were found to be inconsistent by the selection of nurse staffing measures. These measures of nurse staffing may capture different aspects of nurse staffing on the nursing unit.

Implications for Policy, Delivery, or Practice: Researchers should select nurse staffing measures based on their study purpose or conceptual model. In addition, our findings indicated that RN perception of staffing adequacy was the strongest predictor of UAPUs. Nurse administrators and managers should evaluate not only HPPD, but also nurses’ perception of staffing adequacy to improve patient outcomes.

Funding Source(s): Other, American Nurses Association

Poster Session and Number: C, #925

The Role of Clinical Information in Dermatopathology

Nneka Comfere, Mayo Clinic; Margot S. Peters MD, Mayo Clinic, Rochester, Minnesota; Jon C. Tilburt MD, Mayo Clinic, Rochester, Minnesota

Presenter: Nneka Comfere, M.D., Physician, Dermatology and Dermatopathology, Mayo Clinic, comfere.nneka@mayo.edu

Research Objective: Characterization of self-reported concerns and challenges of pathologists in the diagnostic testing handoff process for skin biopsy.

Study Design: Survey

Population Studied: Membership of the American Society of Dermatopathology

Principal Findings: Survey response rate was 33% (367/1103). 70% of respondents were male and 30% were female. 61% (224/367) had been in practice for greater than 10 years. 44% (162/367) of respondents reported spending more than 80% of their pathology practice interpreting skin specimens and 37% (136/365) signed out an average of less than 50 specimens per day. The majority of respondents (78%;258/331) noted that their primary role as a
The most common mode of communication utilized by requesting clinicians to convey clinical information for skin biopsy specimens included paper/electronic requisition forms (87%; 285/331), followed by telephone (7%; 24/331) and face-face (4%; 12/331) communication. However, most respondents reported being either somewhat or very dissatisfied with the paper/electronic requisition forms as compared to telephone (7%) or face-face communication (4%). 55% (189/341) respondents noted that the quality of clinical information supplied by their requesting clinicians were excellent, very good or good and 97% (331/340) noted that the dermatologic experience of the requesting clinician was crucial to the quality of clinical information provided. Key clinical elements identified by most respondents as necessary for rendering accurate histopathologic interpretations included dermoscopic features, clinical photos, ABCDE criteria, results of relevant laboratory tests, clinical symptoms, lesion morphology, duration of lesions, partial or complete sampling, known clinical diagnoses, previous dermatopathology diagnoses, previous and current treatments and clinical differential diagnoses. 63-84% of respondents noted that the quality, completeness and clarity of the clinical information provided by the requesting clinician had a large impact on their diagnostic confidence, diagnostic accuracy, specificity of diagnosis, speed of diagnosis, need for additional communication with clinician, need for additional histopathologic studies and ability to provide meaningful clinical guidance within the pathology report.

Conclusions: Pathology members of the American Society of Dermatopathology highlighted the importance of the quality and completeness of clinical information supplied by the requesting clinician to diagnostic accuracy, relevance of the pathology interpretation, pathology service utilization and pathologist efficiency. They also cited significant dissatisfaction with the common mode of communicating clinical information - paper/electronic requisition forms and suggested some critical clinical elements necessary for accurate and relevant pathologic interpretation.

Implications for Policy, Delivery, or Practice: The common modes of communicating clinical information between the requesting clinician and pathologist fail to consistently include salient diagnostic information important for accurate dermatopathologic interpretation. This likely greatly influences the quality of dermatopathologic interpretation and ultimately will also influence the quality and safety of patient care, health care utilization and costs. This survey highlights significant knowledge gaps in optimal modes of communicating pertinent clinical information and mechanisms to support consistent and efficient transfer of such information between the requesting clinician and the pathologist.

Funding Source(s): Other, Center for the Science of Healthcare Delivery, Mayo Clinic, Rochester, Minnesota.

Concordance Between Self Reported Medication Use and Medicare Part D Claims

Elizabeth Cook, University of Iowa; Kathleen M. Schneider, Buccaneer, A General Dynamics Company

Presenter: Elizabeth Cook, M.S., Research Specialist, College of Pharmacy, University of Iowa, elizabeth-cook@uiowa.edu

Research Objective: To examine the concordance between self-reported cardiovascular medications on arrival and claims-based measures of drug use at the time of admission to inpatient care for an acute myocardial infarction (AMI).

Study Design: The inpatient medical records for a sample of Medicare patients (n=730) who were hospitalized for AMI in 2007 or 2008 were abstracted and linked to Part D claims data. Abstracted on-arrival medications were compiled and patients were identified as statin, beta-blocker, and/or ACE/ARB users. Using Medicare Part D data, we then compared abstraction results to three different claims based measures of use of these medications. These included: 1) any prescription filled within the 90 days prior to admission, 2) estimated cabinet supply (pills on hand) based on the last fill prior to admission, and 3) estimated cabinet supply based on fill history for 6 months prior to admission. Sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) were calculated for all three measures, using abstraction measures as the gold standard.

Population Studied: 730 Medicare patients with fee-for service Part A and B, and the Part D
benefit who were hospitalized with AMI in 2007 or 2008.

**Principal Findings:** For statins, sensitivities for the three claims based measures ranged from 67-73%; specificities ranged from 83-87%. For beta blockers, sensitivities ranged from 72-80% and specificities ranged from 79-85%; for ACE/ARBs, sensitivities ranged from 70-80% and specificities ranged from 71-77%. The estimated cabinet supply based upon the last fill prior to admission was the least sensitive measure for all three types of drugs, while its specificity was between the other two claims based measures. Evidence of any fill in the 90 days prior to admission was the most sensitive for all three types of drugs and the least specific of all three measures; although this measure was more sensitive than specific for beta blockers and ACE/ARBs, the relationship was reversed for statins, and this measure also had the highest NPV for all three drugs. Estimated cabinet supply based on fill history for 6 months prior to admission consistently had the highest specificities, sensitivities that fell between the other two measures, and the highest PPVs across all three drugs.

**Conclusions:** When measuring use of statins or beta blockers, claims based measures that rely on either measure of estimated cabinet supply tend to be more specific than sensitive, while evidence of a fill in the past 90 days tends to be more sensitive. When measuring use of ACE/ARBs, sensitivity and specificity measures are similar regardless of the measure. Cabinet supply measures that use fill history over six months appear to offer the best tradeoff in terms of sensitivity and specificity.

**Implications for Policy, Delivery, or Practice:** Depending on study objectives and investigator requirements for accuracy, Medicare claims-based measures of cardiovascular drug use appear to be reasonably concordant with self-reports.

**Funding Source(s):** AHRQ

**Poster Session and Number:** C, #927

**Children’s Safety Initiative-EMS: A Five-Part, Mixed-Methods Research Project**
Jeanne-Marie Guise, Oregon Health and Science University; Erika Cottrell, Oregon Health and Science University; Erika Barth Cottrell, Oregon Health and Science University; William Lambert, Oregon Health and Science University; Jonathan Jui, Oregon Health and Science University; Merlin Curry, Oregon Health and Science University; Kerth O'Brien, Oregon Health and Science University; Phillip Engle, Oregon Health and Science University; Garth Meckler, Oregon Health and Science University

**Presenter:** Erika Cottrell, Ph.D., M.P.P., Comparative Effectiveness K12 Scholar, Oregon Health and Science University, cottrele@ohsu.edu

**Research Objective:** Emergency Medical Services (EMS) professionals are charged with responding to a range of critical events including emergencies, natural disasters, and traumas. This type of care relies upon professionals who must make decisions under conditions of uncertainty and considerable time pressure. Errors are bound to occur and their consequences can be a matter of life and death. While the incidence of, and contributors to, adverse events in hospitals are well described, we know little about adverse events in the prehospital care environment, particularly in regard to children. The Children’s Safety Initiative-EMS was designed to increase our understanding of safety in the prehospital pediatric emergency setting. The overarching goal of this project is to describe the contributors to and underlying causes of pediatric safety events - which we have termed UNSEMs (Unintentional injury or consequence, Near miss, Suboptimal action, Error, Management complication) - and to identify opportunities for interventions that will ultimately improve EMS care for children. Attaining such a multi-faceted understanding requires a thorough investigation of existing patterns and contributors using a mix of methodological tools. This abstract describes the comprehensive and unique methodology of The Children’s Safety Initiative.

**Study Design:** The Children’s Safety Initiative-EMS has five main study components: focus groups, a 3-round national Delphi survey and expert advisory panel, prehospital chart review, an anonymous reporting system, and in situ simulations. Each component is necessary to fully understand the range of individual and systems contributors to the occurrence of safety events.

**Population Studied:** Participants include EMS providers (fire department, private ambulance, public ambulance, volunteer, and paid EMT’s as well as emergency department physicians and nurses), EMS program managers and EMS leaders.

**Principal Findings:** Focus groups (n=45) were conducted to identify the range of contributors to
safety events in the prehospital emergency care of children. These findings were used to develop a 3-round Delphi survey (n=722) to establish consensus on the most important contributors to safety events in a larger national sample. At the conclusion of the three-round Delphi survey, we engaged an expert advisory panel to provide input on our results and apprise us of ongoing interventions or trainings related to our findings. With the focus groups, Delphi survey, and expert advisory panel portions complete, we have identified the top five contributing domains to EMS-C safety events: assessment and decision-making, medication and equipment, training, EMS cultural norms, and scene characteristics.

**Conclusions:** Additional investigations and methodologies will broaden the foundation of knowledge gained through the focus groups, Delphi survey, and expert advisory panel. Chart review, the anonymous reporting system, and in situ simulation will further expand our knowledge of key ingredients that lead to safety events and provide insight to facilitate the development of interventions to improve the safety of children’s prehospital emergency care.

**Implications for Policy, Delivery, or Practice:** Utilizing a mix of methodological tools provides a unique and comprehensive understanding of the factors that contribute to safety of children’s prehospital emergency care that will enable the design of interventions to improve the delivery of care and the overall health of children.

**Funding Source(s):** NIH

**Poster Session and Number:** C, #928

**Assessing Two Year Readmission Risk in Small Children Hospitalized with Acute Respiratory Distress: A Retrospective Cohort Analysis Using Administrative Hospital Data**

Chris Craver, MedAssets; Kathy Belk, MedAssets, Inc.; Dr. Chris Blanchette, IMS Health and University of North Carolina at Charlotte

**Presenter:** Chris Craver, MA, Senior Director, Health Data Analytics, MedAssets, ccraver@medassets.com

**Research Objective:** The objective of this research is to conduct cohort feasibility analysis using hospital based administrative billing data to assess causes and long term readmission risk for children under the age hospitalized for acute respiratory distress.

**Study Design:** The study cohort consisted of children between one and two years of age who were hospitalized in 2009 for acute respiratory distress (ARD) in the MedAssets Health System Database. ARD was defined as bronchiolitis (ICD-9 466.1x), wheezing and cough (ICD-9 786.0x), or asthma (ICD-9 493.xx). Where possible the population was further classified based on the underlying cause of respiratory distress including RSV (ICD-9 079.6), rhinovirus (ICD-9 079.3), or influenza (ICD-9 487.1). The occurrence of pneumonia was identified as well. Patients were excluded from the cohort if they were hospitalized during a period three months prior to the reference hospital discharge. Finally, to insure consistency, hospital data were only included in the analysis if both inpatient and outpatient data were available for the entire study period (between October 2008 and December 2011). The primary independent variable was inpatient readmissions. Primary dependent variables included patient demographics (age/sex), visit characteristics (discharge status, admission source, admission type) and hospital service characteristics (bed size, location, teaching status, and urbanicity). Univariate statistical methods were used to describe the base population. A negative binomial generalized linear regression model was used to identify key predictors of readmission.

**Population Studied:** The base population consisted of 407 unique patients across 57 acute care hospitals.

**Principal Findings:** The patient population were predominately male (62.9%) and were admitted to hospitals with 300+ beds (75.0%) that were teaching facilities (75.3%). The primary type of admission for the reference hospitalization was emergent or urgent (64.0%). Asthma (51.1%) was by far the most common diagnosis for the study population’s first hospitalization. This was followed by pneumonia (37.3%), bronchiolitis (29.5%), wheezing (12.3%), and influenza (7.6%). Patients may have multiple respiratory diagnoses during their initial hospitalization.

During the study period the base population generated over 1600 (3.9 per patient) additional admissions which were distributed as 35% inpatient admissions and 65% outpatients visits. Of these subsequent admissions 795 could be classified as respiratory related by the primary diagnosis. After controlling for patient characteristics and hospital demographics only a prior hospitalization of asthma (1.56 additional
visits, p < .001) and type of admission of emergency (1.3 additional admissions, p < 0.05) in the reference hospitalization predicted readmission.

**Conclusions:** Young children hospitalized with acute respiratory illness tend to have recurring hospital visits throughout the first three to four years of their lives. In this study only an initial hospitalization for asthma was associated with significantly more hospital visits in the follow-up period. However, one limitation of administrative data is that patients cannot be tracked across facilities or care settings.

**Implications for Policy, Delivery, or Practice:**
This study demonstrates that it is possible to use administrate data to identify and track pediatric respiratory distress patients in an acute setting. Use of data of this type can provide directional if not concrete evidence of resource utilization patterns and treatment paths

**Funding Source(s):** No Funding
**Poster Session and Number:** C, #929

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**Cost Effectiveness and Health Outcomes of Consumer Directed Long Term Care Services in Colorado**

Candle Dalton, Colorado Department of Health Care Policy and Financing; Sally Langston, Colorado Department of Health Care Policy and Financing; Aaron Neiderhiser, Colorado Department of Health Care Policy and Financing; Josh Winkler; Jed Ziegenhagen, Colorado Department of Health Care Policy and Financing

**Presenter:** Candie Dalton, Participant Directed Programs Specialist, Colorado Department of Health Care Policy and Financing, candie.dalton@state.co.us

**Research Objective:** Consumer Directed Attendant Support Services (CDASS) allows long term care recipients to manage their own services, caregivers, and the budget to pay for those services. Medicaid cost data shows that CDASS in Colorado is more costly than agency-based care; however, there is not a method to compare CDASS cost data to clients with similar levels of need who receive services from an agency-based model. In this study, the acuity level of CDASS clients is compared to client cohorts who receive agency-based care to evaluate cost effectiveness of service delivery and health outcomes.

**Study Design:** The study design utilizes a difference-in-difference approach with patient fixed effects to isolate the effect of the program on cost and health outcome metrics.

**Population Studied:** Adults age 18 years and older who receive long term care services through one of three Medicaid-funded Home and Community Based Services (HCBS) Waivers operated in Colorado that offer both agency-based care and CDASS. The study includes approximately twenty five thousand clients, as of June 2012, who have a physical disability, a diagnosis of a major mental illness, or who are elderly (ages 65 and older).

**Principal Findings:** Initial analysis shows the average per capita costs for clients directing their own services are greater than the average per capita cost for each of the three HCBS Waivers. Further analysis of the comparative control group reveals that when total Medicaid costs are combined for clients with similar acuity levels, the per capita cost of CDASS is no greater than the per capita cost of agency-based care. Health outcomes data reveals that critical incidents and adverse health outcomes that lead to emergency room visits, increased hospital admissions, and longer lengths of stay do not occur at a higher rate in CDASS than when care is managed by an agency. While this might be due, in part, to the controls implemented to limit clients with unstable or unpredictable health progression to participate in CDASS, it might also be due to clients being able to select and train their own caregivers.

**Conclusions:** The conclusion of the research demonstrates that consumer direction is a viable service delivery option to provide cost effective services to clients who require long term care while also maintaining or increasing positive health outcomes by reducing the number of critical incidents and hospital admissions.

**Implications for Policy, Delivery, or Practice:**
Evidence that CDASS is cost effective and does not increase adverse health outcomes has significant implications for policy, delivery, and practice. This evidence further supports the development and implementation of public policy to expand the opportunities for consumer direction and allow for a more fluid continuum of service delivery options from agency-based care to consumer directed care to include increased self-determination practices and person centered planning across the spectrum of long term care.

**Funding Source(s):** CMS
**Poster Session and Number:** C, #930
Challenges in Safely Managing the Pain in Living Liver Donors
Daniela Ladner, Northwestern University; Amna Daud, Northwestern University; Kathryn Waitzman, Northwestern University; Teri Strenski, Northwestern University; Mary Ann Simpson, Lahey Clinic; Robert Brown, Columbia University; Robert Fischer, Virginia Commonwealth University; Tija Berzins, , Donna Woods, Northwestern University

Presenter: Amna Daud, M.D., M.P.H., Clinical Research Associate, Northwestern University, a-duad@northwestern.edu

Research Objective: Living liver donation (LD) is a large surgery associated with pain. However, managing pain after LD is difficult, as opioid pharmacokinetics change after a large liver resection. Respiratory depression and perceived pain in LD have not previously been reported.

Study Design: Retrospective medical record review
Population Studied: Retrospective medical record review (years 2008-2010) of 23 LDs from four large LDLT centers was conducted by an RN reviewer. POD#0-7 pain scores (1-10 scale), pain medication, and incidence of respiratory depression requiring intervention were assessed.

Principal Findings: All LDs received IV opioids after LD. 56% received IV NSAIDS, 26% had an epidural. PO medications increased from 13% to 100% at discharge. LD had mean pain scores of 3.86, 4.52, 4.03, 3.74, 4.81, 4.41, 5.91, and 4.75 from POD #0-7, respectively; however pain scores ranged from 0-10 throughout POD#0-7. The highest reported mean pain scores occurred on POD#6 (5.1). Percentage of pain score assessments > 6 increased on POD#4 (34%), and were highest on POD#6 (48%). (Table). 5 LD (22%) suffered respiratory depression requiring higher level care (PACU, ICU), respiratory interventions (i.e. re-intubation), reversal agents, and adjustments in ordered pain medications.

Conclusions: LD experience significant pain after LD according to their subjective pain scores, despite extensive multifaceted pain regimens. Most pain is experienced as IV drugs are switched to PO regimen.

Implications for Policy, Delivery, or Practice: Despite close monitoring a significant portion of patients experience sequelae of over narcotization, presenting significant patient safety risk to LD. Pain management in LD needs to be improved to safely provide better pain control.

Funding Source(s): NIH, Poster Session and Number: C, #931

Safety Issues Identified by Proactive Liver Transplant Safety Debriefing
Daniela Ladner, Northwestern University; Amna Daud, Northwestern University; Tija Berzins, Northwestern University; Elizabeth Pomfret, Lahey Clinic; Robert Brown, Columbia University; Robert Fischer, Virginia Commonwealth University; Teri Strenski, Northwestern University; Lisa McElroy, Northwestern University; Donna Woods, Northwestern University

Presenter: Amna Daud, M.D., M.P.H., Clinical Research Associate, Northwestern University, a-duad@northwestern.edu

Research Objective: Transplantation and, in particular, living donor liver transplantation (LDLT), involves complex systems and process of care that are particularly susceptible to medical errors and preventable complications. In order to capture safety issues during LDLT procedures, a proactive, web-based clinician safety debriefing tool was developed and implemented at four Adult-to Adult Living Donor Liver Transplant (A2ALL) hospitals.

Study Design: All clinicians at four A2ALL centers who participated in LDLT procedures (Donor, Recipient) between Sept. 2010 and Oct. 2012 received a request to complete the web-based Safety Debriefing via email immediately after an LDLT surgery. The debriefing tool takes less than 3min to complete and provides clinicians with 24 prompts (e.g. “Access to Necessary Clinical Data”, “ABO Matching”) to elicit recollections of complications, near miss events and other safety issues that occurred. Reporters were identified, but answers were anonymous.


Principal Findings: 85 LDLT surgeries were debriefed. Responses were provided by surgical staff (32%), nursing staff (30%), anesthesiology staff (20%), and others (18%) (Perfusionists, Techs, Radiology team, Observers, etc.). 542 safety issues were reported. The most common reported categories were related to equipment
problems (15%), distractions (10%), inter-provider communication (8%), and timing of related procedures (6%).

Conclusions: Anonymous, short, online debriefings can successfully elicit rich information on the safety risk associated with LDLT surgery far beyond hospital wide reporting systems, which captured less than 5% of safety issues related to LDLT surgeries reported in the online debriefings. This is supporting evidence that to date safety risks associated with LDLT are poorly described and vastly underestimated.

Implications for Policy, Delivery, or Practice: The proactive comprehensive safety risk assessment of LDLT is crucial in the quest to perform safety LDLT surgeries for donors and recipients.

Funding Source(s): NIH
Poster Session and Number: C, #932

Blast Survey Takes Crack at Undergraduates' Health Information Technology Communication
Paul Frank Meole, BA, Eckerd College; Donna Ettel, Saint Petersburg College; George Leonard Ettel, III, University of South Florida; Donna Lee Ettel, Ph.D., Saint Petersburg College

Presenter: Donna Ettel, Ph.D., Adjunct Professor, Saint Petersburg College, ettel.donna@spcollege.edu

Research Objective: College students are faced with a unique set of challenges which may plausibly affect their healthcare decisions and there is minimal information in the literature about the nature and scope of HIT communication. The purpose of this study is to improve our understanding where college students go when they are ill, if insurance coverage is an issue, their trust in online sources and finally whether or not they are willing to communicate with their physicians electronically.

Study Design: The surveys were administered with links that were unique to the individual user to ensure privacy and allow the student to only submit the survey once. Analysis included descriptive statistics, and multi-variate analyses of variance to identify significant trends. This study was approved by IRB at Eckerd. The independent variables were student characteristics including age, race/ethnicity, grade level, and health insurance status. The dependent variables examined was student use of computers, search engines utilized and email utilization. Quality related variables include

where college students go when they are ill, if insurance coverage is an issue, their trust in online sources and finally whether or not they are willing to communicate with their physicians electronically.

Population Studied: The population at Eckerd College consisted of 2,310 of undergraduate students (43.8% males) with a racial make-up that was 61.5% white, 11.5% African-American, 16.8% Hispanic, 6.3% Asians and .52% other.

Principal Findings: A response rate of 15.97% (n= 292) was recorded. Of the respondents, 95.87% (n=280) reported that they had health insurance and 79.79% (n=233) had a primary care physician. Only 27.05% (n=79) of the respondents were male and 83.22% (n= 243) of respondents lived on campus. These data show that 90.75% (n= 265) do not use email to communicate with their physicians about medical related information, but 73.63% (n= 215) were willing to. If the respondents were ill, 58.56% (n= 171) reported they would first go to a health facility on campus and 42.47% (n= 124) would first go to their primary care physician; however 11.99% (n=35) would first go to an emergency room and 29.56% (n=86) would first go to a free clinic if they were ill.

Conclusions: These data clearly show that physicians appear to be an underutilized source of vital information that affects young adults in critical stages of their lives. These findings raise questions about how to ensure that college students have access to health information that is accurate and trustworthy. This study has several limitations. We studied students from a single, secular private college whose students do not necessarily reflect the population at large. Therefore, we are reluctant to infer that these findings are generalizable, although many of our results are similar to other reports.

Implications for Policy, Delivery, or Practice: This information is the first of its kind in the area of electronic healthcare surveys administered to college students and may assist policymakers and other key stakeholders in Florida—and nationally—in identifying, designing and implementing strategies to provide college students who are transitioning into adulthood access to appropriate healthcare information, including the role of physicians

Funding Source(s): No Funding
Poster Session and Number: C, #933
Survivorship Care Planning among Cancer Survivors in the United States
Albert Farias, University of Washington; Steven Zeliadt, PhD, University of Washington, Dept. Health Services; Department of Veterans Affairs Puget Sound Health Care System

Presenter: Albert Farias, MPH, PhDc, Graduate Researcher, Health Services, University of Washington, afarias@uw.edu

Research Objective: To describe how frequently cancer survivors are provided with a written survivorship plan and given advice about where to receive follow up care following initial treatment.

Study Design: The study design is cross sectional. We used data from the 2010 cancer control supplement on cancer survivorship from the National Health Interview Survey for 593 breast, cervical, ovarian, prostate, and colon cancer survivors who were within 10 years of diagnosis. The NHIS annual household survey is a representative sample of non institutionalized, civilian household population of the United States. We applied survey sampling weights in order to make estimates about the entire US population. Covariates included sex, age, educational attainment, marital status, employment status, race and ethnicity, body mass index, and number of comorbidities. Logistic regression was used to identify factors associated with the likelihood of receiving follow up advice.

Population Studied: Our sample includes cancer survivors or those individuals who reported ever being told by a doctor that they had colon, prostate, lung, cervical, ovarian or breast cancer. We restricted our analysis to individuals over the age of 18 as the cancer survivor supplement was only given to adults. We further restricted the study sample to include individuals who are within 10 years of a cancer diagnosis.

Principal Findings: Approximately 80 percent of US cancer survivors received advice on where to go for follow up cancer care and 39 percent received written documentation of their cancer treatment. US cancer survivors who have survived from 5 to 10 years from the time of survey assessment were significantly less likely to receive advice about where to go for follow up cancer care compared to those who were diagnosed less than 1 year from the time of survey assessment, OR 0.51, 95 percent CI 0.27 to 0.96. Survivors who received written documentation of their cancer treatment were significantly more likely to have received advice about where to go for follow-up cancer care, OR 2.08, 95 percent CI 1.21 to 3.59. Lung cancer survivors were significantly less likely to receive written documentation of their cancer treatment compared to breast cancer survivors, OR 0.31, 95 percent CI 0.11 to 0.93, while colon cancer survivors were significantly more likely, OR 2.85, 95 percent CI 1.46 to 5.57.

Conclusions: A great majority of cancer survivors receive advice about where to go for follow up care from a physician or nurse, however there are differences that depend on the time since cancer diagnosis. Even fewer patients receive written documentation of cancer treatment and differences exist by cancer type.

Implications for Policy, Delivery, or Practice: As cancer survivorship increases the goal should be to have both written documentation and advice on where to receive care for all cancer survivors.

Funding Source(s): NIH
Poster Session and Number: C, #934

Association between Veteran Status and Diabetes Prevalence
Joseph Finkelstein, Johns Hopkins University School of Medicine

Presenter: Joseph Finkelstein, MD, PhD, Associate Professor of Medicine, Gerontology and Geriatric Medicine, Johns Hopkins University School of Medicine, jfinkel9@jhu.edu

Research Objective: The growing prevalence of diabetes in the US adult population represents a serious public health challenge. High diabetes prevalence results in substantial health care expenditures. A better understanding of risk factors for development of diabetes in adults may contribute to diabetes prevention efforts. Currently, it is unclear whether veteran status can be considered as a risk factor for diabetes. The goal of this project was to assess the association between veteran status and risk of developing diabetes.

Study Design: The Integrated Health Interview Series (IHIS) is a harmonized dataset for the U.S. National Health Interview Survey (NHIS). Using the IHIS 1997-2010 dataset, population-based prevalence of diabetes among veterans was compared to non-veterans, and further stratified by gender. Veteran status was defined as a positive answer to the question, "Have you ever been honorably discharged from active
duty in the U.S. Army, Navy, Air Force, Marine Crops, or Coast Guard?" Diagnosis of diabetes was based on self-report. Regression models were performed to evaluate the association between veteran status and risk for diabetes. In the gender-stratified analysis adjustment was made for socio-demographic factors and health behaviors. Sampling weights that adjust for the complex design of the NHIS were applied in all analyses presented. Statistical analyses were performed using SAS version 9.0. **Population Studied:** US National Health Interview Survey (NHIS) **Principal Findings:** From 1997 to 2010, overall 12.1% of veterans reported to have diabetes compared to 6.7% of non-veteran civilians (Rao-Scott chi square, p<0.0001). Among men, 12.6% of veterans and 5.8% of non-veteran civilians had diabetes (Rao-Scott chi square, p<.0001). For females, prevalence of diabetes (6.0%) was lower in veterans than non-veteran civilians (7.3%) with statistical significance (p<0.05). A regression model adjusting for age, race, education, poverty level, marital status, body mass index, alcohol consumption, smoking and exercise showed that male veterans were 1.4 times (95% CI 1.3-1.5) more likely to have diabetes than non-veteran civilians. For females, veterans had 6% (95% CI: 0.8-1.1) less risk for diabetes than civilians but with no statistical significance. **Conclusions:** Overall, the prevalence of diabetes was higher in male veterans as compared with non-veteran civilians. This association remained significant after adjusting for socio-demographic and health behavior factors. **Implications for Policy, Delivery, or Practice:** Since male veterans have higher risk of developing diabetes, a systematic pre-diabetes screening may be warranted in this population. **Funding Source(s):** No Funding **Poster Session and Number:** C, #935 **Effect of Providing Community Based Services on Hospitalization Rates for High Utilization Sample** Nancy Flinn, Courage Center **Presenter:** Nancy Flinn, Ph.D., Director, Outcomes And Research, Public Affairs and Research, Courage Center, nancy.flinn@couragcenter.org **Research Objective:** Persons with physical disabilities and cognitive deficits are high utilizers of hospital and emergency department services. These individuals have difficulty managing their health in a variety of ways – they are more likely than the general population to delay or not received medical care due to cost (31.8% to 13.8%) and not get prescribed drugs due to cost (26.5% vs. 7.5%) (National Center for Health Statistics, 2011). In Minnesota, Independent Living Services (ILS) are low-cost, community based service available through Medicaid waivers for individuals who are at risk for nursing home placement. These services are not generally reviewed for their impact on health care costs. ILS provides client-centered care, with an additional focus on accessing appropriate services. Roughly 30% of clients entering Independent Living Skills are at high risk of homelessness, so common goals for the program are stable housing, along with access to medication, food, and transportation, and access to primary and specialty health care. These social determinants of health are critically important for these clients who have limited resources. **Study Design:** A pre/post cohort design was used to analyze this data. Using Minnesota Department of Human Services data accessed through our medical home, hospital days were tracked for individuals before and after enrollment in ILS, during periods when they were not enrolled in the medical home. Through an analysis of the hospital days for 23 medical home clients enrolled in Independent Living Skills, per member per month hospitalization rates were calculated. **Population Studied:** This sample was 61% male, 39% female; 59% had incomes below poverty, 32% lived within 200% of poverty, and 9% lived above 200% of poverty. All clients in this sample were working age adults. The diagnostic groups served by these clients was 44% acquired brain injury, 21% other neurological conditions, 13% spinal cord injury, 13% cerebral palsy, and 9% musculoskeletal condition. All clients were on Medicaid, with 61% dually eligible for Medicaid and Medicare, and 39% for Medicaid only. **Principal Findings:** In this high utilization population, the average hospitalization rate was .70 days per member per month prior to enrollment in Independent Living Skills Services. After enrollment in ILS, the hospitalization rate dropped to .39 days per member per month. **Conclusions:** Low-cost community based services are a viable addition to a coordinated, comprehensive medical home as a cost-
effective method for meeting the triple aim. ILS can help clients be healthier and avoid hospitalization through addressing social determinants of health, such as housing, food, medicine, and medical care.

**Implications for Policy, Delivery, or Practice:** As health care costs continue to rise, finding effective solutions for addressing the health needs of expensive and medically complex populations is needed. The success of programs such as Independent Living Skills should change the debate to recognize the value of community-based services. This model is a low cost intervention to improve the health of individuals through effectively addressing the social determinants of health.

**Funding Source(s):** Other, Minnesota Department of Human Services

**Poster Session and Number:** C, #936

**Identifying Urban-Rural Health Disparities**
Sheila Franco, CDC/NCHS; Deborah D. Ingram, CDC/NCHS

**Research Objective:** To explore urban-rural health disparities using the six-level urban-rural classification scheme developed by the National Center for Health Statistics (NCHS).

**Study Design:** NCHS developed a six-level urbanization scheme based on the metropolitan, micropolitan, or noncore county designations from the Office of Management and Budget and metropolitan population size cut points defined by the Department of Agriculture’s Rural Urban Continuum Codes. NCHS supplemented these sources by conducting a discriminant analysis and formulating classification rules to separate the large metro category (counties in metro areas with population of 1 million or more) into large central (“inner cities”) and large fringe (“suburbs”). This distinction among large metro counties is important because residents of suburban areas tend to fare substantially better on many health measures than residents of other urbanization levels. The scheme was applied to data from the 2008-2010 National Vital Statistics System and the 2009-2011 National Health Interview Survey to explore differences in selected health measures by urbanization level.

**Population Studied:** U.S. population, adults aged 18 and over.

**Principal Findings:** Substantial differences in health measures by urbanization level were found. For example, death rates from motor vehicle accidents progressively increase across the six urbanization levels, with the lowest rates in large central metropolitan counties and the highest rates in rural counties. The age-adjusted motor vehicle accident death rate was approximately three times higher in the most rural counties than in the most urban counties. Homicide rates also differed by urbanization, with the highest rates in large central metropolitan counties. Fair or poor health status was lowest among adults aged 18–64 years residing in large fringe metropolitan counties and highest among those in the most rural counties. The percentage of uninsured adults aged 18–64 was lowest among those residing in large fringe metropolitan counties compared to all other urbanization levels.

**Conclusions:** For many health measures, differences by urbanization level were found. Of special note are the findings that residents of large central (inner cities) and large fringe (suburbs) metropolitan counties differ in many health measures. These differences are often obscured in urban-rural analyses which use large metropolitan as one category.

**Implications for Policy, Delivery, or Practice:** This analysis reveals differences in health measures across the six urbanization levels and demonstrates the usefulness and importance of the NCHS taxonomy for health analysis.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #937

**Health Insurance Coverage Gaps in Early Adulthood: Implications for Current Insurance and Care**
Tracy Garber, The Commonwealth Fund; Jennie Smith, The Commonwealth Fund

**Presenter:** Tracy Garber, MPH, Senior Policy Associate, Affordable Health Insurance, The Commonwealth Fund, tg@cmwf.org

**Research Objective:** In 2011, 13.2 million adults ages 19-29 were uninsured, down from 13.8 million in 2010. This reversal in a trend of increasing numbers of uninsured young adults is largely attributable to the Affordable Care Act’s provision allowing young adults to stay on their parent’s plan until age 26. Still, not all young adults have this option and subsequently experience gaps in coverage at key transition points such as leaving high school. This
analysis identifies characteristics of young adults likely to experience a gap in coverage in early adulthood. It examines their current health care experiences to inform potential policy solutions that will ensure access to affordable coverage and health care for all young adults.

**Study Design:** Data for this survey comes from the Commonwealth Fund Health Insurance Tracking Survey of Young Adults, 2011, a nationally representative online survey of young adults ages 19-29 conducted by Knowledge Networks between November 4 and 24, 2011. The survey sample was drawn from KnowledgePanel—a probability-based online panel that is representative of the U.S. population and includes cell phone only and low-income households typically difficult to reach using traditional telephone surveys and random digit dialing sampling. **Population Studied:** Young adults in the U.S. ages 19 - 29 (N=1,863). The analysis is restricted to those who had insurance some or all of the time in high school (N=1,494).

**Principal Findings:** An estimated 8.5 million young adults who had insurance at least some of the time during high school lost their insurance or experienced a gap in coverage after leaving high school (23%). Compared to those who did not experience a gap, this group was more likely to: be black or Hispanic (44% vs 21%), be low income (59% vs 29%), stop seeing a childhood doctor by age 19 (76% vs 46%), take two or more years to find a new regular doctor (29% vs 19%) or to report never find one (43% vs 26%). Young adults with a coverage gap after high school had higher odds of being uninsured in the past year (OR 5.97 p=0.000), and lower odds of having a regular source of care (OR 0.54 p=0.005).

**Conclusions:** Young adults with a disruption in insurance coverage at the start of adulthood were poorer and more likely to be minorities than those who did not have a gap after high school. A gap in coverage at early adulthood is also related to a tenuous connection to insurance coverage and a regular doctor in the future.

**Implications for Policy, Delivery, or Practice:** The new state health insurance exchanges have the potential to close coverage gaps some young adults experience. The exchanges will provide a place for them to purchase coverage if they cannot join a parent’s plan or do not have an offer of affordable employer coverage, and will determine eligibility for public programs and premium subsidies. As open enrollment approaches in October 2013 states must undertake strategic public outreach to educate young adults about the exchanges. States should structure their exchanges so that enrollment and movement between plans do not interrupt coverage.

**Funding Source(s):** CWF

**Proton Pump Inhibitor Prescriptions and Agreement in Diagnoses between Otolaryngologists and Gastroenterologists**

**Research Objective:** Otolaryngologists (ENT) often prescribe proton pump inhibitors (PPIs) for symptoms associated with laryngopharyngeal reflux (LPR) and gastroesophageal reflux disease (GERD). Variations in diagnosis and management of reflux symptoms between ENT and gastroenterologists (GI) is unknown. The aims of this study were to determine 1) PPI prescriptions, diagnoses, and testing in patients seen by ENT and 2) Compare agreement in diagnoses, PPI prescriptions, and testing in patients also seen by GI.

**Study Design:** Retrospective cohort study at Northwestern University.

**Population Studied:** Patients aged 18-90 seen in the Northwestern ENT practice and provided a new PPI prescription from 2005-2011 were included. PPI prescription, diagnoses, and procedure data were obtained from the electronic database. Chart review was performed on patients with both an ENT and GI evaluation to determine differences in diagnoses, PPI prescriptions, and diagnostic testing. Descriptive statistics and tests for agreement in diagnoses were performed.

**Presenter:** Andrew Gawron, M.D., Ph.D., Fellow, Division of Gastroenterology/Institute for Healthcare Studies, Northwestern University Fernbeg School of Medicine, agawron@fsm.northwestern.edu
**Principal Findings:** 2,427 patients were provided a new PPI prescription by ENT between 2005 and 2011. Patients were 52.2 yrs of age (sd 15.4) and predominantly female (56.4%), white (58.1%), and non-Hispanic (65.6%). Esomeprazole accounted for the greatest number of prescriptions (722, 29.8%), followed by omeprazole (582, 24.0%). Of patients given a PPI prescription, the primary, secondary, or tertiary ENT diagnosis was reflux (GERD, LPR) in 1,018 patients (41.9%). Other diagnoses were highly variable and included hoarseness (11.2%), cough (6.1%), and sleep apnea (4.9%). Diagnostic laryngoscopy was performed in 672 encounters (27.7%). A total of 140 patients (5.8% of 2,427) also saw GI (90 after ENT, 48 prior to ENT, and 2 on the same day). Of these 140 patients, 94 (67.1%) were given a standard diagnosis of GERD by GI and 33 (23.6%) were documented to have extra-esophageal symptoms (e.g. sore throat, globus). GI and ENT agreed 55.7% of the time in a standard reflux diagnosis (kappa statistic = 0.08). GI diagnoses, including extra-esophageal symptoms, supported reflux in 81.4% of patients who were prescribed a PPI by ENT. GI and ENT prescribed the same PPI in 73 patients (59.8%). PPI dose and frequency were the same in 78 (70.9%) and 77 patients (63.6%), respectively. Instructions on PPI timing were the same in 57 patients (47.1%). Laryngoscopy was performed in 135 patients, and 90 of these exams showed evidence of reflux. Upper endoscopy was performed in 96 patients (34.4% with hiatal hernia, 13.5% with esophagitis) and 19 had pH testing (11 with positive results for reflux). Of 17 patients with pH testing and laryngoscopy, 5 (29.4%) had evidence of reflux on both tests.

**Conclusions:** In patients evaluated by ENT and GI, agreement in diagnosis of standard reflux disease is poor, PPI prescriptions between the two specialties are highly variable, and esophageal reflux testing is rarely used.

**Implications for Policy, Delivery, or Practice:** Our results suggest that further work is needed to coordinate care and align management strategies for patients referred to specialty care for reflux disease and symptoms.

**Funding Source(s):** AHRQ

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**Racial and Ethnic Differences in the Prevalence of Mental Health Service Use among all U.S. Adults and Adults with Serious Mental Illness**

Cristie Glasheen, RTI International; Judith Teich, SAMHSA; Lisa Colpe, NIMH; Sarra Hedden, CBHSQ

**Presenter:** Cristie Glasheen, Ph.D., Behavioral Health and Criminal Justice Division, RTI International, cglasheen@rti.org

**Research Objective:** Studies of mental health service use show that the majority of individuals with disorders do not seek professional help (Jensen & Goldman, 2011; Wang, Lane, et al., 2005). In addition, mental health service use is lower among members of minority communities, compared with non-Hispanic whites (Swartz, Wagner, et al., 1998; Wang, Lane, et al., 2005). This study presents mental health service use for specific race/ethnicity groups among all adults in the US and among adults with serious mental illness using data from the 2008-2011 National Survey on Drug Use and Health (NSDUH).

**Study Design:** This study used data from the 2008-2011 National Survey on Drug Use and Health (NSDUH). NSDUH is an annual survey of the civilian, non-institutionalized population of the United States aged 12 years old or older. The survey collects data on substance use treatment and mental health service use as well as data on the need for treatment and reasons for not receiving treatment.

**Population Studied:** NSDUH data was used to assess the past year prevalence of mental health service use by service type (any, inpatient, outpatient, and prescription medication) among specific race/ethnic groups and by selected demographic and socio-economic characteristics. Prevalence rates were assessed among all adults as well as among adults with serious mental illness.

**Principal Findings:** Preliminary results indicate that the annual average of any mental health service use among all adults in the US was 13.6 percent (se=0.15). Among specific racial/ethnic groups, the prevalence of any past year mental health service use was 5.1 (se=0.53) percent among Asian adults, 7.3 (se=0.32) percent among Hispanics adults, 7.3 (se=0.32), percent among non-Hispanic black adults, and 18.2 (se=1.60) percent among non-Hispanic adults of two or more races, 16.8(se=1.81) percent among American Indian/Alaska Native adults,
been limited to perioperative outcomes with little
the cervical spine is off-label. Prior studies have been limited to perioperative outcomes with little
enhance bone fusion after spine surgery. It is a biologic product intended to

Research Objective: Bone Morphogen Protein (BMP) is a biologic product intended to
improve services for these groups. Initiatives to improve rates of mental health service use in the US, particularly among adults with SMI, will contribute to the overall health of the Nation. These findings suggest that policy makers need to focus on major initiatives to improve mental health service use in the past year. Conclusions: These results show considerable variation in mental health service use by race/ethnicity groups.

Implications for Policy, Delivery, or Practice: Initiatives to improve rates of mental health service use in the US, particularly among adults with SMI, will contribute to the overall health of the Nation. These findings suggest that policy makers need to focus on major initiatives to improve services for these groups.

Funding Source(s): N/A, SAMHSA
Poster Session and Number: A, #92

Complications, Revision Fusions, Readmissions and Utilization Over a One-Year Period Following Bone Morphogenic Protein Use During Primary Cervical Spine Fusions

Adam Goode, Duke University; William J. Richardson, MD, Duke University Medical Center; Robin M. Schectman, MSPH, University of North Carolina Chapel Hill; Timothy S. Carey, MD, MPH, University of North Carolina Chapel Hill

Presenter: Adam Goode, D.P.T., Ph.D., Assistant Professor, Community and Family Medicine, Duke University, adam.goode@duke.edu

Research Objective: Bone Morphogenic Protein (BMP) is a biologic product intended to enhance bone fusion after spine surgery. It is approved for use in the lumbar spine, but use in the cervical spine is off-label. Prior studies have been limited to perioperative outcomes with little investigation of effectiveness. To fill this gap in the literature we assessed: 1) the risk of complications and cervical revision fusions; 2) differences in hospital readmission rates; 3) differences in healthcare services utilization over a one-year period among patients. These findings would improve the understanding of the effectiveness of BMP during primary cervical spine fusions.

Study Design: A retrospective cohort study over a one-year period using data from a large, nationwide multi-payer commercial U.S. claims database.

Population Studied: Patients aged 18 to 64 years old receiving and not receiving BMP at index surgery during a primary (C2-C7) cervical spine fusion.

Principal Findings: There were 61,937 eligible primary cervical spine fusions between 2002 and 2009 of which 1,677 received BMP. The use of BMP was more common among non-capitated insurance types (odds ratio [OR]=1.21 ((95% CI 1.06 to 1.40)) and 4+ levels fused (OR=2.01 ((1.79 to 2.25))). Diagnoses other than disk herniation and degenerative diseases were more likely to receive BMP (OR=1.14 ((95% CI 1.02 to 1.27))). The use of BMP was strongly and independently related to comorbidities, with increasing use of BMP with an increasing number of comorbidities (p<0.001). After adjusting for patient characteristics (i.e., age, sex, levels of fusion, type of fusion approach, diagnosis, insurance type and year of fusion), hospital region and comorbidity using multivariate regression, patients receiving BMP were 38% more likely to have a complication in a one-year period (adjusted odds ratio [aOR]=1.38 ((95% CI 1.20 to 1.58)) and had a significant risk of CNS complication (aOR=1.44 ((95% CI 1.11 to 1.88))). BMP use was not a risk factor for wound, medical or dysphagia/hoarseness complications. A strong risk for cervical revision fusion surgery within a one-year period was found among patients receiving BMP (aOR=1.73 ((95% CI 1.35 to 2.22)). The risk of 30-day readmission was greater with BMP use (aOR=1.37 ((95% CI 1.07 to 1.73)), and re-admission occurred on average 27.4% sooner. Patients receiving BMP were more likely to receive computed tomography scans (aOR=1.38 ((95% CI 1.22 to 1.57)) and epidural injections following anterior surgical approaches (aOR=1.29 ((95% CI 1.00 to 1.65)).

Conclusions: No evidence was found that BMP has a protective effect for any complication or a cervical revision fusion. Patients receiving BMP...
had higher hospital readmission rates and utilized more healthcare services in a one-year period.**

**Implications for Policy, Delivery, or Practice:**
The use of BMP is considered off-label with cervical spine fusions, as the Food and Drug Administration has not approved its use. These findings question the effectiveness of off-label BMP use with primary cervical spine fusions.

**Funding Source(s):** AHRQ

**Impact of a Prior Authorization for Long-Acting Beta-Agonist and Inhaled Corticosteroid Combination Therapy in a Medicaid Population.**

Kathy Ketchum, Oregon State University; Daniel Hartung, Oregon Health & Science University; Dean Haxby, Oregon State University; Luke Middleton, Oregon State University; Kathy Sentena, Oregon State University

**Research Objective:** Evidence suggests that long-acting beta-agonists (LABA) are associated with an increased risk of severe asthma exacerbation. The US Food and Drug Administration and clinical practice guidelines recommend LABA therapy be reserved to those who remain symptomatic on an inhaled corticosteroid (ICS). Despite this, only 20% of patients initiating a LABA appear to be on a previous asthma controller medication. In an effort to improve utilization, the Oregon Medicaid program implemented a prior authorization (PA) policy restricting LABA/ICS combination product use to patients with a recent history of asthma or COPD controller medication use. The objective of this study was to evaluate the impact of this PA on adverse clinical events.

**Study Design:** We conducted a retrospective cohort study using administrative data from the Oregon Medicaid program to compare patients who experienced a PA claim rejection for an ICS/LABA combination product to a historical control group of patients with an incident ICS/LABA prescription in the previous year. The primary outcome was a claim for an asthma or COPD-related emergency department (ED) encounter or hospitalization within 60 days of ICS/LABA claim rejection or incident control fill. Other outcomes included all-cause mortality, ED, hospitalizations, and oral steroid utilization during the same time period. Multivariate logistic regression was used to quantify the association between PA claim rejection and adverse outcomes while adjusting for baseline demographic and disease severity indicators.

**Population Studied:** The study sample included patients with 3 months of continuous Medicaid fee-for-service enrollment before and after their index event (claim reject or control claim fill). Individuals with dual Medicare eligibility, and those less than 5 or greater than 64 years of age were excluded.

**Principal Findings:** A total of 812 patients met inclusion criteria. Of the 278 patients who had a PA rejection, 15 (5.4%) had a subsequent ED or hospitalization for asthma or COPD compared to 21 of 534 (3.9%) of patients in the control group (unadjusted odds ratio (OR) 1.39, 95% CI 0.71 – 2.75). After multivariate adjustment, this association became statistically significant (adjusted OR 2.69, 95% CI 1.23 – 5.88). PA rejection was also associated with oral steroid use within 60 days (adjusted OR 1.93, 95% CI 1.3 – 2.86). There was no association between PA rejection and all-cause hospitalization, ED use, or death (adjusted OR 0.95, 95% CI 0.65 – 1.38). Subgroup effects among those with asthma or COPD at baseline were not statistically significant. Sensitivity analyses assessing outcomes at 30 and 90 days yielded similar findings.

**Conclusions:** Although the overall event rate was low, a PA policy restricting inhaled ICS/LABA appears to increase the risk for adverse outcomes in Medicaid patients.

**Implications for Policy, Delivery, or Practice:** Although efforts were made to minimize disruptions in patients who may have been harmed by treatment delay, policy restrictions that affect individuals with respiratory disease may have undesired consequences and warrant careful implementation and evaluation.

**Funding Source(s):** No Funding

**Dental Service Utilization and Expenditures Among Kansas Medicaid Aged, Blind, and Disabled Beneficiaries**

Jacqueline Hill, University of Kansas Medical Center; Theresa Shireman, PhD, University of Kansas Medical Center

**Presenter:** Jacqueline Hill, M.P.H., Doctoral Student, Health Policy & Management
University of Kansas Medical Center,
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Research Objective: Prior to April 2010, oral health services were covered for Medicaid beneficiaries on home and community-based service (HCBS) waiver programs for persons with developmental disabilities (DD), physical disabilities (PD), and the frail elderly (FE) in Kansas. This analysis explores dental service utilization and related expenditures for these Kansas Medicaid populations.

Study Design: We conducted a retrospective, cross-sectional analysis of Kansas Medicaid fee-for-service claims from April 2009 to March 2010. Dental services were identified through procedure codes from outpatient and emergency department (ED) claims. Services were further divided into preventive and non-preventive categories and characterized at the visit-level with associated expenditures.

Population Studied: We studied adults age 18 and older who were continuously enrolled in the Kansas Medicaid fee-for-service program for the 12 month study-period and on HCBS waivers for DD, PD, and FE.

Principal Findings: Of the 22,375 Kansas Medicaid fee-for-service enrollees on HCBS waivers for PD, DD and FE, 21% (N=4,702) had dental claims totaling nearly $2.7 million. Nearly 61% of outpatient dental claims were for preventive services and 75% of these services were performed by dentists. Over 3% of dental service claims were performed in the ED, totaling approximately $57,000. Although each HCBS population comprised nearly one-third of the total eligible study population, nearly 50% of dental service users were enrollees with DD who accounted for 37.5% of total dental costs. Conversely, FE enrollees comprised only 20% of service users, but were responsible for nearly 34% of total dental costs. Moreover, the majority (60.2%) of dental claims among DD enrollees were for preventive services, compared to 26.1% and 18.3% among FE and PD enrollees, respectively.

Conclusions: Only one-fifth of Medicaid enrollees on DD, PD, and FE waivers had dental service claims, implying limited access to these services. In particular, preventive services appear to be underutilized among PD and FE enrollees. Expenditures associated with dental services were lower for DD enrollees, reflecting higher rates of preventive care, while the average cost per dental claim was higher for FE enrollees due to higher rates of non-preventive dental services.

Implications for Policy, Delivery, or Practice: Understanding dental service utilization in this population is important first step in effectively addressing oral health disparities among individuals with disabilities. In 2013, Kansas Medicaid implemented statewide managed care services for all beneficiaries that focus on more integrated, whole-person care with an emphasis on HCBS. Under this reform, ‘value-added services,’ such as preventive dental services are covered for adults age 21 and older. As Kansas Medicaid moves forward with implementing these new services, it will be important to track dental service utilization rates and expenditures, particularly among disabled beneficiaries. Based on our findings, when dental services were previously covered, they were vastly underutilized by disabled beneficiaries, particularly those on PD and FE waivers. However, dental service costs among these beneficiaries were higher, indicating a need for improved dental care coordination to mitigate disparities in oral health access among disabled Medicaid beneficiaries.

Funding Source(s): No Funding

Poster Session and Number: C, #942

Advancing a Common Understanding of Real-World Evidence to Meet Public Health Needs
Sarah Donovan, Avalere Health; Nikita Jeswani, Avalere Health; Elizabeth Guo, Avalere Health; Nicholas Wimbush, Avalere Health; Tanisha Carino, Avalere Health; Gillian Woollett, Avalere Health

Presenter: Nikita Jeswani, B.A., Associate, Evidence-Based Medicine, Avalere Health, njjeswani@avalerehealth.net

Research Objective: The push for value in healthcare has generated growing a interest by payers, providers, clinicians, policymakers, and patients to understand the real-world risks and benefits of therapies. As a result, stakeholders are increasingly demanding non-traditional types of evidence, including real-world evidence (RWE), to answer questions about outcomes that are not adequately captured in randomized controlled trials. Despite investment in new forms of evidence generation, the environment refers to RWE in a variety of ways. Given this lack of consensus on a single definition, we investigated how RWE could be understood so
that stakeholders can effectively generate, communicate, and use RWE to better address public health needs.

**Study Design:** Using publicly available information, we identified a sampling of organizations across stakeholder groups that generate, communicate, and use RWE. In November 2012, we compiled definitions, positions, public statements, methods for RWE generation, and additional information by searching the organizations’ websites, press releases, newsletters, job postings, and publications. We aggregated findings in a database for analysis.

**Population Studied:** We evaluated 50 organizations from the following groups: academia, comparative effectiveness research (CER)/health technology assessment organizations, pharmaceutical manufacturers, patient advocacy groups, payers, professional societies, regulators, and research institutions.

**Principal Findings:** Our analysis showed that though there is a research need for RWE, there is a lack of consensus among stakeholders around how RWE should be defined. Of the organizations assessed, only 38 percent have developed a definition of RWE, and 28 percent did not have readily available information on RWE. We identified several commonalities across the available concepts of RWE. Specifically, organizations noted the need for RWE in post-market CER. However, organizations frequently disagreed on multiple aspects of RWE, including the best approach to address methodological rigor concerns.

**Conclusions:** Given the evolving marketplace for post-market evidence collection (e.g., electronic health records) and growing demands to understand the real-world effects of therapies, the capabilities to generate, communicate, and use RWE are expanding. However, stakeholders, such as the Food and Drug Administration, appear skeptical of this type of evidence, due to a lack of clarity on what RWE is, if it can be methodologically rigorous and reproducible, and how it can be used meaningfully. We propose a conceptual framework for advancing a more common understanding: RWE is research that is designed to answer unique questions that go unanswered by other types of evidence. To ensure that RWE meets public health needs, evidence generators, communicators, and end-users must consider three critical factors when designing studies: meaningful endpoints, appropriate study design, and real-world data sources.

**Implications for Policy, Delivery, or Practice:** If adequately defined and communicated, RWE can provide important insight to the real-world relative risks and benefits of clinical options for patients by assessing endpoints not sufficiently addressed in other types of evidence; confirm the value of medical products through demonstrable outcomes; inform payer decision-making; and support decisions on appropriate clinical treatment pathways in specific therapeutic areas. However, in order for the healthcare industry to successfully utilize RWE, stakeholders need to engage in a dialogue to develop a common understanding of what RWE is and how it can be applied meaningfully.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #943

### The Potential for Care Teams to Positively Influence Quality of Care and Health Outcomes for Mental Health Patients

**Presenter:** Nikita Jeswani, B.A., Associate, Evidence-Based Medicine, Avalere Health, njeswani@avalerehealth.net

**Research Objective:** Recent literature highlights the ability of an effective care team to promote high quality care through care coordination for various patient populations. The increasing severity and prevalence of mental health conditions, combined with the rise in comorbidities in the U.S., have created a lack of clarity on the leadership, composition, and optimal settings for care teams to facilitate care management. Given these complexities, Avalere sought to understand how care teams can engender better management of mental health conditions by patients and health professionals.

**Study Design:** In December 2012, we conducted a white and grey literature search to identify behavioral health homes. We applied National Committee for Quality Assurance (NCQA) patient-centered medical home (PCMH) criteria to determine a set of models to evaluate. From this set, we profiled three models as case studies. To assess the composition, team member roles, and support tools utilized by care teams, we researched websites, press releases,
Population Studied: We examined the following behavioral health home models across three distinct geographic regions: Rhode Island Chronic Care Sustainability Initiative, Maimonides Medical Center - Brooklyn Care Coordination Consortium, and Depression Improvement Across Minnesota Offering a New Direction. 

Principal Findings: We determined that when implemented appropriately, the use of care teams can produce tremendous improvements in healthcare quality. Though composition and roles of each of team member varied significantly, leadership by a care manager and family member participation was foundational to each institution’s care team approach. Consistent with NCQA standards, care teams that measured best practices and focused on care coordination by centralizing care around a single manager, partner, or navigator achieved notable early success in outcomes and cost savings.

Conclusions: Findings from early behavior health home models show that holding a team accountable for individual patient needs leads to better quality of care. Building a partnership and mutual trust among practitioners, patients, their families, caregivers, and advocates empowers patients to proactively manage their mental health conditions. Care teams in these delivery models have demonstrated early success, but there is room for improvement. Specifically, care team roles and composition need to be more clearly defined. While there are numerous accreditation programs for PCMHs, there is a need to prioritize the development of qualifying criteria for behavioral health homes.

Implications for Policy, Delivery, or Practice: As the composition of innovative care delivery models continues to evolve, care teams can be utilized as a mechanism to improve care coordination and promote high quality care for patients. Additional research is needed to define optimal structure and unique roles of team members before incorporating care teams into a behavioral health home model. As organizations consider potential standards for behavioral health homes, the inclusion of specific care team criteria focused on best practices will be essential to achieving quality improvement.

Funding Source(s): No Funding

Poster Session and Number: C, #944
the differences in access when local non-VHA stroke facilities were included. All GIS analyses were conducted using the ARC-GIS software version 10 from ESRI (Redlands, CA).

**Population Studied:** All VHA enrollees aged 65 and older and VHA patients diagnosed with acute stroke.

**Principal Findings:** We identified 4,694,511 VHA enrollees in FY2010 who were older than 65 years of age and 59,127 unique patients with acute stroke between FY2006 and FY2010. Based on recently mandated VHA stroke center criteria, there are 65 VHA medical centers providing acute stroke care (including 33 full-time primary stroke centers and 32 limited hours stroke facilities) and 1,074 Joint Commission certified non-VHA Primary Stroke Centers across the nation. Our GIS analyses showed that (1) 1,277,099 (27.2%) VHA enrollees over the age of 65 and 28,094 (47.5%) patients with acute stroke lived within 60-minute driving time from a VHA stroke center. With the addition of the non-VHA private stroke centers, the overall 60-minute driving time coverage would increase from 27.2% to 41.7% for VHA enrollees over the age of 65 and from 47.5% to 61.2% for acute stroke patients.

**Conclusions:** While up to 47.5% of the VHA enrollees and 61.2% of the VHA stroke patients could potentially receive acute stroke care intramurally or extramurally, creative solutions are required to increase access to acute stroke care for the Veterans residing beyond 60-minute driving time from a VHA and/or non-VHA stroke facility.

**Implications for Policy, Delivery, or Practice:** Treatment of acute stroke patients in stroke centers increases the odds that patients receive tissue plasminogen activator (tPA) which has been demonstrated to decrease stroke morbidity. The ultimate goal of this study was to make strategic recommendations to VHA policy makers regarding the locations of VHA facilities capable of delivering acute stroke care, and the use of potential alternate strategies such as tele-stroke care or outsourcing to community stroke centers where VHA resources are lacking.

**Funding Source(s):** VA

**Poster Session and Number:** C, #945

**Effects of Telerehabilitation on Functional Outcomes and Health-Related Quality of Life**

Huanguang Jia, Rehabilitation Outcomes Research Center; Charles E. Levy, Rehabilitation Outcomes Research Center, North Florida/South Georgia Veterans Health System, Department of Veterans Affairs; David L. Omura, William Jennings Bryan Dorn VA Medical Center, Department of Veterans Affairs; Paul M. Hoffman, Veterans Rural Health Resources Center – East Region, Department of Veterans Affairs; Diane C. Cowper Ripley, Rehabilitation Outcomes Research Center, North Florida/South Georgia Veterans Health System, Department of Veterans Affairs; William B. Mann, Rehabilitation Outcomes Research Center, North Florida/South Georgia Veterans Health System, Department of Veterans Affairs

**Presenters:** Huanguang Jia, PhD, Research Health Scientist, North Florida/South Georgia Veterans Health System, Department of Veterans Affairs, Rehabilitation Outcomes Research Center, Huanguang.Jia@va.gov

**Research Objective:** The Veterans Health Administration (VHA) of the Department of Veterans Affairs (VA) currently enrolls 3.3 million rural Veterans, and approximately 43% (2.27 million) of the VHA patients with a service-connected disability live in rural areas. Telerehabilitation is expected to play an important role in meeting the needs for rehabilitation care and expanding healthcare access for the Veterans with disabilities residing in rural areas. In this study, we assessed the functional outcomes, health-related quality of life (HRQoL) and satisfaction among a group of Veterans who participated in the Rural Veterans Telerehabilitation Initiative (RVTRI) program between February 22, 2010 and April 1, 2011.

**Study Design:** This retrospective, pre-post study included 54 Veterans enrolled in the RVTRI. Functional outcomes were measured by Functional Independence Measure (FIM), Quick Dash (QuickDASH), the Montreal Cognitive Assessment (MoCA), and Two-Minute Walk Test (2MWT). HRQoL was assessed using the Veterans RAND 12-Item Health Survey (VR-12). Satisfaction was evaluated using a telehealth satisfaction scale. All these outcomes measurements were collected at Veterans’ admission and discharge date from the RVTRI, except for satisfaction which was measured solely at discharge. Veterans’ residential and the VHA hospital ZIP codes were used to calculate travel distances.

The RVTRI network system consists of two sets of endpoints (video codecs) connected via an encrypted secure VA Expressway. One endpoint was located at the provider’s work station behind the VA firewall; the other was...
located at the participating Veteran's home. Rehabilitation therapy was delivered by a Cisco-Tandberg E. 20 video phone and/or Tandberg's Movi 2/3 software installed on a personal computer equipped with a web camera. A Wilcoxon signed-rank test was used to compare the difference in the repeated outcome measures.

**Population Studied:** Community-dwelling Veterans were enrolled at a local VA medical center following an initial in-person assessment. Veterans who required hands-on rehabilitation (i.e., manual mobilization) were excluded.

**Principal Findings:** The study cohort consisted of 94.5% male, 63.0% between 50-64 years of age, and 53.7% diagnosed with neurological and/or musculoskeletal disorders. On average, the participants were in the program for 95.4 (SD=43.4) days and received 9.8 (SD=43.3) therapeutic sessions. The RVTRI program helped save an average total of 1,679.1 (SD=2,115.2) travel miles, 28.0 (SD=35.3) driving hours, and $696.80 (SD=$877.80) of VHA travel reimbursement per Veteran, excluding costs for hotel, meals, child care, and lost work time. Our Wilcoxon signed-rank test showed a significant improvement in the participants' FIM (p<0.0001, r=0.3), MoCA (p=0.0003, r=0.4), the 2MWT (p=0.0031, r=0.8), and VR-12 (p=0.0316, r=0.2) scores. The upper-limb functional restoration assessed by QuickDASH was not significant. Ninety-eight percent (98.0%) of the participants were very satisfied with the telerehabilitation experience.

**Conclusions:** Delivering needed real-time and appropriate rehabilitation therapy through the RVTRI program at participating rural Veteran's homes demonstrated a significant and large effect on improving the participants' two-minute walking distance, a significant and medium effect on improving the participants' functional independence and cognitive function, and a significant but small effect on the participants' HRQoL.

**Implications for Policy, Delivery, or Practice:** These results suggest that in-home telerehabilitation via internet connected videophones can be a viable alternative to rehabilitation care delivery.

**Funding Source(s):** VA

**Poster Session and Number:** C, #946

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**Development of a Vertical Equity Measure for a Federally-Funded Cancer Control Program**

Kristy T. Joseph, Centers for Disease Control and Prevention; Kristy Joseph, Centers for Disease Control and Prevention; Ketra Rice, ORISE; Chunyu Li, Centers for Disease Control and Prevention

**Presenter:** Kristy Joseph, B.S. Accounting M.A. Economics, Public Health Analyst, Division for Cancer Control and Prevention, Centers for Disease Control and Prevention, vio5@cdc.gov

**Research Objective:** The goal of the Centers for Disease Control and Prevention’s (CDC) Colorectal Cancer Control Program (CRCCP) is to increase colorectal cancer screening rates to 80 percent by 2014 in funded States through promotion efforts which includes evidence-based interventions, policy and systems changes and the provision of screening to low-income, uninsured adults ages 50-64. Ensuring equitable funding for all grantees is important to maximize the return on investment. A funding equity measure should convey procedural justice (fair process) and support distributive justice (fair outcomes) for grantees. CDC is developing a new funding process that supports a more equitable distribution of resources. The purpose of this study was to develop a measure to promote funding equity.

**Study Design:** Using CRCCP program and state-level population data, a vertical equity measure was developed and calculated for each grantee. Vertical equity asserts an unequal, but equitable distribution of funding based on need. The denominator is the proportion of the funding awarded to an individual grantee to total funds awarded for a given year. The numerator represents the proportion of a grantee’s population eligible for screening compared to the total CRCCP population. The equity measure reflects how a 1 percent increase in funds yields a given percentage increase in population reached. Next, we grouped grantees with like characteristics at the state and program levels to represent need. Equity measures were compared within and across groups to establish vertical equity (i.e., high or low) and compared to group-level means.

**Population Studied:** 25 State CRCCP grantees were studied to establish vertical equity. Characteristics included in the analysis were: (1) State-level population characteristics (e.g., socioeconomic composition, colorectal cancer screening and mortality rates, rural/urban landscape) and (2) program structure (e.g., grantee organizational capacity).

**Principal Findings:** Vertical equity measures ranged from 0.15-5.44 percent, an average of...
0.98 percent, illustrating the wide range of funding levels to the proportion of the eligible population. Results demonstrate existing inequalities in the current funding distribution. For example, a grantee in one group had the lowest funding award ($527,000), but the highest proportion of population need (0.12) and lowest CRC screening rate (57%). The vertical equity measure for this state was .66 percent, meaning that a 1 percent increase in funds will yield an increase of .66 percent population reached.

**Conclusions:** Applying a vertical equity measure may contribute to an equitable funding process and improved program outcomes. In moving toward a more equitable distribution of funds, all CRCPP grantees have a balanced opportunity to reach the program goal of 80 percent screening rates.

**Implications for Policy, Delivery, or Practice:** Public health organizations could more justifiably distribute funds and better maximize outcomes by using an equity measure in their funding processes. By establishing groups based on diversity of need, funding ranges could be established to systematically ensure an equitable treatment of like grantees.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #947

**Cost per Treated Patient for Biologics in Rheumatoid Arthritis in Medicaid**

Machoan Bonafede, Truven, Andover, MA, USA; George Joseph, Amgen; George Joseph, Amgen Inc., Thousand Oaks, CA; Nicole Princic, Truven, Cambridge, MA, USA; David Harrison, Amgen Inc., Thousand Oaks, CA

**Presenter:** George Joseph, Ph.D., M.S., Senior Manager, Global Health Economics, Amgen, gejoseph@amgen.com

**Research Objective:** To estimate annual cost per treated patient for the Tumor Necrosis Factor (TNF) blockers etanercept, adalimumab and infliximab in rheumatoid arthritis (RA) in patients covered by Medicaid.

**Study Design:** For this retrospective cohort study, the MarketScan Medicaid Multistate Database was used to identify adult patients, age 18 or over with one or more claim for a biologic of interest between January 1, 2007 and December 31, 2011. A subject’s first claim preceded by at least 6-months of enrollment and followed by 12 months of continuous enrollment was their index claim and defined their index date and treatment cohort. Patients had to have a diagnosis of RA in the 6-months preceding their index date. Patients with other conditions treated with these agents including psoriasis, psoriatic arthritis, ankylosing spondylitis, Crohn’s disease, or ulcerative colitis pre-index were excluded. “Continuing” patients had one or more claim for their index biologic before their index date, “New” patients did not. Mean monthly dose and total dose of other biologics after discontinuation of their index biologic was calculated for the 12-months after index. Wholesale acquisition costs and the Medicare Physician Fee Schedule were applied to the mean monthly dose and related drug administration to calculate cost per treated patient in US dollars.

**Population Studied:** Adult Medicaid patients with RA treated with etanercept, adalimumab or infliximab between January 1, 2007 and December 31, 2011.

**Principal Findings:** A total of 1,085 patients were included; 48% received etanercept at index (n=521); 37% received adalimumab (n=405); and 15% received infliximab (n=159). Patient characteristics were similar across groups; mean age 47.4 years (SD=10.7) and 83% were female. For all patients, the annual RA biologic cost per treated patient was $15,747 for etanercept, $17,939 for adalimumab and $20,445 for infliximab. For all agents, annual costs were lower for new patients, $15,352 for etanercept, $16,222 for adalimumab and $19,067 for infliximab than for continuing patients, $16,199 for etanercept, $20,922 for adalimumab, and $21,706 for infliximab. The proportion of patients remaining on their index agent was also higher for continuing patients, 49% for etanercept, 47% for adalimumab, and 58% for infliximab compared to 38% for etanercept, 34% for adalimumab, and 36% for infliximab in new patients.

**Conclusions:** Based on drug utilization in this Medicaid population, etanercept had the lowest cost per treated patient in RA in both new and continuing patients. The higher cost for continuing patients was partially driven by higher persistence. Both etanercept and adalimumab which are self-injected were less expensive than infliximab, which is infused.

**Implications for Policy, Delivery, or Practice:** There are meaningful differences in annual drug costs for patients starting on different TNF blockers which may be an important consideration when designing formulary and reimbursement policies in Medicaid.
Funding Source(s): Other, Research funded by Immunex Corporation, a wholly owned subsidiary of Amgen Inc., and by Wyeth, which was acquired by Pfizer Inc. in October 2009.

Poster Session and Number: C, #948

Disseminating CER-Based Models for Substance Misuse and Depression in Primary Care Clinics across Four States Keith Kanel, Pittsburgh Regional Health Initiative; Robert Ferguson, Pittsburgh Regional Health Initiative

Presenter: Keith Kanel, MD MHCM FACP, Chief Medical Officer, Pittsburgh Regional Health Initiative, kanel@jhf.org

Research Objective: The research objectives for the Partners in Integrated Care consortium include: (1) establish a multi-state partnership that includes three Chartered Value Exchanges (CVEs); (2) develop an implementation strategy that addresses both system- and practice-level barriers to widespread implementation; (3) increase the number of primary care practices implementing IMPACT for depression and SBIRT for substance misuse; (4) increase the number of eligible patients who receive these CER-based services; (5) reduce symptoms of depression and frequency of substance misuse; and (6) recruit another CVE through the Network for Regional Healthcare Improvement as a dissemination site.

Study Design: The consortium is led by the Pittsburgh Regional Health Initiative (PRHI). Each of the organizations in the consortium is responsible for regional implementation, which includes recruitment, training, coaching, learning collaboratives, data collection, and regional policy work. The Steering Group oversees five work groups that include members from each of the partnering organizations.


Principal Findings: Regarding recruitment, the following can present challenges: finding and paying for a consulting psychiatrist, practice and staffing constraints (limited resources), commitment to other projects, provider and staff inexperience and discomfort with team care, and the reimbursement equation. However, strong leadership and an understanding of the what’s in it for me statement can trump these concerns. Regarding implementation, even if a primary care site is simply adding SBIRT to an existing IMPACT infrastructure, implementation and training still require substantial effort, resources, support, culture change, and leadership. Also, an electronic care management tracking system is critical for care management, caseload review, and data collection. Regarding dissemination, cultural and regional differences trump standardized terminology and training and implementation strategies.

Conclusions: Disseminating CER-based models in different regions with unique histories, policies, and cultures requires adaptations; however, standardization is necessary for model fidelity and aggregating data. Future work is needed to determine how to design the organizational structure of the consortium to standardize model fidelity and data collection, while allowing local adaptation.

Implications for Policy, Delivery, or Practice: Four factors are necessary to sustain CER-based care delivery models: alignment of local, state, and federal quality measures; new types of payment; changes in legislation; and provider leadership.

Funding Source(s): AHRQ

Poster Session and Number: C, #949

Patient-Centered Medical Homes and Physician Assistant Education Gerald Kayingo, Yale School of Medicine

Presenter: Gerald Kayingo, Ph.D., M.M.Sc., P.A., Instructor, Physician Associate Program, Yale School of Medicine, gerald.kayingo@yale.edu

Research Objective: The Patient-Centered Medical Home (PCMH) utilizes interprofessional teams to deliver quality healthcare in a manner that focuses on the patients’ needs. Despite being prominently featured in the Affordable Care Act, little is known about the impact of the PCMH on medical education and how institutions are preparing students to provide care in this new model. The aim of this project is to determine the extent to which Physician Assistant (PA) students are exposed to elements of the PCMH during the didactic and clinical phases of their education.

Study Design: In 2012, using Survey Monkey, a prevalidated survey was distributed to American PA programs. The survey inquired about curricula central to practice in the PCMH; team based care, electronic medical record utilization and principles of care coordination. The study protocol was approved by the Yale School of Medicine Human Investigation Committee.
**Population Studied:** Physician Assistants

**Principal Findings:** Seventy-eight clinical coordinators (49%) completed the survey of which 94% stated they teach principles of team-based practice, 71% instruct their students in the use of the electronic medical record, 61% expose the students to care coordination, and 30% teach them about payment structures that reward care coordination and high quality care, while 22% stated students do not have exposure to the PCMH. Most importantly less than 25% of programs utilize designated PMCH clinical sites and those that do have been doing so for less than two years.

**Conclusions:** The data indicate that many PA programs introduce concepts of the patient-centered medical home in the lecture hall but few PA students’ are exposed to medical homes during clinical training.

**Implications for Policy, Delivery, or Practice:** This project is among the first of its kind to study the PCMH and PA Education and has identified areas for further research that may prepare PAs to function better in team based practices.

**Funding Source(s):** Other, PAEA

**Poster Session and Number:** C, #950

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**The Impact of Payment Reform on Rural Medicare Advantage Enrollment and Quality**

Leah Kemper, Washington University in St. Louis; Abigail Barker, PhD, Washington University in St. Louis; Timothy McBride, PhD, Washington University in St. Louis

**Presenter:** Leah Kemper, M.P.H., Policy Analyst, Brown School of Social Work, Washington University in St. Louis, kemper@wustl.edu

**Research Objective:** This project examines the implications of changes in Medicare Advantage (MA) payment implemented in the Affordable Care Act (ACA) and in the current Centers for Medicare and Medicaid (CMS) demonstration of quality-based bonus payments. We focus on two key issues: (1) how the changes to MA payment, including bonus payments linked to quality-based star ratings, could impact the plans available to rural beneficiaries, and (2) the likely impact of these changes on rural enrollment in MA plans.

**Study Design:** We analyze MA enrollment and quality as a function of geography as well as the benchmark and quality bonus payments received by the plans, and we generate results using both the parameters established by the ACA and the current CMS demonstration. Thus, the research focuses on the significantly higher quality-based bonus payments due to lower qualification criteria, and it also measures the impact of transitioning to the quality parameters established by the ACA as the demonstration concludes.

**Population Studied:** The population studied is the entire Medicare population within the U.S. The unit of analysis is the county level.

**Principal Findings:** We find that rural MA payment will decline in most areas, but it will not be as negatively impacted as many urban areas. In addition, we find that rural MA plans have lower quality than urban MA plans due to rural enrollment being concentrated in PPOs rather than HMOs, which generally have higher quality ratings. Therefore, rural areas will receive smaller quality bonus payments, especially once the demonstration program ends. However, we also identify specific quality indicators that account for the majority of the difference in quality among rural and urban plans, and we categorize these with regard to their implementation feasibility.

**Conclusions:** Some of the reductions in MA payment that will occur with the implementation of the ACA will be offset by quality-based bonus payments. Rural areas have lower average quality ratings and less HMO enrollment; therefore, they won’t benefit significantly from the ACA quality payments. As demonstration bonus payments end in 2014 and the transition to the new MA payment structure begins, these reductions in payment could have an impact on MA enrollment and plan availability going forward.

**Implications for Policy, Delivery, or Practice:** Due to the provision that ties benchmark payments to a county’s relative fee-for-service costs, rural areas will experience a smaller decline in payment than urban areas. However, going forward, rural areas are unlikely to benefit much from the quality-based bonus payments due to the lower average quality scores of rural plans. As we look at the quality measures that could feasibly be addressed by rural MA plans to improve quality, we predict that these actions are likely to generate only modest quality gains. Thus, policymakers concerned with strengthening the presence and quality of MA in rural areas should consider expanding the quality thresholds which define the bonus payments to allow for incremental improvements in quality, thus encouraging the marginal
improvements which are in many cases the only feasible goal for plans in rural areas.

**Funding Source(s):** HRSA

**Poster Session and Number:** B, #498

**Prevalence and Predictors of Chronic Pain in the US Adult Population: New Data from the 2010 NHIS QOL Supplement**

Taylor Schraudner, WSU Department of Health Policy and Administration; Jae Kennedy, Washington State University, Spokane; Sean Murphy, WSU Department of Health Policy and Administration; Sterling McPherson, WSU College of Nursing

**Presenter:** Jae Kennedy, Ph.D., Professor, Health Policy and Administration, Washington State University, Spokane, jjkennedy@wsu.edu

**Research Objective:** The objectives of this study are to 1) develop current population estimates of chronic pain, and 2) identify factors associated with chronic pain.

**Study Design:** Prevalence estimates and logistic regression models using data from the 2010 National Health Interview Survey (NHIS) Quality of Life (QOL) Supplement. The supplement includes information about quality of life indicators like communication limitations; self-care capacity; mental health concerns like depression and anxiety; physical limitations and fatigue; and general measures of chronic pain. This study will define chronic pain as pain persisting for at least 3 months, broadly consistent with the American Chronic Pain Association and American College of Rheumatology definitions (and different from site specific pain measures used in the main NHIS and other surveys like the NHANES).

**Population Studied:** General health data on US households was generated from the three components (core groups) of the 2010 NHIS. This included the interviews of 89,976 persons in 35,117 families. The 2010 Quality of Life Supplemental Survey was randomly assigned to roughly one quarter of the Sample Adult Core (N=6,775). The sample group for this inquiry was limited to non-institutionalized adults over the age of 18.

**Principal Findings:** Analysis of NHIS data indicates a national chronic pain prevalence estimate of approximately 19%. In multivariate logistic models, chronic pain is significantly more prevalent among women (OR=1.5; 95% CI, 1.2-1.8); adults who rate their health as fair or poor (OR=2.8; 95% CI, 2.2-3.6); adults who report symptoms of depression (OR=2.6; 95% CI, 1.7-4.0); adults who are limited in ability to work and/or self-care (OR=4.6; 95% CI, 3.6-5.8); adults who were hospitalized one or more times in the previous year (OR=1.5; 95% CI, 1.2-1.9); and adults who are overweight (OR=1.4; 95% CI, 1.1-1.8) or obese (OR=1.6; 95% CI, 1.3-1.9). Chronic pain is less common among nonwhites (OR=0.5; 95% CI, 0.4-0.7) and Hispanics (OR=0.5; 95% CI, 0.4-0.7). Rates of chronic pain are lowest for adults aged 18-29 (7.6%), and peak at age 60-69 (OR=2.8; 95% CI, 1.9-4.1).

**Conclusions:** Approximately 39 million adults in the US report pain lasting longer than 3 months. Pain is associated with a variety of health and disability measures.

**Implications for Policy, Delivery, or Practice:** Assessing chronic pain is a critical component of quality of life measurement. Individual suffering, paired with the high costs of pain treatment, make the widespread prevalence of chronic pain an important public health concern. Timely and appropriate treatment of chronic pain could significantly improve quality of life, particularly for adults with chronic health conditions.

**Funding Source(s):** Other, WA Life Sciences Discovery Fund

**Poster Session and Number:** B, #499

**Beverage Consumption and Individual-Level Association in South Korea**

Euna Han, Gachon University; Tae Hyun Kim, Yonsei University; Lisa M. Powell, University of Illinois at Chicago

**Presenter:** Tae Hyun Kim, Ph.D., Assistant Professor, Graduate School of Public Health & Institute of Health, Yonsei University, thkim@yuhs.ac

**Research Objective:** Few previous studies investigated consumption distributions of sugar sweetened beverages (SSBs) over time and individual-level associations in Asia despite of the recent interest in SSBs regarding obesity control. This study aimed to provide recent evidence on beverage consumption trends from 2001 to 2009 for overall and subtypes of SSBs and for milk as a comparable healthy beverage in South Korea. In addition, we also explored individual socioeconomic factors associated with SSB consumption in South Korea.

**Study Design:** The Korean National Health and Nutrition Examination Surveys during 2001-2009 were used. Consumption prevalence and average caloric intake by SSB type were
examined. Associations of socioeconomic status (SES) with consumption were assessed in a logistic regression model (consumption prevalence) and in a two-part model (overall caloric intake adjusting consumption probability).

**Population Studied:**

**Principal Findings:** SSB consumption prevalence increased to 38%, 69%, 70%, and 50% by 2009 up from 31%, 66%, 63%, and 32% in 2001 among young adults, adults, and elderly, respectively. Miscellaneous SSBs (sports/energy drinks, coffee/tea products, flavored milk, and others) were the most prevalent and their prevalence increased among adults (from 62% to 69%) and elderly (from 30% to 47%) between 2001 and 2009. Adolescents consumed the largest calorie from miscellaneous SSB in all beverage types despite that the prevalence of its consumption was lower than regular soda and milk in both 2001 and 2009. Women (only the top-income group) and men in higher income groups showed higher consumption odds of total SSB (OR=1.18-1.25), soda (OR=1.18, men only), fruit drinks (OR=1.18, the top-income only for both genders), and miscellaneous SSBs (OR=1.1-1.2). Men with higher-education showed higher odds of total SSB consumption (OR=1.14-1.20), and all subtypes of SSBs (OR=1.18, 1.29, 1.19 for soda, fruit drinks, and miscellaneous SSBs, the top-education group only). There were only minimal differences in the overall amount of caloric intake from SSBs by individual SES for both genders.

**Conclusions:** South Korea is following the global nutrition transition toward greater consumption of SSBs. However, the prevalence was higher among high SES-people for fruit drinks and miscellaneous SSBs like other developed countries. Further research is needed to build the international evidence base.

**Implications for Policy, Delivery, or Practice:**

**Funding Source(s):** No Funding

**Poster Session and Number:** B, #500

**Socioeconomic Factors with the Unmet Medical and Dental Needs of Elderly Koreans**

Nam-hee Kim, Yonsei University; Ji-Eun Jeon, Yonsei University; Yang-Heui Ahn, Yonsei University; Chun-Bae Kim, Yonsei University

**Presenter:** Nam-hee Kim, Ph.D., M.P.H., Assistant Professor, Dental Hygiene, Wonju College of Medicine, Yonsei University, nami71@yonsei.ac.kr

**Research Objective:** In Korea, the elderly population has been increasing exponentially, too. Medical expenses for the elderly account for more than 30% of total national medical costs. However, the demand to address the unmet medical and dental needs of the elderly persists. This study aims to reveal the socioeconomic factors related to the unmet medical and dental health needs of the Korean elderly.

**Study Design:** We conduct a cross-sectional study based on secondary data analysis. The data used in this study was sourced from the 4th Cycle of the Korean National Health and Nutrition Examination Survey (KNHANES?), conducted by the Korea Centers for Disease Control and Prevention (KCDC) for a period of three years (2007–2009). These samples were collected through a three-stage stratified cluster sampling method, taking into account the residence area, housing type, and age.

**Population Studied:** A total of 3,578 elderly subjects (weighted n = 4,566,263) aged 65 years and older were selected. The dependent variables were the rate of unmet medical needs and the rate of unmet dental needs. The “percentage of subjects who did not receive necessary care when needed within the past year” was calculated for medical and dental care respectively. Five socioeconomic factors were set as independent variables. These included residential area, education, income, type of guaranteed health insurance, and enrollment in private health insurance. Statistical processing was conducted using complex sample multiple regression analysis with adjustments for age and gender. The PASW statistics 19.0 (SPSS Inc, Chicago, IL, USA) was used.

**Principal Findings:** The results show that 23% of elderly experienced unmet medical needs. A much higher percentage (36%) experienced unmet dental needs. After adjusting for age, gender, and socioeconomic factors, the income was determined associated with unmet medical needs. Compared to the group with the highest income level, the group with the lowest income level had an 8% higher rate of unmet medical needs. On the other hand, the socioeconomic factors associated with unmet dental needs were income and type of guaranteed health insurance. The unmet dental needs in the lowest income level group were 10% higher compared to the highest income level group (p < 0.05). Also, subjects on medical aid had a 13.5% higher rate of unmet dental needs compared to those enrolled in local health insurance (p < 0.05).
Conclusions: In the Korean elderly, unmet dental needs are a more serious issue than unmet medical needs. The income of the elderly is the greatly affects their unmet medical and dental needs. In particular, the degree of unmet dental needs showed significant differences depending on the extent of health insurance benefits.

Implications for Policy, Delivery, or Practice: It is necessary to continue providing the social support for low-income elders. It is evident that the National Health Insurance does not fulfill all of their unmet medical and dental needs. Thus, it is crucial to address the unmet dental needs of the Korean elderly by expanding health insurance coverage and reducing dental co-payments for them.

Funding Source(s): Other, This work was supported by the National Research of Korea Grant funded by the Korean Government

Poster Session and Number: B, #501

Depression and Mortality among Persons With Diabetes: Are Older Adults at Higher Risk? - Results from the Translating Research Into Action for Diabetes Study

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Presenter: Lindsay Kimbro, MPP, Project Manager, Department of General Medicine, University of California, Los Angeles, lkimbro@mednet.ucla.edu

Research Objective: Several studies have found that depression is linked to an increased risk of mortality among diabetic patients. However, these studies do not show the modifying effect of age on the association of depression with mortality. The purpose of this paper is to test whether the depression-mortality association varies in magnitude between elderly and non-elderly diabetic populations.

Study Design: We used data from the Translating Research Into Action for Diabetes (TRIAD) Study. TRIAD is a multicenter prospective longitudinal study of persons with diabetes in managed care settings. Depression was measured by the Patient Health Questionnaire (PHQ8), and those with a score of 10 or greater were classified as depressed. We tracked mortality in this sample for 5-6 years after the wave 2 survey was completed using the National Death Index (NDI). We conducted a survival analysis with depression as the key predictor adjusting for patient demographic and health variables and including fixed effects for each research site on our full sample, followed by stratified analyses on two subsamples—those age 65 and over, and those under age 65.

Population Studied: This analysis includes data from 3,341 diabetic persons aged 18 and over who participated in wave 2 of the TRIAD survey, which is the wave in which depression was measured.

Principal Findings: After controlling for age, gender, race/ethnicity, income, and other comorbidities, mortality risk among depressed persons in the full sample was 49% higher than among non-depressed persons (p<.01). This was consistent with the findings of previous studies. However, in age-stratified models, the results were different. After controlling for the same variables, mortality risk among persons over the age of 65 years with depression was 78% greater than among elderly diabetic persons without depression (p<.01). For the less than 65-year-old cohort, the effect of depression on mortality becomes small and insignificant (p = .36).

Conclusions: This analysis suggests that the effect of depression on mortality among diabetic persons is most important for older adults. This could be a result of a greater effect of non-adherence to medication or other diabetic care due to depression, the interaction of depression and diabetes with other age-related comorbidities, or a lower level of depression diagnoses and treatment among the older populations.

Implications for Policy, Delivery, or Practice: Elderly persons with diabetes should be considered a high priority population for depression screening and treatment. As some depression treatments have been shown to have negative effects on other diabetes related health factors, it is vital to recognize, diagnose, and treat depression in older adults as quickly as possible.

Funding Source(s): CDC

Poster Session and Number: B, #502

Improving Care for Patients with End Organ Failure – A Singapore Experience

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**Presenter:** Alvin Koh, Manager, Regional and Primary Care Department, Agency for Integrated Care, alvin.koh@aic.sg

**Research Objective:** The HOME (HOlistic Care for MEdically Advanced Patients) Programme is the first palliative home care programme for non-oncology patients in Singapore. This programme aims to validate the local use of advance care planning (ACP) in these patients and provide a multidisciplinary approach to care at the end of life. This service provides symptom relief, ACP and bereavement counselling in the patients’ homes, as well as coordinates care with relevant medical specialists. This study looks at the impact of the HOME programme on respecting patient choices at the end of life and hospital utilisation.

**Study Design:** This study is based on patients enrolled in the HOME Programme from May 2008 to March 2011. Data is gathered from administrative databases and compared against historical controls. Key outcomes studied include completion of ACP, hospital utilisation data including readmission rate, and place of death. The hospitalisation episode that resulted in death was excluded from the data analysis for both the control and the intervention group.

**Population Studied:** Suitable patients with end-stage lung, renal and heart disease were identified during hospitalisations in three public healthcare institutions with a life expectancy of less than 1 year. A total of 489 patients were recruited from May 2008 to March 2011. Retrospective controls were chosen based on deaths in the same hospitals with matched ICD codes.

**Principal Findings:** Of the patients recruited, 22.3% had chronic obstructive pulmonary disease, 34.4% had heart failure and 43.3% had end-stage renal failure. 100% of mentally and emotionally competent patients completed advance care planning. It also demonstrated lower hospital utilisation with a 30 and 180 day readmission of 5.5% and 19.4% compared with 22.8% and 44.4% in controls. Patients also showed a higher percentage of deaths at home (68%) compared with national norms (28%).

**Conclusions:** This study validated the use of ACP in patients with heart, kidney or pulmonary end-stage disease in Singapore, with improved understanding and respect for patient’s choices, as well as demonstrated reduction in hospital utilisation.

**Implications for Policy, Delivery, or Practice:** Improving medical technology and increasing prevalence of chronic diseases result in more patients living with organ failure. While these patients often have a more uncertain prognosis compared with advanced oncology patients, the palliative care model can still play a significant role in improving their quality of life. The HOME Programme provides holistic, humane and benevolent care to patients with end-stage organ failure in the home environment guided by the ACP and helmed by a group of dedicated palliative care physicians, nurses and counsellors.

Findings suggest that this program should be continued from both the patients and systems perspective, and further research done to analyse if this programme would benefit other types of patients with end-stage organ failure.

**Funding Source(s):** Other, Agency for Integrated Care

**Poster Session and Number:** B, #503

**National Care Transition Program Cuts Hospital Admission of High Risk Patients**

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**Presenter:** Alvin Koh, Manager, Regional and Primary Care Department, Agency for Integrated Care, alvin.koh@aic.sg

**Research Objective:** Elderly patients with complex care needs frequently require care from different healthcare settings. Poor coordination during transitions across health services can compromise patient safety, create undue stress and increase costs. Transitional care interventions for carefully selected patients from hospital to other settings had shown promise in reducing rates of subsequent hospitalizations. We evaluated the effectiveness of ACTION (Aged Care TransitlON), a state funded national care transition care program involving Singapore’s five largest public hospitals to reduce acute care utilization.
**Study Design:** We compared the risk of unplanned hospital re-admission and emergency department (ED) attendance of acutely ill patients on ACTION program to other patients admitted during a similar time frame, matched for age, gender and hospital subsidy status. Propensity (conditional probability of enrolment into program) scores were derived by multiple logistic regression with the covariates age, gender, length of initial hospital stay, Charlson index, past 180 days hospital admission, past 180 days ED attendance. A logistic regression model was fitted to the data. Unplanned rehospitalisation and ED attendance were compared after covariate adjustment and weighting by propensity scores.

**Population Studied:** Suitable patients were identified and recruited into ACTION program during hospitalisations. The program, delivered by dedicated care coordinators, is goal-oriented and time-limited (1-3 months) to complete the care recipient’s restorative process and assist them and their families to make long term arrangement for care. We performed a retrospective cohort study of 4132 patients in ACTION program discharged from the five acute hospitals from Feb 2009 to Jul 2010 and 4132 control patients chosen from the State Hospital Claim System.

**Principal Findings:** The baseline characteristics of patients in the two groups were similar after weighting by propensity. Baseline characteristics for ACTION patients were: age (SD) 79.2 (7.7) y, 44% male, mean length of hospital stay (SD) 11.6 (13.0) days, mean Charlson index (SD) 1.6 (1.8), mean no. of hospitalization and ED attendance 180 days prior to index admission were 0.79 (1.4) and 1.9 (2.0) respectively. Subjects enrolled on the program were less likely to have unplanned rehospitalization and ED visit. The adjusted odds ratio (95% CI) comparing rehospitalization and ED re-attendance of program subjects with that of controls at 30 days, were 0.5 (0.5, 0.6) and 0.8 (0.7, 0.9) respectively; and at 180 days, were 0.6 (0.6, 0.7) and 0.9 (0.8, 1.0) respectively.

**Conclusions:** Supporting vulnerable patients and their caregivers to take a more active role during care transition through a care transition program is effective in reducing subsequent rehospitalization and ED attendance in acutely ill patients at risk for transitions.

**Implications for Policy, Delivery, or Practice:** Efforts to reduce rehospitalizations should focus on identifying vulnerable patients for comprehensive assessment, improving discharge planning and introducing inexpensive methods of linking with community care services to enhance communication during and after discharge from hospital.

**Funding Source(s):** Other, Re-investment Fund (RF08), Ministry of Health, Singapore

**Poster Session and Number:** B, #504

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**The Impact of Recommendations and Patients’ Resources on the Distance Travelled to a Hospital for Breast Cancer Surgery**

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**Presenter:** Christoph Kowalski, M.A., Dr., Research Associate, IMVR, University of Cologne, christoph.kowalski@uk-koeln.de

**Research Objective:** In 2003, the German federal state of North Rhine-Westfalia (population 17.8m) established an accreditation system for breast care centers that led to the standardization and improvement of care quality, as well as to the closure of hospitals that could not fulfill the requirements. Despite the improvement in all hospitals, a significant proportion of patients (who have free hospital choice in Germany) still travel to distant hospitals. We investigated whether recommendations of a hospital by relevant others and patient resources are associated with the choice of a hospital that is not the closest to the patient’s home.

**Study Design:** The analyses were based on data from 4,529 patients treated in 88 hospitals that were included in a patient survey in 2011. Distances from the patients’ homes to the closest eligible hospitals and the chosen hospital were calculated. Logistic regression analyses were estimated to identify factors associated with choosing a hospital other than the closest eligible one, controlling for socio-demographic, disease and treatment characteristics.

**Population Studied:** Breast cancer patients.

**Principal Findings:** Approximately 45% of patients chose a hospital other than the closest eligible one. Higher education, private health insurance, living with a partner, young age and lower self-rated health were associated with choosing a distant hospital (model 1). No impact was found for cancer stage, having children, native language, or cancer site. After adding
recommendations by relevant others (model 2), references from friends/family and health insurance companies were associated with choosing a distant hospital, whereas recommendations by the patients’ gynecologists and mammography facilities were associated with choosing a nearby hospital. No significant association was found for the family doctor’s recommendation.

Conclusions: Resources such as living with a partner and higher socioeconomic status facilitate patients choosing a distant hospital.

Implications for Policy, Delivery, or Practice: Gynecologists and mammography facilities appear to play a crucial role in allocating patients to hospitals. It is unclear why their recommendations differ from those of health insurance providers and friends/family.

Funding Source(s): No Funding
Poster Session and Number: B, #505

**QUEST Collaborative improvement in Mortality, Quality and Cost of Care Compared to U.S. Hospitals**

Marla Kugel, Premier Incorporated; John Martin, Premier, Inc.; Eugene Kroch, Premier, Inc.; Michael Duan, Premier, Inc

Presenter: Marla Kugel, M.P.H., Principal Research Scientist, Public Affairs, Premier Incorporated, marla_kugel@premierinc.com

Research Objective: To compare the change in mortality and cost of care as well as the result of the first year of the inpatient Value-Based Purchasing (VBP) program among hospitals in the QUEST collaborative over time to a nationally matched sample of hospitals not part of the QUEST collaborative.

Study Design: QUEST charter member hospitals were compared to hospitals not associated with the collaborative. A matched case-control analysis was implemented for comparing observed to expected mortality ratio. Hospitals were matched on the following hospital characteristics: size, teaching status, geographic region, and urban location. Case-mix adjusted costs per discharge were measured using administrative claims data from MedPAR from 2006 through the third calendar quarter of 2011. CMS released inpatient VBP payment adjusters were used to determine how the QUEST and non-QUEST cohorts fared under the new payment program.

Population Studied: Matched controls were selected from all inpatient prospective payment system (IPPS) hospitals with no missing data in the MedPAR inpatient discharge claims data from federal fiscal year (FFY) 2006 through FFY 2011 for the mortality comparison. All IPPS hospitals never enrolled in QUEST was the comparison group for cost per discharge and VBP payment adjustment.

Principal Findings: QUEST hospitals went from having a 3 percent lower average observed to expected (O/E) mortality ratio in FFY 2006 to a 17 percent lower average mortality O/E ratio in FFY 2011 compared to the matched cohort of non-QUEST hospitals (O/E of 0.97 QUEST and 1.14 non-QUEST). The average case-mix adjusted CMS calculated cost of care per discharge was approximately $45 (0.8 percent) greater in federal fiscal year 2006 and $92 (-1.3 percent) less by FFY 2011. Approximately 64 percent of QUEST hospitals eligible for the FY 2013 inpatient VBP program that joined the collaborative prior to 2010 will receive incentive payments greater than their contribution payments compared to 50 percent of the non-QUEST matched controls.

Conclusions: The QUEST Collaborative performed better than a national cohort of matched hospitals in mortality and show signs of better performance in quality of care (although not statistically) and cost as measured by the CMS program in FFY 2013. Most of these findings were consistent over multiple years of measurement where data was available.

Implications for Policy, Delivery, or Practice: The QUEST program was developed to help facilities improve patient outcomes via measurement in multiple domains, provision of intervention material, and sharing of best practices. Currently, healthcare systems are seeking to improve patient quality, processes, efficiency and experience; all while reducing costs of care. The results from this evaluation demonstrate that through collaborative activities and transparency in measurement this goal can be achieved.

Funding Source(s): No Funding
Poster Session and Number: B, #506

**The Patient Experience Consistency Score in Medicare Inpatient Value-Based Purchasing – Rewarding Consistently Low Performance?**

Marla Kugel, Premier Incorporated; Danielle Lloyd, Premier, Inc.; Christine Van Dusen, Premier, Inc.
**Research Objective:** To determine if the consistency score portion of the patient experience domain score (based on measure results from the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) tool) associated with the Medicare inpatient Value-Based Purchasing (VBP) program is rewarding hospitals for consistently low performance.

**Study Design:** Scores for the eight individual HCAHPS measures and the consistency score were calculated using measure data submitted by hospitals in 2009 and 2010 for the baseline and performance period respectively, using the FY 2013 final inpatient Value-Based Purchasing (VBP) benchmark and achievement thresholds published in the VBP Program final rule. The consistency score assigns the maximum 20 points to a hospital if the lowest HCAHPS measure is at or above the achievement threshold. Consistency scores were compared to the distribution of “high” and “low” individual measure scores. A low score was defined as a value less than or equal to 2 points; a high score was defined as a value greater than or equal to 6 points. These values corresponded approximately to the median and 90th percentile of score values across HCAHPS measures.

**Population Studied:** All inpatient prospective payment system hospitals eligible for the inpatient VBP program according to inclusion criteria and measure data minimums specified in the VBP Program final rule.

**Principal Findings:** There are 3,054 hospitals eligible for the FY 2013 inpatient VBP program according to the data time periods used. The maximum number of points for the consistency score is 20, which is worth 20 percent of the patient experience domain score for FY 2013 VBP. Consistency score average value was 16.1 and the median value was 17. Almost two-thirds of hospitals had a majority of individual HCAHPS measures with a score of 2 or less (61.4 percent). About one-third (28.5 percent) of these low performing hospitals had a consistency score of 17 or greater and no measures with a score of 6 or better. Six percent of hospitals scoring the maximum number of consistency points had 4 or more individual measures scoring 2 or less; however that percentage increases to 47 percent for a consistency score of 19. More than half of these hospitals had no individual measures with high scores (score of 6 or greater).

**Conclusions:** Hospitals with consistently low scores are being assigned a higher than average consistency score. This will have an impact on the total performance score and thus how the hospital is rewarded under the inpatient VBP program.

**Implications for Policy, Delivery, or Practice:** The results question the current inclusion of the consistency score as part of the total domain score for patient experience. The consistency score calculation may need to be modified to reward hospitals for performing consistently well and encourage hospitals to perform better.

**Funding Source(s):** No Funding

**Outcomes of African American Patients with Metastatic Renal Cell Carcinoma Treated with Standard First Line Therapy**

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**Research Objective:** Metastatic renal cell carcinoma (RCC) is a disease that kills approximately 13,000 people in the United States every year. RCC does not affect all racial groups equally as African Americans as compared to Caucasians have a higher incidence, younger age of onset, shorter progression free survival and shorter overall survival. Established prognostic factors including lab values, extent of disease and performance status can be used to separate patients into well-defined groups of good, intermediate and poor risk. Between 2005 and 2010 3 new oral drug therapies, all Vascular Endothelial Growth Factor Receptor Tyrosine Kinase Inhibitors (VEGFR-TKIs), were FDA approved for first line treatment of metastatic RCC. These drugs became the standard of care for first line therapy in good and intermediate risk metastatic RCC patients and one option for first line therapy for poor risk patients. However, the phase III trials supporting their approval were conducted with minimal African American patient participation. No studies have
specifically examined the effectiveness of standard first line therapy (VEGFR-TKIs) for metastatic RCC in African Americans.

**Study Design:** This was a retrospective cohort design. Our institution’s electronic medical record was searched from 2004-2012 for all patients with metastatic RCC. The medical records of all Caucasian and African American individuals started on first line VEGFR-TKI therapy with at least one follow up visit were abstracted for self-reported race, type of treatment, prognostic variables, date of progression as defined by the treating physician, and other demographic and clinical variables. The Social Security Death Index was used to establish date of death. Overall survival and time to progression were analyzed using Kaplan-Meier and Cox proportional hazards models.

**Population Studied:** 34 Caucasian patients and 12 African American patients with metastatic RCC treated with first line VEGFR-TKI therapy were included.

**Principal Findings:** African American patients exhibited worse prognostic factors with 54.6% classified in the poor risk group compared with 10.7% of Caucasians. African American patients compared to Caucasian patients had a non-significant trend toward worse overall survival (HR 1.49, p 0.36) and time to progression (HR 1.59, p 0.27). After adjustment for risk group we found very similar results between the two races for overall survival (HR 1.00, p 0.99) and progression free survival (HR 1.26, p 0.66).

**Conclusions:** This is a small preliminary study that suggests first line VEGFR-TKI therapy is an effective choice for African American patients and that metastatic RCC responds to treatment similarly in African American versus Caucasian patients.

**Implications for Policy, Delivery, or Practice:** While multi-site studies would be needed to confirm these results, the data suggest that providers should feel comfortable treating African American patients with first line VEGFR-TKI therapy.

**Funding Source(s):** AHRQ

**Poster Session and Number:** B, #508

**The Influence of Sensory, Functional and Activity Limitations on Employment Disparities**

Debra L. Brucker, Institute On Disability, University of New Hampshire; Eric Lauer, University of New Hampshire; Purvi Sevak, Department of Economics, Hunter College; Andrew J. Houtenville, Institute On Disability, University of New Hampshire

**Research Objective:** National surveys which measure the prevalence of limitations are used to provide estimates of how health conditions are functionally limiting individuals in society and their impact on other outcome disparities (e.g. employment). We investigated the association of employment outcomes with sensory, functional and activity limitations. We tested the hypothesis that the employment outcomes of people with sensory and functional limitations (Group A) will be lower than the employment outcomes of people without sensory and functional limitations (Group B), controlling for environmental and other personal characteristics. In addition, we tested whether employment outcomes for people with sensory, functional, and activity limitations (Group C) have lower employment outcomes than the remaining people in Groups A or remaining people in group B, controlling for environmental and other personal characteristics.

In addition, we tested the hypothesis that the screening mechanics of the surveys used has a significant effect on self-reported limitation, resulting in a different association between limitation and employment outcomes (survey effect). Specifically, individuals may only be asked about the presence of a difficulty or impairment if they first reported having an activity limitation.

**Study Design:** Ordinary least squares methods were used to model regressions on the outcome of employment – working or not, and then estimate regressions on the outcomes of hours, and wages (measured in the natural log of wages). Employment was modeled as a function of sensory, functional and activity limitations, demographic characteristics, and state fixed effects. Demographic variables include age, race, gender, educational attainment, marital status, number of children, and urbanicity. State fixed effects are used to control for the environment.

**Population Studied:** Our sample consists of respondents to the American Community Survey (ACS, 2009-2011) and Medical Expenditure Panel Survey (MEPS, 2009-2011) ages 18-64 with and without any reported limitation. Survey
items included sensory (hearing and vision), functional (ambulation and cognition) and activity limitations (independent living). Demographic items included age, gender, race, and educational attainment.

**Principal Findings:** Individuals who self-report limitations have poorer employment outcomes than individuals who do not report such limitations, controlling demographic characteristics. In addition, individuals who self-report more than one limitation have worse employment outcomes than individuals reporting only one limitation.

**Conclusions:** In the context of public health, sensory, functional and activity limitations are thought to arise from health conditions. Once health conditions reach a certain severity they directly impact an individual’s ability to attain and maintain employment. Limitations can be conceptually used as a proxy for the presence of a health condition severe enough to cause a limitation as perceived and reported by an individual.

**Implications for Policy, Delivery, or Practice:** A major issue in disability and health policy is the definition of disability. Disability is frequently defined as the presence of a limitation or impairment (such as blindness and deafness) that limits at least one major life activity (e.g., the Americans with Disabilities Act of 1990) or that limits a specific major life activity, such as work (e.g., Social Security Disability Insurance). Such approaches do not directly include individuals with health conditions and mitigating personal and environmental factors such that they are not limited (hence the American with Disabilities Act Amendments Act of 2008, which extended the ADA to cover those with such mitigating measures). Future policy initiatives should take this into account, especially when attempting to disentangle health and disability within national survey results founded on these definitions.

**Funding Source(s):** Other, The National Institute on Disability and Rehabilitation Research

**Poster Session and Number:** B, #509

**The Value of a Health System-Based Comparative Effectiveness Center**
Brian Leas, University of Pennsylvania Health System; Matthew Mitchell, University of Pennsylvania Health System; Julia Lavenberg, University of Pennsylvania Health System; Kendal Williams, University of Pennsylvania Health System; Craig Umscheid, University of Pennsylvania Health System

**Presenter:** Brian Leas, M.S., M.A., Research Analyst, Center for Evidence-based Practice, University of Pennsylvania Health System, brian.leas@uphs.upenn.edu

**Research Objective:** In 2006 the University of Pennsylvania Health System created a Center for Evidence-based Practice (CEP) to support the quality, safety and value of patient care. The Center is distinctive, as one of few health-system based research institutions that conducts rapid-cycle comparative effectiveness reviews to address daily patient care and real-time decisions about quality, care delivery, policy development, and purchasing. CEP synthesizes published and local evidence to inform clinicians and administrators throughout the health system, and supports the development of computerized clinical decision support interventions. We examined the Center’s nearly seven year history to identify the impact and value provided by a hospital-based comparative effectiveness research center.

**Study Design:** CEP produces multiple types of reports that reflect the needs of end users and the scope of the literature. Products include: original systematic reviews with meta-analyses; concise synopses of clinical guidelines and published systematic reviews; inventories of published studies that serve as environmental scans and enable efficient decision making about future review priorities; and special reports on policy issues affecting the health system. The Center also contributes to the development of clinical decision support interventions and practice guidelines. CEP’s research reports and administrative records were reviewed and analyzed.

**Population Studied:** CEP is funded by the health system’s Chief Medical Officer with an annual budget of approximately $750,000. The Center is staffed by two physician co-directors trained in epidemiology, three research analysts, physician and nurse liaisons, a statistician, economist, and librarians totaling 5.5 FTE. CEP examines a broad range of topics, including processes of care, devices, drugs, diagnostic tests, and health system policy.

**Principal Findings:** The Center has completed over 200 reports since its inception. The median time from project opening to first draft report is four weeks, which is rapid compared to the development timeline of more traditional comparative effectiveness reviews. During its first few years, CEP’s primary clients were
purchasing committees and administrative leadership, but clinical departments now account for close to half of the reviews. Patient safety and quality improvement are often the primary goal of initiating CEP reviews, while value based purchasing and organizational efficiency are also important factors. Several recent, high impact initiatives have incorporated CEP reviews into strategic decision making, including efforts to reduce preventable readmissions, promote appropriate screening, and support workforce management.

Conclusions: An evidence-based practice center within an academic medical center can offer systematic evaluations of high impact clinical questions, support information management infrastructure, and enable efficient management of healthcare resources. Besides informing clinical practice, such evaluations can promote a culture of evidence-based decision-making and drive quality improvement.

Implications for Policy, Delivery, or Practice: CEP presents its reviews to the original requestors to inform decision making, and we often work with key stakeholders to implement our findings. Evidence reviews are shared publicly through the National Guideline Clearinghouse, the Cochrane-indexed HTA database, and peer-reviewed publications. CEP also offers education through workshops, courses for faculty, staff and trainees, and academic detailing. In addition, CEP contracts with the CDC to develop national infection control guidelines, and in 2012 partnered with the ECRI Institute as one of 11 AHRQ-designated Evidence-based Practice Centers.

Funding Source(s): No Funding
Poster Session and Number: B, #510

Segmentation for Health Information Channels according to Themes in a Metropolitan City of Korea
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Presenter: HeyJean Lee, M.D., Clinical Assistant Professor, Department of Preventive Medicine, Kangwon National University Hospital, vishue@ewhain.net

Research Objective: Information is important resource for health. Self management of lifestyle disease become important. Disease information contribute to patient’s relief and health behavior change. Health information retrieval depends on individual and channels may differ according to themes.

Study Design: We conducted a telephone survey. We asked the main channel to retrieve health information according to themes. Themes were chronic disease, healthy lifestyle, and mental health. We also collected data about sociodemographic characteristics, concern about community news, concern about public health information, self check of health, and perception about living environment.

Population Studied: We selected 1,048 dwellers in a district of Metropolitan City. We considered gender, age for selection.

Principal Findings: 839 people(80.1%) have retrieved all the information about chronic disease, healthy lifestyle, and mental health. Chronic disease information retrievers can be segmented by age, self checking for health, concern about public health information, and income. 20s and 30s mainly use TV and Internet. Whereas 20s and 30s who checking health regularly get information not only from TV and Internet but also from professional. 50s and 60s mainly get information from TV and professional. 40s with low income less use the newspaper. For Healthy lifestyle and mental health, people concerning about public health information use the Internet more. Whereas people do not concern about public health information get more information from neighbors.

Healthy lifestyle and mental health retrievers can be segmented by age and concern about public health information. 20s and 30s mostly use TV and Internet. 40s who concern about public health information more use the Internet but who do not frequently get information from neighbors.

Conclusions: People show different patterns and associated factors in health information retrieval according to the themes they want.

Implications for Policy, Delivery, or Practice: To provide public health information well, it would be helpful to design and customize information for themes according to segmented population.

Funding Source(s): Other, Office of District, Seoul
Poster Session and Number: B, #511

The Relationship between Nurses’ Work Value and Patient-Centred: Moderating Effect of Organizational Playfulness
Jui-fen Rachel Lu, Department of Health Care Management, College of Management, Chang
Developing a Model-based Risk Index for Unplanned 30-Day Hospital Readmissions
Klaus Lemke, Johns Hopkins University

Objective: To develop a 30-day all-cause readmission risk model for unplanned acute care hospitalization after an initial hospitalization for any condition. Alternating inpatient and outpatient episodes of care were created from longitudinal claims data. Model vectors included healthcare utilization, care coordination, medication adherence, and comorbidity measures. Features were derived from claims data with the Johns Hopkins ACG® System for risk adjustment and predictive modeling. Features for pairs of inpatient and outpatient episodes were combined, and patients with recurrent readmissions had multiple model vectors. The framework enables the development of a readmission risk prediction model for peri-discharge prioritization of patients for care transition programs.

Study Design: Retrospective study using longitudinal claims and enrollment data from the IMS Health LifeLink™ Health Plan Claims Database. Three years of claims data from 2009 to 2011 from a single health plan were used. The data included individual medical services and filled prescriptions. Planned admissions were identified using an algorithm developed by

Gung University; I-chen Lee, Chang Gung University, College of Management

Presenter: I-chen Lee, PHD, Assistant Professor, Industrial and Business Administration, Chang Gung University, College of Management, ichen@mail.cgu.edu.tw

Research Objective: This study aims to investigate relationships among nurses' work value, organizational playfulness, and patient-center attitude, and examines if work value has moderating effect.

Study Design: Questionnaire Survey.

Population Studied: This study's subjects are nurses at Hospitalization department in Taiwan's biggest medicine center. The inclusion criteria includes: 1. To Select full-time nurses, so as to increase comparison chances. 2. Among excluding list are head nurses, ward manager, nursing practitioners, students of nursing department, interns. That is because the above people with such statuses or positions all have works which are different from others that need to share nursing duty on rotation basis. Therefore they are excluded. 3. Those people who serve more than 6 months in this hospital. With that we can avoid introducing the interference form factors as career and role adaption to this study. In total 300 copies of questionnaires are distributed and 290 effective copies are responded, with response rate at 96.7%.

Principal Findings: 1. Organizational playfulness is negatively related to patient-center attitude (β=.193, p<.01), which indicates that the higher the organizational playfulness, the lower the patient-center attitude.

2. Affective value in work value is positively related to patient's central attitude (β=.208, p<05), which indicates that nurses who have higher affective value will have higher patient-center attitude.

3. Affective value has positively moderating effect on organizational playfulness and patient-center attitude (β=.173, p<.05).

Conclusions: Supposing that nurse's affective value is lower, a higher level of organizational playfulness will lead to lower patient-center attitude. However when nurse's affective value is higher, a higher level of organizational playfulness will be instrumental to patient-center attitude.

Implications for Policy, Delivery, or Practice: Past literature indicates that the organizations which have stronger organizational playfulness will have more flexibility in their institutions. Their works are more challenging in nature. Their leaders will be more humorous. The management level will have less obvious distinction with general employees. Team members will cooperate and trust with each other. The former three characteristics are rather different from characteristics of medical institutions. The latter two characteristics are rather similar to characteristics of medical institutions. Therefore the role played by organizational playfulness in medical institutions has to fit with the individual work value of nurses. As such it will be instrumental in displaying a higher patient-center attitude in an appropriate organizational playfulness climate, thereby enhancing patients' well-being.

Funding Source(s): Other, National Science Council, Taiwan
Poster Session and Number: B, #512
the Yale New Haven Health Services Corporation that uses procedure codes and discharge diagnosis categories. Admissions for childbirth were excluded. Logistic regression was used to fit the model. We applied the methods described by Sullivan et al. (2004) to create a readmission risk index.

**Population Studied:** Persons of all ages with health insurance, mostly in employer-sponsored managed care plans, also Medicaid recipients and Medicare beneficiaries of all ages. Study subjects were admitted as inpatients to an acute care hospital for non-childbirth conditions and were enrolled for at least 30 days post-discharge.

**Principal Findings:** The study population of 113,137 persons had 180,628 inpatient admissions over three years. Of all admissions, 11.8% occurred within 30-days. Risk factors with significant (p-value < .001) odds ratio estimates between 1.4 and 2.6 were insurance status, low birth weight, disability, frailty, count of prior hospitalizations, and likely coordination risk. Factors with odds ratios significantly below 1.0 were presence of dialysis services, nursing services, count of active ingredients, length of hospital stay, presence of major inpatient procedure, count of emergency room visits, and count of outpatient management visits. The c-statistic for this model was .92. The best-performing model additionally included 184 significant comorbidity markers from the ACG system and produced a c-statistic of .95. Medication adherence markers and an inpatient procedure classification marginally improved model performance. The readmission risk index used fewer risk factors with good predictive performance.

**Conclusions:** A readmission risk model using an episode-based approach and time-varying predictors derived from claims data resulted in intuitive patterns of risk factors and excellent model performance. A readmission risk index was derived.

**Implications for Policy, Delivery, or Practice:** Model-based prioritization of discharged patients for care transition management enables hospitals to augment the prioritization of patients who will benefit from transition management to outpatient care and be less likely to be readmitted within a 30-day period.

**Funding Source(s):** No Funding

**Moderating Role of Work-Family Balance on Hospital Medical Directors’ Patient-Related Work Stresses and Health**

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**Presenter:** Blossom Yen-Ju Lin, Ph.D., Professor, Department of Health Services Administration, China Medical University, yenju1115@hotmail.com

**Research Objective:** Previous studies have demonstrated that hospital medical directors, who are senior physicians in management positions with high job demands in clinical practices and management, have a lower self-rated health. By considering the work stress of hospital medical directors, this study examined how their work-family balance might moderate work stress regarding their health.

**Study Design:** This was a cross-sectional survey study. A developed and structured questionnaire encompassed the dimensions of patient-related work stress (i.e., physician-patient relationship stress and patient condition stress; 10 items), self-rated health status (2 items) and health complaints (26 self-reported symptoms in 1 month short-term or more than 6 months long-term), work-to-family (6 items) and family-to-work (6 items) balances, and personal and work characteristics. Factor analyses were performed for the constructs of physician-patient relationship stress, patient condition stress, work-to-family balance, and family-to-work balance into factor scores for further analysis. The Cronbach’s alpha values were 0.890–0.916. Hierarchical regressions were performed. According to the logic of risk and protective factors, statistically significant increases of R2 (p<.05), when the work stress factors and interaction terms were entered, showed that the levels of work stress directly affected the hospital medical directors’ self-rated health, and that their work-family balance had moderate effects. SPSS statistical software 20.0 was used in this study.

**Population Studied:** The study population totaled 2,245 hospital medical directors identified on the hospital websites of all of the accredited hospitals in Taiwan. Between August and November 2009, each hospital medical director was surveyed by mail. A total of 737
valid respondents yielded a response rate of 32.83%.

**Principal Findings:** Of the responding hospital medical directors, 92% were male, 94% were married, 93% lived with others (family or friends), and the average age was 49 years. On average, the responding hospital medical directors were living with 1.4 children and 0.3 elderly people. Regarding work environments, 24% of the responding hospital medical directors worked in medical centers, 49% worked in regional hospitals, and 28% worked in district hospitals. In addition, 59% of the respondents worked in public hospitals and had been working as medical practitioners for 21.5 years and in their current hospitals for 13.1 years, on average. Controlling for the personal and work characteristics revealed that hospital medical directors’ work stress in physician-patient relationships was negatively related to their perceived health status compared to the general population and their self-reported short-term health complaints. The hospital medical directors’ family-to-work balance could moderate the negative effects of their physician-patient relationships on short-term health complaints and improved health complaints.

**Conclusions:** Hospital medical directors’ work stress in physician-patient relationships was found to have more negative effects on their self-reported health status and complaints; and family-to-work balance was found to have moderating effects on hospital medical directors’ health complaints in this study.

**Implications for Policy, Delivery, or Practice:** More personnel benefits and fringe planning could be employed in the human resource management of health care facilities for enhancing hospital medical directors’ possible family-to-work interfere other than their family (or personal) supports should be called for.

**Funding Source(s):** Other, Year grant from Department of Health, Executive Yuan, Taiwan, R.O.C. (DOH98-NNB-1046)

**Poster Session and Number:** B, #514

**Moderating Role of Work-Family Balance on Dentists’ Patient-Related Work Stresses and Health: A Nationwide Survey Study**

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**Presenter:** Blossom Yen-Ju Lin, Ph.D., Professor, Department of Health Services Administration, China Medical University, yenju1115@hotmail.com

**Research Objective:** Work stress has been reported to be a major cause of dentists’ self-perceived health, health related behaviors, retirement, musculoskeletal disease, and premature disability caused by trauma. Work-life balance has been emphasized in the new era of workplace life. This study examined how work-family balance might moderate dentists’ work stress regarding their health.

**Study Design:** This was a cross-sectional survey study. A developed and structured questionnaire encompassed the dimensions of patient-related work stress (i.e., dentist-patient relationship stress and patient condition stress; 10 items), self-rated health status (2 items) and health complaints (26 self-reported symptoms in 1 month short-term or more than 6 months long-term), work-to-family (6 items) and family-to-work (6 items) balances, and personal and work characteristics. Factor analyses were performed for the constructs of dentist-patient relationship stress, patient condition stress, work-to-family balance, and family-to-work balance into factor scores for further analysis. The Cronbach’s alpha values were 0.826–0.923. Hierarchical regressions were performed. According to the logic of risk and protective factors, statistically significant increases of R2 (p<.05), when the work stress factors and interaction terms were entered, showed that the levels of work stress directly affected the dentists’ self-rated health, and that work-family balance had moderate effects. SPSS statistical software 20.0 was used in this study.

**Population Studied:** By using a systematic sampling method, 1,100 dentists were each mailed a questionnaire, encompassing approximately 10% of the updated national certified dentist lists in Taiwan. Between August and November 2009, 531 dentists responded, yielding a response rate of 48.27%.

**Principal Findings:** Of the responding dentists, 73% were male, 74% were married, 88% lived with others (family or friends), and their average age was 43.26 years. On average, the responding dentists were living with 1.1 children and 0.7 elderly people. Regarding work environments, 63% of the responding dentists worked in clinics and 37% in hospitals, and 85% worked in private organizations and had been working as dental practitioners for 17 years and
in their current organizations for 12 years, on average. Controlling for the personal and work characteristics revealed that the surveyed dentists' patient relationships and patient condition work stress levels were negatively related to their perceived health (compared with the general population and medical peers) and their short-term and long-term health complaints. However, only family-to-work balance could have moderate effects on the dentists' patient condition work stress levels.

**Conclusions:** All types of work stress in dentist-patient relationships and patient conditions were negatively related to the dentists' health. However, we find that only dentists' family-to-work balance is a key to relieve their work stress of patient conditions for better self-reported health.

**Implications for Policy, Delivery, or Practice:** Future studies have to explore other potential factors related to improving dentists' stress levels of dentist-patient relationships in the workplace.

**Funding Source(s):** Other, Year grant from Department of Health, Executive Yuan, Taiwan, R.O.C. (DOH98-NNB-1046)

**Poster Session and Number:** B, #515

**Complications after Outpatient Colonoscopy: A Multilevel Analysis**

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**Research Objective:** Colonoscopy is recommended for polyps and cancer screening in average risk person, aged between 50 and 75. It is estimated that over 14 million colonoscopies are performed annually in the United States. Several studies focused on patient-level factors that may affect the development of some complications after the procedure. But few examined the impact of organizational and market-level factors. This study examined the impact of patient demographic and clinical characteristics, organization-level factors, and characteristics of the local healthcare market.

**Study Design:** This study was observational and cross-sectional in nature. Same day ED visit or hospitalization, 30-day serious gastrointestinal events resulting in ED visit or hospitalization, and 30-day non-gastrointestinal events resulting in ED visit or hospitalization were used to quantify complications developed after outpatient colonoscopy. Three-level generalized hierarchical linear models (GHLM) were used to examine factors at patient, facility, and market levels.

**Population Studied:** The study population was patients who underwent outpatient colonoscopy between January 1, 2005 and November 30, 2007 in California. Hospital emergency department and inpatient discharge records were merged to the outpatient surgery data. The final sample contained 1,278,886 colonoscopy cases.

**Principal Findings:** After controlling for confounding factors, the study found that senior age, being covered by Medicaid, greater Charlson Index or the number of ED visits or hospitalizations in the prior six months, and receiving more invasive procedures (colonoscopy and biopsy or lesion removal colonoscopy) versus diagnostic colonoscopy were associated with higher probability to experience related complications after colonoscopy. Among organizational-level factors, having moderate or high facility colonoscopy volume was associated with lower odds for two to three of the four quality measures. At the market level, higher HHI index (lower competition level in the market) was associated with higher odds for same day ED visit or hospitalization and 30-day non-gastrointestinal events resulting in ED visit or hospitalization. The uninsured rate was associated with lower odds for 30-day other gastrointestinal events resulting in ED visit or hospitalization. The uninsured rate was associated with lower odds for 30-day other gastrointestinal events resulting in ED visit or hospitalization and 30-day non-gastrointestinal events resulting in ED visit or hospitalization.

**Conclusions:** Organization- and market-level factors together with patient-level factors can affect a patient's likelihood to develop complications after outpatient colonoscopy. But the set of factors that are associated with a certain type of complication may vary. Future studies of quality of ambulatory surgical procedures should consider a systematic exploration of relevant factors at multiple levels.

**Implications for Policy, Delivery, or Practice:** This study provided useful information about how to identify patient subgroups that are prone to develop certain type of complications after outpatient colonoscopy. Such information should be made available to physicians, health care
Variation in the Utilization of Blood and Blood Products in the Acute Care Setting: Opportunities for Reducing Costs and Saving Lives

Timothy Lowe, Premier Incorporated; Raymond Perigard, Premier Inc.; Eugene Kroch, Premier Inc.; John Martin, Premier Inc.; Richard Bankowitz, Premier Inc.

Presenter: Timothy Lowe, Ph.D., M.S.W., Principal Research Scientist, Premier Incorporated, timothy_lowe@premierinc.com

Research Objective: Transfusion of blood products, including whole blood, red blood cells, platelets, plasma and cryoprecipitate, is a critical part of clinical care, responsible for saving up to 4.5 million Americans each year, or nearly 10,000 lives per day. Overuse or inappropriate use of blood products is a frequently unrecognized problem that presents significant patient safety issues. Recent research indicates that use of blood products beyond a level deemed medically necessary can increase complication rates and length of hospitalization. Overuse can also substantially increase the cost of care. This research examined variations in blood product use and potential opportunities for improvement.

Study Design: De-identified patient data from 7.4 million discharges between April 1, 2011 and March 30, 2012 were analyzed. Individual hospitals’ blood utilization for whole blood, red blood cells, platelets, plasma and cryoprecipitate, were compared to a benchmark set of utilization rates using negative binomial regression with adjustment for patient DRG assignment, 3MTM APR-DRG Severity of Illness assignment, licensed acute care beds, teaching status, geographic region, and urban/rural population served. Benchmarks were defined as the trimmed mean utilization rate for the first quartile of facilities (best performers). The number of lost opportunities (defined as blood product utilization above benchmark by DRG assignment for each patient) were multiplied by blood product acquisition costs to convert lost opportunities to U.S. dollars.

Population Studied: Analyses used clinical, administrative and supply chain data from patients with similar conditions (DRG assignment) at 464 U.S. acute care hospitals contained within a database maintained by Premier, Inc., Charlotte, NC.

Principal Findings: Results across all 464 hospitals show that, to treat similar patients, the top performing quartile of hospitals used fewer units of all blood products. Summation of all lost opportunities resulted in (36,501; $1.8M) whole blood, (358,617; $75.7M) red blood cells, (134,642; $71.9M) platelets, (183,850; 11.2M) plasma, and (89,106; $4.4M) cryoprecipitate, or a potential savings of $165M annually. The largest volume of potential opportunity identified for all blood and blood products were in internal medicine (196,698 units), followed by cardiac surgery (167,490 units), and general surgery (156,325 units). Data for the top ten inpatient diagnoses (by DRG) showed that the largest opportunity for utilization reduction were sepsis (35,560 units), total joint replacement (34,087 units), and cardiac valve and other cardiothoracic procedures (28,752 units).

Conclusions: If all hospitals analyzed were able to achieve blood product utilization similar to that of the top performing quartile, blood product use would be reduced by 802,000 units, with a combined savings of $165 million annually, while maintaining positive patient outcomes.

Implications for Policy, Delivery, or Practice: Identification of areas for cost reduction within hospitals and health systems is essential to reigning in excessive healthcare spending and keeping up with the proposed reductions in payments to healthcare providers. The lost opportunities identified in this analysis only capture the cost of product purchasing. Other cost savings may be achievable due to the additional expenses associated with blood testing, and with the storage, transportation and administration of blood products.

Funding Source(s): No Funding

The Quality and Productivity Connection: Can Hospitals Improve Quality While Managing Labor Expense?

Timothy Lowe, Premier Incorporated; Doug Miller, Premier Inc.; Eugene Kroch, Premier Inc.; John Martin, Premier Inc.; Richard Bankowitz, Premier Inc.

Presenter: Timothy Lowe, Ph.D., M.S.W., Principal Research Scientist, Premier Incorporated, timothy_lowe@premierinc.com
Research Objective: As healthcare expenditures continue to rise, government and private payers are searching for ways to reduce cost and improve quality. To maintain solvency, facilities are looking for methods to reduce overhead and increase profitability. Two key areas of expense, and areas felt to be ripe with opportunity for improvement within hospitals are labor and supply chain. Inefficiency in the deployment of hospital staff has been consistently identified as a primary driver of high cost healthcare. However, if hospitals seek to better manage their labor expense, there is a question of a negative effect on hospital performance. This study examined the association between wage-index-adjusted labor expense per case-mix-index-adjusted discharge and hospital performance in five measurement domains.

Study Design: Due to the high skew of the data, a negative binomial regression was used to examine the potential association between wage-index-adjusted labor expense per case-mix-index-adjusted discharge on five measures of hospital performance. These performance measures were: cost of care, use of evidence-based care, harm (AHRQ patient safety indicators), inpatient mortality, and patient experience (satisfaction survey). The model was evaluated using likelihood ratio and Hosmer-Lemeshow goodness of fit statistics and adjusted for number of licensed hospital beds, teaching status, geographic region, and urban/rural population served.

Population Studied: The analysis included the patient and department level data from 344 acute care hospitals. Data were drawn from clinical, administrative, and operational sources contained within a database maintained by Premier, Inc., Charlotte, NC.

Principal Findings: For all five measures, a one unit increase in hospital performance in each measurement category produced a corresponding case-mix-adjusted labor expense decrease of $264.81 (p>0.001). The primary drivers of this downward trend were compliance with evidence-based care and patient experience. Three of the domains indicated a negative association (use of evidence-based care, inpatient mortality, and patient experience) while cost of care and harm indicated a positive association.

Conclusions: These results demonstrate that quality improvement initiatives can both increase quality of care and reduce labor expense. Although the analysis found a negative association, the high skew of the data indicates that there is high variability between hospitals. Thus, the actual cost savings associated with an increase in hospital performance may vary between facilities.

Implications for Policy, Delivery, or Practice: The future of the U.S. healthcare system depends on reducing cost without negatively affecting care quality. This study shows that initiatives focusing on better management of hospital labor expense can result in both cost savings and improvements in quality.

Funding Source(s): No Funding

Poster Session and Number: B, #518

Identifying the Primary Drivers of Healthcare Waste: Potential Savings in Acute Care Facilities

Timothy Lowe, Premier Incorporated; Doug Miller, Premier Inc.; Eugene Kroch, Premier Inc.; John Martin, Premier Inc.; Richard Bankowitz, Premier Inc.

Presenter: Timothy Lowe, Ph.D., M.S.W., Principal Research Scientist, Premier Incorporated, timothy_lowe@premierinc.com

Research Objective: The rapid growth in the cost of providing healthcare services has raised considerable concern among all who are responsible for paying for healthcare. Recent trends indicate U.S. healthcare spending may rise to 20% of gross domestic product by 2019, or roughly $4.6 trillion. Estimates of how much of this expenditure is due to waste — the consumption, spending, or employment of health services without adequate return — range as high as 30%. Premier developed a set of measures targeting healthcare waste to assist healthcare facilities in identifying and reducing waste. This study assessed the amount of potential healthcare waste and its attendant cost in order to identify drivers of waste in the acute care setting.

Study Design: Premier developed 16 measures to assess areas of potential savings for hospitals and health systems spanning clinical, operational, and supply chain domains. Waste was measured in dollars based on comparative cost calculations from the Premier database. Risk adjustment is incorporated through published methodologies or by benchmarking against best-performing peers. As the measures are predominantly high level, there is some overlap between the domains. In order to avoid the bias that would result from summing all...
domains, mean, standard deviation, skew and kurtosis were calculated for each measure.

Population Studied: Assessment of potential waste used the data from 558 acute care hospitals contained within a database maintained by Premier, Inc., Charlotte, NC. Potential waste was assessed using clinical, administrative, operational, and supply chain sources.

Principal Findings: There were 16 measures identified: overuse of blood bank, diagnostic imaging, laboratory services, respiratory therapy, anti-infectives, central nervous system drugs, hospital-acquired complications [AHRQ patient safety indicators], excessive length of stay, ICU length of stay, ICU utilization, readmissions, staffing efficiency [adjusted labor expense per discharge], staffing premium pay [overtime and agency hours], staffing skill mix, contract activation, and purchase order administration. Of the 16 measures, there were eight that had the highest level of waste measured in dollars. These were: staffing efficiency ($5.9M), staffing overtime ($1.2M), staffing skill mix ($1.8M), excessive length of stay ($2.2M), readmissions ($2.3M), overutilization of diagnostic imaging ($682,704), laboratory tests ($902,030), and respiratory therapy ($550,740). All measures had a high positive skew indicating high variability between facilities.

Conclusions: Through this work we were able to identify 16 measures that can be used to evaluate hospital waste. In addition, we found 8 measures that appear to significantly contribute to waste in hospitals. Further refinement of measures in the future will provide a more clear picture of where overlapping measures of waste can be consolidated or refined to improve the accuracy of our measures.

Implications for Policy, Delivery, or Practice: As the healthcare industry adapts to ongoing reimbursement cuts, hospitals must reduce waste across the full spectrum of their operational and clinical practices. Identifying the primary drivers of healthcare waste will assist providers in developing and monitoring targeted programs to successfully reduce waste.

Funding Source(s): No Funding

Poster Session and Number: B, #519

Reducing Healthcare Waste: The Premier Cardiac Device Waste Measures
Timothy Lowe, Premier Incorporated; Choreh Partovian, Yale University Medical Center;

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Presenter: Timothy Lowe, Ph.D., M.S.W., Principal Research Scientist, Premier Incorporated, timothy_lowe@premierinc.com

Research Objective: Overutilization, or the provision of medical care with little benefit or where harm outweighs therapeutic benefit, has been posited as a primary driver of high medical cost. Recent studies have identified cardiac procedures as a prime area for cost reduction. This research developed and validated eight measures for assessing the potential savings from reducing cardiac procedure waste.

Study Design: Measure development used a three step approach: literature search, clinical guidelines review, and consultation with physicians and healthcare executives. Potential measures were reviewed by both a clinical panel (two cardiologists and two advanced practice nurses) and an administrative panel (two analysts and a database manager) to assure they were high impact, feasible, and useful/functional. Measures were risk-adjusted using Premier’s CareScience™ methodologies or mean peer value based on MS-DRG assignment. Internal consistency of the measures was evaluated using Cronbach’s alpha and Spearman rank correlations.

Population Studied: Measure development and validation used the data from 261 hospitals participating in a database maintained by Premier. Data were drawn from clinical, administrative, operational, and supply chain sources.

Principal Findings: The development and review process produced eight measures of overutilization: dual-chamber defibrillators, higher cost devices, MRI-compatible pacemakers, drug eluting stents, length of stay, ICU length of stay, and premium pay (overtime and agency hours). Using the QUEST Premier data, we found high variability in resource utilization across facilities. Validation of the measures using item-to-total correlations (range=0.27-0.78), Cronbach’s alpha (0.88), and Spearman rank correlation (0.92), showed high reliability and discriminatory power.

Conclusions: Due to the level of variability observed among hospitals, this study suggests that there is opportunity for facilities to design successful waste reduction programs targeting select cardiac procedures.
Implications for Policy, Delivery, or Practice:
Identification of areas for cost reduction within hospitals and health systems is essential to reigning in excessive healthcare spending and keeping up with the proposed reductions in payments to healthcare providers. With the aging of the U.S. population and attendant increase in the frequency and cost of cardiac procedures, measures, such as these, that identify multiple areas of waste in addressing cardiac procedures waste will be critical in reducing cost while maintaining care quality.

Funding Source(s): No Funding
Poster Session and Number: B, #520

Quality Improvement Implementation in Local Health Departments: Results from the 2010 Profile Study
Huabin Luo, CDC; Sergey Sotnikov, CDC; Anita McLees, CDC; Saira Nawaz, CDC

Research Objective: Over the past decade, quality improvement (QI) has become a major focus in advancing the goal of improving performance of local health departments (LHDs). However, limited data exists on the current status of QI initiatives in LHDs and factors associated with successful QI implementation. The objectives of this study were:
1) To examine the current status of QI implementation projects by LHDs; 2) To identify organizational and community characteristics of LHDs that are associated with their involvement in QI projects.

Study Design: In this study, LHDs’ QI implementation was measured by the number of formal QI projects reported by respondents to the 2010 National Profile of Local Health Departments Study (Profile Study) conducted by National Association of County and City Health Officials. The Profile Study included a sample of 531 LHDs participating in the Module I survey. This module included questions concerning the number of formal QI projects implemented. The Profile Study dataset was merged with the Health Resources and Services Administration’s Area Resource Files and the Association of State and Territorial Health Officials’ 2010 survey. Multiple ordinal logistic regression models were run to estimate LHD organizational and community characteristics associated with formal QI implementation. Analyses were conducted using Stata 11 SVY procedure to account for the complex sampling design. Results were considered significant if p<0.05.

Population Studied: A sample of 531 Local Health Departments from Profile Study.
Principal Findings: The 2010 Profile Study data indicated that about 74% of the LHDs reported implementing 1 or more QI projects, but 7% of them did not implement any of the essential elements for formal QI as recommended. LHDs with large jurisdiction population (above 50,000), more per capita public health expenditure, a full-time director, and with a designated QI staff member were more likely to have implemented more formal QI projects (ps<0.05).

Conclusions: The 2010 Profile Study suggests approximately one-quarter of LHDs surveyed did not report implementing a formal QI project. Additional efforts might be needed to promote QI in LHDs, especially LHDs with limited resources. Targeted investments in QI programs and designation of QI staff are effective strategies to promote QI adoption.

Implications for Policy, Delivery, or Practice:
The validity of formal QI projects definition needs to be established. More research to identify the barriers for successful QI implementation at LHDs is needed.

Funding Source(s): No Funding
Poster Session and Number: B, #521

Temporal Changes and Regional Variation in Prostate Cancer Imaging in a Nation-Wide, Population-Based Cohort Following an Effort to Discourage Inappropriate Use
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Research Objective: Encouraging appropriate use of imaging to stage incident prostate cancer is a challenging problem highlighted recently as a Physician Quality Reporting System quality measure and by ASCO in the Choosing Wisely Campaign. Since 2000, the National Prostate Cancer.
Cancer Register (NPCR) of Sweden has led an effort to decrease national rates of inappropriate prostate cancer imaging by disseminating personalized utilization data along with the latest imaging guidelines to urologists in Sweden. We sought to determine the temporal and regional effects of this effort on prostate cancer imaging rates.

**Study Design:** We performed a retrospective cohort study, analyzing imaging utilization over time stratified by clinical risk group (low, intermediate, high) and geographic region. Generalized linear models with a logit link were used to test for time trend.

**Population Studied:** Men diagnosed with prostate cancer from the NPCR from 1998-2009 (N=99,879).

**Principal Findings:** Thirty six percent of men underwent imaging within 6 months of prostate cancer diagnosis. Overall, imaging utilization decreased over time, particularly in the low-risk group, among whom the imaging rate decreased from 45% to 3% (p<0.01), but also in the high risk group, among whom the rate decreased from 63% to 47% (p<0.01). Despite substantial regional variation, all regions experienced significant decreases in prostate cancer imaging (p<0.01).

**Conclusions:** A Swedish effort to provide data on personalized prostate cancer imaging utilization and imaging guidelines to clinicians dramatically reduced inappropriate imaging over a 10-year period, while slightly decreasing appropriate imaging in high-risk patients.

**Implications for Policy, Delivery, or Practice:** These results may inform current efforts to promote guideline concordant imaging, by encouraging policy makers to consider providing incentives for appropriate use as well as disincentives for inappropriate use, in the US and internationally.

**Funding Source(s):** Other, The Swedish Research Council 825-2008-5910 and The Swedish Cancer Foundation 11 0471

**Poster Session and Number:** B, #522

**A Tale of Two Pilots: Provider and Staff Perspectives on Care Manager Implementation for Two Regional Health Plan Medical Home Pilots**

Rebecca Malouin, Michigan State University; Heather Howard, PhD, Michigan State University; Amy Faucher, MS, Michigan State University; Seven Mattes, Michigan State University; Martha Callow, Michigan State University

**Presenter:** Rebecca Malouin, PhD, MPH, Assistant Professor, Department of Family Medicine and Department of Pediatrics and Human Development, Michigan State University, rebecca.malouin@ht.msu.edu

**Research Objective:** This study evaluates the effect of two approaches to patient-centered medical home (PCMH) delivery system improvement strategies, specifically the implementation of care managers. Each PCMH strategy focused on improvements in structures and processes within practices with the intention of reducing costs, improving health outcomes, and improving experience. One regional health insurer in New York provided health plan staff as care managers to work in the practice one or two days a week with the patients of that health plan. The other regional health insurer, in Michigan, provided grants to the practices to hire a care manager and utilize them according to individual practice needs. The objective is to examine, from the perspective of providers, staff, and health plan administrators, the effectiveness of two different strategies for implementing care managers in primary care practices.

**Study Design:** 100 key informant interviews and 23 focus groups were conducted with practices from April to June 2011 and April to June 2012, respectively. Practices were reimbursed $100 for each interview and $500 for each focus group. All interviews and focus groups were transcribed and then coded and analyzed by multiple investigators using NVivo qualitative analysis software.

**Population Studied:** Interview participants, in addition to health plan staff, most often included the physician champion, practice administrator, and care manager, while focus groups were conducted solely with practice staff.

**Principal Findings:** The care managers in New York practices were nurses provided by the health plan, who worked in the practice one or two days a week with patients of that health plan. Some practices were initially leery of having a health plan employee in their practice. These care managers helped to coordinate patient care by, for example, following-up with patients after hospitalizations and specialist visits.

The care managers in Michigan were hired by each practice, using grant money provided by the health plan, and came from different backgrounds, such as nursing, social work, and
kinesiology. These care managers were practice employees and could see all practice patients. Many practices were not sure how to implement them in their practice, as the need was so great and integrating them into existing practice structures was challenging. Following the end of the pilot, many of the New York practices continue to access their care managers from the health plan. However, in Michigan some of the practices have been unable to sustain support for their care managers following the loss of the grant money.

Conclusions: The implementation and integration of new roles, such as care managers, presents an area of particular challenge when undergoing practice transformation. Primary care practices can benefit from the use of a care manager, but practices may want to seek out advice from other practices or learning networks on the best practices for hiring, integrating, and sustaining a care manager.

Implications for Policy, Delivery, or Practice: Planning for the type of individual that would best serve the practice and patients, how they will be integrated into the current practice structure, and how they will be sustained financially, could help maximize the benefits that can come from having a care manager.

Funding Source(s): AHRQ

Poster Session and Number: B, #523

The Association between Patient Preferences for Colorectal Cancer Screening and Screening Receipt in the VA

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Research Objective: Incorporation of patient preferences is a critical component of patient-centered care. Despite relatively high colorectal cancer (CRC) screening rates within the VA, adherence with screening among some subgroups of veterans remain suboptimal. Preferences for screening modality (colonoscopy vs. fecal occult blood testing [FOBT]) vary, and may influence receipt of screening. The objective of this study was to evaluate the relationship between stated preference for CRC screening modality and adherence to CRC screening type among veterans.

Study Design: This study used data from an intervention trial of a preference-tailored decision tool aimed at increasing CRC screening adherence (intervention data not reported). Veterans’ preferred screening modality (colonoscopy vs. FOBT) was obtained following completion of the decision tool. Screening outcome was assessed by chart review six months later. We utilized multinomial logistic regression to examine the relationship between stated preference for CRC screening modality (colonoscopy vs. FOBT) and screening outcome (non-adherent, adherent with colonoscopy, adherent with FOBT) at six months follow-up. We included age, race, education, income, marital status, and study arm as control variables in the analyses.

Population Studied: Veterans, aged 50 to 77, due for CRC screening, with a scheduled primary care appointment, at two VA health systems (N=374).

Principal Findings: Thirty-nine percent of veterans were adherent with CRC screening at the six month follow-up. Among the 258 veterans in our sample stating a preference for FOBT, 64 percent were non-adherent with any screening modality at six months and 28 percent were adherent with FOBT. Of the 114 veterans who stated a preference for colonoscopy, 56 percent were non-adherent at follow-up and 33 percent were adherent with colonoscopy. At six months, ten percent of veterans in this sample who preferred colonoscopy at baseline were adherent with FOBT, while 8 percent of veterans preferring FOBT were adherent with colonoscopy. In the adjusted multinomial model comparing adherence to either colonoscopy or FOBT to non-adherence, veterans preferring colonoscopy versus FOBT were significantly more likely to be adherent with colonoscopy than to be non-adherent with screening overall (OR=5.15 p=0.001), and veterans preferring colonoscopy over FOBT at baseline were less likely to be adherent with FOBT (versus non adherent) at follow-up (OR=0.43 p=0.014). In the model with adherence to FOBT as the base category, veterans who preferred colonoscopy over FOBT were more likely to be adherent with colonoscopy versus FOBT at follow-up (OR=11.8 p=0.001). Veterans who preferred colonoscopy over FOBT were more likely to be
non-adherent at six months than adherent with FOBT (OR=2.30, p=0.014). No other covariates were significantly associated with adherence in either model.

**Conclusions:** In our sample of veterans eligible or overdue for CRC screening, overall screening adherence at the six month follow up point was low. Yet among those who got screened, there was a strong association between preference for screening modality at baseline and receipt of the same test six months later.

**Implications for Policy, Delivery, or Practice:** Understanding and acknowledging patients' preferences for a specific CRC screening modality may translate to higher CRC screening adherence in various primary care settings and, ultimately, be necessary for improving provision of patient-centered care.

**Funding Source(s):** VA

**Poster Session and Number:** B, #524

**Establishing the Overall Health Status of Low-Income Children Enrolled in Head Start Programs in Boston, Massachusetts from 2011-2012**

Karine Martirosyan, Action for Boston Community Development, Inc; Karen Hampanda, University of Colorado Denver; Jennifer Pawson, Action for Boston Community Development, Inc.

**Presenter:** Karine Martirosyan, M.D., M.P.H., Director, Head Start Health Services, Head Start and Children’s Services, Action for Boston Community Development, Inc, karine.martirosyan@bostonabcd.org

**Research Objective:** To establish the most prevalent morbidities impacting the health of children 0 to 5 years of age enrolled in Head Start programs and the overall health status of the population.

**Study Design:** A Cross sectional analysis of data from the Action for Boston Community Development (ABCD) Head Start Promis Cleverex V5.16 database was conducted to determine the prevalence of specific morbidities among low-income children in Head Start programs. Descriptive statistics were calculated based on the child’s diagnosis, including asthma, allergies, eczema, optical problems, and heart conditions, in the Head Start database. The prevalence of dental caries and learning disabilities were not included in this analysis since previous research has focused specifically on these topics.

**Population Studied:** Children ages 0-5 years enrolled in Head Start or Early Head Start programs from 9/1/2011 to 5/31/2012. All children meet the federal guidelines for living at or below the poverty level. A total of 2,939 children’s records were included in the analysis.

**Principal Findings:** Of 2,939 children enrolled in ABCD Head Start programs, 548 (18.6%) were diagnosed with asthma, 348 (11.8%) with allergies and 68 (2.3%) with eczema. Additionally, 71 (2.4%) children have optical problems corrected with glasses and 16 (1%) have a diagnosed heart condition, such as heart palpitations.

**Conclusions:** The most common health conditions in this group were found to be asthma, allergies and vision problems. The study demonstrates that children in Head Start programs in Boston often have chronic health conditions that have the potential to impact their ability to learn in school and function in their daily lives.

**Implications for Policy, Delivery, or Practice:** This study provides a basis for initiating or continuing key services to the population of low-income children in Boston. There is need for families with young children to receive health education, particularly related to asthma and allergies, given the high prevalence of these conditions. Furthermore, the high rate of asthma in Head Start children indicates the need for assistance in providing asthma friendly homes and schools throughout Boston.

**Funding Source(s):** No Funding

**Poster Session and Number:** B, #525

**Trends in Prevalence of Asthma Diagnosis in Children Enrolling in Head Start and Early Head Start Programs from 2009 to 2012 in Boston, Massachusetts**

Karine Martirosyan, Action for Boston Community Development, Inc; Karen Hampanda, University of Colorado Denver; Jennifer Pawson, Action for Boston Community Development, Inc.

**Presenter:** Karine Martirosyan, M.D., M.P.H., Director, Head Start Health Services, Head Start and Children’s Services, Action for Boston Community Development, Inc, karine.martirosyan@bostonabcd.org

**Research Objective:** To establish trends in childhood asthma diagnosis among the Head Start and Early Head Start population in Boston, Massachusetts from 2009 to 2012.
Meeting the Oral Health Needs of Homeless Children enrolled in ABCD Head Start programs in Boston, Massachusetts: a Look at Their Oral Health Status, Caries Experience, and Dental Services Received through On-Site Mobile Dental Care 2010-2011

Karine Martirosyan, Action for Boston Community Development, Inc; Karen Hampanda, University of Colorado Denver; Kathy Lituri, Boston University Goldman School of Dental Medicine; Mark J. Doherty, DentaQuest Institute

Research Objective: To study the oral health needs of homeless children enrolled in ABCD Head Start programs in Boston, Massachusetts.

Study Design: A Cross sectional analysis of data from the Action for Boston Community Development (ABCD) Head Start Promis Cleverex V5.16 database and children's dental records was conducted to determine the prevalence of oral health problems among homeless in ABCD Head Start programs. We studied 31 homeless children who had a dental exam from an on-site mobile dentist during the 2010-2011 school year. We compared their outcomes with dental health status of 62 low-income housed children enrolled in ABCD Head Start program during the same period.

Population Studied: Homeless and housed low-income children 3 to 5 years old enrolled in ABCD Head Start programs in Boston, Massachusetts during the 2010-2011 school year. The total sample size is 93 Head Start children (31 homeless and 62 low-income housed children).

Principal Findings: Only one of the 31 homeless children had a dental home prior to enrollment in Head Start; over 96% of children had no dental home. All of the homeless children (N=31) in the study had health insurance. Thirty homeless children (96.8%) have publically-funded health insurance with full dental coverage. In comparison, approximately half of housed Head Start children had dental homes prior to enrollment and 92% rely on publically-funded health insurance (N=62). Homeless Head Start children have statistically significant more dental caries (p>0.010); they

Study Design: A trend study design using cross-sectional data from two school years (2009-2010 and 2011-2012) was employed to examine the prevalence of asthma diagnosis among Head Start and Early Head children. Cross-sectional data was collected using ABCD Head Start Promis Cleverex V5.16, the database for all enrolled children in Boston Head Start programs. Using calculated descriptive statistics with the outcome of asthma diagnosis, prevalence trends from the two school years and two programs were compared.

Population Studied: Children 0 to 5 years old enrolled in either Head Start (3-5 years old) or Early Head Start (0-3 years old) programs from 9/1/2009-5/31/2010 and 9/1/2011-5/31/2012. The total sample size is 3,941 Head Start children.

Principal Findings: In the 2009-2010 school year, of the 1,002 children enrolled in ABCD Head Start programs, 177 (17%) were diagnosed with asthma: 172 (17.8%) in Head Start and 53 (20.1%) in Early Head Start. In the 2011-2012 school year, of the 2,939 children enrolled in ABCD Head Start programs, 548 (18.6%) were diagnosed with asthma: 522 (19%) in Head Start and 35 (13.9%) in Early Head Start.

Conclusions: Compared with the 2009-2010 school year, overall asthma prevalence in children enrolling in ABCD Head Start programs increased by 1.6% in the 2011-2012 school year. Among 3-5 year olds, asthma diagnoses increased 1.2%. However, asthma in the younger children deceased over 6%.

Implications for Policy, Delivery, or Practice: Head Start children have much higher rates of asthma than the national prevalence. This follows nationwide trends in health disparities indicating that lower socioeconomic status (SES) children suffer from worse health outcomes. There is an urgent need to address the environmental exposure and other social determinants of health that may be attributable to this difference. More research is needed to fully understand the increase in asthma diagnoses among older Head Start children, but the dramatic decrease among younger Head Start children.

Funding Source(s): No Funding

Poster Session and Number: B, #526
are 3.1 times more likely to have caries than housed children. Prevalence of untreated caries is 35.5% in homeless Head Start children and 11.2% in low-income housed Head Start children. Over 41% of homeless children have caries experience, defined as at least one tooth with an untreated cavity, a filling, or a missing permanent molar. In addition, there was one child with a broken tooth from trauma that needs to be monitored by a dentist for possible infection. Of the 31 children that were seen by the mobile dentist at Head Start, six (19%) were referred for treatment to a community dental clinic (see Chart 1). 30 children (97%) received fluoride varnish; 26 children (83.9%) received sealants on multiple teeth; and 2 children (7%) received fillings for existing caries provided by the on-site mobile general dentists with experience in pediatrics.

**Conclusions:** Homeless children in Head Start are less likely than housed children to have a dental home prior to enrollment. The vast majority of Head Start children rely on publically funded health insurance to pay for their dental care, especially if the family is homeless. The children in this study were from 3-5 years old and almost none of the homeless children had seen a dentist prior to the mobile dental exam at Head Start. This study has also found that homelessness increases children’s risk of having poor oral health.

**Implications for Policy, Delivery, or Practice:** There is an urgent need to create earlier preventative oral health interventions for homeless families to prevent dental caries and decay from developing in homeless preschool-age children. The on-site mobile dental program is essential for providing comprehensive dental care to homeless children. However, more emphasis should be placed on helping homeless families establish dental homes in order for their children to receive on-going oral health care after they leave Head Start. However, enrolling homeless children in center based preschool programs such as Head Start is an important step to help this vulnerable group of children access comprehensive dental services.

**Funding Source(s):** No Funding

**Poster Session and Number:** B, #527

**Organizational Predictors of Coordination in Inpatient Medicine**


**Presenter:** Nathalie McIntosh, Boston University, mcintnm@gmail.com

**Research Objective:** As the care of hospitalized patients becomes more complex, intraprosessional coordination among nurses and among physicians, and interprofessional coordination between these groups is likely to play an increasingly important role in the provision of hospital care. The purpose of this study was to identify the independent effects of organizational factors on provider ratings of overall coordination in inpatient medicine.

**Study Design:** This was a cross-sectional, descriptive study. Primary data were collected between June 2010 and September 2011 through surveys of inpatient medicine nurse managers, physicians, and chiefs of medicine at 36 Veterans Health Administration (VHA) medical centers. Secondary data from the 2011 VHA national survey of nurses were also used. Individual-level data were aggregated and analyzed at the facility level. Multivariate linear regression models were used to assess the relationship between organizational factors and provider ratings of overall coordination in inpatient medicine.

**Population Studied:** Inpatient medicine nurses, nurse managers, attending physicians, and chiefs of medicine at 36 VHA medical centers.

**Principal Findings:** Organizational factors that were common across models and associated with better provider ratings of overall coordination in inpatient medicine included: provider perceptions that the goals of senior leadership are aligned with those of the inpatient service and that the facility is committed to the highest patient care; having resources and staff that enable clinicians to do their jobs; and use of strategies that enhance interactions and communication among and between nurses and physicians.

**Conclusions:** Alignment of the goals of senior leadership with those of the inpatient service, facility commitment to the highest patient care,
having adequate resources and staff enabling clinicians to do their jobs, and the use of strategies that enhance intra- and interprofessional interactions and communication are associated with higher provider perceptions of overall coordination.

**Implications for Policy, Delivery, or Practice:**
To improve intra- and interprofessional coordination, and consequently patient care, facilities should consider: making patient care quality a more important strategic organizational priority; ensuring that providers have the staffing, training, supplies and other resources they need to do their jobs; and implementing strategies that improve interprofessional communication and working relationships, such as multidisciplinary rounding.

**Funding Source(s):** VA

**Poster Session and Number:** B, #528

**Asthma-Related Healthcare Utilization and the Effects of Direct to Consumer Advertising among White and Black Medicaid Children**

Luceta McRoy, University of Alabama at Birmingham; Meredith Kilgore, Ph.D., University of Alabama at Birmingham; W. David Bradford, Ph.D., University of Georgia; Robert Weech-Maldonado, Ph.D., University of Alabama at Birmingham

**Presenter:** Luceta McRoy, Ph.D., Health Administration, University of Alabama at Birmingham, lmcroy@uab.edu

**Research Objective:** The increasing burden of asthma affects approximately 40 million Americans. The prevalence is higher among minorities and those from low income families resulting in higher levels of asthma-related hospitalizations and emergency department visits. The purpose of this study is to examine the effects of DTCA on asthma-related hospitalizations and emergency department visits.

**Study Design:** In this study we combined Medicaid administrative data with national advertising data on asthma medication expenditures from 1999 to 2002. Dependent variables are asthma-related hospitalizations measured as the number of hospital visits per year and asthma-related emergency department visits measured as the number of emergency department visits per year. The main independent variable is DTCA measured as advertising expenditure by county over the study period. Control variables were: race measured as whites and blacks; age measured as year at baseline; and gender measured as male and female. We used a series of logistic regression with population average effects for the analysis.

**Population Studied:** The study included Medicaid children between the ages of 5 and 18 who had an asthma diagnosis at any time during the study period 1999 to 2002.

**Principal Findings:** Increased spending of DTCA is associated with a decrease in emergency department visits (p <.05). Among black children, emergency department visits decreased significantly (p<.05). There was no significant effect on white Medicaid children. Increased DTCA spending is associated with an increase in asthma-related hospitalizations among white Medicaid children (p <.05) and although asthma-related hospitalizations decreased among black children the effects were not significant

**Conclusions:** DTCA spending has some effect on health utilization. The effects vary significantly among black and white Medicaid children for emergency department visits and hospitalizations.

**Implications for Policy, Delivery, or Practice:**
With increased debates on the benefits of DTCA, policy makers should consider that DTCA could assist in improved health outcomes and decreased health utilization. Further consideration should be given to the role of DTCA in helping to reduce the burden of asthma and health-disparities.

**Funding Source(s):** No Funding

**Poster Session and Number:** B, #529

**Chronic Health Conditions Prior to Entry into Medicare Fee-for-Service or Medicare Advantage**

Eric Miller, National Center for Health Statistics; Sandra L. Decker, National Center for Health Statistics; Jennifer D. Parker, National Center for Health Statistics

**Presenter:** Eric Miller, Ph.D., Senior Research Fellow, National Center for Health Statistics, bwe6@cdc.gov

**Research Objective:** Although studies have examined the health conditions of Medicare beneficiaries enrolled in Medicare managed care [Medicare Advantage (MA)] versus traditional fee-for-service (FFS), there is little information on the health of beneficiaries prior to enrollment and if these characteristics have changed as
Medicare policies have changed. Using National Health Interview Survey (NHIS) data linked to Medicare enrollment data, we examined if individuals who initially enroll in MA rather than FFS at age 65 have fewer health conditions or better overall health (i.e. positive selection) and if the degree of positive selection into MA changed between 2000-2009, particularly beginning in 2006 when drug coverage become available for FFS enrollees.

**Study Design:** We used self-reported health data from the 1997-2005 NHIS linked with Medicare enrollment data from 2000-2009. The analysis was restricted to survey participants aged 60-64 years in the NHIS with Medicare enrollment data when they aged into the program at 65. Enrollment into MA was defined as any MA enrollment during the first 6 months of entitlement. We compared self-reported health status and health conditions for MA and FFS enrollees overall and within two time periods (2000-2005 and 2006-2009). Health conditions included diabetes, hypertension (if diagnosed on more than one visit), cardiovascular disease [(CVD); including myocardial infarction, stroke, angina, hypertension, and coronary heart disease], cancer (excluding non-melanoma skin), asthma, and also the total number of conditions (0,1,>1). Multivariable logistic regression models were used to calculate the associations of each condition with MA enrollment controlling for sex, race/ethnicity [white non-Hispanic, black non-Hispanic (BNH), Hispanic, other], education [up to high school (HS) degree, >HS coursework] and region of residence in the U.S.. We also examined potential changes in enrollment patterns from 2000-2005 to 2006-2009 by including an interaction term for each condition and a dichotomous variable for time-period. We used a Satterthwate adjusted F test (p=0.05) to determine statistical significance. Estimates were weighted and standard errors calculated using SUDAAN v11.0 to account for the complex survey design.

**Population Studied:** Sampled adults aged 60-64 years in the 1997-2005 NHIS linked with 2000-2009 Medicare enrollment data.

**Principal Findings:** Data were available from 6,254 NHIS participants who aged into Medicare between 2000 and 2009. A significantly higher percentage of MA beneficiaries were female (p<0.01), of lower education level (p=0.04), or of Hispanic ethnicity (p<0.01) compared to FFS. Enrollment in MA increased from 10.0% during 2000-2005 to 19.1% during 2006-2009 (p<0.01).

There were no statistically significant associations between MA enrollment and self-reported health or any of the chronic conditions examined. Results were similar after adjusting for demographic characteristics in multivariable logistic regression models. When examining potential changes by time period with an interaction term, there were no significant changes in enrollment patterns for any of the chronic conditions.

**Conclusions:** We found no evidence of positive selection in MA by chronic health conditions we were able to examine and no evidence that enrollment patterns have changed between 2000 and 2009.

**Implications for Policy, Delivery, or Practice:** We found no evidence of positive selection into MA for new Medicare enrollees.

**Funding Source(s):** CDC

**Poster Session and Number:** B, #530

**Healthy TEAM Healthy U: An effective Worksite Wellness Program**

**Esther Moe, Oregon Health and Science University**

**Presenter:** Esther Moe, Ph.D., M.P.H., Research Assistant Professor, Medicine, Oregon Health and Science University, moe@ohsu.edu

**Research Objective:** To assess the effectiveness of a team-based worksite wellness program, designed to improve exercise and nutrition behaviors among employees at the Oregon Health & Science University (OHSU).

**Study Design:** All OHSU benefit-eligible employees were offered the opportunity to participate in the Healthy TEAM Healthy U (HTHU) wellness program, with an inducement of reduced insurance premiums and up to two hundred dollars as a financial bonus. HTHU is a scripted, team-centered curriculum with a curriculum and web component for tracking participation and points for achieving weekly goals and completing on-line activities and additional learning opportunities. Teams of 4-6 co-workers met weekly for twelve, 30-minute sessions. A Team Leader curriculum instruction manual was rotated among participants who use a workbook and ancillary wellness guide. Height, weight, resting blood pressure measurements and completion of pre and post nutrition and physical activity behavior surveys and related health knowledge were assessed among consented volunteers.
**Population Studied:** OHSU employees (n=852) involved in the first year of the HTHU wellness program responded to survey questions at both pre and posttest. Of those, 253 participants also had physical measurements assessed.

**Principal Findings:** Overall, there was a significant decrease in systolic and diastolic blood pressure, with greater reductions, nearly 10 mm Hg and 5 mm Hg among those with systolic (> 135 mm Hg) and diastolic (> 85 mm Hg) blood pressure, respectively. Although the overall BMI for those measured did not decrease, among those with a higher pre-intervention BMI (> 25), there was a significant BMI reduction (p<0.0001). Self-reported fruit and vegetable intake increased overall; however the greatest increase (increase of 1.68 servings/day) was among those with pre-test intake of less than < 3 servings/day (p<0.0001). There was a significant increase of 2 days/week of intense physical activity of the HTHU participants (p<0.0001) for participants who initially reported lower levels of weekly physical activity. Indices of past month depression among those reporting being initially depressed improved (p<0.0001) (pre=5.29, post 3.37). The number of HTHU participants who missed work due to any medical reason at baseline significantly decreased their report of missing days of work after completion of the HTHU program (p<0.0001). Knowledge of the health benefits of fruits and vegetables also revealed improvement.

**Conclusions:** The Healthy TEAM Healthy U employee wellness program changed objective health measures (blood pressure and BMI), fruit and vegetable intake and physical activity. The impact of coworkers positively influencing health behaviors was evident by a significant increase in reporting that co-workers “now remind me to eat healthier” (pretest=3.34, posttest 4.44 out of 5). Additional analyses concerned with return on investment, compared to a comparable control group will determine the medical costs as compared to a similar aged and sex-based cohort for all participants (n=2786).

**Implications for Policy, Delivery, or Practice:**
A team-based workplace strategy that encourages healthy diet and physical activity can improve healthy behaviors and improve objective health measures.

**Funding Source(s):** No Funding

**Poster Session and Number:** B, #531

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**Child and Adolescent Healthcare Quality Disparities: Findings from the National Healthcare Quality and Disparities Reports**

**Study Design:** Child and adolescent healthcare measures were extracted from the NHQR-DR database and analyzed. The measures are organized into child and adolescent age groups (0-17) stratified by race/ethnicity, education, income, insurance and urban vs rural location. The significant differences between populations for most recent year and trends over time (at least 3 data years) are tested for statistical significance at alpha=0.05, using two-tailed test, and a minimum relative difference of 10 percent between the comparison and reference group.

**Population Studied:** United States child and adolescent population

**Principal Findings:** From 2007 to 2009, the percentage of Non-Hispanic Black live-born infants with low birth weight (less than 2500 grams) was higher than for Non-Hispanic White infants. In 2007, infant mortality per 1000 live births was higher for American Indian or Alaska Native and Black infants than for White infants. Asian or Other Pacific Islander infants had lower mortality rates than did White infants. From 2001 to 2005, maternal deaths per 100 000 live births were higher for mothers with only a high school education than those with at least some college education. From 2002 to 2009, children ages 2-17 with public insurance and those without insurance were less likely to have a dental visit than those with private insurance. From 2002 to 2009, the percentage of children ages 2-17 given advice to exercise was significantly less
for those without insurance compared to those who have private insurance.

From 2002 to 2009, the percentage of children ages 2-17 given advice about healthy eating who live in small metro and non core areas was significantly lower compared to those who live in large fringe metro areas. In 2009 and 2010, adolescent females ages 13 to 15 from middle income families were less likely to receive 3 or more doses of HPV vaccine than females from high income families. In 2009 adolescents ages 10 to 17 from middle, low and poor income families were less likely to receive a well visit in the last 12 months than those from high income families.

**Conclusions**: The results from this evaluation show that disparities in the quality of healthcare services are experienced by Non-Hispanic Black, American Indian or Alaska Native children and those from lower socioeconomic strata across a range of healthcare quality measures.

**Implications for Policy, Delivery, or Practice**: Focused policies and research that can identify specific ways to improve the isolated areas of concern identified from this assessment, can greatly improve the quality of life and health of disadvantaged children in the United States. For example, there have been successful, interventions, such as the Nurse-Family Partnership, aimed to educate mothers from lower income households to improve pregnancy outcomes. Other initiatives focusing on child and adolescent health include the Carilion Clinic Dental Care-Pediatrics, which is a hospital-based outpatient clinic providing comprehensive dental care for children without insurance.

**Funding Source(s)**: AHRQ

**Poster Session and Number**: B, #532

**Community Health Center Expansion: Roles of Nurse Practitioners, Physician Assistants, and Clinical Nurse Midwives**

Perri Morgan, Duke University Medical Center; Christine Everett, University of Wisconsin-Madison; Esther Hing, Center for Disease Control

**Presenter**: Perri Morgan, M.S., P.A., Associate Professor, Community and Family Medicine, Duke University Medical Center, perri.morgan@duke.edu

**Research Objective**: Since their creation as part of the War on Poverty in the 1960’s, Community Health Centers (CHCs) have filled an important role in providing health care to underserved populations. Recent infusions of federal support have expanded this role, and demands on CHCs are expected to grow with full implementation of the Affordable Care Act. Nonphysician clinicians have been used extensively in CHCs for decades, but their use has increased, with nurse practitioners (NPs), physician assistants (PAs), and nurse midwives (CNMs) providing 30% of CHC visits in 2006-07. This project examines the roles of NPs, PAs, and CNMs in CHCs from 2006-2010

**Study Design**: This study analyzes annual cross-sectional restricted survey data National Ambulatory Medical Care Survey (NAMCS) Community Health Center strata from 2006-2010. We describe provider mix in relation to clinic characteristics (size and major sources of financial support), estimate number of weekly clinical encounters by provider type, and compare nonphysicians with physicians with regard to patient characteristics and patient care attributes. We also examine trends in skill mix use in CHCs. Survey weights are used to produce national estimates.

**Population Studied**: The NAMCS CHC sample is a representative national sample of CHC providers and patients nationally.

**Principal Findings**: The sample included CHC visits to 1186 physicians, NPs, PAs, and CNMs, representing a national average estimate of 150,100 providers per year. Of the 1186 providers, 68% were physicians, 21% were NPs, 9% were PAs, and 2% were CNMs. The physician to nonphysician ratio did not change significantly over the five years studied. Nationally, there were, on average, 36, 469, 000 visits to CHCs per year over the five year period. NPs, PAs, and CNMs provided 36.8% of these visits. Analyses of patient care characteristics of CHC physicians, NPs, PAs, and CNMs are in progress and will easily be complete by 2/28/13.

**Conclusions**: Results provide detailed information about staffing patterns and deployment of nonphysician clinicians in a setting in which they comprise a large portion of providers and care for populations that carry a large burden of chronic disease.

**Implications for Policy, Delivery, or Practice**: This project is relevant to pressing current issues related to the success of healthcare reform, access to care for vulnerable populations, costs of healthcare, and expected workforce shortages. The Affordable Care Act stipulates reforms that require a strong primary care system, but the adequacy of the U.S.
primary care workforce is in doubt. This project describes a system that embodies a potential solution to this problem—staffing models that utilize high proportions of nonphysicians in primary care settings. Since nonphysicians cost less to employ than do physicians, results of this analysis also have implications for addressing costs associated with provider staffing. This information will be useful to health care administrators and workforce planners in other settings as they face the difficulties of providing care to growing numbers of Americans with chronic disease and seek solutions to anticipated workforce shortages.

**Funding Source(s):** Other, Physician Assistant Education Association

**Principal Findings:** The key informants endorsed the value for CER D&I via the CTSA consortium. Some institutions were actively engaged in D&I activities. However, many highlighted their perception of the limited investment committed by CTSAs to this effort. Other barriers to CER D&I included: lack of institutional awareness, limited capacity of researchers with appropriate D&I expertise, lack of established D&I methods, confusion about what CER is (especially on the part of stakeholder partners). Institutions that were conducting CER D&I activities involved specific research groups in partnership with health systems or as a component of quality improvement initiatives. The audience for CER D&I was primarily healthcare providers within each CTSA’s community network. Few CTSAs engaged in systematic dissemination of CER evidence from landmark clinical trials or of resources developed by national organizations such AHRQ. Dissemination techniques often lacked sophistication and involved traditional methods, including presentations at national meetings, publications, and local seminars. Unless individual investigators had received funding to conduct a D&I study with specific outcome measures, D&I evaluation at the CTSA organizational level largely consisted of tracking publications and scientific presentations.

**Conclusions:** The CTSA consortium is positioned to contribute to the expanding national CER D&I infrastructure. However, greater understanding of D&I best practices and emphasis on the value of D&I (including financial support) are needed to address institutional barriers.

**Implications for Policy, Delivery, or Practice:** Two opportunities emerged to improve national D&I of robust CER evidence using the CTSA
Cost-Effectiveness of a Multidisciplinary ED Care Coordination Program Using a Regional Hospital Information System

Sean Murphy, Washington State University; Darin Neven, Providence Sacred Heart Medical Center & Children’s Hospital

Research Objective: A small proportion of individuals often consume a relatively-large quantity of emergency-department (ED) resources. Frequent and unnecessary utilization of the ED is likely a sign of a serious latent patient issue, and negatively impacts hospitals, providers, third-party payers and society. Therefore, policymakers have been focused on reducing non-urgent ED expenditures. For example, the Washington State Health Care Authority (HCA), proposed a policy to deny reimbursement for “not-medically-necessary” ED visits made by Medicaid beneficiaries. The policy was suspended by the legislature, and replaced by one allowing hospitals to apply best practices for reducing non-emergent ED visits; however, the HCA can revert to the previous plan if an adequate reduction in ED expenditures is not achieved. This paper assessed the cost effectiveness of a multidisciplinary-ED-care-coordination program in Spokane, Washington. The program is somewhat unique in that not only are individualized-ED-care guidelines created by a committee of experts, but it also contains a regional-hospital-information system capable of sharing care plans with other cooperating EDs.

Study Design: This is a two-year retrospective pre-post analysis. To determine whether the program was cost-effective from the hospital’s perspective for both relatively-low and -high frequent-users, the sample was split into two groups, those with 3-11 ED visits in the 365 days preceding enrollment (frequent users), and those with more than 11 visits (extreme users). Differences in ED visits, treatment costs, cost-per-visit and net-income were tested using nonparametric bootstrapping techniques. Regression towards the mean (RTM) was controlled for using an adjusted measure of change.

Population Studied: Patients eligible for the study were at least 18 years of age, and had complete data for, and at least 3 visits to the ED in, the year prior to their induction into the program.

Principal Findings: There were significant decreases in ED visits and direct-treatment costs leading to hospital cost-savings and increased net-income for both frequent and extreme users. The results further indicated that fewer resources were utilized per visit, and that the cost of enrolling a patient could increase approximately eightfold before the extreme-users’ direct-treatment costs would not be significantly lower post-enrollment, while the cost for frequent users could double. RTM does not appear to be an issue.

Conclusions: The program analyzed here appears to be cost-saving from the hospital’s perspective for both frequent and extreme ED users, but especially for the latter group. We speculate that fewer resources were utilized per visit due to ED physician being better informed by the ED care guidelines.

Implications for Policy, Delivery, or Practice: ED-care-coordination programs would appear to be an efficient use of both hospital and public resources. In addition to our findings, a prior analysis by the HCA of Medicaid beneficiaries enrolled in the program indicated a cumulative 44% reduction in ED visits across all EDs in Washington. This is indicative of the potential associated with combining an ED-care-coordination program with a patient-information-exchange system. The fact that program-staff members ensure each patient has a primary-care physician who helps develop their care guidelines, suggests that care for non-emergent conditions is accessible. Finally, a cost-analysis suggested economies-of-scale, implying that one large program per area would be efficient.

Funding Source(s): NIH

Poster Session and Number: B, #534

Funding Source(s): Other, Washington State University Spokane Office of Research

Poster Session and Number: B, #535
Research Objective: Few studies have examined the potential connection between violence and prescription opioid abuse. A pharmacological explanation for the observed positive effect of opioid abuse on violence does not appear to exist. However a number of other explanations have been posited. This study attempts to shed additional light on the latent factors linking opioid abuse and adolescent violence, while controlling for the prescription-opioid source (prescribed or diverted) and other substances. This study is one of the first, if not the first, to distinguish between adolescents who misused their own prescriptions and those who obtained the medications from alternative sources, in this context. A secondary objective was to compare the estimated effects of opioid abuse on violence to those associated with other substances. Developing a better understanding of the connection between opioid abuse and violence is critical, given (a) the highly addictive nature of opioids; (b) the negative consequences associated with their abuse; and (c) the drastic increase in prescriptions since the late 1990s.

Study Design: The model was estimated using full information maximum likelihood within a structural equation modeling framework to account for missing data.

Population Studied: The study population was Washington State public-school students. The study sample consisted of a simple random sample of Washington students who completed the 2008 Healthy Youth Survey.

Principal Findings: Diverted- and own-prescription opioid abuse among adolescents were evidenced to be predictive of the likelihood of violent thoughts and subsequent violent behavior. Own-prescription abuse had the largest effect on the likelihood of violence, followed closely by diverted-prescription and alcohol abuse. Additional substances that appeared to increase the likelihood of violence were inhalants, marijuana, and nicotine.

Conclusions: We add to the literature by drawing inferences on the latent factors linking opioid abuse and adolescent violence. By incorporating both intent and subsequent behavior, our operationalization of violence reduces the likelihood that individuals simply found themselves in a violent situation. Furthermore, we categorized opioid abusers according to whether they were misusing their own, or a diverted-opioid prescription, and found frequency of abuse to be positively associated with the likelihood of engaging in violence regardless of the source. The positive and significant effect of own-prescription abuse on violence suggests that the link is not merely the result of substance abusing patients committing crimes to pay for their drugs.

Implications for Policy, Delivery, or Practice: A connection between opioid abuse and violence adds to the staggering economic costs associated with the former. The fact that this outcome was observed among youths abusing their own prescriptions is further cause for concern given the 402% increase in opioid sales between 1997 and 2007. Moreover, given the highly addictive nature of opioids, many adolescents will continue to abuse them into adulthood. Our finding that the prescribing of high doses of opioids over time could be contributing to violence among adolescents indicates that opioid abuse is a potentially modifiable risk factor. Therefore, it is clear that additional resources should be allocated to strategies aimed at reducing misuse and overprescribing of opioids.

Funding Source(s): Other, Governor’s Washington State Life Science Discovery Fund

Poster Session and Number: B, #536

Measuring Service Needs for Children with Complex Medical Conditions Using the Kids Intensity of Care Survey

Ann-Margaret Navarra, Columbia University; Linda Mosiello RN, MS, Sunshine Children’s Home and Rehabilitation Center; Laura Schneider, RN, MSM, Sunshine Children’s Home and Rehabilitation Center; Mary Keenan, MS, Sunshine Children’s Home and Rehabilitation Center; Elaine Larson, RN, PhD, CIC, FAAN, Columbia University School of Nursing

Presenter: Ann-Margaret Navarra, D.Phil., Post Doctoral Research Fellow, School of Nursing, Columbia University, ad66@columbia.edu
Research Objective: Children with complex medical conditions (CMC) have substantially increased in number over the past decade resulting in disproportionate utilization of healthcare resources. Yet severity of illness and intensity of service needs are typically quantified using taxonomies designed for adult patients. The ability to estimate service needs for children with CMC using a psychometrically sound pediatric measure is needed to better predict allocation of healthcare resources. The aims of this pilot study were to test the Kids Intensity of Care Survey (KICS) tool and assess the correlation of the KICS with the case mix index (CMI) in children with CMC.

Study Design: This study was part of a larger parent project designed to improve infection prevention practices in three New York area pediatric long-term care (LTC) facilities, and was funded by the Agency for Healthcare Research and Quality (AHRO - 1R01HS021470). The KICS was developed by content experts specializing in pediatric LTC. It is a 33 item tool designed to measure and predict intensity of care in five categories (basic, skilled and restorative nursing care, medication administration and need for specialty care clinic visits). Scores range from 0.01 to 1.0 with higher scores suggesting increased levels of care intensity. Psychometric testing of the KICS was performed in one 54-bed, pediatric skilled nursing facility. A review panel of three experts examined content and construct validity of the KICS. Interrater reliability was tested by comparing intensity scores between two expert pediatric nurses with comparable education and LTC clinical experience for seven pediatric residents with CMC.

Resident intensity scores on the KICS were correlated with scores on the CMI, an index that is used to represent differences in care needs for adult residents of nursing homes. CMI indices are derived from scores on the Resource Utilization Groups (RUGS), a product of the resident assessment process using the Minimal Data Set (MDS). CMI scores determine Medicare reimbursement rates.

Population Studied:
Principal Findings: Mean KICS and CMI composite scores were 0.99 and 1.35, respectively. There was a high correlation between raters for composite scores (Spearman’s rho =0.93, p < 0.003) and subcategories of skilled (rho=0.96, p=<0.001) and restorative nursing care (rho=0.93, p=0.002). No statistically significant correlation was observed between raters for three of the five KICS’ subcategories including basic nursing care, medication administration, and specialty care clinic visits outside the facility (p >0.05), and content mapping demonstrated inconsistencies for these conceptual and operational definitions. No statistically significant association was observed between resident CMI and intensity composite scores (p > 0.05).

Conclusions: The KICS tool met criteria for a minimal standard of reliability; however validity has not yet been established. The lack of association between the KICS and the CMI speaks to the diversity among children with CMC who are likely to differ in service needs from adults.

Implications for Policy, Delivery, or Practice: Appropriate provision of healthcare resources is dependent on the development of tools that could most accurately predict service needs for children with CMC. In the next phase of the project, we will use these findings to revise and re-evaluate the KICS.

Funding Source(s): AHRQ, Grant # T32 NR013454 - TRAINING IN INTERDISCIPLINARY RESEARCH TO PREVENT INFECTIONS (TIRI)

Poster Session and Number: B, #537

The Effects of Foreign Educated Nurses on Nurse and Patient Outcomes: What About the Work Environment?
Donna Neff, University of Florida; Dr. Jeffrey Harman, University of Florida Department of Health Services Research, Administration and Management

Presenter: Donna Neff, Ph.D., R.N., FNAP, Associate Professor, College of Nursing, University of Florida, dneff@ufl.edu

Research Objective: To determine whether hospital employment of foreign educated nurses is associated with nurse outcomes, quality of care and patient safety outcomes (PSIs) (medication errors, falls with injury, healthcare-associated nosocomial infections and pressure ulcers).

Study Design: A cross-sectional, observational study designed to measure the direct and interacting effects of hospital nurse staffing and the percentage of foreign-educated nurses on nurse burnout, job satisfaction, work environment and PSIs.

Population Studied: Primary data from a 2008 survey 8,853 nurses employed by 176 hospitals
in Florida. Of the nurse in this study, 1072 nurses were educated outside the US.

**Principal Findings:** The hospital proportion of FENs had no main effect on any of the outcomes and the interaction of proportion of FENs and nurse work environment was also not significant. However, work environment alone significantly predicted all outcomes in all of the models.

**Conclusions:** We provide the first empirical evidence demonstrating that hospital employment of non-US educated nurses in US hospitals is not associated with poor nurse outcomes, poor perceived quality of care or adverse patient outcomes. In fact, nurse work environment was the sole predictor of these outcomes.

**Implications for Policy, Delivery, or Practice:** Consistently, research has found that nurse perceptions of their work environment are key predictors of both nurse and patient safety. In this study, we found that regardless of country of origin, a professional nurse work environment that has adequate staffing, respectful nurse and physician relationships and administrative support of patient-centered care was found to have improved outcomes. Findings add fuel to the ongoing discussions at the national and state policy levels!

**Funding Source(s):** NIH, National Council of State Boards of Nursing

**Poster Session and Number:** B, #538

**Do Hospitalist Programs Improve Patient Care?**

Dwight Neilson, Premier, Inc.; Michael Duan, Premier, Inc.; John Martin, Premier, Inc.; Howard Bankowitz, Premier, Inc.; Neilson Dwight

**Presenter:** Dwight Neilson, M.S., Senior Research Analyst, Premier Insights, Premier, Inc., dwight_neilson@premierinc.com

**Research Objective:** The hospitalist specialty is a fast growing medical specialty. Presently, over two-thirds of US hospitals have a hospitalist program. On the basis of our previous study, we set out to test further whether hospitalist programs were linked to improvements in patient care using regression modeling techniques.

**Study Design:** The study assumed internal medicine (IM) and family practice (FP) as the comparable specialties of hospitalist. Three risk-adjusted outcomes, including mortality, length of stay and cost, were examined across the two cohorts among five diseases that were regularly attended by IM or FPs and served as clinical focus groups (CFGs) for this study. Analyses were conducted at both the hospital level and patient level.

For the hospital-level analysis, hospitals were divided into three groups based on their use of hospitalists. Linear regression analyses were used with the risk-adjusted outcomes being the dependent variables and the hospital characteristics, including the hospitalist utilization, being the predictor variables. For the patient-level analysis, hospitalist and IM/FP cohorts were created from propensity scores based on patient and hospital characteristics. The risk-adjusted outcomes were again used as the dependent variables in regression analyses in which the sole predictor variable was that of hospitalist/IM/FP practitioner.

**Population Studied:** The study was based on 8.5 million inpatient discharges from 382 acute-care hospitals over a two-year period (2008q4-2010q3). After one-to-one propensity score matching, about 372,000 cases were selected from five CFGs (acute cerebrovascular disease, acute myocardial infarction, congestive heart failure, pneumonia, and sepsis). The attending physicians were either hospitalists or IM/FPs.

**Principal Findings:** At the hospital level, the mortality rates of patients cared for by hospitalists were significantly lower at the p<0.05 level across four CFGs (AMI $\beta=-0.01718$, CHF $\beta=-0.01115$, pneumonia $\beta=-0.00425$, sepsis $\beta=-0.02124$) and not significantly higher in the remaining group (ACD $\beta=0.00117$). The length of stay was significantly lower (p<0.01) across all five CFGs. However, the costs of patients cared for by hospitalists were not significantly different than those cared for by IM/FPs, with there being slightly lower costs in four CFGs and slightly higher costs in one.

At the patient level, hospitalist-treated patients had significantly lower mortality rates (p<0.01) across all five CFGs, than those treated by IM/FPs. Coefficients ranged from -0.02727 to -0.006160 depending on the CFG. There were also significantly lower length of stay and costs (p<0.01) across all five groups, with length of stay coefficients ranging from -0.71813 to -0.52479 and cost ranging from -1,310.22 to 716.97.

**Conclusions:** Hospitalists performed better than their IM/FP colleagues in all three
Implications for Policy, Delivery, or Practice: With a third of US hospitals without hospitalist programs, policies encouraging growth in the number of physicians focusing in this specialty may substantially improve inpatient care. Alternatively, identifying practices and procedures used by hospitalists to achieve such performance and transferring those to other specialties should also be encouraged.

Funding Source(s): No Funding

Poster Session and Number: B, #539

Measuring Behavioral Health in the Context of Work: Psychometric Evaluation of a Behavioral Health Function Measurement Tool for Work Disability Determination

Elizabeth Marfeo, Boston Univeristy Health & Disability Research Institute; Pengsheng Ni, Boston University School of Public Health; Elizabeth Marfeo, Boston University School of Public Health; Kara Bogusz, Boston Universityer Health & Disability Research Institute; Mark Meterko, Boston Univeristy Health & Disability Research Institute; Christine M. McDonough, Boston Universityer Health & Disability Research Institute; Leighton Chan, National Institutes of Health, Mark O. Hatfield Clinical Research Center Rehabilitation Medicine Department; Elizabeth K. Rasch, National Institutes of Health, Mark O. Hatfield Clinical Research Center Rehabilitation Medicine Department; Alan M. Jette, Boston Univeristy Health & Disability Research Institute

Presenter: Pengsheng Ni, MD, MPH, Research Assistant Professor, Health Policy & Management, Boston University School of Public Health, psni@bu.edu

Research Objective: To develop and conduct psychometric evaluation of a new assessment tool measuring behavioral health function relevant to work—the Social Security Administration Behavioral Health Function (SSA-BH) Instrument.

Study Design: Data were collected from a cross-sectional survey consisting of 165 items administered to two samples of US adults—(1) a sample of claimants applying for SSA disability benefits due to mental health conditions, and (2) a normative sample of US adults. Building upon results from previous factor analytic work, item response theory (IRT) analysis was used to calibrate the SSA-BH and computer adaptive test (CAT) simulations were conducted to evaluate its psychometric properties including reliability, accuracy, and breadth of content coverage. Functional profiles were generated for SSA claimants compared to age and gender matched norms for the four scales: Mood and Emotions, Self Efficacy, Social Interactions, and Behavioral Control.

Population Studied: A sample of adults applying for Social Security disability benefits (N=1015); and a sample of US adults to develop normative scores (N=1000).

Principal Findings: The SSA claimant sample had a mean age of 44, SD 11 years; was approximately 56 percent female and 61 percent white. The normative sample had an average age of 49, SD 15 years with 52 percent males and 77 percent white. IRT analyses supported the development of a 79 item, four-scale SSA-BH instrument: Mood and Emotions (35 items), Social Interactions (6 items), Self Efficacy(23 items), Social Interactions (6 items), and Behavioral Control (15 items). All SSA-BH scales demonstrated robust psychometric properties including high correlations of the simulated 5- or 10- item CATs with the full item bank (r greater than 0.91), very little loss of reliability and precision of the 5- and 10- item CATs compared to the full item bank, and minimal ceiling and floor effects. Resulting SSA-BH score profiles of SSA claimants versus normative scores differed in the expected direction for all four scales of behavioral health function.

Conclusions: The SSA-BH represents a significant psychometric advancement in current measurement of work related behavioral health function. Initial testing and evaluation of the SSA-BH instrument demonstrated high degrees of accuracy, reliability, and broad content coverage along all four scales. These findings support the potential utility of integrating a CAT-based measurement approach to collect standardized, comprehensive functional information about claimants for purposes such as SSA disability evaluation.

Implications for Policy, Delivery, or Practice: The US Social Security Administration’s (SSA) disability programs provide financial support to over 18 million disabled individuals and their families. Mental health impairments represent a significant proportion of the disabling conditions for which individuals receive work disability...
benefits (SSDI). The nature of mental health related disability is complex and multifaceted, making systematic, accurate measurement challenging and resource intensive. Advanced methodologies in health assessment based on IRT and CAT were used in the development to the SSA-BH. These modern assessment methodologies allow for significant gains in efficiency and accuracy in terms of measuring complex health phenomena such as behavioral health related work disability. The SSA-BH instrument’s notable psychometric properties provide initial evidence to support its incorporation within the context of SSA’s disability evaluation processes.

**Funding Source(s):** NIH

**Poster Session and Number:** B, #540

**Development and Psychometric Evaluation of a Computer Adaptive Physical Function Instrument for Social Security Administration Disability Determination**

Pengsheng Ni, Boston University Health & Disability Research Institute; Pengsheng Ni, Boston University School of Public Health; Elizabeth E. Marleo, Boston University Health & Disability Research Institute; Christine M. McDonough, Boston University Health & Disability Research Institute; Alan M. Jette, Boston University Health & Disability Research Institute; Kara Bogusz, Boston University Health & Disability Research Institute; Elizabeth K. Rasch, National Institutes of Health, Mark O. Hatfield Clinical Research Center Rehabilitation Medicine Department; Diane E. Brandt, National Institutes of Health, Mark O. Hatfield Clinical Research Center Rehabilitation Medicine Department; Leighton Chan, National Institutes of Health, Mark O. Hatfield Clinical Research Center Rehabilitation Medicine Department

**Presenter:** Pengsheng Ni, MD, MPH, Research Assistant Professor, Department of Health Policy & Management, Health & Disability Research Institute, Boston University School of Public Health, psni@bu.edu

**Research Objective:** To develop and test a new instrument measuring physical function relevant to work—the Social Security Administration Physical Function (SSA-PF) Instrument.

**Study Design:** Data collected from a 139-item survey administered to two samples of US adults—(1) claimants applying for SSA disability benefits because of limitation(s) in work-related physical function, and (2) a normative sample of US adults were used to develop and test the SSA-PF. Prior factor analytic work supported further development of the SSA-PF using item response theory (IRT) data analyses methods for instrument calibration and computer adaptive test (CAT) simulations to evaluate the psychometric properties of the SSA-PF instrument. Distinct functional profiles were generated for SSA claimants to compare age and gender matched norms along five scales: Changing & Maintaining Body Position, Whole Body Mobility, Upper Body Function, Upper Extremity Fine Motor, and Wheelchair Mobility.

**Population Studied:** A sample of SSA disability claimants (N=1017), and a normative sample of US adults (N=999).

**Principal Findings:** The mean age of the claimant sample was 49, SD 10 years; the normative sample 49, SD 16 years. The SSA claimant sample was approximately 53 percent male and 59 percent white; the normative sample was approximately 52 percent male and 78 percent white. IRT analyses supported the construction of the SSA-PF a 99 item, five scale instrument: Changing & Maintaining Body Position (23 items), Whole Body Mobility (16 items), Upper Body Function (23 items), Upper Extremity Fine Motor (29 items), and Wheelchair Mobility (8 items). The SSA-PF scales demonstrated strong psychometric properties including high correlations (r greater than 0.95) between the simulated 5- and 10-item CATs with scores based on the full item bank; the shorter versions demonstrated little loss of reliability or precision. Score profiles generated for SSA claimants and compared to age and gender matched norms differed in the expected direction along all five dimensions of physical function.

**Conclusions:** The SSA-PF instrument contributes a new tool for measuring the work related physical function for adults applying to the SSA disability programs. Overall, our initial psychometric evaluation indicated excellent accuracy, reliability, and content coverage along all five scales. This work represents significant psychometric advancements in the measurement of physical function relevant to the context of work.

**Implications for Policy, Delivery, or Practice:** The US Social Security Administration’s (SSA) disability programs are large federal programs, which provide financial resources to over 18 million disabled individuals and their families. Physical impairments represent the largest
group of work disabling conditions among current SSDI claimants. Collection of functional assessment data using efficient and accurate methodologies is essential for streamlining current disability determination processes. Measuring the nature of disability with a focus on various aspects of physical function requires a multifaceted approach. Advanced methodologies in health assessment based on IRT analysis and CAT administration allow for an appropriately multifaceted approach that more efficiently and accurately measures work-related physical function. The SSA-PF instrument's strong psychometric properties may provide initial support for utilizing this tool within the context of SSA's disability evaluation processes.

**Funding Source(s):** NIH

**Poster Session and Number:** B, #541

**Psychological Safety Assessment within Veterans Health Administration Hospitals**

Ryan Derickson, Veterans Health Administration; Katerine Osatuke, Veterans Health Administration; Jonathan Fishman, Veterans Health Administration; Janis Beckstrand, Veterans Health Administration

**Research Objective:** In psychologically safe workplaces, employees feel comfortable taking interpersonal risks without fear of retaliation (Edmondson, 2002). Systematically supporting this climate optimizes clinical and operational outcomes (Edmondson, 1996; 1999). Race and supervisory level can shape healthcare employee perceptions of workplace climate (DesRoches et al., 2010; Nembhard & Edmondson, 2006). Using mixed-method approach to Veterans Health Administration (VHA) data, we investigated relationships between psychological safety, race, and supervisory level.

**Study Design:** Psychological safety survey ratings were evaluated across race and supervisory levels and compared to employees' interviews data. Quantitative. The VHA All Employee Survey (AES) is an annual confidential census of workplace climate. Two AES questions address psychological safety: (PS1) "Members of my workgroup are able to bring up problems and tough issues"; PS2 "It is safe to take a risk in

this workgroup". To determine if psychological safety relates to race and supervisory level, we conducted two ANOVAs using PS1-2 mean scores as DVs, with race (White, minority, and multiracial) and supervisory level (1-non-supervisory; 6-senior executive) as IVs. Qualitative. Employee interviews confidentially conducted by organizational consultants at VHA hospitals asked why employees would/would not report a medical/ethical violation and what might prevent others from reporting. Transcribed responses were analyzed by three trained coders using NVivo software. Themes derived using grounded theory (Glaser & Strauss, 1967) from a larger subset were applied to 374 interviews.

Mixed Methods. We analyzed interview responses from a hospital below the 3.57 national mean of PS1 (hospital A; M=3.47, t(1,301)=2.98, p<.005) and above the national mean (hospital B; M=3.66, t(1,848)=3.66, p<.005) and examined how many employees at each would/ would not report an error/violation (hospital A: n=93, hospital B: n=113).

**Population Studied:** VHA employees

**Principal Findings:** Quantitative. Significant main effect for race F(1,189,915)=361.07, p<.001. The White employees' mean (3.38, n=128,590) was higher than minorities (3.29, n=54,438) and multiracial employees (3.06, n=6,890). Race only accounted for .4% psychological safety variance (\(\eta^2=.004\)). Significant main effect for supervisory level (F(5,199,258)=1223.46, p<.001, \(\eta^2=.03\)). In Tukey follow-up tests, psychological safety increased with supervisory levels, except executives to senior executives.

Qualitative. 76% of respondents said they would always report an error; professional ethics were their main motivation. 11% said the type/severity of error would influence their decision. 12% said they would never report, citing fear of retaliation as their main deterrent.

Mixed Methods. 71% of hospital A (low PS1) respondents stated they would report an error; 13% would not. Conversely, at hospital B (high PS1), 91% said they would report an error; no one said they would not report.

**Conclusions:** Race explained little variance in psychological safety, suggesting VA employees are not experiencing racially-dependent influences on psychological safety. The supervisory level results corroborated previous findings; psychological safety increases with power (Nembhard & Edmondson, 2006). Interview analyses suggested that some
employees openly reveal they would not report an error; i.e. social desirability did not induce respondents to claim otherwise.

Implications for Policy, Delivery, or Practice: Our mixed-method results linked psychological safety climate and intended behaviors of healthcare employees. Creating psychologically safe workplaces may facilitate error reporting, thereby lowering the operational and clinical costs of errors and improving patient outcomes.

Funding Source(s): VA
Poster Session and Number: B, #542

Measuring Burnout and Its Effects within Veterans Health Administration
Emily Crowe, Veterans Health Administration; Katerine Osatuke, Veterans Health Administration; Robert Teclaw, Veterans Health Administration; Jan Beckstrand, Veterans Health Administration; Katerine Osatuke, Veterans Health Administration

Presenter: Katerine Osatuke, Ph.D., Health Scientist, Veterans Health Administration, katherine.osatuke@va.gov

Research Objective: Burnout at workplace involves emotional exhaustion, depersonalization, and reduced personal accomplishment (Schaufeli, 1999; Maslach & Jackson, 1981). Healthcare professionals are especially susceptible to burnout given their highly demanding tasks (e.g. taking care of sick patients). Since employees are the main vehicle of care delivery, beyond personal costs to employees, burnout impacts patient care and satisfaction (Garman, Corrigan, & Morris, 2002), thus ultimately affecting the quality of services. Veterans Health Administration (VHA) is committed to improving its employees’ work lives and providing excellent patient care. VHA measured burnout in its confidential census survey to gauge its incidence and correlates. This study presents results of this pilot assessment.

Study Design: We applied exploratory analyses to data from the 2012 All Employee Survey (AES), VHA census of workplace perceptions and job satisfaction (N=273,556; 63.4% participation). The piloted burnout measure asked respondents to select their ratings from 1=I enjoy my work, I have no symptoms of burnout to 5=I feel completely burned out and often wonder if I can go on. I am at the point where I may need some changes or may need to seek some sort of help.

We used frequency counts to determine the incidence of burnout and logistic regression to examine which demographic characteristics, job satisfaction aspects, and specific workplace perceptions were associated with endorsing either of the top two burnout categories. Because many survey items are correlated, all items were entered into the model to determine potential associations in the presence of the other IV’s.

Population Studied: VHA employees
Principal Findings: 30% of VHA respondents reported burnout, with Inpatient Medical/Surgical and Intensive Care/Critical Care reporting the highest rates. Physicians and low grade employees reported significantly lower burnout rates than nurses, other clinical, and administrative employees. The five (of 19) services with the highest burnout rates were Inpatient Medical/Surgical, Intensive Care/Critical Care, Laboratory and Pathology, Primary Care, and Prosthetics/Sensory Aids. Burnout was positively associated with being younger, female, not Black or Asian, of longer tenure, and non-supervisory status. 27 of 43 survey items were significantly associated with burnout, but the effect sizes measured by odds ratios were small for most. Burnout was strongly associated with satisfaction with the amount of work, overall satisfaction, working conditions, working fast, and feeling that the VA cares about their general job satisfaction, all in the expected direction.

Conclusions: Burnout is not evenly distributed among hospital staff. Paradoxically, younger employees are more likely to be burned out, but employees with less tenure in the organization are less likely to be so. Although burnout is statistically significantly associated with many specific workplace perceptions the AES measured, only a few items showed strong relationships: amount of work, working conditions, speed of work, overall satisfaction, and employee perceptions of whether VA cares about their satisfaction.

Implications for Policy, Delivery, or Practice: Our findings point to specific aspects of healthcare workplace that need to be monitored and proactively addressed to prevent burnout. We also identify demographic and occupational groups particularly vulnerable to burnout. These results directly inform workforce support initiatives in healthcare organizations.

Funding Source(s): N/A
Poster Session and Number: B, #543
The Role of Coping in Depression Treatment Utilization in VA Primary Care Patients

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Population Studied: Veterans (N=271) receiving primary care in three VA medical centers were mailed questionnaires if they screened positive for depression on the mandated annual VA PHQ-9 (>10) or PHQ-2 (>3) depression screen, had not received a diagnosis of depression in the past 12 months, and were not prescribed any anti-depressants in the 12 months prior to their screening date. A subsample (n=23) of these veterans participated in a qualitative interview. 

Principal Findings: Three different binary outcomes of receipt of mental health treatment three months after a positive depression screen were constructed based on the degree of treatment received (“treatment” defined as VA guideline-concordant depression treatment, depression treatment not concordant with VA guidelines, or other mental health treatment). Logistic regression models showed that participants who reported using instrumental support and active coping were more likely to receive depression and other mental health treatment within three months of their positive depression screen. Those who used emotional support and self-distraction strategies were less likely to receive any treatment in the same time frame. Grounded thematic analysis of the interviews revealed that Veterans used these four coping strategies as well as others such as positive reframing, venting, planning, and substance use. In addition, it appeared that similar strategies may have a different impact on treatment engagement. For example, one Veteran who engaged in depression treatment exercises regularly, and believes that exercise helps him because it releases endorphins. Another Veteran indicated that he uses yoga for his comorbid PTSD and did not engage in depression treatment post-screening.

Conclusions: From a quantitative perspective, the use of coping strategies, namely active coping, instrumental support, emotional support, and self-distraction can impact Veterans’ treatment engagement for depression. Qualitatively, the results indicate that Veterans use a variety of coping strategies which, depending on their individual contexts, may lead to different levels of treatment engagement for depression.

Implications for Policy, Delivery, or Practice: Patients with depression can delay seeking treatment for as long as 8 years. Thus, it is important for providers to understand and discuss with their depressed patients the types of coping strategies they use and how they are impacting their treatment engagement.

Funding Source(s): VA

Poster Session and Number: B, #544
The Effect of Utilizing Community Health Workers to Address Patients’ Social Needs on Primary Care Practice
Thearis Osuji, ICF International; Marnie J. House, Ed.D., MPH, ICF International; Julia Fine, MPH, ICF International

Research Objective: Despite many public health efforts, hypertension (also known as high blood pressure) rates in the U.S. have remained steady over the last 10 years with no sign of decline. In a Robert Wood Johnson Foundation (RWJF) survey of 1,000 U.S. physicians conducted in 2011, 80% of physicians agreed that “patients’ social needs are as important to address as their medical conditions,” while 85% of physicians felt there was a direct correlation between not addressing social needs and worsening health. This highlights a growing problem known as “health care’s blind side,” where there are not enough resources and time for physicians to help patients with their social needs, including unemployment, housing assistance, eating nutritiously, or exercising regularly (RWJF, 2011). Community health worker (CHW) programs can help close this gap between social and medical needs, thereby improving quality of life and ultimately the management of chronic illnesses such as hypertension. For the Centers for Disease Control and Prevention, ICF International is conducting an evaluation of the St. Johnsbury, Vermont, Community Health Team (CHT) model which was developed under the auspices of the Vermont Blueprint for Health. In the St. Johnsbury CHT model, CHWs link patients to economic, social, mental health and community supports via state agencies and community-based organizations to assist them in improving their disease management and quality of life. The purposes of this study are to: (1) detail implementation processes to inform practice, and (2) determine the impact of the CHT model on patient outcomes related to quality of life and hypertension.

Study Design: This multi-method study involves both quantitative and qualitative methods. In this presentation, the authors will focus on findings from the qualitative methods which include systematic document reviews and in-depth interviews with CHT members and providers.

Population Studied: An estimated 17,325 patients are attributed to medical homes in St. Johnsbury, which is the largest town and commercial center in a predominantly rural service area. In 2009, approximately 18.9% of the population lived below the poverty line compared to 11.4% statewide.

Principal Findings: The implementation of the St. Johnsbury CHT model has affected the quality of care among primary care providers in the area. It has helped reduce burden by providing referral resources for providers to assist patients with complex social and health issues instead of taking time to address these issues in the limited timeframe of clinical encounters. Providers also expressed that since the implementation of this model, they are more willing to talk with patients about their social needs and the impact on their health.

Conclusions: Findings from this study suggest that CHWs can be engaged in multidisciplinary health care teams to address patients’ social needs, promote well-being in communities and reduce burden on primary care providers.

Implications for Policy, Delivery, or Practice: Implementation of a care model that utilizes CHWs to address social needs may help improve quality of care and provide patients with the resources and assistance needed to live healthy lives.

Funding Source(s): CDC

Impact of Severity Measures on Patient Satisfaction Integration Process
Koichiro Otani, Indiana University - Purdue University (IPFW)

Research Objective: The purpose of this study was to investigate how the severity of illness level influences patients’ attribute reaction integration process to arrive at their overall satisfaction. Thus, this study aims at finding how seriously ill patients differ from less seriously ill patients.

Study Design: A multiple linear regression analysis with a scatter term, a severity measure, and interaction effects of the severity measure was conducted while controlling for age, gender, and race.

Poster Session and Number: B, #545
**Population Studied:** Data were collected from 5 large hospitals in the St. Louis areas by using a patient satisfaction questionnaire.

**Principal Findings:** The severity of illness variable itself was not statistically significant in either the overall quality of care or willingness to recommend to others model, but revealed the interaction effects with physician care, staff care, food, and scatter term variables in the willingness to recommend to others model.

**Conclusions:** With more seriously ill patients, physician care becomes more important, and staff care becomes less important, and seriously ill patients are proportionately more likely to combine their attribute reactions only in the willingness to recommend to others model.

**Implications for Policy, Delivery, or Practice:** All six attributes (admission process, nursing care, physician care, staff care, food, and room) are not equally influential. Nursing care and staff care show consistent influence in both models. These findings show that if health care managers need to improve their patient satisfaction, they should improve nursing care and staff care first. They would see the most improvement.

**Funding Source(s):** No Funding

**Poster Session and Number:** B, #546

**Review of Existing Overuse Measures for USPSTF D Recommendations and Choosing Wisely List of Questionable Healthcare Services: High Yield Prospects for Overuse Measure Development**

Divya Pamnani, National Committee for Quality Assurance; Bob Rehm, National Committee for Quality Assurance; Najilla Nassery, Johns Hopkins University School of Medicine; Mary B. Barton, National Committee for Quality Assurance

**Presenter:** Divya Pamnani, M.H.S.A., Healthcare Analyst, Performance Measurement, National Committee for Quality Assurance, pamnani@ncqa.org

**Research Objective:** The Agency for Healthcare Research and Quality defines overuse as the provision of care such that the potential for harm exceeds the potential for benefit. Overuse is responsible for approximately 30 percent of US healthcare spending. In an effort to concurrently improve quality and reduce costs, the federal government has made reduction in overuse a priority in its National Quality Strategy. Despite the urgent need to improve healthcare affordability, performance measures for overuse, unlike measures for underuse, have been underrepresented in the quality measurement landscape. The purposes of this project are to quantify the number of existing overuse performance measures and identify opportunities for measure development.

**Study Design:** The U.S. Preventive Services Task Force (USPSTF) D recommendations and Choosing Wisely campaign provided a framework and good starting point for research into possible overuse areas. We reviewed USPSTF D recommendations (i.e., services that have no net benefit or services where the harms outweigh the benefits for a general population) and the 2012 Choosing Wisely list of questionable healthcare services (presented by the American Board of Internal Medicine as a collaboration with nine medical specialty organizations). We subsequently searched the National Quality Forum’s (NQF) inventory of endorsed performance measures, as well as measures currently known to be in development, to identify those that mapped to overused services identified by USPSTF D or Choosing Wisely. To meet the second objective, we shortlisted opportunities for new measure development based on public health importance, strength of evidence and feasibility of implementation.

**Population Studied:**

**PrincipaL Findings:** Thirty-seven USPSTF D recommendations and 45 Choosing Wisely services were identified. These included high-cost items and low-unit cost, high frequency items. Those identified by USPSTF D were applicable primarily to asymptomatic populations while those identified by Choosing Wisely were more likely to be condition specific, relevant to populations under the care of specialists. The 82 total cited overused services mapped to 37 overuse measures. Of these 37 measures identified, 25 were NQF endorsed and 12 were measures in development. The measures represented different sources of accountability including provider, practice, health plan, acute care facility and emergency department. Opportunities for measure development were identified from both sources – USPSTF D and Choosing Wisely. There was variation in terms of public health importance, strength of evidence, and feasibility of implementation among the identified overused services. Ambiguity around exclusions, or caveats such
ICH Dialysis Center). CMS is currently using the items (Kidney Doctor, Dialysis Center Staff and Patient Information) and 3 composite scores (Nephrologists’ Communication, Quality of Care, and Patient Information) to assess patient experiences of care but there is no published information on the psychometric properties of the instrument.

**Conclusions:** Our research reveals that while there are some measures available, new high impact overuse measures are needed. Performance measurement targeting this domain is ripe for development, having the potential to be an important lever for changing clinician behavior through feedback, public reporting, clinical decision support and financial incentives.

**Implications for Policy, Delivery, or Practice:**
The landscape for overuse measures is changing. Additional specialty societies will be joining the Choosing Wisely campaign, and USPSTF continues to refine its recommendations. Moreover, the spread of electronic health records as clinically rich data sources lends itself as fertile ground for implementing existing and developing new measures beyond administrative claims.

**Funding Source(s):** No Funding

**Poster Session and Number:** B, #547

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**Evaluation of the Psychometric Properties of the In-Center Hemodialysis Survey - Consumer Assessment of Healthcare Providers and Systems in Chronic Kidney Disease Patients on Dialysis**

Robert Wood, Adelphi Real World; Carly Paoli, Amgen, Inc.; Ron D. Hays, University of California; Gavin Taylor-Stokes, Adelphi Real World; James Piercy, Adelphi Real World; Matthew Gitlin, Amgen, Inc.

**Presenter:** Carly Paoli, PharmD, MPH, Health Economics Manager, Global Health Economics, Amgen, Inc., cpaoli@amgen.com

**Research Objective:** In 2011, the Centers for Medicare and Medicaid Services (CMS) implemented an End Stage Renal Disease (ESRD) Prospective Payment System (PPS) for Medicare reimbursement of outpatient dialysis-related services along with a Quality Incentive Program (QIP) to monitor quality of care of dialysis facilities. Some QIP measures utilize patient-reported outcomes (PRO) as process metrics. The ICH-CAHPS is a 58-item questionnaire, which yields 3 composite scores (Nephrologists’ Communication, Quality of Care, and Patient Information) and 3 global rating items (Kidney Doctor, Dialysis Center Staff and Dialysis Center). CMS is currently using the ICH-CAHPS to assess patient experiences of care but there is no published information on the psychometric properties of the instrument.

**Study Design:** Data are from the 2012 Adelphi CKD Disease Specific Program (DSP), a cross-sectional survey of US nephrologists and their patients, in addition to a patient questionnaire to obtain PRO outcomes (including the ICH-CAHPS). Assessment of the psychometric properties of the three composite scores included an evaluation of item-scale correlations and internal consistency reliability (Cronbach’s alpha).

**Population Studied:** 404 patients were eligible for this analysis from 76 centers. 56% of patients were male. The mean age of patients was 57 years with 33% over the age of 65 years, and mean time on dialysis was over 3 years (range 13-1352 weeks). The sample is very similar to the United States Renal Data System (USRDS) 2011 dialysis population in terms of age and gender.

**Principal Findings:** For Nephrologists’ Communication, 5 of 6 items had item-scale correlations (corrected for item overlap) greater than or equal 0.4 and all items had stronger correlation with Nephrologists’ Communication than the other 2 composites; internal consistency reliability was supported by a coefficient alpha of 0.81. Fourteen of the 17 Quality of Care items correlated greater than or equal 0.4 with the composite with most items correlating more highly with Quality of Care than the other two composites; coefficient alpha was 0.90. For Patient Information, none of the items had an item-scale correlation coefficient greater than or equal 0.4 with the composite and coefficient alpha was only 0.55.

**Conclusions:** The analysis demonstrates good item-convergence and item-discrimination as well as satisfactory internal consistency reliability for the Nephrologists’ Communication and Quality of Care composites.

**Implications for Policy, Delivery, or Practice:** These results suggest that additional psychometric evaluation is needed prior to using ICH-CAHPS as a CMS clinical performance measure.

**Funding Source(s):** Other, Amgen, Inc.

**Poster Session and Number:** B, #548
Associations between the Consumer Assessment of Healthcare Providers and Systems (CAHPS®) In-Center Hemodialysis Survey and Patient and Dialysis Facility Characteristics among Chronic Hemodialysis (HD) Patients in the United States (US)
Carly Paoli, Amgen, Inc.

**Presenter:** Carly Paoli, Pharm.D., M.P.H., Health Economics Manager, Global Health Economics, Amgen, Inc., cpaoli@amgen.com

**Research Objective:** To estimate associations of CAHPS-ICH composites and global rating items with selected patient and facility characteristics.

**Study Design:** This study examines whether selected patient characteristics and structural variables within a dialysis facility are related to dialysis patients’ perception of health care received. Data are from the Adelphi Real World Chronic Kidney Disease (CKD) disease specific program, a cross-sectional survey of physicians and their patients in the first quarter of 2012. The CAHPS-ICH survey assesses the experiences of HD patients who receive care from dialysis facilities. It yields 3 multi-item composite scores (Nephrologists' Communication, Quality of Care, and Patient Information) scored on a scale from 1-4 (except Patient Information, scored 0-1) and 3 global rating items (Kidney Doctors, Dialysis Center Staff, and Dialysis Center) scored on a scale from 1-3. CAHPS-ICH scores were analyzed across patient (age; gender; BMI; vascular access type; ethnicity; employment status; time since diagnosis; dialysis vintage; ever receiving anemia management education; hemoglobin level) and facility (patient to technician, nurse and physician ratios; number of shifts at facility; number of chairs/stations at the facility, patient wait time; patient’s time between appointments with a physician) characteristics (all variables were categorical, not all shown in results here) using one-way ANOVAs.

**Population Studied:** Nephrologists treating a minimum of 20 HD patients a month and actively involved in their treatment decisions completed patient record forms on 10 randomly selected, prevalent HD (on dialysis= 3 months) patients. Those 10 patients were given a survey with additional questions (including the CAHPS-ICH).

**Principal Findings:** There were 76 facilities treating 404 eligible patients in the study. Mean patient age was 57 years, mean dialysis vintage was 3 years, and 44% were female. Mean # of patients per technician, nurse, and physician was 4, 9, and 28, respectively. There were 55% of patients who reported having received any anemia education. While the trend was not entirely consistent, patient:nurse ratio (<5/nurse, 5 to <8, 8 to <12 and 12+) differentiated CAHPS-ICH scores in Quality of Care (3.56, 3.52, 3.39 and 3.41 respectively, p<0.05), Patient Information (0.91, 0.84, 0.76 and 0.84 respectively, p<0.01), global rating of the Dialysis Center (2.67; 2.62, 2.40, and 2.52 respectively, p<0.05), and global rating of the Dialysis Center Staff (2.66, 2.58, 2.37, and 2.51 respectively, p<0.05). Patients receiving anemia education (yes vs. no) reported more positive experiences with Patient Information (0.89 vs. 0.78, p<0.01) and rated the Dialysis Center Staff more positively (2.60 vs. 2.46, p<0.05).

**Conclusions:** Some CAHPS-ICH composite scores and global rating items are sensitive to patient and facility characteristics in a sample of facilities treating CKD patients on HD in the US. **Implications for Policy, Delivery, or Practice:** The Center for Medicaid and Medicare Services (CMS) is using the CAHPS-ICH Survey as a process reporting measure for their End-Stage Renal Disease (ESRD) Quality Incentive Program (QIP). The results of this study demonstrate that CAHPS-ICH can detect some differences across some patient and dialysis facility variables.

**Funding Source(s):** Other, Amgen, Inc.

**Poster Session and Number:** B, #549

Unit-level Nurse Turnover Effects on Pressure Ulcer Outcomes: A Longitudinal Study
Shin Hye Park, University of Kansas Medical Center; Diane K. Boyle, University of Kansas Medical Center

**Presenter:** Shin Hye Park, Ph.D., R.N., Post-Doctoral Fellow, Nursing, University of Kansas Medical Center, spark@kumc.edu

**Research Objective:** High rates of nurse turnover on units may gradually increase the remaining staff’s workload and burnout, affect workforce collaboration among the remaining and new staff, and thus may result in poor patient outcomes in the current and subsequent periods. Many researchers address this adverse relationship between nurse turnover and patient care quality. However, previous studies offer little empirical evidence of a relationship between nurse turnover and patient outcomes.
based on data longitudinally collected from hospitals nationwide. Our study purpose was to examine the lagged and concurrent effects of unit-level registered nurse (RN) turnover rates on unit-acquired pressure ulcer rates using longitudinal data.

**Study Design:** We used a longitudinal, observational design. Quarterly unit-level administrative data were obtained from the National Database of Nursing Quality Indicators (NDNQI) for the years 2008 to 2010. We conducted multilevel logistic regression models, controlling for nurse staffing and hospital and unit characteristics (unit type and hospital Magnet status, size, and patient case mix). For regressions, lagged RN turnover effect was included to determine if influences occurred either contemporarily or with time lags. Average quarterly RN turnover rates were calculated at the unit level. We measured the proportion of patients with a unit-acquired pressure ulcer of any stage among patients surveyed on the units each quarter.

**Population Studied:** Our sample included a total of 15,277 quarter-observations (3,151 units from 478 NDNQI member hospitals). Unit types included were critical care, step-down, medical, medical-surgical, surgical, and rehabilitation for adult patients.

**Principal Findings:** We found that nursing units with higher RN turnover rates in a quarter were expected to have higher rates of unit-acquired pressure ulcers in the next quarter (odds ratio, OR=1.006, p=.002). For every 10 percentage-point increase in the RN turnover in a quarter, the odds of a patient having a unit-acquired pressure ulcer increased by 6 percent in the next quarter. No significant association was found between concurrent RN turnover rates and pressure ulcers. Higher RN staffing was associated with lower rates of unit-acquired pressure ulcers (OR=0.973, p=.019). Higher rates of RN turnover in a quarter were associated with lower RN staffing levels in the next quarter.

**Conclusions:** Our findings showed that nursing units with higher RN turnover in a quarter were expected to have higher rates of unit-acquired pressure ulcers in the next quarter; however, there was no concurrent relationship. The negative effect of higher unit-level RN turnover on unit-acquired pressure ulcers was delayed until the next quarter rather than immediately observed.

**Implications for Policy, Delivery, or Practice:** We suggest that RN turnover is an important factor that affects unit-acquired pressure ulcer outcomes and adequate RN staffing levels needed for high quality care. Given the high rates of RN turnover, hospital and nursing administrators should prepare for the negative effect on patient outcomes.

**Funding Source(s):** Other, American Nurses Association

**Poster Session and Number:** A, #93

**Evaluation of the NDNQI Nurse Turnover Data: A Survey of Hospitals**
Shin Hye Park, University of Kansas Medical Center; Diane K. Boyle, University of Kansas Medical Center

**Presenter:** Shin Hye Park, Ph.D., R.N., Post-Doctoral Fellow, Nursing, University of Kansas Medical Center, spark@kumc.edu

**Research Objective:** Since 2007, the National Database of Nursing Quality Indicators (NDNQI), a program of the American Nurses Association, has collected monthly nurse turnover data from nursing units in member hospitals. As of 2011, about 46 percent of member hospitals had participated in nurse turnover data collection. The NDNQI reports quarterly national comparison data on nurse turnover indicators to help member hospitals improve their nursing work environments and quality of care. Although the NDNQI has periodically evaluated data elements, evidence of the quality of NDNQI nurse turnover data collection has not been established fully. Our study purpose was to evaluate the NDNQI nurse turnover data collection based on the National Quality Forum’s criteria (reliability, validity, usability/feasibility, and importance) and to investigate reasons for hospitals not participating in the turnover data collection.

**Study Design:** We randomly surveyed member hospitals during the period February to April 2012. Hospitals were categorized into two groups: those having submitted turnover data at least once since 2007 (Turnover group, n=794) and those not having participated in turnover data collection ever (No-Turnover group, n=926). A long-form questionnaire (Turnover group) was designed with questions about NDNQI’s turnover data collection and reports; a short-form questionnaire (No-Turnover group) was intended to investigate barriers to the turnover data collection. Both the questionnaires were self-administered through an online survey.
tool by hospital site coordinators working with NDNQI turnover data submission.  

**Population Studied:** One hundred-five surveys were returned from the Turnover group (response rate=31.9 percent) and 73 surveys from the No-Turnover group (response rate=22.3 percent). Our sample hospitals were typically teaching institutions located in metropolitan areas.  

**Principal Findings:** The large majority (92.4 percent) of Turnover group hospitals strongly agreed or agreed that their turnover data collection processes were implemented consistently across units and over quarters. About 91 percent of the Turnover group hospitals reported their hospital’s nurse turnover data submitted to NDNQI were accurate. When asked if nurse turnover data reported by NDNQI were useful for nursing workforce management in their hospital, the majority of hospitals strongly agreed (27.6 percent) or agreed (52.4 percent). More than half the hospitals in the No-Turnover group answered that their hospitals collected hospital-level turnover data rather than unit-level data (54.8 percent), and they also cited difficulties in obtaining specific separation reasons (34.3 percent) and identifying separations by nursing staff categories (24.7 percent).  

**Conclusions:** The survey findings supported the validity, reliability, usefulness/feasibility, and importance of NDNQI nurse turnover data collection. The NDNQI nurse turnover data were useful in identifying units with higher turnover rates than desired or units with an increasing trend in turnover rates. But hospitals reported difficulty identifying specific separation reasons, difficulty collecting nurse turnover data at the nursing unit level, and concerns about the amount of time and resources needed for unit-level turnover data collection.  

**Implications for Policy, Delivery, or Practice:** We suggest that the development of hospital-level nurse turnover indicators may be useful to extend member hospitals’ participation in the NDNQI turnover data collection. We also recommend improving the guidelines for identification of specific separation reasons to enhance quality of NDNQI nurse turnover data.  

**Funding Source(s):** Other, American Nurses Association  

**Poster Session and Number:** A, #94  

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**Admission and Retention of Individuals with Moderate to Severe Cognitive Impairment: Findings from the 2010 National Survey of Residential Care Facilities**  

Eunice Park-Lee, CDC/NCHS; Manisha Sengupta, CDC/NCHS  

**Presenter:** Eunice Park-Lee, Health Scientist, CDC/NCHS, hta8@cdc.gov  

**Research Objective:** Assisted living and similar residential care communities (RCCs) provide an alternative to nursing homes for individuals with dementia and other cognitive impairment. RCCs are not federally regulated, and state approaches to RCC regulations vary widely. Within the parameters set by the state, RCCs decide whether to admit or retain residents with moderate to severe cognitive impairment (MSCI): these policies may affect individuals’ abilities to age in place. Using data from the 2010 National Survey of Residential Care Facilities, we examined provider characteristics associated with different admission and retention policies for residents with MSCI.  

**Study Design:** Two mutually exclusive RCC types were identified: 1) RCCs that neither admit nor retain residents with MSCI; and 2) RCCs that retain residents with MSCI (regardless of whether they admit such residents). Provider characteristics compared by RCC type include: ownership, size, having dementia-specific units, developing formal negotiated risk agreement/similar document, percent of private units in RCC, direct care staff hours per day per resident, and resident case-mix variables. Because of the complex sampling design, analyses were performed using SAS-callback SUDAAN. Estimates were compared using chi-square and t-tests. All significance tests were two-sided using p<0.05.  

**Population Studied:** We examined a nationally representative sample of 2,302 assisted living and similar residential care communities (RCCs).  

**Principal Findings:** About 65% of RCCs would retain residents with MSCI, while the remainder would neither admit nor retain residents with MSCI. RCCs that retain individuals with MSCI were more likely to be for profit, smaller communities with 4 to 25 beds, and have some or all of their units being dementia-specific and higher personal care aide hours per resident per day than RCCs that neither admit nor retain individuals with MSCI. Higher proportions of residents in RCCs that retain residents with
MSCI were bladder incontinent, and received assistance in toileting and with medications compared to those in RCCs that neither admit nor retain individuals with MSCI. Higher percentages of residents who moved out of RCCs that neither admit nor retain individuals with MSCI went to nursing home or hospital than those who moved out of RCCs that retain residents with CI. No significant differences were observed between RCC type relative to developing formal negotiated risk agreement, percent of private units, RN and LPN/LVN hours per resident per day, and resident case-mix by demographics and receiving services paid by Medicaid.

**Conclusions:** Close to two-thirds of RCCs have polices to retain individuals with MSCI. Compared with RCCs that neither admit nor retain residents with MSCI, these communities were more likely to be smaller, for-profit communities, have dementia-specific units and higher personal care aide hours per resident per day, and serve more functionally impaired individuals.

**Implications for Policy, Delivery, or Practice:** Findings on characteristics associated with RCCs that retain residents with MSCI could be useful to consumer advocates, persons with cognitive impairment and their family members when considering which kinds of RCCs may better meet their care needs and preferences, including a desire to age in place.

**Funding Source(s):** CDC

**Posters Session and Number:** A, #95

**Military Sexual Trauma among Homeless Veterans**
Joanne Pavao, VA Palo Alto Health Care System; Jessica A. Turchik, PhD, VA Palo Alto Health Care System; Jenny K. Hyun, PhD, MPH, VA Palo Alto Health Care System; Julie Karpenko, MSW, VA Palo Alto Health Care System; Meghan Saweikis, MS, VA Palo Alto Health Care System; Susan McCutcheon, EdD, RN, VA Mental Health Services; Vincent Kane, MSS, National Center on Homelessness Among Veterans; Rachel Kimerling, PhD, VA Palo Alto Health Care System

**Presenter:** Joanne Pavao, M.P.H., Health Science Specialist, National Center for PTSD, VA Palo Alto Health Care System, joanne.pavao@va.gov

**Research Objective:** Military sexual trauma, MST, is the Veteran Health Administration’s, VHA, term for sexual assault and/or sexual harassment that occurs during military service. The experience of MST is associated with a variety of mental health conditions. Preliminary research suggests that MST may be associated with homelessness among female Veterans, although to date MST has not been examined in a national study of both female and male homeless Veterans. The objective of the current study is to estimate the prevalence of MST, examine the association between MST and mental health conditions, and describe mental health utilization among homeless women and men.

**Study Design:** This is a cross-sectional, national study of homeless Veterans who used VHA care between October 1, 2009 and September 30, 2010. All variables were obtained from VHA administrative databases, including homeless status, MST screening, ICD-9-CM codes to determine mental health diagnoses, and VHA utilization. Adjusted logistic regression models were used to examine a Veteran’s likelihood of having a mental health diagnosis by MST history, while adjusting for age, race, ethnicity and marital status. We examined the intensity of mental health utilization by MST history using a generalized estimating equation model with a negative binomial distribution while adjusting for age, race, ethnicity, and marital status.

**Population Studied:** A total of 126,598 homeless Veterans who have utilized VHA care, including 8,915 female and 117,683 male Veterans.

**Principal Findings:** 39.7 percent of female and 3.3 percent of male homeless Veterans in VHA experienced MST. Homeless Veterans who experienced MST demonstrated a significantly higher likelihood of almost all mental health conditions examined as compared to other homeless Veterans, including depression, posttraumatic stress disorder, other anxiety disorders, substance use disorders, bipolar disorders, personality disorders, suicide, and, among men, schizophrenia and psychotic disorders. Nearly all homeless Veterans received mental health services, 97.9 percent of women, and 95.3 percent of men. Veterans who experienced MST utilized significantly more mental health visits compared to Veterans who did not experience MST.

**Conclusions:** A substantial proportion of homeless Veterans using VHA services have experienced MST, and those who experienced MST had increased odds of mental health conditions associated with MST.
diagnoses. Homeless Veterans who had experienced MST had higher intensity of mental health care utilization and high rates of MST-related mental health care.

**Implications for Policy, Delivery, or Practice:** Services to homeless Veterans are a key priority for VHA, and the findings suggest that efforts to engage this population in mental health care appear successful. Our results also underscore that MST is an important clinical issue among this population. This study highlights the importance of trauma-informed approaches to care for this population. It is important that homeless case managers understand how trauma-related issues, including MST, may affect a Veteran's ability to obtain and maintain housing, healthy relationships and employment.

**Funding Source(s):** VA

**Poster Session and Number:** A, #96

**Results from a Patient-Centered Medical Home Pilot at UPMC Health Plan Hold Lessons for Broader Adoption of the Model**

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**Presenter:** Pamela Peele, Ph.D., Chief Analytics Officer, Health Economics, UPMC Center for High-Value Health Care, peelepb2@upmc.edu

**Research Objective:** To assess the impact of UPMC Health Plan’s Patient-Centered Medical Home (PCMH) pilot program on cost, service utilization, and clinical quality outcomes for participating practice sites.

**Study Design:** In 2008, UPMC Health Plan instituted a pilot program designed to improve the efficiency and quality of service delivery for its members by providing practice-based care management resources, data sharing, and other supportive services to practices interested in transitioning to PCMHs. Using health plan claims data, we analyzed medical and pharmacy costs, hospital service use, and the percentage of members receiving appropriate care between 2008 and 2010. Using a difference of differences approach, we compared changes for UPMC Health Plan members served by the participating sites to changes for members served by the rest of the plan’s primary care network. To determine the health plan’s return on investment (ROI), we calculated the ratio of net cost avoidance for the program between calendar years 2009 and 2010 and total program costs for the same period.

**Population Studied:** The study included 23,930 adult UPMC Health Plan members (61 percent commercial, 21 percent Medicaid, 11 percent Medicare, and 7 percent Special Needs Plan) who received primary care at the 10 participating practice sites. All of the sites were located in urban settings but varied by size (number of physicians and patients), the proportion of UPMC Health Plan members to total patients served, and use of the UPMC electronic health record and registry software.

**Principal Findings:** Over the two-year study period, participating sites collectively achieved significantly lower medical and pharmacy costs, more efficient service delivery, such as lower hospital admissions and readmissions and less use of hospital emergency departments, when compared with nonparticipating sites. Although there were no significant differences on HEDIS measures between participating sites and the rest of the network between 2008 and 2010, participating sites consistently outperformed the rest of the network on all measures. This performance earned the health plan an average ROI of 160 percent. Seven of the 10 participating sites have since applied for and received recognition as PCMHs under the NCQA’s Physician Practice Connections-PCMH Recognition Program.

**Conclusions:** These results demonstrate the feasibility of improving the efficiency and quality of service delivery by supporting the transition of primary care practices to PCMHs. Positive outcomes can be achieved for adults with various chronic conditions and insured through different products, across multiple practice types, within a short period of time, and with a positive ROI for the payer.

**Implications for Policy, Delivery, or Practice:** Working together, payers and providers at local and regional levels are well positioned to lead the transition toward PCMHs and deliver care that is both high quality and increasingly efficient to all types of patients at all types of practices. Approaches that could spur the adoption and spread of the PCMH model include incentivizing payers to enter into PCMH contracts with interested providers, increasing payers’ efforts to provide primary care practices with access to usable data on their patient populations, and instituting telehealth to connect care managers.
to patients and practices when in-person visits are not possible or necessary. 

**Funding Source(s):** Other, UPMC Health Plan 
**Poster Session and Number:** A, #97

**Achieving Clairvoyance: Text Mining Electronic Medical Records – Real Meaningful Use**

Scott Zasadil, PhD, UPMC Center for High-Value Health Care; Pamela Peele, UPMC Center for High-Value Health Care; Pamela Peele, PhD, UPMC Center for High-Value Health Care

**Presenter:** Pamela Peele, Ph.D., Chief Analytics Officer, Health Economics, UPMC Center for High-Value Health Care, peelepb2@upmc.edu

**Research Objective:** To determine if a relationship exists between the words in patient-level clinical care notes and a patient’s future use of emergency department or urgent clinic visits. 

**Study Design:** We accessed a proprietary electronic care management platform (Identifi) used by medical care managers at a large health plan (over 2 million covered lives) to record their interactions with health plan members for the purposes of coordinating and managing patient care as well as directing patient interventions and education. Identifi is a member-centric electronic system that contains structured fields as well as a large volume of unstructured free text. Free text notes include care managers’ comments about their interactions with members as well as other care management notes and observations (chronic conditions, medications, caregiver information) and summaries of overall care coordination/management (service authorizations). StatSoft’s Text Miner tool was used to perform text mining. Four hundred unique words appeared in at least 1 percent of the notes and were extracted from this corpus. Associations between important words/phrases were then tested for a statistically significant association with an increase in the cumulative utilization of emergent/urgent care in the 12 months after the date of the note containing the words. To guide the contextual interpretation of the results, discussions were held with the nurses and care managers responsible for documenting in Indentifi. Future use of emergent/urgent care was determined from the place of service identified on the health plan’s medical claims database. 

**Population Studied:** 444,000 clinical records (associated with 66,300 unique members) created in the electronic medical record (EMR) between July and December 2010. The entirety of the clinical note was included. 

**Principal Findings:** Distinct classes of words and phrases exhibited recognizable and significant associations with each other. Some phrases, such as “social worker,” were found to be reliable indicators of a patient’s future use of emergent/urgent care while other words, such as “mother,” were associated with low future use of such care. In these records, the average cost of patients’ emergent/urgent future care use was $6,780 compared to $3,440 when the word “mother” was present and $13,288 when the word “social worker” was present. As a class, notes associated with an inpatient admission were also found to be frequently associated with future emergent/urgent care. Furthermore, the length of the note itself was found to be a simple proxy for predicting future emergent/urgent care.

**Conclusions:** Free text mining (as opposed to natural language processing) of EMRs can create new knowledge about specific words which serve as reliable sentinels of future use of emergent/urgent need for care. 

**Implications for Policy, Delivery, or Practice:** Rapid investment in EMRs by health care providers is producing a large and ever growing body of unstructured textual information. While clearly useful for direct patient care, an additional novel use of these records is the application of text mining to create an entirely new body of knowledge that could not reasonably be produced from paper records. This work illuminates a clear, pragmatic, and compelling way to leverage the ongoing national investment in EMRs for improving patient care and outcomes.

**Funding Source(s):** Other, UPMC Health Plan 
**Poster Session and Number:** A, #98

**Provider Office Characteristics Associated with Achieving High-Quality, Affordable Care for Patients Served through the UPMC Health Plan’s Patient-Centered Medical Home Program**

Pamela Peele, UPMC Center for High-Value Health Care; Patty Houck, MSH, UPMC Center for High-Value Health Care
**Presenter:** Pamela Peele, Ph.D., Chief Analytics Officer, Health Economics, UPMC Center for High-Value Health Care, peelepb2@upmc.edu

**Research Objective:** To identify the association between provider office characteristics and health care cost reduction for members and practices participating in the UPMC Health Plan’s Patient-Centered Medical Home (PCMH) program.

**Study Design:** UPMC Health Plan provides practice-based care management services and timely information on members’ quality of care to all practices participating in its PCMH program. Using a panel-data, fixed-effects model, we examined the effect of providing these resources on members’ health care service utilization costs as well as the mediating effect of provider office characteristics on the association between PCMH program participation and costs. Medical and pharmacy costs were analyzed using health plan claims data for the period between July 2008 and March 2012. Provider office characteristics, including specialty composition, NCQA certification through the Physician Practice Connections-Patient Centered Medical Home (PPC-PCMH) Recognition Program, location, size, care management type (onsite versus telephonic), system-owned or independent, and patient composition, were determined through surveillance data compiled by the health plan’s Network Management team and publically-available information on the NCQA website.

**Population Studied:** This study includes 77 practices that participated in the UPMC Health Plan PCMH program between July 2008 and March 2012 and 89,689 unique UPMC Health Plan members who received primary care at these practices. Approximately 60 percent of members were insured through a commercial product; 24 percent through Medicaid; and 17 percent through Medicare. The mean age of members was 42.8 years, and 57 percent were women.

**Principal Findings:** Participation in the UPMC PCMH program has demonstrated a reduction in overall health care costs. Significant practice-level variation in health care costs was observed around financial performance and a relationship was found between significant cost moderation and five specific provider office characteristics, namely NCQA PPC-PCMH certification, serving mainly as a primary care practice, having five or more doctors in the practice, located more than 10 miles from downtown Pittsburgh, and having at least 20 percent Medicaid members.

**Conclusions:** Results suggest that the ability of providers to leverage PCMH resources varies by provider office characteristics. Benefits are most likely to be found among NCQA-certified practices with at least five physicians located outside of major urban areas and serving at least 20 percent publicly-insured patients.

**Implications for Policy, Delivery, or Practice:** In the search for a higher quality, more affordable health care system, PCMH programs have gained momentum and attention as an innovative approach to health care delivery. Health plans, payers, employers, and other organizations seeking to support the implementation of PCMH programs may wish to target resources to those practices that are most likely to be able to leverage those resources into the highest levels of improvement. Attention should be paid to a range of provider office characteristics, including readiness to systematically employ patient-centered, coordinated care management processes, as signified by PPC-PCMH NCQA certification, focus on primary care, number of physicians, patients’ access to care, and patients’ need for care coordination and care management services.

**Funding Source(s):** Other, UPMC Health Plan

**Poster Session and Number:** A, #99

**Comparison of Administrative Data and Electronic Medical Record Data for Use in Pediatric Policy Evaluation**

Robert Penfold, Group Health Research Institute; Karen Hacker, Cambridge Health Alliance; Lisa Arsenault, Cambridge Health Alliance; Shalini Tendulkar, Cambridge Health Alliance; Fang Zhang, Harvard Pilgrim Healthcare Institute

**Presenter:** Robert Penfold, Ph.D., Assistant Investigator, Group Health Research Institute, penfold.r@ghc.org

**Research Objective:** Rigorous policy evaluation (e.g., using interrupted time series analysis) requires defining populations with a stable composition over time. Many investigators use the Medicaid Analytic Extract (MAX) data to conduct such analyses. Our objective was to identify the strengths and weaknesses of claims-based and electronic medical record (EMR-based) data for use in evaluating the impact of state and local policies on youth in safety-net
populations where the composition of the population is often argued to be highly transient.

**Study Design:** We conducted a retrospective cohort analysis in order to compare the demographics, continuity of enrollment, insurance eligibility, and rates of health care utilization obtained from claims-based and EMR-based data systems.

**Population Studied:** The study included children and adolescents aged 4.92 to 18 years and enrolled in Medicaid in two states, Massachusetts and New York and a large pediatric safety-net population (Cambridge Health Alliance) for whom we could access complete EMR data. The study used data collected between Jan. 1, 2001 and Dec. 31, 2008.

**Principal Findings:** We identified several general trends in the annual rates across states between 2001 and 2008. The percentage of individuals coded as “Other” race generally declined over the study period (e.g., NY: 17.2% in 2001 and 5.9% in 2008). The demographic composition across 4 sites within Cambridge Health Alliance was stable. For example, the percentage of White patients was 47.7 in 2002 and 44.2 in 2006. Spanish speakers were 3.4% of the CHA population in 2002 and 4.5% in 2006. At the state level, the percentage of children who qualified for coverage on the basis of age alone generally declined while the percentage who qualified on the basis of poverty increased (e.g., NY: 16.9% in 2001 and 29.0% in 2008). There were also large changes in managed care enrollment and primary care case management over the study period (e.g., NY: 31% in 2001 and 74% in 2008).

**Conclusions:** The demographic composition of the Medicaid and safety net populations was remarkably stable between the two states and 9 years included in this study. However, insurance eligibility (e.g., poverty, SSI, foster care) and managed care enrollment changed dramatically. EMR-based data had the advantage of being more detailed clinically; however, there was a lack of enrollment data to define a continuously eligible cohort. Investigators need to be aware of the various limitations of data collected in order to evaluate any intervention.

**Implications for Policy, Delivery, or Practice:** Evaluation of state and local policies on access, utilization, and clinical outcomes in safety-net populations requires population standardization with respect to eligibility groups and managed care enrollment in order to be valid. Evaluations using EMR-based data must use carefully considered alternatives to “continuous enrollment” such as rolling cohorts of individuals with any health care utilization in the last 12 months.

**Funding Source(s):** NIH

**Poster Session and Number:** A, #100

**Gaps and Opportunities for Quality Measurement in the Management of Schizophrenia in the United States – Avenues for Improved Value in Behavioral Healthcare.**

Grant Picarillo, Avalere Health LLC; Morgan Hanger, Avalere Health LLC; Kristi Mitchell, Avalere Health LLC

**Presenter:** Grant Picarillo, M.S., Senior Associate, Evidence Based Medicine, Avalere Health LLC, gpicarillo@avalerehealth.net

**Research Objective:** For the 1 percent of the US population with schizophrenia, quality of care remains suboptimal. Recent national developments have elevated the conversation about care for the mentally ill, raising awareness about the need for improvement. One increasingly popular way to promote effective care across many therapeutic areas is measuring and rewarding providers for patient outcomes. Recognizing that the complex patient population and variable disease progression may make outcome-based measurement especially difficult in this space, Avalere sought to understand the current measurement landscape for schizophrenia and to identify potential areas for improvement.

**Study Design:** Using publicly available sources, Avalere compiled US-based schizophrenia measures, capturing both their endorsement status and implementation in quality measurement programs. To determine where gaps existed, measures were mapped against a care continuum based on our analysis of leading schizophrenia guidelines (e.g., American Psychiatric Association, The Schizophrenia Patient Outcomes Research Team, Magellan Health Services, and The Texas Medication Algorithm Project). Avalere first determined whether existing measures assessed the most meaningful aspects of care, and subsequently evaluated gap areas to determine if they were linked either to a lack of necessary evidence or lack of an existing measure concept.

**Population Studied:** NA

**Principal Findings:** Avalere indentified 43 schizophrenia measures developed by both
private and public entities. The majority (44 percent) focus on clinical processes/effectiveness, while a smaller percentage focuses on care coordination (23 percent) and patient and family engagement (23 percent). The remaining measures address patient safety (7 percent) and efficient use of healthcare resources (3 percent). Across these topic areas, only 4 (11 percent) assess a patient outcome. Over half of schizophrenia measures (23 in number, including 2 of the outcomes measures) are currently used in prominent public or private quality improvement initiatives. Measure gaps appear across the care continuum, with few measures addressing screening and diagnosis, clinical outcomes, episode of care, quality of life, and shared decision-making, despite an evidence base in many of these areas. While some measures speak to aspects of care coordination, few meaningfully incent effective patient management (e.g. care planning across facilities and communities) to encourage more supportive, continuous treatment for patients with schizophrenia.

Conclusions: Current schizophrenia measures do not adequately address many care stages that are critical for the successful management of schizophrenia, despite an evidence base that could support such measures. Furthermore, although some measures assess concepts elemental to high quality care, a disproportionate number focus on intermediary processes, revealing an opportunity to develop and deploy more robust measures related to patient outcomes.

Implications for Policy, Delivery, or Practice: As the national dialogue about more comprehensive care for mental health patients grows louder, stakeholders will explore many ways to improve the effectiveness of treatment; careful measure development and implementation may be one piece of the puzzle. Additional care improvement models such as behavioral health medical-homes may marry nicely with targeted measurement to achieve better clinical outcomes in schizophrenia, both by emphasizing smooth care transitions between providers and within communities, and by focusing care more directly on appropriate and achievable patient-level outcomes.

Funding Source(s): No Funding

Emergency Department Boarding of Admitted Patients

Stephen Pitts, Emory University; Marc M. Gautreau, University of Massachusetts Medical School; Frances L. Vaughn, Emergency Care Coordination Center, Ass't Sec'y for Preparedness and Response; Graydon Lord, Emergency Care Coordination Center, Ass't Sec'y for Preparedness and Response

Presenter: Stephen Pitts, M.D., M.P.H., Associate Professor, Emergency Medicine, Emory University, srpitts@emory.edu

Research Objective: Boarding of inpatients in the emergency department (ED) has been identified by the Government Accountability Office and the Institute of Medicine as the principal cause of ED crowding, and has led to new Centers for Medicare and Medicaid Services (CMS) reporting mandates. However, nationally representative estimates of boarding prevalence and duration have not been available until now. We analyzed new boarding-related items in the National Hospital Ambulatory Medical Care Survey (NHAMCS).

Study Design: Serial cross-sectional samples that use multi-stage, stratified design, with sampling weights and design variables supplied by the National Center for Health Statistics in online public-use files. Individual ED identity is masked, but an ED identifier code and ED-level sampling weights are provided in recent files, allowing analysis by ED as well as by visit. Our ED-level analyses used the year 2010 only, because ED identifier codes changed between years; visit-level analyses use surveys from 2009-2010; and institutional boarding questions were available for the years 2007-2010.

Population Studied: The 2010 NHAMCS is a nationally representative sample of ED visit data abstracted from clinical records. Data include an indicator for hospital admission and a duration of boarding in minutes, defined as the time between bed request and actual departure from the ED. Of 4628 hospital admissions sampled in 2010, 3422 (74%) reported a boarding time.

Principal Findings: From 2007 to 2010 there was a decrease from 64 to 55 (p=0.087) in the percentage of EDs that reported sometimes boarding hospital admissions for more than 2 hours. During the same period the percentage of EDs that moved boarded patients to other areas of the hospital like non-ED hallways, the so-called “full capacity” policy, increased minimally, from 16 to 25 (p=0.025). Boarding duration
(2009-2010) was markedly skew in the weighted sample, with a mean of 127 minutes and a median of 79 (IQR 36 to 145). The percentage of admissions boarded more than 2 hours was 32 (95% CI 30 to 35), and for more than 4 hours was 10 (95% CI 9 to 12). Visit-level predictors of “boarding more than 2 hours” included older age, arrival during office hours, ambulance arrival, advanced imaging, and “seen by resident or intern”. We divided EDs into quartiles based on median boarding duration. The EDs in the highest quartile of boarding saw 41 percent of ED visits, and the highest two quartiles together saw 73 percent, implying an association between ED volume and boarding duration. Specific visit volumes are not disclosed in public-use files. In an ED-level multivariable linear regression on log-transformed median boarding duration, ED characteristics independently associated with longer boarding included a higher proportion of visits by non-Hispanic blacks, the Northeast geographic region, and urban location.

Conclusions: We have described the new ED boarding items in the NHAMCS, and determined which ED factors are associated with median boarding time.

Implications for Policy, Delivery, or Practice: The use of median boarding duration as a CMS “core measure” incentive may unintentionally reward some EDs for characteristics beyond their control, like lower visit volumes.

Funding Source(s): Other, HHS/ASPR/OPEO/ECCC

Poster Session and Number: A, #102

Price Variation for Colonoscopy in a Commercially Insured Population
Alexis Pozen, UC Berkeley

Presenter: Alexis Pozen, BA, Graduate Student, Health Services and Policy Analysis, UC Berkeley, apozen@berkeley.edu

Research Objective: We aimed to quantify the variation in prices for colonoscopy in a concentrated geographic region, as well as to evaluate whether market competitiveness was associated with this variation.

Study Design: We retrospectively analyzed the fee-for-service prices - defined as allowed amount - paid by a large Midwestern commercial insurer for a colonoscopy to hospital outpatient departments [HOPDs] and ambulatory surgery centers [ASCs] in a geographic region spanning part of two states. To mitigate outlier bias, we report results excluding the top and bottom one percent of prices. We conducted multivariate regressions of log price on varying tests of market competitiveness, controlling for current procedure terminology [CPT] code and facility [HOPD or ASC] and month fixed effects. Standard errors in each case were heteroskedasticity-robust and clustered at the county level.

Population Studied: We studied 110,907 claims from 101,769 commercially insured adults 18 and older who underwent outpatient colonoscopy in 138 HOPDs and 18 ASCs between 2005 and 2010.

Principal Findings: The mean price of a colonoscopy across facilities was 1,789 dollars at a HOPD [SD = 572], with a minimum price of 270 dollars and a maximum of 10,261 dollars. The mean price at an ASC was 1,324 dollars [SD = 115.6], with a minimum price of 318 dollars and a maximum of 2,930 dollars. ASCs had significantly lower mean prices than HOPDs [p less than 0.001]. Colonoscopy price increased with expected reasons [advancement in time, more complex CPT codes]. Although the coefficients on the variables of interest, the market competition variables, were all in the expected direction, they were all very small and statistically insignificant: number of facilities in the county [-0.0040, SE=0.0059]; market share based on number of colonoscopies performed [3.56e-06, SE=0.0002]; county Hirschman-Herfindahl Index, the sum of squared colonoscopy market shares [-1.28e-06, SE=3.00e-06].

Conclusions: There is substantial variation in the price paid for a colonoscopy in the Midwestern region studied. Our analysis tested whether market competition was associated with this price variation using several definitions of competitiveness, but we did not find evidence of a link between the two for the procedure studied.

Implications for Policy, Delivery, or Practice: While spending variation for Medicare patients is well-documented, new data are beginning to show that such variability exists for commercial patients as well, reflecting not only variability in utilization but also price. In health care, high prices do not always reflect high quality but a host of other reasons, including concentrated provider markets and lack of transparency to both consumers and other providers. This study has aims to shed light on both the extent of pricing variability for a relatively straightforward procedure as well as some explanations for why it exists, an area that is just beginning to be
Complex Comorbidity Clusters: A Cross Section Assessment of Healthcare Utilization

Mary Jo Pugh, South Texas Veterans Health Care System; Erin P. Finley, South Texas Veterans Healthcare System; Polly H. Noel, South Texas Veterans Healthcare System; Laurel A. Copeland, Central Texas Veterans Healthcare System; Chen-Pin Wang, University of Texas Health Science Center San Antonio; Jacqueline A Pugh, South Texas Veterans Health Care System

Presenter: Mary Jo Pugh, Ph.D., R.N., Research Health Scientist/Assistant Professor Of Medicine, VERDICT REAP, South Texas Veterans Health Care System, pughm@uthscsa.edu

Research Objective: Studies that describe physical or mental conditions among Veterans from Afghanistan and Iraq (OEF/OIF/OND) have focused primarily on the Polytrauma Clinical Triad: Traumatic Brain Injury (TBI), Post-traumatic Stress Disorder (PTSD), and chronic pain. The purpose of this study was to identify clusters of deployment-related, and chronic conditions in an OEF/OIF/OND cohort.

Study Design: We used VA inpatient, outpatient, and pharmacy data to identify OEF/OIF/OND veterans receiving VA care FY08-09, and identify conditions associated with TBI, blast injury, chronic pain, and chronic diseases using previously validated algorithms. We developed hierarchical clusters based on presence or absence of specific conditions. We used latent class analysis to identify latent classes of co-occurring comorbidity and labeled those based on conditions that are most common in the class. We then describe characteristics including healthcare utilization in FY10 by latent class.

Population Studied: Veterans of Afghanistan/Iraq wars who received VA care.

Principal Findings: We found six latent classes. The first two fit the pattern of polytrauma clinical triad; the first had twice the likelihood of pain diagnoses as the second, while the second had twice the likelihood of TBI diagnosis. Class three had high likelihood of mental health and substance use disorders. Class four had 100% likelihood of sleep disorders, with high likelihood of hypertension and amputation diagnoses. Class five was characterized by pain (excluding headache) and chronic disease. Class six was relatively healthy. Mental Health care and suicide related behaviors were more common in Classes 1-4; Pain, orthopedic/neurosurgery were more common in Class 5.

Conclusions: Distinct classes of comorbidity clusters were revealed in this cross-sectional cohort, and healthcare utilization, particularly for mental health, was very common in this cohort.

Implications for Policy, Delivery, or Practice: Assuring adequate access to mental health care is of critical importance in this population where suicide related behavior is increasing over time.

Funding Source(s): VA
Poster Session and Number: A, #103

Treatment Costs of Advanced Cancer: Variation in Costs for Stage IV vs. Recurrent Breast, Colorectal, Lung, and Prostate Cancers


Presenter: Debra Ritzwoller, Ph.D., Health Economist, Institute for Health Research, Kaiser Permanente Colorado, debra.ritzwoller@kp.org

Research Objective: Advanced cancer results in the bulk of cancer-related deaths, morbidity, and expenditures. Previous studies have described the variation in utilization and costs associated with cancer patients diagnosed at late stage vs. early stage. Other studies have described the high cost of cancer care in the terminal phase. Little is known regarding variation of costs of advanced cancer care between patients diagnosed de novo with stage IV cancer versus those with recurrent metastatic cancer that develops after definitive therapy for early-stage disease and a period of disease-free survival. We evaluate medical care costs and resource use during the year after development of metastatic disease among patients presenting with stage IV disease and
versus those with metastatic recurrence, using data from two Cancer Research Network (CRN) HMOs with tumor registries that capture recurrence, adjusting for patient and tumor characteristics.

**Study Design:** Retrospective cost analysis comparing treatment costs of patients diagnosed with stage IV versus metastatic recurrent, breast, colorectal, lung, or prostate cancer. Patients were followed for twelve 12 months following diagnosis date (or through the end of 2008, or death, or disenrollment). Patient and tumor characteristics, comorbidities, utilization, and mortality were obtained from the Virtual Data Warehouses (VDW) from two HMOs (Kaiser Permanente Colorado and Kaiser Permanente Northwest) who participate in the CRN. Estimates of costs were derived from the CRN “Standardized Relative Resource Cost Algorithm” (SRRCA) by adapting these systems to assign real (deflated) costs that are based on CMS fee schedules that are mapped to VDW event-specific diagnostic and procedure data (DRGs, ICD-9-CM, HCPCS CPT, etc.). Descriptive statistics and multivariate regression analyses were used to compare costs and resource use.

**Population Studied:** Patients aged > 21+ years and HMO-enrolled/insured at the two CRN sites who were diagnosed with stage IV or recurrent metastatic breast (n = 383), colorectal (n = 752), lung (n = 1,463), or prostate (n = 364) cancer, between 2000-2007, were included in the analysis.

**Principal Findings:** 40% of patients were under age 65. Age at diagnosis was significantly lower for patients with stage IV (vs. recurrent) colorectal (66.4 vs 68.2, p = .05) cancer, and significantly higher for stage IV lung (68 vs 66 p = .02) and prostate (69.5 vs 62.8) cancers. Relative to patients with recurrent disease, stage IV colorectal and lung cancer patient had a significantly lower (p < .0001) comorbidity scores. Stage IV breast cancer patients had the highest annual treatment cost ($57,506) and recurrent prostate cancer patients had the lowest ($23,876). Adjusted marginal annual treatment costs were significantly higher for patients diagnosed with stage IV breast ($21,000, p = .0005) and colorectal ($13,500, p < .0001) cancers, relative to patients diagnosed with recurrent disease. No significant differences were found for lung and prostate stage IV vs recurrent cancers.

**Conclusions:** The findings from this analysis could have significant clinical and policy relevance related to the cost implications of treating advanced cancer.

**Implications for Policy, Delivery, or Practice:** Higher costs for de novo vs. recurrent advanced stage disease should be examined from a clinical quality perspective with a focus on comparative effectiveness of initial and end-of-life care.

**Funding Source(s):** NIH

**Poster Session and Number:** A, #105

**Improved Trends in VA Facilities in Best Practices for Heart Failure: VA CHF QUERI**

Anju Sahay, Veterans Affairs Palo Alto Health Care System; Paul Heidenreich, MD, MS, Dept. of Veterans Affairs

**Presenter:** Anju Sahay, PhD, Research Health Science Specialist, CHF QUERI, Veterans Affairs Palo Alto Health Care System, anju.sahay@va.gov

**Research Objective:** Heart failure (HF) has been the number one reason for admission among Medicare patients and those in the Veterans Affairs (VA) Health Care System. Through multi-level and multi-facility evidence-based interventions, the Chronic Heart Failure (CHF) QUERI, has been facilitating best practices for HF care at all the VA facilities. Mortality for patients with heart failure has been improving but it is unclear if this has been associated with improved processes of care. The goal of this study was to assess changes in the structures and processes of HF care from 2008 to 2011 at all the VA facilities.

**Study Design:** Using a longitudinal approach in 2008 the CHF QUERI identified facility-level best practices for improved HF care.

**Population Studied:** In 2008 and then again in 2011 cross-sectional surveys were completed by the Chiefs of Medicine or Chiefs of Cardiology at each VA facility. For both waves of data collection we had a response rate of 100% from 140 facilities.

**Principal Findings:** Significant improvements were observed from 2008 to 2011 across structures and processes of care at the VA facilities. For facilities reporting no use of the following processes of care in 2008 consistent increases were seen in the presence of clinics with a HF focus (22%); use of a protocol for diuretic titration by providers (25%) and by patients (14%); use of HF educational materials (56%) and home-monitoring (53%); and involvement of pharmacists (54%) and dieticians.
Are Discharge Policies Now Better for Hospitalized Heart Failure Patients? VA CHF QUERI
Anju Sahay, Veterans Affairs Palo Alto Health Care System; Paul Heidenreich, MD, MS, Dept. of Veterans Affairs

Presenter: Anju Sahay, PhD, Implementation Research Coordinator, CHF QUERI, Veterans Affairs Palo Alto Health Care System, anju.sahay@va.gov

Research Objective: Over the past few years the VA Chronic Heart Failure (CHF) QUERI has been facilitating national initiatives like the Save 5 Million Lives Campaign and Hospital To Home (H2) with specific focus on inpatients, discharge process and follow up HF care. Survival following discharge has improved though it is not clear if discharge policies have changed.

Study Design: Using a longitudinal approach in 2008 the CHF QUERI identified facility-level best practices related to discharge processes for hospitalized HF Veterans.

Population Studied: In 2008 and then again in 2011 cross-sectional surveys were completed by the Chiefs of Medicine or Chiefs of Cardiology at each VA facility. For both waves of data collection we had a response rate of 100% from 140 facilities.

Principal Findings: Comparative findings over the 3 years show that VA facilities have markedly improved their discharge policies for hospitalized HF patients. Among the facilities reporting none of the following discharge policies in 2008, in 2011 53% of those facilities routinely schedule a follow-up phone call after discharge within <1 week (59%) and >1 week (41%); and 100% of those facilities routinely scheduled a follow-up visit with provider at the time of discharge within <1 week (83%) and >1 week (17%).

In 2011 facilities reported that during the first follow-up visit with provider after discharge the HF patient is usually seen in HF clinic (41%), by cardiology provider not in HF Clinic (19%), by primary care provider (37%) and other (3%).

Conclusions: Significant improvements in the discharge policies of hospitalized HF patients at VA facilities have occurred from 2008 to 2011.

Implications for Policy, Delivery, or Practice: Improved discharge HF care may have contributed to the reduction in 30-day mortality.

Funding Source(s): VA

Developing a Heart Failure Toolkit for Providers: VA CHF QUERI
Anju Sahay, Veterans Affairs Palo Alto Health Care System; Paul Heidenreich, MD, MS, Dept. of Veterans Affairs

Presenter: Anju Sahay, PhD, Research Health Science Specialist, CHF QUERI, Veterans Affairs Palo Alto Health Care System, anju.sahay@va.gov

Research Objective: Reducing readmission rates for heart failure (HF) patients is the primary goal of the Department of Veterans Affairs (VA) and its Chronic Heart Failure (CHF) QUERI Center. Since its establishment in 2005 the CHF QUERI has undertaken many initiatives to improve the quality of HF care by providers for veterans. One such initiative is the forming of the Heart Failure (HF) Provider Network which currently consists of over 800 members (providers) at all the 150 VA facilities. These providers are Chiefs of Cardiology, Chiefs of Medicine, Chiefs of Staff, cardiologists, physicians, nurse practitioners, nurses, pharmacists, telehealth coordinators, facility-level leadership, VISN (region)-level leadership, and others.

With the growing number of VA’s collaboratives and its Central Office’s initiatives like the Patient Aligned Care Teams (PACT) it is important for operations, staff and providers to have access to evidence-based tools for the management of heart failure patients for improved outcomes. Based on input and collaboration with the HF Network as the key stakeholder, recently the CHF QUERI developed a comprehensive evidence-based “Heart Failure (HF) Toolkit for Providers”.

Funding Source(s): VA
Study Design: This is a web-based toolkit with links and downloadable PDF documents.

Population Studied: Here the focus is on HF care. This toolkit has been developed through collaboration with the members of its HF Network as well as non-VA organizations. These tools are organized as tools from VA Sources, Non-VA Sources: Other; and Non-VA Sources: GWTG-AHA (Get With The Guidelines - American Heart Association). The tools can be used by providers, operations, patients and caregivers.

Principal Findings: This toolkit focuses on several key areas in the management of heart failure like mortality risk models, practice guidelines, clinical pathways, clinical algorithms, screening forms, admission and discharge order sets and instructions, best practices, and education materials for providers, patients and caregivers. This toolkit has been developed through the collaboration of HF Network members as well as non-VA organizations. Tools are organized as provided by VA Sources, non-VA Sources (Other) and non-VA Sources (American Heart Association’s Get With the Guidelines Program). Ongoing formative evaluation of the toolkit includes suggestion box for sharing tools, evaluation of the downloaded tool and comments.

This toolkit is being disseminated within the VA through the HF Network and VA Program Offices. Outside the VA it is being uploaded as a quality tool on AHRQ Health Care Innovations Exchange website and has been provided to the National Hospital to Home (H2H) initiative focusing on reducing heart failure readmissions.

Conclusions: Providers and staff are finding such a toolkit extremely valuable for the management of heart failure patients.

Implications for Policy, Delivery, or Practice: Evidence-based comprehensive, well-organized and easily accessible resources are very helpful for improved outcomes of heart failure patients.

Funding Source(s): VA

Poster Session and Number: A, #108

Combining Population Health Surveys and Administrative Data to Promote Coordination and Accountable Care

Michael Sajovetz, State of Colorado; Alyson Shupe, Colorado Department of Public Health and Environment

Presenter: Michael Sajovetz, M.A., Statistical Analyst, Health Care Policy and Financing, State of Colorado, michael.sajovetz@state.co.us

Research Objective: This project demonstrates how combining Medicaid claims data with public health survey data can highlight opportunities for integrating behavioral and physical health care in the context of the Accountable Care Collaborative (Colorado Medicaid’s Accountable Care Organization). Furthermore, it draws attention to areas in which the Regional Care Collaborative Organizations, which are responsible for care coordination for Medicaid beneficiaries one of seven regions in the state, can align their efforts with the various recipients of the nearly $400 million Colorado has received through Affordable Care Act-related funding.

Study Design: At the beginning of the Hickenlooper administration, the Colorado Departments of Health Care Policy and Financing, Public Health and Environment, and Human Services worked to identify ten “winnable battles” to improve public health. In the two years since these areas were identified, the three departments have collaborated to develop key health indicators across various data sources to address each of these battles. Many of the indicators identified are measurable using data from the CDC’s Behavioral Risk Factor Surveillance System, Colorado’s supplemental Child Health Survey, and Medicaid administrative claims and enrollment data.

Measures pertaining to the prevalence and potential cost of concurrent mental health and chronic physical health conditions were aggregated for each RCCO. In addition to prevalence and cost estimates, data was collected showing how much ACA funding has already been distributed to public and private organizations in each region of the state, and the activities these organizations are engaged in to integrate behavioral and physical care.

Population Studied: Data from the 2011 public health surveys was aggregated for three main groups of interest: current Medicaid beneficiaries, people likely to be eligible for the Medicaid expansions of 2014 based on self-reported income level and insurance status, and people expected to participate in the private insurance market, either through the health insurance exchange or through employer-sponsored insurance.

Medicaid administrative data was aggregated for all beneficiaries eligible in state fiscal year 2011-12. Particular attention was paid to those beneficiaries who utilized both behavioral and physical health services and have a “dual
diagnosis" of severe mental illness and chronic physical health conditions.

**Principal Findings:** The end result of this project is a series of Locality Health Profiles, specific to each one of the seven RCCOs in the state. These profiles show what key opportunities for integrating behavioral and physical health care exist, and what activities are already underway to support integrative efforts.

**Conclusions:**

**Implications for Policy, Delivery, or Practice:** Accountable Care Organizations are widely believed to be a solution to the problem of fragmented behavioral and physical health care systems, but there is little consensus regarding how that integration will occur. Combining public health surveys and administrative data can show where the most fruitful opportunities lie. Furthermore, Colorado Medicaid’s regional approach to accountable care allows for efforts to potentially be aligned not only at the state level, but also between state agencies, local health departments, and private entities.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #109

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**An Iterative, Community Feedback-Driven Approach to Household Survey Design**

Lujia Zhang, Medicine, UCLA; Ibrahima Sankare, UCLA; Arleen Brown, UCLA GIM HSR; Keyonna King, UCLA Medicine; Ibrahima Sankare, UCLA Medicine; Katherine Kahn, UCLA Medicine; D’Ann Morris, Los Angeles Urban League; Loretta Jones, Healthy African American Families; Nell Forge, Charles Drew University

**Presenter:** Ibrahima Sankare, M.H.A, Research Associate II, Medicine, UCLA, isankare@mednet.ucla.edu

**Research Objective:** While household surveys are common in epidemiologic research, few studies have employed community partnered participatory research (CPPR) in the research design phase. CPPR is a process in which community and academic partners are valued equally and collaborate jointly in research development, implementation, and dissemination. The Healthy Community Neighborhood Initiative (HCNI) is a collaborative effort between the Los Angeles Urban League, and Healthy African American Families (HAAF), Charles Drew University, and University of California in Los Angeles (UCLA) to improve health and health care in a South Los Angeles community disproportionately affected by preventable chronic conditions. Community-academic input informed survey development and study design to build capacity for community engaged research to reduce health disparities.

**Study Design:** HCNI members identified key topics for the interview and examination and then iteratively ranked items, refined and piloted elements of the survey and clinical examination; obtained community input on the informed consent form, the survey, and the clinical and laboratory data collection protocols; and piloted household surveys. After each household visit, observer and participant recommendations were incorporated into the protocol for the next visit.

**Population Studied:** The HCNI aims to improve the health and health care of Latino and African American populations residing in South Los Angeles.

**Principal Findings:** enhanced participant understanding of the informed consent form (ICF) and survey questions, reduced time spent “in-home” by 30 minutes, and streamlined the protocol to facilitate fewer surveyors in the household.

**Conclusions:** An iterative, community-academic feedback-driven revision process resulted in substantive changes to the ICFs, surveys, and data collection protocols that reflected the unique characteristics of the community and its residents. By emphasizing community engagement early in the study design phase, we established bidirectional knowledge exchange between researchers and the community.

**Implications for Policy, Delivery, or Practice:** An iterative process of eliciting and incorporating feedback from study participants and a diverse group of community and university-based team members resulted in improvements to the survey content and protocol that streamlined the survey process and made it easier for participants to understand study procedure and findings. This framework can help to examine the impact of incremental changes in CPPR protocols on study processes and outcomes.

**Funding Source(s):** N/A

**Poster Session and Number:** A, #110
Community Partnered Participatory Research as an Effective Method for Developing New Paradigms for the Recruitment and Retention of Underrepresented Populations in Medical Research

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Presenter: Ibrahima Sankare, M.H.A., Research Associate II, GIM-HSR, UCLA, isankare@mednet.ucla.edu

Research Objective: Low levels of recruitment, retention and participation of minority populations in medical research studies hinder efforts to address and reduce ethnic and racial disparities in health care and health status. As part of the Healthy Community Neighborhood Initiative (HCNI) community-partnered study that aims to improve health and health care in a community in South Los Angeles, we (1) identified barriers to participation of minority populations in research, and (2) identified effective recruitment and retention strategies for use with predominantly African American and Latino residents in South Los Angeles.

Study Design: Using the PubMed database, we conducted a literature review and found 20 articles specifically related to the recruitment and retention of federally underrepresented minorities (African Americans/blacks, Latinos/Hispanics). We evaluated each article based on: (1) the use of a CPPR process to design the recruitment and retention strategies, (2) the effectiveness of reported strategies in yielding positive outcomes in a predominantly Latino and African American populated area, and (3) the effectiveness of these strategies in generating trust among these demographics that have historically mistrusted health-related studies due to negative historical precedents. The findings of the selected articles were summarized in an oral presentation to community and academic partners. To reflect the diversity of the HCNI partners in the selection of recommended strategies, 13 HCNI community and academic partners subsequently ranked each of the identified strategies. The HCNI partners then applied the highest ranked strategies to recruitment efforts in South Los Angeles and queried enrolled study participants about what motivated their study participation.


Principal Findings: We identified 10 recruitment and 17 retention strategies that had been proven to increase participation of underrepresented populations in medical research by maximizing the quality of a research participant’s experience through (1) meaningful interactions with study team members, (2) demonstration of appreciation for the participant’s efforts and (3) the provision of feedback throughout and upon the completion of the research study. The three highest ranked recruitment strategies were: word of mouth, use of newsletters, and postings of fliers on bulletin boards. The highest ranked retention strategies were: compensation through gift cards, mailing of holiday cards, and provision of certificates of study completion. To date, the HCNI partners have contacted 90 potential participants and enrolled 79 participants using a combination of the cited strategies. Sixty percent of the enrolled participants cited word of mouth as the strategy that most motivated their interest in study participation.

Conclusions: CPPR provides an extraordinary opportunity to identify relevant and effective mechanisms for recruiting underrepresented populations. After applying recruitment strategies supported by the literature and by a diverse set of community-academic partners, we learned from enrolled study participants that “word of mouth” involving personal interaction was the most effective recruitment strategy in this community.

Implications for Policy, Delivery, or Practice: While initially, this recruitment strategy may cause selection bias as we disrupt the mistrust barrier, with time, the development of trust between community and academia is likely to facilitate building a highly engaged and unbiased population-based sample.

Funding Source(s): N/A

Impact of Teaching Intensity and Academic Status on Medical Resource Utilization by Teaching Hospitals in Japan

Daisuke Sato, The University of Tokyo Hospital; Kiyohide Fushimi, Health Policy and Informatics Section, Department of Health Policy, Tokyo Medical and Dental University Graduate School
Research Objective: In this study, we aimed to quantitatively determine the impact of teaching intensity and academic status on medical resource utilization, by analyzing administrative data from teaching hospitals in Japan.

Study Design: Administrative data for 47,397 discharges from 40 academic and 12 non-academic teaching hospitals in Japan were collected. Hospitals were classified into three groups according to intern/resident-to-bed (IRB) ratio. Resource utilization of medical services was estimated using fee-for-service charge schedules and normalized with case mix grouping. Hospitals were classified into three groups according to the IRB ratio in 2004, which represented the teaching intensity: low IRB (IRB < 0.02, LIRB), medium IRB (0.02 = IRB < 0.05, MIRB), and high IRB (IRB = 0.05, HIRB).

The number of residents was based on the list of residency matching program used by Japan’s Residency Matching Program. Relative medical resource utilization for each patient was determined according to the fee-for-service charge schedule, which is a good estimate of healthcare costs because there is a high correlation between the cost and the charge [29]. Case-mix adjustments by the DPC code group were performed as follows: first, for each DPC code group, the average fee-for-service charge value for service categories such as laboratory tests, radiological examinations, and so on, was calculated. Next, relative medical resource utilization for each service category of each patient was calculated as the charge value of the service category divided by the average charge value for the DPC code group of the patient. Relative medical resource utilization was calculated for laboratory tests, radiological examinations, injections, medications, non-surgical procedures, and surgical procedures. Similarly, the case-mix-adjusted relative average length of hospital stay (ALOS) was calculated.

This study was approved by the ethics committee of Tokyo Medical and Dental University. Age was stratified into two categories on either side of 65 years of age. Charlson’s comorbidity index was classified into five groups (0, 1, 2, 3, 4 or more). The significance of differences was determined using the two-tailed t-test. In multivariate regression analysis, to examine the effects of teaching intensity, which presumably represents activities for postgraduate training, and academic status, which represents functions such as medical research and undergraduate teaching, on relative medical resource utilization, sex, age category, Charlson’s comorbidity index and relative intensity of surgical procedures for each case were used as control variables to adjust for case mix differences. The relative intensity of surgical procedures was calculated as follows: first, for each DPC code group, the average fee-for-service charge value for surgical procedures was calculated. Next, the relative intensity of surgical procedures of each patient was calculated as the charge value of surgical procedures of the patient divided by the average charge value of surgical procedures for the DPC code group of the patient. An independent effect of teaching intensity and academic status was assumed and the potential interaction of the two factors or hospital clustering effect was ignored owing to limitation of the data. All analyses were performed using SPSS Software (version 12.0; SPSS, Inc., Chicago, IL). A twosided p value < 0.05 was considered statistically significant.

Population Studied: The data used in this study were collected electronically from hospital administrative records for the period from July through October 2004, and these were obtained from 40 national university academic teaching hospitals, which provide medical research and undergraduate medical teaching in addition to postgraduate training, and 12 non-academic teaching hospitals, which simply provide postgraduate training, in Japan. The data were voluntarily offered to our study group. The hospitals were located in different parts of the country and provided postgraduate medical education for more than two years, prior to the alteration of the postgraduate medical education system in 2004.

These data included International Classifications for Diseases and Related Conditions Version 10 (ICD10) codes for primary diagnosis, comorbidities and complications, and demographics, as well as the daily utilization of procedures, medications, and materials. A 14-digit Diagnosis Procedure Combination (DPC) code, which was assigned to each patient record for per-diem prospective payment based on primary diagnosis, comorbidities, and procedures as described elsewhere, was used for case mix adjustment. Charlson’s comorbidity index was calculated from 12 diagnostic data fields.
Principal Findings: 15–24% more resource utilization for laboratory examinations, radiological imaging, and medications were observed in hospitals with higher IRB ratios. With multivariate adjustment for case mix and academic status, higher IRB ratios were associated with 10–15% more use of radiological imaging, injections, and medications; up to 5% shorter hospital stays; and not with total resource utilization. Conversely, academic status was associated with 21–33% more laboratory examinations, radiological imaging, and medications; 13% longer hospital stays; and 10% more total resource utilization. We found that high teaching intensity was associated with more resource utilization for radiological imaging, injections, and medications, but less hospital stays and, in consequence, did not have any significant effect on total resource utilization. In contrast, academic status was associated with more resource utilization for laboratory examination, radiological imaging, medications, and hospital stays, resulting in an approximate 10% more total resource utilization.

Conclusions: While differences in medical resource utilization by teaching intensity may not be associated with indirect educational costs, those by academic status may be. Therefore, academic hospitals may need efficiency improvement and financial compensation.

Implications for Policy, Delivery, or Practice: As for health policy implications, on the basis of resource utilization patterns, our results may indicate that financial compensation for teaching activity does not need to be large. Instead, our result may imply the necessity of health policy measures for excess costs in academic teaching hospitals. The mechanisms behind the remarkable difference in resource utilization between academic and non-academic teaching hospitals were unclear from our analysis. Inefficiency of inpatient care owing to inadequate oversight or the inexperience of residents may partially account for this difference. In addition, the poor management capability of university hospitals may potentially account for their inefficiency. This inefficiency need not be compensated by health-care payments, and the introduction of guidance for hospital management or fair market competition will hopefully improve their efficiency. Alternatively, it is conceivable that more medical resource utilization may arise from the superior setting and resources in academic hospitals, including easily accessible tests for teaching purposes [11], on-site clinical research, and standby capacity for specialized patient care. In addition, incomplete case mix adjustment, which may hardly be perfect even with refined case mix classification system, for sicker patients in academic hospitals may account for their excess costs. For these kinds of excess costs, financial supports for academic medical hospitals or further refinement of the case mix system will need to be acknowledged.

Funding Source(s): Other, DPC/PDPS

Poster Session and Number: A, #112

Increases in the Rate of Pediatric Epilepsy Surgery Following Evidence-Based Guidelines
Nicholas Schiltz, Case Western Reserve University; Elia Pestana-Knight, University Hospitals Case Medical Center; Paul Bakaki, Case Western Reserve University; Siran Koroukian, Case Western Reserve University; Kitti Kaiboriboon, University Hospitals Case Medical Center

Presenter: Nicholas Schiltz, BS, PhD student, Epidemiology & Biostatistics, Case Western Reserve University, nicholas.schiltz@case.edu

Research Objective: Epilepsy surgery is safe and effective and can lead to significant improvements in quality of life for persons with medically uncontrolled epilepsy, but utilization remains low. Evidence-based guidelines published in 2003 called for referral of these patients for evaluation as possible surgical candidates, but studies have shown no significant increase in utilization of surgery among adults. Temporal trends in the rate of pediatric epilepsy surgery have not been investigated at the population level.

Study Design: Retrospective cross-sectional study using the Kids Inpatient Database from 1997, 2000, 2003, 2006, and 2009. Annual estimates of the number of pediatric epilepsy surgical procedures were derived using sample weights. Subgroup variables of interest include age group, gender, race/ethnicity, and primary payer, hospital characteristics, and surgery type. Annual rates of epilepsy surgery per 1000 person-years were calculated using published prevalence estimates of pediatric epilepsy as the denominator. Linear regression was used to test for changes in rates over time.
**Population Studied:** Children age 0 to 17 with epilepsy in the United States

**Principal Findings:** The rate of epilepsy surgery increased steadily from 1997 (0.83 surgeries / 1000 person-years) to 2000 (0.87/1000), 2003 (1.24/1000), 2006 (1.43/1000), and 2009 (1.48/1000). The rate of surgery increased from 1997 to 2009 across all age groups, race categories, gender, and payer types. Rates were lowest among blacks compared to whites (0.62/1000 vs. 1.20/1000 in 2009), Medicaid-enrolled compared to private payers (0.71/1000 vs. 2.03/1000 in 2009), and males (1.26/1000 vs. 1.81/1000 in 2009) in all years. Overall utilization of epilepsy surgery remained low as the range in number of cases per year was 375 (1997) to 706 (2009). The majority of procedures took place at children’s hospitals (range: 84% - 100%), and teaching hospitals (85% - 97%).

**Conclusions:** Rate of change in pediatric epilepsy surgery in USA increased from 1997 to 2009 across all pediatric demographic and payer categories. Still, while a sizable proportion of children with epilepsy may be good candidates for surgery, far less than 1% receive surgery annually. Rates of epilepsy surgery remained significantly lower for black children and those on Medicaid indicating persisting disparity.

**Implications for Policy, Delivery, or Practice:** The rate of pediatric epilepsy surgery has increased indicating some increased awareness among health professionals of the benefits of early epilepsy surgery. However, surgery continues to be under-utilized especially among black children and those enrolled in Medicaid, indicating additional outreach efforts may be needed targeted toward general pediatricians, family medicine physicians, and general neurologists to improve referral of difficult to treat epilepsy cases to specialized care.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #113

**Racial Variation in Heart Failure Comorbidities and Therapy Use in a Medicaid Population**

Fadia Shaya, University of Maryland School of Pharmacy; Ian Michael Breunig, University of Maryland School of Pharmacy; Mandeep R Mehra, Harvard Medical School; Center for Advanced Heart Disease, Brigham and Women's Hospital, Boston, MA

**Presenter:** Fadia Shaya, Ph.D., M.P.H., Professor; Director Of Research And Outreach

**Cips, CIPS:** Center for Innovative Pharmacy Solutions, University of Maryland School of Pharmacy, fshaya@rx.umaryland.edu

**Research Objective:** To explore the association between race, comorbidity, and first-line therapy use among patients with heart failure (HF) in a contemporary Medicaid population.

**Study Design:** Using medical/prescription/enrollment records from Maryland State Medicaid, we examine the prevalence of comorbidity and use prevalence of first-line therapies among white, black, Hispanic and other race/ethnicity enrollees diagnosed with HF. Diagnosis for HF was defined as the earliest encounter claim that included ICD-9 code 428.xx. Comorbidity diagnoses (chronic obstructive pulmonary disease (COPD), stroke, renal dysfunction, diabetes, psychological disorder, hyperlipidemia, chronic ischemic heart disease, hypertension, and other cardiovascular disease) were between patients’ earliest claim and within three months after HF diagnosis. First-line therapy use was ascertained using pharmacy claims with first-date-of-service between HF diagnosis and the end of follow up. Variation across race/ethnicity groups in comorbidities and therapy use is described.

**Population Studied:** Maryland State Medicaid, Managed Care Organization or Fee-for-services, non-dual enrolled, ages 18-64, with a diagnosis of HF between July 1st, 2005 and December 31st, 2009, and followed for at least 3 months.

**Principal Findings:** Among 15,764 HF patients, 60 percent (n=9,388) were black, 33 percent (n=5,158) white, 6 percent (n=919) other, 2 percent (n=299) Hispanic. Over half were female (55%percent); 29 percent were ages 18-44, 36 percent ages 45-54, and 36 percent ages 55-64. Prevalence (percent) of comorbidities in race/ethnicity groups was: COPD (40 white, 22 black, 20 other, 11 Hispanic; p<0.001), stroke (22 black/other, 20 white/Hispanic; p=0.170), renal dysfunction (38 Hispanic, 30 black, 27 other, 22 white; p<0.001), diabetes (42 white/Hispanic, 40 black, 38 other; p=0.040), psychological disorder (65 white, 52 black, 46 other, 37 Hispanic; p<0.001), hyperlipidemia (44 white, 39 Hispanic, 31 other, 33 black; p<0.001), chronic ischemic heart disease (47 white, 41 black/Hispanic/other; p<0.001), hypertension (76 black, 72 Hispanic, 68 white, 67 other; p<0.001), other cardiovascular disease (80 Hispanic, 79 black, 77 white/other; p=0.167). Excluding other cardiovascular disease, the median number of comorbid conditions was 3 in each race/ethnicity...
group. Among black, white, Hispanic and other race/ethnicity groups, only 5.8, 4.4, 9.0, and 7.3 percent had zero comorbidities, and 14.2, 11.4, 12.4, 15.8 percent had only one comorbidity, respectively. Hispanics (53 percent) were less likely than blacks (62 percent), whites (61 percent), or others (57 percent) to be prescribed ACE-inhibitor/ARB, beta-blockers, aldosterone antagonists, and/or other cardiovascular drugs including combination nitrates/hydralazine (p<0.001).

**Conclusions:** Among HF patients enrolled in Maryland Medicaid, whites were most likely to be diagnosed with COPD, psychological disorders, hyperlipidemia, and chronic ischemic heart disease. Hypertension was most likely among blacks, and renal dysfunction most likely among Hispanics. Multiple comorbidities are highly prevalent among all Medicaid enrollees with HF. Hispanics and other race/ethnicity were less likely to be prescribed or use therapies for HF compared to white and black HF patients.

**Implications for Policy, Delivery, or Practice:** This study is among the first to address the epidemiology of comorbidities in a high-risk Medicaid population, reflecting a demographic largely under-represented in large scale studies or clinical trials.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #114

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**Comorbidity Burden among Heart Failure Patients in a Medicaid Population**

Fadia Shaya, University of Maryland School of Pharmacy; Ian Michael Breunig, University of Maryland School of Pharmacy; Mandeep R Mehra, Harvard Medical School; Center for Advanced Heart Disease, Brigham and Women's Hospital, Boston, MA

**Presenter:** Fadia Shaya, Ph.D., M.P.H., Professor; Director Of Research And Outreach Cips, CIPS: Center for Innovative Pharmacy Solutions, University of Maryland School of Pharmacy, fshaya@rx.umaryland.edu

**Research Objective:** Increasing prevalence of heart failure, increasing enrollment in state programs, sparse literature on population-based heart failure studies, and the associations between lower socioeconomic status, increased comorbidity burden and greater utilization rates necessitate an examination of the prevalence of HF comorbidity in a contemporary Medicaid population.

**Study Design:** Using medical/prescription/enrollment records from Maryland State Medicaid, we examine the prevalence of comorbidity and multiple-comorbidities among HF patients. Diagnosis for HF was defined as the earliest encounter claim that included ICD-9 code 428.xx. Comorbidity (chronic obstructive pulmonary disease (COPD), stroke, renal dysfunction, diabetes, psychological disorder, hyperlipidemia, chronic ischemic heart disease (CIHD), hypertension, and other cardiovascular disease (CVD)) was ascertained from ICD-9 codes observed between patients' earliest claim and within three months after HF diagnosis; psychological disorder was also determined using prescription records. The frequencies and cross-frequencies of the selected comorbidities are examined.

**Population Studied:** Maryland State Medicaid, Managed Care Organization or Fee-for-services, non-dual enrolled, ages 18-64, with a diagnosis of HF between July 1st, 2005 and December 31st, 2009, and followed for at least 3 months.

**Principal Findings:** Among 15,764 HF patients, 60 percent (n=9,388) were black, 33 percent (n=5,158) white, 6 percent (n=919) other, 2 percent (n=299) Hispanic. Over half were female (55 percent); 29 percent were ages 18-44, 36 percent ages 45-54, and 36 percent ages 55-64. The most common comorbidity was other CVD (78 percent), followed by hypertension (73 percent), psychological disorder (57 percent), CIHD (43 percent), diabetes (41 percent), hyperlipidemia (37 percent), COPD (28 percent), renal dysfunction (28 percent), and stroke (21 percent). This pattern persisted within any particular comorbidity sub-group. Excluding hypertension and other CVD: 10 percent of patients had zero comorbidities, 20 percent had only one, 70 percent had multiple comorbidities; 0.7 percent (n=114) had every comorbidity. The median number of comorbidities was 2; median being 4 if hypertension and other CVD are included.

**Conclusions:** An overwhelming majority of HF patients enrolled in Maryland Medicaid have multiple comorbidities. The prevalence of any comorbidity above was no less than 21%; the most prevalent comorbidities being hypertension, other cardiovascular disease, and psychological disorder.

**Implications for Policy, Delivery, or Practice:** Our findings call attention to the level comorbidity in a high-risk Medicaid population, reflecting a demographic largely under-represented in large scale studies or clinical
The Use of Transarterial Chemoembolization for Treating Hepatocellular Carcinoma in the SEER-Medicare Population

Ian Michael Breunig, University of Maryland School of Pharmacy; Fadia Shaya, University of Maryland School of Pharmacy; Fadia T Shaya, University of Maryland School of Pharmacy; Nader Hanna, University of Maryland School of Medicine; Brian Seal, Bayer HealthCare Pharmaceuticals, Inc.; Viktor Chirikov, University of Maryland School of Pharmacy; C. Daniel Mullins, University of Maryland School of Pharmacy

Research Objective: Transarterial chemoembolization (TACE) is a first-line therapy to treat intermediate staged hepatocellular carcinoma (HCC) and multiple courses of TACE are often undergone. TACE is often used as a bridge-therapy to surgery or to treat tumor recurrence, and TACE-Sorafenib combination therapy is a promising new therapeutic approach based on synergistic properties. We explore historical patterns of TACE use to inform future evaluations of the effectiveness of TACE as it is utilized in a transformative therapeutic landscape for HCC.

Study Design: Data are from the Surveillance, Epidemiology and End Results (SEER) and linked Medicare databases, with claims generated from Parts A and B. We describe rates of TACE use before and after transplant, resection, and ablation in the follow-up period. Among non-transplant/non-resection patients, we describe rates of multiple TACE treatments and use Kaplan-Meier analysis to examine mean weeks between HCC diagnosis, first TACE, repeated TACE, and death.


Principal Findings: There were 11,047 total HCC patients. Among 411 transplant patients, 29 percent received TACE before transplant, and 3 percent after transplant. Among 851 resection patients, 2 percent received TACE before resection, and 11 percent after resection. Among 1116 ablation patients, 17 percent received TACE before ablation, and 19 percent after ablation. Among 1228 non-transplant/non-resection patients who received TACE, 57 percent received one course, 24 percent received two courses, 11 percent received three courses, and 8 percent received 4 or more courses. Among patients with one, two, three, and four or more TACE treatments, first treatment was at 26, 21, 21, and 20 weeks after HCC diagnosis, and TACE was discontinued after 35, 53, 95, and 125 weeks, respectively; mean weeks survived post-discontinuation was 64, 61, 59, and 50 weeks, respectively.

Conclusions: When used with transplantation, TACE has been more often used as a bridge-therapy; with resection, more often to treat non-optimal tumor response. TACE is frequently used concomitantly with ablation. Intent to treat first-line TACE patients with multiple courses of TACE is difficult to ascertain in observational studies since additional treatments may be prescribed under a patient-specific treatment protocol or due to non-optimal tumor response. Nonetheless, mean weeks survived after discontinuing TACE was relatively similar regardless of number of treatments received.

Implications for Policy, Delivery, or Practice: The value of TACE, and related combination therapy, should be viewed with regard to its ability to extend the period of eligibility for treatments, reduce rates of recurrence, as well as extend overall survivorship.

The Effect of a Change in Out-of-Pocket Policy of the National Health Insurance on Medical Use in the Tertiary Hospitals

Changwoo Lee, Korea Insurance Research Institute; Euichul Shin, The Catholic University of Korea

Research Objective: This study explores whether the increase of outpatient service cost sharing rate at tertiary hospitals, enforced from July 2009, indeed decreased outpatient service...
utilization at tertiary hospitals. Using the Korea Medical Panel Survey(KMPS), we investigate if the tertiary hospital patient cost sharing policy change did not at all affect medical use in the tertiary hospital.

**Study Design:** Especially, private health insurance holders are likely to be less sensitive to change in NHIC’s cost sharing rate since their out-of-pocket payments for the large hospital are reimbursed through the private health insurance. Therefore, considering them as a control group, we attempt to determine the effect of the patient cost sharing policy change at large hospitals on the outpatient utilization at upper level hospital by the difference-in-difference method.

**Population Studied:** For this study 2009, KMPS data is used. Medical panel data enables independent estimation by constructing samples of 8,000 nationwide households, and it evaluates medical use and medical cost expenditures of 16 major cities (Jung, 2009). It contains detailed information, not only including individual’s socio-economical characteristics and also whether or not individual holds private medical insurance policy, and its coverage. Especially in health care use, there is a merit in that the date of health care use can be traced down, which allows to separate before and after the 2009 (patient cost sharing) policy change.

**Principal Findings:** When private health insurance holders are selected as a control group, the difference between the control group and treatment group existed. The results show that the change of cost sharing policy indeed is effective.

**Conclusions:** According to the data provided by Health Insurance Review & Assessment Service(HIRA), which only investigates general tendency of upper level hospital outpatient service use patients cost sharing policy change carried out in July 2009 may be determined to be not as effective. However, determining whether there was a policy change via difference-in-difference method, patient cost sharing policy indeed seems to be effective. If further data is offered for support, robustness of the result can be once confirmed.

**Implications for Policy, Delivery, or Practice:** The results show that the change of cost sharing policy could be effective in reducing medical use.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #117

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**Developing and Testing Pediatric Quality Indicators for Administrative Claims Data**

Emily Ehrlich, Truven Health Analytics; Mark W. Smith, Truven Health Analytics; Ginger Carls, Truven Health Analytics; Marilyn Novich, Truven Health Analytics

**Presenter:** Mark W. Smith, Ph.D., Director, Truven Health Analytics, mark.w.smith@truvenhealth.com

**Research Objective:** Administrative claims data remain the only widely and readily available source of information on processes and outcomes of care for children. Yet, few pediatric quality indicators have been developed that can be implemented with claims data alone. As a result little is known about the quality of care provided to children on a regional or national scale. Here we describe the process used to identify a large set of pediatric quality indicators for use with claims data and how they were tested for scientific acceptability.

**Study Design:** Project staff conducted a literature review of pediatric quality indicators. Draft definitions based on the literature review were edited by an expert panel of physicians. The final definitions were transformed into programming specifications and then applied to claims data form a Midwestern health plan. Corresponding patient medical record audits were conducted. The team assessed validity for a subset of the measures, comparing agreement between sources in eligibility for the measure (the denominator of a quality indicator rate) and in performance, or evidence that high-quality care was given as indicated (the numerator). Agreement was assessed through Cohen’s Kappa statistic and the Spearman correlation coefficient.

**Population Studied:** The quality measures apply to children ages 0-17 regardless of gender, race, or insurance status. Indicators were tested against medical records of children enrolled in a private health plan in the Midwest.

**Principal Findings:** The literature review revealed a dearth of quality measurement for children’s healthcare using administrative claims, but also a wealth of evidence-based practices that are observable in claims data. The project staff developed and the expert panel honed more than 80 candidate indicators for ambulatory screening, prevention, or treatment of high-volume and high-impact conditions. Twenty-eight of these indicators, spanning 12 conditions, were validated against medical
records. Of these, twenty-four had eligibility (denominator) agreement of 65% or greater, and 10 had 85% or greater agreement. Sixteen of the 28 indicators differed in their performance (numerator) by less than 20 percentage points. Ten indicators had a Cohen’s Kappa greater than 0.75, indicating a high level of agreement between administrative data and medical records. Correlations followed a similar pattern.

**Conclusions**: Published studies and clinical experience provide a strong foundation for potential pediatric quality indicators. This study provides initial evidence that many can be measured with reasonable reliability using claims data.

**Implications for Policy, Delivery, or Practice**: If further validation supports these measures, it will soon be possible to track the level and trends in the quality of children’s health care on a broad scale.

**Funding Source(s)**: NIH
**Poster Session and Number**: A, #119

**Evaluating PROMIS Physical Function Measures in Older Adults at Risk for Cognitive Decline**

Kathleen Smyth, Case Western Reserve University; Curtis Tatsuoka, Ph.D., Case Western Reserve University; Nasim Seifi, M.A., Case Western Reserve University; Martha Sajatovic, M.D., Case Western Reserve University

**Presenter**: Kathleen Smyth, Ph.D., Associate Professor, Epidemiology and Biostatistics, Case Western Reserve University, kathleen.smyth@case.edu

**Research Objective**: Independence in activities of daily living (ADLs) becomes a central concern with age. Elders with mild cognitive impairment (MCI) have subtle functioning deficits that may predict conversion to dementia. With exponential population growth among U.S. elderly, there is a critical need for patient-reported measures that efficiently assess physical functioning in elders at risk for cognitive decline (CD). The Patient Reported Outcomes Measure Information System (PROMIS) aims to assess symptoms/problems across a wide array of chronic diseases and conditions. PROMIS has made significant strides, but assessing the performance of its measures in diverse populations and in comparison with commonly used (Legacy) measures is needed. Our goal was to evaluate the utility of a subset of PROMIS physical function items most likely to capture functional change related to CD.

**Study Design**: In a prospective cohort study, we administered PROMIS and Legacy measures of physical function, depression and cognition, and demographic, comorbidity and health literacy measures to older adults. Prior to assessment, an expert panel experienced in the care or study of elderly persons with cognitive impairment used the Nominal Group Process Method to select 62 items from the 125-item PROMIS physical functional battery deemed most likely to be affected by CD.

**Population Studied**: Over 300 individuals 70 or over were recruited from clinical and community settings. Three sub-groups were targeted: those with normal cognition, MCI and mild to moderate dementia. We report here on findings from baseline interviews with the first 180 subjects recruited.

**Principal Findings**: Total scores on the PROMIS items correlated in the expected direction with Legacy measures of: global basic and instrumental ADLs and an ADL measure designed for use in MCI (r = .31 to .65, p = .000). Significant correlations with both basic and instrumental ADL measures suggest that the PROMIS items capture multiple constructs (confirmed by factor analysis). In regression models predicting PROMIS and Legacy measures, level of cognitive impairment was an independent predictor only of the MCI-specific measure. Number of comorbidities (p = .009) and depressive symptoms (p = .000) were independently related to the PROMIS measures (but to only some of the Legacy measures) in the expected direction. Health literacy was not a significant predictor of any measure.

**Conclusions**: Findings suggest that a subset of PROMIS physical function items chosen for their relevance to CD span both basic and instrumental ADL domains as captured by global Legacy measures. Scores on both the PROMIS and Legacy measures appear sensitive to depression, possibly due to associated apathy and fatigue. The usefulness of PROMIS physical function items may be enhanced by developing sub-domain scores to capture the multidimensional nature of the items and increase sensitivity to CD.

**Implications for Policy, Delivery, or Practice**: Given the aging of the U.S. population, valid and reliable patient reported outcome measures for persons at risk for or experiencing CD are critical in clinical practice and research. Our initial evaluation of the PROMIS physical
function measures suggests that with additional work to uncover sub-domains, they may be useful in clinical practice with elderly populations and in assessing the effects of interventions in this group.

**Funding Source(s):** NIH, University Hospitals Case Medical Center Neurological Institute

**Poster Session and Number:** A, #120

**State Regulation of Nonprofit Hospital Community Benefit**

Martha Somerville, The Hilltop Institute

**Presenter:** Martha Somerville, J.D., Director, Hospital Community Benefit Program, The Hilltop Institute, msomerville@hilltop.umbc.edu

**Research Objective:** The term, "hospital community benefits" refers to nonprofit hospitals' activities, including free and discounted care, reimbursement "shortfalls" from Medicaid participation, improving access to care, medical research, health professionals' training, and other contributions to promote population health. A hospital's community benefit activity may express its charitable mission, but it also serves to justify tax exemption. This study identifies varied approaches of and trends in state legislation and regulation governing nonprofit hospital community benefit responsibilities and hospitals’ accountability to the communities they serve.

**Study Design:** Collection and analyses of primary data from the statutes and regulations of the 50 states. Data collection determined the presence or absence in each state of law or regulation mirroring selected elements of the federal nonprofit hospital community benefit requirements established by the Affordable Care Act (ACA) §9007 (26 U.S.C. §501(r)). Relevant state law and regulatory activity were initially identified by law students. A nonscientific survey, primarily of state hospital association representatives, was conducted to support verification of researchers’ negative findings. Accuracy was confirmed by review and, as necessary, correction by J.D./MPH-credentialed program staff.

**Population Studied:** This study identifies and analyses state community benefit requirements and their relevance to nonprofit hospital accountability and transparency and, ultimately, to population health.

**Principal Findings:** Data collection has been completed, with ongoing analysis scheduled for completion no later than March 1, 2013. Principal findings will focus on the varied approaches to state community benefit regulation including requirements relating to: The provision and reporting of nonprofit hospital community benefits; Community health needs assessment; Charity care and financial assistance; Limitations on patient charges, billing, and debt collection; Community benefit as a condition of tax exemption and hospital licensing.

**Conclusions:** Before the ACA, nonprofit hospitals’ community benefit contributions sprang from the demands of charitable mission, loosely-defined federal tax exemption requirements, and a patchwork of varying state laws and regulations. Today, the ACA and IRS have standardized community benefit requirements, but only at the federal level. The financial value of state tax exemption is at least as great as that of the federal exemption and thus creates a powerful financial incentive for nonprofit hospital community health improvement activities. Analysis of the study’s findings will identify policy implications associated with differing state regulatory approaches, such as: Requiring nonprofit hospitals to provide and/or report community benefits at the state level; Specifying mandatory community benefit expenditure levels; Conditioning tax exemption, licensing, or other government action benefitting hospitals on the provision of community benefits.

**Implications for Policy, Delivery, or Practice:** The study’s findings will be useful to state legislators as they consider legislative, regulatory, and policy approaches that may either reconcile existing state community benefit policies with the new federal requirements; retain state regulatory frameworks in their current form, or establish new, independent state standards that may build on or exceed federal community benefit requirements.

**Funding Source(s):** Other, The Kresge Foundation

**Poster Session and Number:** A, #121

**Improving Depression Care through an Online Learning Collaborative**

Melissa Starkey, American College of Physicians; Amir Qaseem, American College of Physicians

**Presenter:** Melissa Starkey, PhD, Clinical Associate, Clinical Policy, American College of Physicians, mstarkey@acponline.org
**Research Objective:** To develop and study the impact of an electronic educational module for physicians and practice teams to improve the screening, diagnosis and management of depression

**Study Design:** The study had a pre-post design. The intervention consisted of an online educational program and conference calls with the practices to aid physicians and their teams in goal setting and to help them with the development and implementation of a quality improvement strategy. Data for this study were gathered from: 1) physician practice pattern surveys and 2) chart abstractions. The Likert-scale survey was intended to capture what the physicians believed they were doing, while the chart audit tool assessed what the physicians were actually doing. Baseline measurements were taken at the initiation of the study, and the follow-up measurements were taken after completion of the intervention.

**Population Studied:** Internal medicine physicians managing patients with depression

**Principal Findings:** Both chart abstraction and survey data indicated that participation in the educational intervention helped physicians to successfully incorporate use of the Patient Health Questionnaire-9 (PHQ-9) into their practices. Data from chart abstractions showed that the PHQ-9 was used to detect and/or diagnose depression for 60.8% of patients post-intervention compared to 17.6% at baseline. Physicians also self-reported administering the PHQ-9 to assess initial treatment response at follow up more often after completing the intervention than at baseline. Additionally, more practices self-reported repeating a depression evaluation (such as the PHQ-9) over time during treatment in order to gauge success of treatment with antidepressants or counseling. There were also improvements in screening of suicide, alcohol and substance abuse following the educational intervention. Other practice changes evidenced from the chart abstractions included an increase in the percentage of patients who were assigned depression care managers (from 3.9% to 20.2%) as well as increased entry of patients into depression registries (7.6% compared to 24.3%).

**Conclusions:** The educational program was helpful for eliciting practice change and physicians successfully incorporated depression screeners into their practices. They noted that having a way to quantify depression severity was previously unknown to them prior to the project and helped them in managing their patients’ conditions. However, physicians were unsure about how to set practice improvement goals and needed an appreciable amount of coaching during conference calls.

**Implications for Policy, Delivery, or Practice:** Promoting the uptake of depression screening tools such as the PHQ-9 can be instrumental in effecting positive practice change. Many practices reported that these screeners were relatively easy to use and incorporate as routine screening tools in their practices. A big challenge to overall quality improvement for depression management was a lack of resources as well as getting “buy in” from other physicians in the practice and from administration.

**Funding Source(s):** Other, Bristol Meyers Squibb, Otsuka America Pharmaceuticals, and Astra Zeneca

**Poster Session and Number:** A, #122

**Development of Patient Experience Survey Tool in Singapore: Use of Cognitive Testing**

**Presenter:** Lindy Tan, Biostatistician, College of Medicine Building, Ministry of Health, lindy_tan@moh.gov.sg

**Research Objective:** With an ageing population and increase in chronic disease burden in Singapore, various national initiatives are put in place to facilitate integrated care for patients, between acute and community settings. Assessing patient experience as they navigate the healthcare system is one way to assess the effectiveness of such measures. A national patient experience survey (NPES) was proposed to provide a standardized methodology for collecting and reporting information through a reliable set of questions that would capture the patients’ experiences in local hospitals.

**Study Design:** The HCAHPS (Hospital Consumer Assessment of Healthcare Providers and Systems) survey is a national, standardised, publicly reported survey of patients’ perspectives of hospital care in the US. It allows objective and meaningful comparisons to be made across hospitals on a national basis. To assess if this is a suitable tool for use in the local context, among the major ethnic groups (Chinese, Malays, Indians) in Singapore, cognitive testing was conducted on 6 selected items from HCAHPS. Items were selected based on...
potential for misunderstanding due to cultural context.
There were 2 rounds of cognitive testing conducted through the telephone. In round 1, English (N = 108) and Chinese (N = 36) cognitive testing took place concurrently. In round 2, survey items were translated into Melayu Behasa and cognitive testing was conducted on the selected items (N = 36). For English cognitive testing, participants were stratified by gender, ethnicity (Chinese, Malay, Indian), age (18 - 40, 41 - 65, > 65) and education (PSLE or less, secondary education, tertiary education) to represent the different gender, ethnic, age and education groups. For Chinese and Melayu Behasa cognitive testing, participants were also stratified similarly by gender, age and education.

**Population Studied:** Chinese, Malay and Indian Singapore residents/ permanent residents aged 18 years and above.

**Principal Findings:** Cognitive testing suggested that patients define "courtesy and respect", as well as "careful listening" similarly. Expectations include making the effort to communicate with patient such that the patient understands his/her condition and progress. This includes speaking in patient’s dialect and utilizing alternative ways of communication (e.g., drawing). Participants interpreted certain terms in varied ways. For instance, “discharge planning” was understood by several participants as a passive activity, such as whether the patient was informed of suitability of discharge and keeping the patient updated on his/her condition. Some items also captured unintended information. For instance, probing on responses to the item “During this hospital stay, how often did doctors explain things in a way you could understand?” showed that some participants did not understand things because they were in pain, dizzy or otherwise unable to focus on what the doctors were saying.

**Conclusions:** Cognitive testing gave a better understanding of patients’ expectations of the healthcare experience. It also revealed the need for clarification of terms used in the NPES.

**Implications for Policy, Delivery, or Practice:** It is necessary to directly survey patients to determine if their experiences have been hassle free. Survey items that are understood as intended and interpreted consistently across participants facilitate accurate measurement of our success with developing integrated care and patient-centeredness.

**Funding Source(s):** Other, MOH, Singapore

### Poster Session and Number: A, #123

**Trends in Breast and Cervical Cancer Screening Rates in the NBCCEDP – 1997-2009**

Florence Tangka, Centers for Disease Control; Tamara Lee, U.S. Census Bureau; Jerzy Wieczorek, U.S. Census Bureau; Wesley Basel, U.S. Census Bureau; Kristy Joseph, Centers for Disease Control; Janet Royalty, Centers for Disease Control

**Research Objective:** Breast and cervical cancer screening rates are low among low income women who lack insurance coverage for mammography and Pap tests. To help these underserved women gain access to breast and cervical cancer screening services, the U.S. Congress passed the Breast and Cervical Cancer Mortality Prevention Act of 1990 (Public Law 101-354), authorizing the Centers for Disease Control and Prevention (CDC) to establish the National Breast and Cervical Cancer Early Detection Program (NBCCEDP) referred to henceforth as the Program. The Program provides services through cooperative agreements, which are in place in all 50 states, the District of Columbia (DC), 5 U.S. territories, and 12 tribes. To date, no study has been done to examine the trends in mammography and Pap tests use in the NBCCEDP.

We examines the trends in breast and cervical cancer screening in the NBCCEDP, to find out if screening rates have changed from 1997 through 2009.

**Study Design:** We analyzed data from the US Census Bureau and the Program from 1997 through 2009 to describe the trends in breast and cervical cancer screening rates in the NBCCEDP, by age groups and by race/ethnicity. Low-income, uninsured women aged 18-64 are eligible for free breast and cervical cancer screening services through the Program. We used data from the U.S. Census Bureau to estimate the number of women eligible for the program, based on insurance status and income. The estimates were adjusted for hysterectomy status using the National Health Interview Survey. We obtained the number of women receiving Program-funded Mammograms and Pap tests from the Program.
Population Studied: Low-income, uninsured women aged 18-64 are eligible for free breast and cervical cancer screening services.

Principal Findings: Results: Rates of breast and cervical cancer screening test use by the NBCCEDP eligible population increased moderately (by less than 5%) over a decade. Screening rate increases varied by age-groups, and by race/ethnicity.

Conclusions: Reducing mortality and late-stage breast and cervical cancers are top priorities in public health. High screening rates results in a decrease in cancer incidence and mortality. Also screening identifies cancers at an earlier stage when treatment is possible and affordable. The NBCCEDP-eligible (underserved) population would benefit from additional interventions (patient navigators, access to usual source of care), besides paying for tests, that will increase their screening rates. Constant monitoring of breast and cervical screening rates trends is critical.

Implications for Policy, Delivery, or Practice: The next step would be to identify factors that explain the variation in screening rates and identify changes that CDC can implement to increase the average screening penetration rates. Such changes would help the program reach more disadvantaged women and help reduce disparities.

Funding Source(s): No Funding

Poster Session and Number: A, #124

The Impact of a School-Community Integrated Behavioral Health Service on Child and Family Outcomes
Lauren Terhorst, Community Care Behavioral Health Organization; James Schuster, UPMC Center for High-Value Health Care, Community Care Behavioral Health; Shari L. Hutchison, MS, Community Care Behavioral Health Organization; Jane N. Kogan, PhD, UPMC Center for High-Value Health Care; Judith W. Dogin, MD, Community Care Behavioral Health Organization

Presenter: Lauren Terhorst, Ph.D., Clinical Outcomes Analyst, Community Care Behavioral Health Organization, terhorstl@ccbh.com

Research Objective: There is increasing concern about children’s unmet mental health needs, with many stakeholders interested in improving the integration of services between community mental health providers and schools. Working closely with several school districts in Pennsylvania to identify needed services and supports, provider organizations and a large nonprofit Medicaid managed behavioral health organization developed an integrated school based behavioral health (SBBH) Team Service to deliver care to youth and families through a clinical home model in schools. This study represents an evaluation of the impact of the implementation of SBBH Team Service on child and family functioning.

Study Design: Child and family functioning and therapeutic alliance were assessed by the Child Outcomes Survey (COS), an 11-item measure completed monthly by parents that assesses the child’s progress in treatment on key domains and facilitates family/Team communication about the child’s progress in treatment. Children’s symptoms and behaviors were assessed quarterly using parent and teacher completed Strengths and Difficulties Questionnaires (SDQ). Linear mixed models were utilized to examine changes over time in child functioning, family functioning, and behaviors during participation in SBBH services.

Population Studied: We identified 925 children receiving SBBH services; the mean age was 10 years with 77% boys. Children being served are racially and ethnically diverse with 28% Hispanic, 15% African American, and 9% more than one race.

Principal Findings: Over the first 12 months of SBBH services, results from the COS demonstrate a significant improvement in average levels of family functioning (F4, 2283=18.95, p<.001), child functioning (F4, 2196=46.36, p<.001) and therapeutic alliance (F4, 2169=6.28, p<.001). Greatest improvements in functioning occurred during the first 6 months, while the greatest improvement in therapeutic alliance occurred between 9 and 12 months. Parents report slightly higher levels of child difficulties but also higher levels of positive social behaviors on the SDQ compared to teacher report. Both parent and teacher report on the SDQ of the child’s total difficulties subscore shows significant improvement over time (F4,1380=13.84, p<.001 and F4,1034=15.27, p<.001, respectively). Parents report the most improvement in child difficulties within the first 3 months, while teachers report greatest improvement over the first 9 months. Parents and teachers also report a significant improvement in social behaviors over time (F4,1487=3.82, p=.004 and F4,984=7.09, p<.001). Parents report the most improvement in...
The Use of Patient Reported Outcomes in Managing Patients with Chronic Conditions: Experience From the Field

Debra Scammon, PhD, University of Utah, David Eccles School of Business; Andrada Tomoaia-Cotisel, University of Utah; Jennifer Tabler, BS, University of Utah, Department of Sociology; Lisa Gren, PhD, University of Utah, School of Medicine, Department of Family & Preventive Medicine; Julie Day, MD, Community Clinics, University of Utah Hospitals and Clinics; Michael K. Magill, MD, University of Utah, School of Medicine, Department of Family & Preventive Medicine

Presenter: Andrada Tomoaia-Cotisel, MHA, MPH, Research Associate, Department of Family & Preventive Medicine, University of Utah, andradat@hsc.utah.edu

Research Objective: To document our experience with (1) developing the capabilities to capture and use patient reported outcomes (PRO), and (2) collecting PRO over time. PRO are a source of useful data for delivering personalized healthcare. They can facilitate goal-setting and monitoring, as well as inform strategies to enhance patient engagement.

Study Design: A mixed methods design to examine experience in a care management program in which care managers (CM) are embedded into care teams. In a pilot study, during initial care management visits, patients completed several assessments with data entered into their Electronic Medical Record (EMR): (1) the PHQ-9 depression screen, (2) the Patient Activation Measure (PAM), and (3) the RAND 36 perceived quality of life measure. Regular CM meetings were held to discuss implementation issues, including those related to the collection and use of PRO. Solutions have been evaluated in Plan Do Study Act cycles. Changes in patients’ assessment results were assessed using test-retest t-tests (alpha =0.05).

Population Studied: Patients with chronic conditions participating in the care management program within nine University Health Care Community Clinics (UUCC), with at least one CM visit during the last 18 months.

Principal Findings: Challenges in developing the capacity to collect and use PRO include developing: (1) infrastructure and capability to capture and integrate PRO into the EMR; (2) work flows and processes to administer assessments; and (3) reporting capabilities so that care managers (CM) can access, interpret, and use the PRO. Attempted administration of repeated assessments revealed several realities: (1) Although 980 patients participating in our care management program, less than 400 have completed each of our assessments at least once (PAM – 390; PHQ9 – 391; RAND 36 -372) and only 7-8% have completed these assessments multiple times. However, when assessments are administered at initial CM visits, the opportunity to obtain re-assessments is increased. (2) Change in the desired direction is evident and statistically significant (p<.05) for some measures among patients who have completed assessments multiple times. Improvement on General Health, Social Functioning, and Energy/Fatigue was significant as measured by the RAND 36; the PAM Activation score showed statistically significant improvement; and the Severity and Symptom scores on the PHQ9 improved significantly. (3) PRO provide important feedback for patients regarding their progress. A patient recently diagnosed with diabetes with an initial depression score of 14 (PHQ9) expressed concerns about weight and needed lifestyle changes. With frequent CM visits to discuss diabetes, diet, and exercise, and motivational interviewing about self-control, the patient's PAM activation score increased by 11 points, his RAND General Health score improved by 50 points and his PHQ9 decreased by 14 points.
Conclusions: PRO complement clinical information for the management of patients with chronic conditions. PRO are challenging to systematically collect, but they provide important feedback for CMs to help patients reach their personal goals.

Implications for Policy, Delivery, or Practice: Building capacity to collect and use PRO is challenging but benefits to patients are observed. Thus, incentives for primary care practices to implement protocols for the ongoing collection of PRO should be encouraged. EMRs provide important infrastructure for acquiring PRO.

Funding Source(s): AHRQ
Poster Session and Number: A, #126

Characterization and Feasibility of a Care Manager-Based Transitions Management Program within a Patient Centered Medical Home
Timothy W. Farrell, MD, University of Utah Department of Family & Preventive Medicine; Andrada Tomoia-Cotisel, University of Utah School of Medicine; Kimberly Brunisholz, MST, University of Utah Department of Family & Preventive Medicine; Norman Waltzman, PhD, University of Utah Department of Economics; Karen Gunning, PharmD, University of Utah Department of Pharmacotherapy; Andrade Tomoia-Cotisel, MPH, MHA, University of Utah Department of Family & Preventive Medicine; Debra Scammon, PhD, University of Utah Department of Marketing; Amber Ferdig, University of Utah Department of Family & Preventive Medicine; Michael K. Magill, MD, University of Utah Department of Family & Preventive Medicine

Presenter: Andrada Tomoia-Cotisel, MPH, MHA, Research Associate, Department of Family & Preventive Medicine, University of Utah School of Medicine, andradat@gmail.com

Research Objective: Care transitions programs supporting patients during the vulnerable period between hospital discharge and the first post-hospitalization outpatient visit often involve a transitions coach. Such support has had a variable effect on reducing readmissions, depending on context and level of support. Few care transitions programs to date explicitly embed the transitions coach function within the Patient Centered Medical Home (PCMH). The objectives of this study were to: (1) characterize care transitions occurring within a defined primary care population; and (2) determine the intensity of care manager (CM) effort required within a dedicated transitions management (TM) program involving CMs embedded within Care By Design, the University of Utah Community Clinics’ (UUCC) version of the PCMH.

Study Design: CMs deployed in 9 of 10 UUCCs identified UUCC patients discharged from the University of Utah Hospital based on a daily electronic registry. CMs logged each care transition from this electronic registry and, for patients they deemed to be at high risk of returning to the hospital or emergency department (ED), attempted a phone contact to the recently discharged patient or her caregiver using best practices in post-hospitalization transitional care. CMs conducted TM in addition to other care management duties targeted for patients with specific chronic conditions.

Population Studied: CM logs (N=2321) documenting review of UUCC patients transitioning from the ED to home or hospital to home between September 2011 and June 2012 were examined. The mean and median age of the transitioning patients was 49.1 and 48.8 years, respectively (SD 19.5). 569 (23.2%) of CM logs involved patients older than age 65.

Principal Findings: 1202 (51.8%) of CM logs documented transitions from the ED to home and 1119 (48.2%) of CM logs documented transitions from the hospital to home. 1459 or 57.1% of all transitions resulted in a CM phone contact to patients or their caregivers based on perceived risk of rehospitalization or return to the ED. Among these 1459 transitions, CMs successfully made phone contacts for 863 transitions (59.2%). Overall, 33.8% of discharges from the ED and hospital resulted in successful CM phone contact. The average CM workload was 38.6 transitions per month, or 1.29 transitions per day. Additional results will be presented comparing the hospital readmission and ED return rates of UUCC Medicare beneficiaries receiving TM to the overall Medicare population in Utah.

Conclusions: The majority of CM contacts within a PCMH-based transitions management program involved discharges from the ED. CMs judged 1 out of 3 of all care transitions to represent high risk of hospital readmission or return to the ED. The workload per CM required to execute TM after reviewing the daily electronic registry was about 1 transition per day.

Implications for Policy, Delivery, or Practice: While care transitions programs often focus on
hospital discharges in order to reduce hospital readmissions, we found ED discharges to be more numerous within a primary care population, suggesting that care transitions programs should incorporate both ED and hospital discharges. The TM program within the UUCC addresses both ED and hospital discharges. TM may be realistically incorporated within the care management function of the PCMH.

**Funding Source(s):** AHRQ

**Poster Session and Number:** A, #127

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Debra Tan, MPH, University of North Texas Health Science Center; Rebecca Trocki, Agency for Healthcare Research and Quality; Shyam Misra, MD, PhD, Agency for Healthcare Research and Quality; Kishena Wadhwani, PhD, MPH, Agency for Healthcare Research and Quality; Francis Chesley, Agency for Healthcare Research and Quality

**Research Objective:** The purpose of this study was to determine research productivity: return investment in AHRQ funded research grants and to perform an analysis of the publication outputs and journal impact factors associated with AHRQ grants in the form of dissemination.

**Study Design:** AHRQ Grants On-Line Database (GOLD) was searched for grants funded from 2003-2010 to allow a two year lag time to publication for a new grant. The National Health Institute Query View and Report Database (NIH QVR) was subsequently searched based on principal investigator and grant identification number to determine any publications and journal impact factors. Findings were stratified based on AHRQ’s Portfolios of Research Priorities. Grant identification number, principal investigator, grant title, institution, state, project start date, project end date, portfolio, publication year, impact score, publication journal, author succession, investigator type and award amount were recorded

**Population Studied:** The Agency for Healthcare Research and Quality (AHRQ) invests in extramural research grants to improve the overall quality, safety, efficiency and effectiveness of health care for all Americans. The results of these extramural research grants in turn help Americans make better informed health care decisions to improve the quality of their health care services. Extramural research grants are prioritized into AHRQ’s Portfolios of Research: Comparative Effectiveness, Value, Health Information Technology, Prevention/Care Management, Patient Safety and Innovations/Emerging Issues.

**Principal Findings:** Overall journal impact score of AHRQ Portfolios of Research (2.034) was consistent with those for Health Services Research (2.293), the official journal of AcademyHealth which AHRQ funds. Health Information Technology received a large amount of funding (n=163, 48.98% of total budget) and had the second to highest average impact score (2.116). Prevention/Care Management received the highest average impact score (2.553) and the second to highest average publications (1.471) for grants. Patient Safety had the highest average publications (1.497). for grants Comparative Effectiveness had very few funded grants (n=20, 1.30% of the total budget) yet consistent average impact score (1.797) but fewer publications (0.80). Additionally, there was a total of 43 funded grants regarding health disparities. However, the number of total publications in peer reviewed journals and the total number impact scores remains consistent with AHRQ Portfolios of Research Priorities grants. The average journal impact score is relatively consistent with AHRQ’s Portfolios of Research Priorities (2.073). The average publication per one grant for AHRQ Health Disparities grants is manifold greater (4.372), however.

**Conclusions:** In summary, this study provides a comprehensive overview of the impact of AHRQ Funded Grants in terms of delivery of scientific knowledge to Health Services Research community. Overall Journal impact score of AHRQ Portfolios of Research (2.034) was consistent with Health Services Research journal impact score (2.293), which is the official journal of AcademyHealth. Although only 43 research projects addressing health disparities were funded by AHRQ, the average number of publications per grant was 4.372 and the average journal impact factor was 2.073, indicating that these funded projects have had significant contribution regarding scientific knowledge on health disparities to HSR community. Questions to be addressed in the future are whether funding has changed for...
Comparative Effectiveness since the implementation of the American Recovery and Reinvestment Act (ARRA).

**Implications for Policy, Delivery, or Practice:**
The outcome and results of the ARRA policy change have yet to be assessed. Moreover, further analysis should be done to examine how the Patient-Centered Outcomes Research Institute (PCORI) will affect the future of AHRQ's Comparative Effectiveness Portfolio funding.

Prospective analysis can be done using funding data obtained from this study. This may lead to a variety of detailed input-output analyses for AHRQ Portfolios of Research Priorities. For example, time histories showing funding or grant type, grants by institution, region, principal investigator, study design etc. could be constructed.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #128

**Analysis of Impact Scores Obtained as a Function of Review Cycles (From June 2010 To June 2012 Review Cycles)**
Debra Tan, MPH, University of North Texas Health Science Center; Rebecca Trocki, Agency for Healthcare Research and Quality; Shyam Misra, MD, PHD, Agency for Healthcare Research and Quality; Kishena Wadhwani, PhD, MPH, Agency for Healthcare Research and Quality; Francis Chesley, MD, Agency for Healthcare Research and Quality

**Presenter:** Rebecca Trocki, MSHAI, Program Analyst, Office of Extramural Research, Education, and Priority Populations, Agency for Healthcare Research and Quality, rebecca.trocki@ahrq.hhs.gov

**Research Objective:** To examine the trend of scientific quality of research grant applications submitted to AHRQ with time, we assessed the overall impact scores provided by each of 5 standing study sections as a function of times during the past 7 review cycles (from June 2010 to June 2012).

**Study Design:** As at the NIH, the Scientific Peer Review Committees at AHRQ use 9 points overall impact score system to evaluate the scientific merit of research grant applications submitted to AHRQ for funding opportunity. This analysis is based upon the enhanced score criterion http://grants.nih.gov/grants/guide/notice-files/NOT-HS-10-002.html using the final impact scores assigned to the applications that were discussed at the review meetings from five study sections and Special Emphasis Panel (SEP) that were reviewed from June 2010 to June 2012 (a total of 7 review cycles). The data used in this analysis was from the National Institutes of Health (NIH) Query View & Report Database (QVR system). Microsoft Excel and SPSS were the tools used for analysis.

**Population Studied:** Research grant applications submitted to AHRQ were reviewed by one of the 5 standing study section committees or by the Special Emphasis Panel (SEP), depending whether these applications responding to Program Announcement (PA) or Requests for Application (RFA) http://www.ahrq.gov/fund/grantix.htm#PA for FY2010 – FY2012. The 5 study section review committees at AHRQ are: Healthcare Systems & Value Research (HSVR) Healthcare Information Technology Research (HITR) Healthcare Effectiveness and Outcomes Research (HEOR) Healthcare Safety and Quality Improvement Research (HSQR) Healthcare Research Training (HCRT), which are described in detailed under the weblink: http://www.ahrq.gov/fund/peerrev/peerdesc.htm. In addition to the 5 study section review committees, AHRQ also has convened many SEPs to evaluate grant applications responding to the RFAs.

**Principal Findings:** The means impact scores trend to increase with time in terms of review cycles (from June 2010 to June 2012). The means impact scores trend to increase with time in terms of review cycles (from June 2010 to June 2012). For example, for the HCRT, HQER or HSR study section, the means impact scores decrease to a lowest values of about 31-35 the exception of February 2011 review cycle meeting. The means of overall impact scores gradually increased to higher values at the subsequent review cycles to about 38 to 53 for all 5 study sections. The means for the June 2010 cycle ranged from 36.26 – 40.76 and the means rose to upward trend for the June 2012 cycle at 38.48 - 53.46 range showing an upward trend. Although the mean values of impact scores implicated an upward trend from June 2010 to June 2012, there was no statistical significance among these mean values (P value greater than .05).

**Conclusions:** Our analysis of impact scores among study sections as a function of time reviewed no statistically significant differences, indicating that the AHRQ peer review process is...
consistent in terms of quality of the scientific review among study sections.

**Implications for Policy, Delivery, or Practice:**
Our findings could provide useful information to the AHRQ leadership as well as extramural health services research community regarding the scientific peer process for grant applications submitted to AHRQ for funding opportunity.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #129

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**The Study of the Relationship between Knowledge, Attitude and Practice toward the Acceptance of H1N1-New Flu Vaccine among Professionally Active Nurses in Taiwan**

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**Research Objective:** Along with the development and promotion of public health effort, the main killer diseases have been changing from acute infectious diseases to chronic ones throughout the past decades. Unfortunately, some highly contagious infectious diseases still caused a great number of deaths lately and it raised great concerns about the control of outbreak as well as the prevention of the newly evolved infectious diseases, such as SARS or Swine Flu. This study is to explore and discuss the relationship between nursing staffs’ knowledge, attitude and their actual practice toward receiving the vaccine for H1N1 swine flu. The purposes of this study include: 1) Assess the accuracy of care knowledge for H1N1-swine flu patients among professionally active nurses. 2) Examine the factors affecting the willingness in receiving H1N1 vaccine among professionally active nurses.

**Study Design:** This study is designed to explore and examine the relationship between the perceptions (knowledge and attitude) of the H1N1-New Flu and their practice in accepting vaccination among clinical nurses in Taiwan. The study performs a survey to collect information from professionally active nurses of their personal characteristics and assessments of their knowledge, attitude and practice in vaccine after the national vaccine campaign period. Based on this data, we further analyze to examine the difference and relationship between the knowledge, attitude and practice toward the H1N1-New Flu and its vaccine acceptance among professionally active nurses. Using the linear and logistic regressions, this study examines the impacts of personal characteristics on vaccine acceptance behavior. This study further uses a path analysis to examine if education level will affect the knowledge level and further influence the willingness to accept vaccine.

**Population Studied:** The subjects of this study include all professionally active nurses working at health stations, hospitals above the district-hospital level, clinical nurses at school in Pingtung County, Taiwan. Altogether, four hundred and ninety-four effective sample surveys were collected. The surveys toward all nurses working at health stations in this county were delivered and collected either in person or through mails. For those surveys performed toward nurses working at hospitals, it is conducted and collected through a random sampling procedure. We first sample hospitals randomly to get a list of participating organizations, then sent out the official written request to get approvals for the survey to be performed at their hospitals. With the approvals from hospitals, we sent out invitation letters to all nursing staffs at hospitals according to the licenses registration record at the county health department to inquire their intentions to participate in the study. The aim was set to reach more than thirty percent of full time employees at each health institutions to be our sample subjects. The sampling procedure and surveys were conducted and collected during February to April 2010 based on the following inclusion criteria:

1) Must be clinically practice or prevention focus practice registered nurse (RN) or license-practice nurses (LPN)
2) Must practice nursing in Pingtung County, Taiwan
3) Must be younger
than sixty years of age who can clearly read and comprehend the contents of the survey and willing to participate in the study.

Principal Findings: This study finds that fewer than half of the professionally active nurses receive influenza vaccination every year. Even with the raging H1N1-New Flu in the end of 2009, it did not increase the acceptance rate of the H1N1 vaccination much (64.57%). This study also finds that professionally active nurses with graduate level of education score significantly higher in the knowledge test about the H1N1-New Flu and its vaccine than those from other groups with lower education levels. Through linear regression analyses, significant differences in score of knowledge test are also found among different working institutions. However, no significant difference was found among other factors, such as, age, frequency of influenza infection, having chronic diseases, side effects due to the vaccination, or even willing to pay for family to receive vaccination using self-pay. The results from a path analysis also show no significant difference if education level acts as the factor influencing the vaccination acceptance practice behavior directly. However, there is a significant association between the education and vaccination acceptance behavior if the score from knowledge test about H1N1 plays as the intervening factor which receives the impact from education level then further transfers it to influence the vaccine acceptance behavior. The results show that education level alone is not the influential factor affecting the willingness of vaccine acceptance. However, acting as an intervening variable, education level may help improve the knowledge scores and further influence the willingness of vaccination acceptance.

Conclusions: This study finds that improving the knowledge and attitude toward the H1N1 vaccine among professionally active nurses actually has significant impacts on vaccine acceptance behavior and it further plays a role in improving the vaccination rate. It is suggested that the CDC in Taiwan should provide sufficient educational material to promote the safety of the H1N1 vaccine in the campaign. In addition, this study also finds it helpful if hospitals of all levels and health departments not only systematically report the adverse reactions due to the vaccine injection but also propose effective prevention mechanisms to them. Since H1N1 is different from and more fatal than the general influenza and H1N5 (bird flu); CDC in Taiwan needs to promote the epidemiologic concept of disease prevention in their operation, as well as, encourage professionally active nurses and other health workers to participate more in those activities advocating disease prevention and absorb right information.

Implications for Policy, Delivery, or Practice: The final knowledge test score in this study was surprisingly low among the nearly five hundred participating professionally active nurses. It may imply an opportunity to enhance the on the job training for those professionally active nurses who provide the primary level of patient care. In addition, professionally active nurses working at hospital ICUs, ERs, dialysis centers, nursing administration or infection control departments scored higher than those who work at health stations or schools may imply that the government needs to put more effort on providing adequate information to those remote areas. In general, professionally active nurses working as the front line health practitioners who expose directly to the diseases, bacteria and virus, should have the highest priority to receive the vaccination. This study finds that there are about 10.37% of professionally active nurses who never received government provided influenza vaccination and only 42.11% received it every year. A mandatory or financially incentive vaccination policy may be suggested to protect these front line workers. Finally, another important finding is that education level among professionally active nurses affects the knowledge of the disease, and the knowledge level. It further influences the vaccine acceptance behavior. It implies that to promote the acceptance rate of vaccination should start with improving the perception, including knowledge and attitude, of the H1N1-New Flu and its vaccine.

Funding Source(s): No Funding
Poster Session and Number: A, #130

Smoking and Adult Asthma Outcomes in the United States, 2006-2009
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Presenter: Chu-lin Tsai, M.D., Sc.D., Assistant Professor Of Epidemiology, Epidemiology, University of Texas School of Public Health, chu-lin.tsai@uth.tmc.edu
Research Objective: Little is known about the effect of smoking on asthma outcomes in adults, particularly at a national level. The objective of this study was to investigate the impact of smoking on asthma outcomes (asthma control, health care utilization and cost, and quality of life).

Study Design: We combined data from multiple panels of the Medical Expenditure Panel Survey (MEPS) to form a longitudinal cohort from 2006 to 2009. The MEPS is a nationally representative survey of the US noninstitutionalized individuals and their medical providers and employers. Participants are interviewed in person for 5 rounds over 2 full calendar years. Individuals provide information on their demographic and socioeconomic characteristics, insurance, medical conditions, health care and medication use, and health status. The Medical Provider Component of the survey is used primarily to supplement individual-reported expenditure information.

Population Studied: Individuals aged 18 to 45 years with current asthma at baseline were identified as study subjects for the present analysis. Based on self-reported smoking status, subjects were divided into two groups: current smokers and non-current smokers. Baseline demographics were compared between the two groups, and smoking status at baseline was used to predict asthma outcomes in subsequent years.

Principal Findings: After the weighting procedures, 30% of adults with asthma in the US reported current smoking. There were an estimated 6,008,000 smoking and 14,000,000 nonsmoking asthmatics in the US. Compared with nonsmoking asthmatics, smoking asthmatics were more likely to be non-Hispanic white (70% vs. 64%, p=0.02), uninsured (28% vs. 9%, p<0.001) or on Medicaid (28% vs. 13%, p<0.001), poor (30% vs. 13%, p<0.001), and less educated (12 vs. 14 years, p<0.001). Smoking asthmatics were more likely to have hypertension (27% vs. 19%, p=0.046), emphysema (5% vs. 1%, p=0.01), chronic bronchitis (21% vs. 9%, p<0.001), and to report poor health status (10% vs. 5%, p<0.001). For asthma outcomes in the subsequent years, smoking asthmatics were less likely to use preventive asthma medicine (34% vs. 42%, p=0.049), visited office-based providers less (5.2 vs. 7.4 times a year, p=0.01), and had lower annual total health expenditure ($3,774 vs. $4,690, p=0.03), compared with nonsmoking asthmatics. Finally, smoking asthmatics reported worse quality of life with lower SF-12 mental health scores (45 vs. 49, p<0.001) and physical health scores (46 vs. 50, p<0.001), compared with nonsmoking asthmatics. After adjusting for baseline characterizes and disease severity, these many differences in asthma outcomes persisted, except that the difference in health expenditure was explained by insurance and disease severity.

Conclusions: Despite having a chronic respiratory disease, about one third of asthmatics still smoke cigarettes. Current smoking in adults with asthma are associated with lower socioeconomic status, poor access to care, worse asthma control and poor quality of life. The lower health expenditure among smoking asthmatics is due, at least in part, to a lack of insurance.

Implications for Policy, Delivery, or Practice: Smoking disproportionately affects disadvantaged asthma populations and is associated with poor asthma outcomes. Public health intervention should focus on smoking cessation among these vulnerable subpopulations in adults with asthma.

Funding Source(s): No Funding

Poster Session and Number: A, #131

The Effect of Hospital Global Budgeting on Stroke Outcomes: The Mediating Role of Medical Services Use
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Research Objective: As health care costs keep rising, cuts in reimbursement, such as global budgeting or the Balanced Budget Act in the United States, have become the key to health care reform efforts. Reimbursement cuts are associated with changes in patient outcomes in several studies; however, the mechanism underlying this relationship has received little attention. This study was to assess the mediating role of medical services use in the association between reimbursement cuts and mortality for ischemic stroke; that is, whether the mechanisms underlying the association can be explained by certain items of care.
Study Design: We used the National Health Insurance Research Database, provided by the Bureau of National Health Insurance and managed by the National Health Research Institutes. We identified patients discharged between years 1997 and 2007 with a diagnosis of ischemic stroke based on the International Classification of Diseases, Ninth Revision, Clinical Modification codes. Multilevel logistic and multilevel linear regression analyses were performed after adjustment for patient, physician, and hospital characteristics to determine the associations of reimbursement cuts with medical services use, and 30-day mortality.

Population Studied: There were 310,542 stroke patients admitted to general acute care hospitals in Taiwan over the period 1997 to 2007.

Principal Findings: Larger reimbursement cuts were associated with certain items of care, including less frequent use of physiotherapy assessment, lower reimbursement for nursing care and ward, shorter length of stay, and higher mortality. The use of physiotherapy assessment, reimbursement for nursing care and ward and length of stay mediated the association between reimbursement cuts and higher mortality.

Conclusions: Reimbursement cuts are associated with higher mortality; the association is mediated by certain items of care.

Implications for Policy, Delivery, or Practice: Financial pressure might influence provider’s decision making and result in poor stroke outcomes. Policymakers might need to develop strategies to ensure quality of physiotherapy and nursing care under reimbursement cuts. Quality improvement strategies for stroke care include establishing national protocols and guidelines, restructuring the fee-for-service schedule by increasing fees for deficient care associated with outcomes, or implementing a pay-for-performance initiative.

Funding Source(s): Other, National Science Council in Taiwan
Poster Session and Number: A, #132

Is there a Link between Using Silver Coated Urinary Catheters and Lower CAUTI Rate?
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Research Objective: Catheter-associated urinary tract infections (CAUTI) are the most frequent health-care related infections in acute care hospitals. University of Colorado Hospital staffs reported utilizing silver coated urinary catheters for a length of time before moving away from silver with no significant impact on urinary tract infection rates. Given Colorado’s success and evidence, we turned to UHC’s databases to better understand the prevalence of silver coated urinary catheter purchases (SpendLINK®) and patient outcomes (Clinical Data Base) to review whether any relationship existed between specific products and patient outcomes. Establishing a relationship between a medical device and quality care is the ultimate goal in proving the value of enhanced products that have been pushed into the supply market.

Study Design: A correlational analysis was conducted using outcomes data obtained from UHC’s Clinical Data Base/Resource Manager (CDB/RM) and SpendLINK®, a tool comprised of reporting modules including price benchmarking and Base MSDRG opportunity reports. Data from the two sources were linked by hospital identification number. The analysis looked for a positive relationship between the percent of urinary catheter spend that was for silver-coated devices versus the CAUTI incidence rate. The data set compared 45 member hospitals in both SpendLINK® and CDB/RM system by silver coated urinary catheters and non-silver coated urinary catheters purchase patterns to hospitals’ CAUTI rate.

Population Studied: The study reviewed FY2010 amounts of hospital-level data for the rate of silver-coated catheter supply spend from SpendLINK® against the rate of CAUTI from the CDB/RM for discharge in FY2010. Data from 45 member hospitals between the two database sets were reviewed, with 76,000+ purchase order records pulled from UHC’s SpendLINK® to determine percentage of silver spend in urinary catheters and twelve months of 2010 patient level data to determine CAUTI rate. The numerator for the rate was defined by adult discharges with a principal or secondary diagnosis code of 996.64 and not present on
admission or all cause readmissions within 7 days with a principal or secondary diagnosis code of 996.64 with present on admission. The denominator was adult discharges.

**Principal Findings:** By analyzing both hospital purchases and patient outcomes databases, we found no correlation between purchase patterns of silver foley catheter and CAUTI rates. Of the 45 hospitals analyzed, CAUTI rate varied between 0.06 and 4.49, while percentage of spend on silver coated catheters varied between 0% and 90%. The R² value between CAUTI rate and percentage of silver spend was 0.0402. On further analysis, we found potential cost savings of 1.99 million dollars in FY2010 ranging from $258 to $151,919 among 35 hospitals associated with moving away from silver while staying with their current supplier. Across the 35 hospitals, there was a mean potential cost saving of $57,142 and a median potential cost savings of $49,796.

**Conclusions:** The analysis of percentage of silver coated catheters purchases compared to CAUTI rate did not exhibit a positive relationship between spending levels and lower CAUTI rate. UHC believes that moving away from silver coated urinary catheter purchases may have significant cost benefits for some hospitals.

**Implications for Policy, Delivery, or Practice:**

- **Funding Source(s):** No Funding
- **Poster Session and Number:** A, #133

**Health Insurance for the Unemployed: The Risk of Unemployment Related Coverage Changes**

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**Presenter:** Namrata Uberoi, MPH, PhD Candidate, Health Policy and Administration, The Pennsylvania State University, namrata@psu.edu

**Research Objective:** The Affordable Care Act (ACA) expands sources of health insurance coverage and creates health insurance exchanges. Nonetheless, the Congressional Budget Office estimates that employer-sponsored insurance (ESI) will continue to be the cornerstone of health insurance coverage, covering 60 percent of Americans. Consequently, changes in employment will continue to cause gaps and transitions in health insurance. The risk of unemployment differs by income. The risk of losing one’s coverage as a result of employment loss also differs by income.

This study examines coverage changes related to employment loss at income levels distinguished by the ACA: less than 138 percent FPL (low), 138-399 percent FPL (middle), and greater than or equal to 400 percent FPL (high).

**Study Design:** This study utilizes data from the 2004 and 2008 Survey of Income and Program Participation and examines individuals’ employment and coverage losses. An employment loss is characterized as going from employed in one month to unemployed in the subsequent month. We examined the monthly risk of employment loss for working adults by income. We then examined coverage in the months before and after employment losses by income.

**Population Studied:** Working adults, ages 18 to 64.

**Principal Findings:** In monthly data, 44 percent of low-income, 20 percent of middle-income, and 5 percent of high-income workers were uninsured. Insurance through one’s current employer increased with income – 27 percent of low-income, 65 percent of middle-income, and 83 percent of high-income workers had ESI. In the month prior to becoming unemployed, 40 percent of the unemployed were uninsured. Of those uninsured, 41 percent were low-income, 47 percent were middle-income, and 13 percent were high-income workers. Twenty-eight percent of individuals who experienced an employment loss had ESI after becoming unemployed. Among individuals with ESI, 10 percent were low-income, 46 percent were middle-income, and 44 percent were high-income. Among low-income individuals who were uninsured after becoming unemployed, 85 percent were uninsured and 6 percent had ESI when employed. Among middle-income individuals who were uninsured when unemployed, 72 percent were uninsured when employed and 15 percent had ESI. For high-income persons who were uninsured when unemployed, 57 percent were uninsured and 23 percent had ESI when working.

**Conclusions:** Seventy-four percent of individuals who are uninsured after losing their jobs were uninsured when employed. Middle and high-income workers are more likely to have ESI and consequently are at greater risk of losing health insurance when they experience an employment loss.

**Implications for Policy, Delivery, or Practice:** Gaps and transitions in health insurance due to employment loss will continue to be significant in
the health reform environment. The ACA provides some new protections. Low-income workers will be covered by Medicaid in states that expand their Medicaid programs. At the other end of the income distribution, high-income workers will receive no support. While middle-income workers will have the benefit of exchange subsidies, this group will have to adjust where and how they attain coverage. Thus understanding the prior and subsequent coverage of workers who lose their jobs is crucial in implementing coverage expansions, minimizing gaps, and identifying subgroups that will and will not benefit from coverage reforms.

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Poster Session and Number: A, #134

Limited Availability of Major Depressive Disorder Care Coordination and Patient Engagement Quality Measures—Current Challenges to Improved Quality of Care
Elizabeth Walsh, Avalere Health; Kelsey Jones, Avalere Health; Michelle Bruno, Avalere Health; Kristi Mitchell, Avalere Health

Research Objective: Major depressive disorder (MDD) is a prevalent disease that frequently occurs alongside other physical and mental health conditions. Identified by the Centers for Medicare & Medicaid Services (CMS) and National Quality Forum (NQF) in 2009 as a top-20 high-impact condition, there has been a recent proliferation of quality measures focused on MDD. While MDD is often diagnosed in the primary care setting, a number of cases require the active participation of mental health specialists and caregivers. Avalere sought to assess whether care coordination measures for this population exist, and if so, the extent to which they are used in national programs to improve quality of care.

Study Design: To assess the landscape of measures, Avalere created a database of MDD-related measures from sources including NQF, professional societies, and relevant government entities. Avalere mapped these measures to the MDD care continuum to determine whether measures focused on one aspect of care (e.g., screening, treatment) or more broadly supported care coordination across the continuum. We identified whether the available care coordination and patient engagement measures are used in national programs. Finally, we conducted interviews with representatives of guideline and measure developers and a national health plan to understand the role care coordination and patient engagement measures play in improving MDD care.

Population Studied: N/A

Principal Findings: Avalere identified 48 MDD-related measures, of which 8 focus on care coordination or patient engagement. These measures were developed by the American Medical Association-Physician Consortium for Performance Improvement, Institute for Clinical Systems Improvement, and Foundation for Accountability (now a defunct organization). None of the measures are NQF-endorsed or used by national quality improvement programs such as the Physician Quality and Reporting System (PQRS). However, “Adult Major Depressive Disorder: Coordination of Care of Patients with Co-Morbid Conditions – Timely Follow-Up,” was proposed for inclusion in PQRS for 2013 despite lacking NQF endorsement. Targeted interviews suggest that care coordination is essential for effective MDD care. Interviewees highlighted successful MDD quality improvement programs (e.g., Minnesota’s “Depression Improvement Across Minnesota, Offering a New Direction”) that rely on an integrated structure that actively facilitates care coordination and involves patients in their care. However, stakeholders noted that measure development, endorsement, and use of care coordination and patient engagement measures has been difficult for a variety of reasons including the burden of data collection, difficulty testing measures, limited feasibility of implementation, challenges to physician buy-in, and lack of appropriate delivery and incentive structures.

Conclusions: With a recognized need for care coordination to improve patient outcomes, few measures that support this aspect of care are being used by national-level programs. Measure developers cite the difficulty of creating appropriate, feasible measures while users point to the limitations in current delivery structures.

Implications for Policy, Delivery, or Practice: Delivery systems that facilitate care coordination within primary care facilities, such as patient-centered medical homes and Medicaid Health Homes, may provide the greatest opportunity to support improved quality of care for MDD patients. With a focus on care coordination, these new delivery systems may provide the
Biopsychosocial Model of Improved Chronic Health for People Age 50 or Older with Chronic Conditions
Chia-chiang Wang, Northwestern University

Research Objective: About 80% of Americans age 50 or older have at least one chronic condition needing long-term care and rehabilitation services. As people getting older, the numbers of chronic condition they have are expected to be getting higher. Chronic conditions consume 84% of medical expenditures and account for 70% of annual deaths. However, most of chronic conditions are controllable and preventable. Early control or improvement in chronic illness for people age 50-64 could potentially decrease their likelihood of having additional chronic conditions and functional limitations as well as the burden on our healthcare system. A lack of empirical information about how to comprehensively improve chronic illness limits the development of integrated person-centered long-term care and health promotion programs, especially for those who are approaching older adulthood. This project aims to examine both the biological and psychosocial factors that are associated with patient-reported improvement in chronic health. It also seeks to explore the relationships between chronic health, functional limitations, self-rated health, and healthcare utilization.

Study Design: The Health and Retirement Survey (HRS) longitudinal database will be used to evaluate the perspective prediction of biopsychosocial factors on patient-reported improved chronic illness. The HRS has a nationally representative sample of at least 20,000 Americans age 50 or older and it is estimated that 6,500 cases will be selected based on the selection criteria. The outcome variable contains the information about the patient-reported improvement in chronic health of people with diabetes, cancer, heart conditions, arthritis, and lung diseases. Hierarchical logistic regression and Structural Equation Modeling (SEM) will be used to conduct statistical analyses. The major research hypotheses are that biological and psychosocial factors at baseline (2006) predicted improvement in chronic health 2 years later (2008), and that improved chronic health (wave 2) was positively correlated with less posterior functional limitations, better self-rated health, and decreased healthcare utilization/cost (all in 2010).

Population Studied: People age 50 or older with at least one chronic condition or disease.

Principal Findings: Expected findings will indicate the biopsychosocial risk/protective factors of improved chronic health for people with different chronic conditions. The differences in the predictors of improving chronic health among the two age groups (50-64 vs. older adults) will be reported. The data in the goodness-of-fit of the proposed model will be also provided.

Conclusions: This study will provide empirical evidence of how improved chronic health may result in less functional limitations, better self-rated health, and eventually decreased healthcare costs. The development of evidence-based biopsychosocial interventions will then help to reduce unnecessary healthcare utilization and medical expenditures.

Implications for Policy, Delivery, or Practice: This study could guide future longitudinal studies on how biological and psychosocial factors affect the health of aging population with different chronic conditions. Also, expected findings will inform the development of disease-specific biopsychosocial interventions to maintain or promote health of people age 50 or above and ease the increasing burden of our healthcare systems. It will then potentially prevent aging population from having additional chronic conditions to have a smooth and healthy transition to their elderhood and increase their financial security with less medical expenditure.

Funding Source(s): NIH

Poster Session and Number: A, #135

Who Receives Weight Reduction Advice? A Study of Patient and Provider Factors
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Funding Source(s): NIH

Poster Session and Number: A, #136
Research Objective: To determine the factors that influence the likelihood with which adult patients report receiving weight reduction advice from a health provider.

Study Design: Cross-sectional data analysis using the 2009 New Jersey Family Health Survey, a random-digit dialed telephone survey that provides population estimates of health care coverage, access, usage, and other topics relevant to health policy in New Jersey. A four model nested logistic regression was conducted to determine the significant predictors of receipt of advice to lose weight. The primary predictors of interest are Body Mass Index (BMI) classification and self-assessed weight status. Model 1 adds patient demographic and self-reported health status variables. Model 2 adds patient health care utilization patterns, health provider type, and respondent rating of patient-provider communication quality, while Model 3 adds BMI category and self-assessed weight status. The final model adds patient-provider race and gender concordance.

Population Studied: 1,929 adult residents of New Jersey who reported visiting a health provider within the previous two years. Respondents were household members 18 years or older considered the most knowledgeable about the health and health care needs of the household.

Principal Findings: The overall percentage of the sample receiving weight reduction advice from a health provider in the past year was 19.8%. Only 15.9% of overweight and 47.6% of obese respondents reported receiving such advice. Logistic regression results: respondents classified as overweight or obese were more likely to receive advice to lose weight compared to non-overweight respondents (OR=2.08, 5.91, respectively), as were respondents who perceived themselves as slightly overweight or very overweight (OR=4.74, 13.89 respectively). Respondents ever diagnosed with diabetes or asthma were more likely to receive advice to lose weight while those with any other chronic disease were less likely. Higher education levels, greater frequency of doctor visits over a 12-month period, and visiting a public clinic as a usual source of care were associated with a greater likelihood of receiving advice to lose weight, while female gender and higher respondent ratings of patient-provider communication quality were associated with a lower likelihood. Age, race, income, marital status, household language, citizenship status, weight-related health symptoms, insurance type, specialist visits, the number of year respondents visited their regular doctor, provider type, and race or gender concordance were not significant predictors of advice receipt.

Conclusions: These findings indicate that many health providers are not initiating weight-reduction discussions with the majority of their patients, even when these patients are clinically overweight or obese. It is essential to understand the barriers faced by providers in offering weight reduction advice to their patients.

Implications for Policy, Delivery, or Practice: The U.S. Preventive Services Task Force (2003) recommends that health providers refer overweight and obese patients to behavioral and nutritional counseling services for weight reduction. The Institute of Medicine (2012) has called for incentives for regular obesity prevention, screening, diagnosis, and treatment by health providers. Such practice incentives to increase the rate at which physicians advise weight reduction and refer patients to counseling services may be necessary to achieve these objectives.

Funding Source(s): RWJF

Poster Session and Number: A, #137

Angina Visits in the Outpatient Setting

Julie Will, Centers for Disease Control and Prevention; Fleetwood Loustalot, PhD, FNP, CDC, Division for Heart Disease and Stroke Prevention; Yuling Hong, MD, PhD, CDC

Presenter: Julie Will, PhD, MPH, Senior Epidemiologist, Division for Heart Disease and Stroke Prevention, Centers for Disease Control and Prevention, jxw6@cdc.gov

Research Objective: “Preventable hospitalizations for angina” has been used as an indicator of failed care in the ambulatory care setting. Rates of these hospitalizations have been rapidly decreasing since the late 1980s which may be a reflection of better care in the outpatient setting- possibly resulting in increasing rates of angina in outpatient settings. We use nationally representative samples of visits to outpatient departments and nonfederal office-based physicians to describe rates of angina and to describe trends over a 16-year period.

Study Design: Age- and sex-stratified rates were calculated using ICD-9 codes detailed in the technical specifications for preventable hospitalization for angina published by the Agency for Healthcare Research and Quality.
which uses data from the U.S. Census Bureau as the denominator for the rates. These specifications require that transfers and certain cardiac procedures be excluded; however, these exclusions did not apply to this outpatient analysis. Data are from the 1995-2010 National Ambulatory Care and National Hospital Ambulatory Care Surveys which are stratified, probability designed surveys with multiple stages of sampling.

**Population Studied:** Patient records were systematically selected over randomly assigned reporting periods from outpatient departments and physician offices. Visit information from these records were combined and used to produce population-based rates of angina for adults aged 18 years and older.

**Principal Findings:** Crude visit rates for men aged 18-64 years dropped significantly from the first study period (1995-1998) to the third period (2003-2006), and then increased in the final period (2007-2010). For women aged 65 years and older, the rates dropped from 1995-1998 (6,649/100,000; 95% CI 5,100-8,217 per 100,000) to 2007-2010 (3,021/100,000; 95% CI 1,835-4,208 per 100,000). For men aged 65 years and older, rates also declined during this same time from 8,533/100,000 (95% CI 6,608 to 10,458/100,000) to 4,079/100,000 (95% CI, 2,019-6,138 per 100,000). Age- and sex-standardized rates for these visits have been reduced by about 50% over 16 years--showing a statistically significant linear decline (p<.0001).

**Conclusions:** As seen with preventable angina hospitalizations, population-based rates of angina have declined substantially in the outpatient setting. Most of this change is observed in those aged 65 years and older. Future research should focus on determinants of angina rate declines in both inpatient and outpatient settings. This may require mixed methods research employing both quantitative and qualitative analyses.

**Implications for Policy, Delivery, or Practice:** Explanations for the decline in preventable hospitalization rates for angina have centered on the increased use of sophisticated diagnostic technologies likely resulting in diagnoses more specific than angina. It is unlikely that such sophisticated equipment is currently being used in the outpatient setting. Understanding whether these declines have resulted from factors such as new guidance, provider behaviors, or reimbursement practices may have important implications for creating efficiencies and cost savings in the U.S. health care system.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #138

**Streamlining of Operating Room for Living Donor Liver Transplantation**

Daniela Ladner, Northwestern University; Donna Woods, Northwestern University; Rebecca Khorzad, Northwestern University; Teri Strenski, Northwestern University; Amna Daud, Northwestern University; Kathryn Waltzman, Northwestern University; Tija Berzins, Northwestern University; Jane Holl, Northwestern University

**Presenter:** Donna Woods, PhD, Northwestern University, woods@northwestern.edu

**Research Objective:** Living donor liver transplantation (LDLT) is highly complex and therefore vulnerable to systems and processes inefficiencies that can compromise patient care. Inefficiencies in care have been associated with increased medical errors and preventable complications. The setup of the operating room and preparation for surgery up until incision is fairly standardized and directed towards preparing the patient and the surrounding for a lengthy surgery. In order to assess the efficiency of the OR system, we performed a systems engineering assessment of the OR setup at three LDLT centers.

**Study Design:** As part of a 5-year LDLT patient safety study (R01DK090129) OR setup was video recorded at 3 Adult-to-Adult living Donor Liver Transplant Centers (A2ALL) (Lahey, Northwestern, VCU) to examine the process cycle efficiency. Set up was defined from first nurse entering the OR for preparation until incision is performed. A seasoned process engineer analyzed the data and identified 10 steps that were used to create current state value stream maps. Value-Added Time (VAT) [defined as time directly spent with the patient creating change], Total Cycle Time (TCT) [total time for OR setup], and Cycle efficiency time (CET) were calculated for each center.

**Population Studied:** Clinicians and medical personnel involved in the care of the living donor liver transplant patients

**Principal Findings:** The 10 process steps identified were: 1. Supplies/equipment verification 2. Supplies/equipment positioning part one 3. Count 4. Supplies/equipment positioning part two 5. Patient positioning and sign in 6. Airway management 7. Lines placement 8. Intubation (gastric) 9. Creation of
Sterile fields 10. Timeout. Steps 6, 7, and 8 were considered value-added time. TCT ranged from 81-182 min, VAT ranged from 19-68 min and (PCE) ranged from 12% to 58% between sites. Step 8 (‘intubation’) had the highest range 3 min-52 min.

**Conclusions:** There was considerable inter-site variability for TCT, VAT and PCE, suggesting ample opportunity for process optimization and streamlining. Process optimization reduces variability (range) and thereby reduces vulnerability to errors.

**Implications for Policy, Delivery, or Practice:**
Streamlining can reduce wastage of resources (i.e., human, material) and as demonstrated in other setting has the potential to reduce errors and preventative complications for vulnerable LDLT patients.

**Funding Source(s):** NIH
**Poster Session and Number:** A, #139

**Safety Risks in Living Donor Liver Transplantation**

Donna Woods, Northwestern University; Tija Berzins, Northwestern University; Elizabeth Pomfret, Lahey Clinic; Robert Brown, Columbia University; Robert Fischer, Virginia Commonwealth University; Amna Daud, Northwestern University; Kathryn Waltzman, Northwestern University; Daniela Ladner, Northwestern University

**Presenter:** Donna Woods, PhD, Northwestern University, woods@northwestern.edu

**Research Objective:** According to the 2010 U.S. Office of the Inspector General’s Report, adverse events (AE) are common in the care of patients. In Living Donor Liver Transplantation (LDLT), given that living donors are healthy volunteers undergoing a major procedure purely for altruistic reasons, without any direct benefit for their own health, prevention of such events is particularly important, when caring for living donors and for the recipients to which they are donating. To inform critical targets for improvement to reduce AEs, we performed a review of medical records at four LDLT centers, to identify AEs as well as systems and process errors.

**Study Design:** Retrospective Medical Record Review

**Population Studied:** Paper and electronic medical records were collected from large transplant centers including documentation for the period of admission for transplant through discharge, plus any readmissions within 30 days. Systematic in depth medical record review was performed for 41 medical records (21 donor records and 20 recipient records) by a trained research nurse reviewer. All issues identified were reviewed by transplant surgeons to determine if an AE occurred. AEs were defined as an injury caused by medical management, rather than by the underlying disease.

**Principal Findings:** In the 41 reviewed records 727 issues were identified (313: donors, 414: recipients). The site distribution: A= 213, B=196, C= 94 and D= 224. Recipients had a mean of 21 issues (7-49) and donors had a mean of 14 (5-44). Twenty-eight percent (n=208) of issues were determined to be AEs: 42% (88) occurred in the care of donors, 58% (120) in the care of recipients. At least one AE occurred in the care of 100% of the donor and 100% of the recipients. The average number of AEs was 4.2 in donors and 6 in recipients. The most common types of AEs were related to Diagnostic (i.e. respiratory failure), Infections (i.e. UTI), Medications/Infusions (i.e. anaphylaxis), and Count Reconciliation leading to sequelae for the patient.

**Conclusions:** This study demonstrates that AEs were common in LDLT. Given the results that AEs occurred in the care of 100% of donors and in the care of 100% of recipients it is critical to address these patients’ risks.

**Implications for Policy, Delivery, or Practice:**
These data can provide guidance to direct toward targets for improvement to reduce AEs and improve the overall safety and care outcomes of LDLT.

**Funding Source(s):** NIH
**Poster Session and Number:** A, #140

**Survival of Patients with Triple-Negative Breast Cancer Using EMR Linked Cancer Registry Data**

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Presented: Hong Xiao, Ph.D., Professor, College of Pharmacy and Pharmaceutical Sciences, Florida A&M University, hong.xiao@famu.edu

Research Objective: Triple-negative of biomarkers (estrogen receptor-negative, progesterone receptor-negative and HER2-negative) is a high-risk breast cancer that lacks the benefit of specific therapy that targets these proteins. This study intended to investigate survival among triple-negative breast cancer patients.

Study Design: Electronic medical records from a network of 9 hospitals were linked to female breast cancer patients diagnosed between 2007 and 2010 in Florida. Bivariate and multivariate survival analyses using the Cox model were conducted. Nonparametric survival curves for race were generated using Kaplan-Meier method (KM).

Population Studied: Female breast cancer patients diagnosed in Florida between 2007 and 2010 were included in the study.

Principal Findings: The study population consisted of 4,220 breast cancer patients. The estimated two-year survival was 95.1%. The median follow-up time for those who died due to breast cancer was 569 days. Log-rank test indicated survival functions between blacks and non-blacks were significantly different over time (p < 0.0001). KM survival curves revealed that survival probability for blacks was lower than that of non-blacks after diagnosis. Hazard of breast cancer death for patients with triple-negative and patients with unknown triple-negative status were 4.34 and 2.35 times that of non-triple negative patients, respectively. Death rate among blacks was 1.6 times the rate among non-blacks over time. Other factors associated with an increased hazard over time were being diagnosed in regional stage or having unknown diagnosis stage, having poorly or undifferentiated tumor, being a Medicare beneficiary, being single, with larger tumor size, and with more positive nodes detected. Immediately after diagnosis distant stage and more comorbidity conditions were associated with an elevated risk, whereas more nodes examined was associated with reduced risk of breast cancer death. Effects of distant stage, total comorbidity, and total lymph nodes examined gradually attenuated over time.

Conclusions: Our results confirm that black women have worse breast cancer survival compared to non-black women. Women with triple-negative breast cancer have the worst outcomes in survival. Hospital EMR linked cancer registry data allows investigations of breast cancer patient outcomes in a more comprehensive way.

Implications for Policy, Delivery, or Practice: There is an urgent need for clinicians, patients, researchers, and regulatory agencies to work together to facilitate research in triple-negative breast cancer populations. Integration of Cancer Registry Data and Hospital Electronic Medical Records should be supported to enhance data for better research to reduce the morbidity and mortality due to cancer and other co-morbidities.

Funding Source(s): AHRQ
Poster Session and Number: A, #141

Comparing Performance Quality Under a State-of-Art Colonoscopy Protocol vs. Typical Endoscopy Protocols - Implications for Colorectal Cancer Protection
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Presented: Sudha Xirasagar, Ph.D., Associate Professor, Health Services Policy and Management, University of South Carolina, sxirasagar@sc.edu

Research Objective: Using Year 1 data from a short-term South Carolina program to fund screening colonoscopies for the indigent (SCOPE-SC), we compare adenoma detection rates and characteristics at Site-3, implementing a high polyp-yield-optimized protocol) with comparison sites (typical community-based endoscopy centers) and discuss the cancer protection implications.

Study Design: A concurrent comparison of a colonoscopy provider site using a polyp-maximizing clinical protocol (Site 3) with the remaining 3 provider sites participating in the program in 2009-09.

Population Studied: Polyp and adenoma yields were studied among 665 program clients of uniformly low SES served, 325 at Site 3 and 340 at Sites 1, 2 and 4 (comparison sites) together.

Principal Findings: Race and gender composition were similar in the two groups.
Percent of patients with polyp(s) were 78.4% at Site 3 and 35.3% at comparison sites, and with adenoma(s) 37.5% and 18.2% (both p<0.001). A total of 338 adenoma(s) were removed, 252 at Site 3 and 86 at comparison sites for a Mean Number of Adenomas per patient screened (MNA) of 0.78 and 0.26 respectively, p<0.001. Proportions of adenomas among polyps (PAP) were similar in both groups, 35.3% and 42.1% indicating that missed polyps at comparison sites may be proportional to missed adenomas. Differences in adenoma numbers by size were as follows: MNA 0.59 vs. 0.16 for =5 mm adenomas, p<0.001); MNA 0.11 vs. 0.05 for 6-9 mm adenomas, p<0.01), and no difference for large adenomas. The percentages of adenomas with advanced histology (high grade neoplasia, villous, tubulovillous, serrated, or carcinoma) were similar in the two groups, 9.9% vs. 12.8%. Further the percentages of small, medium and large adenomas showing advanced histology were similar. One 2 mm adenoma was an invasive carcinoma.

**Conclusions:** In a uniform SES, race and gender composition sample, we find that a high-polyp detection maximizing protocol resulted in higher adenoma detection rates. Importantly the adenoma size categories that were detected at much higher rates at Site 3 showed a similar percentage of histologically advanced lesions at both site groups. The disproportionately high frequency of small adenomas at Site-3, coupled with the similarity of advanced histology percentages at the two side groups (regardless of size), together with the finding of invasive malignancy in one 2 mm adenoma lead us to conclude that procedures performed at comparison sites may have conferred lower cancer protection than those performed at Site 3. High rates by Site 3 may validate the utility of its state-of-art protocol to enhance lesion detection and removal.

**Implications for Policy, Delivery, or Practice:**
The innovative elements of the protocol of Site-3 should be studied further to potentially include the critical elements in colonoscopy practice guidelines by the professional societies with appropriate payer adjustments to cover the costs of providing these innovative elements.

**Funding Source(s):** NIH, South Carolina Department of Health and Environmental Control

**Poster Session and Number:** A, #142

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**Hospital Center Effect for Laparoscopic Colectomy among Elderly Stage I-III Colon Cancer Patients**

Zhiyuan Zheng, University of Maryland School of Pharmacy; Nader N Hanna, MD, University of Maryland School of Medicine; Eberechukwu Onukwugha, PhD, University of Maryland School of Pharmacy; Kaloyan Bikov, BS, University of Maryland School of Pharmacy; C. Daniel Mullins, PhD, University of Maryland School of Pharmacy

**Presenter:** Zhiyuan Zheng, Ph.D., Postdoctoral Fellow, Pharmaceutical Health Services Research, University of Maryland School of Pharmacy, jzheng@rx.umaryland.edu

**Research Objective:** Surgical outcomes are associated with patient and surgeon characteristics. If outcomes are also independently impacted by the specific hospital where the surgery occurs, there is a hospital center effect (HCE). This study is to examine HCE among elderly stage I-III colon cancer patients with laparoscopic colectomies.

**Study Design:** Multilevel regressions were utilized to study potential HCE for length of stay (LOS), 30-day re-hospitalization, and in-hospital mortality, adjusting for patient, surgeon and hospital level characteristics. To quantify the impact of HCE, we calculated median instantaneous rate ratio (MIRR) for LOS and median odds ratio (MOR) for in-hospital mortality and 30-day re-hospitalization. Sensitivity analyses were also conducted for high volume/medical school affiliated hospitals and colorectal surgeons.

**Population Studied:** The Surveillance, Epidemiology and End Results (SEER)-Medicare dataset was used to identify stage I-III colon cancer patients in 2003 to 2007 with laparoscopic colectomies.

**Principal Findings:** The multilevel analyses based on 4,617 patients from 465 hospitals documented significant HCEs for LOS (MIRR = 1.36; p less than .001) and in-hospital mortality (MOR = 1.72; p equal to 0.037), but no HCE for 30-day re-hospitalization. For patients with Charlson comorbidty index (CCI) greater than or equal to 3, MIRR rose to 2.27 for LOS and MOR rose to 6.87 for in-hospital mortality, as compared to patients with CCI = 1. The sensitivity analyses confirmed our findings. HCE was significant for LOS in all subgroup analyses, and was significant for in-hospital mortality for high volume/medical school affiliated hospitals.
Conclusions: HCE is an important source of variation for the short-term outcomes of laparoscopic colectomies, and it is still significant when patient, provider and hospital level characteristics are adjusted. HEC exist for both LOS and in-hospital mortality. The findings are robust to high volume/medical school affiliated hospitals and colorectal surgeons.

Implications for Policy, Delivery, or Practice: Hospital center effect is a potential area to improve the quality of care for stage I-III laparoscopic colon cancer patients.

Funding Source(s): No Funding

Poster Session and Number: A, #143

Association between Overall Incremental Cost and Survival Benefit of Second Line Chemotherapy/Biologics Treatment among Elderly Medicare Metastatic Colon Cancer Patients

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Presenter: Zhiyuan Zheng, Ph.D., Postdoctoral Fellow, Pharmaceutical Health Services Research, University of Maryland School of Pharmacy, jzheng@rx.umaryland.edu

Research Objective: To examine the overall incremental cost and survival benefit associated with the receipt of second line chemotherapy/biologics (Tx2) among elderly Medicare metastatic colon cancer (mCC) patients who had received first line chemotherapy/biologics treatment (Tx1).

Study Design: Cox regression and partitioned least squares regression were utilized to obtain the incremental survival benefit and the overall incremental cost associated with the receipt of Tx2 within a five-year period, respectively. The regressions controlled for patient demographic and clinical characteristics including cancer related measures, Charlson comorbidity index and proxy for poor performance status. Bootstrapping was used to produce 95 percent confidence intervals (CI).

Population Studied: Elderly (66+) SEER-Medicare patients diagnosed with mCC in 2003-2007 were identified and followed until death or Dec 31, 2009. The analysis was restricted to patients who received any chemotherapy/biologics treatment.

Principal Findings: Of the 3,266 elderly Medicare mCC who received Tx1, 2,744 (84 percent) died within the observation period; 1,440 (44 percent) received Tx2; 274(8 percent) received subsequent treatments. The incremental survival benefit associated with the receipt of Tx2 was 0.631 years (CI: 0.517 - 0.761), and the associated overall incremental cost was 107,027 dollars (CI: 93,401 - 120,887). The incremental cost-effectiveness ratio for Tx2 was 169,722 dollars per life year gained (CI: 137,139 - 208,134).

Conclusions: The estimated survival benefit of receiving second line chemotherapy/biologics treatment ranges from 6 to 9 months, which is consistent with evidence from clinical trials. This improved survival was associated with costs that are slightly above 100,000 dollars.

Implications for Policy, Delivery, or Practice: It is consistent with the evidence from clinical trials that the survival benefit of receiving second line chemotherapy/biologics treatment is substantial, so is the associated overall incremental cost that patients incur during second line treatment

Funding Source(s): Other, Bayer HealthCare Pharmaceuticals, Wayne, NJ

Poster Session and Number: A, #144
HEALTH CARE WORKFORCE

Comparative Assessment of Physician and Non-Physician Productivity in Provider-Based Rural Health Clinics: A Factorial Invariance Approach
Abiy Agiro, WellPoint; Thomas T.T.H Wan, PhD; MHS, University of Central Florida; Judy Ortiz, PhD MBA, University of Central Florida

Presenter: Abiy Agiro, Ph.D.,M.H.S.,B.Sc., Senior Research Analyst, HealthCore, WellPoint, abiyagiro@gmail.com

Research Objective: CMS requires physician and non-physician (physician assistant and/or nurse practitioner) productivity standards on independent Rural Health Clinics (RHCs). Given the absence of productivity standards on provider-based RHCs, comparing the productivity of health practitioners for these clinics would be of interest.

Study Design: Data for provider-based RHCs were obtained from CMS Cost Reports. Latent variable modeling was utilized to assess productivity as a latent construct. Productivity was indirectly measured through four Data Envelopment Analysis (DEA) scores: 1) categorical DEA scores that take into account the level of social disadvantage faced by provider-based RHCs, 2) 'super-efficiency'-oriented DEA scores to address the extent and magnitude of DEA score changes in less productive practitioners on the bases of productive practitioners, 3) slacks-based-non-oriented DEA scores to incorporate underutilization or overutilization of input resources, and 4) non-discretionary DEA scores with input and output control variables. The four DEA scores reflected the three major categories of DEA models (radial, non-radial and oriented, non-radial and non-oriented). Utilizing the RUCA four level classifications of rural areas, DEA scores were computed separately for practitioners falling in the same rural classification. The input variable for physician productivity DEA models was total physician FTEs while the output variable was total physician visits (controlling for total non-physician FTE inputs and total non-physician visit outputs). Non-physician productivity was assessed in similar manner. To account for population-level risk differences, the sum of mortality rates for the four leading causes of deaths at county level was divided by the national sum of mortality rates for the same causes of deaths. DEA scores were multiplied with the aforementioned cause-specific mortality rate. The reliability and validity of physician and non-physician productivity latent variable models were assessed. Next, a multi-group latent variable model was applied to physician and non-physician productivity models to identify measurement and structural differences.

Population Studied: The study included 30% (N=509) of all provider-based RHCs in the U.S. for 2007 (N=1,701).

Principal Findings: We find that (1) latent measure of productivity for non-physicians had construct validity (Chi-square [2, N = 509] = 2.922, p = .232, RMSEA = .030, CFI = 1.000) and was reliable (reliability coefficient = 0.8998); (2) latent measure of productivity for physicians had construct validity (Chi-square [1, N = 509] = 4.371, p = .037, RMSEA = .071, CFI = .999) and was reliable (reliability coefficient = 0.8640); and, (3) latent variable models of physicians and non-physicians showed full measurement and structural variance.

Conclusions: In provider-based RHCs, physician and non-physician productivity levels differed from each other. A key limitation was the absence of case-mix adjustments.

Implications for Policy, Delivery, or Practice: The poor factorial invariance of physician and non-physician latent variable models indicated the need to assess the productivity of each practitioner through different measures. In other words, defining productivity as the maximization of outputs (visits/encounters) while minimizing inputs (FTE labor) is biased since physicians generally deal with more acute visits than non-physicians.

Funding Source(s): HRSA
Poster Session and Number: A, #293

Critical Tasks and Challenges Associated with Initiating Care Transitions for Hospitalized Patients Receiving Skilled Home Healthcare Services after Hospital Discharge
Alicia Arbaje, Johns Hopkins University

Presenter: Alicia Arbaje, M.D.,M.P.H., Assistant Professor Of Medicine, Associate Director Of Transitional Care Research, Department of Medicine, Johns Hopkins University, aarbaje@jhmi.edu

Research Objective: For reasons that are poorly understood, patients who require skilled home healthcare (SHHC) services after hospital
discharge (e.g. home nursing, physical therapy) are among those at highest risk of hospital readmission. The care transition to SHHC is often initiated by hospital-based discharge planners or home care coordinators (HCCs). Ensuring that HCCs provide the SHHC agency with relevant patient information is critical for a successful care transition, yet little is known about HCC workflow. The aim of the study was to (1) identify critical tasks in HCC workflow, and (2) identify challenges faced by HCCs in coordinating care for those requiring SHHC services after hospital discharge.

**Study Design:** The conceptual framework guiding this study is the Systems Engineering Initiative for Patient Safety model, based on the field of human factors and systems engineering, which can be used to proactively understand risks in complex systems. We used qualitative research methods using ethnographic techniques (direct observations and interviews) to extract process and systems level information about HCC workflow.

**Population Studied:** HCCs and associated staff (n=15) were shadowed within an SHHC agency and on 9 medical and surgical units in two hospitals and a skilled nursing facility within an academic health system. Data collection took place during multi-disciplinary rounds, patient bedside visits, and office work involving development and transmittal of referrals to the SHHC agency.

**Principal Findings:** We identified several critical tasks in HCC workflow to refer patients to SHHC: a) identify eligible patients; b) collect relevant information; c) perform bedside patient visits; d) complete paperwork; e) provide patient education; f) contact the receiving SHHC agency; g) schedule follow-up patient visits; and h) transmit referral package to SHHC agency. These steps were often not done in chronological order due to time constraints, limited access to information, and challenges associated with timely communication with nurses, patients and skilled nursing facilities. Four primary challenges were identified for HCCs in completing these tasks: 1) locating and identifying relevant patient information from various sources; 2) access to physicians for prescriptions and orders; 3) inadequate support to track progress of multiple concurrent referrals; and 4) uncertainty of care plans due to changes in patient status.

**Conclusions:** This study characterized critical tasks and challenges in the initiation of patients’ care transitions from the hospital to the SHHC setting. Future studies are needed to track patients as they receive SHHC services after discharge to identify additional challenges in care delivery.

**Implications for Policy, Delivery, or Practice:** Those receiving SHHC after hospital discharge remain at high risk for early hospital readmission, but few studies focus on improving care for this vulnerable population. The challenges identified could pose a risk to patient safety and quality of care, and these could be targets for intervention. For example, information technology solutions could alleviate challenges associated with locating relevant patient information. Multitasking is required of HCCs, and tracking and coordination tools could reduce cognitive workload associated with multiple concurrent referrals. These findings have implications for SHHC agencies, discharge planners, and health systems interested in improving transitional care for those with complex needs.

**Funding Source(s):** Other, National Patient Safety Foundation

**Poster Session and Number:** A, #294

**Changes in Primary Care Physician Productivity over Time: Is there Evidence of Physician Burnout in Response to the Current Practice Environment?**

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**Presenter:** Steven Atlas, M.D., Director, Primary Care Practice-based Research And Quality Improvement, General Medicine Division, Massachusetts General Hospital, satlas@partners.org

**Research Objective:** Despite evidence that systems with a strong primary care foundation provide better care at a lower cost, interest in careers in primary care have decreased among U.S. medical school graduates. Many factors contribute to changes in the physician workforce, but dissatisfaction with the current practice environment has been reported. We sought to examine changes in primary care physician (PCP) productivity measures over time and whether there were differences among PCPs based upon years in practice.
Study Design: We examined provider productivity among staff PCPs who practiced within a large, academic primary care network over a four-year period between 2009 and 2012. Eligible PCPs included those practicing in 2009 and who remained in the network for at least 2 additional years. Productivity measures were assessed on an annual basis using data from electronic scheduling and billing systems and included outpatient office hours worked per week based upon a 28 hour full-time equivalent (FTE) model, outpatient visits per FTE (Visits/FTE) and PCP’s patient panel per FTE (panel/FTE). PCPs were categorized into tertiles at baseline based on the number of years since medical school graduation (<15, 15-24, or >24 years) to examine whether years of experience were associated with changes in productivity. We examined unadjusted productivity measures over time among all PCPs and among PCPs stratified by years since graduation. We used repeated-measures linear mixed effects models to assess the impact of time and the interaction between time and tertiles of PCP years since graduation on adjusted productivity measures after controlling for physicians’ gender and practice type (community health center or not).

Population Studied: PCPs within an academic primary care network.

Principal Findings: Among 155 PCPs, those with less than 15 years since graduation (n=51) were more likely to be female (59% vs. 50% [15-24 years, n=54] and 46% [>24 years, n=50], p=0.03) and more likely to work at a community health center (45% vs. 28% [15-24 years, n=54] and 24% [>24 years, n=50], all p<0.001). Overall, between 2009 and 2012, PCP FTEs declined 4% from 0.55 to 0.53 (p=0.01), the number of visits/FTE increased 6% from 3110 to 3303 (p<0.001), and panels/FTE decreased slightly from 1466 to 1451 patients (p=0.7). After stratifying PCPs into tertiles by years since graduation, unadjusted and adjusted productivity measures were not different from the trends among all PCPs combined.

Conclusions: Among PCPs practicing within a single, academic primary care network between 2009 and 2012, clinical hours decreased 4% and outpatient visits increased 6%, but there was no change in the size of PCP patient panels over a three year period. Productivity measures did not differ among PCPs according to the years since medical school graduation.

Implications for Policy, Delivery, or Practice: We did not find evidence that the current primary care practice environment is associated with differences in physician productivity measures among veteran primary care physicians compared to more recent medical school graduates.

Funding Source(s): N/A

Poster Session and Number: A, #295

Preparing an Inter-Professional Health Care Workforce
Juanyce Taylor, PhD, University of Mississippi Medical Center; Jess Bailey, University of Mississippi Medical Center; Ellen Jones, PhD, University of Mississippi Medical Center; Jessica Bailey, PhD, University of Mississippi Medical Center

Presenter: Jess Bailey, Ph.D., M.S., B.S., Interim Dean, School of Health Related Professions, University of Mississippi Medical Center, jhbailey@umc.edu

Research Objective: We sought to investigate how participating in inter-professional educational programs, both on-line and in a traditional classroom/laboratory format, could be a transformative learning experience.

Study Design: A qualitative observational study was initiated, using reflective writings by students who were provided a prompt from the researchers, to provide evidence of lived experiences in inter-professional educational settings.

Population Studied: A purposeful sampling of students at an academic health science center in the southeastern United States with a School of Allied Health Professions containing nine discipline specific programs was conducted. The School offers doctorate degrees in Clinical Health Sciences, Physical Therapy, and Health Administration; master degrees in Occupational Therapy, Health Informatics and Information Management, and Health Sciences; and bachelor degrees in Radiologic Sciences, Medical Laboratory Science, Health Sciences, Health Informatics and Information Management, Cytotechnology and Dental Hygiene. A post-baccalaureate certificate in Nuclear Medicine is also offered. Inter-professional education offerings are provided at the bachelors, masters, and doctoral levels of these educational programs.

Principal Findings: The opportunity to learn in an inter-professional setting promoted a culture for students that simulated the real-world health care environment. Students wrote about significant learning experiences that enabled
them to adapt to seeing the workplace through a new lens that provided a broader perspective.  

**Conclusions:** Creating an inter-professional educational setting improves student understanding of a coordinated care team, supports a patient-centered focus, and improves relationships among distinct disciplines. Classroom and field experiences that are inter-professional better prepare students for the health care workforce.

**Implications for Policy, Delivery, or Practice:** The Affordable Care Act (ACA) encourages coordinated approaches to health care provided by a team of efficient health care providers. There are provisions in the ACA intended to strengthen the current primary care workforce and to build the future workforce. By providing inter-professional educational opportunities we are able to better equip for students the critical roles they will occupy in the future health care workforce.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #296

**Climate versus Culture: Barriers to Influenza Vaccination among Nursing Home Staff**

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**Presenter:** Sarah Blake, PhD, MA, Senior Associate, Department of Health Policy & Management, Rollins School of Public Health of Emory University, scblake@emory.edu

**Research Objective:** Seasonal influenza vaccination among nursing home staff has been shown to reduce the risk of flu among vaccinated adults and the risk of illness and death among nursing home residents. For over two decades, the U.S. Advisory Committee on Immunization Practices (ACIP) has recommended annual influenza vaccination of health care personnel. Yet according to a 2012 CDC report, fewer than 50% of health care staff working in long-term facilities received the flu vaccine. This study examined the policies and practices of nursing homes in three states (Florida, Georgia, Wisconsin) to ascertain potential facilitators and barriers to staff vaccination.

**Study Design:** The study used qualitative methods to explore staff flu vaccination policies and practices in nursing homes. Interviews were conducted with nursing home administrators and senior staff to learn about how flu vaccination is offered, delivered, and documented for health care staff.

**Population Studied:** Site visits were held with 39 nursing homes in three states (Florida, Georgia, Wisconsin). Interviews were conducted at each site with a range of informants (administrators, Directors of Nursing, infection control managers) who had knowledge and/or responsibility for overseeing staff flu vaccination.

**Principal Findings:** Findings reveal that nursing homes facilitate flu vaccination by offering the vaccines to staff free of charge and usually onsite. These facilities also all provide some type of outreach or education to staff about the need for flu vaccination. In addition, approximately 30% of nursing homes offer some type of incentive (e.g., gift card or cash) to promote flu vaccination among staff. Yet administrators report that staff vaccination rates remain low in most facilities (~50%). Staff refuse to be vaccinated due to a fear of getting sick, fear of needles, and overall lack of interest in the vaccine. Habit appears to play a major role as well, as many nursing home staff have never been vaccinated and do not feel they need it. Other barriers include: mistrust of the vaccine and fear “of the unknown.” Many nursing home workers are suspicious of the flu’s ingredients and hold culturally-based beliefs against vaccination. Interestingly, nursing home leaders also report low flu vaccination rates, particularly in Georgia and Florida, where only 50% of administrators and senior staff receive flu vaccination.

**Conclusions:** Despite the availability and accessibility of flu vaccination in nursing homes, staff vaccination rates among facilities in our study were low. Findings reveal that nursing home workers hold strong personal beliefs and bias against vaccination, including nursing home administrators and senior staff. Educational efforts to increase flu vaccination should be directed to all levels of nursing home staffing as well as leadership. Such efforts should clarify the public health benefits of flu vaccination as well as the risks of transmission to nursing home residents.

**Implications for Policy, Delivery, or Practice:** Increasing staff vaccination in nursing homes should be a priority for public health officials and managers of long-term care facilities. Our study
supports the need for improved education and outreach so that nursing home staff can overcome personal and cultural barriers to flu vaccination.

**Funding Source(s):** CDC

**Poster Session and Number:** A, #297

**Title VII Grant Programs’ Effect on Medical School Graduates’ Career Plans to Pursue Primary Care and Work with Underserved Populations**

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**Presenter:** Shannon Bolon, M.D., M.P.H., Primary Care Medical Education Branch Chief, Health Resources and Services Administration, Department of Health and Human Services, sbolon@hrsa.gov

**Research Objective:** To study the effect of medical school funding from Title VII grants on student career plans to pursue primary care and work with underserved populations.

**Study Design:** Data consisted of medical school-specific Title VII funding provided by HRSA combined with applicant, matriculant, and graduate medical student information from the AAMC. Each medical school was grouped by the amount of Title VII funding corresponding to the years that graduate cohort attended medical school. Generalized estimating equations were used to model students’ career plans at graduation for primary care specialty and work with underserved. Analyses were adjusted for covariates that included a more complete set of school and student characteristics than possible with previous related research and were stratified based on student interest in primary care at matriculation. Career plans at graduation were chosen as the outcome rather than eventual practice in order to isolate the impact of medical school-based Title VII funds from later subsequent training experiences that might influence career plans.

**Population Studied:** Students graduating from all allopathic U.S. medical schools between 2001 and 2004, n = 62,831. This period contains comprehensive information on student career plans at multiple points in time.

**Principal Findings:** As students were exposed to increasing levels of Title VII grant funding, there was a stepwise increase in the likelihood of a graduating student reporting plans to enter primary care. Students from schools in the highest quartile of funding were 26 percent more likely, 95CI= 1.05-1.46, than students at schools with no funding to indicate plans at graduation to practice primary care, while those at schools in the lowest quartile were 13 percent more likely, 95CI= 1.04-1.22. An increased interest in working with the underserved was found for those graduating students who attended schools in the highest quartile of funding, compared to those with no funding, those with an initial interest in primary care were more likely to sustain that interest, RR=1.26; 95CI= 1.05-1.46, while those who were initially undecided about their specialty interest were more likely to shift toward a planned career in primary care, RR=1.29; 95CI= 1.05-1.56.

**Conclusions:** After controlling for key covariates, Title VII grant funding to medical schools has had a sizeable positive impact on graduates’ plans to practice primary care and a modest positive influence on plans to work with underserved populations.

**Implications for Policy, Delivery, or Practice:**

The Public Health Service Act Title VII Section 747 grant program – celebrating its 40th anniversary in 2013 – represents an important effort to strengthen the primary care pipeline and produce more physicians for the underserved. In light of projected shortages of primary care physicians and those working with the underserved, this study highlights the successful effects of the Title VII grant program. Title VII funding to medical schools supports primary care as a career choice during medical school and also has a positive impact on students’ plans to work in underserved communities.

**Funding Source(s):** HRSA

**Poster Session and Number:** A, #298

**Overview of Findings from the Longitudinal RNWORK study: Newly Licensed and Early Career Registered Nurses’ Turnover**

Carol Brewer, University of Buffalo, School of Nursing; Christine T. Kovner, PhD, RN, FAAN, College of Nursing, New York University
**Presenter:** Carol Brewer, Ph.D., R.N., FAAN, Associate Dean and Professor, School of Nursing, University of Buffalo, School of Nursing, csbrewer@buffalo.edu

**Research Objective:** The purpose of this presentation is to report longitudinal descriptive findings about nurses' work environment and predictors of turnover. We also will consider changes over time among newly licensed RNs (NLRNs) who have been followed from 2006 to 2011.

**Study Design:** The study design is a panel survey in which data were collected on the same sample of newly licensed registered nurses (NLRNs) early career nurses and two additional cross-sectional cohort surveys at five time periods 1-2 years apart. The conceptual framework is a model of turnover that incorporates nurses' demographics, work characteristics, organizational attributes and perceptions of the work environment and job opportunities.

**Population Studied:** The longitudinal sample is a nationally representative sample of recently licensed RNs from 34 states and the District of Columbia, who completed four waves of data collection immediately post initial licensure. A sample of 3370 RNs were enrolled in 2006 (Wave 1). Respondents to the initial survey were followed in 2007 (Wave 2, n=2,386), 2009 (Wave 3, n= 2,007), and 2011 (Wave 4, n= 1,544). The comparison cohort samples were from 14 states NC1 (n=1,765), and NC 2 (n=1,613).

**Principal Findings:** A majority of NLRNs experienced difficult months at their first job; some had already left their first job prior to the first survey. 17.3% had left their first nursing job within 1 year; but 54.5% had left within 6 years; most stayed in hospital nursing in subsequent jobs. They were satisfied with their work group but felt inadequate support from supervisors. Most of them reported having worked voluntary overtime, experiencing verbal abuse and physical injuries, and having inadequate supplies and equipment. RNs working in poor work environments experience higher physician abuse as well as more colleague abuse. As predicted by theory, turnover appears to be mediated by intent to stay: only if intent is removed from the regression does satisfaction and organizational commitment directly impact turnover. More sprains and strains and intent to stay directly increased turnover while working more voluntary overtime, holding more than one job for pay, reduced turnover. In multivariate analyses, organizational commitment is negatively influenced by mandatory overtime and low promotional opportunities. More variety and work group cohesion have a positive impact on satisfaction. During the economic downturn, RNs in the later cohort had higher commitment to their job though there were no changes in incomes and level of job satisfaction; NLRNs are also geographically immobile.

**Conclusions:** Solutions to turnover need to focus on predictors of satisfaction and organizational commitment.

**Implications for Policy, Delivery, or Practice:** Turnover problems are complex. Nurses tend to stay close to home so that local job opportunities impact choices. The work environment’s impact on the intent to stay and ultimately turnover underscores the need to create healthy work environments from nurses to keep them in their jobs, but over time keeping nurses in their first job is difficult. Better career advising by employers may keep nurses with the employer even if they change jobs internally.

**Funding Source(s):** RWJF

**Poster Session and Number:** A, #299

**Twenty-Five Oral Health Workforce Innovations for Preventive Services**

Elizabeth Jacobs, ICF International; Karen Cheung, ICF International; Karen Cheung, ICF International; Michelle Revels, ICF International; Kari Cruz, ICF International; Mary Ann Hall, ICF International; Lisa Carver, ICF International; David Krol, Robert Wood Johnson Foundation

**Presenter:** Karen Cheung, M.P.H., Manager, Public Health and Survey Research, ICF International, karen.cheung@icfi.com

**Research Objective:** To describe the 25 innovations that participated in evaluability assessment site visits and discuss the findings related to programs’ potential impact in improving oral health, feasibility of implementation, and generalizability for a variety of settings.

**Study Design:** In 2012, as part of the Systematic Screening and Assessment of Oral Health Workforce Innovations project, researchers solicited nominations of promising workforce models and convened a panel of experts to review and select innovations for evaluability assessment (pre-evaluation) site visits. The purpose of these evaluability assessments was find innovations that were...
ready for evaluation and highly promising in terms of effectiveness, reach to the target population, feasibility, and generalizability. Between September-December 2012, trained site visitors conducted 3-day site visits to 25 innovations and workforce models that aimed to increase access to preventive oral health services. Prior to each visit, site visitors reviewed background documents and developed a preliminary logic model summarizing their understanding of the intervention design. During the site visit, the team used semi-structured guides to interview about 9-12 program staff members and stakeholders. During the last day of the site visit, EA site visitors facilitated a debriefing session with the program director and other key staff clarify their understanding of the program, refine the draft logic model, and discuss potential evaluation questions of interest.

**Population Studied:** Innovations implemented by dental providers in non-dental settings, non-dental providers in non-dental settings, and new types of dental professionals trained to provide preventive services.

**Principal Findings:** Dental providers may expand the public’s access to oral health services through a variety of programs and settings such as WIC clinics, Head Start programs, schools, mobile clinics, and senior centers. Non-dental providers, such as physicians, nurses, and nutritionists, can integrate oral health into their workflow and be trained to educate patients, perform dental screenings, and make referrals for dental treatment. New dental professionals who focus on preventive services may be added to the dental team, function independently in collaborative program with a dentist, or program under general supervision of a dentist. While some programs appear to be ready for evaluation, others may benefit from technical assistance in improving implementation practices.

**Conclusions:** Promising workforce innovations are being implemented across the country and have the potential to increase the capacity of dental and non-dental professionals in the provision of preventive oral health services.

**Implications for Policy, Delivery, or Practice:** These types of workforce interventions, programs, policies, and models strive to increase American’s access to oral health care, as well as prevent the onset of real diseases (e.g., tooth decay, gum disease, cavities).

**Funding Source(s):** RWJF

**Poster Session and Number:** A, #300

**Evaluation Opportunities of Oral Health Workforce Innovations**

Karen Cheung, ICF International; Karen Cheung, ICF International; Elizabeth Jacobs, ICF International; Kari Cruz, ICF International; Mary Ann Hall, ICF International; Lisa Carver, ICF International; David Krol, Robert Wood Johnson Foundation

**Research Objective:** To explore common existing data sources, data collection efforts, and outcome evaluation opportunities that may help demonstrate impact.

**Study Design:** As part of the Systematic Screening and Assessment of Oral Health Workforce Innovations project, a team of researchers conducted evaluability assessments (pre-evaluation site visits) to 25 innovations across the country. Two key products from these evaluability assessments included: (1) logic models that describe and link program resources and activities to outcomes and (2) potential evaluation questions and evaluation design options. Using the logic model as a tool and in collaboration with program staff, researchers derived suitable outcome evaluation questions.

**Population Studied:** Dental providers, non-dental providers, and new types of dental providers who expand the workforce to provide preventive oral health services for vulnerable populations, such as children, pregnant women, seniors, and Medicaid beneficiaries.

**Principal Findings:** A number of potential evaluation questions and designs for the 25 innovations participating in Systematic Screening and Assessment project were considered. There are a core set of research questions that help determine program effectiveness, such as: Which settings are most effective for reaching the target population? To what extent does the type of service provider impact the ability to reach the target population? To what extent does the program increase knowledge of and compliance with oral health recommendations among the target population? To what extent does participating in the program improve oral health outcomes, compared to those who do not participate in the program? To what extent does participating in the program...
increase linkage with a regular dental home? How does the program impact health disparities?

**Conclusions**: There is a need for further rigorous evaluation of oral health workforce innovations to assess their effectiveness in increasing access to and availability of preventive services—and ultimately, their effectiveness in improving oral health outcomes. Evaluation through direct data collection (e.g., parent and provider surveys and interviews) and existing data sources (e.g., claims data and dental records on diagnoses, treatments, and procedures) may answer questions about impact on oral health behaviors and outcomes.

**Implications for Policy, Delivery, or Practice**: Strong evidence of effectiveness comes from outcome evaluation studies that can meet high standards of rigor. More research is needed to develop this evidence base regarding the effective and efficient utilization of current health care workforce and their impact on access to preventive care and oral health outcomes. To create this evidence base, we must have a better understanding of the current interventions and practices being implemented and what works best.

**Funding Source(s)**: RWJF

**Poster Session and Number**: A, #301

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**To What Extent Do Physician Assistants and Nurse Practitioners Provide Chronic Disease Primary Care?**

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**Research Objective**: Physician assistants (PAs) and nurse practitioners (NPs) are increasingly employed to provide a broad range of medical services. However, despite their growing utilization, the extent to which NP/PA providers manage various medical conditions is not well known. As the population ages and the prevalence of chronic diseases grows, conditions such as hypertension, diabetes, and hyperlipidemia rank high among those for which care is needed. Therefore, the objective of this project was to determine the proportion of chronic disease services being provided by NP/PAs.

**Study Design**: All primary care patient visits from 2001-2010 were examined using the National Hospital Ambulatory Medical Care Survey (NHAMCS). Survey results were analyzed to estimate the total share of primary care visits by provider type and to identify differences in patient characteristics evaluated by each primary care provider.

**Population Studied**: The NHAMCS is a dataset of national samples of visits to outpatient departments of non-federal and non-institutional, general, and short-stay hospitals in the United States.

**Principal Findings**: The presence of NP/PAs represented in the NHAMCS almost doubled in this century. In the aggregate, NPs (8.9%) and PAs (5.4%) attended more than 14% of 777 million weighted visits, with NP/PAs managing 36% of visits in non-metropolitan areas. Over the latter five years, NP/PAs were the provider of record for one fifth of visits involving at least one chronic condition. For all three providers, the most common chronic disease visits were for diabetes and hypertension with similar percentages; 2% - 4% of visits to each provider type were for hypertension and 2% - 4% for diabetes. The only significant differences in patient characteristics resulted from sources of payment; NP/PAs were less likely to see patients with Medicare but more likely to see those with “no charge” than physicians. NPs were more represented in pediatrics, women’s health, and geriatric encounters than PAs. When examining non-metropolitan visits, hypertension was the most frequent of all diagnoses seen by physicians (3.4%) and PAs (5.4%) and the third most common diagnosis for NPs (3.9%). PAs were proportionately more represented than NPs in non-metropolitan clinics.

**Conclusions**: The proportional distribution of primary care chronic disease visits appears to be similar for PAs, NP, and physicians, with NP/PAs providing a significant proportion of care for patients in non-metropolitan areas.

**Implications for Policy, Delivery, or Practice**: We suggest that policies addressing chronic disease management strategies include NPs and PAs as deployable resources.

**Funding Source(s)**: Other, Physician Assistant Education Association

**Poster Session and Number**: A, #302
Early-Career Nurse Managers Report on Work Environment, Quality Improvement Education and Participation
Maja Djukic, New York University; Christine T. Kovner, PhD, RN, New York University College of Nursing; Carol S. Brewer, PhD, RN, Univeristy at Buffalo School of Nursing; Farida Fathehi, BS, MS, New York Univeristy College of Dentistry

Presenter: Maja Djukic, Ph.D., Assistant Professor, College of Nursing, New York University, md1359@nyu.edu

Research Objective: Front-line nurse managers can play a pivotal role in leading collaborative efforts to improve health care as recommended by the Institute of Medicine Future of Nursing Report, Key Recommendation #2. A knowledge gap exists on early-career nurse manager perceptions of health care environments in which they work and their education and participation in quality improvement (QI), which are key facilitators of health care improvement. We examined perceptions of work environments, QI education and participation in a national sample of early-career nurse managers to address this knowledge gap.

Study Design: We used a cross-sectional, descriptive design, and multiple data sources from an ongoing longitudinal study. QI data were collected in 2008 and work environment data in 2011 using a Dillman Tailored Design method mixed-mode survey. The research team used valid and reliable measures which were reviewed by a five-member expert panel and pilot tested. We examined responses to each survey question using descriptive statistics.

Population Studied: Registered nurses (RNs) initially licensed to practice between August 2004 and July 2005 from 34 U.S. states and D.C. were studied. We analyzed data from 42 RNs from the 2008 QI survey and 237 RNs from the 2011 work environment survey who reported being a nurse manager.

Principal Findings: With the exception of quantitative workload, nurse managers from the work environment survey reported generally positive ratings (defined as a mean rating above midpoint of each measurement scale) of job satisfaction, organizational commitment, intent to leave organization, workgroup cohesion, distributive and organizational justice, variety, autonomy, mentor support, collegial nurse-physician relations, promotional opportunities, and organizational constraints. In comparison to staff nurses, nurse managers reported significantly more autonomy and promotional opportunities. Less than a third of QI survey nurse managers reported being very prepared by their pre-licensure education programs and current employers across 12 measured QI activities such as data collection, analysis, measurement, flowcharting, and assessing gaps in practice. Only 9.5% reported being very prepared in using QI data analysis or project monitoring tools. Less than a third reported participating in any of the QI activities more than once monthly. More than half reported receiving zero hours of QI training from their employers. Specifically, 23.8% reported never participating in a root cause analysis, 81.0% reported no training in assessing gaps in practice, 61.9% reported no training in applying research evidence in practice, and 76.2% did not participate in web-based QI education, primarily because it was not offered.

Conclusions: Early-career nurse managers have positive perceptions of their work environments, but inadequate education and participation in QI. This represents a major barrier to taking on a leadership role in improving health care as recommended by the Institute of Medicine.

Implications for Policy, Delivery, or Practice: Employers and nursing education programs should work strategically to improve nurse manager education and participation in QI as a fresh approach to securing high quality patient care. Currently, no minimal education requirement policies exist for nurse managers. Developing such policies in conjunction with educational and organizational support might address the critical need to build nurse-manager leadership capacity to improve health outcomes at the front-lines of care delivery.

Funding Source(s): RWJF
Poster Session and Number: A, #303

How Would Training Institutions Respond to a Reduction in Support for Graduate Medical Education?
Norman Edelman, State University of New York at Stony Brook; Mahrukh Riaz, Stony Brook University; Michael Yen, Stony Brook University

Presenter: Norman Edelman, M.D., Professor, School of Medicine, State University of New York at Stony Brook, norman.edelman@stonybrook.edu
Research Objective: All current federal budget proposals call for a reduction of support for graduate medical education [GME] by the Medicare program, some by as much as 33 percent of the total [Direct plus Indirect components]. The objective was to understand how training institutions might respond.

Study Design: Web based survey.

Population Studied: GME directors of all ACGME and AOA accredited non-federal general medical/surgical institutions.

Principal Findings: Of the 266 [51%] who responded, 20% of institutions with smaller programs [10 or less core residencies] and 31% of the larger [16 or more core residencies] indicated that a contingency plan for reduction of support had been developed. When asked the sequence of actions they would recommend if their institutions’ support for GME had to be reduced, the first steps of the larger programs focused on reduction of support for specific residencies while the smaller programs preferred across the board cuts. Eliminating a core program was a last choice by all; however a variety of subspecialty programs and the transitional year were frequently listed as potential choices for elimination.

To discern the value of core programs to the institutions, we asked respondents to rate the importance of programs to their institution both from an operational [and financial] point of view as well as a public service [and educational] point of view. Internal Medicine, Surgery and Emergency Medicine were ranked as “high” or “very high” from both points of view by 75% or more respondents. In contrast, Dermatology, Nuclear Medicine, Plastic Surgery and Preventive Medicine were ranked as “high” or “very high” by fewer than 35% of respondents from both points of view. Discordant responses were: Anesthesia and Neurosurgery [high operational, low public service] and Family Medicine and Psychiatry [high public service, low operational].

When asked which current GME governance policies generate unnecessary costs, most respondents cited restrictive work hour rules [57%] and excessive documentation requirements [47%]. Furthermore, when asked what changes in financing structure they would support as options to deal with a reduction of support from Medicare, the majority favored an all payer system [64%], movement to a non-Medicare based system such as that in place for Children’s Hospitals [53%], and if new funds are not available, restructuring of Direct GME reimbursement toward a single value per resident in order to increase the number of positions supported [52%].

Conclusions: We conclude that directors of GME are cognizant of a potential reduction of GME support by Medicare and are beginning to develop contingency plans. They would tend to preserve funding for core residencies over subspecialties and larger institutions would reduce support for specific core residencies rather than across the board. The broad range of perceived value of core programs may provide insight into which might be affected. At the national level, the majority would be willing to contemplate substantial changes in funding mechanism to preserve GME programs.

Implications for Policy, Delivery, or Practice: Residency training in areas not valued by institutions may be at risk for reduced support. Incentives for retaining those of public value such as Family Medicine and Preventive Medicine may be necessary.

Funding Source(s): Other, Institutional Funds

Poster Session and Number: A, #304

Educating Future Physicians to Track Healthcare Quality: Feasibility of a Healthcare Quality Report Card for Medical Students

Donna Woods, PhD, EdM, Northwestern University; Daniel Evans, Northwestern University; Paul Jansson, BA, Northwestern University; Pietro Bortolotto, BS, Northwestern University; Sean O’Neill, PhD, Northwestern University; Erin Unger, MD, Northwestern University; Kristine Gleason, MPH, RPh, Northwestern University

Presenter: Daniel Evans, M.D., Assistant Professor, Department of Medicine, Northwestern University, devans@nmff.org

Research Objective: Background: The Patient-Centered Medical Home (PCMH) model aims to provide patient-centered care, lower costs, and improve health outcomes. In spite of the increased national emphasis on healthcare quality and outcome measurement, medical schools do not routinely provide educational opportunities for students to track quality measures or outcomes for patients.

Aim: To test the feasibility of a quality metric report card for medical students as part of a longitudinal Education-Centered Medical Home (ECMH) curriculum based on the PCMH model.
**Study Design:** We embedded teams of students in existing faculty practices and recruited a high-risk patient panel for each team, assigning students to be "health coaches" for 2-5 patients. From December 2012 through January 2013, students enrolled in the ECMH curriculum performed retrospective chart reviews and reported de-identified patient data on 20+ nationally endorsed Meaningful Use quality metrics.

**Population Studied:** Study population: 202 medical students (thirteen ECMH student-teams) across nine existing Chicago area primary care clinics.

**Principal Findings:** To date, 143 students submitted de-identified QI data (71% response rate) for at least one patient (315 patients total, mean of 2.2 submissions per student). Health conditions of the ECMH patient panel included: 66% abnormal body-mass index, 58% hypertension, 26% diabetes, 23% active smokers, 21% coronary artery disease, 9% moderate to severe asthma, 7% atrial fibrillation, and 5% systolic heart failure. Initial performance on quality measures ranged from a high of 93% adherence to beta-blockers and ACE-inhibitors in systolic heart failure to a low of 13% on documentation of dilated diabetic eye exams. Among the ECMH patient panel, 68 patients (22%) were admitted to a hospital in 2012 (132 total admissions) with 32 re-admissions at <30 days.

**Conclusions:** Creating a healthcare quality report card using nationally endorsed certified for Meaningful Use quality improvement (QI) metrics for a medical student patient panel is feasible. Interim analysis demonstrates that our student-teams have been successful in recruiting a high-risk patient pool and that there is significant variation in adherence to national QI metrics at baseline. For each of the QI metrics tracked we asked students to report end-of-year performance data from 2010, 2011 and 2012. Future research will use these three data points as a baseline to use statistical process improvement and prospectively track ECMH quality. Further study is needed to assess the educational impact of this QI tracking curriculum on medical student knowledge, attitudes and skills regarding QI objectives.

**Implications for Policy, Delivery, or Practice:** Evidence is mounting that the PCMH might deliver on the “Triple Aim” of patient-centered care, lower costs, and improved health outcomes. Our patients need coordinated care – and our medical trainees need an educational home in order to acquire the unique skills and attitudes necessary for PCMH transformation. As medical school educators, we need innovative, practical and sustainable curricula to make sure our students are prepared for practice in this setting. We need graduates prepared to measure the quality of their care, and capable of improving the system moving forward.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #305

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**Cost Analysis of Staffing Options for Inpatient Care**

Evan Fieldston, University of Pennsylvania
School of Medicine & CHOP; Joan Li, McKinsey & Company; Bo Huang, Wharton School, University of Pennsylvania

**Presenter:** Evan Fieldston, M.D., M.B.A., Assistant Professor, Pediatrics, University of Pennsylvania School of Medicine & CHOP, fieldston@email.chop.edu

**Research Objective:** Develop a financial model to compare the costs of various unit-level frontline ordering clinician (FLOC) staffing options and understand the role of graduate medical education (GME) funding on the costs of resident-trainees as FLOCs.

**Study Design:** Financial modeling of staffing cost for a hypothetical 20-bed pediatric unit under 4 coverage models: (1A,1B) intern/senior residents with attending supervision (1A: post- / 1B: pre-2003 ACGME duty-hour restriction); (2) hospitalist only; and (3) nurse practitioner (NP) & attending physician. Cost estimate based on effective annual compensation for inpatient time of clinicians only, accounting for number of employees, difference in resource utilization efficiency, and GME subsidy. Sensitivity analysis to obtain range of cost estimates with different mixes of full-time clinicians vs. rotating academic attendings.

**Population Studied:**

**Principal Findings:** The most expensive option is residents & attendings without GME subsidy ($1.42 million/year or $163/hour). The least expensive is NPs & attendings ($793,750/year or $91/hour). The duty-hour regulations increase costs significantly. One example of clinical resource inefficiency (e.g. extra testing) estimated at the 10% level also illustrates the costs of an institution of having trainees as FLOCs. Including GME funding reduces cost to
comparable levels with staffing either hospitalists or NP & attendings.

**Conclusions:** The cost of staffing an inpatient unit varies across a number of parameters, but trainees are not the obvious least expensive option. GME funding is important to offset the costs of trainee and supervisor staffing, especially with duty-hour rules.

**Implications for Policy, Delivery, or Practice:** Government subsidy of medical training via GME subsidy is important to maintain the public good of and prevent market failure in physician training.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #306

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**Patient Satisfaction is Lower in English Hospitals with More Imported Nurses**

Hayley Germack, University of Pennsylvania; Douglas M Sloane, School of Nursing, University of Pennsylvania; Anne Marie Rafferty, Florence Nightingale School of Nursing & Midwifery, Kings College London; Linda H Aiken, School of Nursing, University of Pennsylvania

**Presenter:** Hayley Germack, B.A. BSN, Hillman Scholar, Center for Health Outcomes and Policy Research Pre Doctoral Fellow, School of Nursing, University of Pennsylvania, germack@nursing.upenn.edu

**Research Objective:** England has long been reliant on imported nurses resulting in international controversy about brain drain from countries with few resources and great illness burden. While the ethics of international nurse recruitment has received much attention, there is little research on whether importing nurses affects quality of care in the host country. This study examines whether patient satisfaction with care in National Health Service (NHS) hospitals in England is associated with the proportions of imported nurses that work in them.

**Study Design:** This cross-sectional study used secondary data from the 2009 NHS Adult Inpatient Survey merged with the EU-funded study of nurses, RN4CAST, providing administrative and nurse survey data from the same period to investigate how hospitalized patients’ experiences were affected by the presence of imported nurses. Logistic regression models were estimated using Huber-White procedures to account for the clustering of patients in hospital trusts to determine whether the proportions of imported nurses were significantly related to patient experiences before and after taking account of other hospital and nursing characteristics and differences across hospitals in the characteristics of the patients surveyed.

**Population Studied:** The patients studied were 13,252 patients discharged from 46 hospitals in 31 NHS hospital trusts in England between June 1st and August 31st of 2009. All patients were 16 years or older, had at least one overnight stay, and were not under the care of a consultant from maternity or psychiatric specialties. The nurses studied were 2,928 professional nurses providing direct care on medical and surgical units in the same hospitals.

**Principal Findings:** Overall, 15% of the nurses in the study hospitals received their nursing education in countries with a developing economy (based on the World Economic Outlook classification of countries). The percentage of imported nurses ranged across hospitals from 0% to 41%, and had a significant and pronounced effect on patient experiences. Even after controlling for a sizable number of potential confounds, every 10% increase in the percentage of imported nurses lowered the likelihood (or odds) of patients reporting good or excellent care by roughly 19% (OR=0.81), and increased the odds on patients complaining about their care by about 19% (OR=1.19). Patient’s confidence in nurses and their satisfaction with nurse communication, staffing adequacy, and pain control were also lower in hospitals with higher percentages of FENs.

**Conclusions:** Patients in hospitals with higher proportions of imported nurses were significantly less satisfied with their care.

**Implications for Policy, Delivery, or Practice:** While imported nurses are commonly employed by first world countries with a developed economy in responding to nurse shortages, the experience of patients in English hospitals suggests that their use may have detrimental consequences for patient satisfaction. Further research should examine whether other quality of care outcomes are associated with substantial use of imported nurses. These findings provide additional motivation for national nursing workforce planning that prevents cyclical nursing shortages through greater reliance on domestically educated nurses.

**Funding Source(s):** Other, Hillman Scholars Program in Nursing Innovation

**Poster Session and Number:** A, #307
Internationally Educated Nurses: Role of Market Factors in the Decision to Hire
Shivani Gupta, University of Alabama at Birmingham; Josue Patien Epane, University of Alabama at Birmingham; Dr. Robert Weech-Maldonado, University of Alabama at Birmingham

Presenter: Shivani Gupta, Graduate Reasearch Assistant, Administration-Health Services, University of Alabama at Birmingham, sgupta9@uab.edu

Research Objective: Although, the recent U.S. nursing shortage seems to have eased as many nurses returned to work due to the 2008 recession, it is projected that the demand for registered nurses will soon surpass their supply due to an aging population. Hospitals hire internationally educated nurses (IENs) as a strategy to address such shortages. The purpose of this study is to examine the impact of competition and other market factors, besides nursing shortage, on the hospital’s hiring decision.

Study Design: Data were derived from two sources: the American Hospital Association (AHA) Annual Survey and the Area Resources File (ARF). The dependent variable represents hiring decision (1 – did hire and 0 - did not hire). The primary independent variables include: competition measured by Herfindahl-Hirschman Index (HHI), states with certificate of need (CON), states with staffing mandate, population 65 years and older, percent of foreign born, percent of Blacks, Hispanics, Asian/Pacific Islanders, American Indians and others, supply of registered nurses per 1000 population, Medicare managed care penetration, unemployment rate, poverty, number of ambulatory centers, rurality, and regional location. Control variables include: diversity orientation (diversity plan), collection of patient’s primary language, ownership status, hospital size, system affiliation, teaching status, and proportion of Medicaid and Medicare patients. A panel logistic regression with facility random effects and year fixed effects was used for analysis.


Principal Findings: Results show that hospitals operating in markets with lower levels of competition (O.R = 0.57; p = 0.016) are less likely to hire IENs. In contrast, hospitals operating in areas with higher a percent of foreign-born (O.R = 1.06; p = 0.001), Blacks (O.R = 1.02; p = 0.001), Hispanics (O.R = 1.03; p = 0.001), and American Indians (O.R = 1.07; p = 0.001) are more likely to hire IENs. Similarly, hospitals in states with certificate of need (O.R = 1.87; p = 0.001) or staffing mandate (O.R = 2.18; p = 0.036) are more likely to hire them. Non-federal government hospitals are less likely to hire IENs compared to for-profit hospitals (O.R = 0.55; p = 0.014). Lastly, larger hospitals (OR= 1.00; p= 0.001) as well as those with a diversity orientation (O.R = 2.54; p = 0.001) and that collect patient’s primary language information (O.R = 1.47; p = 0.014) are more likely to hire IENs.

Conclusions: Results suggest that hospitals use IENs as a strategy to meet staffing needs in more competitive and diverse markets, and in states with staffing mandates.

Implications for Policy, Delivery, or Practice: The recruitment of IENs can have considerable impact on the quality of care and patient outcomes. Furthermore, IENs can alleviate the consequences of nursing shortages. Therefore, it is important to understand the various factors that may influence the recruitment and retention of IENs.

Funding Source(s): No Funding
Poster Session and Number: A, #308

State Variation in Generalist and Specialty Physicians with Non-Physician Clinicians in Physician Offices, 2012
Esther Hing, National Center for Health Statistics; Chun-Ju Hsiao, National Center for Health Statistics

Presenter: Esther Hing, M.P.H., Survey Statistician, Ambulatory and Hospital Care Statistics Branch, National Center for Health Statistics, eshire2@cdc.gov

Research Objective: This study examines state variation in the percentage of generalist (general or family practice, internal medicine, pediatrics) and specialty physicians working with non-physician clinicians (nurse practitioners, physician assistants, and nurse midwives) in office-based practices.

Study Design: The 2012 National Electronic Health Record Survey, an annual nationally representative sample survey of nonfederal office-based physicians, was designed to produce state-level estimates. This study...
compares the percentage of generalist and specialty physicians working with non-physician clinicians. Estimates were weighted by the inverse of selection probabilities to make state and national estimates. State differences were evaluated by t-tests and multivariate analysis. Covariates examined included urban-rural classification of the practice location (large central metropolitan, large fringe metropolitan, medium of small metropolitan, non-metropolitan areas), practice size (1-2 physicians, 3-10 physicians, 11 or more physicians), multi-specialty practice status, percent revenue from Medicaid (above median, equal or below median, unknown), and state.

**Population Studied:** Generalist and specialty physicians reporting whether their practice had non-physician clinicians (n=4,430).

**Principal Findings:** There was no difference in the percentage of generalist (53%) and specialty physicians (55%) working with non-physician clinicians in 2012. Overall, the percentage of physicians working with non-physician clinicians was greater in practices located in small or medium metropolitan areas (60%) than in large central (51%) or large fringe metropolitan areas (49%), increased with size (from 33% among solo and partner practices to 80% among practices with 11 or more physicians), was higher in group single-specialty (58%) and group multi-specialty practices (77%) than solo practices (28%), and was higher in practices with percent of Medicaid revenue above the median (57%) than in practices with less Medicaid revenue (48%). The percentage of physicians working with non-physician clinicians varied by state. After controlling for location and practice characteristics, generalist physicians were more likely to work with non-physician clinicians in practices with 11 or more physicians compared with solo or partner practices, in multi-specialty practices compared with solo physicians, and outside of large central or large fringe metropolitan areas. Compared with generalist physicians in California, generalist physicians were more likely to work with non-physician clinicians in 15 states (Alaska, Arizona, Colorado, Idaho, Kansas, Massachusetts, Minnesota, Montana, New Hampshire, North Carolina, North Dakota, South Dakota, Tennessee, Vermont, and Wyoming). Comparable analysis among specialty physicians found lower use of non-physician clinicians in Connecticut and Hawaii compared with California specialty physicians.

**Conclusions:** In 2012, after controlling for location and practice characteristics, generalist physicians were more likely to work with non-physician clinicians in large practices, multi-specialty practices, in medium, small, or non-metropolitan areas, and in 15 states. After controlling for location and practice characteristics, there was little state variation among specialty physicians with non-physician clinicians in their practice.

**Implications for Policy, Delivery, or Practice:** State variation in generalist physician use of non-physician clinicians reflects, in part, higher use in rural states, and in states with higher percentages of large multi-specialty practices. Further research is needed to monitor the supply of generalists and their use of non-physician clinicians as provisions of the Patient Protection and Affordability Act expand Medicaid eligibility criteria in 2014.

**Funding Source(s):** CDC

**Poster Session and Number:** A, #309

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**Estimate of Physician Supply and Distribution for Greater Tokyo in 2020**

Hiroo Ide, Chiba University; Hideaki Kawaguchi, The University of Tokyo; Soichi Koike, The University of Tokyo

**Presenter:** Hiroo Ide, Ph.D., M.A., Associate Professor, Research Division of Healthcare Policy in Aging Society, Chiba University, ide@chiba-u.jp

**Research Objective:** The population of Greater Tokyo was approximately 35 million in 2010 and is expected to remain the same in 2020. However, the population of the elderly (aged > 65 years) will increase by about 2 million and the proportion of them will rise from 21.0 % to 26.8%. Greater Tokyo is likely to remain the world's most densely populated area and demand for healthcare services for the elderly will increase.

**Study Design:** Retrospective database study

**Population Studied:** We used the data acquired from the official physician registry survey (Survey of Physicians, Dentists, and Pharmacists) in Japan. The number of physicians and information on sex, age, their specialty, and their working facilities were obtained from the registry data 1996–2010. We used the Bayesian theorem to estimate the numbers of physicians in all areas in Greater Tokyo. We calculated the numbers of physicians per 100,000 population and 100,000 elderly, and

**Principal Findings:** The total number of physicians is predicted to increase from 76,000 to 94,000 by 2020, equivalent to an increase in physicians per 100,000 population from 215.4 to 267.6. Although physicians per 100,000 elderly increased from 1,012.6 in 2000 to 1,048.3 in 2010, we expect the per capita supply to decrease to 997.9 by 2020. Internists in clinics administer primary care in Japan. We expect internists in clinics per 100,000 elderly will also decrease by 2020. We calculated Gini coefficients for all physicians per 100,000 population and per 100,000 elderly and found the inequity was almost stable. However, Gini coefficients for internists in clinics per 100,000 elderly will rise from 0.3265 in 2000 to 0.3959 in 2020.

**Conclusions:** Although the supply of physicians per capita in Greater Tokyo will increase, the number of physicians per 100,000 population is well below the average for Japan. Furthermore, physicians per 100,000 elderly and the equity of primary care distribution will decrease. These results imply access to healthcare services will become more difficult and may present a substantial problem for health care provision.

**Implications for Policy, Delivery, or Practice:**
The government estimates that by 2030, 27.9% of the population will be elderly. Unless steps are taken to ensure an adequate supply of physicians, access to and equity in healthcare services will worsen. Existing policies have encouraged physicians to practice in rural and remote areas. However, changes in the age structure and the distribution of urban populations indicate that more physicians are needed in urban areas that will appear throughout the world by the middle of this century. We suggest the existing physician distribution policy should change to provide for urban areas as well as for rural and remote areas.

**Funding Source(s):** Other, Health and Labor Sciences Research Grant of Japan

**Poster Session and Number:** A, #310

**A Strategy for Enumerating the National Public Health Workforce, the Netherlands**

Marielle Jambroes, Academic Medical Center Amsterdam; Karin Stronks, Academic Medical Center Amsterdam; Marie-Louise Essink-Bot, Academic Medical Center Amsterdam

**Presenter:** Marielle Jambroes, M.D., M.P.H., Phd Student, Public Health, Academic Medical Center Amsterdam, m.jambroes@amc.nl

**Research Objective:** Insufficient insight in the size and composition of the public health workforce is an issue in many countries. We developed and tested an online questionnaire in order to enumerate the current national public health workforce capacity and project future needs.

**Study Design:** Based on international examples (e.g. USA, UK, WHO) of essential public health services, we defined ten essential public health services for the Netherlands, for example ‘Disease prevention and control’, ‘Development and evaluation of health policies’ and ‘Health promotion and social participation’. Subsequently we developed and tested an online questionnaire based on these essential services. The validity of the questionnaire was tested by interviewing respondents afterwards.

**Population Studied:** 580 employees of a medium-sized municipal health service were invited by e-mail to participate in the feasibility study. Participants were asked to indicate whether each of the essential services is part of their work and if so, the working time spent per essential service per week.

**Principal Findings:** Response was 217/580 (37%) with no significant differences in distribution by age and sex with the population that was invited to participate. 186 respondents (88%) indicated that at least one essential service was part of their work and 77 (37%) executed four or more. Most hours were spent on the essential service ‘Disease prevention and control’, the least hours were spent on ‘Assuring a competent workforce’. The distribution of educational levels within an essential service differed per essential service. For example 70% of the respondents involved in ‘Public health policy’ had an academic degree whereas of the respondents involved in ‘Health promotion’ 35% had an academic degree, suggesting that academic requirements differ per essential service.

The retrospective interviews showed that the individual estimation of the number of hours spent per essential services was the most difficult part of the questionnaire.

**Conclusions:** Our online questionnaire, based on essential public health services, is a good tool and strategy to enumerate the multidisciplinary public health workforce. The results of the feasibility study represent daily
practice and respondents appreciated the topic and the length of the questionnaire, although some questions were experienced as difficult to fill-out.

**Implications for Policy, Delivery, or Practice:**
We will now start implementing the tool on a national level because these data is essential to determining how to improve and maintain public health workforce competency and effectiveness.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #311

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**Interdisciplinary Teamwork and Nurse Autonomy: Are They Compatible and How Is Teamwork Associated with Nurse Outcomes**

Xiao Kang, University of Pennsylvania; Matthew D. McHugh, University of Pennsylvania, School of Nursing, Center For Health Outcomes And Policy Research

**Presenter:** Xiao Kang, B.A., B.S.N., Predoc, Center For Health Outcomes And Policy Research, University of Pennsylvania, kangxi@nursing.upenn.edu

**Research Objective:** The aim of the study was to examine whether interdisciplinary teamwork and autonomy were positively associated and determine the relationship between teamwork and nurse outcomes.

**Study Design:** A secondary analysis of the Multi-State Nursing Care and Patient Safety Study which collected data on characteristics of the hospital work environment and satisfaction with various aspects of the work environment from hospital nurses working in California, Pennsylvania, and New Jersey between September 2005 and August 2006 and in Florida between 2005 to 2006. Questions related to interdisciplinary teamwork and autonomy were aggregated to the hospital level to assess the relationships between these factors as well as the relationship between teamwork and nurse outcomes.

**Population Studied:** This study used a sample of 39,350 registered nurses from the Multi-State Nursing Care and Patient Safety Study. The nurses in this sample worked in 682 hospitals in California (n=13,176), Pennsylvania (n=9,973), New Jersey (n=8,381) and Florida (n=7,820). The sample includes at least 10 nurses per hospital.

**Principal Findings:** A strong association was found between teamwork and autonomy (r =0.87). When separated into categories of high (>75%), medium (25-75%) and low (<25%) levels of teamwork based on quartiles, nurses in hospitals with high levels of teamwork were significantly more likely than nurses in hospitals with low levels of teamwork to be satisfied with their jobs (mean = 0.85 vs. 0.70, p<0.001), satisfied with nursing as a career (mean = 0.91 vs. 0.83, p<0.001), less likely to leave their jobs (mean = 0.10 vs. 0.17, p<0.001) and had lower burnout scores (mean = 0.26 vs. 0.39, p<0.04).

**Conclusions:** Autonomy and teamwork are compatible characteristics of hospital work environments. Interdisciplinary teamwork was associated with better nurse outcomes.

**Implications for Policy, Delivery, or Practice:** Our findings support the Institute of Medicine’s recommendation promoting a team based approach to health care and interdisciplinary education as part of the preparation of the health care workforce. Hospitals should consider interventions that can promote both autonomy and interdisciplinary teamwork that can lead to better nurse outcomes.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #312

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**Determinants of Physician Practice Styles**

Herbert S. Wong, Agency for Healthcare Research and Quality; Zeynal Karaca, Social and Scientific Systems, Incorporated

**Presenter:** Zeynal Karaca, Ph.D., Health Economist, Center for Delivery, Organization, and Markets, Social and Scientific Systems, Incorporated, zeynal.karaca@ahrq.hhs.gov

**Research Objective:** Disparities in physician “practice styles” have emerged as a viable explanation for the substantial variations in medical treatment patterns across geographic regions. While this hypothesis enjoys a high degree of professional consensus, the specific factors that cause variation in the intensity of physicians’ use of medical resources are not well understood. This study identifies factors that influence physicians’ use of medical resources.

**Study Design:** We employed linear cost models using all hospital inpatient stays registered to physicians for whom we had information on observable characteristics. We also estimated multilevel regression models that clustered hospital inpatient visits across physicians. We repeated our linear regression analysis focusing separately on physicians working only in either teaching or non-teaching hospitals to address possible endogeneity of patient case mix and unobservable physician-specific factors.
that may not be completely addressed via regression models. Finally, we re-estimated our multilevel model using all hospital inpatient stays registered to two subsamples of physicians based on their observable characteristics by employing propensity score nearest-neighbor (NN) matching without replacement. The first subsample included equal numbers of male and female physicians with a similar distribution of observable characteristics. The second subsample included equal numbers of foreign trained and U.S.-trained physicians with similar observable characteristics.

Population Studied: We used the Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID), the American Hospital Association Annual Survey Database, and the Area Resource File in this analysis. Our hospital data for 2008 were drawn from Arizona and Florida, and physician information was obtained from medical boards of each state where we used physicians’ license numbers to register each hospital inpatient visit to a physician. Over 2.5 million inpatient records were used in the analysis.

Principal Findings: Our key findings remained the same across all estimations. Our risk-adjusted results show that the average cost of inpatient hospital visits registered to female physicians or foreign-trained physicians was significantly lower when compared to that of their respective cohorts. We observed an inverse relation between the average costs of hospital inpatient visits and physicians’ years of experience. We also found that physician practice specialty was an important source of variation in hospital inpatient costs, which were significantly higher for patients primarily treated by surgeons or cardiologists.

Conclusions: The key findings of our study indicate that: 1) the costs of hospital inpatient stays registered to female physicians or foreign-trained physicians are significantly lower than the costs of hospital stays registered to male physicians or U.S.-trained physicians; 2) the costs of hospital stays registered to physicians with more experience is lower when compared to physicians with less experience; and 3) there is substantial variation in costs of hospital inpatient stays across board certified physician specialties, where surgeons and cardiologists are generally associated with higher costs of hospital inpatient stays.

Implications for Policy, Delivery, or Practice: Our findings have important implications as they demonstrate that physicians’ characteristics have a significant impact on the costs of hospital inpatient stays.

Funding Source(s): No Funding
Poster Session and Number: A, #313

Maryland Learning Collaborative Implementation of State Policy Using Educational Engagement of Primary Care Practices
Niharika Khanna, University of Maryland School of Medicine; Norman Poulsen, Johns Hopkins Community Physicians; Scott Feeser, Johns Hopkins Community Physicians; Sheila Richmeier, Remedy HC; Kathryn Montgomery, University of Maryland School of Nursing

Presenter: Niharika Khanna, MBBS, MD, DGO, Associate Professor, Family and Community Medicine, University of Maryland School of Medicine, nkhanna@som.umaryland.edu

Research Objective: The objectives of the Maryland Learning Collaborative (MLC) are to educate and engage primary care practices in Maryland to implement state policy, disseminate best practices and promote adoption of the Advanced Primary Care Model (APCM) and, to coach practices to transform into Patient Centered Medical Homes (PCMHs) recognized by NCQA and link PCMHs to health systems and community resources.

Study Design: We established the MLC as a state-academic partnership guided by the state’s medical schools, medical societies and PCMH practice champions to create a dynamic forum for development and implementation of the APCM. Year 1 featured: 1) Practice transformational activities by an expert coach with development of teamwork, leadership and care process redesign, culminating in recognition of PCMHs by NCQA; 2) developing collaborative peer learning forums utilizing live and multi-media methods; 3) supporting practices in interaction with state government and insurance carriers; 4) embedding PCMH care management; 5) practice workflow redesign for efficient, cost contained chronic disease management, population health and enhanced access to care; 6) optimizing EHR use; and 7) ensuring quality measures data was recorded in EHR fields that permit accurate data extraction.

Year 2 work includes: 1) quality improvement activities utilizing data reported by PCMHs benchmarked to the other MLC practices; 2)
adding a workforce training series with a didactic format for specific needs such as behavioral health training, Advanced Directives, and Medication Management; 3) linking PCMHs to community resources; 4) Pediatric Behavioral Health integration to enhance capacity to screen, manage and refer; 5) Partnership with Million Hearts; 6) ongoing practice transformation maintenance and care manager training; and 7) encouraging HIE linkage and utilization.

We evaluated the impact of MLC on primary care practices after one year of participation using an internet-based survey tool.

**Population Studied:** Statewide, 52 primary care practices, including 339 practitioners, make up our study population.

**Principal Findings:** Sixty-seven survey responses were analyzed. Of these, 49% were MD/DOs, 40% had 11-20 years in practice, 72% respondents were family physicians, and 68% were in a single specialty practice. The most important reasons for participating in the MLC were participation in the development of the APCM (45%) and readiness for healthcare reform (33%). After a year, MLC participants had a better understanding of the PCMH, improved job satisfaction, improved satisfaction with patient access to care, optimization of electronic health records, practice connectivity, care management, and medication management.

**Conclusions:** The MLC is an essential clinical component of the Maryland program in addition to administrative and technical components. MLC has successfully implemented the state’s policy to develop and implement an APCM and transform practices into PCMHs recognized by the NCQA.

**Implications for Policy, Delivery, or Practice:** A learning collaborative is an essential clinical component in state level programs to translate policy into implementation. PCMH Learning collaborative can provide the vehicle for integrating PCMHs into the Public Health Infrastructure, utilization of the Health Information Exchange and the Health Insurance Exchange to link newly insured patients to PCMHs.

**Funding Source(s):** Other, state of Maryland, Maryland Community Health Resource Commission and Maryland Health Care Commission

**Poster Session and Number:** A, #315

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**Dental Supply is Worse than You Think: Results from a Census of Georgia Dentists**
Glenn Landers, Georgia State University; Kristi Fuller

**Presenter:** Glenn Landers, Sc.D., M.B.A., M.H.A., Associate Project Director, Georgia Health Policy Center, Georgia State University, glanders@gsu.edu

**Research Objective:** To evaluate Georgia’s national dentist to population ranking and the availability of dentists serving Medicaid members.

**Study Design:** The study employed a mixed survey design. Subjects could respond by telephone, Internet, FAX, or through the U.S. mail.

**Population Studied:** All 5,881 dentists listed by the Georgia Secretary of State’s office as having an active dentist license as of March, 2012.

**Principal Findings:** Of the 5,881 dentists identified by the Georgia Secretary of State’s Office and the Georgia Dental Association, only 3,645 (61.5%) are in full or part-time practice in Georgia. Based on responses to this census, Georgia has 3.76 dentists per 10,000 residents. The most recent American Dental Association (ADA) ranking has Georgia at 4.4 dentists per 10,000 residents and a rank of 49. The state only has 885 dentists who accept Medicaid, and only four percent of those who do not are interested in becoming a Medicaid provider. Georgia has 16 counties without a dentist. Residents in these counties must travel approximately 18 miles or 29 minutes to the closest dentist in a neighboring county. Rational service areas are generally defined by 40 minutes of travel time to the nearest dentist or 25 miles under normal conditions on primary roads. Of the 16 counties without a dentist, 13 already have some type of dental health professional shortage area (DHPSA) designation, and the remaining three might qualify for single county designation based on their dentist-to-population ratios. Of the counties that already have some type of DHPSA designation, three appear to exceed the dentist-to-population ratio needed to qualify at least for single county designation. On the other hand, 28 counties without DHPSA designation might qualify based on low dentist-to-population ratios. FQHC and/or public health dental practices are located in some DHPSA designated counties, but many of them struggle financially.
Conclusions: State dentist licensing rolls may not be the most accurate measure of state dentist supply. It is from these rolls that organizations such as the American Dental Association, Kaiser State Health Facts, and the Centers for Disease Control and Prevention (CDC) create dentist to population ratios and national rankings. Such rolls may overinflate dentist supply by including dentists no longer practicing, practicing out of state, and practicing in environments not available to the general public, such as in dental schools and hospitals.

Implications for Policy, Delivery, or Practice: A short, standardized survey instrument completed upon license renewal could provide states with a more accurate picture of true dentist supply. Those states with below average dentist to population ratios might consider revision of scope of practice laws to allow dental assistants or therapists to expand the availability or oral health prevention and screening services. To improve the supply of dentists willing to serve Medicaid members, states might review reimbursement rates and policies aimed at patients keeping set appointments, a common complaint among those dentists who serve Medicaid members.

Funding Source(s): Other, Georgia Dental Association

Poster Session and Number: A, #316

Insurance Coverage among Personal Care Aides in Residential Care Facilities
Bernie Lau, University of Washington

Presenter: Bernie Lau, M.P.H., Phd Student, Health Services, University of Washington, bernlau@uw.edu

Research Objective: As the American population ages, the demand for residential care facilities (RCFs), also known as assisted living facilities, is expected to grow. In this growing sector, demand for personal care aides (PCA) is predicted to increase almost 50% in the next decade. This expected growth in demand will provide new opportunities for employment for many low-skilled and semi-skilled workers; however concerns about ethical labor practices are emerging. Employment is an important source of health insurance coverage for many Americans, yet many lower-wage earners are not offered coverage or are unable to afford the premiums. As PCA develop as an occupation, the patterns of insurance coverage may be representative of coverage in other comparable fields.

Our study aims to estimate the proportion of RCFs offering health insurance coverage to PCAs and to test the association between offering insurance coverage and the RCFs’ financial certainty and demand for PCAs.

Study Design: We conducted a cross-sectional analysis of data from the 2010 National Survey of Residential Care Facilities. RCF financial certainty was approximated by three survey items: Medicaid revenue; occupancy rate; and not-for-profit status. Demand for PCAs was approximated by the hours of direct care provided by PCAs, the number of expected tasks performed by PCAs, and the use of substitutable labor such as volunteers and contractors. Logistic regressions were conducted to determine whether RCF financial certainty and PCA demand were associated with the offering of insurance coverage to PCAs. Regression models adjusted for facility size and staff composition.

Population Studied: The study population comprised 2,200 licensed RCFs with at least four beds and employing at least one full-time PCA.

Principal Findings: About 61% of surveyed RCFs provided some form of health insurance coverage to its PCAs; and among RCFs offering coverage to PCAs, about two-thirds provide at least 50% premium support. Adjusted regression analyses reveal most indicators of demand for PCAs were not significantly associated with insurance offering; although RCFs utilizing volunteers were more likely to offer insurance coverage (OR 1.44, 95% CI 1.13, 1.83). RCFs with high occupancy rate (OR 1.34, 95% CI 1.06, 1.70), owned by a chain (OR 3.65, 95% CI 2.88, 4.62), and employing more PCAs (OR 1.30, 95% CI 1.13, 1.49) were more likely to offer insurance. RCFs receiving Medicaid payments (OR 0.91, 95% CI 0.84, 0.98) and for-profit RCFs (OR 0.20, 95% CI 0.15, 0.28) were less likely to offer insurance.

Conclusions: These findings from a nationally representative sample indicate that a many RCFs offer insurance coverage to their PCA employees; however, this rate is lower than for the overall working population. Our analyses suggest the likelihood of insurance coverage may not be associated with indicators of demand for PCA labor. However, several factors related to financial security, as well as facility characteristics were associated with insurance offering.
**Implications for Policy, Delivery, or Practice:** Despite increasing demand for RCFs and PCAs, rates of insurance coverage are low compared to the overall working population. The ability and willingness to offer insurance coverage are likely associated with financial certainty of RCFs. In the face of impending employer mandates for coverage, changes in PCA employment dynamics may be expected; however, such changes may have consequences on the supply of RCFs as well as the quality of care provided.  
**Funding Source(s):** AHRQ  
**Poster Session and Number:** B, #317

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**A Profile of Physician Medical Malpractice**

Doohee Lee, Marshall University; Charles E. Begley

**Presenter:** Doohee Lee, Ph.D., Associate Professor, Management, Marketing, MIS, Marshall University, leed@marshall.edu

**Research Objective:** While previous studies have examined various aspects of medical malpractice, the current literature lacks the information about physicians' perspectives of medical malpractice and their practicing behaviors at the national level. Therefore, we aim to answer the following research questions: Who are those physicians concerned about malpractice? Who are those physicians ordering more tests and consultations to avoid malpractice? Are any organizational and personal factors positively or negatively linked to the characteristics of physicians who concern about malpractices?

**Study Design:** This cross-sectional study simply documents the characteristics of physicians who concern about malpractices. Several statistical approaches were employed for this study including descriptive and inferential statistics for all variables. We also performed multivariate regression including the ordered probit model to test if personal and organizational factors remain significant in relation to malpractices. All of the data analysis was fully adjusted, using the weight variable given in the data and STATA `svy` commands, in order to represent a national sample and correct the complex survey design.

**Population Studied:** We analyzed secondary data, “the 2008 Health Tracking Physician Survey data (n=4,720)” collected by the Center for Studying Health System Change (HSC) and sponsored by the Robert Wood Johnson Foundation (RWJF).

**Principal Findings:** Regression results show that physicians who concern about malpractices are more likely to be male/older/IMGs/minority physicians; to report market competition. It is interesting to find physicians providing charity care are more likely to worry about malpractice. Finally physicians in Western states tend to concern about malpractice.

**Conclusions:** There is a great variation of physician characteristics in relation to medical malpractice.

**Implications for Policy, Delivery, or Practice:** Our study findings are based on physicians’ perspectives on medical malpractices. No prior study has investigated the characteristics of physician medical malpractices in relation to organizational and personal factors at the national level. More research is needed to understand how and the extent to which physicians strengthen or diminish their clinical ability in relation to medical malpractice.

**Funding Source(s):** No Funding  
**Poster Session and Number:** A, #318

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**Improving Access to Dental Care through Diversity: The Data Disconnect**

Elizabeth Mertz, University of California, San Francisco; Cynthia Wides, UCSF Center for the Health Profession; Alexis Cooke, UCSF Center for the Health Professions

**Presenter:** Elizabeth Mertz, Ph.D., M.A., Assistant Professor, Preventive and Restorative Dental Sciences, University of California, San Francisco, elizabeth.mertz@ucsf.edu

**Research Objective:** The US seeks to improve the racial/ethnic and socioeconomic diversity of the dental workforce with the goal to improve access to oral health care for underserved populations. Yet most program evaluations fall short of linking recruitment, retention, practice patterns and patient outcomes. Building from the conceptual model of the “dental pipeline,” this study explores what data elements, methods, and operational steps are required to connect the chain.

**Study Design:** We conducted a systematic literature review in PubMed, Google Scholar, and Sociological Abstracts combining 20 keywords to identify programs to improve diversity, the stated rationales and goals, and reported outcomes. We examined publicly available data sources on the dental workforce, programmatic data where possible, and
assessed the linkages among them for longitudinal tracking over time.

**Population Studied:** Dental Students and Dentists

**Principal Findings:** Evidence presented to link diversity to patient access to oral health care consists primarily of racial concordance between patients and practitioners -- often not based on practice data but on geographic proximity. Metrics and data measuring ‘cultural competence’ and ‘access to care’ outcomes, cited as key goals for diversity programs, are lacking. Data linking dental student recruitment efforts to education exist but are generally not publicly available. Association data are available on education (admission, entry survey, exit survey, matriculation) and practice (state of license, practice location, practice populations and staffing), however, education and practice data are not linked restricting longitudinal tracking. Payment data (Medicaid, private insurance) tracks utilization, however health outcomes are only available from national population surveys.

**Conclusions:** A wealth of dental workforce data exists, however these data sources are disconnected or not publicly available, restricting meaningful analysis of the impact of diversity efforts within the “dental pipeline” on dental care access and health outcomes. Organizational policies pose a greater barrier to analytic progress in this area than do methodological issues.

**Implications for Policy, Delivery, or Practice:** Organizations which collect and maintain dental workforce data need to better collaborate with each other, as well make data available to workforce researchers if meaningful analysis on the dental pipeline is to made be possible. Policy analysis on the actual health care system outcomes of dental diversity and other pipeline efforts will not be possible without more transparency, linkages, and access to data on the dental workforce. Supported by NIDCR P30DE020752 & U54DE019285

**Funding Source(s):** NIH

**Poster Session and Number:** A, #319

**Interprofessional Collaboration and Identity Development at the VA Connecticut Healthcare System Center of Excellence in Primary Care Education: A Qualitative Analysis**

Emily Meyer, VA Connecticut Healthcare System; Rebecca Brienza, MD, MPH

**Presenter:** Emily Meyer, Ph.D., Research Coordinator, Center of Excellence in Primary Care Education, VA Connecticut Healthcare System, emily.meyer@va.gov

**Research Objective:** The primary objective of this research was to assess how internal medicine interns/residents and nurse practitioner (NP) fellows at the VA Connecticut Healthcare System (VACHS) Center of Excellence in Primary Care Education (CoEPCE) developed interprofessionally during their first academic year of training.

**Study Design:** Qualitative methods were used to assess how the first cohort of VACHS trainees changed not only individually, but also as a group. Three sets of semi-structured interviews were conducted at discrete data collection time points to assess individual and group growth (n = 20). Interviews were transcribed and uploaded into Atlas.ti 9.0. Implementing theoretically-grounded qualitative methods, we assessed how CoEPCE NP fellows and residents’ professional and team identities developed over the academic year. The data underwent three phases of reduction, which resulted in several distinct themes and sub-themes.

**Population Studied:** Our target population includes health care professionals currently engaged in post-graduate clinical training. The specific program under investigation, the VACHS CoEPCE, employs an innovative approach to post-graduate health professional education by training resident physicians and NP fellows to function effectively in teams and provide exceptional patient-centered team-based care. Based on four core domains of shared decision making, sustained relationships, performance improvement and interprofessional collaboration, the CoEPCE is one of the first national efforts to embrace an interprofessional training approach that directly addresses divergence in nursing and medical care models.

**Principal Findings:** Findings indicate that NP fellows and interns/residents entered the CoEPCE with a strong sense of self; however an understanding of how they complement other professionals in an educational and clinical environment was less apparent. Over time, both groups demonstrated increased understanding of others’ roles and were able to reflect on how differences/similarities informed interprofessional patient-centered care: “I just think it’s great to have the opportunity [to debate] issues and figure out how different people are...”
Evaluating State-Level Support-for-Service Programs Targeting Nurse Faculty

Jennifer Craft Morgan, Georgia State University; Marilyn H. Oermann, PhD, RN, FAAN, ANEF, University of North Carolina at Chapel Hill; Donald Pathman, MD, MPH, University of North Carolina at Chapel Hill; Mary R. Lynn, PhD, University of North Carolina at Chapel Hill; Thomas R. Konrad, PhD, University of North Carolina at Chapel Hill

Research Objective: State-level support for service (SFS) programs have been implemented by states to increase the numbers of nurses attracted into faculty positions in schools of nursing (recruitment), to enhance the qualifications and worklife of existing faculty, and to increase the retention of faculty in nursing programs. Most commonly, these are loan repayment, scholarship and loan cancellation/forgiveness programs in which an incentive is provided to a target group (e.g., graduate nursing students or currently active nurse faculty holding previous loans) if they teach in a nursing program within the state offering the support. The purpose of this paper is understand the perceived impact of these programs on recruitment and retention of nurse faculty from the perspective of deans and directors of nursing programs.

Study Design: Data are from a web-based survey of deans/directors of nursing programs (e.g., schools and departments) in eight states that have SFS programs (N=106; 46% response rate). All degree program types were included in the sample. Semi-structured interviews were conducted with a sub sample (N=27) of deans and directors and also with SFS program key informants (N=9). Interviews were transcribed, coded and a thematic analysis was conducted.

Population Studied: Deans and directors of nursing programs in community colleges and four year universities in eight states that have or have recently had a support-for-service program.

Principal Findings: About 70% of respondents indicate that they encourage faculty to use SFS programs to further their education. About 40% of deans and directors indicate they have hired faculty who have participated in a SFS program. Most deans and directors indicated that they believe that SFS programs have had some impact in their state in increasing the educational qualifications of current and newly hired faculty, retaining faculty, improving teaching quality, increasing the pool of qualified applicants and increasing the number of students their programs could enroll. More than half (64%) respond that the SFS program in their state helps to alleviate the nurse faculty shortage. However, relatively few use the programs explicitly as a recruitment or retention tool. Interview data will be used to contextualize the results. Factors that condition the severity of the shortage and the impact of the SFS programs include state-level, program-level and...
local labor market factors including the impact of the recent recession.

**Conclusions:** State-level SFS programs are perceived by deans/directors to have some impact on retention, capacity and recruitment pools for nurse faculty. The impact and effectiveness of these programs on nurse faculty recruitment and retention has been understudied. Phase two of the study will assess the impact of SFS programs on individual faculty participants.

**Implications for Policy, Delivery, or Practice:** This study highlights the need to understand the impact of SFS programs so that policymakers and program administrators can use scarce dollars to target SFS program use in contexts (e.g., type of degree program, faculty appointment type, labor market context) where they appear to have the greatest impact.

**Funding Source(s):** RWJF

**Poster Session and Number:** A, #322

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**The Changing Landscape of Nursing Education Programs: A Factor in the Surge of the Number of Young RNs?**

Douglas Staiger, Dartmouth University; Ulrike Muench, Vanderbilt University; David Auerbach, RAND; Peter Buerhaus, Vanderbilt University

**Presenter:** Ulrike Muench, Ph.D., M.S.N., Postdoctoral Fellow, School of Nursing, Vanderbilt University, ulrike.muench@vanderbilt.edu

**Research Objective:** Projections of an unprecedented nursing shortage to hit the US by 2020 have recently been updated by evidence suggesting a sudden increase in the numbers of registered nurses (RNs). While this was partially driven by the recession, research shows a dramatic surge in the number of young RNs, particularly RNs under the age of twenty-five. This is surprising, given the widespread concern about insufficient capacity of RN programs. In this study we examine whether this unexpected surge in young RNs may be driven by growth in nursing education programs.

**Study Design:** We conduct secondary descriptive analysis of data from the Integrated Postsecondary Education Data System (IPDS) of the 2000-2010 survey years. This survey collects institution-level data from US postsecondary institutions and includes data on types of degrees conferred, number of students enrolled, graduation rates and other institutional and demographic characteristics.

**Population Studied:** We study associate and baccalaureate degree RN graduates of the years 2000 through 2010.

**Principal Findings:** The total absolute growth of nursing degrees was 80,267 (104%), with relatively even absolute growth of 40,511 for baccalaureate (117%) and 39,756 associate degree programs (94%). All school types, i.e. public, private (not-for-profit), and private (for-profit), experienced growth. Private (for-profit) schools had the most significant growth of 2162% (515 programs in 2000 versus 11,649 programs in 2010), compared to 109% of private (not-for-profit) (17,676 programs in 2000 versus 369115 programs in 2010), and 85% growth of public programs (58,695 programs in 2000 versus 61,260 programs in 2010). Growth was observed for both men (140%) and women (100%), and across ethnicities, particularly for Hispanics (187%) and for other non-whites (263%). There was considerable variation in geographic growth by states, with states in the West and Midwest experiencing greater growth.

**Conclusions:** From 2000 to 2010, there was strong growth in the number of associate and baccalaureate degree RN graduates across a wide range of demographic groups and types of schools. Tremendous growth was observed in degrees from proprietary education programs.

**Implications for Policy, Delivery, or Practice:** Our findings suggest that increased demand in nursing education programs let to growth in this sector of education, producing workforce recruits rapidly, and easing concerns about a looming nursing shortage. While this is good news, there are concerns about the effects this may have on patient care and the delivery of health care services in the long term: First, the quality of RNs may have fallen as a result of an increase in 2-year college degrees. Second, evidence of an emerging surplus appears to surface. This may signal a discouraging outlook to the new generation of potential nurses, and could turn jobseekers to other professions, despite the continuing increased demand for nurses in the long-term given the demographic changes of the population.

**Funding Source(s):** Other, Gorden and Betty Moore Foundation

**Poster Session and Number:** A, #323
Leveraging Worksite Health Promotion to Achieve Health-Risk Reduction, Lower Health-Related Spending, and a More Productive U.S. Health Care Workforce: Insights from the UPMC MyHealth Program

Michael Parkinson, UPMC Center for High-Value Health Care; Pamela Peele, PhD, UPMC Center for High-Value Health Care; Donna Keyser, PhD, MBA, UPMC Center for High-Value Health Care

Presenter: Michael Parkinson, M.D., M.P.H., Senior Medical Director, Health And Productivity, UPMC Center for High-Value Health Care, parkinsonmd@upmc.edu

Research Objective: To examine changes over time in the health-risk profile, individual lifestyle risk prevalence, preventive service use, and medical/pharmacy and productivity costs of a large health care workforce participating in a group health incentivized benefit plan incorporating a comprehensive wellness and health management program.

Study Design: This four-year, quasi-experimental cohort study of 15,510 UPMC health care employees participating in the UPMC MyHealth worksite health promotion program uses the Edington University of Michigan Health Research Center health-risk framework and a proprietary stratification model to identify an employee’s risk factors, categorize the population into low-, moderate-, and high-risk groups, and track movement between risk levels from 2007 to 2011. Changes in health risk, preventive service use, and cost outcomes for the entire cohort, as well as subgroups with targeted chronic conditions and modifiable lifestyle risks, are evaluated using McNemar, Chi-Square, and Paired-T statistics and available claims data from a statistically-matched control group.

Population Studied: The study cohort comprises group health-insured UPMC employees who completed a Health Risk Assessment as part of the UPMC MyHealth program and were continuously enrolled between 2007 and 2011. In 2011, cohort members were 49 years old on average and 77.6 percent female with the highest proportions employed as nurses (22.1 percent) or administrative support staff (20.1 percent).

Principal Findings: Significant health-risk improvements and associated positive-cost trending was observed for the entire cohort as well as specific subgroups. Between 2007 and 2011, the proportion of cohort members at low health risk increased significantly, 89.2 percent of members improved or maintained their health-risk status, significant improvements were observed in individual lifestyle risk prevalence, and medical/pharmacy and productivity costs decreased for members with improved risk status and increased for those with worsened risk status. Significantly higher use of preventive services and lower average medical/pharmacy costs were observed for the cohort in comparison with the control group. Among cohort members with diabetes, hypertension, or low back pain, percentages at low and high health risk increased and decreased respectively. Positive trending in medical/pharmacy and productivity costs was observed for cohort members who improved BMI and physical activity, reduced stress, and quit smoking in comparison with those who did not.

Conclusions: Continuous, high levels of participation in incentivized, comprehensive worksite health promotion programs, particularly when incorporated into health insurance benefit design, can improve the health-risk profile and individual lifestyle risk prevalence of the health care workforce leading to reduced health-related costs for the entire population as well as subgroups with specific chronic conditions and modifiable lifestyle risk factors.

Implications for Policy, Delivery, or Practice: Key provisions of the Affordable Care Act encourage employers to adopt and significantly financially incentivize wellness programs in order to improve the overall health status of Americans and control health care spending. Our findings suggest that the health care industry can benefit from these provisions as it works to improve the relatively poor health-risk status and high risk-adjusted service utilization of the U.S. health care workforce, constrain or reduce rising health-related costs, and enhance the productivity of this prominent and growing sector of the U.S. economy.

Funding Source(s): Other, UPMC Health Plan

Poster Session and Number: A, #324

Family Medicine Rural Training Tracks: Graduate Early Career Outcomes

Davis Patterson, University of Washington; Randall Longenecker, MD, Ohio University Heritage College of Osteopathic Medicine; David Schmitz, MD, Family Medicine Residency of Idaho; Robert L. Phillips, Jr., MD, MSPH, American Board of Family Medicine; Susan M.
Research Objective: The proportion of matriculating medical students in 2011 reporting they intended to practice in a small town or rural area in 2011 was just 2.7 percent. The 1-2 model of family medicine rural training track (RTT) residencies combines one year of urban training with two years of rural training to address a well-documented shortage of rural providers, expected to worsen with insurance coverage expansion under the Affordable Care Act (ACA). The RTT Technical Assistance Program (RTT TAP), funded by HRSA’s Office of Rural Health Policy, aims to sustain, expand, and assess the outcomes of 1-2 RTTs. The last national evaluation of RTTs occurred more than 10 years ago. This study uses new data to determine the early-career outcomes of RTT program graduates in choosing to provide care to rural and underserved populations.

Study Design: Residency graduate identifiers, including National Provider Identifier numbers, were matched to post-graduate practice information in several sources, including the American Medical Association (AMA) Masterfile, Centers for Medicare and Medicaid Services (CMS) claims data (2009), and American Board of Family Medicine data. Graduates were tracked longitudinally from graduation for up to three years post graduation (depending on how recently they graduated) to determine their practice locations (urban/rural as defined by Rural-Urban Commuting Area codes; Health Professionals Shortage Areas (HPSAs)) and facility types (Federally Qualified Health Centers (FQHCs), Rural Health Clinics (RHCs), Critical Access Hospitals (CAHs)).

Population Studied: The RTT TAP collected data on 123 RTT graduates, in the academic years 2008-9 through 2011-12, from 18 of 25 RTT programs graduating residents during the period.

Principal Findings: Compared with family medicine residents overall, RTT graduates were more often male (54 percent), international medical graduates (51 percent), and older (by about 4 years). Of graduates from 2007-8 through 2009-10, 81 percent had achieved board certification as of 2011. Using AMA data, 49.4 percent of RTT graduates in clinical practice were in rural locations at graduation, declining slightly to 44.8 percent three years post-graduation. In contrast, using data from RTT programs, 71.9 percent of clinically active graduates began practice at graduation in rural areas. At graduation, 41.8 percent practiced in HPSAs, declining to 27.6 percent three years post graduation. Of those graduating in 2007-8 and 2008-9, nearly half (48.1 percent) were practicing in safety net facilities in 2009, mostly RHCs and CAHs but also FQHCs.

Conclusions: Depending on the data source analyzed, RTT graduates were approximately two to three times more likely than all family medicine graduates to practice in rural areas. High proportions practiced in HPSAs and safety net facilities. These findings suggest that RTT programs have succeeded in recruiting and preparing family physicians for practice with rural and underserved populations.

Implications for Policy, Delivery, or Practice: Increasing healthcare demand under the ACA highlights the urgency to identify and support effective strategies to ensure a sufficient primary care workforce. Policy and programmatic options to support the RTT model include new funding mechanisms; collaborations with FQHCs, RHCs, and CAHs to create new RTTs; technical assistance; human resource development; sharing of best practices; and augmentation of data to inform performance improvement and policy.

Funding Source(s): HRSA

Poster Session and Number: A, #325


Elena Platonova, University of North Carolina at Charlotte; S. Robert Hernandez, University of Alabama at Birmingham

Presenter: Elena Platonova, Ph.D., MHA, Assistant Professor Of Healthcare Management, Public Health Sciences, University of North Carolina at Charlotte, eplatono@uncc.edu

Research Objective: To examine the extent to which innovative human resource (HR) practices were used in a national sample of US hospitals. The study also assessed the extent to which HR management strategies were included in the organizational strategic planning process and the association between the inclusion and
involvement of senior HR professionals in corporate or business unit strategic planning with the use of innovative HR practices.

**Study Design:** An HR survey was developed and pretested. The Survey requested information on innovative HR practices in the following domains: human resource management (HRM) strategic planning, design of work systems, staffing methods, performance evaluation and compensation, employee training and development. The Survey also asked about senior HR professionals’ involvement in strategic planning and inclusion of HR strategies in organizational strategic planning. Frequency distributions were used to describe innovative HR practices in the sampled hospitals. Then, an HRM strategic involvement score for each hospital was calculated. Based on the score, all sampled hospitals were divided into a high or low HRM strategic involvement group. Binary logistic regression analysis was conducted to determine whether HRM involvement was associated with the use of innovative HRM strategies in the hospitals.

**Population Studied:** The Survey was administered to chief executive officers and HR executives from 85 hospitals across the United States in 2005. Respondents from 48 hospitals (56% of the contacted hospitals) completed the Survey.

**Principal Findings:** The most frequently used innovative HR practices were a customer focus orientation (mean 3.99 on a 5-point scale), innovative staffing methods (mean 3.81), and employee training and development (mean 3.36). The least used innovative HR practices were team-based pay plans, team-based compensation based on results, and job rotation strategies (means 1.9, 2.03, and 2.16, respectively). We found significant associations between HRM strategy inclusion in the strategic planning process and senior HR professionals’ involvement in organizational strategic planning and three innovative HR practices. Specifically, hospitals with high HRM involvement were about five times as likely as other hospitals to find talent in advance for key job openings (odds ratio (OR)=4.61, 95% CI: 1.10-7.38). Similarly, hospitals with high HRM involvement were about four times as likely to stress organizational culture and values in the selection process (OR=3.97, 95% CI: 1.01-3.97). Finally, hospitals that included HR strategies in the strategic planning process and involved their senior HR professionals in organizational or unit strategic planning were about six times as likely to base individual or team compensation on goal oriented results (OR=6.17, 95% CI: 1.17-3.37).

**Conclusions:** Our HRM data clearly indicate that innovative HR practices are still underused in some US hospitals despite their good potential to improve overall hospital performance. The means were far below 4.0 (on the 5-point scale) for the most innovative HR approaches.

**Implications for Policy, Delivery, or Practice:** We recommend that top hospital administrators should involve senior HR executives more extensively in the organization strategic planning process, incorporate strategic HRM practices in organization or unit business strategy, and increase the use of innovative HR practices in their organizations.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #326

**Nurse Practitioners as Primary Care Providers: Practice Environments and Outcomes in Two States with Varying Scope of Practice Regulations**

Lusine Poghosyan, Columbia University; Carolyn Sun, MSN, ANP-BC, RN, Columbia University School of Nursing; Samantha Brown-Stonbraker, MPH, Columbia University School of Nursing

**Presenters:** Lusine Poghosyan, Ph.D., M.P.H., R.N., Assistant Professor, School of Nursing, Columbia University, lp2475@columbia.edu

**Research Objective:** The purpose of this study was to investigate practice environments for primary care nurse practitioners (NP) and the impact of practice environments on NP job satisfaction and turnover in Massachusetts (MA) and New York (NY).

**Study Design:** Cross-sectional survey design. Data were collected through mail (in MA) and online (in NY) surveys in 2012, using the Nurse Practitioner Primary Care Organizational Climate Questionnaire (NP-PCOCQ), measures of job satisfaction, turnover, demographics, and work characteristics. NP-PCOCQ measures practice environments in terms of NP-physician relations, NP-administration relations, support and resources, role visibility, and autonomy. In MA, surveys were mailed to 807 NPs recruited from the Massachusetts Provider Database; In NY, members of the New York Nurse Practitioner Association were emailed the link to our online survey. In MA, 298 NPs and in NY,
278 NPs completed the survey. Multiple logistic regression models were used to test the relationship between practice environments and NP outcomes. Models were controlled for NP demographics and work characteristics including years employed in the position, hours worked, and state (a dummy variable).

**Population Studied:** 576 primary care NPs participated. The mean age was 50 and 6.2% were male. Respondents practiced in a variety of care settings including physician offices, community health centers, hospital-based clinics, etc.

**Principal Findings:** 86% perceived that NPs and physicians practice as a team. Physicians in MA were more likely to ask NPs for suggestions (81.8% versus 72.0%, p=.005), and collaborate with them (95.4% versus 90.3%, p=.016). Of 576 NPs, 20% reported not receiving the same support for care management as physicians and 23% reported inadequate staff support to prepare patients for visits. In MA, NPs were more likely to have staff support than in NY (84.3% versus 69.6%, p<.001). As perceived by NPs (58.1%), administrations did not treat NPs and physicians equally or share information equally (43.6%). In NY, more NPs were dissatisfied with their jobs than in MA (30.2% versus 22.5%, p=.027) and reported intentions to leave their current job (19.4% versus 10.2%, p=.002). Controlling for NP and work characteristics, NP practice environments were associated with job satisfaction and NP turnover. The odds of job satisfaction increased 2.8 times with every unit increase in the scores of role visibility subscale. The odds of turnover decreased 2 times with every unit increase on the NP-physician relations subscale score.

**Conclusions:** In both states, there are deficiencies in NP practice environments. Favorable working relations with administration and physicians, access to necessary support, and clear visibility of NP role are important for successful NP practice.

**Implications for Policy, Delivery, or Practice:** This evidence will help organizations to design effective practice environments that will facilitate the optimal practice of NPs as primary care providers and promote their ability to deliver high quality care. The findings support the Institute of Medicine’s recommendation to expand the NP workforce in primary care settings by creating practice environments that minimize NP turnover and maximize job satisfaction. Maintaining a functional NP workforce is necessary to meet the increased demand for primary care during the implementation of health reform.

**Funding Source(s):** AHRQ

**Poster Session and Number:** A, #327

**Self-Reported Burnout among Primary Care Employees within the VA’s Patient-Aligned Care Team**

Joseph Simonetti, University of Washington Medical Center; Christian Helfrich, Health Services Research and Development, Department for Veterans Affairs; Emily Dolan, Office of Analytics and Business Intelligence, Department for Veterans Affairs; David Mohr, Center for Organization, Leadership and Management Research, Department for Veterans Affairs; Richard Stark, Primary Care Program Office, Department for Veterans Affairs; Gordon Schectman, Primary Care Program Office, Department for Veterans Affairs; Stephan Fihn, Division of General Internal Medicine, Department of Medicine, University of Washington, Seattle, WA; Health Services Research and Development, Department for Veterans Affairs; Kari Nelson, Division of General Internal Medicine, Department of Medicine, University of Washington, Seattle, WA; Health Services Research and Development, Department for Veterans Affairs; General Medicine Service line, VA Puget Sound

**Presenter:** Joseph Simonetti, Fellow, Division of General Internal Medicine, Department of Medicine, University of Washington Medical Center, simonja@uw.edu

**Research Objective:** In April 2010, the Veterans Health Administration launched a nationwide Patient-Centered Medical Home initiative called the Patient-Aligned Care Team (PACT). We assessed reported burnout among primary care employees approximately 2 years later and compared assessments using 2 different burnout measures. We also compared reported burnout among employees working in VA primary care with reported burnout in non-primary care settings using a national employee survey.

**Study Design:** A web-based PACT survey was administered in May 2012 to employees in primary care settings, including primary care providers (PCPs), nurses, clinical associates (e.g., LPNs) and clerical assistants. We used 2 measures of burnout: A 9-item version of the Maslach Burnout Inventory (MBI) which...
measures 3 sub-scales (emotional exhaustion, cynicism, and professional efficacy) using a 7-point Likert scale (sub-scale range 3-21). We also used a single-item measure from the Physician Worklife Study which asks respondents to classify their level of burnout using a 5-item scale (1=no burnout, 3=definitely burning out, 5=completely burned out). We defined respondents as having burnout based on a high score (>=9.5) on the emotional exhaustion sub-scale of the MBI or a score of >=2 on the single-item measure. We compared PACT findings to the 2012 VA All Employee Survey (AES), an annual survey administered to all VA employees (n=255,931, 62 percent response rate) that included the single-item burnout measure.

**Population Studied:** VA primary care employees.

**Principal Findings:** The PACT survey was completed by 6,467 employees (approx. 30 percent response rate); 27 percent were PCPs, 21 percent were clinical associates, 18 percent were nurse care managers, 9 percent were registered nurses (other than nurse care managers), 9 percent were clerical assistants and 16 percent were employed in another position. Based on the MBI, rates of self-reported burnout were highest for PCPs (48.5 percent) and nurse care managers (41.2 percent), followed by clerical assistants (36.8 percent), registered nurses (33.8 percent) and clinical associates (30.4 percent). Burnout rates, as measured by the single-item instrument, were similar to results from their MBI emotional exhaustion scale across all employee categories. A similar pattern of burnout among occupational groups was observed among Primary Care respondents to the AES; though burnout rates were 2-5 percent lower, on average, by occupation. Burnout rates were similar between AES respondents in Primary Care and AES respondents overall, except for providers, where PCPs reported a 40.3 percent burnout rate compared to 28.1 percent for VA providers overall.

**Conclusions:** Self-reported burnout among VA primary care employees was high, particularly among PCPs and nurse care managers. Estimates of burnout were very similar between two different burnout instruments and two different survey cohorts.

**Implications for Policy, Delivery, or Practice:** Burnout has been linked to employee turnover and quality of care, and may affect the ability of VA providers to address the primary care needs of Veterans nationally. This study demonstrates that we can reliably assess burnout in VA primary care settings, and is an important first step in assessing the association of PACT implementation with rates of employee burnout.

**Funding Source(s):** VA

**Poster Session and Number:** A, #328

**Outpatient Productivity and Practice Characteristics of Rural Primary Care Nurse Practitioners in States with Varying Physician Oversight Regulations**

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**Presenter:** Susan Skillman, M.S., Deputy Director, Center for Health Workforce Studies, University of Washington, skillman@uw.edu

**Research Objective:** Nurse practitioners (NPs) are a growing segment of the rural primary care workforce, yet little is known about how physician oversight requirements are related to rural NP practice characteristics or outpatient productivity. NPs’ roles are likely to grow even more important as the rural physician workforce struggles to meet demand. Limitations to NP practice autonomy, however, may impede NPs’ ability to meet the primary care needs of rural communities. This study examines outpatient productivity and practice characteristics of NPs in rural primary care settings across states with varying requirements for physician involvement.

**Study Design:** This mail/web cross sectional survey conducted in 2011 drew from a representative sample of NPs with rural mailing addresses (determined using Rural-Urban Commuting Area codes) in 13 states representing all Census regions. The sample (response rate 40%) included 745 NPs after excluding those not principally engaged in rural primary care. Each state’s NP practice regulations were categorized to explore whether productivity and practice patterns varied by degree of NP practice autonomy. Six states authorized fully autonomous NP practice, 5 required physician supervision and 2 required physician collaboration.

**Population Studied:** NPs practicing rural primary care in 13 states.

**Principal Findings:** Across all states, most rural practicing NPs worked in private practice (33.6
percent), federally qualified Rural Health Clinics (23.4 percent), and federally qualified community health centers (11.9 percent). Two thirds (66.7 percent) reported a practice specialty of family health, followed by women’s health (10.4 percent), adult health (9.3 percent), and pediatrics (9.1 percent). NPs in autonomous states reported similar average weekly hours in rural direct patient care as those in physician collaboration or supervision states (33.4, 35.1, 35.3, respectively; p=0.081) but fewer average total visits per week (54.9 vs. 71.2 vs. 66.6; p=0.000). NPs in autonomous states provided slightly fewer average weekly prenatal care visits (1.4, 2.6, 2.1; p=0.303) and more minor procedures (5.1, 4.6, 4.7; p=0.770) than in other states but the differences were not statistically significant. NPs in autonomous states provided fewer average weekly well child visits (5.3, 8.0, 7.9; p=0.012) compared with NPs in the other states. Most (83.6 percent) rural primary care NPs in autonomous states practiced with at least one physician, fewer than NPs in physician collaboration (86.8 percent) or supervision states (91.0 percent) (p=0.039). Approximately three quarters (73.8 percent) of all rural primary care NPs practice with other NPs, 31.9 percent practice with at least one physician assistant, and 6.0 percent practice with at least one midwife.

Conclusions: Rural NP productivity varies depending on state practice regulations. Further research is needed to identify the underlying reasons for the differences observed by this study and the patient care outcomes associated with varying NP practice models. For example, in autonomous practice states NPs may have more chronically ill and complex patients requiring longer visits than in states where physician supervision or collaboration is required. In autonomous states NPs may be involved in more administration which decreases productivity.

Implications for Policy, Delivery, or Practice: Estimates of the number of NPs required to meet rural population needs should consider the potential impact of state physician oversight requirements.

Funding Source(s): HRSA
Poster Session and Number: A, #329

Rural Access to Primary Care: Evaluating the Quality of Research and Health Care Work Force Solutions
Johanna Steenrod, University of Pittsburgh; Alla G. Khadka, University of Pittsburgh; Abigail Stark, University of Pittsburgh

Research Objective: The United States continues to struggle with achieving equitable access to primary care for its rural citizens. Local, state and federal agencies as well as researchers and practitioners are working to address this issue through a number of intervention and policy avenues, particularly related to workforce training, distribution, and diversification; however, a sustainable solution has been slow to formulate. We model the knowledge production system to understand which authors, sources, and professions are the top influencers of knowledge creation and use, regarding improving rural access to primary care.

Study Design: By analyzing the stock of over 5,000 publications on this topic, generated from a literature review, we employ Citation Network Analysis to elicit the knowledge production system and Social Network Analysis to gauge the most powerful players in the network via centrality measures. Using a generalizable normative model of knowledge production, based on Gibbons et al. (1994), we evaluate how the system performs in terms of two scaled indicators: multidisciplinarity and heterogeneity.

Population Studied: The knowledge production system entails all authors and organizations that have written or were cited within publications from the literature review. The review includes all publications from 1993 to the present that address rural populations in the United States, access, and primary care, defined as clinical care for all physical, mental, and behavioral conditions, ranging from screening through monitoring.

Principal Findings: Our findings suggest that the knowledge production system is highly concentrated within academic institutions, certain government agencies, the South Atlantic geographic region of the United States, and within family medicine departments. The networks for both authors and sources grew by 67 percent over the study period and decreased in density and overall centralization. Analysis of
top authors and sources showed increased centrality of new disciplines (e.g. dentistry and mental health), chronic diseases (e.g., cancer and diabetes), government agencies, and health policy.

**Conclusions:** The knowledge production system became more multidisciplinary over the study period but heterogeneity remained consistent in terms of types of knowledge producers and geography. This suggests that the system is open to innovation from new disciplines that can offer new perspectives and approaches to the workforce and access issue. As the system becomes more decentralized and multidisciplinary, however, innovation is restricted by concentrated sites and knowledge producers.

**Implications for Policy, Delivery, or Practice:**
This study stresses the importance of continuing and enhancing multidisciplinary approaches to studying and developing solutions for primary care access issues, including disadvantaged rural populations. It also implies that research funders and researchers (academic, practitioner, government, foundation, think-tank, etc.) should diversify their efforts and funding across more heterogeneous sites to be more reflexive to stakeholders.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #330

**Hospital Adherence to Policies: Evaluation of Operating Room Nurse Staffing Policy Review**
Melissa Bathish, PhD(c), RN, CPNP-PC; University of Michigan School of Nursing; Akkeneel Talsma, University of Michigan; Margaret McLaughlin, PhD, RN, University of Michigan School of Medicine

**Presenter:** Akkeneel Talsma, Ph.D., R.N., Assistant Professor, Surgery - Transplant, University of Michigan, antalsma@umich.edu

**Research Objective:** Numerous studies have evaluated the role of unit based nurse staffing levels and patient outcomes and linked with quality of care outcomes. Little is known about the characteristics of operating room (OR) nurse staffing, as it does not follow the unit staffing format. OR nurses are assigned to one OR room for each procedure, unlike unit nurses who care for multiple patients at the same time. Staffing policies and guidelines provide a framework for evaluating the relationship between nurse staffing and quality patient care.

Therefore, the purpose of this study was: (1) To review nurse staffing policies in ORs of hospitals within the Perioperative Outcomes Initiative (POI), a Michigan quality collaborative, and (2) To compare policies to staffing guidelines of the Association of periOperative Registered Nurses (AORN). The Quality Health Outcomes Model (QHOM) guided this study. The QHOM is an extension of the structure-process-outcome-model, using bidirectional relationships among its main constructs (system, interventions, client, and outcomes). Thus, surgical patient outcomes affect and are affected by staffing (system characteristic).

**Study Design:** All 17 hospitals participating in POI were invited to submit OR staffing policies for review. Agreements were established to only share aggregate and de-identified information, such that the hospital name was not disclosed to members of the collaborative.

**Population Studied:** A descriptive, exploratory study was conducted. The submitted OR staffing policies were reviewed and compared with parameters from AORN’s perioperative staffing recommendations and guidelines. Descriptive analyses identified frequencies and percentages of parameters included in hospital staffing policies consistent with the AORN framework.

**Principal Findings:** Response rate to policy submission within the consortium was 35% (6/17). The hospitals that did not submit a policy for review cited the following reason(s): (a) policy did not exist, (b) no permission received from leadership to submit for review, (c) labor related contracts prohibit release of the policies for review. A majority, 67% (4/6) of the reviewed policies included the policy purpose and provided direction about direct patient caregivers. Half of the policies included an AORN-derived guidance statement individualized to the organization and identified a minimum requirement of one registered nurse per OR suite for a surgical procedure. Productive and non-productive time and provisions for emergent procedures were included in 33% (2/6) of policies. Very few (16%; 1/6) policies identified provisions for unplanned procedures, number of scrub persons per procedure, call staffing, or flexible staffing formulas.

**Conclusions:** This study indicates that perioperative nurse staffing policies lack many of the components included recommended AORN guidelines. In particular, guidelines pertaining to flexible staffing guidelines, provisions for
The Great Recession of 2007 and California Nurses: A Descriptive Analysis
Michelle Tellez, California State University, East Bay; Pamela Neronde RN BSN, ; Sherly Wong, Student RN, California State University East Bay

Presenter: Michelle Tellez, Ph.D., R.N., Assistant Professor, Nursing and Health Science, California State University, East Bay, michelle.tellez@csueastbay.edu

Research Objective: To investigate the effect of the Recession of 2007 on nurses’ wages, demographics, human capital, and work environment characteristics.

Study Design: Descriptive study using data collected by the California Board of Registered Nursing Surveys of 2006, 2008 and 2010.

Population Studied: Nurses working and residing in the state of California who earned a wage and were less than 75 years old. Once selection criteria were enforced 7767 nurses were included in the study.

Principal Findings: The Recession eliminated secondary nursing positions. Although 30% of nurses worked part-time in 2010, nurses worked on average 51 weeks a year in their primary nursing positions. Household incomes were stable though continuous increase in wages. Location of employment and job title changed over this period with more nurses working in ambulatory care settings and more individuals holding advanced practice titles. Nurses are more satisfied with their work environment and most do not intend to leave, although 30 would like to work fewer hours a week. Less than 50% of California nurses held a BSN degree or higher at the time of the surveys. Their average age was 48, and the majority was either White or Asian.

Conclusions: As the economy recovers, secondary nursing positions will re-appear and the nurse shortage will re-surge.

Implications for Policy, Delivery, or Practice:
Intense focus in three policy areas is recommended: education, faculty training, and recruitment and retention of African Americans, Hispanics, and older nurses. Nursing educational enrollment must be maintained at the present levels, and additional emphasis must be placed in the recruitment of students of color. Strides made in the number of students admitted to nursing programs the past 10 years cannot be lost. Faculty shortage is a well-known problem that continues to plague the nursing educational system. Nurse faculty training programs and loan re-payment incentives programs are essential to bringing more individuals in the field of education. A focus on conflict management and leadership training can assist the recruitment and retention of Hispanics and African American nurses. Flexible work environments and teaching programs may be able accommodate older nurses. Keeping older, more experienced nurses in the labor supply as resources and mentors may facilitate the entry of new graduates while ensuring a high skill in the workplace.

Funding Source(s): Other, BCBSM

Public Opinions Regarding Advanced Dental Hygiene Practitioners in a High-Need State
Sarah Walsh, Foundation for a Healthy Kentucky; Jennifer Chubinski, Health Foundation of Greater Cincinnati; Eric Rademacher, The Institute for Policy Research at the University of Cincinnati

Presenter: Sarah Walsh, M.P.H., Knowledge Officer, Foundation for a Healthy Kentucky, swalsh@healthy-ky.org

Research Objective: The American Dental Hygienists’ Association has developed a set of professional competencies for a new type of oral health professional: the Advanced Dental Hygiene Practitioner (ADHP). It is hoped that the ADHP will increase access to oral health care for the general population, particularly in rural and underserved areas. In order for this strategy to be successful, the public must feel comfortable with the care provided by ADHPs and seek out their services. This study
assessed consumer receptivity to the ADHP in a particularly high need area: Kentucky. As a point of comparison, respondents were also asked about their comfort with care provided by two other so-called “mid-level” clinicians already licensed in the state, advanced practice register nurses (APRN) and physician assistants (PA).

**Study Design:** A random sample of 1,680 adults from throughout Kentucky was interviewed by telephone as part of the annual Kentucky Health Issues Poll. Specifically, 1,360 landline interviews and 320 cell phone interviews were conducted between September 20 and October 14, 2012. Sample responses were weighted based on American Community Survey estimates for gender, race, age, educational attainment and region of Kentucky.

**Population Studied:** This study polled a representative sample of adults from a state with significant oral health challenges and limited access to care. According to the 2010 Behavioral Risk Factor Surveillance System (BRFSS), 27.4% of Kentucky adults over age 65 have had all of their natural teeth extracted, trailing only Tennessee and West Virginia for the highest rate of edentulous seniors in the nation. Just 63.2% of Kentucky adults reported seeing a dentist for any reason in the past year, according to the 2010 BRFSS. Only 5 states report lower rates of dental access. Kentucky typifies the types of oral health needs that the ADHP profession was created to address.

**Principal Findings:** After hearing a brief description of the profession, nearly 3 in 4 Kentucky adults said they would be somewhat (35.4%) or very (38.2%) comfortable seeing an ADHP for routine dental care. Just 1 in 6 said they would be somewhat (7.7%) or very (8.5%) uncomfortable seeing an ADHP. An additional 6.6% said they would be neither comfortable nor uncomfortable seeing an ADHP and 3.6% did not have an opinion. The total proportion of Kentucky adults who were comfortable seeking care from an ADHP (73.6%) was less than the proportion indicating comfort seeing an APRN (79.7%) or PA (81.3%). In general, respondents who were younger, who had higher incomes, and who were in better overall health were more likely to be comfortable with an ADHP.

**Conclusions:** For all demographic sub-groups studied, the majority of Kentucky adults would be somewhat or very comfortable seeing an ADHP for routine dental care. While Kentuckians reported less comfort with ADHPs than with other “midlevel” clinicians, this may be related to a lack of direct experience with ADHPs.

**Implications for Policy, Delivery, or Practice:** Adults are receptive to new models of care delivery and report high levels of comfort with ADHPs. Consumer concerns are unlikely to be a barrier to expanded licensure for dental hygienists in high need areas like Kentucky.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #333

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**The Association Between Medical Student Career Interests and Attitudes Toward Primary Care, Faculty Mentorship, and Institutional Support**

Charlotte Ward, Massachusetts General Hospital; Susan Edgman-Levitan, Massachusetts General Hospital; Marya J. Cohen, Massachusetts General Hospital; Rebecca A. Berman, Massachusetts General Hospital

**Presenter:** Charlotte Ward, M.P.H., Research Analyst, Massachusetts General Hospital, cward0@partners.org

**Research Objective:** The Crimson Care Collaborative (CCC), a series of 5 student-faculty collaborative practices, aims to give medical students hands-on practical experience in primary care practices across the Harvard Medical School network, with the hope that these students will be more inclined to pursue a career in primary care after they graduate. We surveyed medical students prior to participating in CCC. Our goal was to examine the relationship between student career interest and faculty mentorship, institutional support and attitudes toward primary care.

**Study Design:** All Harvard Medical School (HMS) students who joined the Crimson Care Collaborative as student-volunteers were administered a survey prior to volunteering which asked questions about their career interests, attitudes toward and knowledge about primary care, and presence of faculty mentoring. Survey responses were compared with Chi-square tests.

**Population Studied:** The study population included 129 HMS students who filled out a survey prior to participating in CCC.

**Principal Findings:** Among students who reported having a faculty mentor at HMS within the field of general medicine, reported interest was higher in general medicine than specialty medicine (60%, vs. 8%, p <0.0001). Students...
interested in general medicine were more likely to report having met a HMS faculty member whose general medicine career is one they would like to emulate (59% vs. 15%, p < 0.001) and to report having disagreed with negative comments that they heard about primary care from either faculty, residents, or their peers (86% vs. 45%, p < 0.001) compared to students interested in specialty medicine. Students interested in general medicine were less likely to report that there was institutional support for future primary care careers than students not interested in general medicine (38% vs. 69%, p = 0.002). There were no significant differences in student-reported importance of income, ability to pay back loans, or amount of student debt between students interested in general medicine versus specialty medicine.

Conclusions: Harvard Medical School students interested in general medicine were more likely to report having faculty mentors and members that they emulate in the fields of general medicine, more likely to disagree with negative comments that they had heard in regard to primary care, but were less likely to report the presence of institutional support. The ability to pay back loans, student debt and importance of income were not associated with career interest, in contrast to previous studies. Our study finds that there are other factors, aside from student debt and income, that play a role in primary care career interest.

Implications for Policy, Delivery, or Practice: By expanding Medicaid and providing federal subsidies to help lower-income individuals purchase private insurance, the Affordable Care Act will extend insurance coverage to 30 million new patients, many of whom will likely need a PCP. It will be important to attract a greater number of medical students to the field of primary care. Our study provides insight into the factors that contribute to student career interests and focusing on these factors as a means of attracting more students to primary care could be valuable for medical institutions to pursue.

Funding Source(s): No Funding

Poster Session and Number: A, #334

Patient Safety Knowledge and Attitudes of Medical Students at Various Stages of Training: A Cross-Sectional Analysis

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Presenter: Donna Woods, Ph.D., Ed.M., M.A., Assistant Professor, Feinberg School of Medicine, Northwestern University, woods@northwestern.edu

Research Objective: Medical error is a leading cause of morbidity and mortality in the United States. Formal training in patient safety is a vital, yet neglected, component of undergraduate medical education. This study reports the initial results of a cross-sectional analysis of medical student patient safety knowledge and attitudes at a single medical school at various stages of training.

Study Design: All participants were asked to complete two validated assessments:

1) Attitudes to Patient Safety Questionnaire, 3rd edition (APSQ-III), which measures nine subscores and a global score of patient safety on a 1-7 Likert scale, and 2) Risk Management Foundation (RMF) Patient Safety Knowledge Test, a 14-item multiple-choice assessment. First year students (M1) were recruited on their second day of medical school, second year students (M2) in the second month of classes, and fourth year students (M4) during the Emergency Medicine Clerkship. The patient safety assessment data was then analyzed to evaluate student patient safety knowledge and attitudes overall, by class and to compare patient safety knowledge and attitudes across the stages of medical education.

Population Studied: Medical students, in the first, second, and fourth year of medical school training during the 2012-13 academic year (N=314).

Principal Findings: 155 M1, 75 M2, and 84 M4 students completed both assessments (N = 314).

M4 students scored modestly higher than M1 and M2 students on the knowledge assessment, 59.5% vs. 51.0% and 51.6%, respectively (p < 0.05).

There were no statistical differences in the global scores between the M1, M2, and M4 students on the APSQ-III (5.46, 5.33, 5.44, respectively). There were no significant differences between classes in the Error Reporting Confidence (4.94, 5.02, 4.94), Error Inevitability (6.33, 6.24, 6.34), Disclosure Responsibility (5.48, 5.22, 5.21), or Patient Involvement in Reducing Error (5.43, 5.39, 5.62) sub-scores. While M4 students had less
favorable attitudes than M1 or M2 students in Working Hours as Error Cause (4.90 vs. 5.67 and 5.39), the M4 students had more favorable attitudes on Patient Safety Training Received (5.41 vs. 4.28 and 4.44), and Professional Incompetence as Error Cause (5.38 vs. 4.99 and 5.05). M1s had more favorable attitudes than M2 and M4 students in Importance of Patient Safety in Curriculum (6.05 vs. 5.48 and 5.40).

Conclusions: While there was a modest positive shift in knowledge and some attitude sub-scores in the domains of patient safety across the four years of medical training, the M4 scores do not demonstrate competence.

Implications for Policy, Delivery, or Practice: Current medical educational frameworks are training medical students to achieve patient safety competence. The incremental increase in knowledge from M1 to M4 year (51-59%) means medical students are graduating medical school unprepared for the current expectations of quality and safety competence in residency and medical practice. To address the significant quality and safety challenges in our healthcare system, it is critical for medical students to achieve quality and safety competence. It is therefore essential to meaningfully integrate quality and safety knowledge, attitudes, and skills, acquisition into medical student learning and into the medical education curricular requirements.

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The Effect of Prior Health-Related Employment on the Wages of Registered Nurses
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Presenter: Byung-kwang Yoo, M.D., Ph.D., M.S., Associate Professor, Department of Public Health Sciences, UC Davis, School of Medicine, yoobk3@gmail.com

Research Objective: Among all registered nurses (RNs), the proportion of RNs with prior employment in health-related positions before completing their initial RN education was 67% in 2008, having increased steadily from 29% in 1992. Prior research found that prior health-related employment is positively associated with the workforce supply. Our objective is to examine whether prior health-related employment was associated with differences in wages, particularly the wage increases received for greater years of experience as an RN.

Study Design: We conducted a cross-sectional analysis, implementing a multivariate ordinary least squared model where the outcome variable was the logarithm of the RN hourly wage. The key covariates included interaction terms between years of experience, experience squared, and six categories of prior health-related employment: Licensed Practical Nursing (LPN), Nursing Aide, Allied Health, Clerk, Manager and all other health-related positions. Additional covariates are whether the RN works more than 40 hours per week, gender, marital status, race, highest nursing degree, and region. We estimated the marginal effect of experience for each of prior health-related employment categories.

Population Studied: The National Sample Survey of Registered Nurses (NSSRN) 2008 (N=20,385), excluding subjects who did not work as RN or worked only part-time.

Principal Findings: Among six categories of prior health-related employment, only RNs with prior employment as LPN were found to statistically differ in the wage received over time, compared to those without prior health-related employment (control group)(p<.05). The LPN group had both a relative advantage and a relative disadvantage compared to the control group. The advantage was observed as a higher starting annual salary for full-time workers ($52,000), which is $2,000 higher. The relative disadvantage is that the returns to experience are lower for those with prior LPN employment. For instance, when experience increased from 5 years to 6 years, the hourly wage increased by $0.27 for the LPN group and $0.38 for the control group. RNs with prior LPN experience earn a higher wage until they have accrued approximately 10 years of experience.

Conclusions: The LPN group had a higher start wage but a lower experience-based wage increase compared to RNs who did not have prior health-related experience. This lower return to experience offsets the initially higher wage once experience exceeded 10 years.

Implications for Policy, Delivery, or Practice: RNs who previously worked as LPNs are an important component of the RN workforce; prior research has found them to have greater
workforce supply than RNs who do not have health-related experience. However, the differences in the wages of RNs with prior LPN experience versus those without may reflect different skills at the start of an RN’s career versus later in the career. The higher initial wage for RNs with prior LPN experience suggests that employers find that RNs with prior experience are more productive when they have little RN experience. However, the higher return to experience for RNs who were not previously LPNs suggests that there are differences in human capital accumulation between these groups. Future research should examine the underlying causes of this difference and whether educational or training interventions could increase the productivity of LPNs with experience.

**Funding Source(s):** Other, University of California, Davis

**Poster Session and Number:** A, #336

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**The Impact of Economic Recession on the Registered Nurse Workforce Supply**

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**Presenter:** Byung-kwang Yoo, M.D., Ph.D., M.S., Associate Professor, Department of Public Health Sciences, UC Davis School of Medicine, yoobk3@gmail.com

**Research Objective:** The severe economic recession starting in 2008 has substantially influenced the registered nurse (RN) workforce supply at the national level. Our objectives are (1) to examine the specific effect of the supply determinants in 2008 and 2010, separately, and (2) to compare the change in these effects between years 2008 and 2010.

**Study Design:** We first conducted the cross-sectional analysis by running multivariate regression models where the dichotomous dependent variable indicated whether working as RNs or not. The covariates included age (5 groups), market RN wage (predicted for all subjects), other income, gender, race, marital status, highest RN-related education attained, residential regions and others. We then compared the estimated coefficients of each covariate between 2008 and 2010. Our hypotheses are that older RNs became more likely to work in 2010 and that RNs became less sensitive to market RN wage and other income in choosing to work as RNs in 2010, compared to 2008.

**Population Studied:** 2008 and 2010 California Board of Registered Nursing data (un-weighted/weighted N=4,239~4,495/241,000~245,000 per year) was used as the largest dataset available for our objectives, because the National Sample Survey of Registered Nurses did not collect data after 2008.

**Principal Findings:** Among all RNs, the proportion working as RNs declined very slightly from 88.0% (2008) to 87.6% in 2010. However, the effects of some determinants significantly changed during this period, supporting our hypotheses. For instance, RNs aged 40-59 were 75~84% (odds ratio (OR)=0.16~0.25, p<.05) less likely to work as RNs compared to the youngest reference group (aged younger than 30) in 2008. This difference disappeared in 2010. Although the oldest age group (aged over 60) was still less likely to work than the reference youngest group in 2010, its OR increased from 0.04 (2008) to 0.19 (2010). Namely, all older RN groups (aged over 40) became more likely to work in 2010, compared to 2008. Also, RNs became less sensitive to financial factors in 2010, compared to 2008. Specifically, when a predicated hourly market wage increased by $1 from its mean value ($45), RNs were 8% more likely to work as RNs in 2008 (p<.05). This statistically significant association between the market wage and the working status became insignificant in 2010 (p>.3).

**Conclusions:** Our analyses quantified the substantial economic recession impacts on the RN workforce supply in California State. Despite the constant proportion of working RNs during this period, the average age of working RNs increased significantly which is consistent with the reported difficult job search among younger RNs. The less sensitiveness to wage and other income in 2010 suggests the serious financial need of RNs’ households.

**Implications for Policy, Delivery, or Practice:** Policy implications include expanding job opportunities for younger RNs and offering flexible schedules for working older RNs. The constant proportion of working RNs implies that
the healthcare industry is securing household income during a severe economic recession accompanying a high unemployment rate at the national level.

**Funding Source(s):** Other, University of California, Davis

**Poster Session and Number:** A, #337

**HEALTH INFORMATION TECHNOLOGY**

**Health Information Exchange Two Years into HITECH**
Julia Adler-Milstein, University of Michigan; David W. Bates, Partners Healthcare; Ashish K. Jha, Harvard School of Public Health

**Presenter:** Julia Adler-Milstein, Ph.D., Assistant Professor, School of Information, University of Michigan, juliaam@umich.edu

**Research Objective:** A core aim of the 2009 HITECH Act is to foster the development of broad-based electronic health information exchange (HIE). Federal efforts have focused on promoting HIE by both including it as a part of Meaningful Use and through direct funds to states to build out HIE infrastructure. Whether the current efforts have led to further expansion of health information exchange is not yet known. We therefore performed a national survey of all HIE efforts to determine the growth in the number of efforts, what kinds of data they are sharing, how many providers they have engaged, whether they are financially viable, and their most substantial challenges to development.

**Study Design:** In the fall of 2012, we surveyed all organizations in the U.S. that facilitate exchange of clinical data between independent entities. We began with our list of efforts from three prior national HIE surveys and supplemented this list with those in the eHealth Initiative directory of HIE efforts and those listed on state and federal government websites. We implemented a web-based survey that asked respondents to report whether they were actively exchanging clinical data, key organizational demographics, types of data exchanged, funding sources, and barriers to development.

**Population Studied:** A national census of local, regional, and state-based organizations engaged in facilitating clinical data exchange between independent entities.

**Principal Findings:** Our response rate was 78% (172/221). We found that since our last national survey in early 2010, there had been substantial growth in the number of entities that are actively sharing clinical data (a 61% increase from 75 in 2010 to 119 in 2012). We found that 1,398 U.S. hospitals (27% of U.S. community hospitals) and 23,341 ambulatory practices (10% of U.S. practices) participated in the 119 operational HIE efforts, more than double the proportion of providers who
participated in 2010. Test results, followed by patient summary care records, were the most common types of data exchanged. More than half of all operational HIE efforts (52%) reported that grants were the most substantial source of support while less than a quarter (24%) reported being able to cover operating costs with revenue from participants. Nearly three out of four operational efforts identified developing a sustainable business model as a major barrier to development.

Conclusions: While HITECH support for HIE has spurred a large increase in the number of organizations facilitating clinical data exchange and the number of participating providers, substantial barriers related to financial viability remain.

Implications for Policy, Delivery, or Practice: Our findings offer the most up-to-date assessment of the state of health information exchange in the U.S. For policymakers, the considerable growth in the number of HIE efforts is early evidence of the beneficial impact of HITECH. However, there are substantial challenges facing HIE efforts, with long-term financial sustainability being at the top of the list. Given that federal funds to support these efforts are soon to run out, we need new attention on identifying sustainable business models. Failure to do so will lead to islands of clinical data with little connectivity, which will impede broader efforts to improve the healthcare delivery system.

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Poster Session and Number: A, #346

Hospital Uptake of the Meaningful Use Incentive Program
Julia Adler-Milstein, University of Michigan; Michael Furukawa, Office of the National Coordinator for HIT; Jennifer King, Office of the National Coordinator for HIT; Ashish K. Jha, Harvard School of Public Health

Presenter: Julia Adler-Milstein, Ph.D., Assistant Professor, School of Information, University of Michigan, juliaam@umich.edu

Research Objective: The centerpiece of the 2009 HITECH Act is incentives for providers to adopt and become "meaningful users" of electronic health records (EHRs) in order to address persistent quality and efficiency challenges stemming from reliance on paper-based records. We sought to assess whether the incentives are sufficient to prompt hospitals to become meaningful users, whether uptake is evenly spread across different types of hospitals, and what types of hospitals are advanced in their ability to meet meaningful use criteria.

Study Design: We used data from CMS, the agency administering the incentive program, to determine which hospitals attested to being a meaningful user of EHRs under the Medicare and/or Medicaid program as of 10/31/2012. We categorized hospitals not attesting to meaningful use into the following three groups: those that met the adopt-implement-upgrade (AIU) option under the Medicaid program, those that only registered for the meaningful use program, and those that did not register or participate.

Using data on hospital characteristics from the American Hospital Association survey, we first assessed the percent of hospitals and discharges that attested to meaningful use, as well as the other three hospital participation categories. We then built multivariate models to assess which characteristics differentiate hospitals that attested to meaningful use versus those that did not. We also examined hospitals that have been paid (attesting to meaningful use + AIU option) versus those that had not. Finally, among hospitals that had attested to meaningful use, we assessed which were particularly advanced, defined as those that could meet all criteria at least 90% of the time.

Population Studied: All Medicare certified hospitals eligible for the meaningful use program that responded to the AHA annual survey (n=4,837)

Principal Findings: 2,286 hospitals (47% of hospitals representing 55% of discharges) attested to meaningful use as of 10/31/12. Another 1,145 hospitals (24% of hospitals, 25% of discharges) received payments under the AIU option. 639 hospitals (13% of hospitals, 12% of discharges) registered for the program but did not receive payment, leaving 767 hospitals (16% and 9% of discharges) not engaged.

Larger hospitals, urban hospitals, and non critical access hospitals (CAHs) were more likely to have attested to meaningful use compared to all other hospitals (Odds Ratio=1.3 for medium, p=0.001; OR=1.7 for large, p<0.001; OR=1.2 for rural, p=0.01; OR=0.8 for CAH, p=0.03). Larger hospitals and non CAHs were also more likely to get paid. We found a broader set of characteristics that differentiated highly sophisticated meaningful users; they were more likely to be small, urban, not-for-profit, system affiliated, offer an HMO product, and be a CAH.
Conclusions: Initial program results suggest high rates of uptake with more than 1 in 3 hospitals attesting to meaningful use and more than half receiving some form of payment. Hospitals that attested to meaningful use were generally larger and not critical access. Among those who attested, however, CAHs were more likely to be sophisticated users.

Implications for Policy, Delivery, or Practice: The early findings from the Meaningful Use incentive program suggest that we need to focus on small, rural, and critical access hospitals that appear to be falling behind in their ability to meet meaningful use.

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Poster Session and Number: A, #347

The Role of HIT in the Patient-Centered Medical Home
Julia Adler-Milstein, University of Michigan;
Genna Cohen, University of Michigan

Presenter: Julia Adler-Milstein, Ph.D., Assistant Professor, School of Information, University of Michigan, juliaam@umich.edu

Research Objective: The HITECH Act seeks to promote widespread adoption of health information technology (HIT) in order to address persistent quality and efficiency challenges facing our healthcare delivery system, many of which derive from reliance on paper records. HITECH also lays the infrastructure for broader efforts to reform healthcare delivery by supporting new models for care delivery. While the role of HIT is thought to be critical, we know little about the extent to which those pursuing new care delivery models are relying on HIT and which specific types of HIT are most widely adopted. We therefore studied a large patient-centered medical home demonstration project in Michigan to assess which types of HIT were most widely used, and how adoption rates changed over time as PCMH practices matured.

Study Design: We leverage survey data collected from practices participating in a Blue Cross Blue Shield of Michigan PCMH demonstration project, which began in 2005. Survey data was collected semi-annually from a practice representative between 2010 and 2012 (a total of four periods). We use descriptive statistics to characterize the most highly adopted HIT functionalities in the initial survey among the four included (patient registry, patient portal, electronic health record, ePrescribing), as well as the functionalities for which adoption increased the most over the two year period between the first and last survey.

Population Studied: 2,171 practices participating in the physician group incentive program, a PCMH demonstration project sponsored by Blue Cross Blue Shield of Michigan for practices throughout the state. We limited our analyses to practices reporting data in all four periods, approximately half of all participants in the program.

Principal Findings: The most highly adopted HIT functionality within PCMH practices was ePrescribing (69%) followed by patient registries (51%). EHRs and patient portals were less often adopted (in 36% and 19% of practices respectively). Over a two-year period, ePrescribing and EHRs were the functionalities most often newly adopted – a twelve percentage point increase for both. Adoption rates were half for patient registries (a 6 percentage point increase) and patient portals (a 5 percentage point increase).

Conclusions: Among PCMH practices, we found widespread use of HIT and increasing adoption over time. There were large differences, however, in the types of HIT functionality implemented in practices as well as differences in adoption over time. Adoption of the two clinically-oriented functionalities, ePrescribing and EHRs, increased the most. While patient registries, the primary population-management functionality, were implemented in more than half of practices at the outset, adoption did not increase substantially over time. Patient portals, which would be expected to be in widespread use given the patient-focused nature of PCMHs, were neither widely implemented at the outset nor widely adopted over time.

Implications for Policy, Delivery, or Practice: This study is among the first to report the types of HIT in use in PCMH practices, suggesting which functionalities may be most essential to achieving the aims of better coordinated and more patient-centered care. Given the observed emphasis on provider-focused functionalities, it will be critical to understand why IT is not being leveraged as heavily to manage population health and engage patients.

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Poster Session and Number: A, #348
Health Information Technology and Hospital Performance on Imaging-use Measures
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Presenter: Ajit Appari, Ph.D., Research Fellow, Center for Digital Strategies at Tuck, Dartmouth College, ajit.appari@tuck.dartmouth.edu

Research Objective: A growing body of evidence suggests that US hospitals over utilize imaging services. While imaging serves a critical role in diagnostics and improving care delivery, it may cause unintended clinical consequences if overused and certainly increases cost. Recently, Jason Mathias and colleagues reported wide variations in imaging utilization across US hospitals, and abnormally high use at rural, for-profit hospitals. The widespread diffusion of health information technology (IT) is expected to improve accessibility of clinical and imaging reports leading to delivery of efficient imaging care, and reducing repeat imaging. This study examines the associative relationship between hospitals’ health IT capability and performance on select imaging use measures.

Study Design: We analyzed data from three sources: operational status of clinical applications from HIMSS-2009 release of health IT inventory; performance on outpatient imaging-use measures (percentage MRI studies of lumbar without antecedent conservative therapy, follow-up imaging after screening mammography, and proportion of CT studies of chest and abdomen with and without contrast) during 2011 from Hospital Compare; and market level (hospital referral region) aggregate imaging event rate per 1000 beneficiaries from Health Indicator Warehouse. Hospitals were rated as Intermediate health IT capability if it has one or more of integrated PACS system, image distribution capability over web, and clinical decision support with physician pathways in addition to clinical applications required to meet the Stage-1 requirements of EHR incentive program. Hospitals with lesser than Stage-1 capability were used as reference group, and rated as Advanced health IT capability if all three system capabilities and Stage-1 capable EHR system. Since all dependent variables are facility level risk standardized rates, the analysis was performed by fitting a GLM with gamma-log link function, in STATA 12, adjusting for structural characteristics including academic status, critical access hospital, membership to multihospital system, rural location, participation I cardiac registry, staffed bed size, outpatient visits volume, market level imaging event rate. The endogeneity issue of health IT adoption was addressed by including propensity for having Stage-1 capable health IT systems. For each dependent variable separate regression models were estimated by stratifying hospitals on profit status.

Population Studied: 3316 non-federal acute care hospitals

Principal Findings: Among non-profit hospitals, users of advanced health IT system have lower imaging utilization rates for CT scan of abdomen (incidence rate ratio IRR: 0.81, 95% CI [0.67, 0.96]), and chest (IRR: 0.67, CI [0.48, 0.93]), and MRI of lumbar (IRR: 0.74, CI [0.63, 0.86]). Additionally, intermediate health IT hospitals had lower rates for follow-up imaging after screening mammogram (IRR: 0.87, CI [0.76, 0.99]). However, among for-profit hospitals, only advanced health IT users had lower utilization rates for CT scan of abdomen (IRR: 0.62, CI [0.45, 0.87]) and MRI of lumbar (IRR: 0.67, CI [0.48, 0.93]).

Conclusions: Our findings suggest that non-profit hospitals with advanced health IT systems perform better on most imaging-use measures. We find limited support for hospitals with intermediate health IT capability.

Implications for Policy, Delivery, or Practice: Recent report raises concern over excessive utilization of imaging services, even though the growth rate has stabilized. Within the broader framework of the ongoing electronic health record incentive program, this study could inform policy makers as well hospital administrators on potential benefits of advanced health IT.

Funding Source(s): Other, National Science Foundation

Poster Session and Number: A, #349

The Role of the PCP in Preventive Cancer Screening Using a Novel Population Management System: Results of a Practice-Randomized Trial
Steven Atlas, Massachusetts General Hospital; Jeffrey M. Ashburner, Massachusetts General Hospital; Adrian H. Zai, Massachusetts General Hospital; Yuchiao Chang, Massachusetts General Hospital; Sanja Percac-Lima, Massachusetts General Hospital; Richard W. Grant, Massachusetts General Hospital

Presenter: Steven Atlas, M.D., Director, Primary Care Practice-based Research And Quality
Research Objective: Preventive cancer testing rates remain suboptimal despite known benefits of screening and use of visit-based reminders. Advances in health information technology (HIT) now permit population-based screening, but the best methods remain uncertain. We implemented a novel visit-independent, population management system within a large primary care (PC) network and compared two versions: one that involved PC providers (PCPs) in patient screening and one that did not. We hypothesized that involving PCPs would lead to more effective and efficient cancer screening. Study Design: We randomized 18 PC sites within an academic network to intervention (n=9) or augmented usual care control (n=9) groups. All practices employed a novel HIT system that identified patients overdue for screening, mailed reminder letters, and tracked scheduling and completion of screening; used scheduling delegates to assist patients; and had access to patient navigators for those at high risk for non-adherence. In intervention practices, physicians (for their patients) and population managers (for other practice patients) personally screened real-time rosters of patients overdue for screening, and could choose an individualized method of patient contact (reminder letter, referral to scheduling delegate, referral to patient navigator) or defer screening. In control practices, all overdue patients were initially sent a reminder letter without provider review and then transferred to a delegate list. Intervention patients without provider action within 8 weeks defaulted to the automated control version. We examined average cancer screening test completion over 1-year of follow-up for each eligible patient and all eligible cancers using a mixed effects model accounting for clustering by PCP or practice and adjusting for patient age, race, insurance, language, and time since last visit. Population Studied: Patients eligible for preventive breast, cervical and colorectal cancer screening. Principal Findings: Among 104,074 eligible patients, baseline screening rates were similar in intervention and control patients for breast (79.4% vs. 79.8%), cervical (80.9% vs. 82.0%), and colorectal (77.6% vs. 76.4%) cancer. Small but statistically significant differences in patient characteristics for age, gender, ethnicity, language spoken, insurance status and time since last visit were seen among intervention (n=51,166) and control (n=52,908) patients (all p<0.001). Most intervention providers used the tool (88 of 98, 90%) and reviewed 8115 patients overdue for at least 1 cancer screening (6017 selected to receive a reminder letter, 407 referred directly to a scheduling delegate, 48 referred to a patient navigator, and 1744 were deferred from screening). An additional 6159 letters were sent to intervention patients not reviewed by a provider (total 12,176 letters). In control practices, 17,237 patient letters were mailed. Adjusted average cancer screening rates did not differ among intervention and control practices for all cancers combined (79.6% vs. 79.6%, p=0.87), or breast (79.7% vs. 79.7%, p=0.98), cervical (80.6% vs. 81.3%, p=0.58), or colorectal cancer (78.0% vs. 77.5%, p=0.78). Conclusions: Involving providers in a visit-independent, population management HIT system for breast, cervical or colorectal cancer screening did not increase screening rates compared to an automated reminder system. Implications for Policy, Delivery, or Practice: Similar screening rates were achieved with fewer patient contacts in intervention practices. Funding Source(s): AHRQ Poster Session and Number: A, #350

Accelerating Primary Care Physicians’ Advanced HIT Practice Transformation Through Technical Assistance Programs and Payment Reform Michelle Doty, The Commonwealth Fund; Anne-Marie Audet, The Commonwealth Fund; David Squires, The Commonwealth Fund

Presenter: Anne-Marie Audet, M.D., Vice President, Quality Improvement and Efficiency, The Commonwealth Fund, ama@cmwf.org

Research Objective: The HITECH Act of 2009 created an extension program offering technical assistance to physicians and financial incentives to support health information technology (HIT) adoption and meaningful use. Evidence suggests that physicians are adopting HIT tools, yet less is known about use of HIT to achieve advanced functionalities. This study describes the variation in primary care physicians’ (PCP) use of various HIT functions; and explores whether sharing resources for technical assistance, being part of an integrated delivery system, and receiving financial incentives for
enhanced primary care activities affect advanced HIT capacity.

**Study Design:** Data come from the 2012 and 2009 Commonwealth Fund International Health Policy Surveys of Primary Care Physicians, collected by mail among a nationally representative sample of U.S. PCPs. Based on survey questions, we created six categories to describe physicians’ use of HIT: 1) generate patient information, 2) generate patient registry and panel information, 3) order entry management, 4) decision support, 5) patient access, and 6) health information exchange. Data were collected on practice size, setting (e.g., part of an integrated delivery system), physicians sharing resources for technical support for information systems or quality improvement consultants, and financial incentives for enhanced primary care activities (e.g., preventive care, managing chronic conditions, medical home fees). We employed multivariable logistic regression to analyze whether participating in integrated delivery system, sharing technical assistance, and financial incentives were associated with greater HIT capacity.

**Population Studied:** PCPs

**Principal Findings:** PCPs’ HIT capacity increased between 2009 and 2012 with variation among functionalities. The largest increases are in electronically prescribing medications (40% to 64%*), electronic transmission to pharmacy (34% to 66%*), and electronic drug alerts (37% to 58%*). Electronic access to clinical data to manage individual patients (30% to 45%*) or panels (29% to 42%*) has also increased. Only 33% of physicians say they can exchange clinical summaries with doctors outside their practice, and 28% say their patients can access their information on a secure website. Physicians that participate in an integrated delivery system are more likely (OR=1.55*) to achieve “multifunctional” HIT capacity, as are those who share technical support with other practices (OR=1.56*); being able to receive financial incentives was not as strongly associated with HIT capacity. Solo and small practices lagged behind larger practices in HIT adoption, though sharing technical support and being part of an integrated delivery system lessened the divide.

*Statistically significant with p<0.05

**Conclusions:** Progress is seen in electronic ordering and electronic information to manage patients and populations, yet challenges remain for health information exchange and patient engagement, both of which are part of the next stage of meaningful use. Technical assistance programs and being part of integrated delivery systems significantly increase physicians’ ability to achieve advanced HIT capacity.

**Implications for Policy, Delivery, or Practice:** Priority should be given to building a national technical assistance infrastructure (e.g., modeled after the extension program) to assist all physicians as they redesign their care delivery to take full advantage of HIT and achieve the national triple aim goals. Payment reform should provide appropriate incentives to support behavior change as well as system redesign and sustainability.

**Funding Source(s):** CWF

**Poster Session and Number:** A, #351

**The Relationship of Online Health Information Seeking with Health Care Access and Health Status**

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**Presenter:** Neeraj Bhandari, Ph.D. Student, Health Policy and Administration, Penn State, nwb5090@psu.edu

**Research Objective:** The Internet plays an increasingly important part in disseminating public reports of health care related quality information and in facilitating consumers’ active roles in improving their health. A better understanding of online health information seeking behavior of particular groups of individuals, (e.g., those facing barriers to health care access and those suffering from chronically illnesses) may provide important insights on health policy designed to reach these constituencies. The aim of this study is to examine how consumers’ financial and non-financial barriers to healthcare access and their health status are related to online information seeking behavior.

**Study Design:** A cross-sectional design that uses the National Health Interview Survey (NHIS) of 2009, which is an annual survey representative of the non-institutionalized adult population of the United States, with oversampling of Black, Hispanic, and Asian populations. The survey collects information on a broad range of health topics through in-person household interviews. Multivariate regression analysis was used to examine the relationship of online health information seeking behavior with
limitations in access to health care, self-rated health status and presence of chronic disease, using a two-step empirical model to first examine health information seeking in the general population, and then examine the use of chat groups and e-mails to physicians among online health information seekers.

**Population Studied:** National Health Interview Survey (NHIS) of 2009, which is an annual survey representative of the non-institutionalized adult population of the United States.

**Principal Findings:** We found that individuals who had limitations in access to health care due to financial and non-financial reasons, those with chronic conditions, and those with higher self-rated health status were more likely than those without to search for health related information on the internet. Among health information seekers, people who face non-financial barriers to access to health care and those who rate their health status poorly are more likely than those without to join chat rooms and communicate with their physicians via email.

**Conclusions:** Our finding suggests that the Internet offers low cost access to health information for people with limited access to traditional channels of health care and for chronic disease patients.

**Implications for Policy, Delivery, or Practice:** Internet is a potentially low cost, although certainly imperfect, venue for delivering health information to the subset of population that faces difficulties in accessing care. Individuals with poor self-ratings of health, a group that has elevated level of risk for adverse health outcomes, could be an important target group for consumer engagement efforts directed at providing specific and individualized health information to consumers via the Internet.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #352

**Improving Quality of Low-Performing Physicians: Lessons for Regional Extension Centers**

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**Presenter:** Samuel Boas, Weill Cornell Medical College, sjb2010@med.cornell.edu

**Research Objective:** Regional Extension Centers (RECs) support the implementation of electronic health records (EHRs). Little is known, however, about how RECs should structure their support. The purpose of this study is to understand how EHRs and technical assistance (TA) from an REC helps low-performing providers improve quality of care.

**Study Design:** Qualitative study

**Population Studied:** We performed a qualitative study of physicians enrolled in the Primary Care Information Project (PCIP), a program of the New York City Department of Health and Mental Hygiene. PCIP subsidizes EHRs and provides ongoing TA to small primary care practices in underserved areas of New York City. It is the largest community-based EHR extension system in the country and is a nationally-recognized REC.

We identified physicians who had low baseline performance (bottom 50% of physicians) on 10 Healthcare Effectiveness Data Information Set (HEDIS) quality measures that were derived from claims data from 13 private payers in New York State. Among these physicians, we identified those who either showed significant improvement in quality after enrolling in PCIP (n=11) or showed significant decline in quality after enrolling in PCIP (n=21). Seventeen physicians agreed to be interviewed. Two investigators coded interview notes using the constant comparative method.

**Principal Findings:** All physicians stated that the EHR improved the quality of care they delivered. Several stated that the EHR specifically helped their management of chronic diseases and their delivery of preventative care. Eleven physicians used the EHR’s clinical decision support system (CDSS). The majority of physicians using CDSS found it to be helpful but some suggested improvements such as better customization for pediatric patients.

Seven physicians stated that the ability to track patients was a key reason why the EHR helped them to improve quality. Eleven used registries to help with tracking; however the majority did not have a system in place to regularly review registry data.

All physicians found TA visits to be useful. Several commented that TA helped them meet meaningful use and PCMH measures. Over half of the physicians wanted more technical assistance, particularly after they had been using the EHR for months or years. We found no consistent differences in responses from physicians whose quality improved from those whose quality declined.
Conclusions: This study stems from our previous work which showed that EHR use was associated with significant improvements in quality of care, particularly for physicians who had many TA visits. We identified three key themes: 1) every physician – regardless of whether their quality of care actually improved after enrolling in PCIP – felt that the EHR improved the quality of care they deliver to their patients, 2) every physician felt that technical assistance from PCIP was very useful and, in some cases, critical to their success in adopting the EHR, and 3) over half of the physicians wanted more, ongoing technical assistance, particularly during the months and even years after they had overcome the initial hurdles of implementing the EHR.

Implications for Policy, Delivery, or Practice:
These are important findings for other RECs that are considering ways to assist physicians in small practices in their use of EHRs.

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Implementation of a Comprehensive Electronic Health Record System within a Patient-Centered Medical Home - Practice Changes and Challenges
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Presenter: Anne Bozack, M.P.H., B.A., Project Director, Center for Evaluation and Applied Research, New York Academy of Medicine, abozack@nyam.org

Research Objective: Medical practices are increasingly utilizing health information technology in response to meaningful use incentive programs and to improve health service delivery. An electronic health record, EHR, was implemented by a network of federally qualified health centers in New York State beginning in 2002, with development continuing during its transition to a patient-centered medical home, PCMH, in 2009. Components of the EHR system included physician decision supports, eprescribing, disease registries, quality tracking, and enhanced patient and provider access to medical information—as well as enhanced electronic access to one another. As part of a larger research project on the PCMH transition process, this study focuses on the EHR, with a primary emphasis on organizational changes and adaptations necessitated by and resulting from EHR implementation.

Study Design: Within a larger mixed-methods study, qualitative open-ended interviews were conducted between January 2011 and April 2012 with leadership, administrators, providers, and staff with diverse roles in the inception, planning, and application of the EHR. Topics included implementation processes, practice changes, and barriers, facilitators, and overall satisfaction with the EHR. Interview transcripts or notes were coded using a hierarchical set of codes and analyzed using standard qualitative techniques. Analyses included pre-identified themes, derived from literature and experience, as well as themes emerging from the data.

Population Studied: Thirty-three staff members were interviewed. Respondents were predominantly physicians, n=14, but also included nurses/medical assistants, n=5, behavioral health providers, n=4, administrators, n=4, and practice managers/patient service representatives, n=6.

Principal Findings: The FQHC EHR system was designed to improve the quality and efficiency of health care delivery, so as to improve services and outcomes for all patients. Interviewees reported that the implementation and effective utilization of the EHR did present clear benefits, as well as ongoing challenges. For example, expanded responsibilities for nurses and medical assistants created efficiencies overall, but were often difficult to manage, given the limited time allocated for office visits. Physicians also noted time related challenges, specifically a need for more administrative time for reconciling patient records and responding to electronic communication from other providers and patients. Despite these concerns, EHR implementation created a number of efficiencies and facilitated improvements in care. Physician decision supports helped providers to better structure the content of office visits, particularly for patients with complex conditions, and the ease of provider-provider communication promoted better coordination of care, including coordination of primary care and mental health services. Some patient inquiries, which would otherwise require an office visit, were resolved.
through communication using the patient portal, enhancing patient access to information while reducing the need for in-person visits.

**Conclusions:** The implementation of an EHR within a PCMH created opportunities for improved patient care and efficiencies, but required organizational changes.

**Implications for Policy, Delivery, or Practice:** Institutions must understand the need for - and benefit of - the reallocation of staff responsibilities and time outside of office visits. Enhanced reimbursement for models that emphasize use of EHRs, like PCMH, should allow for necessary shifts in workflows and responsibilities.

**Funding Source(s):** AHRQ

**Poster Session and Number:** A, #354

**A Predictive Model for High Costs Following Occupational Injuries**
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**Presenter:** Renan Castillo, Ph.D., M.S., Assistant Professor, Health Policy and Management, Johns Hopkins Bloomberg School of Public Health, rcastill@jhsph.edu

**Research Objective:** Work-related disability and medical costs are a considerable burden to society and back pain is the largest contributor to this burden. There is a need to understand what claims characteristics are associated with high-cost claims, and to develop tools that make it possible to target high-risk individuals with additional medical care and psychosocial interventions. The availability of large claims datasets and computerized claims management systems make it possible to create screening systems to improve an insurers’ ability to identify individuals at risk for high costs following occupational injuries. The goal of this project was to develop and evaluate such a model based on data available within the first 24 hours of injury.

**Study Design:** This study is a secondary analysis of claims data. Claims were dichotomized as high or low cost and multiple imputation techniques were used to account for missing data. Multiple variable logistic regression models were developed and tested in two separate, randomly selected datasets. A single model was developed for all injuries, then evaluated on claimants with all injuries, and claimants with back injuries only.

**Population Studied:** Claims data from 1998 through 2008 from a large workers’ compensation insurance carrier in a single Mid-Atlantic state in the United States.

**Principal Findings:** A cutoff for high cost claims was selected such that high cost cases accounted for 10% of claims but 90% of total compensation in the overall population. The main predictors of high cost claims used in our model were higher age, higher wages, attorney involvement, hospitalization, treatment in emergency room and divorced, widowed, or separated marital status. In the overall population, the predictive model identified high and low cost cases with 90% sensitivity and 90% specificity. Among claimants with back injuries, the same predictive model identified high and low cost cases with 89% sensitivity and 85% specificity.

**Conclusions:** It is possible to accurately predict high-cost cases based on information available within 24 hours of injury. Although the model was developed for all injuries, it still performed well when used only on claimants with back injuries.

**Implications for Policy, Delivery, or Practice:** Similar modeling can be used to predict future costs, allocate administrative resources, and target interventions to high-risk claimants. Models that predict high cost patients based on information available within 24 hours of injury are especially useful to healthcare providers as they allow targeted, early intervention.

**Funding Source(s):** Other, The Injured Workers Insurance Fund of Maryland

**Poster Session and Number:** A, #355

**The Neglected Social Component of the Meaningful Use of Health Information Technology**
Chung King Chia, Tan Tock Seng Hospital; Issac Lim, National Healthcare Group

**Presenter:** Chung King Chia, Associate Dean, Tan Tock Seng Hospital, drchungking@gmail.com
Research Objective: The debate regarding health information technology (HIT) has very much moved from whether information technology should play a part in health care, to what form it should take in the larger agenda of care delivery reform. The Health Information Technology for Economic and Clinical Health provisions of the 2009 American Recovery and Reinvestment Act allocated close to $US30 billion to encourage meaningful use of electronic health records (EHRs). Largely missing in the HIT and meaningful use conversation is HIT’s impact on the social component of the clinical environment. This study focuses on visualizing the communication patterns in a setting in which HIT has been fully implemented for close to a decade. We ask the question, how do communication patterns look like with HIT in the picture?

Study Design: We conducted 120 hours of participant observation and coded a segment of the data into adjacency matrices to perform social network analysis (SNA). Using UCINET, we calculated and compared the size of networks, average degree, and density of three clinical units. To create visualizations of the social structures and the communication patterns, we created sociograms using Gephi, an open source software for graphs and network analysis. We then created videos of dynamic communication networks using the Social Network Image Animator (or SoNIA). We also computed the time doctors and nurses spent on communicating intra- and interprofessionally, as well as time spent with patients and on HIT.

Population Studied: We focused on observing interactions between doctors, nurses, patients, and their use of HIT in three clinical settings, namely general internal medicine, general surgery, and intensive care units, in a large public general hospital.

Principal Findings: Although the communication patterns differed across the three clinical units that we observed, several findings were largely consistent. Intraprofessional communication far exceeds interprofessional communication. Doctor-to-doctor interactions was between 13.7% and 35.5% of total time in the units, whereas nurse-to-nurse interactions was between 13.5% and 25.8%. Interprofessional interactions ranged between 0.7% and 6.8% of time in the units. Most strikingly, doctors and nurses spent between 20% and 39% of their time on HIT, less than the time they spent on patients, which was between 18.4% and 26.9%. Scrutinizing the sociograms and dynamic network movies, it was clear that HIT was, in social network terminology, the most central node in the communication networks.

Conclusions: The centrality of HIT in the communication patterns in clinical settings is unequivocal.

Implications for Policy, Delivery, or Practice: A combination of factors makes our observed phenomenon noteworthy. First, our data strongly suggests that HIT has supplanted instead of facilitating face-to-face interprofessional communication. Second, the research on computer-mediated communication (CMC) often reveals the tendency for miscommunication because of its lack of social cues. Third, The Joint Commission found that 80% of serious medical errors involve miscommunication between caregivers and when patients are transferred or handed-off. Putting these three factors together, it is urgent that we include the impact of HIT on the social component of clinical environments in our conversations and research. HIT is a double-edged sword that comes with affordances and constraints. The potential of HIT in facilitating team work and close coordination is tremendous, but we have barely begun to think about it in enough details.

Funding Source(s): No Funding

Poster Session and Number: A, #356

Health Information Technology use among Adults in the United States, 2009 and 2011

Robin Cohen, National Center for Health Statistics; Vaishali Patel, DHHS Office of the National Coordinator for Health Information Technology; Michael Furukawa, DHHS Office of the National Coordinator for Health Information Technology

Presenter: Robin Cohen, Ph.D., M.S., Statistician, Division of Health Interview Statistics, National Center for Health Statistics, rcohen@cdc.gov

Research Objective: Although recent trends suggest that adults’ use of health information technology (HIT) is increasing, adults’ access to and usage of their electronic health information has been relatively low overall. In 2009, the HITECH Act was passed to promote and expand the use of HIT. Federal programs began that sought to increase physician adoption of electronic health records (EHRs), including financial incentives for physicians who
demonstrated meaningful use of EHRs. As a part of demonstrating meaningful use, physicians need to electronically engage with patients, including providing access to electronic health information. This has the potential to increase adults’ own use of HIT. We sought to examine variation in adults’ HIT use since 2009 in five specific areas: using the computer to look up health information on the Internet, fill prescriptions, schedule appointments with health care providers, communicate with health care providers by email, and use online chat groups to learn about health topics.

**Study Design:** This study used data from the 2009 and 2011 National Health Interview Survey (NHIS), which is nationally representative of the U.S. civilian noninstitutionalized population, to examine the use of HIT for adults aged 18 years and over. Data were derived from the NHIS Family Core component, which collects sociodemographic information on all family members in each household, and the Sample Adult component, which collects additional information (including HIT information) from one randomly selected adult per family. In addition to NHIS data, county level data from the Health Resources and Services Administration Area Resource File on provider coverage and Federal Communications Commission data on broadband coverage and competition were used in the analysis.

**Population Studied:** Civilian non-institutionalized resident adult population of the United States (n=60,745).

**Principal Findings:** This paper will analyze the association between HIT use among adults and the following factors: selected demographic characteristics; usual source of healthcare; healthcare utilization; chronic health conditions; health status; and county level information on broadband coverage and provider coverage. Preliminary findings regarding the associations between demographic characteristics and HIT use show that among adults aged 18-64, women were more likely than men to use computers to look up health information on the Internet, fill prescriptions, schedule appointments with health care providers, communicate with health care providers by email, and use online chat groups to learn about health topics. However, among adults aged 65 and older, women were less likely than men to do each of these activities. Higher HIT use was also associated with higher incomes, education, and living in urban areas. Preliminary analyses are still underway to examine the association between the other key factors and HIT use.

**Conclusions:** Adults’ overall use of HIT has grown since 2009, and usage varies by demographic characteristics.

**Implications for Policy, Delivery, or Practice:** NHIS can play an important role in monitoring HIT use as policy changes take effect that seek to improve adults’ access to their electronic health information and electronic engagement with their providers. Identifying potential variation in adults’ use of HIT will be important in order to ensure that the potential benefits of HIT are widely available.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #357

**Patient-facing Kiosks to Support Quality Improvement at Mental Health Clinics**

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**Presenter:** Amy Cohen, Ph.D., Psychologist, Mental Illness Research, Education, and Clinical C, Greater Los Angeles VA Healthcare Center, ancohencan.ucla.edu

**Research Objective:** Obesity and related medical disorders are common in people with serious mental illness. This population dies 10 – 20 years prematurely, largely because of cardiovascular disease. Psychosocial weight loss interventions for this population are efficacious; yet, these interventions are rarely utilized by patients. This gap in care has been perpetuated by a lack of routinely collected data on patients’ clinical status and treatment utilization. However, routine data collection can be completed by these patients, especially when aided by health information technology (HIT) that is adapted for populations with cognitive deficits, limited literacy, and little computer experience. It is not known whether such patient reported outcomes data can be used to improve care quality.

**Study Design:** In a controlled trial, eight medical centers of the Veterans Health Administration were assigned to intervention or usual care for 13 months. The intervention included evidence-based quality improvement...
strategies including data from patient-facing kiosks, continuous data feedback, education, clinical champions, social marketing, and quality improvement teams. The kiosks, which were located in waiting rooms next to a scale, included a touchscreen monitor, computer, headphones and a color printer. At every clinic visit, before seeing the clinician, patients responded to kiosk questions regarding weight and service utilization. A Summary Report printed following the last question, which patients used at their clinical encounter. Mixed methods evaluated the impact of the kiosks on utilization of and retention in weight services.

Population Studied: 571 patients with schizophrenia who were overweight and had not used weight services.

Principal Findings: The majority of patients (80%) were overweight and the average body mass index fell in the obese range. In the year prior to baseline, rates of having at least 1 weight service appointment were low and comparable at implementation (13%) and control (18%) sites (p>.05). Compared with usual care, implementation resulted in individuals being more likely to use weight services (R2 = 10.5, p<.01), getting services more than 5 weeks sooner (t=2.0, p=.05), and using 3 times more visits (t=-4.6, p<.01). When compared to the year prior to implementation, patients at implementation sites saw a three-fold increase in treatment visits. Usual care resulted in no change from the previous year.

In terms of acceptability, the majority of patients responded affirmatively that they enjoyed using the kiosks (76%) and liked getting a Summary Report (71%). Patients noted that kiosk questions promoted self-reflection: “It asked questions that made you think about changing things about yourself;” “It kept me in check with myself;” “I like talking and being heard; I got a lot out of my system.”

Conclusions: In specialty mental health, obesity is a pervasive problem, but only a small proportion of patients receive appropriate services. Evidence-based quality improvement is possible, can be supported by HIT, and can lead to substantial increases in the use of appropriate services.

Implications for Policy, Delivery, or Practice: Patient-facing kiosks are feasible, acceptable, and inexpensive to implement. Such kiosks could be implemented in primary care or specialty clinics to identify patients’ needs, preferences, and utilization and those data could drive referrals and prioritization of services offered.

Funding Source(s): VA

Poster Session and Number: A, #358

Identifying Medication Discrepancies Through Linked Administrative Pharmacy Claims

Dominique Comer, Jefferson School of Population Health; Joseph Couto, Jefferson School of Population Health; Ruth Aguiar, Christiana Care Health System; Edward Ratledge, University of Delaware; Daniel Elliott, Christiana Care Health System

Presenter: Dominique Comer, Pharm.D., Postdoctoral Research Fellow, Jefferson School of Population Health, dominique.comer@jefferson.edu

Research Objective: Medication reconciliation can be used to identify medication discrepancies between what a clinician has documented and what a patient is actually taking. Dramatic improvements in the availability of administrative pharmacy claims in the electronic health record (EHR) may facilitate accurate medication reconciliation, particularly in the ambulatory care setting. The objective of this study is to identify and characterize medication discrepancies through the use of linked pharmacy claims data.

Study Design: We conducted a retrospective cross-sectional study on all patients prescribed a new antihypertensive within a large primary care practice network from 2011-2012. Patients were included if they had a diagnosis of hypertension or elevated blood pressure at the time of the new prescription and at least one visit within the previous 18 months. We excluded patients who had not had an imported pharmacy fill history on or after the index visit date. Additionally, we excluded patients who did not have evidence of at least one claim in the pharmacy fill history prior to the index visit date. All pharmacy claims within the 120 days prior to the new prescription were compared to the medication lists from the EHR. Prescribed medications were considered active if the prescriber’s history showed that the medicine was still to be taken at the time of the index visit. The primary outcome was the number of medication discrepancies, defined as a medication that appears on either the EHR medication list or the pharmacy fill claims list but not both. Differences in dose were not considered for this study.
Population Studied: 611 patients prescribed a new antihypertensive in 2011-2012 within a large primary care practice network. The average age (SD) was 58.3 years (14.0), 61.5% were female, 24.2% of patients were black, 54.8% were white, and 19.3% were of another race or undetermined.

Principal Findings: There were a total of 4602 active medications in the EHR prescribed lists (average of 7.5 medications per patient) and 2854 medications in the fill history (average of 4.7 medications per person). Of the active medications in the physician list, 2083 (45.3%) were matched to a claim in the pharmacy fill history; the remaining 2519 (54.7%) were not matched to a medication in the physician list. Overall, patients had an average (SD) of 5.4 (4.3) medication discrepancies. Of the unmatched medications found in the pharmacy fill history, 139 (18.1%) were controlled substances.

Conclusions: In our cohort we identified frequent medication discrepancies between the pharmacy fill history and the prescriber's record. Importantly, there was a high prevalence of medications that patients had filled that were not recorded in the prescribing record, of which many were controlled substances.

Implications for Policy, Delivery, or Practice: The real-time availability of pharmacy fill history to providers in clinical practice has the potential to dramatically enhance medication reconciliation by providing objective documentation of what a patient is filling at the pharmacy. Our findings suggest that the availability of pharmacy claims may provide valuable information to providers as they conduct medication reconciliation.

Funding Source(s): Other, Delaware Health Sciences Alliance

Poster Session and Number: A, #359

Utilization of Health Care Services and Costs among Medicaid Recipients Seeing Primary Care Providers Participating in a City-Sponsored EHR Subsidy Program
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Presenter: Samantha De Leon, Ph.D., City Research Scientist, Primary Care Information Project(PCIP), New York City Department of Health & Mental Hygiene, sdeleon@health.nyc.gov

Research Objective: Compare the costs and health care utilization patterns of patients whose primary care providers are participating in the Primary Care Information Project (PCIP) to patients whose primary care providers are not participating in the program. PCIP is a quality improvement initiative targeting medical offices with high levels of Medicaid and uninsured patient populations and focusing on chronic disease prevention/management by facilitating the implementation of an electronic health record that promotes preventive care and improvement of population health.

Study Design: Using Medicaid claims data, patients were assigned to the PCIP or non-PCIP primary care group, total volume of health care costs were stratified by type of health service (i.e., hospital inpatient, emergency room, hospital outpatient, outpatient physician office visits, and specialty care services), calendar year and patient demographics such as age, gender and presence of major chronic diseases. Higher cost patients with cancer, HIV and end-stage-renal disease were excluded from the analyses. Mean values were compared for groups of patients by clinician between baseline year (2008) and end-of-study (2011). Cost estimates were further stratified by age and chronic conditions.

Population Studied: Fee-for-service Medicaid beneficiaries, excluding dual eligible beneficiaries, with at least one primary care visit in 2008 and another visit from 2009-2011 in New York City. Patients had to have all primary care visits with either a PCIP or non-PCIP primary care provider (i.e., family medicine, general medicine, internal medicine, geriatrics, obstetrics and gynecology, or preventive medicine). Approximately 274,000 patients were assigned to the PCIP group and 263,000 patients were assigned to the non-PCIP group representing 2,300 PCIP and 8,000 non-PCIP primary care providers.

Principal Findings: For patients 40-64 years, with at least one chronic condition, PCIP patient costs were higher at baseline ($4,606 per PCIP patient compared to $4,245 per non-PCIP patient). However, PCIP patients had a slower rate of increase in costs over time. Total costs increased by 17.4% ($801/patient) for PCIP patients and 19.4% ($821/patient) for the non-PCIP patients from 2008 to 2011. Hospital
inpatient costs had the largest increases over time, with PCIP patients having a slower rate of increase in costs. For example, PCIP patients with diabetes had a 39.3% increase of $8,416/patient whereas non-PCIP patients had an increase of 79.0% of $12,921/patient. With the exception of ischemic heart disease and the other four chronic conditions reviewed, PCIP patients had lower cost increases. **Conclusions:** Both the PCIP and non-PCIP groups had increased health care costs over time. Although at baseline, PCIP patients had higher health care costs, they had smaller increases over time, particularly for inpatient services. While we expected that the high proportion of Medicaid and uninsured patients at PCIP practices would result in less efficient care, results of this study suggest that a prevention-oriented focus to health care may have a positive impact on health care costs over time. **Implications for Policy, Delivery, or Practice:** As health care costs continue to increase, further research is needed to understand how quality improvement initiatives and information technology can decrease health care utilization and costs without adversely affecting patient quality-of-care. **Funding Source(s):** No Funding **Poster Session and Number:** A, #360

### Expanding the Use of Free Text in EMR to Study Breast Cancer

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**Presenter:** Marquita Decker, MD, General Surgery Resident, School of Medicine and Public Health, University of Wisconsin, mdecker@uwhealth.org

**Research Objective:** Data sources to study breast cancer care in large populations are limited by access to cancer-specific variables. We sought to address this gap by developing a validated, reusable approach to extract cancer-specific variables from the free text of electronic medical records (EMR) in a large cohort of US community hospitals. **Study Design:** Free text documents were received as a single XML file per patient, which was first parsed into individual documents (N=103,106). Randomly selected documents (N=1,597) were reviewed and classified by two independent surgical reviewers, with a breast surgical oncologist adjudicating disagreement. A portion of the adjudicated data set was used to train an open-source machine learning-based software to identify all breast cancer related operative reports, clinic notes, and pathology reports. The software was also used to further classify operative reports as diagnostic or therapeutic. Extraction of cancer-related variables from those documents was performed using a rules-based approach. Training sets of 200 pathology and 150 clinic notes and test sets of 50 of each were randomly selected. Two independent reviewers coded 8 concept-level variables with a similar adjudication process. Inter-rater reliability (IRR) was assessed using Cohen’s kappa (k). Computer performance was assessed using recall, precision and f-measure. **Population Studied:** An analytic cohort of 5,194 patients (11,022 encounters) from a nationwide cohort of 59 community hospitals was identified. Each patient underwent a breast procedure between January, 2006 and December, 2009 and had an available electronic operative report. **Principal Findings:** Classification of breast cancer-related document type: The abstracter IRR was 0.96 for identification of pathology reports, 0.86 for clinic notes, and 0.91 for operative notes. Computer performance was strong with recall of 0.95, 0.96, and 0.91; precision of 0.95, 0.88, and 0.85; and f-measure of 0.94, 0.91, and 0.87 for pathology, clinic, and operative notes respectively. A total of 2,055 pathology reports, 25,714 clinic notes, and 15,131 operative reports were ultimately identified. The computer identification of therapeutic operative notes showed similar high performance (0.96 recall, 0.93 precision, 0.94 f-
meanings). Concept-level Classification: IRR between manual reviewers for clinic notes ranged from 0.94 for tumor (T) and nodal (N) stage to 0.97 for tumor grade and 1.0 for estrogen receptor (ER) status with similar performance for pathology reports. Computer performance was more variable. Recall was high (1.0) for T and N stage, and grade, but lower for AJCC stage (0.95), ER (0.86), PR (0.90) and Her-2-neu (0.84) status. Precision was high (1.0) for T stage, PR and Her-2-neu status, but lower for N stage (0.92), AJCC stage (0.88), and grade (0.75). F-measures ranged from 0.86 for grade to 1.0 for T stage.

Conclusions: We have demonstrated the ability to reliably abstract several cancer-specific variables from the free text of EMR notes in a large cohort of US community hospitals. With further refinement, we anticipate improvement in performance for the others.

Implications for Policy, Delivery, or Practice: This new data source can be used for future comparative effectiveness and other health services research in breast cancer. Given the large, diverse set of hospitals, the approach is scalable and generalizable and can be modified for future research questions.

Funding Source(s): NIH

Poster Session and Number: A, #361

What Type of Hospitals Have Achieved Meaningful Use?
Mark Diana, Tulane University; Christopher A. Harle, University of Florida; Timothy R. Huerta, The Ohio State University; Eric W. Ford, University of North Carolina, Charlotte; Nir Menachemi, University of Alabama, Birmingham

Presenter: Mark Diana, Ph.D., M.B.A., M.S.I.S., Assistant Professor, Health Systems Management, Tulane University, mdiana@tulane.edu

Research Objective: The government has released the names of hospitals that received Medicare EHR incentive payments through November of 2012 under the Health Information Technology for Economic and Clinical Health (HITECH) Act. The objective of this study is to examine the characteristics of hospitals that have received Medicare EHR incentive payments.

Study Design: We used data from the Centers for Medicare and Medicaid Services, the American Hospital Association Annual Survey of Hospitals, and the American Hospital Association EHR Adoption Database. We conducted a logistic regression to examine the relationship between hospital and market characteristics and the likelihood of receiving Medicare EHR incentive payments through 2012. Hospital characteristics included hospital size, ownership, region of the country, teaching status, geographic location (rural versus urban), system membership, and accreditation status in the Joint Commission. In addition, we obtained information from the AHA Annual Survey on whether (1) the hospital is eligible for Medicaid incentive payments (measured as having 10% or larger share of Medicaid discharges), and (2) the proportion of hospital inpatient days billed to Medicare (Medicare caseload). We calculated EHR adoption status in 2010 (prior to the start of the program) and whether the hospital had a single EHR vendor using the AHA EHR Adoption Database. We calculated market concentration at the hospital system level using the Herfindahl-Hirschman Index (HHI).

Population Studied: The final sample consisted of 5,888 hospitals, with 959 (16%) of these having received Medicare MU incentive payments through November 2012. Of these hospitals, 2,955 (50%) provided information on their EHR status in the AHA EHR Adoption Database, and 653 (22%) of these received Medicare MU incentive payments.

Principal Findings: Overall, 16% of hospitals achieved meaningful use and received incentive payments. When examining the characteristics of hospitals that received these payments, we found that hospital size, for-profit tax status, and presence of an EHR system in 2010 (1 year prior to the commencement of the incentive program) were associated with achieving meaningful use. System hospitals and those located outside of the Northeast were less likely to receive incentive payments.

Conclusions: The main finding of our analysis is that adoption of EHR before the start of the incentive program was the strongest predictor of achieving MU. A little over one-half of hospitals with a comprehensive EHR in 2010 earned a MU payment by November 2012. An increase in Medicare share was positively associated with achieving MU.

Implications for Policy, Delivery, or Practice: Thus far, there is little evidence to suggest that the HITECH incentive program has enticed hospitals without an EHR system to adopt and achieve MU. This raises the concern that the EHR incentive program may not rapidly achieve the intended goal of widespread EHR MU,
which, because of low national EHR adoption rates, must be driven by new EHR implementations. On the other hand, the goals of reducing Medicare costs by providing greater incentives to high-volume Medicare hospitals may be having the desired impact. Policy makers should consider modifying the inventive program to accelerate the adoption and meaningful use of hospitals without EHRs.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #362

### National Survey on Health Information Exchange for Clinical Laboratories

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**Presenter:** Prashila Dullabh, M.D., Health IT Program Area Director, Health Care Research, National Opinion Research Center at the University of Chicago, dullabh-prashila@norc.org

**Research Objective:** Under the Health Information Technology for Economic and Clinical Healthcare (HITECH) Act the federal government has made unprecedented investments in health information technology. A central piece of HITECH includes the electronic exchange of clinical information, including laboratory information. Approximately 6.8 billion laboratory tests are performed annually in the U.S. However, often these results are not readily accessible, diminishing providers’ ability to follow-up on test results and impacting the resultant quality of care, patient safety, and satisfaction. In addition, due to inefficiencies in how lab orders and test results are currently managed, there is evidence of unnecessary and duplicate testing among providers in different locations. Finally, there are no comprehensive data sources on the capacity of laboratories to exchange clinical data or the frequency of electronic information exchange between laboratories and healthcare providers.

The Office of the National Coordinator under the Department of Health and Human Services has funded a national survey of clinical labs. The survey aims to: 1) Provide national and state-level estimates of electronic lab information exchange capacity and volume for independent and hospital labs; and 2) Assess laboratory information exchange standards, systems, and technical architecture, and identify barriers and facilitators of laboratory information exchange.

**Study Design:** A mail out/mail back survey will be administered in two waves during 2013 and 2014. Respondents will be mailed an advance invitation letter explaining the purpose and importance of the survey. A mailed packet will follow containing a cover letter, hard copy questionnaire, and a postage paid return envelope. Non-responders will be mailed a reminder packet, a post card reminder, and a final reminder packet if needed. Finally, non-responders will be contacted by telephone and may complete the survey at that time if desired.

**Population Studied:** There are approximately 225,000 laboratories in the U.S. and territories. This survey will collect key information from a sample of 13,957 hospital and independent laboratories, intended to yield at least 4,963 completed surveys. A sample this large will provide reliable estimates of information exchange capacity of laboratories at the national level and in the 50 states, D.C., and Puerto Rico.

**Principal Findings:** Data collection will commence in January 2013; initial survey findings will be available late in 2013. This presentation will focus on the survey design, addressing measurement challenges in questionnaire design and data collection methodology, methods used to minimize respondent burden, and approaches to generating estimates of interest.

**Conclusions:** The survey is integral to inform nationwide efforts to promote electronic information exchange. It will yield invaluable information on current trends in laboratory information exchange activity at the state and national levels and identify common trends and persistent barriers.

**Implications for Policy, Delivery, or Practice:** Findings from the survey could potentially inform state and federal policies to promote electronic lab information exchange.

**Funding Source(s):** Other, Office of the National Coordinator for Health Information Technology

**Poster Session and Number:** A, #363
Developing a Typology for State Health Information Exchange

Prashila Dullabh, NORC at the University of Chicago; Felicia LeClere, NORC at the University of Chicago; Jean-Ezra Young, NORC at the University of Chicago; Vaishali Patel, Office of the National Coordinator for Health Information Technology; Matthew Swain, Office of the National Coordinator for Health Information Technology

Presenter: Prashila Dullabh, M.D., Health IT Program Area Director, Health Care Research, NORC at the University of Chicago, dullabh-prashila@norc.org

Research Objective: The State Health Information Exchange (HIE) Cooperative Agreement Program (“the Program”) was created by the American Reinvestment and Recovery Act to expand the secure movement of electronic health information among health care systems, providers, and consumers. Under this Program states were given a broad charge to enable HIE and were expected to take an incremental approach to developing the policies, structures, and technical requirements to support it.

A multi-year evaluation of the Program has commenced with the following primary objectives: 1) to characterize the approaches and strategies states are pursuing to enable HIE; 2) to assess state progress; and 3) to identify factors that influence health information exchange.

Study Design: For the evaluation, we developed a method of organizing the strategies pursued by states to promote HIE in the state. Data was collected from all the states and territories (“the states”) on 14 aspects of their program design (legal and policy-related activities, governance structure, and technical aspects) to understand how these approaches vary by state and whether there are commonalities among state that accelerate the development of HIE. Contextual variables ((geography, demographics, healthcare market characteristics, health IT and HIE maturity at baseline) were assembled from secondary sources. Data analyses will occur in three parts. First, we identify key program factors that may contribute to the viability of information exchange. An initial characterization of states approaches to facilitating HIE will be conducted using cluster analyses to identify states that have similar programmatic approaches. The second step will be to use multivariate models to examine the association between the contextual factors and the state clusters identified in step one. In the third step, we will examine trends in the volume of HIE and provider participation in information exchange across the state clusters identified in earlier steps.

Population Studied: The typology will be based on data collected from all 50 states, 6 territories, and DC.

Principal Findings: Data collection for the initial typology variables is complete and statistical analysis is underway. Preliminary descriptive results from the states suggest diversity in approaches used to enable HIE. Most states (79%) are using a technical model that combines the ability to ‘push’ and ‘query’ electronic data. The most common technical services provided by the states are Directed secure messaging (54%), secure messaging (50%), provider authentication services (48%) and clinical care summary exchange (48%). The most common consent model is opt-out (66%). States are using other levers to enable HIE including legislation for HIE and EHR (56%) and incentives and grants (55%). This presentation will also share findings on the typology clusters and association between the typology clusters and contextual factors. Also discussed will be limitations faced in developing the typology and how these will be accounted for in the interpretation of key findings.

Conclusions: Preliminary results have allowed us to identify a core set of factors upon which to evaluate state successes. Our statistical analysis will take into account data from these states to determine the influence of each program factor, the interaction between program and contextual factors, and any clustering of factors that may influence state-level progress.

Implications for Policy, Delivery, or Practice: By assessing state progress across the nation and evaluating the influence of factors that contribute to successful HIE implementation, we hope to contribute to the knowledge base guiding HIE planning and implementation.

Funding Source(s): Other, Office of the National Coordinator for Health Information Technology

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Providers Experience with Using an Electronic Medication Refill History in Primary Care

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Dominique Comer, Thomas Jefferson University; Lindsey Olivere, Duke University; Joseph Couto

Presenter: Daniel Elliott, Physician, Christiana Care Health System, deliott@christianacare.org

Research Objective: Medication Reconciliation including assessing adherence is a core responsibility of primary care providers. Providers historically rely upon patients to subjectively report medication usage, but electronic-prescribing networks have made multi-payer pharmacy fill history information increasingly available to clinicians. This data may facilitate medication reconciliation and adherence assessment. The objective of this study is to understand the adoption, utilization, and impact of pharmacy refill data in primary care practice.

Study Design: We conducted a survey of primary care providers in a large community practice network one year after an electronic Medication Refill History became available within the shared electronic health record (EHR). The function allowed providers to retrieve prescription fill data through SureScripts (Arlington, VA). We developed a 14-item survey to assess knowledge of the medication history function within the EHR, previous experience with the system, and identification of barriers to using the function. We also asked providers to identify the potential value of prescription fill data. Surveys were distributed to providers at practice meetings and electronically through SurveyMonkey (Palo Alto, CA). Responses are summarized as proportions.

Population Studied: We received surveys from 55 of 72 primary care providers (76.4% response rate).

Principal Findings: We received surveys from 55 of 72 providers (76.4% response rate). Of these, 47 (86%) were aware of the function within the EHR, and 36 (77%) had used it previously. Of these 36, 19 (53%) reported that it was extremely helpful, and 16 (44%) said it was somewhat helpful to clinical care. Eighty percent (29/36) used the function for 30% or less of their patients in the previous 3 months. The most common situations that providers reported using the medication history were at the time they are considering prescribing a narcotic (92%), when seeing a new patient (79%), and when they have a concern about non-adherence (79%). Providers were least likely to use it when prescribing a medication for acute illness (36%). In terms of Medication Reconciliation, providers indicated that when used in the past, the refill history enabled them to confirm adherence to currently prescribed medications (54%), identify medications that were not on their current medication list (69%), and identify a potentially significant medication discrepancy (49%). Barriers to use included delays in access (57%), concern for inconsistent or incomplete data (15%), and the time pressures of clinical practice (37%). All providers reported that a complete, reliable, and accessible medication refill history would be extremely (74%) or somewhat (26%) helpful to clinical practice, particularly in the setting of pain management (96%) and transitions of care (89%).

Conclusions: Our results suggest that practicing primary care providers access multi-payer pharmacy refill data in a variable and selective manner, with emphasis on high-risk situations such as pain management and transitions of care. When used, primary care providers indicate that the data is valuable and identifies medication discrepancies.

Implications for Policy, Delivery, or Practice: Improvements in information technology infrastructure have increasingly made a patient’s multi-payer Medication Refill History available to practicing physicians. This data has the potential to improve medication reconciliation in primary care. If this data is to provide maximum benefit to inform clinical care, implementation should focus on making this data complete and easily-available to providers in routine clinical practice.

Funding Source(s): Other, Delaware Health Sciences Alliance

Poster Session and Number: A, #365

The Sequence of Health Information Technology Adoption in U.S. Hospitals
Shou-Yih Lee, University of Michigan; Jordan Everson, University of Michigan; Julia Adler-Milstein, University of Michigan; Jordan Everson, University of Michigan

Presenter: Jordan Everson, M.P.P., Doctoral Student, Health Management and Policy, University of Michigan, jeverson@umich.edu

Research Objective: The federal meaningful use program aims to align financial incentives in order to increase the adoption of health information technology (HIT) by healthcare providers. We know little about the types of decisions that hospitals are making regarding
the timing and sequence of adoption of the HIT functionalities that are required under meaningful use. Each functionality, such as computerized provider order entry (CPOE) and results reporting, carries its own set of complexities, so it would be helpful to know if a best practice is emerging regarding the order of adoption. We therefore empirically assessed the sequence of HIT adoption across U.S. hospitals. We then compared this to the seven-stage EMR Adoption Model (EMRAM) developed by the Health Information Management and Systems Society (HIMSS), which is widely used as a benchmark in the industry but has not been empirically assessed to determine if it conforms to hospital behavior.

**Study Design:** We used data from the American Hospital Association’s IT Supplement Surveys to determine HIT functionalities adopted by hospitals over time. We then matched HIT functionalities from the survey to each of the seven stages of EMRAM. Factor analysis was performed to validate the grouping of HIT functions into the seven stages of EMRAM. Mokken scale analysis was conducted to test the hierarchical ordering of EMRAM stages and whether or not the ordering reflected the general sequence of HIT adoption in U.S. hospitals.

**Population Studied:** All non-federal, general acute-care hospitals in the U.S. Compared to the general hospital population, respondents to the AHA IT Supplement Surveys were more likely to be larger, not-for-profit, system-affiliated, teaching hospitals, and located in urban areas. Where possible, analyses were weighted to reflect the general hospital population.

**Principal Findings:** Ancillary reporting and ordering systems were the most frequently adopted HIT functionality. Physician-oriented functionalities such as clinical documentation, medication CPOE, and consultation request CPOE were the least frequently adopted. Factor analysis revealed a single dominant factor underlying all HIT functionalities and a poor match between the EMRAM seven stages and HIT functionalities. Mokken scale analysis showed a high degree of homogeneity, suggesting that HIT adoption adhered to a linear and hierarchical framework. However, the ordering of the EMRAM seven stages was inconsistent with the natural sequence of HIT adoption in U.S. hospitals. While the initial stages aligned well with the observed pattern of HIT adoption, later and more advanced stages of the model received little empirical support.

**Conclusions:** Our results suggest that there is an “industry standard” approach to the sequencing of adoption of HIT functionalities across hospitals, but that this approach does not adhere to the widely used EMRAM.

**Implications for Policy, Delivery, or Practice:** An empirically-derived model of the approach to HIT adoption in hospitals can help guide future stages of meaningful use. It informs what is reasonable to expect of hospitals as well as the best order to raise the bar on required HIT functionalities. It also informs leaders of healthcare organizations who can benefit from a model to assist in their planning for future adoption.

**Funding Source(s):** N/A

**Poster Session and Number:** A, #366

**The Beacon Communities Journey in Cincinnati**

Gerry Fairbrother, AcademyHealth; Tara Trudnak, PhD, AcademyHealth; Patricia Bondurant, DNP; RN, HealthBridge

**Presenter:** Gerry Fairbrother, Ph.D., Senior Scholar, AcademyHealth, gerry.fairbrother@academyhealth.org

**Research Objective:** To describe the journey and experience of the Greater Cincinnati Beacon Program, a program that is part of a larger federal strategy to use health information technology as a foundation for improving the nation’s health care system from the HITECH Act. Specifically, this work highlights the successes and challenges involved in implementing the Beacon project, and the enhancements brought by Health IT and other community-wide improvement efforts.

**Study Design:** This qualitative study involved 18 semi-structured interviews with key stakeholders involved in the Cincinnati Beacon Communities Program. Interview topics included improvement efforts and IT infrastructure that were in place before Beacon, the community vision for the Beacon program, challenges and barriers faced, high points and successes, and degree to which the Beacon work is sustainable and how it has set up the community for future work. Interviews were coded and analyzed using NVivo 9 software. A Kappa reliability measure, to test for inter-coder reliability, of 0.95 was achieved indicating high reliability.

**Population Studied:** Key stakeholders in the Cincinnati Beacon Communities Program
**Principal Findings:** The vision for the Beacon Communities Program was broad, and involved both implementing a technology infrastructure for the future as well as a care improvement infrastructure that could be applied to transformation and improvement for many diseases or conditions and in many spheres. By the end of the Beacon Communities Program, a community-wide technology infrastructure was in place that included electronic health records for providers, a community-wide health information exchange (HIE) for warehousing and exchanging data, a robust master patient index, and capability for managing patient populations and reporting outcomes. Consistent with the overall focus of the Beacon Community Program, the focus in Cincinnati was not on technology per se, but on using technology, in concert with other innovative strategies, to improve care and outcomes. Cincinnati targeted two diseases for special focus – asthma and diabetes.

Some of the successes and challenges lead to lessons for other Beacon Communities. The Cincinnati community succeeded in developing their envisioned infrastructure and is well-positioned for the future. However, the infrastructure was not in place soon enough to bring about enhancements to quality of care. There were lessons about the ambitions nature of the deliverables, communication about delays and user expectations of the technology. Further, there were important lessons around what is necessary to fully integrate technology into quality improvement and community transformation. The Cincinnati Beacon Communities Program reorganized its governance structure to put emphasis on community transformation, and is taking steps to further integrate technology into quality improvement.

**Conclusions:** Beacon Communities Program in Cincinnati yielded important lessons around implementation of major technological enhancements, as well as lesson in keeping a focus on quality of care.

**Implications for Policy, Delivery, or Practice:** Technology is best viewed not as a stand-alone set of applications, but rather as applications that enhance quality of care. Payment reform is the third essential element for community transformation.

**Funding Source(s):** Other, Office of the National Coordinating Committee

**Poster Session and Number:** A, #367

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**Implementing an Informatics-Supported Care Management Intervention: A Project of the Washington Heights/Inwood Informatics Infrastructure for Community-Centered Comparative Effectiveness Research Initiative**

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**Presenter:** Penny Feldman, Ph.D., M.A., Senior Vice President, Research and Evaluation, Visiting Nurse Service of New York, pfeldman@vnsny.org

**Research Objective:** To evaluate the feasibility of implementing an informatics supported hypertension (HTN) care management intervention linking clinic-based primary care providers (PCPs) with community-based care managers (CMs).

**Study Design:** Eligible, consented patients were enrolled in a 6-month HTN CM intervention. The pilot study was designed to provide informatics support to enhance CMs’ communication and coordination with PCPs.

Planned components included: (1) CM access to home care and ambulatory clinic electronic health records (EHRs) of enrolled patients, and to clinic scheduler to secure patient appointments; (2) CM ability to transmit secure electronic messages to PCP; (3) integration of a CM structured note into clinic EHR to allow PCP to view CM assessment and monitor patient status; (4) CM ability to generate an electronic alert to PCP on the day of a patient visit indicating that new information was available; (6) communication portal for PCP and CM to exchange additional information. Intervention fidelity was monitored throughout the project.

**Population Studied:** Patients with uncontrolled HTN who had a history of post-acute home healthcare service use and who identified a medical provider in the ambulatory care clinic.

**Principal Findings:** Fifty-three patients have been enrolled. The mean age of study participants is 69; 66% are female; 85% Hispanic. The average BP at enrollment was 154/83. Successes include CM read-only rights
What Influences the Sustainability, Expansion, and Discontinuation of Health IT Projects?
Grace Ferry, Mathematica Policy Research, Inc.; Suzanne Felt-Lisk, Mathematica Policy Research; Rebecca Roper, Agency for Healthcare Research and Quality

Presenter: Grace Ferry, M.P.H., Research Analyst, Mathematica Policy Research, Inc., gferry@mathematica-mpr.com

Research Objective: From 2004-2009, the Transforming Healthcare Quality through Information Technology (THQIT) grant program funded 118 grantees to plan, implement, and study health information technology (IT). Under the THQIT program, the Agency for Healthcare Research and Quality (AHRQ) engaged patient care delivery organizations that have traditionally lagged in health IT implementation, such as small physician practices and Critical Access Hospitals. This study assesses what influenced THQIT project sustainability, expansion, or discontinuation after the grant period, with a particular focus on resource-poor organizations.

Study Design: Our study synthesizes grantees’ experiences during the THQIT grant period and the 2-5 years after the grant ended. We systematically reviewed grantee final reports and other available publications and conducted web-based surveys to follow-up on identified themes. The response rates for the surveys ranged from 79 to 87 percent depending on the grantee type. Data were not sufficient to conduct a multivariate analysis; we completed bivariate statistical tests, as appropriate. We then conducted in-depth semi-structured interviews with 1-3 respondents from 16 grantees selected to represent a range of organizational characteristics.

Population Studied: AHRQ awarded grants to 118 applicants in 38 states. Eighty-six percent of THQIT projects included at least one hospital, more than half included private physician practices, and over one-fourth included safety-net providers. Most commonly, grantees focused on health information exchange (HIE), electronic health records (EHRs), computer decision support (CDS), computerized provider order entry (CPOE), and/or telehealth.

Principal Findings: Seventy percent of grantees sustained or increased use of at least some of the health IT they were funded to implement or study under the THQIT program. At the same time, 60 percent of these grantees reported having to narrow their project activities from those originally planned. Sustainability varied by type of health IT, with EHRs and CPOE most likely to be sustained or show increased use after the grant period, followed by HIE, CDS, and telehealth. Our analysis suggests several factors may influence project...
sustainability: (1) conducting intensive process redesign before implementation; (2) developing a detailed implementation plan; (3) the ability to demonstrate benefits from the health IT; (4) clinician support for the technology, and (5) adequate financial support. Our findings are published on the AHRQ website (http://healthit.ahrq.gov/THQIT).

**Conclusions:** The fact that most of the THQIT projects led to sustained health IT implementations has particular significance because these grantees represent health care organizations that are more typical of those that serve most of America, rather than the larger, innovative systems that were the first to adopt and study health IT. Those implementing health IT now may find encouragement in the fact that others found their implementations valuable enough to sustain. They can also build on the lessons learned from THQIT by planning ways to demonstrate the benefits of the health IT to their organization, working to build clinician support, and conducting intensive process redesign prior to implementation.

**Implications for Policy, Delivery, or Practice:** Patient care delivery organizations pursuing health IT implementation over the next few years will face many of the same hurdles tackled by early adopters and can learn from the THQIT grantees’ experiences implementing and sustaining health IT.

**Funding Source(s):** AHRQ

**Poster Session and Number:** A, #369

**Health Data Aggregation and Gene Patents: Clinical, Economic and Legal Conflicts**

Sean McElligott, University of Pennsylvania; Robert Field, Drexel University Earle Mack School of Law; Mirar Bristol-Demeter, University of Pennsylvania; Susan M. Domchek, University of Pennsylvania Hospital; David A. Asch, Philadelphia Veterans Affairs Medical Center

**Presenter:** Robert Field, J.D., Ph.D., M.P.H., Professor of Law, Drexel University Earle Mack School of Law, robert.field@drexel.edu

**Research Objective:** Gene patents are a double-edged sword in the application of EHR-based data for clinical care and research. They facilitate data concentration by a single entity, but also inhibit access by outside investigators. We analyzed the implications of this dual role from clinical, economic and legal perspectives to identify possible conflicts and solutions.

**Study Design:** Our analysis focused on the patents for the BRCA 1 and 2 genes, which determine susceptibility to breast and ovarian cancer. Myriad Genetics holds the patents, administers all testing for the genes, and compiles results in a single database. This information is linked to data on family histories and outcomes provided voluntarily by external providers. These data represent a crucial resource for analyzing susceptibility to breast and ovarian cancer for genetic variants of unknown significance (VUS). If multiple firms administered the test, no comparable source of data would exist. However, Myriad maintains the database as proprietary, leaving those outside the company with limited access.

**Population Studied:** N/A

**Principal Findings:** Absent the patent, it appears unlikely that the data would have been aggregated and the risk of BRCA VUS would likely not be as well known. However, limited access to the BRCA VUS inhibits continued research into the differential risk that patients face and ultimately impedes physician and patient decision making around risk reduction and surveillance options.

From an economic perspective, the database is a trade secret that confers competitive advantage and limits market entry after patent expiry. Providers and patients will be more likely to submit tests to a company that has the VUS database because the results are more informative than testing by potential competitors. The result is that Myriad will likely maintain competitive advantage and be able to extract monopoly rents.

**Conclusions:** EHRs will not fulfill the promise of being useful research tools if they are not both aggregated and linked to outcomes in a meaningful way as well as being more widely disseminated. This dynamic applies for all patented genetic tests. On the one hand, a single source of testing permits the creation of meaningful databases on the relationship between genetic traits and clinical outcomes. On the other hand, exclusive control limits optimal patient care and market outcomes.

**Implications for Policy, Delivery, or Practice:** The Supreme Court will consider the validity of gene patents this year. Regardless of the outcome, the policy conflict between data aggregation and access remains. A legal solution can be found using several existing statutes that govern medical testing, such as CLIA, HIPAA, or the FDA Act. An alternative would be to grant NIH authority to maintain all
Disparities in Health Information Exchange Participation Rates between Rural and Urban U.S. Hospitals

Bithia Fikru, UMKC School of Pharmacy; Mark Patterson, UMKC School of Pharmacy

Presenter: Bithia Fikru, M.P.A. and Pharm.D. Student, Student Researcher, Pharmacy Practice, UMKC School of Pharmacy, bethbithia@gmail.com

Research Objective: BACKGROUND: Health Information Exchange (HIE) and Regional Health Information Organizations (RHIOs) were created from the Health Information Technology for Economic and Clinical Health (HITECH) Act in order to facilitate patient data sharing between healthcare providers and to improve the coordination of care. This data sharing and improved coordination of care holds promise in improving patient outcomes, yet the expense necessary to connect to these exchanges may prevent smaller rural hospitals from actively participating. Characterizing differences in HIE/RHIO adoption rates between rural and urban hospitals is pivotal in determining the existence of disparities, which in turn, could create missed opportunities for rural hospitals to improve the coordination of care and health outcomes. OBJECTIVE: Our objectives are to determine if the likelihood of HIE/RHIO participation differs among US hospitals located in urban versus rural areas, and to determine if hospital size, ownership type, availability of state-level health IT grant impact the likelihood of HIE/RHIO participation.

Study Design: STUDY DESIGN: This hospital-level analysis merged data from the American Hospital Association (AHA) 2010 Health IT survey and Rural-Urban Commuting Area (RUCA) Codes database in order to classify hospitals as being located in urban, suburban, small town, or rural locations. Hospitals were classified as HIE/RHIO participants if they responded as having actively exchanged data in at least one HIE/RHIO and as non-participants if they did not have the electronic framework in place and/or did not participate in any HIE/RHIO. Multivariate logistic regressions were used to determine the likelihood of HIE/RHIO participation conditional upon location, controlling for hospital characteristics and availability of state-level health IT grant funds.

Funding Source(s): N/A

Poster Session and Number: A, #370

Principal Findings: RESULTS: Across all hospitals, 54% and 10% were located in urban and rural areas, respectively, while 22% reported having actively exchanged data in at least one HIE/RHIO. Of these hospitals actively exchanging, 66% and 6% were located in urban and rural areas, respectively. The absolute difference in the proportion of hospitals participating versus not participating in exchanges was 42% and 72% for urban and rural hospitals, respectively. Compared to rural hospitals, urban hospitals were significantly more likely (OR=1.5, 95% CI 1.05 – 2.35) to have reported actively exchanging data in at least one HIE/RHIO. Federally-owned (OR=6.1, 95% CI 3.5 – 10.6), centrally administered (OR=1.6, 95% CI 1.2 – 2.2), and larger sized (OR=1.8, 95% CI 1.3 – 2.6) hospitals were more likely to participate in HIE/RHIOs.

Conclusions: CONCLUSIONS: The increased likelihood of urban compared to rural hospitals participating in exchanges suggests that geographical disparities exist with regards to HIE/RHIO participation. The significant impact of hospital ownership, size, and structure suggests the importance of infrastructure and resource availability in determining HIE/RHIO participation.

Implications for Policy, Delivery, or Practice: POLICY IMPLICATIONS: The significant disparities in HIE participation that exist between urban and rural hospitals provides an impetus for policy makers to prioritize increasing rural hospitals’ participation in health information exchanges. Furthermore, emphasis should be placed on smaller, non-federally-owned hospitals that are less likely to participate.

Funding Source(s): No Funding

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The Reliability of EHR-based Clinical Quality Measures: Issues with the Comprehension and Implementation of eCQMs

Kathleen Fuda, Abt Associates, Inc.; Mark Metersky, Qualidigm; Ryan Fair, Health Services Advisory Group; Deborah Krauss, Centers for
Medicare and Medicaid Services; Terry Moore, Abt Associates Inc.

**Presenter:** Kathleen Fuda, Ph.D., Senior Associate, Health Policy, Abt Associates, Inc., kathy_fuda@abtassoc.com

**Research Objective:** It is often assumed that, electronic clinical quality measures, i.e., eCQMs, expressed in a format suitable for automatic extract from electronic health records, i.e. EHRs, will be reliable by their nature. But a number of reliability challenges arise for quality measurement across providers, including different electronic health records products, and provider variation in how a given EHR product is implemented and/or used. In addition, eCQMs are expressed in formats unfamiliar to many hospitals and clinicians, and can be quite complex and lengthy, potentially leading to difficulty in understanding their intent and logic. Such understanding is needed to ensure that the data requirements are mapped properly to local systems and data capture patterns and workflows in each location.

The Hospital eMeasures project, funded by CMS, has conducted extensive testing of measure properties for twelve retooled eCQMs, based on paper-based equivalents, as well as two de novo eCQMs. Experience gained during the testing process highlights key areas that should be addressed to ensure the reliability of quality measurement across hospitals or other providers using eCQMs.

**Study Design:** Mixed methods were used to test eCQMs, including surveys of hospital IT and quality experts concerning the clarity of the eCQM logic, a survey of hospital IT staff concerning the availability and formatting of specific data elements used in the eCQM, and comparison of data extracted automatically from EHRs with data abstracted by trained nurse reviewers.

**Population Studied:** A convenience sample of up to four hospital experts per eCQM were surveyed, and eight hospitals, representing four different EHR systems, contributed data for the testing of one de novo eCQM, and four for the second de novo eCQM. Seven hospitals responded to a survey about the availability of specific data elements which were required to report the second de novo eCQM.

**Principal Findings:** The understandability of the human-readable formats of the eCQMs, as rated by hospital experts, varied by measure; for eight of the twelve retooled eCQMs, at least one respondent could not understand them. Measures that included nested logic in the population criteria were more likely to be poorly understood. Hospitals also varied in the ways specific data elements were captured or coded, and how data flowed from ancillary IT systems to the inpatient EHR. Finally, all hospitals that extracted data from their EHRs for our project required substantial assistance from our team to capture the required data adequately.

**Conclusions:** Understanding eCQMs can be challenging for hospital staff, and variation in local data capture and storage patterns may produce disparate results even when similar EHR products are used.

**Implications for Policy, Delivery, or Practice:** Development of eCQMs will facilitate use of the rich data found in EHRs for quality measurement. However, robust education of local implementers, as well as of EHR vendors, will help to improve the reliability of data capture for eCQMs across hospitals and other provider types. Thorough testing of both eMeasures themselves and resulting hospital eCQM scores is advisable before they are used for public reporting of quality, pay for performance, or similar uses.

**Funding Source(s):** CMS

**Poster Session and Number:** A, #373

**How Current Standalone Personal Health Records Meet Patient Desires**

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**Presenter:** Kevin Fuji, Pharm.D., Research Assistant Professor, Center for Health Services Research and Patient Safety, Creighton University, kfuji@creighton.edu

**Research Objective:** To evaluate how the functionalities within standalone personal health records (PHRs) address the functionality desires of patients.

**Study Design:** This descriptive study compared the extent to which different standalone PHRs met the functionality desired by patients.
based, free of charge, standalone PHRs were identified through an Internet search using the keywords: online patient record, personal health record, electronic patient record, and patient portal. Nineteen of 58 standalone PHRs were evaluated. The remaining 39 were excluded because they were fee-based or discontinued from the market, or prior evidence identified inferior attributes, including missing key health information tracking functionalities, usability difficulties, or sign-up difficulties. A literature review for patient PHR desires was conducted using the same keywords. Inclusion criteria required that papers discussed PHR patient desires actually identified by patients - not providers or policymakers. The literature review for patient PHR desires yielded 200 possible publications, 14 of which met the inclusion criteria. Any patient desire identified by two or more papers was included in a checklist for PHR evaluation. For each PHR an account was created with a mock patient profile and the functionality evaluated.

**Population Studied:** Web-based, free-of-charge, standalone PHRs.

**Principal Findings:** Eleven patient PHR functionality desires were identified: ability to share health information in the PHR with others; receiving feedback based on entered health information; information presented in layman’s terms; ensuring the security and privacy of health information; communicating directly with health care providers using e-mail or secure messaging; interoperability with the provider-based record; generating a printed report of health information; creating new sections in the PHR for additional information such as donor wishes; customizing the visual appearance of the PHR; restricting access of individuals to only view specified types of health information; and having tailored support that is need or ability-based. Three desires were met by almost all of the PHRs evaluated: ensuring security and privacy of health information; having information presented in layman’s terms; and generating a printed report of health information. None of the evaluated PHRs addressed personalized support or customizing the PHR’s visual appearance. Only five PHRs met over half of the patient desires.

**Conclusions:** Standalone PHRs do not fully meet patient desires and serve primarily as a health information repository, not an interactive tool that can facilitate patients becoming more knowledgeable about and involved in their health care.

**Implications for Policy, Delivery, or Practice:** Findings emphasize the need to incorporate patient perspectives when designing these patient-centered health information technology tools. Nearly all patient desires address functionalities that can be alleviated through better design. These include the need for dynamic tools within the PHR that can help patients gain knowledge and take appropriate action to improve their health care such as drug-drug and/or drug-allergy interaction alerts. There is also a clear need for interoperability between PHRs and various EHR systems in order for both patients and providers to fully benefit from this technology.

**Funding Source(s):** AHRQ

**The Impact of Electronic Health Records and Teamwork on Quality of Diabetes Care**

Ilana Graetz, Kaiser Permanente; Mary Reed, Division of Research, Kaiser Permanente Northern California; Jie Huang, Division of Research, Kaiser Permanente Northern California; Richard Brand, Department of Epidemiology and Biostatistics, University of California - San Francisco; Stephen M Shortell, School of Public Health, University of California - Berkeley; Thomas Rundall, School of Public Health, University of California - Berkeley; John Hsu, Mongan Institute for Health Policy, Massachusetts General Hospital, Harvard Medical School

**Presenter:** Ilana Graetz, PhD, Data Analyst, Division of Research, Kaiser Permanente, ilana.p.graetz@kp.org

**Research Objective:** In 2011, eligible physicians began receiving billions of dollars in federal incentive payments for meaningful use of certified EHRs. While the meaningful use criteria were carefully developed to target improvements in the overall quality of healthcare, they do not specifically address any organizational attributes of the work environment. Previous studies of the association between electronic health records (EHRs) and patients’ clinical outcomes have found mixed results and none have explored how the organizational context may modify the EHR-effect. We examined whether cohesion among primary care team members modified the effect of EHR use on clinical outcomes for patients with diabetes.

**Study Design:** We collected previously validated survey measures of team cohesion...
from primary care team members working in a large, integrated delivery system in 2005 (N=780, 50% response rate) before the staggered implementation (2005-08) of a commercially available, certified outpatient EHR system. To create a binary indicator of lower team cohesion, we aggregated responses across members from the same primary care team and then created an indicator for teams in the lowest quartile. Using survey and automated claims data, we examined the interaction effect between team cohesion and outpatient EHR use on glycemic control (HbA1c) and cholesterol levels (LDL-C) in 2005-2009 for patients with diabetes. We used multivariate linear regression with patient-level fixed effects, adjusting for year to account for secular time trends and calendar quarter to account for seasonal effects.

Population Studied: 80,611 patients with diabetes mellitus at Kaiser Permanente Northern California, a large integrated delivery system. During the study period (2005-2009), these patients had a total of 598,924 HbA1c and 549,619 LDL-C tests; 60.1% of HbA1c and 58.4% of LDL-C tests were done after the implementation of the certified-EHR.

Principal Findings: Teams varied substantially in their baseline levels of cohesion. The outpatient EHR was associated with significantly greater reductions in HbA1c and LDL-C among patients cared for by teams with higher team cohesion compared with those cared for by teams with lower cohesion (p<0.01). Among patients cared for by teams with higher cohesion, the EHR was associated with a decrease of 2.15 mg/dL (95%CI: 1.86-2.43 mg/dL) in their LDL-C and 0.11% (95%CI: 0.09-0.12%) in their HbA1c results compared with a decrease of 1.42 mg/dL (95%CI: 1.03-1.80 mg/dL) in their LDL-C and 0.08%(95%CI: 0.07-0.10) in their HbA1c for patients cared for by teams with lower cohesion.

Conclusions: We found that patients cared for by clinicians working in primary care teams with lower cohesion experienced significantly reduced improvements from the EHR compared with patients cared for by teams with higher cohesion.

Implications for Policy, Delivery, or Practice: Team cohesion is critical to fully realize the potential care quality gains from EHR use. EHRs are used within complex social systems, therefore it is important to account for the organizational context, in particular team functioning, when examining the impact of EHR on care quality outcomes. Policies aimed at increasing targeted EHR use to improve care quality should consider including combined interventions that aim to improve team integration.

Funding Source(s): AHRQ
Poster Session and Number: A, #375

Clinical Decision Support Systems Employed in Eye and Vision Care
Lori Grover, Johns Hopkins University School of Medicine

Presenter: Lori Grover, O.D., Ph.D., Assistant Professor Of Ophthalmology, Ophthalmology, Johns Hopkins University School of Medicine, lgrover@jh.edu

Research Objective: 1) to conduct a systematic literature review to understand the state of Clinical Decision Support (CDS) Systems employed in optometric and ophthalmologic practice; and 2) to understand the scope of advanced CDS functionalities and potential for realizing associated outcomes in eye care.

Study Design: Systematic literature review

Population Studied: Clinical decision support (CDS) systems are information technology systems designed to improve clinical decision making and form the cornerstone of health informatics research and practice as an embedded concept in clinical information systems. From the health care perspective, clinical decision support (CDS) refers to a variety of approaches providing clinicians, staff, patients, and others with knowledge and individualized person-specific information. A primary purpose of CDSS is to assist clinicians at the point of individual patient care, and CDS has important applications for impacting population health.

Principal Findings: Evidence was categorized into four functional areas: administrative, clinical complexity management, cost control, and decision support. The information was found in several formats: peer-reviewed journal publication; published abstract, conference presentations, and proceedings from professional meetings. A total of 39 articles met inclusion criteria. The articles were summarized into four categories based on a CDS functional classification. The majority of evidence was related to diabetes population and telemedicine-related applications. New theoretical methods for estimating treatment thresholds and emerging population risk factors have been reported that will ultimately affect physician risk.
thresholds in managing chronic conditions. Other existing strategies and tools for future inclusion into eye care CDS systems include applications for encoding and exchange of metadata, grading algorithms and other disease/condition-specific differential diagnostic tools, access to eye care-specific evidence (i.e. evolving CPG) in EHR systems, incorporation of eye disease and vision condition-specific decision trees and cost-effectiveness models into EHR, use of graphical information systems (GIS) for population compliance management, and stakeholder tele-support groups and educational forums. These represent only a small fraction of CDSS applications that can assist in meeting the unique needs of eye care providers and the patient populations for whom care is a necessity.

**Conclusions:** Despite the widespread use of CDS systems throughout health care and the increased applications in eye and vision care over the past decade, there remains a relatively limited scope of applications in eye care. Telemedicine and DM-related population management in optometry and ophthalmology are common, as are tools for clinical diagnosis and management. Adoption of EHR language, HIT schema, and other administrative CDS are emerging within eye care, as is the use of cost-control CDS albeit as a component of broader EHR systems. A lack of evidence was found for the employ of clinical complexity and management CDS specific to eye and vision care.

**Implications for Policy, Delivery, or Practice:** Findings from this study support future research addressing identified scientific gaps, and ongoing review of the literature should be performed to monitor progress, identify measurable CDSS outcomes and new functionalities for eye and vision care stakeholders. Findings suggest that the potential for expansion of CDSS functionalities in eye care exists as referenced by what is emerging and/or “in the wings” awaiting incorporation into eye care-related CDS systems.

**Funding Source(s):** NIH

**Poster Session and Number:** A, #376

**Findings from the Evaluation of the Health IT Workforce Development Program**

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**Presenter:** Kristina Hanson Lowell, PhD, Principal Research Scientist and Associate Director, Health Care Research, NORC at the University of Chicago, lowell-kristina@norc.org

**Research Objective:** Funded by the Health Information Technology for Economic and Clinical Health provisions of the American Recovery and Reinvestment Act, the Office of the National Coordinator for Health Information Technology in the Department of Health and Human Services launched a workforce development program to help prepare a workforce skilled in health IT and equipped to meet employers’ current needs. The aims of the workforce development program’s national evaluation are to: 1. identify the processes grantees have used to implement the programs and meet program goals; 2. assess the extent to which grantees have met their respective program requirements; 3. and examine whether students enrolled in the funded programs have gained employment in health IT.

**Study Design:** One of the key elements of this mixed-method evaluation has been a series of surveys with students enrolled in the community college and university-based training programs. We are conducting six surveys of community college students and six surveys of university students - with 3 cohorts of each group of students surveyed at baseline and follow-up. All but one of these surveys has been conducted thus far. Each baseline cohort includes a random sample of students and, six months after the baseline, respondents are invited to participate in a follow-up survey.

**Population Studied:** All students who participated in the university-based training program, as well as a randomly selected subset of community college students are eligible to participate in the study.

**Principal Findings:** To date, findings from the surveys demonstrate that students in the program are by and large very satisfied with the training, with results indicating that between 69 - 73 percent of community college students and 80-94 percent of university students describe themselves as satisfied or very satisfied with the
program. The presentation will explore longitudinal findings from the surveys -baseline vs. follow-up - as well as comparisons across cohorts over time. Along with additional student feedback on the program, the presentation will discuss survey findings highlighting students’ reasons for entering health IT training programs, details on students’ educational and professional backgrounds, impressions of the learning format and program content, and experiences with seeking and obtaining employment.

**Conclusions:** Findings from these surveys suggest that students are generally satisfied with the workforce program and feel it has prepared them well for professional opportunities in the field. However, they also include recommendations for how the program could be structured to better prepare graduates to enter and succeed in the health IT workforce.

**Implications for Policy, Delivery, or Practice:**
As a growing number of providers adopt electronic health records, a workforce equipped to support the implementation and continuing operation of health IT will become all the more critical. The evaluation of this workforce development program provides key insights on strategies for building this workforce and how future training programs could best supplement this effort.

**Funding Source(s):** Other, Office of the National Coordinator for Health Information Technology

**Poster Session and Number:** A, #377

**Is There a Role for Health Information Technology in Care Coordination?**
Chun-ju Hsiao, National Center for Health Statistics; Jennifer King, The office of the national coordinator for health information technology; Esther Hing, National Center for Health Statistics; Alan Simon, National Center for Health Statistics

**Presenter:** Chun-ju Hsiao, Ph.D., Health Scientist, Division of Health Care Statistics, National Center for Health Statistics, jhsiao1@cdc.gov

**Research Objective:** Improving care coordination among providers by sharing patient health information electronically with other providers, including hospitals, ambulatory providers, and laboratories is one of the goals of Health Information Technology for Economic and Clinical Health Act (HITECH). However, little is known about whether HIT is associated with improved care coordination. Thus, we examine care coordination in US physician offices and the association between HIT and care coordination.

**Study Design:** Data were from the 2012 National Electronic Health Records Survey (NEHRS), an annual nationally representative sample survey of nonfederal office-based physicians. We examined whether physicians received relevant patient health information from other providers (reports when other physicians are consulted, patient’s history and reason for consultation when the physician is consulted by others, and receipt of a hospital discharge summary when a patient has been discharged). Among those who received relevant patient health information, we further examined whether it was received electronically. Multivariate logistic regression analyses examined associations between use of HIT (measured by use of EHR systems and sharing patient information electronically with other providers) and receiving relevant information, adjusting for provider characteristics (physician age, physician specialty, practice size, ownership status, and urban-rural classification). Results with p-values < 0.05 were considered statistically significant.

**Population Studied:** Office-based physician respondents to the 2012 NEHRS survey (n=4,545). The analytic samples excluded observations with missing information on use of HIT, ownership, and receiving relevant information.

**Principal Findings:** In 2012, 64.3% of physicians reported “routinely” receiving; 31.4% reported receiving, but “not routinely”; and 4.3% reported not receiving the results of consultations from other providers. For patient information for consultation, 45.5% of physicians reported routinely receiving; 36.5% reported receiving, but not routinely; and 18% reported not receiving. For hospital discharge summaries, about 54% of physicians reported routinely receiving; 30.2% reported receiving, but not routinely; and 15.4% reported not receiving. Among physicians receiving relevant information (routinely and not routinely), the majority did not receive it electronically. After adjusting for covariates, physicians who used EHR systems and shared patient health information electronically with other providers were more likely to routinely receive (vs. not receive) results of consultations and patient information for consultation than those without EHR systems.
Conclusions: About two-thirds of physicians routinely received results of consultations after referring their patients to other providers. Less than half of physicians routinely received patient information prior to consultation with patients referred to them. Just over half of physicians routinely received hospital discharge information. The majority of physicians who received relevant patient health information did not receive it electronically. Use of HIT was positively associated with routinely receiving results of the consultation and patient information for consultation.

Implications for Policy, Delivery, or Practice: Not all physicians received relevant patient health information when caring for patients, indicating room for improvement in care coordination. Also, the small percentage of physicians receiving relevant information electronically suggests that meaningful use objectives have not been achieved. Future studies on physicians’ experiences with health information exchange (HIE) would improve our knowledge on the barriers associated with implementing HIE.

Funding Source(s): CDC
Poster Session and Number: A, #378

State Variation in E-Prescribing Trends in the United States
Meghan Hufstader, Health and Human Services; Matthew Swain, Office of the National Coordinator for Health Information Technology; Michael F. Furukawa, Office of the National Coordinator for Health Information Technology

Presenter: Meghan Hufstader, Ph.D., Economist, Office of the National Coordinator for Health IT, Health and Human Services, meghan.hufstader@hhs.gov

Research Objective: To describe changes in e-prescribing at the national and state level between December 2008 and June 2012, we examined changes in rates of physician e-prescribing, pharmacy capability to accept e-prescriptions and the volume of e-prescriptions.

Study Design: This study examined trends in e-prescribing using data from Surescripts, a leading e-prescribing network. Data for annual percentages of new and renewal prescriptions routed through the Surescripts network data exclude controlled substances, which are not yet permitted on the Surescripts network. Physician denominators was developed with SK&A, a propriety data set using a combination of the title and specialty variables. The counts were de-duplicated to correct for individual providers who are observed at multiple sites.

Population Studied: Physicians e-prescribing on the Surescripts network in all 50 states and the District of Columbia were included in the analysis. This analysis also included chain, franchise, and independently owned pharmacies. Medical device manufacturers, nuclear, government, military, and infusion pharmacies are excluded using pharmacy type variables provided by National Council for Prescription Drug Programs.

Principal Findings: The percent of physicians e-prescribing using an EHR increased from 7% in December 2008 to almost half of physicians (48%) in June 2012. Increases occurred in all fifty states and the District of Columbia. The growth in e-prescribing has not been limited to physicians. In the same period, the percent of community pharmacies enabled to accept e-prescriptions grew from 76% to 94%. Wyoming, Nebraska, and Kansas had the largest increases in community pharmacies enabled to accept e-prescriptions. The growth of physicians and pharmacies e-prescribing has corresponded with a ten-fold increase in the growth of new and renewal prescriptions sent electronically. In 2008, only 4% of new and renewal prescriptions were sent electronically. Our forecasting using data through June 2012 predicts that 45% of new and renewals prescriptions will be sent electronically in 2012.

Conclusions: E-prescribing is proving its potential to create a gateway to the improved patient care that health IT promises. When complete EHRs are used, not only are quality improvement benefits of e-prescribing made possible, but additional benefits as well. This analysis shows that the vast majority of pharmacies in the U.S. are able to accept e-prescriptions and nearly half of providers are e-prescribing via an EHR, and this has increased significantly as pharmacy and prescribing practitioner experience grows.

Implications for Policy, Delivery, or Practice: This study shows positive emerging trends in electronic prescribing by demonstrating accelerated growth in adoption of electronic prescribing at both provider and pharmacy level. With the continuous efforts and possibly focused further investments, most of the barriers in implementation could be expected to diminish in future.
E-Prescribing in Medicare Part D: Implications for Cost Savings and Adverse Drug Events

Christopher Powers, PharmD, Centers for Medicare and Medicaid Services; Meghan Hufstader, Health and Human Services; William Encinosa, PhD, Agency for Healthcare Research and Quality; Julie P.W. Bynum, MD, Dartmouth

Research Objective: This research represents a first look at e-prescribing in Medicare Part D for 2010. Additionally, results are pending for trend analyses including 2011 data. The objective of this study is to report the use of e-prescribing among Medicare patients and prescribers, focusing on diabetes treatment, before and after the Centers for Medicare and Medicaid Services (CMS) Electronic Health Record (EHR) Incentive Payment Program began.

Study Design: In order to conduct a comprehensive assessment of the baseline e-prescribing among diabetic patients and prescribers in Medicare, administrative data directly from CMS were used. These include 100% 2010 Medicare Part A and B claims data, Part D Prescription Drug Event (PDE) data, beneficiary enrollment data, and Prescriber Characteristics data, and will include 2011 data (currently not available). The main exposure variable used in this analysis was the Prescription Origin Code, which designates the origin of a prescription as written, telephone, electronic, or facsimile.

Population Studied: The patient analysis file was limited to Medicare Fee-for-Service beneficiaries with diabetes, 12 months of full coverage with Medicare Part A, B, and D, aged 65 or older, alive for the entire study year, and with at least one prescription for a diabetes medication. We defined beneficiaries with e-prescribing as those that had 50 percent or more of their diabetes prescription claims e-prescribed as indicated by a Prescription Origin Code value of electronic.

The prescribers in this study were limited to those who prescribed to the Medicare diabetic population. Prescriber’s e-prescribing status was defined based upon Part D claims from all of their Medicare Part D beneficiaries. We defined e-prescribers as prescribers with 40 percent or more of their beneficiaries’ prescription claims e-prescribed which is in line with the Meaningful Use Stage 1 EHR Incentive Payment Program core requirements.

Principal Findings: Fifteen percent of all Medicare diabetics in 2010 had more than 50 percent of their prescriptions e-prescribed. Of these, on average 77% of their diabetic prescriptions were e-prescribed and they had slightly lower average medical service use compared to beneficiaries in the low e-prescribing group. Among prescribers caring for diabetic Medicare beneficiaries, 15% prescribed more than 40 percent of their prescriptions electronically, equivalent to the threshold for Meaningful Use. These higher e-prescribers were more apt to be younger and female. Our findings indicate that e-prescribing is associated with a higher generic drug utilization rate.

Conclusions: This analysis is the first to describe e-prescribing to Medicare beneficiaries and characteristics of the e-prescribing Medicare providers. Small differences were found between high and low e-prescription users but higher rates of generic drug utilization among high e-prescribers may have potential for prescription cost savings.

Implications for Policy, Delivery, or Practice: With the requirement of e-prescribing as part of the Meaningful Use objectives, in 2010 CMS began requiring Medicare prescription drug plan sponsors to report the source of the original prescription via PDEs submitted to CMS. However, to date, these data have not been examined in the literature. The 2010-2011 analysis will highlight impact of e-prescribing on Medicare Part D costs and adverse drug events.

Using Electronic Health Records to Produce Quality Measures: A Study of the Health Information Technology Capabilities of Practices in the Comprehensive Primary Care Initiative

Matthew Humphrey, Telligen; Deborah Peikes, Mathematica Policy Research; Stacy Dale, Mathematica Policy Research; Patrice Holtz, CMS; Rachel Shapiro, Mathematica Policy
Research Objective: To understand health information technology (IT) capabilities of high-functioning primary care practices selected for CMS’s Comprehensive Primary Care initiative (CPC), which aims to transform primary care through multi-payer payment, performance feedback, and technical assistance.

Study Design: In Fall 2012, CMS administered a survey on health IT use to 502 practices under final consideration for CPC, with a 97% response rate. The survey covered: (1) the extent of provider attestation to Meaningful Use (MU) Stage 1 requirements; (2) the availability of IT staff to customize electronic health records (EHRs); and (3) practices’ capacity to generate and meaningfully use EHR-based quality measures to promote the delivery of high-quality care.

Population Studied: 488 CPC practices in 7 regions

Principal Findings: Practices reported moderate to strong EHR capabilities, with room for improvement in producing measures from their EHRs and in using those measures in a meaningful way to promote delivery of high quality care. Medicare eligible professionals (EPs; non-hospital based physicians and chiropractors) and Medicaid EPs (non-hospital based physicians, dentists, certified nurse-midwives, nurse practitioners, and physician assistants in Federally Qualified Health Centers/Rural Health Clinics) are eligible for incentive payments if they meet MU requirements. CPC practices reported over 70% of Medicare EPs and 37% of Medicaid EPs successfully attested to MU Stage 1, and more EPs planned to participate in MU Stage 2—80% and 46% for the Medicare and Medicaid incentive programs, respectively. For a majority of quality measures included in MU Stage 1, at least 80% of practices reported their EHRs can produce measures, although level of capability varied across measures, ranging from 37.5% (for screening for falls risk) to over 95% (for smoking and tobacco use cessation services).

The percentage of practices reporting that at least one of their providers used their EHR meaningfully (that is, could use the EHR to generate MU Stage 1 measures) was below 10% for most measures, and ranged from zero (for urine screening for diabetes) to nearly 65% (for smoking and tobacco use cessation services).

Most practices (nearly 97%) reported that their EHRs incorporated clinical decision support guidance, but some also reported a lack of IT support by a staff member or other non-vendor resources for customizing (14%) or programming (21%) their EHRs beyond their built-in capabilities.

Additional analyses will examine findings separately by geographic region, practice size, organizational affiliation, and medical home certification to indicate how practices function across these dimensions. We will also compare reported rates of MU attestation against actual rates obtained from CMS.

Conclusions: CPC practices reported a high capacity for using their EHRs to produce quality measures, which is not surprising given health IT use was a key factor in CMS’s selection process. However, providers made limited use of their EHRs to produce MU measures. Overall, the health IT capabilities of these high-functioning practices participating in CPC were impressive, but there was opportunity for significant improvement in the practices’ meaningful use of EHR-based quality measures and in their obtaining support to customize and program their EHRs.

Implications for Policy, Delivery, or Practice:

Funding Source(s): CMS

Poster Session and Number: A, #381

The Progress of Health Center Providers Working with Regional Extension Centers on the Journey Toward Meaningful Use of Health Information Technology

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Presenter: Emily Jones, Ph.D., M.P.P., Team Lead, Hitech Evaluation, Office of Economic Analysis, Evaluation, and Modeling in the Office
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Research Objective: The objective is to describe the progress of providers employed by federally-qualified health centers (FQHCs) and working with Regional Extension Centers toward the adoption and meaningful use of health information technology, and to compare this progress with non-FQHC providers working with RECs. Health centers serve over 20 million underserved patients annually, and there are 62 Regional Extension Centers assisting providers with adopting and meaningfully using health information technology, particularly small practices and providers dedicated to enhancing access to care for underserved populations.

Study Design: This cross-sectional study uses a novel data set constructed from three sources. The Customer Relationship Management (CRM) Tool is maintained by program staff of the Regional Extension Center program, at the Office of the National Coordinator for HIT. Information on the Centers for Medicare and Medicaid Services (CMS) EHR Incentive Program was linked using National Provider Identifier. HRSA Data Warehouse FQHC data were matched on the basis of address and practice name. After presenting descriptive statistics, the adoption of HIT among FQHC providers is compared with non-FQHC providers, among providers working with RECs.

Population Studied: This study examines providers working with Regional Extension Centers, with a focus on those who are employed by FQHCs.

Principal Findings: 83% of FQHCs have providers enrolled with an REC, and a total of 18,286 providers who work in FQHCs are working with RECs. In most states, 90% or more of the FQHCs are participating with an REC, and every FQHC is working with their local RECs in 20 states. Over half of FQHC providers who are working with an REC are physicians (57%), 26% are nurse practitioners/CNMs, and ten percent are physician assistants. REC-enrolled providers working in FQHCs are significantly more likely to be live on an EHR than REC providers who do not practice in FQHCs (79% compared with 71%, RR=1.10, p<0.0001). Almost four in five FQHC providers participating with an REC are live with an EHR, and about one in ten are demonstrating meaningful use. Over half of the REC providers in FQHCs (53%) have received CMS EHR Incentive funds to adopt, implement or upgrade (AIU) EHR technology, and 390 FQHC providers working with RECs have been paid by the Medicaid and Medicare EHR Incentive Program for demonstrating meaningful use of certified EHR technology. FQHC providers who are working with RECs have received over $209 million from the CMS EHR Incentive Program.

Conclusions: The Health Resources and Services Administration played a significant role supporting health IT adoption in FQHCs by funding information technology infrastructure and Health Center Controlled Networks. The REC and EHR Incentive Programs build on this foundation.

Implications for Policy, Delivery, or Practice: Although FQHC providers have high rates of health IT adoption, only 9% of FQHC providers working with RECs are currently demonstrating meaningful use. Delays in state Medicaid EHR Incentive Program launches and vendor upgrades, as well as the perception of competing priorities, may be impacting the rate of health IT adoption and utilization. Ensuring that there is adequate technical assistance available will assist FQHC providers on the journey to meaningful use of health information technology.

Funding Source(s): No Funding
Poster Session and Number: A, #382

Electronic Health Records Association with Cost Savings in a National Sample: Show Me the Money
Abby Kazley, Medical University of South Carolina; Annie Simpson, Medical University of South Carolina; Kit N Simpson, Medical University of South Carolina; Ron Teufel, Medical University of South Carolina

Presenter: Abby Kazley, Ph.D., Associate Professor, Health Administration and Policy, Medical University of South Carolina, swansoa@musc.edu

Research Objective: Hospitals face pressure to adopt electronic health records (EHRs) by payer groups and policy such as the HITECH Act. Despite this pressure, little is known about the relationship between EHR use and the impact on patient cost of care in hospitals. This study examines the association advanced electronic health record (EHR) use in hospitals and cost of providing inpatient care.

Study Design: Using 2009 data and a cross sectional design, a patient level analysis is
conducted with propensity scores included to control for selection bias. Both patient and organizational level variables are included as controls. Data from the National Inpatient Sample (NIS) and the Health Information Management Systems Society (HIMSS) Annual Survey were combined in the analysis. The NIS provides the outcome variable of total cost per patient as well as hospital and patient level control variables. The HIMSS data are used to measure advanced EHR use, which is based on individual applications reported in the hospitals using a previously validated adoption model. The main outcome measure is total cost per patient discharge and represents the amount that it costs the hospital to provide services based on the adjusted charges for an admission.

Population Studied: General acute care hospitals provide the setting for the care provided to patients. We include patients who are 18 years or older who were discharged from a hospital in 2009. These include 5,047,089 individuals treated at 550 hospitals in the United States and represent a population-based sample. Patient age, race, DRG Group, insurance status, gender, and transfer status are included in the model. We also control for patient risk of mortality and disease severity.

Principal Findings: There are 104 (18.9%) hospitals included in the sample that use advanced EHRs. The mean cost for patient admissions at hospitals with advanced EHRs being $7,207 and the mean cost for patient admissions at hospitals without EHRs being $7,938. Patients treated in hospitals with advanced EHRs cost, on average, $731 or 9.66% less than patients admitted to hospitals without advanced EHRs after controlling for patient and hospital characteristics.

Conclusions: Hospitals that use advanced EHRs have lower cost per patient discharge than comparable hospitals, indicating that advanced EHRs use may be cost-saving. Incentive programs, such as the HITECH Act, provide motivation for hospitals to purchase EHR systems. It appears that the financial promise of EHRs may be real, once the technology is in place.

Implications for Policy, Delivery, or Practice: The cost savings associated with advanced EHR use will benefit many third-party payers, hospitals, and patients, and incentives such as those provided through the HITECH Act to promote EHR adoption and use will benefit hospitals. Since many previous studies have shown EHRs can improve the safety and quality of care in hospitals, the projected cost savings in this study provides additional motivation and builds the business case for hospitals to make the large investment in adopting and maintaining an EHR system.

Funding Source(s): No Funding
Poster Session and Number: A, #383

The Perceptions of Eligible Providers on the Barriers and Facilitators of Meaningful Use: A Large Provider Survey in Washington and Idaho
Benjamin Keeney, Geisel School of Medicine, Dartmouth College; Douglas A. Conrad, University of Washington; Quincy D. Moore, University of Washington; Douglas L. Weeks, Inland Northwest Health Services

Research Objective: Empirical evidence is mixed regarding the impact of electronic health records. The Health Information Technology for Economic and Clinical Health Act (HITECH) of 2009 first introduced the concept of meaningful use (MU) as specific strategies to encourage providers to use electronic health records (EHRs) to meaningfully and directly enhance patient care. The Department of Health and Human Services (DHHS) identified quantitative measures of MU for providers and hospitals in the following year. Even with financial incentives for meeting MU objectives, the rate of provider attestation for MU has been slow. Little published research has studied perspectives of eligible providers (EPs) for MU incentives to gain their sense of barriers and facilitators for achieving MU. We administered a survey that aimed to capture EP perceptions in Washington State and Idaho.

Study Design: We developed two 69-item MU surveys (Survey A and Survey B) in consultation with established MU experts and clinicians. The MU-attested survey was sent to EPs who had attested or were in the process of registering to attest. The non-MU-attested survey was sent to EPs for whom there was no evidence of attestation or registration. Although two surveys were developed, the actual items are identical with two exceptions and the survey introduction. The introduction allowed us to identify whether the survey had gone to a member of the desired target population. Items include statements on
EP demographics, clinic demographics, Likert-scaled items on various statements about MU and perceptions of MU, their progress and difficulty (anticipated or experienced) on attaining the DHHS MU Objectives, and two items encouraging open-ended responses about MU. The survey was conducted by mail, with a prepaid incentive and two waves of follow-up. By design, the research team was blinded to the identity of survey respondents and non-respondents.

**Population Studied:** The study population is 800 eligible providers (EPs), qualified for MU attestation, in the Spokane region of the United States, including 400 that attested for MU (Survey A) and 400 providers that have not (Survey B). EPs were identified from Medicare attestation qualifying lists provided by DHHS. The surveys were sent to EPs in December, 2012.

**Principal Findings:** Currently, we have received 160 surveys from Spokane-area EPs following initial mailing, with two follow-up mailings in progress. Early trends indicate that a substantial proportion of EPs have concerns about the long-term standing of MU and whether MU measures capture care improvement and will contribute to improved care quality. Full analyses, including comparisons of attested and non-attested EPs, will be completed for AcademyHealth.

**Conclusions:** Eligible providers offer a variety of opinions concerning MU. Many have worries about whether MU offers a valid, effective way of measuring and improving healthcare.

**Implications for Policy, Delivery, or Practice:** A substantial proportion of EPs have not pursued MU, despite being qualified and having financial incentives. Attested MU EPs continue to have concerns about whether MU incentives will continue. Understanding differences in the characteristics of attested and non-attested EPs will contribute significantly to MU policy and implementation.

**Funding Source(s):** N/A, Office of the National Coordinator for Health Information Technology

**Poster Session and Number:** A, #384

**Barriers and Facilitators to Clinical Decision Support Systems Adoption: A Systematic Review**

Hadi Kharrazi, Johns Hopkins School of Public Health; Srikanth Devaraj, Indiana University; Dyan Fausto, Indiana University; Sara Viernes, Indiana University

**Presenter:** Hadi Kharrazi, Assistant Professor, Health Policy and Management, Johns Hopkins School of Public Health, kharrazi@gmail.com

**Research Objective:** The objective of the study was to identify potential barriers and facilitators to improve clinical practice using computer-based Clinical Decision Support System (CDSS).

**Study Design:** Studies published since 2000 were found using PubMed database, PsychInfo, CINAHL, EBSCOhost database, and Google scholar. Additionally, the reference lists of some included articles in Implementation Science Journal were also searched for further references. Two hundred sixty studies were found from combinations of various related keywords. This number was reduced to twenty-six publications that were identified as relevant to our study objective.

**Population Studied:** Thirty-five unique barriers and twenty-five unique facilitators were identified in the literature as important determinants of CDSS’s adoption in clinical practice. The list of barriers and facilitators collected from each study were then organized under the four dimensions of The Unified Theory of Acceptance and Use of Technology (UTAUT) model – performance expectancy, effort expectancy, social influence, and facilitating conditions.

**Principal Findings:** Some of the important barriers to CDSS use includes: lack of time or time constraints, economic constraints (finance and resources), lack of knowledge of system or content, reluctance to use system in front of patients, obscure workflow issues, less authenticity/reliability of information, lack of agreements with the system and physician/user attitude towards the system. Providing or collecting relevant information for user/patient, potential to improve quality of care, improve productivity, proper documentation of procedures, and fast information retrieval/transfer, flexibility of system, and positive user attitude were found to be important facilitators to CDSS use. Future work includes the creation of an ordinal-scale survey questionnaire based on the barriers and facilitators mentioned in this paper to facilitate user data collection and forming recommendations to increase the efficiency of CDSS.

**Conclusions:** In order to fulfill the positive benefits of CDSS, it would be necessary in the future to identify and evaluate users of healthcare providers who have already
implemented or will be implementing CDSS in the future, to create a survey based on this review paper and gather user data.

**Implications for Policy, Delivery, or Practice:**
Results of this study can help organizations to prepare themselves for CDSS implementation through a qualitative systematic UTAUT assessment.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #385

**Requirements for an Interactive Web Portal According to Cancer Survivors and Their Health Care Providers: A Qualitative Study**


**Presenter:** Wilma Kuijpers, Phd Student, w.kuijpers@nki.nl

**Research Objective:** Interactive web portals are often used in health care to increase patient empowerment, but in oncology these portals are still uncommon. The aim of this study was to derive a set of requirements for an interactive web portal in the oncology setting.

**Study Design:** We conducted five focus group discussions with cancer survivors and four with health care providers. Possible features of an interactive web portal were presented: survivorship care plan, access to the medical record, overview of appointments, e-consultation, forum, patient reported outcomes + feedback, telemonitoring, rehabilitation program, and self-management program. This presentation was followed by a semi-structured discussion based on the Unified Theory of Acceptance and Use of Technology (UTAUT), which consists of seven components that directly or indirectly relate to the behavioural intention to use a technology and/or the actual use of that technology. The focus groups were audio-taped and transcribed verbatim. The transcripts were coded manually. For each feature both positive and negative statements were selected and these statements were classified according to components of the UTAUT framework.

**Population Studied:** Breast cancer survivors (n=21), lung cancer survivors (n=14) and health care providers (n=31) in the Netherlands Cancer Institute, a comprehensive cancer centre in Amsterdam, the Netherlands.

**Principal Findings:** Cancer survivors were positive about a survivorship care plan, access to the medical record, appointments and e-consultation. The majority was negative about a forum and had doubts about patient reported outcomes. In addition, breast cancer survivors were positive about a rehabilitation program and a self-management program, and had mixed opinions about telemonitoring. Lung cancer survivors were positive about telemonitoring, whereas they had mixed opinions about a rehabilitation program and a self-management program. Health care providers were positive about a survivorship care plan, patient reported outcomes, telemonitoring, and a rehabilitation program, whereas they had reservations about access to the medical record and a self-management program and were negative about e-consultation and a forum. They did not refer to an overview of appointments.

**Conclusions:** Breast and lung cancer survivors had different opinions of telemonitoring, rehabilitation program and self-management program but agreed on the other possible features of a patient portal. Cancer survivors and health care providers agreed on the potential value of a survivorship care plan and the redundancy and possible risks of a forum, but disagreed on access to the medical record and e-consultation. In combination with findings from the literature, we would recommend that an interactive web portal for the oncology setting includes: a survivorship care plan, access to the medical record, an overview of appointments, patient reported outcomes + feedback, telemonitoring for lung cancer patients and a rehabilitation program.

**Implications for Policy, Delivery, or Practice:**
This study used input from cancer survivors and health care providers to identify relevant characteristics of an interactive web portal for cancer survivors. This information will be used to develop such a portal, the effects of which will be tested in future studies.

**Funding Source(s):** Other, Dutch Cancer Society/Alpe d'Huzes

**Poster Session and Number:** A, #386

**The Effectiveness and Costs of Two Population-Based Cancer Screening Programs: The Value of PCP Input**

Douglas Levy, Harvard Medical School; Vidit Munshi, Massachusetts General Hospital;
Period, there were 104,074 eligible patients.

**Principal Findings:**

Population Studied:

Uncertainty in individual parameters.

Used to aggregate costs taking into account techniques to estimate the costs of the HIT tool, screening (up to 3 tests). We used micro of time eligible patients were up to date on all effectiveness was measured as the proportion patients' screening status or designate them for providers' personal knowledge to update screening. The intervention program leveraged software design could reduce one advantage of providers' personal knowledge of their patients.

Conclusions: An automated program of patient outreach achieved identical screening success at lower cost compared to one designed to take advantage of providers' personal knowledge of their patients.

Implications for Policy, Delivery, or Practice: Standardization of information infrastructure and software design could reduce one-time costs and make the intervention approach more cost-effective compared to the control.

Funding Source(s): AHRQ

Poster Session and Number: A, #387

**Research Objective:** Rates of guideline-recommended preventive cancer screening remain suboptimal despite proven health benefits. Our primary care (PC) network recently completed a practice-randomized trial comparing two versions of a health information technology (HIT) population management system to increase preventive cancer screening in eligible patients. We assessed the relative effectiveness and costs of these two population management programs.

**Study Design:** The HIT system included a patient registry which continuously identified PC network patients overdue for cancer screening; permitted targeted outreach; and tracked tests scheduled and completed. The control program used an automated outreach process where overdue patients were first sent letters asking them to call and schedule an appointment. If there was no response, delegates in the provider’s office would call the patient. If there was still no response, patients at high risk for non-adherence were assigned to navigators who would work closely with patients to complete screening. The intervention program leveraged providers' personal knowledge to update patients' screening status or designate them for personalized letter, phone, or navigator outreach. If a provider did not act within 8 weeks, the patient defaulted to the automated outreach used in the control arm. Nine practice sites were randomized to each study arm. Effectiveness was measured as the proportion of time eligible patients were up to date on all screening (up to 3 tests). We used micro-costing techniques to estimate the costs of the HIT tool, HIT training, mailing materials, and clinical staff time over 1 year. Monte Carlo methods were used to aggregate costs taking into account uncertainty in individual parameters.

Population Studied: Patients eligible for breast, cervical and/or colorectal cancer screening.

Principal Findings: Over the 1-year study period, there were 104,074 eligible patients.

Adjusting for practice-level clustering, patient age, race, insurance, language, and time since last visit, patients in intervention and control groups spent equal amounts of time with all pertinent screenings completed (79.9% vs. 79.6%, p=0.87). We estimated the cost for the control arm was $167,170 while the cost for the intervention arm was $215,377 (95% CI for difference $1,717-$126,321). One-time costs (software, training) were lower for control ($125,144) than intervention ($175,780; 95% CI for difference $6,265-$128,211), driven almost entirely by the additional complexity of the intervention software design. However, ongoing costs (mailing, personnel) were somewhat higher for the control arm ($42,026) than intervention ($39,596; 95% CI for difference -$8,709-$15,248). Physicians estimated they spent less time managing patients' cancer screening in the intervention arm than in the control arm, though this difference was only statistically significant for Pap tests (24.5 min/day intervention, 30.0 min/day control, p=0.04). Sensitivity analyses suggest that software costs, and therefore overall program costs, could be increased 4 to 5 times if the program were introduced in a setting where there was substantial incompatibility across existing information systems.

Missing Behavioral Health Services Data in a Large EHR: the Role of Off-Site Utilization

Jeanne Madden, Harvard Medical School & Harvard Pilgrim Health Care Institute; Matthew Lakoma, Harvard Medical School & Harvard Pilgrim Health Care Institute; Donna Rusinak, Harvard Medical School & Harvard Pilgrim Health Care Institute; Christine Lu, Harvard Medical School & Harvard Pilgrim Health Care Institute; Steve Soumerai, Harvard Medical School & Harvard Pilgrim Health Care Institute

Presenter: Jeanne Madden, Ph.D., Instructor, Department of Population Medicine, Harvard
Research Objective: There is a major push to expand use of electronic health records (EHRs). Massive federal spending on EHRs has been justified on grounds of patient safety and cost savings. EHRs are also widely used in the conduct of health services research. The majority of US health systems are fragmented, with health plan members assigned to a primary care site but receiving specialty care at other locations which do not feed into the primary EHR. Our study compared the amount of information available in a typical EHR with data from insurance claims, focusing on diagnoses and visits for depression and bipolar disorder.

Study Design: We identified three potentially vulnerable clinical groups and extracted complete insurance claims and primary care site EHR data for one year. We compared diagnoses of interest, office visits, and hospital-based events (behavioral and non-behavioral) from the two sources.

Population Studied: We included Harvard Pilgrim Health Care (HPHC) members aged 12 and over who were assigned throughout 2009 to Harvard Vanguard Medical Associates (HVMA), a multispecialty medical practice serving over 300,000 in Massachusetts. Both organizations are national healthcare quality leaders, while at the same time typifying the fragmentation of the US healthcare system. Study cohorts were members with a claims diagnosis for depression (without bipolar disorder, N=5140); diagnosis for bipolar disorder (N=462); or, neither diagnosis and at least 2 claims for an antidepressant medication (using a narrowly-defined antidepressants list, N=1475). These represented 16% of continuously HPHC-HVMA-enrolled adolescents and adults.

Principal Findings: Only 73% of depression patients and 72% of bipolar patients had their diagnosis of interest appear in the EHR. For both diagnosed cohorts, all service events in the HVMA EHR also appeared in claims data. However, the majority of behavioral health visits were missing from the EHR. For example, in 2009, depressed patients had 3.4 mental health specialist visits within the HVMA system, and another 5.1 mental health specialist visits outside of HVMA not appearing in the EHR. Overall, depressed patients had an average of 11.2 outpatient visits within HVMA, and 9.9 outside of HVMA. We found similarly incomplete EHR capture of inpatient events.

Conclusions: Because specialist care often occurs outside of primary care settings, EHRs in fragmented systems inadequately capture diagnoses and events. The problem of missing data was not limited to behavioral health care; it occurred across types of care. Key missing information can sometimes be found in the EHR in the form of free-text clinician comments, scanned documents, etc., but these tend to be ad hoc, incomplete, and inaccessible for population-level IT functions.

Implications for Policy, Delivery, or Practice: Research that relies on EHRs alone in typical healthcare systems will undercount mental health patient populations and service utilization, and by extension, important therapies such as psychotropic medications. EHR data missingness raises concerns about the quality of health IT used in clinical visits and for management functions such as policy-setting and patient safety. More attention to the quality of information in health IT is needed. The rush to invest in EHR systems for health IT may be premature given the current fragmentation of US healthcare.

Funding Source(s): NIH
Poster Session and Number: A, #388

Can Information Technology Improve the Medicaid Application Process? Enrollee Perceptions from Georgia

Angela Snyder, Georgia State University, Georgia Health Policy Center; James Marton, Georgia State University; Abhay Mishra, Georgia State University, Institute of Health Administration; Pat Ketsche, Georgia State University, Institute of Health Administration; Susan McLaren, Georgia State University, Georgia Health Policy Center

Presenter: James Marton, Ph.D., Associate Professor of Economics, Andrew Young School of Policy Studies, Georgia State University, marton@gsu.edu

Research Objective: To assess whether beneficiaries believe that information technology (IT) can improve the Medicaid application process in Georgia.

Study Design: We compare Georgia Medicaid enrollees, who are required to apply at state offices or through the mail, with Georgia CHIP enrollees, who have no in-person application option. We also isolate CHIP enrollees with previous Medicaid coverage, since they are
demographically similar to the Medicaid enrollees.

**Population Studied:** Our sample is based on a telephone survey of Georgia Medicaid and CHIP enrollees and eight focus groups conducted in the summer of 2012.

**Principal Findings:** Medicaid enrollees recognize the potential value in using IT, though some may still require caseworker interaction.

**Conclusions:** Medicaid enrollees in Georgia generally appear ready to use IT to apply for benefits.

**Implications for Policy, Delivery, or Practice:** While these results provide support for increasing the role of IT in the Medicaid application process, we also found that a significant number of respondents place value on paper-based applications and the assistance they receive through a face-to-face interaction with caseworkers. Thus, while Georgia may be able to save money by moving to an online application process, it seems important to continue to offer a paper-based, face-to-face application option, though, as in Florida, it may ultimately get used by a small number of applicants. To address such issues, states should make sure to include both IT and eligibility policy experts when planning such programmatic changes.

**Funding Source(s):** Other, Georgia Medicaid

**Poster Session and Number:** A, #389

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**When Does Adoption of Health Information Technology by Physician Practices Lead to Use by Physicians Within the Practice?**

Sean McClellan, UC Berkeley; Lawrence P. Casalino, MD, Ph.D, Department of Public Health, Weill Cornell Medical College; Stephen M. Shortell, Ph.D, Division of Health Policy and Management, School of Public Health, University of California, Berkeley; Diane R. Rittenhouse, MD, Department of Family and Community Medicine, University of California, San Francisco

**Presenter:** Sean McClellan, B.A., Graduate Student Researcher, Health Services and Policy Analysis, UC Berkeley, smcclellan@berkeley.edu

**Research Objective:** We sought to determine the extent to which adoption of health information technology (HIT) by physician practices may differ from the extent of use by individual physicians, and to examine factors associated with adoption and use.

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**Study Design:** The National Study of Small and Medium-Sized Physician Practices (7/2007-3/2009) was a forty-minute cross-sectional telephone survey conducted with the lead physician or lead administrator of a national sample of physician practices having 1–19 physicians.

We examined the extent to which organizational capabilities and external incentives were associated with the adoption of five key HIT functionalities by physician practices and with use of those functionalities by individual physicians. The five functionalities were: problem lists, progress notes, drug interactions, prompts and reminders, and abnormal test results. Adoption of each functionality by practices, captured through binary indicators, was examined using logit regression models. Average marginal probabilities derived from the logit regressions were used to assess effect sizes. Linear regression was used to assess the percent of physicians within practices using each functionality.

**Population Studied:** We studied 1,744 primary care, cardiology, pulmonary and endocrinology physician practices; adjusted response rate of 63.2 percent.

**Principal Findings:** Thirty-four percent of practices adopted at least one HIT functionality. When practices adopted HIT functionalities, one in seven physicians, on average, did not use those functionalities. Notably, one physician in five did not use prompts and reminders following adoption by their practice.

After controlling for other factors, both adoption of HIT by practices and use of HIT by individual physicians were moderately higher in primary care practices and larger practices. In particular, among practices that had adopted HIT, multi-specialty practice type was strongly negatively associated with use of HIT by physicians relative to primary care practices (range across the five functionalities: -6 to -22 percentage points). Practices reporting an emphasis on patient-centered management were not more likely than others to adopt, but their physicians were more likely to use HIT (range across all five: 1.0-8.4 percentage points for each additional point, out of five total, on the patient-centered management index).

**Conclusions:** Adoption of HIT by practices does not mean that physicians will use the HIT. Additionally, the factors associated with adoption of HIT may be different from the factors associated with use of the HIT by individual physicians once their practice has adopted HIT.
Larger practices were most likely to have adopted HIT, but other factors, including specialty-mix and self-reported patient-centered management, had a stronger influence on use of HIT once adopted. **Implications for Policy, Delivery, or Practice:** Different types of practices may need different kinds of support in achieving meaningful use of HIT. Smaller practices may need special assistance – such as the support provided by regional extension centers – to help promote both adoption of HIT and use of the HIT by physicians once adopted. Additionally, physicians in multispecialty practices may be more likely to use HIT if vendors can create HIT systems that are perceived as useful by physicians across many specialties.  
**Funding Source(s):** RWJF  
**Poster Session and Number:** A, #390

### Organizational Relationships and the Adoption of Health Information Technology by Small and Medium-Sized Physician Practices in the United States

Sean McClellan, UC Berkeley; Stephen M. Shortell, Ph.D., Division of Health Policy and Management, School of Public Health, University of California, Berkeley

**Research Objective:** To distinguish between internally oriented and externally oriented health information technology (HIT) functionalities, and to examine the effect of ties with other healthcare organizations on the adoption of externally oriented HIT functionalities. HIT can be divided into two distinct categories – internally oriented and externally oriented functionalities. Internally oriented functionalities help assist with the documentation and tracking of patient information, support tasks related to population management, and give providers clear and timely information for improving quality of care. In contrast, externally oriented functionalities help to link practices to other entities, such as other physician practices, hospitals, regional health information exchanges, insurers, and patients.  
**Study Design:** The National Study of Small and Medium-Sized Physician Practices (7/2007-3/2009) was a forty-minute cross-sectional telephone survey conducted with the lead physician or lead administrator of a national sample of physician practices having 1–19 physicians. Using linear regression, we examined organizational characteristics and external incentives associated with the adoption of HIT among small and medium-sized physician practices.  
**Population Studied:** We studied 1,744 primary care, cardiology, pulmonary, and endocrinology physician practices; adjusted response rate was 63.2 percent.  
**Principal Findings:** Surprisingly, externally oriented functionalities were adopted more frequently than were internally oriented functionalities. While practices had adopted 41 percent on average of all items in the externally oriented HIT index, they had adopted 19 percent of the items in the internally oriented HIT index. Our hypotheses regarding the importance of organizational relationships for the adoption of externally oriented functionalities were confirmed. Ownership by a hospital/system/HMO was strongly associated with the externally oriented HIT index (8.66 percentage points, CI: 6.45, 10.87) but was not associated with the internally oriented HIT index. Receiving a significant proportion of patients from an independent practice association or physician-hospital organization was also associated with the externally oriented HIT index (3.34, CI: 0.02, 6.66) but not the internally oriented HIT index.  
**Conclusions:** Consistent with other literature reporting on the adoption of HIT during this time period, we found that adoption of most functionalities was quite low. Centrally, this study demonstrated, for the first time, that different organizational characteristics and external incentives were associated with the adoption of internally versus externally oriented HIT functionalities. In particular, having strong ties to hospitals/systems/HMOs was strongly associated with the adoption of externally oriented functionalities.  
**Implications for Policy, Delivery, or Practice:** Independent physician practices may need to explore closer organizational ties that facilitate the adoption of external HIT functionalities. Additionally, our findings suggest that policies enabling and encouraging healthcare organizations to cooperate with one another may help stimulate the adoption of externally oriented HIT. For example, an incentive to adopt externally oriented HIT could be provided to both hospitals and physician practices, on the condition that both organizations adopt certain...
functionalities. Likewise, supporting the development of more robust regional health information organizations may help independent practices work with other healthcare organizations in their community. Participation in accountable care organizations, in which physicians, hospitals, and other clinicians and health care organizations explicitly work together in providing care to a defined population of patients, might also motivate independent practices to adopt externally oriented HIT.

**Funding Source(s):** RWJF

**Poster Session and Number:** A, #391

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**“Sherlocking” Secondary Data for Health Services Research: Promises and Pitfalls**

Anne-Marie Meyer, University of North Carolina, Chapel Hill; Huan Liu, University of North Carolina at Chapel Hill; Tzy-Mey Kuo, University of North Carolina at Chapel Hill; William R. Carpenter, University of North Carolina at Chapel Hill

**Presenter:** Anne-Marie Meyer, Facility & Research Director, University of North Carolina, Chapel Hill, meyera@email.unc.edu

**Research Objective:** Within health research fields, secondary data are primarily defined as data collected by someone other than the current user. However, rapid advances in data availability and analytic computing are changing the landscape of secondary data resources for health research. Highly complex, linked ‘big data’ resources are increasingly leveraged despite the fact that they were not designed or intended for research. There is a dearth of literature on understanding how these changes influence our understanding, definition, and uses of secondary data. Using examples from registry-linked claims data we outline several discrete steps for evaluating secondary data, improving analytic data quality, and informing study designs.

**Study Design:** Using specific examples from registry-linked claims data and recently published comparative effectiveness research (CER) questions, we demonstrate how the initial intent and structure of the data influences their validity and application. By changing how we apply our knowledge of clinical coding schema (i.e., effective or termination dates for HCPCS codes) we can significantly change the exposure or outcome definitions of the study which influences both potential bias and study design. For example, using this information we can directly influence the exposure prevalence of Folfox in CER studies of colon cancer by integrating additional information from the data structure and coding schema changes.

**Population Studied:** Retrospective cohorts of colon, breast, and prostate cancer patients in SEER-Medicare and North Carolina Cancer Registry-linked claims data.

**Principal Findings:** Data validity and study quality can be improved by “sherlocking” secondary data and walking through key questions (the who; what; when; where; why and how of data). Algorithms defining treatment and outcomes can also be improved by incorporating more nuanced information from clinical coding schema and nomenclature (e.g., HCPCS/CPT, ICD, snomed CT). Cohort size, exposure and outcome prevalence change significantly based on these practices and additional information

**Conclusions:** Health services researchers can mitigate error and bias while creating analytic datasets by taking discrete steps to better understand sources of secondary data.

**Implications for Policy, Delivery, or Practice:** Greater awareness is needed regarding the origination and structure of secondary data for health services research. Additional informatics resources need to be widely developed and deployed to facilitate timely and valid research on these data.

**Funding Source(s):** Other, University Cancer Research Fund of North Carolina (UCRF)

**Poster Session and Number:** A, #392

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**The Relationship Between Mimetic Pressure and Rural EHR Adoption**

Arthur Mora, Tulane University; Mark L. Diana, PhD, Tulane University; Valerie A. Yeager, DrPH, Tulane University

**Presenter:** Arthur Mora, M.H.A., Doctoral Student, Global Health Systems and Development, Tulane University, amora1@tulane.edu

**Research Objective:** As a component of the broader national health information technology (HIT) strategy, electronic health records (EHR) have been offered as a way to reduce health care costs, increase care coordination and improve outcomes. In 2009, the Health Information Technology for Economic and Clinical Health Act (HITECH) included $20.6 billion in economic incentives to accelerate adoption and utilization of EHR systems by individual and hospital providers. The purpose
of this study is to examine the relationship between mimetic pressure, or the pressure to replicate strategies of positively perceived peer organizations, and EHR adoption in rural hospitals.

**Study Design:** A retrospective, cross-sectional analysis was performed using secondary data from the 2009 American Hospital Association (AHA) Information Technology supplement. This supplement was disseminated to the 6,019 respondents of the 2008 AHA Annual Survey. In total, there were 3,615 respondents to the AHA IT supplement, representing a return rate of 60.1%. This AHA EHR adoption data was merged with the 2006 Rural-Urban Commuting Area Codes to determine EHR adoption in hospitals operating in rural areas. The 2008 Centers for Medicare and Medicaid Services Hospital Cost Report was used to obtain payer mix and revenue. EHR penetration, computed as the number of rural hospitals that have adopted EHRs in a state divided by the total number of rural hospitals in that state, provides an indicator of mimetic pressure. This was stratified into high, medium and low levels of penetration. Probit analysis was performed to estimate the effect of within state penetration of adoption of EHR in rural hospitals on the likelihood of rural hospital EHR adoption.

**Population Studied:** Non-federally owned acute care hospitals located within rural markets within the 50 U.S. states that responded to the AHA Information Technology supplement and that had complete data for all variables (n = 1331).

**Principal Findings:** In preliminary analysis, medium penetration of EHR adoption within a state is associated with a 7.1% greater probability of a rural hospital adopting an EHR compared to rural hospitals in states with the lowest penetration (7.2%, p < 0.00). A rural hospital located in a state with high penetration is predicted to experience a 15.4% greater probability of adoption compared to rural hospitals within states with the lowest penetration (p < 0.00). Additionally, the predicted probability of a for-profit hospital adopting an EHR was 11% below the base rate of adoption for government, non-federally owned hospitals (p < 0.00).

**Conclusions:** Our findings suggest that prior to economic incentives and penalties enacted by the HITECH Act, mimetic pressures were a significant influence on the decision to adopt EHRs among rural hospitals.

**Implications for Policy, Delivery, or Practice:** Recent EHR adoption trending data suggests that the gap in adoption between urban and rural hospitals is widening. These trends lead to questions regarding the effectiveness of economic incentives to encourage adoption of technology in rural hospitals. As these data become available and before more funding is allocated, future research should further compare economic incentives and organizational factors to understand the influential determinants and motivators for EHR adoption.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #393

**Aligning Research with Public Health Priorities: Visualizing the Needs and Gaps**

Buki Ogunseitan, University of Illinois at Chicago; Ariadna Garcia, MS, Bioinformatics Core, Center for Clinical and Transitional Science; Denise M. Hynes, MPH, PhD, RN, Bioinformatics Core, Center for Clinical and Transitional Science; Carol Ferrans, PhD, RN, FAAN, Community Engagement and Research Core, UIC Center for Clinical and Translational Science; Susan Newman, MPH, Community Engagement and Research Core, UIC Center for Clinical and Translational Science; Deborah Burnet, MD, MA, General Internal Medicine, University of Chicago; Jen Brown, MPH, Center for Community Health, Northwestern University Institute for Public Health and Medicine; Melissa Garrett, MSW, Bioinformatics Core, Center for Clinical and Translational Science

**Presenter:** Buki Ogunseitan, M.Sc, Technical Project Director, Bioinformatics Core, Center for Clinical and Transitional Science, University of Illinois at Chicago, buki1@uic.edu

**Research Objective:** Community-based research (CBR) focus and coverage may be driven by public health priorities, funding opportunities, as well as partnership opportunities and community interest. The Chicago Partnership for Public Health identified priority action areas to improve Chicago’s public health infrastructure. CBR is a critical component to addressing these priorities. However, visualizing and tracking whether these priorities are being met with CBR has not been performed. We sought to identify and characterize CBR underway in the communities,
CBR university-community partnerships, and CBR gaps in meeting key health priorities.

**Study Design:** We identified CBR at four academic institutions in Chicago: University of Illinois at Chicago, Northwestern University, University of Chicago and Rush University from 2010-current. The visualization tool and community map were developed with input from representatives from CBR at each university, community organizations and The Chicago Consortium for Community Engagement("C3") - a collaborative formed by the community engagement programs of the three Chicago Clinical and Translational Science institutes. CBR projects were identified and validated by each university institution. We constructed the CBR Map, an information system that includes a relational database accessible via a dynamic web-based interface. The CBR Map provides profiles of each CBR project linked to a geographic map with select census data of all the Chicago community areas. The web interface comprises 1) an interactive map of the 77 Chicago Community areas which displays active projects, with hyperlinks to the collaborative partners and investigators; 2) a search tool with a variety of options to query the database; 3) a showcase of projects by research topic using assigned keywords 4) a density map that highlights CBR concentration within and across communities.  

**Population Studied:** CBR projects from four Chicago institutions and 77 community areas in Chicago.  

**Principal Findings:** Preliminary analysis focuses on 3 of the 4 institutions in 2012. Additional information from 2013 and a fourth institution will be added to the final analysis. A total of 175 CBR projects were identified. All of the CBR projects aligned with the Chicago health priorities with the three highest areas focused on HIV (23%), Access to health (15%), Cancer (14%); however, there were no CBR projects to date address smoking cessation. Of the 77 Chicago communities, one ethnically diverse community (Near West Side; 42% White, 32% Black, 9% Hispanic, and 15% Asian) was the focus of 29 CBR projects. Six communities had the lowest frequency of projects with two each; 49 CBR projects were being conducted citywide. The reach of the three institutions for CBR was overlapping in some areas; 7 communities have projects from all three 3 institutions while 44 communities have projects from at least 2 of the institutions. There was no community without CBR projects.  

**Conclusions:** This tool provides readily available information about CBR being conducted in Chicago communities. Preliminary analysis using this new innovative tool suggests that HIV, access to care, and cancer are among those areas being addressed in several communities; targeting smoking cessation may be a gap among the currently active CBR projects in Chicago.  

**Implications for Policy, Delivery, or Practice:** The vision is to create integrated, effective sustained community-wide partnerships for health promotion that can be replicated nationwide.  

**Funding Source(s):** NIH  
**Poster Session and Number:** A, #394  

**Health Information Technology: An Updated Systematic Review with a Focus on Meaningful Use Functionalities**  
Spencer S. Jones, RAND; Robert Rudin, RAND Health; Robert S. Rudin, RAND; Paul G. Shekelle, RAND  

**Presenter:** Robert Rudin, Associate Policy Researcher, RAND Health, rudin@rand.org  

**Research Objective:** This project is an update of previous systematic reviews on the effects of health information technology on key aspects of care including healthcare quality, safety and efficiency. Unlike previous reviews, this review focused specifically on health IT as outlined in the “meaningful use” regulations.  

**Study Design:** This review was carried out in three stages by two health IT subject matter experts, with input from a panel of five nationally-known health IT experts. The first stage involved independent, dual-rater screening of articles based on their titles against a set of inclusion/exclusion criteria. Next, the reviews screened each article at the abstract level using a standardized abstraction form. The final stage involved a full text review and classification using a standardized abstraction form. Inclusion/exclusion or classification discrepancies between the two reviewers were resolved by consensus. We conducted an update search using the same search terms through November 2012 using a computer-aided screening system that extends a previously described approach for facilitating systematic review updating.  

**Population Studied:** We used the English-language literature indexed in MEDLINE between January 2010 and November 2012. We
searched the Cochrane Central Register of Controlled Trials, the Cochrane Database of Abstracts of Reviews of Effects, and the Periodical Abstracts Database, and hand-searched personal libraries kept by content experts and project staff. We asked content experts to identify evidence outside the peer-reviewed literature. Finally, a technical expert panel identified published articles and non-peer reviewed resources.

**Principal Findings:** We identified 12,202 titles and found 205 studies meeting the eligibility criteria. Approximately 76% of studies reported positive or mixed-positive findings. Analyses found that neither study setting (ambulatory, non-ambulatory), recognition as a health IT leader, nor commercial status were significantly associated with results. However, studies of efficiency were significantly less likely to report positive results than studies of safety or quality, and studies that evaluated e-prescribing and multifaceted health IT interventions were significantly less likely to report positive results than studies of decision support or computer provider order entry.

**Conclusions:** Overall, a majority of studies reported findings that were to some extent positive. These studies evaluated several forms of health IT: metrics of satisfaction, care process and cost, and health outcomes across many different care settings. Our findings agree with previous health IT literature reviews suggesting that health IT, particularly those functionalities included in the meaningful use regulation, has the potential to improve healthcare quality and safety. The relationship between health IT and efficiency is complex and remains poorly documented or understood, particularly in terms of healthcare costs, which are highly dependent upon the care delivery and financial context in which the technology is implemented.

**Implications for Policy, Delivery, or Practice:** The published literature on health IT is expanding rapidly, driven primarily by studies of commercial health IT systems. However, much of the health IT literature still suffers from methods and reporting problems that limit our ability to draw firm conclusions and generalize to other contexts. Studies of health IT must be designed, conducted, and reported in such a way that stakeholders can better understand study results and how they can replicate or improve on them.

**Funding Source(s):** Other, ONC

**Poster Session and Number:** A, #395

**Using Electronic Health Record Data to Prevent 30-day Readmissions: Early Identification and Implementation of an Organization-Wide Intervention**

Efrat Shadmi, University of Haifa, Israel; Natalie Flaks-Manov, Clalit Research Institute, Chief Physicians’ Office, Clalit, Israel; Orit Goldman, Clalit Research Institute, Chief Physicians’ Office, Clalit, Israel; Moshe Hoshen, Clalit Research Institute, Chief Physicians’ Office, Clalit, Israel; Lo Marcelo, Clalit Research Institute, Chief Physicians’ Office, Clalit, Israel; Haim Bitterman, Clalit Research Institute, Chief Physicians’ Office, Clalit, Israel; Ran D. Balicer, Clalit Research Institute, Chief Physicians’ Office, Clalit, Israel

**Research Objective:** One of the key challenges to preventing readmission is the timely identification of high-risk patients. Data availability and information flow capacity limit the degree to which models can be used in practice. We developed and tested a readmission prediction model based on data from Electronic Health Records (EHR). Data availability and implementation were considered to create a risk identification tool for use early during the index admission, as well as immediately upon discharge, by primary care providers.

**Study Design:** Multivariate analysis of EHR and administrative data was performed. Predictors included: morbidity, demographic and socioeconomic characteristics, resource use (inpatient and outpatient), cost, medication prescribing and dispensing, risk factors and disability. Data was retrieved for all first admissions between January - March 2010, and the 30-day follow up period. We used a three month window to prevent over representation of first time admissions. We used derivation and validation cohorts in model development.

**Population Studied:** A total of 26, 500 internal medicine admissions of adults age 65 or older enrolled in a partially integrated delivery system (Clalit Health Services) in Israel.

**Principal Findings:** The model showed acceptable discriminatory power (c-stat = 0.70). We calculated the readmission risk of all index admissions which had a recent (less than 30 day) prior discharge. As readmission for these index admissions was high (30%), regardless of other factors, we created a two phase process to
account for update lags. In phase 1 a risk score is generated in Clalits’ central data warehouse, based on EHR and administrative data updated monthly. This process results in an a priori risk score (transformed to a 0-100 scale) of each of Clalits’ ~500,000 older adults. In phase 2, on a daily basis, the risk scores, together with information on recent prior admissions, are transferred through integrated computerized systems to each of 25 hospitals in Israel, upon admission of persons meeting the inclusion criteria. Admissions that have a prior recent discharge are automatically ranked highest in the risk score list. Additionally, upon discharge, risk scores are automatically communicated to each patient's own primary care clinic. Risk scores are used in hospital and community settings to target the highest risk patients for transitional care interventions.

Conclusions: We report of the development of a model, which uses only EHR and administrative data available at the health plan’s data warehouse prior to the index admission. The model presents acceptable discriminatory power, especially given that it uses data only from preadmission risk factors.

Implications for Policy, Delivery, or Practice: We present an approach that can potentially be used by health plans or insurers to streamline data on their enrollees’ readmission risk, to guide readmission reduction interventions. Lessons from model development and implementation can be drawn, as the model is in use for almost a year, guiding both hospital and community targeting for transitional care interventions.

Funding Source(s): Other, Israel National Institute for Health Policy

Poster Session and Number: A, #396

Provider Utilization of Electronic Prescribing Increases Over Time

Max Sow, Surescripts; Seth Joseph, Surescripts

Presenter: Max Sow, M.B.A., B.S.E., Director, Business Intelligence, Surescripts, max.sow@surescripts.com

Research Objective: The Health Information Technology for Economic and Clinical Health (HITECH) Act provides an incentive program designed to spur adoption of Electronic Health Records (EHR) use by providers. Electronic prescribing (e-prescribing) is one of the core functions required by this program due to the improvements in efficiency, accuracy, and quality for patients, from the provider's workflow to the pharmacy. Momentum from this program has led to an increase in provider adoption of e-prescribing since its inception. The objectives of this study were to investigate provider utilization of e-prescribing systems following providers’ point of adoption.

Study Design: More than 450,000 office-based providers – including physicians, nurse practitioners, physician assistants, and other medical professionals with prescriptive authority were evaluated. A longitudinal study was conducted to evaluate e-prescribing transactional data from the Surescripts network over a 5 ½ year period between January 2007 and August 2012. Data was gathered using prescription transactions including new prescriptions and renewal authorization responses sent by providers as the key metric of determining utilization levels. Average prescription transactions per provider were analyzed on a monthly basis and as a function of the time a provider has been on the network. Providers were also categorized by e-prescribing system to determine whether utilization increases over time were observed consistently across systems.

Population Studied:

Principal Findings: Average provider transaction volume has steadily increased over the time of the study, from an average of 92 e-prescriptions per month by 2007 YE to an average of 155 e-prescriptions per month by the end of the study in August 2012. Findings from this study suggest that average utilization levels per provider vary across EHR and e-prescribing vendors, but length of time using e-prescribing is a strong predictor of utilization across all vendors. After one year of use, the average provider generates 93 e-prescriptions per month; this increases to an average of 136 e-prescriptions per month by the end of two years of use, 178 e-prescriptions per month after three years of use, and up to 220 e-prescriptions per months for those who have been e-prescribing for more than three years. Among the top twenty vendors (as measured by registered and active providers), every vendor displayed the same pattern of increasing use among providers based on the length of use e-prescribing.

Conclusions: Our findings have implications for the Centers for Medicare and Medicaid Services (CMS) as it considers setting meaningful use thresholds for e-prescribing and other EHR functional measures. First, when considering setting meaningful use threshold measures for
e-prescribing, CMS should consider that these findings suggest that provider utilization behavior is dynamic and increases over time, as evidenced by the universal increases in utilization across all e-prescribing systems year over year. Second, the consistency of the increases in utilization levels over time and across all e-prescribing systems further suggest that e-prescribing is becoming a standard part of clinical workflow. This suggests that the elevated utilization levels of e-prescribing will persist beyond the timeline of the HITECH program.

**Implications for Policy, Delivery, or Practice:**

EHRs are made to act as an intervention and management tool for patients. However, the process of implementation may lead to resistance to the significant cultural and work environment changes initiated by EHRs. Despite the many challenges, the hospital achieved some early positive results. These included: the ability to check progress notes and monitor staff activities; improving quality of care as a result of real-time, more accurate and shared patient records across the hospital; and potentially improving the safety of care through increasing the legibility of the clinical record.

**Principal Findings:** The implementation of the EHR system was challenging and cumbersome. During early stages, some clinicians felt that using the software was time-consuming and not fit for purpose. Most interviewees complained from restricted software customization and limited adoption and use. Users’ low IT literacy along with inadequate training in using the EHR software led to resistance to the significant cultural and work environment changes initiated by EHR. Despite the many challenges, the hospital achieved some early positive results. These included: the ability to check progress notes and monitor staff activities; improving quality of care as a result of real-time, more accurate and shared patient records across the hospital; and potentially improving the safety of care through increasing the legibility of the clinical record.

**Conclusions:** Notwithstanding what was seen as a turbulent, painful and troublesome implementation of the EHR systems in England, this hospital achieved some early clinical and managerial benefits from implementing EHRs. The ‘sociotechnical changing’ framework helped us go beyond the dichotomy of success versus failure, and enabled us to learn how the EHR was formed, translated and reproduced in various entities and the different meanings it embodied for various stakeholders, at different times and locations. There is now a strong policy drive to implement EHRs in mental health settings. As mental health settings face greater challenges for providing a quality service at an acceptable cost, wise implementation of suitable EHR applications may boost chances for the success.

**Implications for Policy, Delivery, or Practice:**

From our perspective, non- or partial adoption but also rejection, misuse, non-use, resistance to EHR and workarounds, all are not simply negative effects, pathologies or signs of failure, but are alternative enactments upon technology, which may pave the trajectory of organizational learning towards future smoother implementation process. In this way, as an intertwined product of technology, work practices; and people who make them work; EHR is made to actively produce a fit system to the needs of organization.

**Funding Source(s):** Other, NIHR- England

**Poster Session and Number:** A, #398
National Health Service’s Integrated Information System in England: Some Evidence-based Remarks for the United States
Amirhossein Takian, Brunel University London; Tony Cornford, London School of Economics and Political Sciences

Research Objective: To rehearse recent history of health information systems (HIS) in England’s National Health Service (NHS), and draw out a core critique and practical lessons to shape future national implementation of electronic health record (EHR) systems internationally.

Study Design: With the estimated budget of £20 (€12.7) billion, National Programme for Information Technology (NPfIT) [2002-2011] was a strategic initiative to integrate NHS’s HIS and transform healthcare. We critically reflected on the history of HIS in England’s NHS, and also drew upon our findings from an independent, longitudinal, sociotechnical and mixed-method evaluation of national implementation of EHRs.

Population Studied: Our data set included 480 interviews; 600 hours of on-site observation; content analysis of 124 sets of documents of various types; and 4400 survey responses from 12 secondary care settings across England that implemented centrally-procured EHR systems.

Principal Findings: NPfIT was born in response to frustrations through the 1990s at the lack of progress with computerization of the NHS, particularly in secondary care. Our evaluation confirmed that main stakeholders were highly ambitious, lacked insight and expertise in judging the complexity of the task, overestimated their own and local NHS hospitals’ capabilities and preparedness, while underestimated the cultural change implied and the managerial efforts and financial resources required to start the transformation. NPfIT came to face substantial problems as it struggled in core areas to deliver useful and usable technical systems, ensure their implementation and generally meet NHS staffs’ expectations.

Conclusions: We can learn from the history of ambition and struggle in NHS information system. In-depth appreciation of the challenges NPfIT faced, and recognition of what was and was not achieved, can allow better choices for the future. Such reflections need to appreciate the deeper processes of institutional adoption of new ways of working with information; encompass consideration of how health system informatics policy is made; establish robust and credible technology supply chains; and understand the multiple stakeholders, the practices of implementation and of change management. Information reform in healthcare is a long-term project, part cultural shift and part cultural reaffirmation.

Implications for Policy, Delivery, or Practice: In line with our ‘sociotechnical changing’ view to EHRs, we see NPfIT as an opportunity for learning, and not simply as either success or failure. We suggest here some ‘foundational principles’ in taking the national implementation of EHRs forward:
- Data standards and interoperability need to be matched by learning and sharing, through a careful balance between the most appropriate level for coordination measures and the governance of directives and incentives.
- To serve the interests of patients and clinical staff, early introduction of clinical functionality is pivotal and should be prioritized over comprehensive EHR systems or (unrealistic) expectations of administrative cost-savings or short-term returns on investment.
- While better information resources that are creatively shared may save money, or serve critical needs of management and allow better decision making, the real transformative power of information is in changing the relationships between patients and clinical stakeholders and the way they organize their work.
- A kite marking scheme or some minimum level of benchmark for usability, clinical safety and technical validity is appropriate.
- It is pivotal to build relationship and establish good lines of communications between technology suppliers, service companies, patients and carers, clinical and administrative users, managers, professional bodies and healthcare commissioners.
- Mapping and re-mapping of work processes, patient pathways and professional jurisdictions, as well as the wider adoption of user-centered organizational design and redesigning services or actively seeking out new ways of improving healthcare delivery are prerequisites of any HIS. Otherwise, EHRs will simply freeze in place or magnify existing problems.

Funding Source(s): Other, NIHR-England
**Poster Session and Number:** A, #399

**Patient Safety and National Electronic Health Record Implementation: The English National Health Service’s Experience**

Derek Meeks, Houston VA Health Services Research and Development Center of Excellence, Baylor College of Medicine; Amirhossein Takian, Brunel University London, UK; Amirhossein Takian, Brunel University London; Hardeep Singh, Houston VA HSR&D Center of Excellence & Medical Center and Baylor College of Medicine; Dean F. Sittig, University of Texas School of Biomedical Informatics at Houston UT - Memorial Hermann Center for Healthcare Quality & Safety, National Center for Cognitive Informatics & Decision Making; Nick Barber, The UCL School of Pharmacy, UK

**Presenter:** Amirhossein Takian, M.D., Ph.D, FHEA, Assistant Professor, Health Studies, Brunel University London, UK, amir.takian@brunel.ac.uk

**Research Objective:** The intersection of electronic health records (EHRs) and patient safety is complex. To advance the understanding of this intersection, we applied a three phase model to understand safety implications of England’s national EHR implementation. The three phases address safety concerns unique to technology; safety concerns from failure to use technology appropriately; and use of technology in order to monitor and improve patient safety, respectively.

**Study Design:** Using qualitative methods, we conducted a 30-month longitudinal, prospective, and case study-based evaluation of the nationwide implementation of three EHR systems into 12 English NHS hospitals (9 acute care and 3 mental health). Data analysis included content analysis of themes related to all aspects of patient safety in the context of the EHR-based ‘sociotechnical’ work system (i.e. technology as well as non-technological factors that influence EHR implementation and use). We then systematically applied the three-phase implementation model to identify and categorize the dimensions most clearly relevant to patient safety concerns.

**Population Studied:** Out of 480 interviews conducted with managers, doctors, nurses, allied health professionals, administrative staff, implementers, and software developers in 12 ‘early adopter’ hospitals, we identified 49 interviews, in which various aspects of patient safety were mentioned.

**Principal Findings:**
- **Phase 1**
  Findings in this phase were found to be unique and specific to technology with the risk most prominent among recent and future adopters. They included factors such as ensuring that an appropriate data center and back-ups were available, human-computer interfaces and interactions were less error-prone, and clinical workflows were implemented to match the EHR features.
- **Phase 2**
  Themes in this phase revealed situations when the technology was inherently safe but was used improperly or in an unsafe manner. Using new technology in an established clinical workflow was found to increase potential patient safety concerns. Clinical workflow and communication was more error prone when the medical record was in transition from paper to electronic form.
- **Phase 3**
  Only a few themes were found relevant to monitoring and identifying safety issues before patients were harmed, most prominent among them was the difficulty in reporting quality measures prior to EHR implementation and the potential advantages of an EHR-enabled healthcare system.

**Conclusions:** We demonstrate the use of a three-phase model to understand the sociotechnical aspects of patient safety during EHR implementation, and the ability of this model to describe complex interactions of technology within the healthcare system.

**Implications for Policy, Delivery, or Practice:**
This framework can assist EHR developers and practitioners to share a concept of risk in the development and implementation of software systems, enabling them to set priorities for each phase of implementation (e.g. proper technology-related requirements in place prior to EHR implementation in phase 1; understanding and changing clinical workflow in phase 2). We believe that future EHR implementations and those already in progress would benefit from a similar approach to ensure patient safety is improved and not reduced by EHR use.

**Funding Source(s):** Other, NIHR - England

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**Poster Session and Number:** A, #400

**Prevention of Hospital-Acquired Conditions: Is Electronic Health Record Use an Effective Strategy?**

Caroline Thirukumaran, University of Rochester; Yue Li, PhD, University of Rochester
**Principal Findings:** Falls and injuries (0.67/1,000), infections from venous (IVC: 0.65/1,000) and urinary (IUC: 0.56/1,000) catheters, and severe pressure ulcers (PU: 0.24/1,000) were the most common HACs.

Meaningful use of EHRs was associated with a 24% reduction (Adjusted Odds Ratio (AOR): 0.81, p=0.05) in the probability of developing IVCs in a hospital, a 21% increase (AOR: 1.27, p=0.01) in the probability of developing IUCs in a hospital, and a 17% increase (AOR: 1.21, p=0.05) in the probability of poor glycemic control. No significant associations were found between meaningful use of EHRs and other HACs or the composite score for developing HACs in hospitals.

**Conclusions:** Our study has identified varied associations of EHR use with the incidence of HACs. Several factors may explain these findings, such as the challenges during transition from a paper-based to an electronic system, the use of administrative instead of clinical data for outcomes reporting, and the need for better-designed EHR systems.

**Implications for Policy, Delivery, or Practice:** Although meaningful use of EHR in hospitals has the potential to improve patient safety and efficiency of care, early evidence and findings of this study suggest mixed impacts. Longitudinal evaluation of EHR use and its implications for patient outcomes, quality of care, and expenditures is warranted.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #401

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**Research Objective:** The Federal government’s ‘Partnership for Patients’ initiative aims to reduce the incidence of preventable hospital-acquired conditions (HACs) by the end of 2013, thereby saving more than 60,000 lives, decreasing medical injuries by approximately 1.8 million, and conserving billions of dollars. Prevention of HACs requires a multi-pronged approach, one component of which can be the use of Electronic Health Records (EHRs). The Health Information Technology for Economic and Clinical Health (HITECH) Act of 2009 has disbursed incentives for the ‘meaningful use’ of EHRs by hospitals, thereby providing a roadmap for realizing the potential of EHRs to prevent medical errors. The objective of our study is to examine the association between meeting the ‘meaningful use’ criteria for EHRs (indicated by receipt of HITECH incentives) and incidence of HACs in acute-care hospitals (ACHs) in the US.

**Study Design:** The unit of analysis was an ACH. We downloaded the incidence data of 2011 for 8 HACs from the Hospital Compare website. We created a dichotomous variable for each HAC indicating its presence or absence in the hospital. We also created continuous (sum of the 8 HAC scores) and dichotomous (1/0: presence or absence of any HAC) composite scores for each hospital. We linked this outcome data to the CMS HITECH incentive payment data and other CMS files. We constructed separate linear and logistic regression models for each HAC, and for each composite score. The dependent variable for linear models was rate per 1,000 discharges and for logistic models was presence or absence of a HAC. The key independent variable was receipt of HITECH incentives (yes/no). In all analyses, we controlled for case mix index, average daily census, rural/urban location, geographic region, ownership status, and presence of emergency services.

**Population Studied:** 3,398 ACHs in the US that publicly reported on HACs in 2011. Of these, 28% received HITECH incentives till June-2012.

**Presenter:** Caroline Thirukumaran, MBBS, MHA, Doctoral Candidate, Public Health Sciences, University of Rochester, caroline_thirukumaran@urmc.rochester.edu

**Do Health Record Text Data Reflect Pain Severity among Individuals with Malignant Oral Lesions?**

Janet Van Cleave, New York University; Yindalon Aphinyanaphongs, New York University; Sarah Brosch, New York University; Brian L. Schmidt, New York University

**Research Objective:** Pain affects up to 100 million persons in the United States and costs approximately $600 billion annually. Although quantitative data from health records have the potential to answer important pain research questions, the validity and reliability of text data remains unclear. We conducted a study to analyze whether text data reflect the pain experienced by individuals with malignant oral lesions. The hypotheses guiding this study were that pain from malignant oral lesions is more severe than pain due to non-malignant oral lesions, and text data as recorded by providers in health records will reflect this difference. The
Specific aims were: 1) Quantify pain severity among individuals with malignant or non-malignant oral lesions, and 2) Determine incidence and frequency of words describing individuals’ pain related to malignant or non-malignant oral lesions.

**Study Design:** Aim 1: To quantify pain severity, we conducted a retrospective study of extant data from 46 individuals enrolled in a cross-sectional study entitled The Role of Proteases and Peptides in Cancer Pain (NIDCR, R01DE019796, Brian L. Schmidt PI). Severity of pain was assessed using the University of California San Francisco Oral Cancer Pain Questionnaire (scores range from 0 to 800 with higher scores representing more severe pain). Multiple linear regression analysis was used to analyze the difference of pain severity between those with malignant or non-malignant oral lesions while controlling for gender, race, and age.

Aim 2: To determine incidence and frequency of words describing patients’ pain, we conducted a retrospective review of medical records from a convenience sample of 46 individuals with oral lesions undergoing biopsy for pathological evaluation for malignancy. Words that providers recorded to describe patients’ pain were abstracted from the record. Descriptive statistics were used to analyze incidence and frequency of words.

**Population Studied:** Individuals with oral lesions undergoing biopsy for pathological evaluation at an academic center in the northeastern United States.

**Principal Findings:**

Aim 1: For the quantitative study of pain severity, 43% of study participants (20 of 46) were diagnosed with oral cancer. Malignant lesions and female gender were associated with higher levels of pain (P=0.001). Older study participants reported less pain than younger participants (p=0.034). Race was not associated with pain severity.

Aim 2: For the analysis of words, 17% of patients (8 of 46) were diagnosed with oral cancer. Providers recorded the word “pain” most frequently, accounting for 8% of words (13 of 153) for individuals with malignant oral lesions and 9% of words (38 of 431) for non-malignant oral lesions. Pain severity was not recorded in any of the medical records reviewed for this analysis.

**Conclusions:** Although use of a valid pain measure shows individuals with malignant oral lesions experience more severe pain than those with non-malignant oral lesions, text data from medical records did not reflect these findings.

**Implications for Policy, Delivery, or Practice:**

Pain constitutes a major public health challenge. New and greater resources are needed to ensure validity and reliability of text data in health records to improve pain assessment and management strategies.

**Funding Source(s):** NIH

**Poster Session and Number:** A, #402

**Health Information Exchange Usage and Repeat Medical Imaging**

Joshua Vest, Weill Cornell Medical College; Rainu Kaushal, Center for Health Informatics & Policy, Weill Cornell Medical College; Michael D Silver, Center for Health Informatics & Policy, Weill Cornell Medical College; Lisa M Kern, Center for Health Informatics & Policy, Weill Cornell Medical College

**Presenter:** Joshua Vest, Ph.D., M.P.H., Assistant Professor, Public Health, Weill Cornell Medical College, jov2025@med.cornell.edu

**Research Objective:** Medical imaging studies may be repeated when providers do not have access to prior patient information. Health information exchange (HIE) system enable access to patient information from multiple providers. We sought to determine the effect of HIE on repeat imaging.

**Study Design:** We constructed a longitudinal cohort of patients and their imaging procedures of patients using claims files. We defined repeat imaging as a claim for an imaging modality at a body region for which the patient already had a claim in the previous 90 days. We determined if providers accessed patients’ data in the HIE system following the first imaging procedure. The HIE system enables physician and users to access patients’ laboratory results, radiology reports and images, medications, and discharge summaries through a web-based portal. We measured the association between HIE system access and repeat imaging using GEE.

**Population Studied:** The cohort included adult patients from the Rochester, NY region who had consented to have their information accessible in the area’s Regional Health Information Organization during calendar years 2009 and 2010. Furthermore, patients had to be continuously enrolled in one of two participating health plans. These two plans cover over 60% of the area population.
**Principal Findings:** The sample included 60,814 unique imaging procedures. Just more than 7% of images were repeated. Repeat rates varied by modality. If the HIE system was accessed within 90 days following an initial imaging procedure, the imaging was less likely to be repeated.

**Conclusions:** Use of the HIE system that increases provider access to previous information was associated with a reduction in the frequency of repeat imaging.

**Implications for Policy, Delivery, or Practice:** This study provides evidence that HIE interventions are an effective tool for reducing imaging utilization. This is an important advancement as the number of studies supporting HIE’s ability to change patient healthcare utilization are few. Furthermore, this study provides one of the few estimates of the rate of repeat imaging for multiple modalities in a multi-payer, multi-provider community. Our findings illustrate that mature exchange organizations, which ensure comprehensive information exchange among a broad set of community providers and organizations, is an avenue to transforming healthcare utilization.

**Funding Source(s):** Other, New York State Department of Health

**Poster Session and Number:** A, #403

**The Association Between Community-Wide Longitudinal Patient Record Systems and Admissions Via the ED**

Joshua Vest, Weill Cornell Medical College; Lisa M Kern, Center for Health Informatics & Policy, Weill Cornell Medical College; Thomas R Campion, JR, Center for Health Informatics & Policy, Weill Cornell Medical College; Michael D Silver, Center for Health Informatics & Policy, Weill Cornell Medical College; Rainu Kaushal, Center for Health Informatics & Policy, Weill Cornell Medical College

**Presenter:** Joshua Vest, Ph.D., M.P.H., Assistant Professor, Public Health, Weill Cornell Medical College, jov2025@med.cornell.edu

**Research Objective:** Relevant clinical information is frequently missing in emergency department (ED) visits. Improved provider access to previously inaccessible patient information may improve the quality of care and reduce hospital admissions. We sought to measure the association between usage of a community-wide longitudinal patient record system and admissions via the ED.

**Study Design:** We created a retrospective longitudinal cohort of patients with an ED visit during a six month time period during 2009-2010. Data were based on claims files. The outcome of interest was a hospital admission via the ED. The primary independent variable was usage of a community-wide longitudinal patient record system during the ED visit. The Rochester Regional Health Information Organization’s (RHIO) community-wide longitudinal patient record system enables the exchange of patient information among healthcare organizations. Physicians and users access patients’ laboratory results, radiology reports and images, medications, and discharge summaries through a web-based portal.

**Population Studied:** The cohort included adult patients from the Rochester, NY region who had consented to have their information accessible in the area’s RHIO during calendar years 2009 and 2010. We examined all patients seen at 7 EDs served by the RHIO. Furthermore, patients had to be continuously enrolled in one of two participating health plans. These two plans cover over 60% of the area population.

**Principal Findings:** The system was accessed during 2.4% of ED visits. The odds of an inpatient admission via the ED was lower when the system was accessed after controlling for confounding factors. Extrapolated to the entire community, the annual savings from system usage would be in the multiple millions of dollars.

**Conclusions:** These findings suggest that the use of a community-wide longitudinal patient record system can reduce hospitalizations from the ED with resultant cost savings.

**Implications for Policy, Delivery, or Practice:** As a community-based RHIO, this study setting addresses the call for more evaluations of systems created in settings without support from academic institutions that are leaders in health informatics and helps demonstrate the effectiveness of such information systems in broader settings.

**Funding Source(s):** Other, New York State Department of Health

**Poster Session and Number:** A, #404

**Barriers and Facilitators to Participation in the Louisiana Health Information Exchange**

Daniel Walker, Tulane University; Valerie A. Yaeger, DrPH, Tulane University; Arthur M. Mora, MHA, Tulane University; Evan S. Cole, MPH, Tulane University; Mark L. Diana, PhD, Tulane University

**Research Objective:** Relevance clinical information is frequently missing in emergency department (ED) visits. Improved provider access to previously inaccessible patient information may improve the quality of care and reduce hospital admissions. We sought to measure the association between usage of a community-wide longitudinal patient record system and admissions via the ED.
Presenters: Daniel Walker, MPH, Graduate Student, Global Health Systems and Development, Tulane University, dwalke4@tulane.edu

Research Objective: This study examines the factors that are facilitating and delaying the adoption and use of the Louisiana Health Information Exchange (LaHIE). Louisiana is a predominantly rural state, and rural hospitals lag behind urban hospitals in Electronic Health Record (EHR) adoption. This existing disparity hinders the sharing of electronic health data and presents a challenge as states try to establish HIEs. Thus, this study provides valuable and unique insight that may inform HIE strategies in other states.

Study Design: We conducted semi-structured qualitative interviews with health care representatives throughout the state. Interview transcripts are being analyzed by coding emerging themes about the facilitators and barriers to participation in LaHIE.

Population Studied: The Louisiana Health Care Quality Forum provided a list of potential interviewees that represented hospital systems and physician practices. Interviewees were identified to represent one of three categories including 1) health care organizations that have adopted LaHIE, 2) those that have not yet adopted LaHIE but are considering it, and 3) those that have shown interest in learning about LaHIE but have chosen not to participate.

Principal Findings: Preliminary analyses suggest that Meaningful Use Stage 2 requirements may be a critical factor influencing the decision to participate in LaHIE. For example, the Meaningful Use Stage 2 requirement that will require that hospitals are able to transfer summary of care documents electronically to other providers was identified as one motivating factor for participation. Findings also indicate that involving stakeholders in the creation of the state HIE facilitated interest from the health care community and influenced participation in LaHIE. For example, stakeholder involvement created buy-in within a few large hospital networks, thereby legitimizing LaHIE and hastening interest in that market. Alternatively, preliminary findings indicate that the fees charged by EHR vendors to develop the interface to connect to LaHIE have been prohibitive. Additionally, the time delays associated with EHR vendor interface development are delaying the use of the HIE. Final analyses will be completed by March 2013.

Conclusions: This study indicates that the costs and time delays associated with reworking an existing EHR to be able to interface with HIEs may be important barriers to the use of HIEs. Additionally, state HIEs may benefit from targeted involvement of state health care leaders who can champion the potential value of the HIE.

Implications for Policy, Delivery, or Practice: Funding from the Medicare incentive program is intended to offset the costs associated with EHR implementation and increase the likelihood that HIEs can provide value to the population. However, costs and time delays associated with developing the EHR interface to connect and share information with HIEs may be key barriers to fully integrated HIEs. Additionally, these issues may further compound the potential financial barriers for rural hospitals. These findings highlight an issue that may be of interest to policy makers and national health care leaders committed to developing functional state and national HIEs. Working with Electronic Health Record vendors to reduce the fees assessed for developing state HIE interfaces may reduce some of the prohibitive costs associated with participating in HIEs.

Funding Source(s): Other, Louisiana Health Care Quality Forum

Poster Session and Number: A, #405

Systematic Review of the Quality of Evidence for CPOE

Charlene Weir, VA SLC; Nancy Staggers, University of Maryland

Presenter: Charlene Weir, Ph.D., Associate Director, GRECC and IDEAS Center, VA SLC, charlene.weir@hsc.utah.edu

Research Objective: Computerized Provider Order Entry (CPOE) is one of the more important components of a complete Electronic Medical Record. It is has been touted as key to leveraging technology to improve the quality of care. Yet, adoption has been abysmally slow and the return on benefits lag significantly behind expectations as noted in a new RAND report. The purpose of this paper is to present two systematic reviews of the CPOE literature focusing on the quality of the empirical evidence. The first is an evaluation of the quality of primary studies claiming to evaluate a CPOE study and the second evaluates the quality of reviews on
CPOE. Both use systematic protocols for conducting reviews

**Study Design:** Cochrane Collaboration (http://www.cochrane.org) protocols for systematic reviews were used to 2 previously conducted systematic reviews. Standardized tools for evaluating quality were used for both reviews

**Population Studied:** The search criteria focused on empirical studies comparing CPOE to non-CPOE only. Studies were excluded if they were not published in English, involved a simulation, or did not measure any outcomes. Also excluded were studies that compared CPOE to CPOE plus decision support. Inclusion relevance criteria included: 1) a direct comparison of a CPOE system with a non-CPOE system; 2) implementation in a clinical setting; and 3) clinically relevant outcomes. A search of the literature from 1976 through mid-year 2011 was conducted using PubMed, CINAHL, Cochrane, PsychInfo, DARE, INSPEC, CENTRAL and HTA databases yielding a final set of 62 articles for primary studies on CPOE. Systematic relevance ratings by independent raters was conducted and those identified after calibration was used to select articles. Quality of the empirical research was assessed using an instrument designed for the informatics literature, the QUAlity ASsessment Instrument or QUASII, was developed using the ‘threats to validity” taxonomy identified by Shadish, Cook and Campbell and other well-known tools for assessing research quality. Quality ratings were made by two independent raters with a final Kappa of 0.85 to 0.94 across items

**Principal Findings:** The overall rating of quality was poor to moderate. Only 12 of the studies used a design with adequate controls (19%). Instrumentation bias was evident in 25% of the studies, implementation was fully described in less than 50% and 40% used improper statistical tests. There was very low agreement regarding the components used in CPOE across studies

**Conclusions:** Empirical evaluation of studies using CPOE have focused on few relevant outcomes, have failed to properly characterize the large variation in implementation, use an intervention with widely diverse components and overall use poor design strategies.

**Implications for Policy, Delivery, or Practice:** Using this evidence to make policy decisions about the necessity of CPOE would require more scrutiny, especially in terms of evaluating the return on investment.

**Funding Source(s):** VA

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**Poster Session and Number:** A, #406

**Primary Care Physician Perspectives on the Usefulness of Chart Note Narratives for Continuity of Care and the Impact of Electronic Medical Records**


**Presenter:** Lisa Welch, Ph.D., Director, Center for Qualitative Research, New England Research Institutes, Inc., lwelch@neriscience.com

**Research Objective:** Medical documentation is viewed as essential to ensure the continuity and quality of health care. The purpose of this study was to determine primary care physician (PCP) perspectives on what they find useful in medical record documentation and to compare this to what they actually include in a typical chart note narrative. This study adds to the literature on medical documentation by focusing specifically on PCPs and examining differences by physician characteristics.

**Study Design:** A qualitative component was included as part of a randomized factorial experiment in which PCPs observed video vignettes of an established patient presenting with poorly controlled diabetes. After viewing the vignette, PCPs wrote a narrative about the vignette patient that was typical for their practice and participated in a semi-structured interview including questions about what they find useful/not useful in chart notes and what they typically exclude. The interviews were recorded digitally, transcribed verbatim, coded, and analyzed for major themes and patterns. Narratives were coded for major categories of what respondents included and excluded. Findings were compared by physician gender and years of clinical experience.

**Population Studied:** 128 PCPs evenly balanced by gender and more/less clinical experience (<=10 or >= 21 years)

**Principal Findings:** Respondents identified two characteristics of chart notes as most useful: the assessment/plan (77%) and the ability to find information easily (65%). The assessment section was key because it assisted with continuity of care, and PCPs verbalized the importance of documenting the clinical reasoning within this section. Understanding the rationale for the assessment/plan acted as a “communication device” by assisting PCPs to
understand the direction of care and decision-making. When completing a narrative about the vignette patient that was typical for their practice, 91% of the sample included an assessment/plan; however, only 67% of the sample incorporated their clinical reasoning. Physician interviews suggest that use of electronic medical records (EMR) may partially explain this discrepancy. Without being asked about EMR usage in medical documentation, over a third of the sample (36%) verbalized concerns about EMR. Among those voicing concerns, three unintended consequences of EMRs emerged: potential exclusion of clinical reasoning within the assessment/plan because of being “locked” into template usage (33%); difficulty in finding information because of the quantity of information to sift through (28%); and a lack of trust in EMR information due to repeated copying and pasting into the templates and outdated information (20%). A greater number of PCPs with more years of experience verbalized these unintended consequences compared to those with fewer years of experience (61% vs. 39%).

Conclusions: From physicians’ perspectives, a comprehensive assessment/plan that includes clinical reasoning within the narrative is important for facilitating continuity of care. EMR systems may interfere with documenting clinical reasoning, make information difficult to find, and reduce physician trust in what they do find.

Implications for Policy, Delivery, or Practice: To achieve the promise of EMR for enhancing continuous, efficient health care delivery, strategies are needed to facilitate the inclusion of clinical reasoning within EMR systems, validation of data input, and organization of data so that information physicians need is readily accessible.

Funding Source(s): NIH

Poster Session and Number: A, #407

Implant Documentation and Identification Practices in Orthopedic Surgery: Implications for Use of Unique Device Identification
Natalia Wilson, Arizona State University; Megan Jehn, Ph.D. MHS, Arizona State University; Sally York, M.N, R.N., University of Washington; Charles Davis III, M.D., Penn State Hershey Medical Center

Presenter: Natalia Wilson, M.D., M.P.H., Co-director Health Sector Supply Chain Research Consortium, Arizona State University, natalia.wilson@asu.edu

Research Objective: The Food and Drug Administration’s (FDA) Unique Device Identification (UDI) System has important implications for patient care, clinical efficiency and post-market surveillance. In light of this new health policy issue and attention focused on UDI integration into health IT and use for device documentation and identification in patient care settings, this project was performed to better understand current process for identification of implantable devices. We designed a survey to examine current methods used to identify failed implant components in revision total hip and knee arthroplasty (THA/TKA), surgeon time to identify components, perceived patient and cost impact when components could not be identified and surgeon’s view of the best standard for documentation.

Study Design: Literature review and expert input by the American Association of Hip and Knee Surgeons (AAHKS) Research Committee informed survey content. A mixed mode (email/direct mail/fax) survey questionnaire was administered to a national sample of orthopedic surgeons.

Population Studied: The 1364 active members of AAHKS were surveyed in May 2012.

Principal Findings: 605 surveys were returned for a response rate of 44% and a margin of error of +/- 3%. 87% of respondents reported regularly using at least 3 methods to identify components of a failed implant prior to revision surgery. Incomplete device documentation was identified as a barrier in identifying components of the failed implant at least some of the time by 88% of respondents. The median time required to identify components per case was 20 minutes (IQR: 15 to 30) of surgeon time and 30 minutes (IQR: 20 to 60) of staff time. 10% of failed implants could not be identified pre-operatively and 2% could not be identified intra-operatively, with reported clinical and cost impact. Respondents indicated UDI in total joint replacement (TJR) registry as the standard practice that would best support identification of failed implants, save time and identify patients with recalled implants.

Conclusions: Survey results highlight the inadequacy of the current process to comprehensively obtain device identification for failed implants in revision THA/TKA. Survey results also highlight surgeon and staff inefficiency as well as perceived clinical and cost
impact on patients. Automated capture of UDI during surgery and documentation in the electronic health record (EHR) would establish a standard format and place for device information and would support UDI in TJR registry as standard practice. The FDA’s UDI rule presents an opportunity for use of UDI in patient care settings, across many specialties, as standard practice for documentation of implantable devices.

**Implications for Policy, Delivery, or Practice:** The FDA’s UDI Proposed Rule, expected to be final by May 2013, mandates manufacturers assign UDI to their marketed devices. The rule does not mandate others in health care to use UDI. Integration of UDI into health IT and use in the patient care setting will require education of multiple stakeholders along with regulation or meaningful incentives at the policy level. There is opportunity and need for further research on use of UDI in the patient care setting as well as for post-market surveillance.

**Funding Source(s):** Other, Faculty support grant

**Poster Session and Number:** A, #408

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**Independent Practice Association Membership Eases Pathway to Meaningful Use for Small Practice Providers in New York City**

Chloe Winther, New York City Department of Health and Mental Hygiene; Mandy Smith Ryan, New York City Department of Health and Mental Hygiene; Jason Wang, New York City Department of Health and Mental Hygiene

**Presenter:** Chloe Winther, B.A., Senior Project Coordinator, Primary Care Information Project, New York City Department of Health and Mental Hygiene, cwinther@health.nyc.gov

**Research Objective:** Shared support organizations, such as Independent Practice Associations (IPAs), allow small practices to maintain their independence while providing a variety of resources, including assistance with HIT adoption and achieving Meaningful Use. This report evaluates the effect of IPA membership on attitudes of providers engaged in implementing an electronic health record (EHR) and moving towards meeting Meaningful Use standards.

**Study Design:** A web-based survey was administered to small practice providers who had been using a fully functional EHR and participating in a citywide EHR implementation and technical assistance project for at least 6 months. Survey administration spanned from November 2010 to October 2011 in two staggered stages: 400 providers (65%) responded. The survey asked about providers’ experiences with implementing and using the EHR, as well as questions about their affiliations with shared support organizations including IPAs.

**Population Studied:** 400 New York City small practice primary care providers serving medically underserved communities of whom 36% (n=143) reported being members of an IPA.

**Principal Findings:** IPA members were more likely to be full or part owners of their practice (70% v. 82%; p = .0001), and generally had fewer providers (mean of 4.0 for members v. 5.4 for members, p = .04) but more patient encounters per year (mean of 13,468 v. 9,602 p = .021). There were no significant differences in terms of time ‘live’ on an EHR or provider type. We found consistent evidence that IPA members were better prepared to implement and use their EHRs and felt more positively towards the experience. IPA members were more likely to report that the EHR implementation costs were less than or equal to their expectations (67% v. 54%, p = .03) and more likely to say they had a clear understanding of the implementation process (61% v. 50%, p = .056). Members reported less concern on two out of ten issues providers face during implementation, with 37% of members and 48% of non-members reporting concern over the time constraints of implementing the EHR (p = .05) and 40% v. 49% reporting concern over loss of productivity during the transition to EHR (p = .09). Additionally, IPA members were more likely to report planning on pursuing meaningful use incentives (93% v. 81%, p = .02) and slightly better understanding of what they had to do to meet meaningful use standards in 2011 (57% v. 46%, p = .07).

**Conclusions:** Results show that IPA membership may ease the transition to an EHR for small practice providers in New York City, and that the comfort and positivity felt by these providers may lead to a higher level of confidence in their ability to achieve meaningful use of an EHR.

**Implications for Policy, Delivery, or Practice:** These findings suggest that IPA members have an easier experience adopting and using EHRs. Independent Practice Associations and other shared support networks can be a lifeline for small practices. As some IPAs transition to...
Accountable Care Organizations, these organizations could become even more important to the survival and financial competitiveness of small practices. Further research is needed to better understand and categorize these organizations and the effect they have on their membership.

**Funding Source(s):** AHRQ

**Poster Session and Number:** A, #409

### The Role of Health Information Technology in the Formation of Accountable Care Organizations

Frances Wu, University of California, Berkeley; Stephen M. Shortell, PhD, MBA, MPH, University of California, Berkeley; Kathleen L. Carluzzo, BS, The Dartmouth Institute; Valerie A. Lewis, PhD, The Dartmouth Institute; Elliott S. Fisher, MD, MPH, The Dartmouth Institute

**Presenter:** Frances Wu, MS, Student, University of California, Berkeley, frances.wu@gmail.com

**Research Objective:** To assess the role of health information technology (HIT) in advancing the implementation of Accountable Care Organizations (ACOs).

**Study Design:** Retrospective cross-sectional analysis of the National Study of Accountable Care Organizations (NSACO), an online survey of ACOs in the United States, and semi-structured interviews. The NSACO is the first of its kind and was administered from September 2012 to February/March 2013 to 227 organizations with ACO contracts in place or under active negotiation with both public and private payers. In addition, semi-structured interviews were conducted with 10 organizations in January 2013 to complement quantitative findings.

**Population Studied:** Preliminary analysis is based on completed survey responses from 79 ACOs. Complete analysis of all respondents and complete findings will be available by the Annual Research Meeting in June.

**Principal Findings:** A measure of ACO implementation was created from seven survey questions related to the following care management capabilities: chronic disease programs, care transition programs, and patient engagement activities (Cronbach’s alpha=0.83). An HIT index comprising seven functions (range=20-63, mean=40.0) included the extent of the primary ACO organization’s inpatient and outpatient data integration, patient risk assessment and stratification capability, electronic referral information exchange, provision of patient information, and use of patient registries, problem lists, and patient reminders. Multivariate regression showed that HIT was associated with a small but significant increase in ACO implementation (0.33, p<0.001), controlling for factors related to the ACO organization, contract arrangement, and local market. Analysis of HIT functionality grouped by the level of coordination provided – in increasing order, data 1) capture, 2) provision, and 3) exchange – showed an increasingly positive association with the degree of ACO implementation (-1.13, 0.37, 0.95; p=0.02, 0.02, 0.01 respectively).

**Conclusions:** The findings suggest that HIT is significantly and positively associated with the development of ACOs. HIT appears to play an important coordination role given the given the different types of coordination needed in delivering various aspects of patient care.

**Implications for Policy, Delivery, or Practice:** The ACO model is intended to be flexible, such that it is achievable by various organizational forms. However, organizations currently possessing a small degree of HIT infrastructure and capability may find it difficult to provide advanced clinical and operational integration. Additional support may be needed to advance the HIT capability of such organizations interested in becoming ACOs.

**Funding Source(s):** CWF

**Poster Session and Number:** A, #410

### Using an EHR for Health Policy Research: The Effect of an Urban Park on Pediatric Obesity Rates

Nir Menachemi, University of Alabama at Birmingham; Valerie Yeager, Tulane School of Public Health and Tropical Medicine; Bisakha P. Sen, University of Alabama at Birmingham; Alva Ferdinand, University of Alabama at Birmingham; Devon M. Taylor, Jefferson County Department of Health; Bryn Manzella, Jefferson County Department of Health

**Presenter:** Valerie Yeager, Dr.P.H., Assistant Professor, Global Health Systems and Development, Tulane School of Public Health and Tropical Medicine, vayeager@tulane.edu

**Research Objective:** We use EHR data from a local health department’s 6 clinics serving a predominately low-income population, to
examine the impact of a new inner-city park on child obesity rates.

**Study Design:** Using a quasi-experimental design we examine whether living in proximity to a newly established park is associated with a reduction in BMI percentile over time. Children living relatively far from the park (=3 miles) serve as a control group. Living nearby was measured as within 0.5 miles in main analyses, and within 1 mile or 1.5 miles in sensitivity analyses.

**Population Studied:** Children ages 19 and under, receiving care in any of the six clinics, whom did not have a change of home address during the study period were included (n=5,424). The study period included one year before and after the establishment of the park (2009 to 2011).

**Principal Findings:** Bivariate analyses compared the average BMI percentile before and after the park for children at each of the distances from the park (0.5 miles, 1 mile, 1.5 miles, and 3 miles or more). Whereas the children that lived closest to the park did not experience an increase in BMI percentile, those that lived =3 miles from the park had a significant increase in BMI percentile (66.8 pre-park compared to 69.7 post-park, p<0.001).

Although the change in BMI percentile in the groups within 0.5, 1, and 1.5 miles was not significantly different between the pre and post-park periods, the average change experienced by children within 1.5 miles was much larger (+5.38) than the changes within 1 mile (+0.9) and 0.5 miles (+0.5) of the park. In adjusted models, the change in BMI percentile across the pre-park and post-park periods was not statistically different for children living nearby (regardless of distance) compared to those living far from the park. However, the sign of the regression coefficients suggested lower BMI percentile growth for those living nearest to the park.

**Conclusions:** While exposure to the park seems to slow the increase in BMI percentile among children living near the park, the effect is statistically insignificant. It is worth noting that the exposure to the park yielded a negative coefficient estimate for those living within 1 mile of the park, though not for those living 1-1.5 miles from the park. This suggests that, if there are benefits of reduced BMI from exposure to parks, they are likely to be confined to those living within 1 mile from the park. Further research should continue to examine how close is close enough to experience weight loss and/or health benefits from green spaces.

**Implications for Policy, Delivery, or Practice:** While this study informs on the relationship between access to physical activity-promoting green spaces and child BMI percentiles, the sample sizes of the near groups were relatively small. Having more children in the near groups would have been ideal, but being able to examine BMI longitudinally, even in a small group of children, provides valuable information for other obesity researchers and policymakers working to address the US obesity epidemic.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #411
IMPROVING QUALITY AND VALUE

The Importance of Organizational Climate in the Performance Improvement Process: Evidence from a Large Health System
Palmer Morrel-Samuels, University of Michigan School of Public Health; Jane Banaszak-Holl, University of Michigan; Ed Karls, University of Michigan Health System; Barry De Cicco, University of Michigan Health System

Presenter: Jane Banaszak-Holl, Ph.D.,M.A., Associate Professor, Department of Health Management and Policy, University of Michigan, janebh@umich.edu

Research Objective: This paper describes how employee engagement, a critical element of organizational climate, is measured and used in unit quality improvement processes for a large health system and provides evidence that employee engagement measures predict a balanced scorecard of unit level performance measures. The purpose of the project is to develop meaningful comparison measures across units that contribute to improving performance but also are important in centralized management.

Study Design: Measures of employee engagement and other organizational climate variables were collected using corporate-wide confidential and anonymous employee surveys that were conducted in 2009 and 2010. The employee surveys had high response rates of 65.9% in 2009 (11,661 of 17,695 employees responded) and 66% in 2010 (11,557 of 17,511 employees responded). These data were then linked to administrative databases on unit performance using a unique matching process linking employees to units identified by their direct reporting supervisor and allowing an employee FTE to be split across units for employees who reported to more than one supervisor. The matching process addresses a critical issue of who is responsible for an employee within large complex health systems. Hierarchical regression methods were used to model the direct relationship between employee engagement and measures of unit performance while controlling for several structural differences (including size and staffing FTEs) across units. As a quality improvement project, this study is exempt from but has been reviewed by the University's Institutional Review Board.

Population Studied: Data come from a single university-affiliated nonprofit network (called University Health System or UHS here) of hospitals and multispecialty health clinics located in 14 Midwestern cities and including approximately 120 outpatient specialty clinics and six major specialty hospitals serving 925 beds. UHS is a relatively large healthcare provider, serving approximately 1.9 million outpatients and 44,000 inpatients per year. Our focus is on the 17,000 employees of UHS, who are organized into 416 work units such that the median headcount across work units is 54 employees (with a range of 4 to 340 employees per unit).

Principal Findings: Employee engagement was found to significantly vary across the 416 units within the health system. And, initially, an action-based intervention was used to improve employee engagement across UHS units. Subsequently, employee engagement was found to systematically improve performance across four areas of a balanced scorecard, including 1. Unit financial operating margin, 2. Patient satisfaction scores (as estimated separately for inpatients and outpatients), 3. Employee retention, and 4. Hospital-acquired infection rates (for inpatients only).

Conclusions: This case study illustrates how employee engagement, a key element of organizational culture, can be changed and that variance in employee engagement is linked to unit performance within a single health system. This study shows how departments can be engaged in improving cultural factors and ultimately, improving performance in ways that will achieve better organizational outcomes.

Implications for Policy, Delivery, or Practice: Management can use quality improvement processes to identify cultural practices within units that improve employee engagement and ultimately lead to better health system performance.

Funding Source(s): No Funding

Poster Session and Number: C, #1068

Testing Strategies to Improve Pain Care Quality in U.S. Hospitals
Susan Beck, University of Utah; Nancy Dunton, National Database of Nursing Quality Indicators; Jeannine Brant, Billings Clinic; Patricia Berry, University of Utah College of Nursing; Bob Wong, University of Utah College of Nursing; Catima Potter, National Database of Nursing Quality Indicators; Jia-Wen Guo, University of Utah College of Nursing
**Research Objective:** To compare three multifaceted implementation strategies to improve pain care quality and outcomes: a) audit and feedback plus usual quality improvement; b) a plus access to a Pain Care Quality Toolkit, and c) a and b plus access to a community of practice to share improvement strategies.

**Study Design:** Patient care units (n=148 nested within hospitals) were randomly assigned to receive one of the three levels of intervention intensity. Each participating unit was asked to form a small Pain Improvement Team and identify a unit-based leader. Trained RNs collected patients’ opinions on pain management via a structured interview using 9 pain quality indicators at baseline and 8 months later. A Pain Care Quality Toolkit guided the quality improvement approach and included websites, interactive presentations, spreadsheets, and examples. The toolkit offered resources such as clinical practice guidelines, huddle sheets, lectures and patient education materials.

**Population Studied:** Units were recruited from a sample of 1611 units (326 hospitals) participating in the National Database of Nursing Quality Indicators Pain Care Quality Indicator Study Time 1 data collection in April 2011. Eligible and consenting units (n = 148) were medical and/or surgical, rehabilitation, or obstetrical (postpartum) that had more than 5 patients assessed at baseline and were in the lower third on unit average pain score and the lower half on one of three quality indicators. On a designated day during a two week window all patients on the unit for 24 hours were screened for eligibility: 19 years and older, speak and understand English, experiencing pain. Consenting patients completed the survey.

**Principal Findings:** The Time 2 data collection for all hospitals included 1191 units and 8835 patients. Multi-level linear modeling indicated that all three intervention groups improved their average pain intensity scores by nearly 1 point (Mean Change = .96) on a 0 to 10 scale (p<.001). The post-test mean pain intensity scores however were still quite high (range 6.03 to 6.46 on a 0 to 10 scale). One of six pain quality indicators, “Pain medications worked well to control my pain,” also significantly improved. There was no significant difference among the three levels of intervention (p>.05). Levels of improvement were greater than the degree of change (Mean Change = .02) that occurred in the units with comparable data (n = 945) that did not participate in the improvement project.

**Conclusions:** Participating in a systematic improvement effort-regardless of the support provided was associated with improvement. There may have been a Hawthorne effect. Because the participating units were selected based on their baseline performance, these findings may also represent regression to the mean.

**Implications for Policy, Delivery, or Practice:** Making a commitment to engage in a systematic improvement effort is critical to improving pain outcomes. Although the online toolkit and community of practice were well-received and utilized, they did not improve the impact of the improvement efforts. A longer time period may be needed to reduce pain levels to targeted benchmarks. Recent policy initiatives to limit access to analgesics are concerning when there is such a high level of unrelieved pain in hospitals.

**Funding Source(s):** RWJF

**Poster Session and Number:** C, #1069

**Identifying Adverse Events after Discharge from a Community Hospital**

Dennis Tsilimingras, Florida State University College of Medicine; Jessica Bishop-Royse, Florida State University College of Medicine; John Agens, Florida State University College of Medicine; Stephen Quintero, Florida State University College of Medicine; Ashley Duke, Tallahassee Memorial Hospital; Leslee Hancock, Tallahassee Memorial Hospital; David Bates, Brigham and Women's Hospital and Harvard Medical School; Les Beitsch, Florida State University College of Medicine; Jeffrey Schnipper, Brigham and Women's Hospital and Harvard Medical School

**Presenter:** Jessica Bishop-Royse, Ph.D., M.S., Post-doctoral Researcher, Health Affairs, Florida State University College of Medicine, jessica.bishop-royse@med.fsu.edu

**Research Objective:** 1) Determine the incidence of adverse events, preventable adverse events, and ameliorable adverse events, and the timeliness of post-discharge ambulatory appointments, affecting urban and rural patients approximately 3-4 weeks after discharge from a hospitalist-run medical service of a large community hospital to home.
2) Identify and classify the types of post-discharge adverse events (e.g., adverse drug events, procedure-related events, hospital acquired (nosocomial) infections, falls, and other) affecting urban and rural patients approximately 3-4 weeks after discharge from a hospitalist-run medical service of a large community hospital to home.

3) Examine the relationships between the population at risk, characteristics of the health care delivery system, and the utilization of post-discharge health services, and how these relationships help us understand the incidence of postdischarge adverse events.

**Study Design:** This 24-month prospective cohort study examines adverse events (AEs) experienced by patients 3-4 weeks after discharge from a community hospital. Adverse events resulting from medications, procedures, diagnostic errors, therapeutic errors, nosocomial infections, and falls are defined as injuries occurring as a result of medical management. Patients were recruited prospectively prior to discharge from the hospitalist service of a community hospital. Postdischarge adverse events were determined by performing an independent implicit health record review (both inpatient and outpatient) and a structured telephone interview 3-4 weeks after discharge from the hospital. We provide frequencies and an odds ratio with 95% confidence intervals (CI) to estimate the likelihood of rural patients experiencing a postdischarge adverse event when compared to urban patients.

**Population Studied:** The population includes 608 patients discharged from the hospitalist service of a community hospital, 308 with home addresses in rural areas and 300 with home addresses in urban areas.

**Principal Findings:** Health record reviews and telephone interviews were completed for 396 patients. One hundred ninety-four (48.9%) were rural patients and 202 (51.1%) were urban patients. Sixty-three (15.9%) of 396 patients experienced postdischarge adverse events. Of these 30 (47.6%) were rural patients and 33 (52.4%) were urban patients. The odds ratio was 0.97 (95% CI: 0.47-1.97) for rural patients experiencing a postdischarge adverse event when compared to urban patients.

**Conclusions:** Preliminary results do not indicate statistically significant differences for experiencing postdischarge adverse events when comparing rural with urban patients. We expect to have completed health record reviews and telephone interviews for 608 patients by June 2013.

**Implications for Policy, Delivery, or Practice:** Risk factors for post-discharge AEs may be different in rural and urban populations. A better understanding of these risk factors may enable health care systems to identify patients at risk and provide tailored interventions to both populations, thus improving patient safety during transitions in care.

**Funding Source(s):** AHRQ

**Poster Session and Number:** C, #1070

**A Comparison of Clinical Outcomes, Processes of Care, and Patient Experiences at Physician and Non-Physician Owned Hospitals**

Daniel Blumenthal, Massachusetts General Hospital; Ashish K. Jha, Harvard School of Public Health

**Presenter:** Daniel Blumenthal, M.D., M.B.A., Resident In Internal Medicine, Department of Internal Medicine, Massachusetts General Hospital, dblumenthal1@partners.org

**Research Objective:** Physician Owned Hospitals (POH) – which are partially or fully owned by doctors – have been criticized for cherry picking healthier patients, siphoning profits away from community hospitals, and increasing service utilization. In response to these charges, Congress added provisions to the Patient Protection and Affordable Care Act of 2010 (ACA) which dramatically constrain the growth of the POH industry. However, we know relatively little about national differences in clinical outcomes, patient satisfaction, case-mix, at physician and non-physician owned hospitals (non-POH). A more comprehensive understanding of the benefits and drawbacks of POHs will help inform future public policy debates about these and other physician-owned entities.

**Study Design:** We obtained a comprehensive list of existing medical and surgical POHs in the United States from Physician Hospitals of America (PHA), an advocacy group for POHs. We assigned each POH to one of 306 Hospital Referral Regions (HRR). Our control group consisted of surgical and medical non-POHs from HRRs containing at least one POH. Using the 2010 American Hospital Association survey, national Medicare data from 2010, and Hospital Compare data, we compared POHs and non-POHs in terms of their demographic
characteristics, processes of care measures, 30 day mortality rates for major illnesses for acute myocardial infarction (AMI), congestive heart failure (CHF), and pneumonia (PNA), readmission rates, and patient satisfaction.

**Population Studied:** 236 POHs and 1913 non-POH Acute Care Hospitals in the U.S. in 2010.

**Principal Findings:** POHs were more often small (< 100 beds), for-profit, and located in urban areas. A lower proportion of POH patients were on Medicaid (17.9% vs. 19.9%, P = 0.064), and/or Hispanic (1.6% vs. 2.7%, P = 0.045). Proportions of Medicare patients were similar at POHs vs. non-POHs (44.1% vs. 44.2%, P = 0.919). POHs performed worse on process measures for CHF (89.5% vs. 92.0%, P = 0.040) and PNA (91.4% vs. 93.2%, P = 0.024), and performed comparably to POHs on process measures for AMI (94.9% vs. 95.7%, P = 0.434). POHs and non-POHs had similar 30 day mortality rates for AMI (15.2% vs. 16.5%, P = 0.335), CHF (11.4% vs. 11.2%, P = 0.710), and PNA (11.4% vs. 12.0%, P = 0.301), and similar 30 day readmission rates for AMI (20.4% vs. 18.6%, P = 0.405), CHF (23.7% vs. 23.9%, P = 0.864), and PNA (17.9% vs. 17.6%, P = 0.628). Patient experience scores were higher at POHs (70.7% vs. 67.8%, P = 0.001).

**Conclusions:** Compared to non-POHs, POHs are generally smaller, for-profit, and located in non-rural areas. POHs serve smaller proportions of Medicaid and Hispanic. They perform slightly worse than non-POHs on processes of care for CHF and PNA, but have similar mortality and readmission rates, and higher patient satisfaction scores.

**Implications for Policy, Delivery, or Practice:** While POHs care for smaller numbers of disadvantaged and minority patients, they have higher rates of patient satisfaction than do non-Posh, and similar clinical outcomes. Comparisons costs of care and resource utilization at POHs and non-POHs are needed to identify associations between physician-ownership and cost effectiveness. Efforts to better understand how POHs consistently attain high patient experience scores may inform attempts to increase patient satisfaction.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #1071

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**A Nationwide System for Evaluation of Teaching Qualities of Clinician-Educators at Teaching Hospitals**

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**Research Objective:** High quality residency training is key to deliver safe and high quality patient care now and in the future. Assessing clinician educators’ teaching performance and providing them with concrete formative feedback to enhance their performance is, therefore, crucial. This paper reports on the development and nationwide implementation of the System for Evaluation of Teaching Qualities (SETQ) in the past five years throughout The Netherlands. The SETQ annually assesses clinicians’ teaching performance by means of two specialty-specific web-based instruments – one completed by residents and another self-administered by each clinician (phase 1). At the end of the one-month assessment period, we send individualized feedback reports containing a summary of the quantitative feedback accompanied by residents’ narrative comments to the clinicians (phase 2). Subsequently, each faculty gets an individualized follow-up and improvement strategy (phase 3). In this paper, we describe (the quality of) the different tools and phases of the SETQ system based on eight completed studies.

**Study Design:** The reliability and validity of specialty specific SETQ tools (phase 1) were examined in five specialty-specific studies using psychometric techniques including factor, internal consistency and generalizability analyses and inter-scale and scale-global correlations. In addition to the quantitative aspects, the content, quality and validity of residents’ narrative comments in the feedback reports (phase 2) were examined in two studies using mixed-methods. A last study using semi-structured interviews explored individual clinicians’ follow-up strategies (phase 3) after receiving their feedback report.

**Population Studied:** The studied population included 3000 clinician educators who self-evaluated and were evaluated by 2800 residents from 220 residency training programs in 45
academic or teaching hospitals throughout The Netherlands from 2008 to 2013.

**Principal Findings:** SETQ is the most widely used assessment system in residency training in Europe. Although participation is not mandatory, the overall response rates were 78% for residents and 81% percent for faculty. The validation studies revealed strong psychometric properties and underscore validity of the specialty-specific SETQ tools (phase 1). Furthermore, residents' narrative comments supplemented quantitative evaluations in the feedback report, providing added value (phase 2). The interviews identified several follow-up strategies and revealed that clinicians' awareness of their responsibilities towards and expectations of residents were enhanced through participation in SETQ (phase 3). Our preliminary cohort analysis strongly suggests that teaching performance has improved.

**Conclusions:** The SETQ is a good example of a feasible robust system with specialty-specific tools that provide reliable and valid data on clinicians' teaching performance. It can be used for large-scale assessments and for targeted feedback and improvement.

**Implications for Policy, Delivery, or Practice:** Since its inception in 2008, the SETQ has been increasingly used for internal and external quality management, making it an important facilitator and indicator for high quality residency training in The Netherlands. It is used for designing and stimulating individual improvement trajectories. Participation in SETQ should be facilitated for all clinicians to improve the quality of residency training which can enhance the quality of patient care delivered during and after residency training.

**Funding Source(s):** Other, Dutch Ministry of Health

**Poster Session and Number:** C, #1072

**The Teacher, the Physician and the Person: How Clinicians’ Teaching Performance Influences Their Role Modeling**

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**Presenter:** Benjamin Boerebach, M.A.Sc., Ph.d.-student, Professional Performance Research Group, Center for Evidence-Based Education, Academic Medical Center, Amsterdam, b.c.boerebach@amc.uva.nl

**Research Objective:** An important part of the learning process of residents occurs through observation and imitation of experienced clinicians, who act as role models. Previous studies identified different types of role models, namely as teacher/supervisor, physician and person and explored which characteristics could distinguish good role models. This study empirically explores how and to what extent clinicians' teaching performance influences residents' perceptions of clinicians as teacher, physician and person role models.

**Study Design:** In an ongoing prospective multicenter multispecialty study of clinicians' teaching performance and role modeling, we used web-based questionnaires to gather residents' evaluations of clinician teachers. The main outcome measures were the different type of role models (as teacher, physician and person). The predictors were clinicians' overall teaching performance and clinicians' performance on specific domains of teaching (namely, learning climate, professional attitude towards residents, communication of goals, evaluation of residents and feedback). We theoretically developed and empirically tested different plausible causal diagrams relating clinicians' teaching performance and different types of role models. We used multilevel random-intercept regressions to analyze our hierarchical data on medical and surgical specialties overall and separately.

**Population Studied:** The studied population included 441 clinician-educators who were evaluated by 317 residents from 17 residency training programs in 11 academic or teaching hospitals throughout The Netherlands during fall 2010.

**Principal Findings:** In total, 219 (69% response rate) residents filled out 2111 questionnaires about 423 clinicians. Clinicians' overall teaching performance and performance on the domain “professional attitude towards residents” were particularly associated with all three role model types. Further, the teaching performance domains “feedback” and “learning climate” were associated with being a teacher/supervisor role model and “evaluation of residents” was associated with the physician role model. The results of the different causal models showed major differences in the magnitude of the relationship between clinicians’ teaching...
performance and their being perceived as role models, but did not impact the significance of the findings.  

Conclusions: As expected, residents perceived clinicians who excelled at teaching as better role model teachers. To a much lesser extent, they also evaluated top performing clinician teachers as better role model physicians. Clinicians who were seen as good role model physicians were not automatically seen as good role model teachers.  

Implications for Policy, Delivery, or Practice: This study shows that residents are able to identify different types of role models. Our findings suggest that clinicians could substantially enhance their role modeling as teachers, physicians and person by improving (aspects of) their teaching performance. The different types of role modeling can be strengthened via different aspects of teaching performance. For clinicians who want to improve their role modeling as a teaching strategy, the good news is that many domains of teaching performance evaluated in this study are cognitive in nature, and can be learned or adapted. By enhancing their role modeling, clinicians will increase the number of positive learning opportunities for residents, thus improving the quality of residency training and, ultimately, impacting the quality of patient care delivered during and after residency.  

Funding Source(s): Other, Dutch Ministry of Health

Poster Session and Number: C, #1073

Inter-market and intra-market Variation in Commercial Insurer Prices to Hospitals and Characteristics of High Priced Hospitals Demonstrate Opportunities for Cost Control

Chapin White, Center for Studying Health System Change; Amelia Bond, Center for Studying Health System Change; Jim Reschovsky, Center for Studying Health System Change

Presenter: Amelia Bond, M.H.S., Health Research Analyst, Center for Studying Health System Change, abond@hschange.org

Research Objective: To describe the variation in prices paid by commercial payers for inpatient hospital services between and within local markets; to identify key market and hospital attributes that are associated with the prices they receive; and to draw policy implications from results.

Study Design: Cross sectional analysis of 2011 claims data for autoworkers and their dependents (n>400,000 enrollees) from 15 metropolitan market areas with sufficient observations. We create a hospital level inpatient price index that represents the total amount paid by the insurer divided by the simulated amount that Medicare would have paid for the same services. Medicare payments are simulated for each claim based on the DRG code and hospital specific base rate. Index values are created for each hospital, and admission weighted averages constructed for each market, adjusting for area differences in input price levels. Within each market, ratios of hospitals with the 90th to 10th percentile index are calculated to determine the amount of variation within each market. Finally, hospitals are grouped into high, medium and low price categories based on their percentile within each market. Data from the 2011 American Hospital Association and 2011 Medicare Cost Reports are used to explore differences among the high, medium and low hospital price categories.  

Population Studied: GM, Ford, Chrysler and UAW autoworker and dependent claims data for those aged between 18 and 64.  

Principal Findings: Consistent with other researchers' findings, casemix adjusted hospital prices vary considerably across markets. Market price indices varied from 0.98 (Louisville) to 1.67 (Indianapolis). Moreover, hospitals commanded considerably different prices within markets. 90th/10th percentile ratios varied from 2.68 in St. Louis to 1.09 in Saginaw, MI, with the median market having a ratio of 1.55. High-price hospitals within their market were more likely to be part of a hospital system (80.4 vs. 60.3%; p=0.001) and be not-for-profit (89.2% vs. 80.8%; p=0.081). Hospital size, patient mix, market share, and indicators of providing tertiary care were not significantly related to relative price. Higher priced hospitals had slightly higher Hospital Compare scores than low-price hospitals (54.3% vs. 48.9%; p=0.017).  

Conclusions: Prices that hospitals receive for a standardized bundle of inpatient services from commercial insurers vary considerably within markets, on par with their variation across markets. Intramarket price variations are associated with hospital and system characteristics. Most notably, the presence of hospital systems within markets appears to a factor in higher priced hospitals. Contribute to intra-market price variation.
Implications for Policy, Delivery, or Practice: For private purchasers attempting to lower inpatient costs, the results suggest consideration of selective contracting, physician network selection strategies designed to shift admissions to lower cost hospitals, and reference pricing for non-emergent admissions as possible means to lower inpatient costs. For public officials, results suggest that a robust anti-trust or state regulatory regime (perhaps one dictating provisions that can be included in payer-provider contracts) is warranted and could have significant effects on lowering hospital costs.

Funding Source(s): Other, National Institute for Health Care Reform

Poster Session and Number: C, #1074

Anti-Anginal Therapy Prior to Percutaneous Coronary Intervention

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Research Objective: Clinical studies in stable coronary artery disease (CAD) patients without acute coronary syndrome comparing medical therapy alone, or in conjunction with percutaneous coronary intervention (PCI), have demonstrated equal rates of cardiovascular events. While PCI provides slightly more angina symptom relief, both intensive medical therapy and PCI are associated with significant improvements in symptoms and many patients become symptom-free with medical therapy alone, avoiding the risks of PCI. Thus, the significant regional variability of PCI rates may be explained by variations in the medical treatment of stable CAD. We sought to determine whether greater use of anti-anginal medications is associated with lower rates of PCI.

Study Design: Using data from the NCDR CathPCI Registry and the Dartmouth Atlas of Cardiovascular Health Care, we examined patients undergoing elective PCI for stable CAD from January 1, 2009 through March 31, 2011 and calculated rates of providing 2 or more anti-anginal medicines prior to PCI, defined as being on at least 2 of the following anti-anginal medications: beta blockers, calcium channel blockers, long acting nitrates, or ranolazine. We analyzed rates of anti-anginal medications and regressed the rates of providing at least 2 anti-anginal medications within Hospital Referral Regions (HRRs) by the regions’ rates of PCI per 1,000 Medicare enrollees in 2007.

Population Studied: There were 300,772 PCI procedures in our final study population, from 1,164 hospitals in 282 HRRs, representing 92.2% of the total 306 HRRs in the Dartmouth Atlas.

Principal Findings: We found that 32.8%, 48.3%, 16.1%, and 2.8% of patients were on 0, 1, 2, or 3 or more anti-anginal medications, respectively. The median rate of providing 2 or more anti-anginal medications prior to PCI was 18.9%. Although substantial variability existed across HRRs in providing 2 or more anti-anginal medications, and in rates of PCI from the Dartmouth Atlas, there was no association between the rates of PCI in each HRR and the rates of 2 or more anti-anginal medications before PCI [Spearman’s rho: 0.0277, p=0.64]. There were 25.9% of HRRs with higher than median rates of providing 2 or more anti-anginal medications, and below median PCI rates. Sensitivity analyses of performing the regression only on patients with a prior diagnosis of cardiovascular disease, in limiting the study population to only Medicare beneficiaries, and including other forms of revascularization yielded similar results.

Conclusions: We found no association between the intensity of anti-anginal therapy and the use of PCI across HRRs, despite the variability of both.

Implications for Policy, Delivery, or Practice: Opportunities likely exist in many regions to increase the use of anti-anginal therapy before proceeding to elective PCI, and more research is needed to explain the observed variability in PCI. However, a significant proportion of regions provided both high degrees of anti-anginal therapy and lower rates of PCI, suggesting that understanding these practice patterns could provide insights into higher quality healthcare.

Funding Source(s): Other, American College of Cardiology Foundation’s National Cardiovascular Data Registry (NCDR)

Poster Session and Number: C, #1075
An Evaluation of International Patient Length of Stay
Lisa Bower, Healthbox; Molly Allen, UHC; Sam Hohmann, UHC; Steve Meurer, UHC; Tricia Johnson, Rush University Medical Center; Andy Garman, Rush University Medical Center

Presenter: Lisa Bower, M.S., B.A., Senior Associate, Healthbox, lisa.c.bower@gmail.com

Research Objective: International patients are a beneficial market for US hospitals, often providing prestige for the institution and higher reimbursements than domestic patients. Despite the incentives associated with attracting international patients, healthcare providers face a number of challenges in caring for these patients. These challenges include language barriers, a lack of social support domestically and limited medical infrastructure within the patient’s home country for sufficient follow-up care. It is likely that patients from different countries and regions of the world face different challenges, which ultimately may impact their length of hospital stay (LOS). Identifying regions of home origin associated with longer than expected LOS could help US hospitals pinpoint countries for which patients might need additional post-discharge care coordination. The purpose of this study is to evaluate whether variation in LOS exists by home region of origin for international patients.

Study Design: This is a retrospective, matched case-control study.

Population Studied: The sample includes international and domestic patients discharged between October 2008 and March 2012 from academic medical center members of UHC’s Clinical Database (CDB). The sample is limited to patients 18 years or older with an admission status of elective or urgent. Data were obtained from UHC’s CDB, the World Bank, the World Health Organization and the CIA World Factbook. The primary outcome is LOS and the primary independent variable is region of home origin, identified by the primary payer. In a secondary analysis, we evaluate the association of country-level factors including English language proficiency and medical infrastructure. Medical infrastructure is defined by physician density and hospital density per 1,000 population to indicate access to post-discharge follow up care and overall sophistication of the health system in a patient’s home region. All analyses control for patient age, gender, hospital, clinical domain, admission severity of illness and comorbidities. Independent samples t-tests and Pearson correlation coefficients are used to test the relationship between LOS and each independent variable. A generalized linear regression model is used to test the association between region of home origin and LOS, controlling for patient and hospital characteristics mentioned previously.

Principal Findings: The sample includes 2,000 international patients matched with 2,000 similar domestic patients. The average LOS of international patients in the sample is 6.7 days. Results are forthcoming.

Conclusions: Region of home origin is a potentially important factor in understanding the underlying drivers of hospital LOS for international patients.

Implications for Policy, Delivery, or Practice: If results demonstrate LOS variation between regions, hospitals can use this information for negotiating leverage with international payers. In addition, if it is found that regions with less sophisticated medical infrastructure demonstrate a longer LOS, there is potential to identify areas for collaboration in those regions to further expand their medical infrastructure to ensure a continuum of care, when possible and prudent.

Funding Source(s): No Funding

Poster Session and Number: C, #1076

Development and Implementation of a Consensus Algorithm to Optimize Pre-Operative Antimicrobial Prophylaxis and Decrease Gram Positive Surgical Site Infections for Cardiac and Orthopedic Procedures
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Presenter: Barbara Braun, Ph.D., Project Director, Health Services Research, The Joint Commission, bbraun@jointcommission.org

Research Objective: 1) To develop and evaluate the effectiveness of a pre-operative prophylaxis algorithm (bundle of practices) to reduce the risk of Gram-positive surgical site infections for cardiac and orthopedic surgical
patients; 2) To identify factors that facilitate or impede implementation of the algorithm as a quality improvement (QI) initiative in 21 diverse community hospitals.

**Study Design:** The algorithm was based on: 1) a systematic literature review (SLR) and meta-analysis of previous studies; 2) a review of existing preoperative prophylaxis guidelines; 3) a call for infection preventionists and organizations to submit current algorithms and 4) advice from a 12-member expert panel comprising cardiac and orthopedic surgeons, infectious disease experts, and anesthesiologists who addressed gaps in guidelines to ensure the final consensus algorithm was based on best available evidence. In year 2, a quasi-experimental (QE) observational study, which will use time series regression analysis techniques, was conducted to assess the algorithm’s effectiveness. A large national healthcare system with centralized informatics systems, QI and infection prevention structures implemented the algorithm as a QI initiative in volunteer hospitals. Project liaisons received centralized, in-person protocol education and materials to facilitate hospital-specific implementation plans. Frequent coaching calls were conducted to answer questions and disseminate study updates. To minimize staff work load, the algorithm bundle was integrated into usual care processes to the greatest extent possible.

**Population Studied:** The primary patient-level outcome is the rate of deep incisional and organ space surgical site infections among adult patients undergoing selected cardiac and orthopedic procedures. Hospital-level contextual factors of interest include equipment availability, staff turnover, physician leadership, outpatient and inpatient coordination etc.

**Principal Findings:** The consensus algorithm reflects best practice given current knowledge and presents a bundle of practices: Staphylococcus aureus nasal screening, mupirocin decolonization, pre-surgical chlorohexidine gluconate (CHG) bathing, and cefazolin antimicrobial prophylaxis with vancomycin added depending on screening results. Algorithm implementation was a comprehensive process requiring patients to use mupirocin and CHG at home, and staff from multiple disciplines and settings – surgical departments, outpatient offices, inpatient peri-operative nursing, pre-operative surgical services, post-operative surgical unit, infection prevention, information technology services, pharmacy, and laboratory – to collaborate. Major activities included modifying EMR screens, revising and reviewing physician pre-operative orders, acquiring essential equipment and supplies, educating staff, and modifying outpatient practices to ensure patients were screened and S. aureus carriers received appropriate decolonization and prophylaxis.

Roll-out of the intervention took longer than the anticipated two months at most sites due to competing initiatives, staff turnover and local outbreaks (meningitis, influenza). Some physicians were reluctant to adopt the prophylaxis recommendations because they had strong opinions and because publication of a national consensus guideline was delayed. Analysis of the QE study to assess algorithm effectiveness is in process.

**Conclusions:** Even within a centralized health system with strong infrastructure, ease of implementation varied across sites. Contextual factors substantially affect implementation of complex QI initiatives.

**Implications for Policy, Delivery, or Practice:** Standardization of practice often improves the quality of care. Yet hospitals differed in their ability to implement the consensus algorithm and time needed to accomplish this goal. Participants expedited the adoption of new practices by quickly sharing their insights.

**Funding Source(s):** AHRQ

**Poster Session and Number:** C, #1077


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**Presenter:** Kitty Chan, Ph.D., Associate Professor, Health Policy & Management, John Hopkins Bloomberg School of Public Health, kchan@jhsph.edu

**Research Objective:** Valid metrics are critical to growing the science on health service overuse. Our objective was to collate existing fully
specified measures of overuse that may be ready for use and to describe the current state of measurement in health service overuse so that priority areas for measure development can be identified.

**Study Design:** we surveyed, collated, and critiqued existing measures and measure concepts identified from measure clearinghouses, major measure developers and quality measures used in incentive programs in the published and gray literature.

**Population Studied:** NA

**Principal Findings:** Health service overuse can be broadly described by the following categories: (1) inappropriate for a specified clinical indication, (2) inappropriate for clinical indication in a specific population, (3) excessive service intensity or sophistication given expected clinical benefit, and (4) excessive frequency of service given expected clinical benefit. Our review identified 37 fully specified measures of health service overuse and 131 measure development opportunities. Many services were considered overuse due to the extension of diagnostic or screening services to low-risk populations. There were more diagnostic or therapeutic overuse measures than for screening or monitoring/surveillance. Imaging services is a major focus of current measures (50% of specified measures, 29% of measure opportunities), but opportunities exist to expand overuse measurement in medication, laboratory services.

**Conclusions:** Measures on overuse is becoming available, however, they tend to focus on a few key services (imaging) and adult populations. Opportunities to develop more overuse measure exist, but improved data sources and denominator specifications are needed.

**Implications for Policy, Delivery, or Practice:** Future development of overuse measures would benefit from new empirical research and clinical guidelines focused on clear identification of indications or populations for which a benefit is likely to be of low or no benefit.

**Funding Source(s):** RWJF

**Poster Session and Number:** C, #1078

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**Influence of a Multifaceted Patient Safety Intervention across Cardiac Surgery Units**

Bickey Chang, Johns Hopkins University School of Medicine; Elizabeth Martinez, Massachusetts General Hospital; Jill Marstaller, Johns Hopkins Bloomberg School of Public Health; Peter Pronovost, Johns Hopkins University School of Medicine; David Thompson, Johns Hopkins University School of Medicine

**Presenter:** Bickey Chang, M.H.A., Sr. Research Program Coordinator, Armstrong Institute for Patient Safety and Quality, Johns Hopkins University School of Medicine, bchang16@jhmi.edu

**Research Objective:** Cardiac surgery is among the most common surgical procedures. The significant associated morbidity and mortality is in large part due to preventable healthcare-acquired infections (HAIs). Efforts to reduce HAIs have been shown to result in substantial reductions in homogenous clinical settings, most notably in ICUs. Little is known about expanding these efforts to a single service line. In this study, we examine the effect of a multifaceted intervention on HAIs in the cardiac surgery service line and monitor context and process factors such as organizational support and team activities.

**Study Design:** A cohort of 17 hospitals from across the nation participated in this study. Operating room, intensive care unit, floor, and universal-bed teams of participating hospitals committed to implementing the intervention. Teams implemented the Comprehensive Unit-based Safety Program (CUSP), a tool to improve patient safety culture, and evidence-based Central Line-associated Bloodstream Infection (CLABSI) and Surgical Site Infection (SSI) prevention bundles developed based on the Translating Research into Practice (TRiP) model. Baseline and monthly CLABSI and SSI rates were collected. The team leader in each unit also submitted monthly Team Check-up Tools (TCTs) to report meeting frequency and information shared with senior executives, progress of intervention implementation, barriers to progress, and perceived staff behavior in performing evidenced practices to reduce CLABSI and SSI.

**Population Studied:** Our cardiac surgery cohort is comprised of 17 ORs, 15 ICUs, 15 floor units, and 2 universal-bed units. Study implementation began in June 2011. We analyzed CLABSI rates submitted by 11 ICUs, SSI rates from 9 ORs, and 147 TCTs from 25 units. CLABSI rates from 2 1-year baseline periods and 12 months and SSI rates from 2 1-year baseline periods and 8
months are available. TCTs from 10 months are available.

**Principal Findings:** The baseline median CLABSI rates were 1.04 and 1.50 per 1,000 central line days respectively for the two years prior to implementation. Upon implementation of the interventions, median CLABSI rates decreased to 0.00 per 1,000 central line days and have been sustained through the first year of implementation. Though only preliminary data was available, the median SSI rates for CBGB and CBGC decreased to 0.00 per 100 cases and have been sustained.

On average, teams met with their senior executive twice every quarter. The top 5 team progress barriers of the project were: not enough time, competing priorities or distractions, confusion about how to proceed with CUSP activities, burden of data collection, and insufficient autonomy. Floor units reported poorer performance in adopting interventions and using evidence-based practices.

**Conclusions:** A downward trend is observed in CLABSI rates and SSI rates. Variations across units in context factors and team activities were found and may affect the level of implementation success.

**Implications for Policy, Delivery, or Practice:** Designing and implementing patient safety interventions across different unit types of the same service line have the potential to increase synergy in patient safety efforts. This study demonstrates a multifaceted intervention combining CUSP and TRIP can be implemented in a single service line and achieve sustainable reductions in HAIs. Context factors can provide new knowledge regarding how to improve patient safety.

**Funding Source(s):** AHRQ

**Poster Session and Number:** C, #1079

**Changes in Hospital Practices for Reducing 30-Day Readmission Rates**

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**Presenter:** Emily Cherlin, Ph.D., M.S.W., Research Associate, Department of Health Policy and Management, Yale School of Public Health, emily.cherlin@yale.edu

**Research Objective:** We examined the recent change in hospital practices used to reduce hospital risk-standardized readmission rates (RSRRs) among hospitals participating in the Hospital-to-Home: Excellence in Transitions (H2H) national quality improvement initiative.

**Study Design:** We conducted a longitudinal study of hospitals participating in H2H using a Web-based survey (baseline and one year later) about hospital strategies to reduce 30-day readmission rates for patients with heart failure (HF) and acute myocardial infarction (AMI). We tracked strategies pertinent to quality improvement, medication management, discharge and follow-up procedures. We used change analysis to identify changes in the prevalence of recommended strategies.

**Population Studied:** All hospitals enrolled in H2H (n=591) by July 1, 2010. A total of 437 hospitals (73.9%) completed both the baseline and follow-up survey.

**Principal Findings:** The use of 13 strategies increased significantly between the baseline and follow-up period one year later: 1) having written a objectives to reduce preventable readmissions (90.4% vs 95.7%, P-value=0.001); 2) partnering with community home care agencies (69.3% vs 74.4%, P-value=0.033); 3) partnering with community physicians (50.9% vs 57.4%, P-value=0.021); 4) partnering with other local hospitals (22.9% vs 30.7%, P-value=0.002); 5) tracking the percent of patients discharged with follow-up appointments in 7 days (32.2% vs 43.0%, P-value=0.001); 6) tracking 30-day readmission rates (94.0% vs 97.5%, P-value=0.009); 7) tracking the proportion of patients readmitted to another hospital (12.0% vs 19.0%, P-value=0.001); 8) having a formal process to estimate and use risk of readmission (22.5% vs 34.6%, P-value=0.001); 9) using electronic medical records to facilitate medication reconciliation (72.8% vs 81.0%, P-value=0.001); 10) using teach-back techniques (e.g., having
the patient “teach” new information back to the educator for patient and family education (68.9% vs 80.0%, P-value=0.001); 11) giving discharged patients an action plan for managing heart failure (52.2% vs 60.0%, P-value=0.005%); 12) discharging patients with an outpatient follow-up appointment already arranged (52.4% vs 61.1%, P-value=0.002); and 13) regularly calling patients after discharge to follow up on post-discharge needs (62.9% vs 71.4%, P-value=0.001). Additionally, the following strategy was used less often in the follow up compared with the baseline time period: fewer hospitals contacted the primary care physician for medication reconciliation (43.3% vs 37.1%, P-value=0.03).

Conclusions: Hospitals significantly increased the frequencies of hospital practices used to reduce RSRR. Despite improvements, however, rates remain low for many practices, suggesting substantial opportunities for further improvement.

Implications for Policy, Delivery, or Practice: Our work highlights areas where participation in a nation-wide campaign may have helped hospitals improve. Reducing readmission rates for either HF or AMI is complex, requiring more than individual hospital efforts. Our findings indicate progress is present but slow. Therefore, further investigation is needed to understand how strategies are being implemented and the impact of these strategies.

Funding Source(s): CWF

Poster Session and Number: C, #1080

Characteristics and Costs of Surgical Malpractice Claims in the United States
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Research Objective: In the wake of healthcare reform, there is still substantial debate regarding the impact of medical malpractice. Our objective was to study the characteristics and financial burden of the most common surgical malpractice claims in the United States (US).

Study Design: Data were collected on the 10 most common surgery related malpractice claims against a physician in the National Practitioner Data Bank (NPDB). For each malpractice report, data were collected on the year of occurrence, patient age, clinical outcome, malpractice payout amount, inpatient or outpatient status, and physician years in practice. The malpractice payouts were inflation-adjusted to the 2012 US dollar using the consumer price index.

Population Studied: Physicians and patients associated with the 10 most common surgery-related malpractice allegations in the NPDB from September 1, 1990 through July 30, 2011.

Principal Findings: We identified 19,473 surgery-related claims. The most common allegations were improper performance (56%, 10,937/19,473), improper technique (10%, 2,009/19,473), and failure to recognize a complication (8.7%, 1,707/19,473). Of the claims, 61% (12,117/19,473) were for permanent injury, 36% (6,814/19,473) were for temporary injury and 3% (542/19,473) were for emotional injury. The mean inflation-adjusted payout was $301,259 per claim. The total annual cost of the claims averaged $266,656,149. 96% of claims were settled out of court. Physicians in practice for 20–29 years were associated with the most claims and those in practice less than 10 years were associated with the least claims.

Conclusions: Despite physician concern, the overall financial impact of the top 10 surgery-related malpractice allegations is less than 0.05% of the $555 billion dollar annual Medicare budget. Of these claims, 96% are settled out of court, leading to lower cost for the medical system.

Implications for Policy, Delivery, or Practice: It has been shown in previous studies that malpractice reform is associated with increased physician supply, improved physician job satisfaction and modest decreases in malpractice payout amounts. However, reform leading to caps on payouts for damages in malpractice cases applies only to jury verdicts. We found that 90% of claims in all categories were settled out of court, which is consistent with previous studies. Additionally, the financial impact of the top surgery-related claims is less than 0.05% of the Medicare budget. Improving physician understanding of the real world costs of these claims could decrease the practice of defensive medicine, thereby improving the quality and decreasing the cost of patient care. It could also improve physician job satisfaction.

Funding Source(s): No Funding

Poster Session and Number: C, #1081
Multi-State Collaboration for Developing and Using Quality Metrics for Psychotropic Medication Use: The MEDNET Experience

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Presenter: Stephen Crystal, Ph.D., M.A., B.A., Research Professor, Chair Division On Aging, Center for Health Services Research on Pharmacotherapy, Chronic Disease Management, and Outcomes, Rutgers University, Institute for Health, Health Care Policy, & Aging Research, scrystal@rci.rutgers.edu

Research Objective: In the Agency for Healthcare Research and Quality funded MEDNET Project, six state Medicaid programs, along with leaders of sister agencies in those states, collaborated with Rutgers University and other partners to accelerate the utilization of evidence-based practices in the use of antipsychotic and other psychotropic medications. Consensus metrics were developed through a cross-state metrics committee, and the metrics were utilized in collaborative QI initiatives in each state that brought together leaders of relevant state agencies, along with their stakeholder communities, to turn data into actionable information. This presentation will share lessons learned from the MEDNET experience.

Study Design: Building on the collaborative work of the AHRQ-funded Medicaid Medical Directors Learning Network/Rutgers CERTs Antipsychotics in Children Project, the states of Washington, Missouri, Oklahoma, Maine, Texas, and California collaborated with Rutgers, AcademyHealth, and Columbia University to implement the MEDNET consortium, advised by a multistate Steering Committee.

Population Studied: States selected target populations for intervention based on local priorities, resources and opportunities identified by their state teams during the project year. Target populations for state initiatives included adults with severe mental illness, children with serious emotional disturbances, and children in foster care.

Principal Findings: Metrics were developed for multiple key aspects of psychotropic use, with a particular focus on safe and effective utilization of antipsychotic medications, and including measures of adherence, antipsychotic polypharmacy, psychotropic (cross-class) polypharmacy, diagnosis consistent with antipsychotic use, mental health services consistent with antipsychotic use, guideline-consistent dosage, metabolic monitoring for patients receiving antipsychotics, underutilization of clozapine, and antipsychotic utilization among nursing home residents. State teams developed and implemented quality interventions related to these metrics using strategies that included feedback to providers of their quality measures compared with peers; mental health clinic based continuous quality improvement initiatives building on New York’s PSYCKES program; state policy and administrative practices designed to support evidence based prescribing practices; and second opinion/case review strategies. Technical assistance and sharing of promising practices across states were supported through steering committee calls, annual consortium meetings, site visits, webinars, working groups, development of resource materials, expert consultation, and other tools.

Conclusions: State level initiatives for quality improvement in Medicaid-funded mental health services confront complex organizational, financing and policy environments, with responsibility for various aspects of care delivery divided among multiple state agencies and service delivery entities. MEDNET state teams addressed these challenges by developing strengthened processes for systematic and focused collaboration aimed at system-level quality improvement, bringing together key leaders from the multiple agencies involved in care delivery, along with relevant stakeholders. These collaborative structures proved to be key to effective measurement and quality improvement. MEDNET states used metrics at multiple levels – patient, provider, community, and state – to identify and act upon quality challenges and outliers.

Implications for Policy, Delivery, or Practice: A critically important tool for improving care processes and patient outcomes is the implementation of metrics and their utilization to support a measurement-driven process of CQI, turning raw data from disparate administrative data systems into usable information that informs health policy and provider practices. In
the face of dynamic and rapidly changing organizational, budgetary, and policy constraints, MEDNET states experienced many significant successes in utilizing metrics to measure and drive improvement in care processes.

**Funding Source(s):** AHRQ

**Poster Session and Number:** C, #1082

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**Longitudinal Impact of Mental Health Outpatient Care on Healthcare Cost For Individuals with Type 2 Diabetes**

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**Presenter:** Clara Dismuke, Ph.D., Research Health Scientist, DHAP, US Department of Veterans Affairs, dismuke@musc.edu

**Research Objective:** Diabetes affects 25.8 million people, or 8.3% of the U.S. population, and is projected to increase to 29 million by 2050. Individuals with diabetes are also more likely to have mental disorders, with rates being 60% higher for major depressive disorder, and 123% higher for general anxiety disorder. Furthermore, diabetes is more prevalent in individuals with mental disorders, such as depression, anxiety disorders, schizophrenia, and bipolar disorder. We examined the longitudinal impact of mental health visits on inpatient, outpatient and pharmacy costs of a national cohort of 120,852 Veterans diagnosed with Type 2 diabetes and at least one co-morbid mental health condition.

**Study Design:** mGLMM with a random intercept and slope was implemented in SAS Proc GLIMMIX to estimate the three cost outcome categories simultaneously while adjusting for demographics and physical comorbidities. To account for the skewness in the observed cost data, a log-normal distribution with an identity link was used. Hence the exponent of the parameter estimates can be interpreted as the percent change in each type of cost as a function of unit change in the covariates.

**Population Studied:** Veterans in the diabetes cohort were included in the study if they had: 1) type 2 diabetes defined by two or more International Classification of Diseases, Ninth Revision (ICD-9) codes for diabetes (250, 357.2, 362.0, and 366.41) in the previous 24 months (2000 and 2001) and 2) ICD-9 codes for type 2 diabetes from inpatient stays and/or outpatient visits on separate days (excluding codes from lab tests and other non-clinician visits) in 2002, and 3) prescriptions for insulin or oral hypoglycemic agents in 2002 based on a previously validated algorithm and 4) at least one mental health diagnosis according to a previously validated algorithm.

**Principal Findings:** In a fully adjusted MGLMM model, we found that having three or more mental health visits was associated with 3% lower inpatient cost relative to not receiving any mental health outpatient care.

**Conclusions:** We provide preliminary evidence that mental health outpatient care while increasing outpatient and pharmacy costs reduce inpatient costs for Veterans diagnosed with type 2 diabetes and co-morbid mental health conditions.

**Implications for Policy, Delivery, or Practice:** Our results suggest the need for including mental health providers in the primary care teams treating individuals with diabetes and co-morbid mental health conditions. Mental health services have the potential to improve economic as well as clinical outcomes by reducing inpatient costs for individuals diagnosed with type 2 diabetes and co-morbid mental health conditions.

**Funding Source(s):** VA

**Poster Session and Number:** C, #1083

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**The Incidence, Risk Factors and Consequences Associated with Harmful Safety Incidents in Ontario Home Care Clients: A Descriptive Study of Secondary National Health Databases**

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Increased odds of long-term care admission, whereas injurious falls, delirium, sepsis and medication-related HIs were associated with increased odds of death.

**Conclusions:** The study results suggest that resources with targeted strategies for addressing risks for HIs are needed to increase HC safety. Tools that already exist in Canada such as the Resident Assessment Instrument and its Clinical Assessment Protocols could be useful for assessing risk and guiding care.

**Implications for Policy, Delivery, or Practice:**
Over the past decade, home care has been a critical part of health care restructuring and has played a key role in primary health care, chronic disease management and aging at home strategies across Canada. Canadian home care programs have experienced a 51% increase in the number of home care recipients. Given the rise in an aging population, the increasing number of patients with chronic conditions, and the trend toward reduced use of institutionalized care settings, the number of persons cared for at home will likely increase. Despite this, the safety of HC and how we can make it safer is something on which there is little existing literature. This study attempted to address this gap. Strategies designed to improve the safety of HC need to focus on reducing the risk of falls and other injuries in the home, improving medication management, and promoting recognition of early signs and symptoms of sepsis/bacteraemia and delirium followed by prompt intervention. Enhanced surveillance and early detection has the potential to reduce safety incidents occurring within the first 30 days of hospital discharge.

**Funding Source(s):** Other, Canadian Patient Safety Institute, Canadian Institutes of Health Research, the Change Foundation and the Canadian Health Services Research Foundation

**Poster Session and Number:** C, #1084

**National Variability in Admission Rate for Geriatric ED Patients**
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Presenter: Scott Dresden, M.D., Fellow, Institute for Healthcare Studies, Northwestern University, s-dresden@northwestern.edu

Research Objective: This study evaluated the current admission rate for geriatric ED patients, the variability in the geriatric admission rate by ED, and hospital factors which are correlated with an increased admission rate for elderly ED patients. We hypothesized that increased ED visits by geriatric patients, leading to increased provider experience will be correlated with decreased admission rate.

Study Design: Using the 2008 Nationwide Emergency Department Sample (NEDS), we performed a cross-sectional analysis of 28.4 million ED visits at 980 hospital EDs. Visits which resulted in death in the ED or transfer to another hospital were excluded. Patient-level admission rates were calculated by age. Data were aggregated by ED, visits by geriatric patients were tabulated for each ED, and ED-level admission rates for adult patients and geriatric patients were calculated for each ED. EDs with fewer than 100 geriatric visits were excluded. Mean and standard deviation of the ED admission rates were calculated. Linear regression of hospital-level ED admission rate for geriatric patients was performed adjusted for hospital factors (ED adult volume, ED geriatric volume, location, region, teaching status, trauma designation, and safety-net status).

Population Studied: ED patients over the age of 65.

Principal Findings: Patient-level admission rate increased with age: 5.4% at age 18 (95% CI 5.3%-5.5%), 32.9% at age 65 (95% CI 32.7%-33.1%), 50.5% at age 87 (95% CI: 50.2%-50.7%), 54.6% at age 96 (95% CI 53.8%-55.3%). Hospital level admission rates were higher with wider variation for geriatric patients than non-elderly adults – age 18-64: 10.5% (SD: 8.3%), age 65-74: 36.0% (SD: 15.0%), age 75-84: 37.8% (SD: 16.6%), age 85+: 43.8% (SD: 17.2%). Factors with a significant association with ED admission rate for geriatric patients (age 65+): admission rate for patients age 18-64: β=1.31 (95% CI: 1.22-1.40); geriatric volume β=0.00058 (95% CI: 0.00032-0.00084); safety net status: β=2.11(95% CI: 0.67-3.56); region: Northeast referent, Midwest β=-5.89 (95% CI: -7.87 to -3.90), South: β=-3.68 (95% CI: -5.71 to -1.66), West β=-6.42 (95% CI: -8.59 to -4.24); urban area: β=4.99 (95% CI: 3.54-6.44).

Conclusions: Geriatric hospital admission rates vary more widely than hospital admission rates for non-elderly adults. Higher hospital admission rate for geriatric patients is associated with higher hospital admission rate for non-elderly patients, higher ED geriatric volume, safety net status, region, and urban setting. Hospital geriatric admission rates are not lower in EDs with higher geriatric patient volume.

Implications for Policy, Delivery, or Practice: Specialized geriatric EDs have been developed with the goal of improving outcomes and decreasing costs, including decreasing unnecessary hospitalizations. As geriatric EDs are created, it is important to understand that ED and hospital factors such as safety net status and ED admission rate for non-geriatric patients are associated with the admission rate for geriatric patients, and that increased experience with geriatric patients in the ED is actually associated with a slightly increased admission rate for geriatric patients. This implies that increased experience with geriatric patients in the ED is not sufficient to decrease admission rates.

Funding Source(s): AHRQ

Poster Session and Number: C, #1085

Changing Surgeons is Associated with Improved Outcomes for Patients with Localized Prostate Cancer

Eva DuGoff, Johns Hopkins University School of Public Health; Katrina Armstrong, University of Pennsylvania Perelman School of Medicine; Justin Bekelman, University of Pennsylvania Perelman School of Medicine; Elizabeth A. Stuart, Johns Hopkins University Bloomberg School of Public Health; Craig Evan Pollack, Johns Hopkins University Bloomberg School of Public Health

Presenter: Eva DuGoff, M.P.P., Graduate Student, Department of Health Policy and Management, Johns Hopkins University School of Public Health, edugoff@gmail.com

Research Objective: To examine the association of changing urologists on surgical complications in men with prostate cancer who were diagnosed by a urological surgeon.

Study Design: A cross-sectional observational study using registry and administrative claims data from the Surveillance, Epidemiology and End Results (SEER)-Medicare database from 1995 to 2005. We defined surgical complications as 30-day surgical complications, late urinary complications, and long-term incontinence.
Subjects were classified as having ‘changed providers’ if they had different diagnosing and treating urologists. ‘Doubly robust’ propensity score weighted multivariable logistic regression models were used to investigate the effect of having different diagnosing and treating urological surgeons (urologist changing) on surgical outcomes.

**Population Studied:** Men over age 65 with prostate cancer who underwent radical prostatectomy.

**Principal Findings:** Men who changed urologists between diagnosis and treatment had significantly lower odds of 30-day surgical complications compared to men who did not change urologists (Odds Ratio: 0.83; 95%CI: 0.77 - 0.89), after adjusting for surgical volume and other demographic and clinical factors. We found that the effect of changing urologists on 30-day surgical complications persisted among men who changed to a high volume (OR: 0.85; 95%CI: 0.73-0.99) and to a low volume urologist (OR: 0.83; 95%CI: 0.76-0.90) compared to men who stayed with the same urologist. Men who changed to a high volume urologist were less likely to experience long-term incontinence (OR: 0.83; 95%CI: 0.70-0.98). We did not observe a significant interaction between provider changing and patient race.

**Conclusions:** This study finds lower 30-day surgical outcomes among men with prostate cancer who change urologists between diagnosis and surgical treatment after adjusting for surgeon volume. These changes may be driven by a combination of physician referral, patient choice, or other factors.

**Implications for Policy, Delivery, or Practice:** In aggregate, identifying the urologists who patients change to for treatment may reflect important information that could help direct patients towards higher quality care. Further research into why some men change urologists is important for understanding how this can be leveraged to achieve better outcomes and reduce disparities in cancer care.

**Funding Source(s):** Other, NCI K awards and AHRQ training grant

**Poster Session and Number:** C, #1086

**Following Practice Guidelines: Does It Hasten Return To Work?**

Eva DuGoff, Johns Hopkins University School of Public Health; Eric T. Roberts, Johns Hopkins University Bloomberg School of Public Health; Sara Heins, Johns Hopkins University Bloomberg School of Public Health; Vladimir Canudas-Romo, Johns Hopkins University Bloomberg School of Public Health; David Swedler, Johns Hopkins University Bloomberg School of Public Health; Dori Feldman, Johns Hopkins University School of Medicine; Stephen T. Wegener, Johns Hopkins University School of Medicine; Renan Castillo, Johns Hopkins University Bloomberg School of Public Health

**Research Objective:** There is limited evidence on the relationship between clinical practice guideline adherence and outcomes of care. We examine the association between adherence with clinical practice guidelines and time to return to work among worker’s with a workplace related back and shoulder injuries.

**Study Design:** Retrospective cross-sectional study of administrative claims and disability data from 2000 to 2010 for a large worker’s compensation insurer. Guideline concordance was determined using diagnosis and procedure codes from claims data. Using Cox proportional hazard models, we compare the association between adherence to clinical practice guidelines and time to return to work. We assessed four guidelines: maximum time on opioids, time to see a specialist physician, ratio of active to passive physical therapy, and time to having a magnetic resonance imaging (MRI).

**Population Studied:** The study sample included 148,188 worker’s compensation claimants who experienced a back or shoulder injury in the United States from 2000 to 2009 and who took time off of work because of their injury.

**Principal Findings:** Guideline adherence varied by injury type and guideline. Adherence to the opioids guideline was associated with an average 20% faster return to work for workers with back injuries and 19% for shoulder injuries. We found that workers receiving guideline concordant care for use of specialists, physical therapy, and time to MRI did not have better outcomes than workers receiving non-concordant care. For these three guidelines, concordant care was associated with longer time out of work.

**Conclusions:** We find that some clinical practice guidelines are associated with improved outcomes for patients, but not all. The strength of the evidence base behind clinical practice
guidelines is variable, and few guidelines provide specific guidance with respect to patient co-morbidities or injury severity. Further research is needed to evaluate the impact of clinical practice guidelines on patient outcomes.

**Implications for Policy, Delivery, or Practice:** Policymakers and quality measure developers should consider the relationship between the clinical guideline adherence and patient outcomes such as time to return to work.

**Funding Source(s):** Other, American International Group

**Poster Session and Number:** C, #1087

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**Specialists as Primary Care Physicians:** Patient Characteristics and Quality of Care of Visits to Generalist and Specialist Physicians

**Self-Identified as Primary Care Physicians**

Samuel Edwards, Veteran’s Affairs Boston Healthcare System; John N. Mafi, Beth Israel Deaconess Medical Center; Bruce E. Landon, Department of Health Care Policy, Harvard Medical School

**Presenter:** Samuel Edwards, M.D., Fellow, Section of General Internal Medicine, Veteran’s Affairs Boston Healthcare System, edwards.sam@gmail.com

**Research Objective:** Adult primary care is typically provided by physicians trained in family practice or general internal medicine, but many patients see medical subspecialists for their primary care. In this study we describe patient, provider and visit characteristics and compare visit-based quality of care for visits to specialist and generalist PCPs.

**Study Design:** We analyzed visits to generalist and specialty physicians using data from a national survey of office based physician visits.

**Population Studied:** We studied a nationally representative sample of visits with adult patients identified from the National Ambulatory Medical Care Survey (NAMCS) over the time period 1997-2010 for which the provider indicated that they were the patient’s primary care physician. We included visits to generalists (family practice, general practice or general internal medicine), cardiologists, and other medical specialists. We describe patient, provider and visit characteristics and compare visit-based quality of care for several common medical conditions after constructing multivariable models to control for patient demographics, payer type, region, and year.

**Principal Findings:** Among 81,898 visits to self-identified PCPs, 93.8% were to generalist physicians, 1.6% to cardiologists and 4.7% to other medical specialists. The majority of visits to generalists were for new problems (40.5%), whereas the majority of visits to cardiologists and medical specialists were for chronic disease management (59.4% and 63.75% respectively, p<0.001). Mean patient age was 55.5 years for PCPs, 58.5 years for medical specialists, and 67.1 years for cardiologists. Visits to specialist PCPs had a higher prevalence of chronic disease than visits to generalists (2.9 chronic diseases for cardiologists vs. 4.5 for other medical specialists vs. 2.3 for generalists). Quality of care for cardiovascular disease was better in visits to cardiologists than in visits to generalists, and better in visits to generalists that in visits to other medical specialists (e.g., beta-blocker for coronary artery disease: 34.5% for generalists, 41.1% for cardiologists, 22.4% for other medical specialists, p=0.016). Pulmonary specialists provided more appropriate treatment of asthma than other specialties, but generalists provided better asthma care than other medical specialists and cardiologists (Appropriate treatment of asthma: 34.8%, for pulmonologists, 25.9%, for generalists, 15.0% for cardiologists, p=0.0013). Generalists performed better quality of care for depression (treatment of depression, 79.3% for generalists vs. 66.2% for cardiologists vs. 70.4% for other medical specialists, p=0.05) and had less misuse of medication in the elderly (9.8% for generalists vs. 16.4% in cardiologists). All of these differences persisted in adjusted analyses.

**Conclusions:** Medical specialists who serve as PCPs tend care for older patients with a higher prevalence of chronic disease, and dedicate the majority of their visits to chronic disease management, usually within their specialty. Specialist PCPs demonstrate higher quality of care within their specialty domain, but lower quality outside of their specialty.

**Implications for Policy, Delivery, or Practice:** As we endeavor to transform primary care through innovative practice models such as the Patient-Centered Medical Home, careful consideration is needed regarding the appropriate integration of specialty care for older medically complex patients.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #1088
Hospitalist Physician Workload: Does it Matter?
Daniel Elliott, Christiana Care Health System; Paul Kolm, Christiana Care Health System; Robert Young, MD MS; Ruth Aguiar, Christiana Care Health System; Joanne Brice, MD, Christiana Care Health System

**Presenter:** Daniel Elliott, Physician, Christiana Care Health System, delliott@christianacare.org

**Research Objective:** Hospital Medicine is the fastest growing medical specialty, in large part due to evidence that hospitalists provide high quality, efficient care. Current reimbursement structures generally incentivize or require increased hospitalist productivity. Increasing workload may negatively impact the quality and efficiency of care, but there is little empirical data to determine this association. We sought to determine the association between hospitalist workload and the quality and efficiency of care.

**Study Design:** We conducted a retrospective cohort study of adult inpatients admitted to a large, private hospital medicine service between February 1, 2008 and January 31, 2011. The exposure was the total daily physician workload on the day of each encounter during the patient’s hospitalization. Daily workload was calculated separately as 1) total work Relative Value Units (wRVU) standardized to 2011 values and 2) total patient census. The primary outcomes were hospital length of stay (LOS) and 30-day readmission rate. Key covariates included patient demographics and severity, physician continuity, and hospital occupancy. We used hierarchical time-to-event models clustered by patient and by physician. Workload and hospital occupancy were allowed to vary over the patient’s hospitalization for the LOS models and fixed as the value on the day of discharge for readmission models. We tested an interaction term between workload and occupancy in all models.

**Population Studied:** We included inpatients over 18 admitted to a large, private hospital medicine service between February 1, 2008 and January 31, 2011. We excluded patients who were admitted directly to an intensive care unit, were not discharged prior to the end of the study period, or had a hospital length of stay (LOS) <0.5 or >30 days.

**Principal Findings:** Overall, 19,558 hospitalizations met study criterion. Median daily physician wRVU was 28.7 (IQR 21.3 - 35.1) and median daily census was 16 patients (IQR 10-20). Physician workload was strongly associated with LOS, but the effect varied across hospital occupancy. At low levels of hospital occupancy (<70%), adjusted LOS was 1.5 days longer across the range of daily workload values when measured as wRVU and 2 days longer when measured by census. There was no association between workload and LOS at hospital occupancy above 90%. The 30-day readmission rate increased from 15.5% to 17.1% (difference) as hospitalist workload measured by RVU on the day of discharge increased. The 30-day readmission rate did not vary across patient census on the day of discharge when hospital occupancy was below 80%. However, at occupancy above 80%, readmission rates ranged from 15.5 – 17.2% (difference).

**Conclusions:** Increased Hospitalist workload was associated with increased LOS and increased 30-day readmission rates in our cohort. Importantly, the association was modified by hospital occupancy such that LOS was most sensitive to workload at lower levels of occupancy and 30-day readmissions were most sensitive to workload at higher occupancies.

**Implications for Policy, Delivery, or Practice:** Our findings suggest that hospitalist groups and hospitals need to work together to mitigate the impact of high volumes on the efficiency and quality of delivered care.

**Funding Source(s):** Other, Christiana Care Chairs Leadership Council

**Poster Session and Number:** C, #1089

Hospitalists and Hospitals’ Efficiency: A Longitudinal Analysis 2007-2009
Josue Patien Epane, University of Alabama at Birmingham; Dr. Robert Weech-Maldonado, University of Alabama at Birmingham; Dr Larry Hearld, University of Alabama at Birmingham; Dr. Nirmal Menachemi, University of Alabama at Birmingham; Dr. Michael Morrissey, University of Alabama at Birmingham; Dr. Stephen O’Connor, University of Alabama at Birmingham; Dr. Bisakha Sen, University of Alabama at Birmingham

**Presenter:** Josue Patien Epane, M.B.A., Doctoral Student, Health Services Administration, University of Alabama at Birmingham, josypat@yahoo.com

**Research Objective:** The unprecedented growth and the potential benefits associated with the use of hospitalists in the U.S. healthcare...
system have made this a growing stream of research in the healthcare literature. Prior studies suggest that the use of hospitalists results in greater efficiency (reduced length of stay and costs) while maintaining at least the same level of quality compared to non-hospitalists. However, most of these studies have been cross-sectional and limited in scope; as most where conducted in one hospital. To bridge this gap, our study examines the association between hospitals’ use of hospitalists and efficiency using a nationwide sample of all medical/surgical acute care hospitals operating in the U.S. between 2007 and 2009.

**Study Design:** Data sources for this longitudinal study included the American Hospital Association Annual Survey, the Area Resource File, Medicare Costs Reports, and Case Mix Index files. The dependent variables for this analysis included: length of stay (LOS) and operating costs per adjusted patient day. The independent variables included hospitals’ use of hospitalists and hospitalists’ contractual arrangements. Control variables included per capita income, occupancy rate, case mix index, and Medicare managed care penetration. We first ran a panel regression with year and facility fixed effects. Given the considerable difference in size between hospitals that used hospitalists and those that did not, we further stratified our sample by size into small (fewer than 99 beds), medium (100 to 299 beds) and large (300 beds and over) hospitals and ran a panel regression with facility and year fixed effects for each of these strata.

**Population Studied:** The studied sample consisted of all medical/surgical acute care hospitals operating in the U.S. between 2007 and 2009.

**Principal Findings:** There were approximately 4,635 hospitals per year, 56.81% of which used hospitalists. Hospitals that used hospitalists were on average larger (247 beds) compared to those that did not (84) beds. The results of our study suggest no significant difference in costs across the full sample. However, small hospitals that use hospitalists, had a significant lower LOS (-0.198 days). Additionally, small hospitals that employed their hospitalists had lower LOS (-0.202 days).

**Conclusions:** Our study validates prior studies that showed reduced LOS among hospitals that used hospitalists, however this was only observed among small hospitals. There was no statistically significant difference in costs between hospitals that used hospitalists and those that did not.

**Implications for Policy, Delivery, or Practice:**

The lower length of stay associated with the use of hospitalists among smaller hospitals may have implications for both costs and quality of care. With the public debate over the issue of hospital acquired infections, a lower length of stay may potentially reduce patients’ exposure to nosocomial infections and other ailments. However, additional studies are needed examining the impact of use of hospitalists on quality of care.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #1090

**Long Term Follow Up of a Community and Academic Asthma Quality Improvement Collaborative Project: Implementing Evidenced Based Asthma Guidelines in a Community Pediatric Independent Practice Association**

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**Presenter:** Monica Federico, M.D., Physician, Pediatrics, University of Colorado School of Medicine, monica.federico@childrenscolorado.org

**Research Objective:** Many children with asthma report poor control despite national guidelines for the management of asthma. Significant barriers exist in the implementation of evidence based guidelines into community practice. Strategies addressing these barriers require a multi-stakeholder investment and are difficult to coordinate. Our objective was to assess the long term impact of a community and academic asthma quality improvement partnership in an independent practice association (IPA) of community pediatricians.

**Study Design:** This is an observational study conducted as a partnership between Children’s Hospital Colorado and an IPA serving more than 160,000 children in a large metropolitan region. The program incorporated a structured asthma educational program given directly to the practices, data collection tools, process improvement, and a practice redesign.
curriculum. Data was entered into web-based registry and data reports were generated regularly. Process of care and health outcomes data were obtained by patient and provider report. Patient data were included if the patient had at least 2 visits in the registry. The rates per 1000 patient days were calculated annually using data reported in the registry in a given calendar year. Results are reported for periods of July-June in order to include a single respiratory season during each period. Rates were compared over time from 2007 to 2012.

**Population Studied:** The IPA consists of 23 practices with 173 providers. The program was instituted on April 1, 2007 and results reflect data through October 9, 2012. By 2012, 17 practices completed asthma education, completed the practice redesign curriculum, and were using the registry. As of 2012, 6752 patients were entered into the registry, 1709 with 2 or more visits. The mean age of the children entered into the registry was 12.2 years, 60 percent were male, and 66 percent have persistent asthma. Private insurance was reported in 72 percent of the patients.

**Principal Findings:** Providers documented asthma severity for all patients starting with the introduction of data collection in 2007. Since 2007, providers prescribed controller medications to patients with persistent asthma 85 percent of the time. The creation of asthma action plans improved from 70 percent in 2008 to 93 percent for children seen in 2011. Health outcomes analysis showed a significant trend towards a decline in emergency room visits, missed work days and missed school days between 2007 and 2012 (p=0.01, p=0.01 and p=0.02, respectively). Admissions decreased, but the trend did not reach significance (p=0.11). Further analysis showed that patients were more likely to have an ED/UC visit (RR: 2.15 (95 percent CI: 1.65, 2.80), missed work days (RR: 2.32 (CI: 2.09, 2.56), and missed school days (RR: 2.00 (CI: 1.85, 2.16) in the first year of the registry, compared to the most recent full year (2011).

**Conclusions:** A quality improvement program that combines asthma education, process redesign, and a registry based tracking system, can improve the care delivered at community based pediatric practices and can improve health outcomes for their patients.

**Implications for Policy, Delivery, or Practice:** The success of this program relies upon standardized care and continuous assessment of gaps in care, and areas that require special attention and more focused intervention.

**Funding Source(s):** Other, Colorado Health Foundation

**Poster Session and Number:** C, #1091

**Pharmacy-Based Interventions to Reduce Primary Medication Non-Adherence**

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**Presenter:** Michael Fischer, M.D., M.S., Associate Professor Of Medicine, Division of Pharmacoepidemiology and Pharmacoeconomics, Brigham and Women's Hospital/Harvard Medical School, mlfischer@partners.org

**Research Objective:** Non-adherence to essential chronic medications is common and leads to substantial morbidity, mortality, and avoidable healthcare costs. Recent studies have recognized the frequency of primary non-adherence, when patients do not fill their first prescription for a new medication. Little is known about what interventions could reduce rates of primary non-adherence. We evaluated two interventions implemented by a large pharmacy chain attempting to reduce primary non-adherence to cardiovascular medications.

**Study Design:** In 2007 CVS retail pharmacies began making automated reminder phone calls to patients who had not picked up new prescriptions within 3 and 7 days after the prescription was initially processed. In 2009 pharmacists and pharmacy technicians began making personal calls to patients who had not picked up their prescriptions within 8 days after initial processing. For each intervention a 1-2% random sample of patients, selected based on birthdate, did not receive the intervention and served as a control group. We used pharmacy and insurance data from CVS-Caremark to identify the rate at which prescriptions for cardiovascular medications were not filled within 30 days after they had first been processed.

**Population Studied:** The automated intervention included 852,629 patients and 1.2 million prescriptions, with a control group of 9,282 patients and 13,179 prescriptions. The
live intervention included 121,155 patients and 139,502 prescriptions with a control group of 2,976 patients and 3,407 prescriptions. The control and intervention groups were balanced by age, gender, and patterns of prior prescription use.

**Principal Findings:** For the automated intervention, the rate of unfilled prescriptions was 4.2% in the intervention group and 4.5% in the control group (p>0.1). For antihypertensives the unfilled prescription rate was 3.6% in the intervention group and 4.0% in the control group (p>0.1) while for statins the rates were 5.4% in the intervention group and 5.6% in the control group (p>0.1).

The live intervention was used in a group that had not filled prescriptions after 8 days and thus had much higher rates of primary non-adherence. In this setting the rate of unfilled prescriptions was 36.9% in the intervention group and 41.7% in the control group, a difference of 4.8% (p<0.0001). The difference in unfilled prescription rate for antihypertensives was 6.9% (p<0.0001) but for statins was only 0.5% (p>0.1).

**Conclusions:** Automated reminder calls encouraging patients to fill their prescriptions had no significant effect on rates of primary medication adherence. Personal calls from pharmacists and pharmacy technicians to patients at high risk for primary non-adherence significantly increased primary adherence to prescriptions for cardiovascular medications, although many patients still did not fill their prescriptions. The findings were driven by improved adherence to antihypertensive medications, with no effect on adherence to statins.

**Implications for Policy, Delivery, or Practice:** Our findings indicate that 20 personal calls from the pharmacy would be needed to yield one additional filled prescription, or 15 calls per prescription filled if the results were limited to antihypertensives. Future analyses of long-term adherence and clinical outcomes will be needed to assess the cost-effectiveness of these interventions for pharmacies or health systems.

**Funding Source(s):** Other, National Association of Chain Drug Stores Foundation

**Poster Session and Number:** C, #1092

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**Effect of Coverage Change and Evidence on Practice Patterns: The Case of Knee Arthroscopy**

Hassan Ghomrawi, Weill Cornell Medical College; Robert Marx, Hospital for Special Surgery; Ting Pan, Hospital for Special Surgery; Matthew Conti, Weill Cornell Medical College; Stephen Lyman, Hospital for Special Surgery

**Research Objective:** More than a million knee arthroscopy (KA) procedures are performed in the US each year. In 2004, CMS denied coverage for lavage and debridement KA for advanced knee osteoarthritis after a controversial RCT (Moseley et al., NEJM, 2002) showed it was ineffective. In 2008, a more definitive RCT study (Kirkley et al., NEJM, 2008) confirmed the results of the first trial. The impact of either event (evidence or coverage change) on practice patterns has been poorly studied. In this study, we examine the effect of 3 events (1st RCT, coverage change, and 2nd RCT) on trends in KA utilization and practice patterns.

**Study Design:** We used data from a statewide database of all hospital admissions and ambulatory surgeries in the state. Our dependent variable of interest is the age and sex-adjusted trend in monthly KA rates for lavage and debridement (CPT codes 29877 and 29871). We estimated the significance of change in procedure rates utilizing a regression spline model. We calculate an ordinary least square regression of the monthly rates for 1997-2010 as a function of the periods after first RCT, CMS’s denial, the second RCT, and a time-trend variable. For each KA, we calculated the surgeon arthroscopy volume in the prior year. Volume categories were <$18 (10% percentile), 18-79 (50% percentile), 80-134 (75% percentile), and 135+. Regression analysis was then run for different KA volume categories and the effects compared.

**Population Studied:** New York State residents who are 40 years and older and underwent outpatient knee arthroscopy from 1997-2010.

**Principal Findings:** There were 29,942 arthroscopies performed between 1997 and 2010. The age and sex adjusted KA rate ranged from 1.3 to 2.4 per 100,000 population. Overall, there was no decrease in the KA rates after the first RCT (after first RCT effect coefficient = 0.003, [-0.006, 0.012], p-value=0.495) and coverage denial (CMS’s denial effect coefficient =0.001[-0.003, 0.005], p-value=0.559). However, there was a significant decrease in KA rates after the publication of the second definitive RCT.
Adopting New Technology for Breast Cancer Treatment

Heather Gold, New York University School of Medicine; Kimberly Pitrelli, New York University School of Medicine; Mary Katherine Hayes, Weill Cornell Medical College; Madhuvanti M. Murphy, University of the West Indies, Cave Hill, Barbados

Presenter: Heather Gold, Ph.D., M.A., Associate Professor, Population Health, New York University School of Medicine, heather.gold@nyumc.org

Research Objective: To better understand physician decision-making concerning adoption of new technology, particularly catheter-based accelerated partial breast irradiation (APBI) for breast cancer prior to Phase III randomized trial (RCT) publication. APBI requires treatment twice daily for 5 days instead of tradition daily treatment for 5-7 weeks.

Study Design: Individual interviews were conducted with 13 surgeons and 14 radiation oncologists across the United States identified through purposive sampling to obtain varied perspectives of community-based (private/HMO, urban/non-urban) physicians. Qualitative analysis using a grounded theory approach was used to identify themes related to adoption of APBI. Each transcript was independently coded by three investigators before reaching consensus, to ensure reliability.

Population Studied: Community-based surgeons and radiation oncologists in the United States.

Principal Findings: Physicians averaged 18 years (range: 1.5-50) in practice, with a mean of 42% (range: 7-98%) breast cancer patients. Of the 20 physicians using APBI, 14 followed guidelines. Although most physicians learn about new technologies elsewhere, the decision to adopt a new technology was discussed and agreed upon within their social networks at their home institution and local geographic area, requiring partnership between surgeon and radiation oncologist. No definitive level of evidence was requisite before technology adoption; RCTs were preferred, but because technology evolves quickly, physicians must be ready to act on often-limited information or intuition and by practicing the “art” of medicine. Several barriers, facilitators, and pressures for adoption were raised: physician motivation is required for adoption, but radiation oncologists often were described as too “old” or “conservative” to learn new technologies; radiation oncologists must be present for each APBI treatment, causing workflow changes that could be a barrier to adoption; surgeons may threaten to refer patients elsewhere if a radiation oncologist does not adopt APBI; patients aware of new technology often exert pressure to adopt; community standards, event with limited evidence, pressure physicians to adopt technology to keep up with peers; and device companies facilitate matches between, and training for, surgeons and radiation oncologists interested in adopting APBI. Training comes in the form of colleagues coaching or showing the techniques and on-line or in-person courses sponsored by device manufacturers. Physicians adopting the new technology use diverse eligibility criteria, from strictly following professional society guidelines or clinical trial eligibility rules, to creating their own with colleagues. Financial incentives seem to play a role in technology adoption, particularly for surgeons who would not otherwise benefit from radiotherapy, and non-financial adoption incentives would lead to increased income indirectly.

Conclusions: Preference for high-quality evidence often gives way to patient pressure, financial incentives, and community norms. Unique to APBI, surgeons and radiation oncologists cannot adopt independently and
must develop partnerships and agree to adoption. Although radiation oncologists may be concerned about declining income-per-patient due to APBI, the trade-off between fractions-per-patient and number of patients seen works in favor of APBI.

Implications for Policy, Delivery, or Practice: Randomized trials take years to complete, yet technology diffuses while awaiting trial results. Adoption of new technology is not solely based on scientific evidence but on practicality of treatment (“what’s best for the patient”) and underlying financial and social pressures.

Funding Source(s): Other, American Cancer Society

Poster Session and Number: C, #1094

Improving Patient Safety from Medical Radiation Exposure: Is Transparency at Clinician Order Entry the Right Approach?

The Clinician Perspective
Jenna Kruger, M.P.H., UCSF Division of General Internal Medicine, Department of Medicine; L. Elizabeth Goldman, University of California, San Francisco; Alice H. Chen, M.D., M.P.H., UCSF Division of General Internal Medicine, Department of Medicine; Alex Rybkin, M.D., UCSF Department of Radiology and Biomedical Imaging; Kiren Leedes, UCSF Division of General Internal Medicine, Department of Medicine; Dominick L. Frosch, Ph.D., UCLA Division of General Internal Medicine & HSR, Department of Medicine; Palo Alto Medical Foundation Research Institute

Presenter: L. Elizabeth Goldman, M.D., M.C.R., Assistant Professor, Medicine, University of California, San Francisco, legoldman@medsfgh.ucsf.edu

Research Objective: The rise in Computed Tomography (CT) scan use over the past decade has led to a substantial increase in medically-associated radiation exposure. To increase safe use of imaging, recent California legislation requires increased transparency of radiation exposure through the inclusion of CT scan radiation dose metrics in radiology reports. We sought to examine (1) outpatient clinician attitudes regarding the consideration of radiation exposure when ordering CT scans; and (2) clinician reactions to a planned intervention posting radiation exposure information for CT scans at the point of clinician order entry in an urban safety-net setting.

Study Design: We conducted a qualitative study consisting of 9 audio-taped focus groups of salaried clinicians working in an urban safety-net setting. To obtain diverse opinions, 6 focus groups were with primary care clinicians and 3 were with subspecialty physicians. Questions focused on clinician knowledge and attitudes about how radiation exposure from CT scans affected their ordering practices, barriers to considering radiation exposure in clinical decisions, potential harms and benefits of posting radiation exposure information at the site of order entry for CT scans, and suggestions for improving the intervention. Focus groups were audio-recorded and transcribed. Two researchers (JK, LG) systematically coded the transcripts and discussed differences to reach consensus using an inductive thematic analysis framework to identify emergent themes.

Population Studied: We recruited a diverse sample of salaried primary care clinicians and subspecialty physicians (nephrology, pulmonary, and neurology) who deliver outpatient care in an urban safety net health system. The participating clinicians (N=50) represented 12 hospital-based clinics and community health centers, all of which use a common electronic order entry system.

Principal Findings: Clinicians expressed a general awareness of the radiation risks with CT scans, although most clinicians felt uncomfortable with their knowledge of the clinical implications of radiation exposure from particular studies. Most primary care clinicians believed clinically relevant information such as the increased risk of malignancy from a given CT scan would be useful to inform decision-making and patient discussions, although most clinicians reported that patients in their practices seldom raised concerns about radiation exposure. Consistently clinicians felt that patient-level cumulative radiation exposure would be most useful, though not currently available. Clinicians also noted that long wait times for imaging studies with less radiation exposure (such as MRI or ultrasound) often acted as a barrier to minimize patient radiation exposure from CT scans. Many felt that to effectively limit radiation exposure would require a system-wide approach that included emergency room and hospital-based clinicians.

Conclusions: Posting patient-specific cumulative radiation exposure information at the site of clinician order entry may improve clinician knowledge and inform clinician-patient discussions regarding risks and benefits of
We sought to evaluate (1) clinician attitudes and practices toward considering cost information when ordering imaging studies in an urban outpatient safety-net setting; and (2) clinician reactions to a planned intervention to post Medicare reimbursement information for imaging studies at the point of clinician electronic order entry.

**Study Design:** We conducted a qualitative study consisting of 9 focus groups among a diverse group of salaried clinicians (6 focus groups with primary care clinicians and 3 with subspecialty physicians). Questions focused on clinician attitudes regarding the effect of costs to patients and to society on their practice, potential harms and benefits of posting Medicare reimbursement information at the site of clinician electronic order entry for ultrasound, computed tomography, and magnetic resonance imaging, and suggestions for improving the intervention. Focus groups were audio-recorded and transcribed. Two researchers (JK, LG) systematically coded the transcripts and discussed differences to reach consensus using an inductive thematic analysis framework to identify emergent themes.

**Population Studied:** We recruited a diverse sample of salaried primary care clinicians and subspecialty physicians (nephrology, pulmonary, and neurology) who deliver outpatient care in an urban safety-net health system. The participating clinicians (N=50) represented 12 hospital-based clinics and community health centers, all of which use a common electronic order entry system.

**Principal Findings:** Clinician responses to incorporating cost in clinical decision-making varied widely. Some clinicians reported regular discussions with patients about costs (to patients and to society) while others were highly concerned about cost influencing individual patient care decisions. In general, clinicians believed that they only ordered clinically impactful tests due to resource constraints in the safety-net and lack of personal financial incentives to order imaging, yet noted that lack of patient co-pays in their practice limited their consideration of costs. Several clinicians expressed ethical concerns with posting reimbursement information at the site of clinician order entry; they worried it could lead to inappropriate rationing of care, and if viewed by patients, could exacerbate patient perceptions of receiving “second class” care in the safety-net. Many clinicians emphasized the limitations of an intervention focused on the costs of imaging tests without a global understanding of other health system costs, which many reported as knowledge they lacked. Clinicians recommended cost-consciousness be promoted through system-wide education and peer-
practice feedback rather than a point of service intervention, particularly in safety-net settings.

**Conclusions:** Initiatives to increase cost-consciousness in health care should incorporate an educational component relevant to the target audience and should monitor for potential unanticipated adverse consequences for patient care, particularly in safety-net settings where patients may be more vulnerable.

**Implications for Policy, Delivery, or Practice:** System-wide education and peer-practice feedback may be more appropriate tools to build cost-consciousness among clinicians in the safety-net than cost transparency at the site of clinician order entry.

**Funding Source(s):** Other, San Francisco General Hospital Foundation Hearts Grant

**Poster Session and Number:** C, #1096

**Health Outcomes of Population-Based Pharmacy Outreach to Increase Statin Use for Primary Prevention in Patients with Diabetes**

*David Grembowski, University of Washington; Melissa Anderson, Group Health Cooperative Research Institute; James Ralston, Group Health Research Institute; Luesa Jordon, Group Health Research Institute*

**Presenter:** David Grembowski, Ph.D., Professor, Health Services, University of Washington, grem@u.washington.edu

**Research Objective:** Few studies have examined whether a large, population-level increase in HMG-CoA reductase inhibitors (statins) use benefits macrovascular disease progression in adults with diabetes. The issue is significant because most deaths among patients with diabetes are from cardiovascular disease. Based on evidence from clinical trials, Group Health (GH) implemented pharmacy-based, system-wide outreach efforts from 2003 to 2005 that increased the preventive use of statins and ACE (angiotensin-converting enzyme) inhibitors in patients at risk for cardiovascular disease, including patients with diabetes. For the population of GH enrollees with diabetes in 1997-2010, aims are to: 1) Describe the utilization of statins and ACE inhibitors in 1997-2010; and 2) Following GH pharmacy outreach, estimate the associations between statin use and major vascular events and total costs in 2006-2010.

**Study Design:** A 13-year longitudinal cohort study design was used to accomplish objectives.

**Population Studied:** The population was 6,975 GH enrollees in the Seattle area with type 1 or 2 diabetes, enrolled continuously in 1997-2010, and no statin use before GH outreach. Health outcomes were all-cause mortality, myocardial infarction, stroke, plus total costs. Statin exposure was measured by cumulative statin utilization since 2003, weighted by the effect of the statin type and dose on LDL (low-density lipoprotein) lowering. Personal, health and health care characteristics also were measured from GH records. Cox proportional hazards regression models estimated the associations between statin use and each health outcome. Generalized linear models were used to estimate the association between statin use and total costs.

**Principal Findings:** Following pharmacy outreach, statin use increased from about 30% to 70% and ACE inhibitor use increased from 60 to 73% in 2003-2005. Of the 6,975 GH enrollees with no statin history at the start of outreach in 2003, only about half were taking statins three years later at the start of the study’s 2006-2010 follow-up period. Cumulative statin use was greater among enrollees with risk factors for cardiovascular disease, and greater statin use was associated with greater use of ACE inhibitors/ARBs. Greater statin use was related to lower incidence of stroke and MI, but greater statin use was associated with greater all-cause mortality, which may be due to confounding by indication. Statin use was unrelated to total costs.

**Conclusions:** We conclude that in patients with diabetes and no statin history prior to pharmacy outreach, GH pharmacy outreach increased the use of statins, and statin use was greater among enrollees with risk factors for cardiovascular disease. In this group of patients, pharmacy outreach had beneficial health outcomes but was unrelated to total costs.

**Implications for Policy, Delivery, or Practice:** Findings contribute to implementation science and support pharmacy outreach as a mechanism for increasing statin use for prevention of cardiovascular disease in patients with diabetes. Findings contribute to the growing evidence that interventions on the entire health system, versus patients or providers, may have the largest benefits for health.

**Funding Source(s):** AHRQ

**Poster Session and Number:** C, #1097
Factors Associated with Guideline-Concordant Adjuvant Therapy among Breast Cancer Patients in Rural Georgia

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Presenter: Gery Guy, Ph.D., M.P.H., Contract Researcher, Department of Health Policy & Management, Emory University, Rollins School of Public Health, gery.guy@gmail.com

Research Objective: To examine factors associated with the receipt of guideline-concordant adjuvant chemotherapy, radiation therapy, and hormonal therapy among women diagnosed with breast cancer in a rural region of the United States.

Study Design: Predictors of guideline-concordant adjuvant therapy, as recommended by the 2000 National Institutes of Health Consensus Development Conference Statement, were examined. Factors associated with receiving guideline concordance with 1) adjuvant chemotherapy 2) adjuvant radiation therapy 3) adjuvant hormonal therapy, and 4) all three adjuvant therapies jointly were examined using multivariable logistic regression. The following variables were examined: patient’s age, race, marital status, insurance status, socioeconomic status, urban/rural status, comorbidities, stage at diagnosis, grade, hormonal receptor status, treatment site, distance to treatment site, and type of surgery performed. Additional logistic regression models were examined using multiple imputation to estimate missing variable values.

Population Studied: The study population consisted of all women residing in a 33-county, largely rural region of Southwest Georgia who were diagnosed with a first, primary, invasive early-stage (AJCC stage I, II, and IIIA) breast cancer from 2001-2003.

Principal Findings: Overall, 41% of women were guideline concordant for all three adjuvant therapies jointly. For individual therapies, guideline concordance was 63% for chemotherapy, 78% for hormonal therapy, and 81% for radiation therapy. After adjustment, higher socioeconomic status was associated with being guideline concordant for all three adjuvant therapies jointly (odds ratio [OR], 3.13, 95% CI, 1.27-7.71), and chemotherapy (OR, 3.13, 95% CI, 1.04-9.42) and Medicaid insurance was associated with guideline concordant chemotherapy (OR, 4.09; 95% CI, 1.50-11.20). Being unmarried was associated with nonguideline concordant chemotherapy (OR, 0.44; 95% CI, 0.22-0.85) and radiation therapy (OR, 0.47; 95% CI, 0.26-0.83) after adjustment. Increased age predicted nonguideline concordance for all three adjuvant therapies jointly, for chemotherapy, and for radiation therapy. The results were robust to the use of multiple imputation.

Conclusions: After adjustment for comorbidities, race, clinical stage, and tumor characteristics, patient age, socioeconomic status, and marital status were independently associated with receiving guideline concordant adjuvant therapy.

Implications for Policy, Delivery, or Practice: Identifying and addressing modifiable factors that lead to non-guideline concordant treatment may reduce disparities in treatment and improve cancer outcomes. Future research should examine the possible reasons for guideline discordance and its potential impact on survival.

Funding Source(s): Other, Georgia Cancer Coalition

Poster Session and Number: C, #1098

Implications of Practice Setting on the Delivery of Physical Therapy Services

Jeffrey Harman, University of Florida; Maggie E. Horn, University of Florida; Steven Z. George, University of Florida; John D. Childs, US Army-Baylor University; Jason Rodeghero, OSF Healthcare - St Joseph Medical Center, Bloomington, IL

Presenter: Jeffrey Harman, Ph.D., Associate Professor, Health Services Research, Management and Policy, University of Florida, jharman@ufl.edu

Research Objective: Musculoskeletal pain is one of the most common reasons for entry into the healthcare system. It has a prevalence rate of up to 65% and affects 116 million US adults. Physical therapy (PT) is a common intervention for musculoskeletal pain and a widespread debate exists regarding the most effective setting to deliver PT services. The purpose of this study was to compare physical therapy functional outcomes and efficiency of care...
delivery among patients receiving PT services in a hospital setting verses private practice setting. We hypothesize that care delivered in the hospital setting will be associated with better functional outcomes and clinicians in this setting will deliver more efficient care.

**Study Design:** This study utilized data in the Focus on Therapeutic Outcomes, Inc (FOTO) database; a de-identified national healthcare database. This study used a prospective cohort design. Demographic and descriptive statistics were performed using t-tests for continuous variables and chi-squared tests for categorical variables when comparing practice settings. Separate linear regression models where performed with functional outcome change score (discharge score-intake score=change score) and efficiency (change score/# of visits=efficiency) as dependent variables. Independent variables and covariates included: practice setting, geographic region, body region, gender, age, type of insurance, duration of symptoms, number of surgeries, number of health problems, and number of visits, receiving prescription medications, exercise frequency and Fear Avoidance Beliefs Questionnaire score. Functional outcomes were measured by standardized outcome assessments designed for each body region. All analyses were performed with STATA 10.0.

**Population Studied:** Patients included in this analysis from the FOTO database included patients from 263 hospitals and 405 private practices in 45 states. 138,025 patients total were included in the analysis (Hospital setting: n=68,010, Private practice setting: n=70,015). The sample had a mean age of 52.63±18.11 years and 39.05±0.48% was male.

**Principal Findings:** Patients receiving PT in the hospital setting had higher functional change scores (mean diff= 1.33, (95%CI 1.16, 1.50), t= 15.52, p<0.0001), better efficiency (mean diff= 2.85, (95%CI 2.85, 3.93), t= 62.72, p<0.0001) and were seen for fewer visits (mean diff= -2.94, (95%CI -3.03,-2.85), t= -62.72, p<0.0001). Those patients receiving PT in the hospital setting achieved on average 3.08 points greater functional change compared to private practice setting ( β=3.08,95%CI -3.93,-0.86, p <0.001). Additionally, those patients receiving PT in the hospital setting required approximately 3 less visits to achieve the same functional improvement as those in the private practice setting ( β=-0.74,95%CI -0.88,-0.59, p <0.001).

**Conclusions:** Although the largest percentage of physical therapists is employed in outpatient settings, this setting may not yield the best functional outcomes or be the most efficient for patients. Our findings support the hypothesis that patients receiving PT in the hospital setting improve with less visits and have greater functional gains compared to patients treated in the private practice setting.

**Implications for Policy, Delivery, or Practice:** The implication of these findings is that when looking at functional outcomes and efficiency only, PT in the hospital setting is more favorable. These findings should be interpreted with caution as they only relate to clinical outcomes and do not factor in expenditures or reimbursement differences between the two settings. Further studies need to be performed to better inform future policy and practices in PT and truly elucidate its value in different practice settings.

**Funding Source(s):** Other, Private Practice Section of the American Physical Therapy Association

**Poster Session and Number:** C, #1099

**Impact of Provider-Level Variation on the Cost of Maternity Care**

Steve Hasley, University of Pittsburgh; Elizabeth E. Krans, MD, MSc, University of Pittsburgh; Kenneth J. Smith, MD, MS, University of Pittsburgh

**Presenter:** Steve Hasley, M.D., Physician, Obstetrics and Gynecology, University of Pittsburgh; hasleysk@mail.magee.edu

**Research Objective:** Maternity care represents the largest single category of hospital expenditures for commercial insurers and state Medicaid programs. Variation in providers’ practice patterns has been hypothesized as a driver of excess health care spending, but this has not been evaluated for maternity care providers. Therefore, objective of this analysis was to determine if provider-level variation in costs and the identification and reduction of costs associated with overutilizing providers could offer cost savings to the health system.

**Study Design:** The study was a retrospective review of inpatient admissions from a large woman’s hospital offering obstetrics and gynecology services from July 2007 through June 2012. For each inpatient admission, the physician, the diagnosis related group (DRG) and cost and charges for all health care services were identified. DRG’s evaluated included a) vaginal delivery, b) cesarean section and c)
hysterectomy. Providers who did not have at least 10 inpatient admissions for the three DRGs were excluded from the analysis.

By each individual physician and for each DRG, the average cost of inpatient admissions was calculated over a two year period of time or “slice”. Then, using rolling two year slices of time with a one year overlap, four slices of time could be obtained over five years. Excessive costs and possible overutilization of health care resources were identified when average costs for a provider for a given DRG was greater than 1SD from the mean for more than 50 percent of the two year time slices. Charges were then substituted for costs and the analysis was repeated.

Finally, to evaluate for the potential for cost savings, we converted the excessive costs associated with overutilizing providers for a two year slice of time to the average cost for that time slice. The difference between each provider’s actual costs and their modeled costs was evaluated.

Population Studied: All inpatient admissions to a large women’s hospital over a 5 year period associated with the DRG a) vaginal delivery, b) cesarean section and c) hysterectomy, (n=82,242) were evaluated. A total of 65 providers had at least 10 inpatient admissions for each of the three DRGs.

Principal Findings: The ability of our analytic method to identify excessive costs and chronic overutilization varied across DRGs (sensitivity 0.5-1.0; specificity 0.89-1.0). Substitution of charges for costs decreased sensitivity but did not change specificity. We estimated an average cost savings of 1.2% (0.19%-5.4%) when excessive costs associated with overutilizing providers were converted to mean costs associated with a given DRG for each two year time slice. If applied to these three DRGs, this would result in an annual savings of approximately $480,000.

Conclusions: The identification and reduction of excessive costs associated with individual providers may provide marginal cost savings for health systems providing maternity care.

Implications for Policy, Delivery, or Practice: Modeling actual versus projected costs associated with an individual provider’s practice patterns may provide insight into potential cost savings for health care systems. Once overutilization associated with a provider is identified, efforts can be made to review practice patterns and patient-level characteristics that could be contributing to excessive costs.

Funding Source(s): No Funding
Poster Session and Number: C, #1100

National Review of Factors Influencing Disparities and Types of Major Lower Extremity Amputations
Tina Hernandez-Boussard, Stanford University; Mohamed Zayed, Stanford University; Fritz Bech, Kennedy University Hospital

Presenter: Tina Hernandez-Boussard, Ph.D.,M.P.H., Assistant Professor, Surgery, Stanford University, boussard@stanford.edu

Research Objective: Despite advancements in diagnosis and treatment of peripheral vascular disease, major lower extremity amputations are still performed at high rates with non-negligible economic burdens. Peri-operative morbidity and mortality is greater for patients who receive an above knee amputation (AKA) compared to patients who receive a below knee amputation (BKA). We sought to further evaluate what variables affect whether a patient receives an AKA versus a BKA procedure.

Study Design: AKA and BKA procedures were identified in the Nationwide Inpatient Sample (NIS) database. Rates of AKA and BKA were evaluated according to patient demographics, co-morbidities, extent of pre-amputation vascular intervention, hospital setting/type, and geographic region. Limb salvaging procedures were identified using ICD-9-CM codes during the same hospitalization as the amputation. Multivariate logistic regression and 2-way ANOVA analyses was used to determine statistical significance.

Population Studied: Adult above and below knee amputations were identified in the NIS database using ICD-9-CM codes from 2005 to 2008 (AKA 84.17; BKA 84.15). Patients with traumatic and oncologic diagnoses were excluded from the analysis.

Principal Findings: A total of 228,624 patients met inclusion criteria (126,076 BKA, 102,548 AKA). The number of amputations decreased annually by 2.8% (p<.0001). A greater proportion of patients who received an AKA vs. BKB were female (p<.0001), older (p<.0001), non-privately insured (p<.0001), and with a higher comorbidity Index (p<.0001). A larger proportion of patients who received a BKA had hypertension, diabetes, and a spinal cord injury (p<.0001). Less limb salvage vascular interventions were attempted in low-volume hospitals (LVH) compared to higher volume hospitals (LVH).
hospitals and in patients who received AKA (p<.0001). Whites were more likely to receive limb salvaging procedures prior to amputation at low-, mid-, and high-volume hospitals compared to other races (p<.0001). The strongest predictors of receiving a pre-amputation limb salvaging procedures within the same hospital stay included: care received at HVH vs LVH (odds ratio [OR]: 1.20, 95% confidence interval [CI]: 1.05-1.38); Black vs. white race (OR: 0.82, CI: 0.73-0.92); Medicaid vs. private payer (OR: 0.86, CI: 0.75-0.98).

**Conclusions:** Demographic differences exist between patients who receive a BKA versus an AKA. More HVH attempted revascularization through limb salvaging procedures compared to LVH. Within HVH, whites were more likely to receive limb salvaging procedures compared to other races. Our findings underscore the importance of more aggressive surveillance and preventative care of at risk populations.

**Implications for Policy, Delivery, or Practice:** Our data suggest that racial and payer disparities exist in rates of limb salvaging procedures. Higher volume centers were more likely to attempt revascularization in patients who ultimately received either a BKA or AKA, suggesting that these centers were more often aggressive in their treatment paradigms. However, disparities exist at these high volume centers, with whites more likely to receive a limb-salvaging procedures compared to other races. These results help explain racial differences in amputation rates. Underlying causes of disparate rates of limb salvaging procedures at high volume centers will help close the quality gap.

**Funding Source(s):** AHRQ

**Poster Session and Number:** C, #1101

**Volume Based Analysis of Left Ventricular Assist Devices**

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**Presenter:** Sam Hohmann, Senior Manager, University HealthSystem Consortium, hohmann@uhc.edu

**Research Objective:** Left ventricular assist devices (LVADs) provide mechanical circulatory support to patients with end-stage heart failure. The use of these devices in the United States has been increasing since the FDA approved the first device in 1994. There is little known about relationship between LVAD procedural volume and patient outcomes, despite large variation across hospitals and surgeons in the volume of LVAD procedures performed. This study sought to explore whether a correlation exists between hospital and surgeon LVAD procedural volumes and in-hospital mortality.

**Study Design:** We conducted a retrospective cross-sectional analysis of all patient discharges from UHC member hospitals between January 2008 and June 2012 after an insertion of an LVAD during their hospitalization. The primary outcome was all cause in-hospital mortality. Average annual LVAD surgeon volume was calculated as the ratio of total procedures to the number of years data was collected. Average annual surgeon LVAD volume was then grouped by tertile. Low volume surgeons were defined as having an average annual LVAD procedure volume between 1 and 12 devices. Surgeons with procedure volume between 12 and 21 per year were categorized as medium volume, and high volume surgeons performed 22 and greater LVAD procedures on average annually.

**Population Studied:** Patients were identified from UHC’s Clinical Database/Resource Manager (CDB/RM) on the basis of the principal or secondary International Classification of Diseases Ninth Revision, Clinical Modification (ICD-9-CM) procedure code 37.66. In 67 hospitals, at least 5 LVAD procedures were performed during the study period, representing 5,920 patients.

**Principal Findings:** A significantly lower proportion of patients seen by a high volume surgeon died during their hospital stay (13% mortality), compared to patients seen by medium (15%) and low volume surgeons (18%). There was significant variation in the mortality for almost all study variables including: age, gender, admission severity of illness, and admission risk of mortality.

**Conclusions:** Our results demonstrate as association between and surgeon volume and in-hospital mortality. LVADs are becoming an increasingly common treatment method for patients with end-stage heart failure and are either waiting transplant or will receive the device as the final method of therapy. Identifying critical volume thresholds could improve...
Association between Outpatient Visits Following Hospital Discharge and Readmissions among Medicare Beneficiaries with Atrial Fibrillation

Mai Hubbard, Mathematica Policy Research, Incorporated; Sloane Frost, Mathematica Policy Research; Kimberly Siu, Boehringer Ingelheim Pharmaceuticals Inc.; Nicole Quon, Boehringer Ingelheim Pharmaceuticals Inc.; Dominick Esposito, Mathematica Policy Research

Research Objective: Beginning in 2013, the Centers for Medicare & Medicaid Services (CMS) will penalize hospitals for certain excessive 30-day readmission rates. While studies examine the relationship between outpatient follow-up and readmission rates for persons with coronary artery disease (CAD), chronic obstructive pulmonary disease (COPD), heart failure (HF), and diabetes, beneficiaries with atrial fibrillation (AF), of which there were an estimated 2.66 million in 2010, are widely overlooked. This study examines the relationship between outpatient visits within 14 days after hospital discharge and readmission within 30, 60, and 90 days.

Study Design: We analyzed Medicare fee-for-service claims and enrollment data (2006-2009) for beneficiaries with AF and those with other non-AF chronic conditions (CAD, COPD, HF, and diabetes). The association between an outpatient visit within 14 days of hospital discharge and 30-, 60-, and 90-day all-cause readmission was evaluated using logistic regression. Readmission rates were calculated at the beneficiary level rather than at the discharge level.

Population Studied: The study population included 283,580 AF beneficiaries and 375,655 beneficiaries without AF but with other chronic conditions.

Principal Findings: The 30-, 60-, and 90-day patient-level readmission rate for AF beneficiaries was 10.9%, 16.8%, and 21.1% compared to slightly lower rates of 9.3%, 14.1%, and 17.9% for those with non-AF chronic conditions. Among those with a hospitalization, 51.4% of AF beneficiaries and 47.0% of other beneficiaries had an outpatient visit within 14 days of discharge. The rate of readmission was 11% to 24% lower for AF and non-AF beneficiaries with an outpatient visit compared to those without a visit (30 days: 9.5% vs. 12.4% for AF and 8.0% vs. 10.5% for non-AF; 60 days: 15.4% vs. 18.3% for AF and 12.9% vs. 15.3% for non-AF; and 90 days: 19.8% vs. 22.4% for AF and 16.7% vs. 18.9% for non-AF).

Conclusions: Medicare beneficiaries with AF had slightly higher readmission rates than their peers with other common chronic conditions. Having an outpatient visit within 14 days of discharge was associated with a lower likelihood of 30-day readmission and may suggest that improved care coordination might lower hospitals' risks of being penalized for readmissions.

Implications for Policy, Delivery, or Practice: As hospitals work to reduce readmissions and providers seek to improve transitions of care, efforts to better control AF quality of care will become increasingly important. Although there are limitations to using administrative claims data for research purposes, such as the reliability of coding of diagnosis codes and procedures, this nationally representative analysis of Medicare beneficiaries provides essential information on the readmission rates for AF beneficiaries. A better understanding of the causes for readmissions for Medicare beneficiaries with AF might help in the design of programs that aim to reduce such readmissions and improve Medicare beneficiaries' quality of life.

Funding Source(s): Other, Boehringer Ingelheim Pharmaceuticals Inc.

Poster Session and Number: C, #1103

Implementing a Lean Management System in Primary Care: Facilitators and Barriers from the Frontlines

Dorothy Hung, Palo Alto Medical Foundation Research Institute; Caroline Gray, PAMFRI; Katie Anderson, PAMF; James Hereford, PAMF
Research Objective: Approximately $750 billion is wasted in the U.S. health system each year, equivalent to roughly one-third of every medical dollar. “Lean” thinking and techniques offer promising solutions by maximizing all care processes that add value to the patient, while eliminating those that do not (i.e., reducing waste in the system). This study examines a large, multispecialty practice’s journey of implementing a Lean management system beginning in primary care. We sought to understand initial drivers and barriers to implementation, with lessons contributing to a broader learning system of quality improvement.

Study Design: Qualitative case study of in-depth interviews and focus groups of primary care staff using inductive, grounded methodology. By identifying points of contention and/or agreement, we gained initial insights into how personnel are experiencing Lean-based changes, and facilitators and barriers to the implementation process.

Population Studied: 16 physician and administrative leaders, 14 medical assistants and administrative staff

Principal Findings: Informants’ thoughts about implementing Lean, and the barriers and facilitators to doing so successfully, were clustered around three main themes: organizational leadership, professional values/culture, and availability of resources. Informants described the need for strong leadership and the importance that leaders embody the qualities that they are espousing, willingness to engage all levels of staff in the change process, and willingness to adjust performance measures according to new job roles to ensure a successful transition to the new system of care delivery. However, many noted that professional values and norms surrounding clinical practice may be at odds with Lean principles, namely the strong focus on standardizing work processes to identify and eliminate waste. This may represent the biggest challenge for physicians who have practiced successfully for many years, and who have been socialized into a culture where independent thinking and autonomy is valued. Availability of organizational resources was also cited as a critical factor in executing changes.

Informants indicated that the most important resource is time, i.e., to do one’s regular work while also helping to implement change, and time that it takes to absorb new ideas and changes. Many also focused on physical space, as Lean “co-location” of physicians and staff requires having adequate space configurations.

Conclusions: Barriers and facilitators to implementing Lean in health care included issues surrounding organizational leadership, professional values/culture, and availability of resources. In a Lean system, “value” is seen first from the patient perspective and while this is a point of easy agreement, how that principle is operationalized in practice can be fraught with challenges that must be negotiated. These challenges may be addressed in part by strong leadership and adequate resources. Further study is currently underway with additional findings to be presented.

Implications for Policy, Delivery, or Practice: Lean is a non-traditional approach to delivering care; rather than organizing the system around providers as has been the case historically, Lean focuses on what is most valued by patients and organizing care to efficiently deliver value from the patient perspective. Due to this alternative approach, organizations seeking to adopt Lean will benefit from lessons on real-world implementation efforts.

Funding Source(s): AHRQ

Are Women Being Over-screened for Cervical Cancer? Screening Frequency since the 2009 American College of Obstetrics and Gynecology Guidelines

J. Elizabeth Jackson, Battelle Memorial Institute; Laura-Mae Baldwin, MD, MPH, University of Washington, Department of Family Medicine; Janelle Guirguis-Blake, MD, Tacoma Family Medicine; Gina Keppel, MPH, University of Washington, Department of Family Medicine

Presenter: J. Elizabeth Jackson, Ph.D., Research Scientist, Center for Analytics and Public Health, Battelle Memorial Institute, jacksonje@battelle.org

Research Objective: To evaluate rates and correlates of over-screening, under-screening and appropriate screening for cervical cancer in two family medicine practices. Based on evidence that less frequent cervical cancer screening is safe and cost effective, in 2009 the American College of Obstetrics and Gynecology
(ACOG) recommended decreasing the frequency of cervical cancer screening to every 3 years for women ages 30-64 with 3 consecutive negative screening tests and no high risk conditions. The degree to which primary care providers follow the 2009 recommendations is unknown.

**Study Design:** Cross-sectional descriptive study including women randomly selected from two family medicine practices. Eligible women were: 1) ages 33-64 at the end of the observation period; and 2) active patients in the practice throughout the 36-month observation period. Patient data were abstracted from electronic health records; 10% of abstracted records were re-abstracted by a senior investigator. Pap test dates and findings were recorded over the 36-month observation period, the last 12 months being after the change in ACOG recommendations. Women were excluded if they had a history of HIV, cervical cancer, or hysterectomy, or pap/HPV test findings indicating the need for cervical cancer screening more often than every 3 years. Based on pap testing in the 24 months prior to the ACOG recommendation change (the “reference period”), rates of cervical cancer over-screening, under-screening, or appropriate-screening were calculated for the eligible study population in the year after the change (the “observation period”; e.g., women with one or more pap tests in the reference period were over-screened if they also had a pap test in the observation period, and appropriately screened if they had no pap test in the observation period). Multinomial logistic regression was used to evaluate the association of patient characteristics (age, race/ethnicity, marital status, pregnancy status, number of visits, practice) with screening status. Analyses were weighted and the standard errors were adjusted for the sampling plan.

**Population Studied:** Women aged 33-64 (n=153) from two urban family medicine practices.

**Principal Findings:** The two practices varied in their screening rates: in practice 1, 30% of patients were under-screened and 12% were over-screened; in practice 2, 23% of patients were under-screened and 24% were over-screened. In preliminary multivariate models including both practices, married/partnered women were significantly more likely to be over-screened than unmarried/unpartnered women, and women with more office visits were less likely to be under-screened.

**Conclusions:** Nearly one in five women who received regular health care and were eligible for every 3 year cervical cancer screening were over-screened for cervical cancer. One in four women were under-screened for cervical cancer, even with less frequent screening intervals.

**Implications for Policy, Delivery, or Practice:** Even with a 3-year cervical cancer screening interval, women in regular medical care in these practices are about as likely to be under-screened as over-screened. Systems-based strategies to recall patients for critical preventive tests such as cervical cancer screening may improve adherence to screening guidelines.

**Funding Source(s):** No Funding

**Inappropriate Boarding: Cost and Quality Issues of Incapacitated Patients Requiring Guardianship**

Margaret Kornuszko-Story, Lehigh Valley Health Network; Kari Jones, Quantitative Health Research, Incorporated; Kari Jones, Lehigh Valley Health Network; Michelle Flores, Lehigh Valley Health Network; Hannah Paxton, Lehigh Valley Health Network; Jeff Etchason, Lehigh Valley Health Network

**Presenter:** Kari Jones, Ph.D., Health Economist, Quantitative Health Research, Incorporated, kjones@qhr-econ.com

**Research Objective:** Many patients who are found to be mentally incapacitated during their acute hospital stays subsequently board in the hospital for many days or weeks waiting for resolution of legal issues related to obtaining the guardian required for their discharge and post-hospital placement. This is not only costly to hospitals and payors, but puts the patient at risk for adverse events such as falls and hospital-acquired infections. One county in Pennsylvania developed an expedited process in order to assign a temporary guardian and facilitate further care.

The study objective is to evaluate the expedited guardianship process with regard to cost and quality issues of patients that required and received guardianship services during their hospital stay. Length of stay, adverse events, and costs of guardianship patients who received guardianship through the traditional process versus through the expedited process were compared.

**Study Design:** This is a retrospective cohort study by chart review. A Mann-Whitney non-
parametric test is used to compare number of days between patients’ date of first competency hearing (citation date) and discharge date for patients receiving guardians through the traditional process versus those receiving the streamlined process. Frequencies of adverse events were tallied.

**Population Studied:** The study included guardianship patients identified by our legal department from 1999-2011. Patients were treated in a multi-hospital network in the northeast.

**Principal Findings:** Fifty-nine guardianship patients were included. They were 41 percent female, most were in the age group of 75 to 84, were 90 percent white, 68 percent had Medicare, and 17 percent were dually eligible. Forty percent were treated for nervous system and mental health disorders. Sixty-six percent of patients stayed between 31 and 90 days; the overall range was 10 to 150 days. The intervention group’s median days between citation date and discharge (LOS) was 7 and the traditional group’s was 21 (p=.004). However, controlling for the effect of time, the effect of the expedited guardianship is insignificant. Seventy percent of the intervention group and 68 percent of the traditional group experienced adverse events. We also found no difference in costs between the two groups.

**Conclusions:** Despite finding no statistically significant differences between the groups, we feel this is an important problem and a national dialogue should be started. The major limitation of this analysis is a small sample size and is the most likely reason that our findings were not significant. Mid-study it was discovered that a subset of the traditional group was actually benefitting from an expedited guardianship process as well. Thus there were 3 groups of patients and sample size issues were exacerbated. The decreasing LOS may indicate that these expedited processes are beneficial for hospitals, payors, and guardianship patients. Future research could include multiple sites in order to increase sample size and be prospective to capture more meaningful data. The data is qualitatively rich and could benefit from mixed methods to further tease out learnings.

**Implications for Policy, Delivery, or Practice:** With the aging of the population, this problem is likely to increase. A research agenda and national dialogue will bring together healthcare and legal professionals committed to sharing knowledge and addressing this problem.

**Funding Source(s):** Other, Pool Trust

**Poster Session and Number:** C, #1106

**Medication Adherence and Readmission in Medicare Myocardial Infarction**

Yuting Zhang, University of Pittsburgh; Cameron Kaplan, University of Pittsburgh; Cameron M. Kaplan, University of Pittsburgh; Seo Hyon Baik, University of Pittsburgh; Chung-Chou H. Chang, University of Pittsburgh; Judith R. Lave, University of Pittsburgh

**Presenter:** Cameron Kaplan, Ph.D., Postdoctoral Associate, Health Policy & Management, University of Pittsburgh, ckaplan@pitt.edu

**Research Objective:** We examine the relationship between 6-month medication adherence after discharge and down-stream heart-disease related readmissions among US Medicare patients who survived an MI.

**Study Design:** We conducted a nested case-control study design. The case group included patients who had their first heart-disease related readmission post-MI discharge during a specific time window (collected twice for 6-9 months post-MI and 9-12 months post-MI). The control group was identified using propensity score matching methods by selecting patients who had not been readmitted by the date that case patients were admitted.

We then defined adherence for all MI drugs and β-blockers separately during the 6-month period prior to the first readmission. We measured adherence by medication possession ratios (MPR) and defined an indicator for good adherence (1=MPR=0.80; 0=otherwise). We performed two types of regressions: rate logistic regression and binary logistic regression, after propensity score matching. Robust standard errors were used to adjust for the dependence within matched group.

**Population Studied:** We used claims data on 100% of Medicare fee-for-service beneficiaries discharged post-MI in 2008 and followed them up until December 31, 2009.

**Principal Findings:** The rates of heart-disease related readmission during the period from six months to 18 months after discharge were 25.0% vs 29.9% (P<0.001) among those with and without good adherence for the recommended medications (β-blockers, statins, and ACEIs/ARBs), respectively. After controlling for demographic, insurance coverage and clinical characteristics, patients who had a heart-
The objective of our study is to investigate the multidisciplinary organisation within hospitals. was introduced to assess and improve the treatment became increasingly multi-method in the Netherlands. The dominant external quality assessment the Netherlands/Centre the Netherlands/University of Twente Candidate Presenter:
Cancer Institute Cancer Centre The Netherlands/Netherlands Dijk Netherlands/University of Twente Siesling Netherlands/University of Twente Melvin Patients in the Netherlands Treatment and Survival in a Large Cohort of Multidisciplinary Colorectal Cancer The Impact of External Peer Review on Multidisciplinary Colorectal Cancer Treatment and Survival in a Large Cohort of Patients in the Netherlands Melvin Kilsdonk, Comprehensive Cancer Centre the Netherlands/University of Twente; Sabine Siesling, Comprehensive Cancer Centre The Netherlands/University of Twente; Boukje van Dijk, Comprehensive Cancer Centre The Netherlands; Renée Otter, Comprehensive Cancer Centre The Netherlands; Wim van Harten, University of Twente/ Netherlands Cancer Institute

**Presenters:** Melvin Kilsdonk, M.D., Phd Candidate, Research, Comprehensive Cancer Centre the Netherlands/University of Twente, m.kilsdonk@iknl.nl

**Research Objective:** External peer review is the dominant external quality assessment method in the Netherlands. When cancer treatment became increasingly multi-disciplinary in the 1990’s, an external peer review program was introduced to assess and improve the multidisciplinary organisation within hospitals. The objective of our study is to investigate the association between this program for multidisciplinary cancer care and aspects of multidisciplinary treatment and survival of colorectal cancer. Colorectal cancer was amongst the first tumours to require guideline based multidisciplinary treatment; three major (multidisciplinary) treatment innovations have been introduced in the last 25-30 years: 1) the introduction of adjuvant chemotherapy in stadium III colon cancer, 2) preoperative radiotherapy in T2/T3 rectal cancer and 3) preoperative chemoradiation in T4 rectal cancer.

**Study Design:** The Netherlands Cancer Registry was used to obtain tumour characteristics, treatment and survival data from every newly diagnosed patient with colorectal cancer. We selected patients that were diagnosed between 1990-2010 in 30 hospitals in the Netherlands. There are interregional differences in the program participation rate between these hospitals, due to a gradual introduction of the program in our country. In the North of the Netherlands 13 hospitals participated in three cycles and in the South/Rotterdam region 10 hospitals participated in two cycles of the program. A control group was added, consisting of patients from 7 hospitals representing regions where the program was not introduced yet. The hospitals were additionally categorized by their implementation rate of the recommendations that were given in the final reports of each participation.

**Population Studied:** 45710 patients were diagnosed with colorectal cancer: 31895 patients with colon cancer (22157 intervention and 9738 controls) and 13815 with rectal cancer (9488 intervention and 4327 controls).

**Principal Findings:** Patients diagnosed in hospitals in the North region with a higher implementation rate of the recommendations given in the final reports of three participations, were more likely to receive preoperative radiotherapy in T2/T3 rectal cancer and adjuvant chemotherapy in stadium III colon cancer when compared to hospitals with a lower implementation rate and the control group (p<0.05). An early adopter effect was apparent. No significant differences were seen in the introduction of preoperative chemoradiation in T4 rectal cancer. For patients from the South/Rotterdam region there was only a positive correlation between program participation and the use of preoperative radiotherapy in T2/T3 rectal cancer.
No statistically significant differences were observed in 5-year survival between patients from different hospital categories.

**Conclusions:** Our study reveals a complicated association between external peer review and survival and the introduction of new treatment modalities for colorectal cancer patients. Although one would expect outcomes to improve based on quality management efforts, this can only be partly confirmed.

**Implications for Policy, Delivery, or Practice:** Improved organization may be a value per se; however if external quality assessment should provide measurable benefits for individual patients, programs need to focus on specific aspects of the delivery of care and clinical outcomes. Possibly a link with clinical audit systems and national registries can lead to the reduction of administrative workload of these programs and improved acceptance for continued peer review in the future.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #1108

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**Implications of Value-Based Insurance Design for Total Knee Replacement**

Lane Koenig, KNG Health Consulting, LLC; David Ruiz, Jr, KNG Health Consulting

**Presenter:** Lane Koenig, President, KNG Health Consulting, LLC, lane.koenig@knghealth.com

**Research Objective:** Value-based insurance design (VBID) is gaining traction as an innovative approach to slowing the growth of health care costs and improving quality. In VBID plans, health care services and products that provide high value to patients are available to plan members at low or no cost, while plan members may have high copayments for services that are viewed as low value or overutilized. Total knee replacement (TKR) for osteoarthritis (OA) is a procedure frequently targeted by payers, because of its high cost, high volume, and unwarranted geographic variation. In April 2011, Oregon introduced a VBID plan for most state employees who will have to pay an additional $500 copayment for TKR and other "preference-sensitive" services. Using Oregon as a case study, we assess the potential economic impact of reduced access to TKR on working-age patients. TKR is an interesting example for two reasons: (1) TKR is being increasingly performed on younger adults who are still working; (2) TKR has been shown to be a highly cost-effective procedure. Thus, fewer TKRs may yield savings in direct costs but could increase indirect costs associated with employment and productivity.

**Study Design:** We apply a Markov model to an age-stratified, state-employed cohort to assess the incremental costs and outcomes of TKR as compared to non-surgical treatment of end-stage knee OA. The model incorporates indirect costs associated with missed work days and lower productivity from end-stage knee OA.

**Population Studied:** Working-age state employees in Oregon.

**Principal Findings:** We found that the societal benefits from TKR more than offset the cost of surgical treatment, with TKR producing average net societal savings of $37,535 over a patient's lifetime. Moreover, we modeled scenarios in which an individual delays TKR to assess the potential impact of Oregon's VBID. In a scenario with no delay, the individual retains the $37,535 in savings to society. However, delaying TKR reduces societal benefits: If TKR is delayed for 7 years, societal savings turns into a loss of -$1,858 per patient.

**Conclusions:** An integral component of value-based insurance design is the classification of procedures as either "high-value" or "low-value" services. Incorrect classification of a given procedure could result in economic inefficiency, as well as reduced quality of life for patients. The Oregon VBID imposes the same level of copayment for TKR regardless of patient severity or functional limitations. A more nuanced policy with cost-sharing levels adjusted to differing patient needs could help increase the value of healthcare spending.

**Implications for Policy, Delivery, or Practice:** Although attention to short-term costs is necessary, policymakers should examine the full value of a procedure to both patients and society. In some cases, the indirect costs of forgoing medical treatment, such as reduced wages, may offset potential program savings.

**Funding Source(s):** Other, American Academy of Orthopaedic Surgeons

**Poster Session and Number:** C, #1109

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**A Census of State-Based Consumer Health Care Price Websites**

Jeffrey Kullgren, Ann Arbor VA Healthcare System and University of Michigan Medical School; Katia A. Duey, University of Pennsylvania; Rachel M. Werner, Philadelphia VA Medical Center and University of Pennsylvania
**Presenter:** Jeffrey Kullgren, M.D., M.P.H., M.S., Assistant Professor, Ann Arbor VA Healthcare System and University of Michigan Medical School, jkullgre@med.umich.edu

**Research Objective:** As Americans’ out-of-pocket health care costs continue to rise, many health plans, consumer groups, and state governments are reporting health care price information directly to patients. Though there is broad recognition that this information must be relevant, accurate, and usable to improve the value of patients’ out-of-pocket spending, it is currently unknown what information is actually being reported to patients. The objective of this study was to describe the types of information that are currently being reported on state consumer health care price websites and identify opportunities to improve the usefulness of this information for patients.

**Study Design:** We conducted a systematic internet search to identify state-based patient-oriented health care price websites that were operational in early 2012. We chose to focus on state-based websites since states are a focal point for health care price transparency initiatives and often publicly report the health care price information they collect under legislative or regulatory authority. For each website we identified, we classified the type of organization that reported the information, the kinds of health care services for which prices were reported, the type of price information that was reported (e.g., out-of-pocket cost, allowable charge, or billed charge), the patient-level factors that were incorporated in the estimate, and the presence of quality information alongside the reported price information. We then calculated frequencies for each of these characteristics.

**Population Studied:** State-based patient-oriented health care price websites that were operational in early 2012.

**Principal Findings:** We identified 62 state health care price transparency websites, most of which were provided by either a state government agency (47.8 percent) or state hospital association (38.7 percent). Most websites reported information on prices of inpatient care for medical conditions (72.6 percent) or surgeries (71.0 percent); prices for outpatient services such as diagnostic or screening procedures (37.1 percent), radiology studies (22.6 percent), prescription drugs (14.5 percent), or laboratory tests (9.7 percent) were reported less often. The reported prices usually reflected only billed charges (80.6 percent). For outpatient services that commonly include both facility and professional fees (e.g., diagnostic procedures or radiology studies), the majority of price estimates (66.0 percent) included just facility fees. Only a small minority of prices were tailored to individual circumstances that commonly affect what a patient is truly expected to pay out-of-pocket for a service, such as their insurance status (9.7 percent) or specific health plan (8.1 percent). For services where price and quality information together could help patients assess value across providers (e.g., outpatient clinician services or outpatient surgeries), quality information was infrequently portrayed alongside prices (13.2 percent).

**Conclusions:** Most states now have websites that report health care prices directly to patients. However, the information being reported on these state health care price websites is unlikely to be useful for most patients, and often fails to reflect the true prices they would actually face for services.

**Implications for Policy, Delivery, or Practice:** Improvements in the relevance, accuracy, and usability of publicly reported health care prices could help this information reach its full potential to improve the value of out-of-pocket health care spending for patients.

**Funding Source(s):** VA

**Poster Session and Number:** C, #1110

**Factors Associated with Primary Care Physicians’ Use of Patient-Centered Communication**

Jennifer Elston Lafata, Virginia Commonwealth University; L. Aubree Shay, Virginia Commonwealth University; Richard L. Street, Texas A&M University; Richard Brown, Virginia Commonwealth University

**Presenter:** Jennifer Elston Lafata, Ph.D., Professor, Center for Health Services Research, Virginia Commonwealth University, jelstonlaf@vcu.edu

**Research Objective:** Patient-centered communication is now considered central to high-quality health care. Communication is impacted not only by personal influences of those communicating, but also by the contextual environment in which the communication takes place. Clinician use of patient-centered communication may be impacted by environmental influences such as electronic medical records (EMRs), patient written
reminders, and health risk appraisals (HRAs). How these increasingly present environmental factors foster or inhibit clinicians' use of patient-centered communication is not known. Controlling for physician and patient personal influences, including patients' self-reported depressive symptoms and decision-making participation preference, we evaluate environmental influences on physician use of patient-centered communication.

**Study Design:** Observational study of N=485 periodic health examinations in primary care. Physician characteristics were obtained from administrative records. Patient characteristics were obtained from a pre-visit survey. Research assistants completed a visit observation checklist that recorded: time the physician was present in the examination room; physician use of EMR; physician use of HRA; and patient use of a written reminder of topics to discuss. Physician communication during the visit was obtained via audio-recordings. Two physician communication behaviors were evaluated: self-initiated partnership building and supportive talk. (Street, 2001) Three research assistants coded recordings by listening while reading transcripts. Inter-rater reliability was assessed with Cohen’s kappa and was 0.66 for physician partnership building and 0.74 for physician supportive talk. A structural equation model, that considered the hierarchical structure of the data, was fit to estimate the association of personal and environmental factors on physician use of self-initiated partnership building and supportive talk.

**Population Studied:** Clinicians (n=64) were salaried family and general internal medicine physicians. Patients (N=485) were HMO-insured, aged 50 to 80 years, and due for colorectal cancer screening at the time of the visit scheduled with a study-participating physician between February 2007 and June 2009.

**Principal Findings:** Among visits, mean patient age was 59 years, 65% women, 28% black, and 9% reported depressive symptoms; mean physician age was 50 years, 57% women, 14% black and 68% general internists; 81% of visits used the EMR, 13% an HRA, and 11% a patient written reminder. Physicians engaged in more supportive talk with patients reporting depressive symptoms and when HRAs were used, and less with patients who brought a written reminder. Physicians used more partnership building with more educated and black patients, and less with patients who brought a written reminder or who had recently seen them. Visits with older physicians included more supportive talk, while those with black physicians used less partnership building. No other factors, including race and gender concordance, patient decision-making preference, EMR use, or how long the patient waited after the scheduled appointment time were significantly associated with physicians' use of patient-centered communication. 

**Conclusions:** While patient-centered communication was associated with physician and patient factors, environmental factors also played a role. Specifically, HRAs had a positive influence on patient-centered communication while patients' written reminders had a negative influence.

**Implications for Policy, Delivery, or Practice:** The impact of commonly present environmental factors on the quality of office visit communication needs to be continually monitored for both positive and negative consequences to patient-centered communication.

**Funding Source(s):** NIH

**Poster Session and Number:** C, #1111

**Preventive Service Use among Colorectal Cancer Survivors**

Jennifer Elston Lafata, Virginia Commonwealth University; Ramzi G. Salloum, PhD, University of North Carolina; Debra Pearson Ritzwoller, Ksier Permanente Colorado; Paul Fishman, Group Health Cooperative; Maureen Okeef Rosetti, Kaiser Permanente Northwest; Mark C. Hornbrook, Kaiser Permanente Northwest

**Presenter:** Jennifer Elston Lafata, Ph.D., Professor, Center for Health Services Research, Virginia Commonwealth University, jelstonlafat@vcu.edu

**Research Objective:** Early detection and improved treatment have lead to longer survival among cancer patients. For many cancer survivors, including colorectal cancer (CRC) survivors, the risk of mortality from co-morbid conditions exceeds that from their original disease. Little is known about the use of evidence-based clinical preventive services among CRC survivors, particularly survivors aged <65 years. We evaluate receipt of US Preventive Service Task Force recommended preventive health screenings among CRC survivors aged >=50 years.
Study Design: Case/control design with controls assigned a pseudo diagnosis date. All data were obtained from automated clinical and administrative data repositories available within 4 participating health plans (Group Health Cooperative, Health Alliance Plan/Henry Ford Health System, and Kaiser Permanente Colorado and Northwest). Cases and controls were followed annually for up to 5 years post diagnosis dates. Preventive service use evaluated included mammography for breast cancer screening (MAM) and Papanicolaou testing for cervical cancer screening (PAP) as well as cholesterol screening (CHOL) and bone densitometry testing (BONE). Unadjusted and adjusted models were fit in SAS® using PROC GLIMMIX to evaluate differences in the annual likelihood of service use by case/control status. Adjusted models controlled for patient age (<65/>=65), gender (as relevant), Charlson-Deyo Comorbidity Score, and years since diagnosis. All models accounted for repeated observations per patient and health plan clustering.

Population Studied: Cases (N=1,829) were HMO-insured and diagnosed (per tumor registry) with in situ, local or regional CRC between 1/1/2000 and 12/31/2008. HMO-insured controls (N=18,834) with no cancer diagnosis were distribution-matched on birth year, diagnosis year, and gender.

Principal Findings: The likelihood of PAP, but not MAM or BONE, was significantly greater (p<0.01) among female survivors relative to female controls in all years. This was true for survivors >=65 where annual screening rates for PAP year 1 - year 5 post-diagnosis ranged from 91%-92% in cases vs. 72%-76% in controls; MAM: 38%-46% in cases vs. 36%-44% in controls; BONE 7%-8% in cases vs. 8%-9% in controls, and those <65 where PAP: 88%-87% in cases vs. 67%-73% in controls; MAM: 51%-54% in cases vs. 50%-54% in controls; BONE 8%-9% in cases vs. 8%-9% in controls. On the other hand, survivors both >=65 and <65 were significantly less likely to use CHOL in all years (39%-37% in cases vs. 45%-46% in controls and 30%-21% in cases vs. 40%-37% in controls, respectively). In adjusted models (n=5,104 case patient years and n=59,452 control patient years) we found significant (p<0.0001) differences in CHOL (OR=1.25), BONE (OR=0.51), PAP (OR=0.24) and MAM (OR=0.23) by control/case status.

Conclusions: CRC survivors compared to matched controls are more likely to receive PAP, MAM and BONE screening, but less likely to receive CHOL screening in the 5 years following diagnosis.

Implications for Policy, Delivery, or Practice: Programs need to be designed, validated, and implemented to ensure that CRC survivors receive not only recommended surveillance and screenings for other cancers, but also recommended screening for cardiovascular disease.

Funding Source(s): NIH
Poster Session and Number: C, #1112

A Realist Evaluation of a Nurse Practitioner-Led Care Transition Intervention
Natasha Lane, University of Toronto; Kristen B. Pitzul, University of Toronto; Anu MacIntosh-Murray, University of Toronto; G. Ross Baker, University of Toronto; Walter P. Wodchis, University of Toronto

Presenter: Natasha Lane, M.S., B.Sc., MD-PhD Student, Institute of Health Policy, Management and Evaluation, University of Toronto, natasha.lane@mail.utoronto.ca

Research Objective: Evidence suggests that the effectiveness of care transition interventions at decreasing readmissions and Emergency Department (ED) visits among older, high-risk adults is sensitive to numerous contextual and implementation factors. The aim of this study was to elucidate these factors in a realist evaluation of a pilot NP-led care transition intervention intended to reduce readmissions and ED visits among high-risk seniors.

Study Design: This case study was based on the core elements of Coleman's Care Transition Intervention. Summative semi-structured interviews were administered to clinical decision makers, hospital staff, and Community Care Access Center (CCAC) staff. A research assistant conducted unstructured formative interviews of participants. The intervention NP also provided a summative report of her experience to investigators.

Population Studied: Patients at high-risk of readmission were recruited from two academic tertiary care institutions. A screening tool, known as the LACE score, was used to determine risk of readmission. Eligible patients were 65 years or older, had a LACE score of greater than or equal to 10, and were discharged to home following an acute care episode.

Principal Findings: A total of 69 patients received the NP-led intervention. Numerous
factors facilitated successful care transition, including; strong leadership (intervention champions), pre-intervention stakeholder training and education, clear role definitions for frontline staff, and positive working relationships between existing staff and intervention steering staff. Challenges to successful care transition included; geographic variation, lack of time, and referral process bottlenecks. Care provided by the NP extended beyond the range of the elements of the Care Transition Intervention, as it was discovered that numerous participants did not have access to a general practitioner. Interviews with clinical decision makers, hospital staff, and CCAC staff revealed that they felt the program was not well defined. Further, there was a potential minimization bias as care was delivered closer to the status quo than originally intended. 

Conclusions: This evaluation revealed numerous contextual factors that aided and impeded successful implementation of an NP-led care transition intervention. Stakeholders identified the lack of knowledge translation surrounding program elements, objectives, and goals as a barrier to optimal program delivery. Implications for Policy, Delivery, or Practice: The implementation of this program led to understanding of the limitations of a care transition intervention due to contextual factors. Future work should focus on early engagement and education of frontline health care professionals to ensure that interventions are implemented in a way that encourages fidelity. 

Funding Source(s): Other, Ontario Ministry of Health and Long-Term Care

Poster Session and Number: C, #1113

Association between Medicare Spending, Clinical Quality, and Community Health Center Penetration among Low-Income Residents

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Presenter: Lydie Lebrun-Harris, Ph.D., M.P.H., Public Health Analyst, Bureau of Primary Health Care, U.S. Department of Health and Human Services, Health Resources and Services Administration, llebrun-harris@hrsa.gov

Research Objective: To determine the association between Medicare spending, quality, and access to primary care by the underserved across Hospital Referral Regions (HRRs), after accounting for key differences among HRRs.

Study Design: We analyzed data from CMS’ Geographic Variation in Medicare Spending and Utilization database that provides cross-sectional demographic, cost, utilization, and quality indicators for all HRRs for 2010 (n=306). For each HRR, we calculated total Medicare spending after adjusting for Medicare population, local input prices, and health risk. We merged HRR-level data on number of Community Health Center (HC) patients in 2010 (from HRSA’s Uniform Data System) and estimates of the number of low-income (= 200% federal poverty level) residents in 2010 (from the 2006-2010 American Community Survey). To estimate access to primary care by the underserved in each HRR, we defined HC patient penetration as HC patients as a proportion of low-income residents. We measured clinical quality by 6 distinct Prevention Quality Indicators (PQIs), hospital readmissions, and emergency department visits. We tested the association between Medicare spending, quality, and HC penetration as follows: (1) we examined Medicare spending as a function of HC penetration, and (2) we sorted all HRRs by HC penetration rate and compared Medicare spending and quality measures of the top and bottom penetration deciles. We weighted all estimates using HRR share of the Medicare population.

Population Studied: Fee-For-Service Medicare beneficiaries by HRR, stratified by HC patient penetration.

Principal Findings: Across all HRRs, average HC penetration rate among low-income residents was 21%, and average adjusted Medicare spending was $9,222. Regression indicated that one standard deviation increase in mean HC penetration (i.e., from 21% to 40%) was associated with 3.9% reduction in adjusted spending (p<0.001). The low-penetration decile had a 3% HC penetration rate while the high-penetration decile had 52% penetration. Relative to the low-penetration decile, the high-penetration decile had 9.7% lower adjusted Medicare spending ($926 per capita, p=0.01). Much of the estimated net savings in the high-
penetration decile accrued from lower unit cost (and slightly less use) of post-acute care (cost differential between the bottom and top deciles was $603 per beneficiary, p=0.029) and hospice services ($123, p=0.001). Hospital readmission and emergency department visit rates were not statistically different between top and bottom deciles (i.e., the differences were 0.7% and -1.5% respectively using bottom decile as reference). For six PQIs - diabetes complications, chronic obstructive pulmonary disease/asthma, congestive heart failure, dehydration, bacterial pneumonia, and urinary tract infection - the high-penetration decile exhibited no different or lower preventable hospital admission rates than the low-penetration decile.

Conclusions: After adjusting for critical differences among HRRs (i.e., population, input prices, and health risk), we found a statistically significant, inverse association between total Medicare spending and HC penetration among low-income residents, even while clinical quality was no different or better among high-penetration HRRs.

Implications for Policy, Delivery, or Practice: Although Medicare beneficiaries currently comprise a modest proportion of all HC patients, HC program expansion supported by the Affordable Care Act may yield Medicare program cost savings while preserving or improving clinical quality. Further study is necessary to determine the source(s) of the apparent savings.

Funding Source(s): No Funding

Poster Session and Number: C, #1114

The Quality Indicator Survey and Pressure Ulcers in U.S. Nursing Homes

Michael Lin, University of Pittsburgh; Andrew J. Lin, University of Pittsburgh

Presenter: Michael Lin, Ph.D., M.S.P.H., Assistant Professor, Health Policy & Management, University of Pittsburgh, linm@pitt.edu

Research Objective: The aim of this study is to determine whether the routine use of the Quality Indicator Survey (QIS) as a regulatory approach is correlated with the quality of US nursing homes.

Study Design: By analyzing and comparing the quality measures related to pressure ulcers, we contrast the quality of care among those nursing homes surveyed with the traditional regulatory approach versus those surveyed by the QIS method. Using t-tests and multivariable regression analyses, we will assess whether systematic differences in quality scores exist among the two regulatory approaches. Publicly-available data obtained from the Centers for Medicare and Medicaid Services include quality measures based upon the Minimum Data Set, which are uniform across nursing homes.

Population Studied: Our target population includes all US nursing homes that participated in the Medicare and/or Medicaid programs in the calendar years of 2007 through 2010. We exclude those nursing homes that are hospital-based and those facilities for which we are unable to match facility characteristics, regulatory approach, and quality of care measures. We study two distinct resident populations: those that are short-stay (i.e., in the nursing home for less than 30 days), and those that are residing in the nursing home long-term.

Principal Findings: Pressure ulcer rates among short-stay residents declined from 2007 to 2010, from an average of 17% in 2007, to an average of 12% across all sampled nursing homes in 2010. During the same time period, pressure ulcer rates among long-stay high-risk residents declined from 12.5% to 10.4% across all sampled nursing homes. Relying on t-test comparisons, we find that the improvement in quality across nursing homes differed based upon state location, regulatory approach, and QIS implementation year: homes in QIS states have lower pressure ulcer rates than homes in states using the traditional approach; homes in QIS states differed based upon whether they were regulated by the QIS versus the traditional approach; the magnitude of improvement in care is affected by the number of years in which the QIS survey has been implemented in that state. Using regression analyses, we find that regulatory approach is not a statistically significant predictor of quality when controlling for ownership, staffing levels, facility size, and competition. The lack of a consistent relationship between regulatory approach and quality holds for both the short-stay and long-stay pressure ulcer measures.

Conclusions: Although nursing home quality appears to be associated with the new regulatory approach, this relationship is confounded by which states have implemented the QIS, how long a state has been using the QIS, and other facility and market characteristics that have been previously-identified as important drivers of quality. Further analyses of QIS
implementation should include additional measures of quality, and how long a state and nursing home have used the QIS regulatory approach.

**Implications for Policy, Delivery, or Practice:**
The implementation of a standardized regulatory approach has been accompanied by improved care, as evidenced by lower pressure ulcer rates. However, given the regression results, policymakers and facility managers should remain attentive to traditional drivers of quality, such as ownership, staffing levels, and market characteristics.

**Funding Source(s):** N/A

**Poster Session and Number:** C, #1115

**Breast Cancer Patients Receiving Guideline-Concordant Adjuvant Therapy Regimens Have Better All-Cause and Disease-Specific Survival: New Findings from Rural Georgia**
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**Presenters:** Joseph Lipscomb, Ph.D., Professor of Health Policy & Management, Rollins School of Public Health, Emory University, jlipsco@emory.edu

**Research Objective:** While many studies have examined the impact of chemo-, radiation, or hormonal therapy on breast cancer survival, we investigated whether patients whose postsurgical care is jointly guideline-concordant with respect to all 3 adjuvant therapy options have better outcomes.

**Study Design:** Patient demographic and clinical characteristics, treatment, and survival status were ascertained via medical chart abstraction and from the Georgia state cancer registry. Guideline concordance was based on recommendations from the 2000 National Institutes of Health Consensus Development Conference on breast cancer treatment. Patients were classified as Concordant if postsurgical care followed guidelines with respect to chemo-, radiation, and hormonal therapies; Non-Concordant if at least one therapy type did not adhere to guidelines; and Discretionary Concordant if treatment status was indeterminate for at least one type of therapy, while concordant for the other types. Survival analyses were conducted through Cox proportional hazards modeling. To adjust for potential patient selection bias in this retrospective cohort design, both propensity score (PS) weighting and the 2-stage residual inclusion (2SRI) instrumental variables techniques were applied. Some model variants used multiple imputation procedures to estimate missing variable values.

**Population Studied:** The study population included all women residing in the 33-county, largely rural region of Southwest Georgia who were diagnosed with a first primary, invasive, early-stage (AJCC stage I, II, and IIIA) breast cancer in calendar years 2001 - 2003, and received at least their first 12 months of therapy entirely in the region.

**Principal Findings:** In all-cause analyses, being Concordant versus Non-Concordant was associated with significantly better overall survival, with hazard ratios (HRs) ranging from 0.41 (95% CI: 0.24-0.72) in the PS-adjusted multivariable Cox model without missing value imputation (N=605) to 0.54 (95% CI: 0.33-0.87) in a Cox model without selection bias correction but with missing value imputation (N=721). The HRs for being Discretionary Concordant compared with Non-Concordant ranged from 0.41 (95% CI 0.23-0.73) to 0.55 (95% CI 0.37-0.79). Similar findings emerged in the breast cancer-specific survival analyses, with HRs slightly higher than in all-cause models but significantly below 1.0 in most cases. Across models, older age and later stage at diagnosis strongly predicted poorer survival outcomes; being not married was significant in all-cause but not in breast cancer-specific models. Survival was not generally associated with surgical treatment delay, insurance, socioeconomic status, rural/urban setting, comorbidities, tumor grade, or hormonal status. The hazard ratio for black women compared with white was greater than 1.0 across models but never significant (p>0.05).

**Conclusions:** Breast cancer patients in rural Georgia who received guideline-concordant care for all types of adjuvant therapy options had significantly better all-cause and breast cancer-specific survival outcomes, after controlling for multiple clinical and demographic factors, as well as patient selection effects.
Implications for Policy, Delivery, or Practice: The methods illustrated here can be readily applied in other cancer care delivery settings. These findings add to the evidence concerning the impact of recommended cancer care, including bundles or regimens of care, on outcomes.

Funding Source(s): CDC, Georgia Cancer Coalition
Poster Session and Number: C, #1116

The Rising Rate of Cesarean Delivery: Reflective of Broader Trends in the Healthcare System?
Sarah Little, Brigham and Women's Hospital; Karen Joynt, Harvard School of Public Health; Ashish Jha, Harvard School of Public Health

Presenter: Sarah Little, M.D., Physician, Obstetrics and Gynecology, Brigham and Women's Hospital, selittle@partners.org

Research Objective: Cesarean delivery (CD) rates are rising, from 21% of deliveries in 1996 to 33% in 2010, and it is now the most common surgery performed in the U.S. This rise has been highly variable across communities, and the reasons for the variability are unclear. This phenomenon has been generally attributed to changes in maternal risk factors, obstetric practice, and malpractice climate. However, the degree to which these rises are simply reflective of broader trends in healthcare spending and utilization is unclear.

Study Design: We used birth certificate data to calculate CD rates for each hospital service area (HSA) in the United States in 1996 and 2004. To reflect broader changes in the healthcare system, we used HSA-level Medicare variables, including total per-beneficiary surgery rates, reimbursement, reimbursement for diagnostic testing, and end-of-life care (hospital days in the last six months of life). We analyzed whether HSA-level variation in the change in these variables between 1996 and 2004 was correlated with variation in the change in CD rates, after accounting for obstetric risk factors (maternal age, race, parity, birthweight, gestational age, multiples, breech, infertility, obesity, hypertension, diabetes), obstetric practice (labor induction, forceps/vacuum deliveries), population factors (number of obstetricians, total deliveries, median income), and malpractice claims.

Population Studied: Births in 1996 and 2004 in all U.S. counties with greater than 100,000 people. Our final sample comprised approximately 3 million births per year, representing 80% of all births in the U.S.

Principal Findings: The absolute change in CD rate per HSA from 1996 to 2004 ranged from -11% to +26%. Change in Medicare surgery rates was not correlated with the change in CD (Pearson -0.01; p=0.8), however change in reimbursements for diagnostic tests was correlated (0.2; p<0.001), as were changes in end-of-life care (0.08; p<0.001). There was a 6.3% rise in the CD rate in HSAs in the highest quartile for the change in reimbursements for diagnostic testing, as compared to a 4.5% rise in the bottom quartile. Similarly there was a 6.6% rise in the CD rate in HSAs in the highest quartile for the change in average maternal age, as compared to a 4.6% rise in the bottom quartile. Overall, variation in obstetric risk factors and variation in Medicare utilization both explained 13% of the variation in the rise in CD. Variation in obstetric practice, malpractice and population-level factors explained little of the variation in the rise (0-6%).

Conclusions: Changes in CD rates are correlated with trends in broader healthcare patterns, as reflected by growth in Medicare reimbursements and end-of-life care. These broader trends in healthcare expenditures and utilization explain as much of the variation in CD rates as traditional risk factors and more than changes in obstetric practice.

Implications for Policy, Delivery, or Practice: Our findings suggest that current strategies, focused primarily on obstetric patients and practice, may fail to slow the rise in CD rates because they ignore the impact of broader trends in healthcare utilization.

Funding Source(s): No Funding
Poster Session and Number: C, #1117

Unnecessary Surgery: Characteristics of Patients and Providers
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Research Objective: The 2012 Institute of Medicine report estimates that the cost of unnecessary medical services, including unnecessary operations, in the United States (US) is $210 billion annually. Unnecessary operations also represent a form of preventable harm. However, little is known about the incidence and characteristics of these events. Our objective was to study the extent of unnecessary surgery in the US.

Study Design: We analyzed malpractice claims involving unnecessary surgery in the National Practitioner Data Bank (NPDB), from September 1, 1990 to July 30, 2010. Data were collected regarding year, type of settlement, payout amount, clinical outcome, patient characteristics, physician characteristics, and state licensure disciplinary action.

Population Studied: Physicians and patients identified in the NPDB with claims involving unnecessary surgery.

Principal Findings: A total of 3,479 claims were identified. The inflation-adjusted mean payout for an unnecessary operation claim was $278,059 (range = $50 – $8,623,217). Out of the 3,479 claims, 1,077 were associated with one of the following clinical outcomes: emotional injury, permanent injury, or temporary injury. 21 (1.9%) claims resulted in emotional injury, 295 (27.4%) claims resulted in temporary injury, 651 (60.5%) claims resulted in permanent injury, and 110 (10.2%) claims resulted in patient death. Surgeon mean age was 44.2 years (range = 20-80 years) and for a mean time in practice was 26.4 years (range = 1-65 years). 15.2% (529/3,489) of surgeons named in claims were named in a prior malpractice claim for unnecessary surgery, 54% (1,879/3,479) were named in a prior malpractice claim of any type, and 11.9% (413/3,479) had prior disciplinary action.

Conclusions: Unnecessary operations are associated with large payouts and patient morbidity and mortality. Approximately one in seven events involves a surgeon previously named in a claim, which was paid because of an unnecessary operation.

Implications for Policy, Delivery, or Practice: The findings of this study identify a subgroup of both physicians and patients for targeted interventions aimed at improving quality and reducing costs in surgery.

Funding Source(s): N/A

Who’s in Charge: A Look at the Relationship between Accreditation and States’ Mental Health Legislation and Policies?

Research Objective: Accreditation, as a form of quality oversight, is increasingly used, although a modest amount of evidence supports its ability to enhance mental health facilities’ performance. The Surgeon General and the Department of Health and Human Services have vocalized support for accreditation’s capability to heal our nation’s mental health systems. The relationship between accreditors and states’ mental health legislation policies has been largely understudied. Is the accreditation phenomenon affecting states’ mental health policies? If so, how is accreditation incorporated into state mental health legislation? What are the trends within state accreditation policies? Through this research, we come to understand which bodies, non-governmental or governmental, are defining mental health policies.

Study Design: Policy and legislative data were gathered from the accreditors and by using Westlaw and Westlaw Next, databases of federal and state laws, codes, and statutes. The search terms “mental health” and “accreditation” yielded over 10,000 laws, but only laws that referenced the Joint Commission, Commission on Accreditation of Rehabilitation Facilities (CARF), or the Council on Accreditation (COA), were included for analysis. Laws were then coded as mandates, deemed status, or if the state evaluated and regulated the mental health facilities.

Population Studied: This study examined all 50 states’ policies that address mental healthcare and accreditation by the Joint Commission, CARF, or COA. All states had accreditation policies, thus allowing for a national picture.

Principal Findings: Over time, more states included accreditation in their mental health policies. States primarily organized their mental healthcare regulations in one of four ways: 1) often states defer to Medicare/Medicaid policies, requiring their facilities to be accredited by the Joint Commission, CARF, or COA. 2) Some
states, solely, evaluate the quality of the state mental healthcare system. 3) Some states offered a deemed status for accredited facilities. 4) A few states require mental health facilities to replicate the quality standards used by the accreditors, but do not require the organizations to become accredited. States often mixed policy approaches depending on facility type, and sometimes the legislation was vague. In addition, states often had similar policies as neighboring states.

**Conclusions:** Findings revealed that accreditors have been incorporated into all 50 states’ mental healthcare policies. Interestingly, the incorporation of accreditation into state policies varies widely across our nation without clear basis. Furthermore, vaguely written laws are influenced by states’ dependence upon neighboring states or federal government’s accreditation choices, thus neglecting local needs.

**Implications for Policy, Delivery, or Practice:** With mental healthcare accreditation requirements on the rise, more accreditation research is imperative. Future research should address if and how accreditation helps states’ mental health systems. Do states that tailor and evaluate their own mental health systems have better healthcare systems than those that rely upon accreditors? States could determine for themselves what policy approach is best for their state rather than asking facilities to deflect to federal recommendations or neighboring states’ approaches. This would allow states to consider varying community needs, which is largely ignored in current legislation. Legislation should explicitly explain quality expectations, thus helping to ensure that citizens in need receive quality mental healthcare.

**Funding Source(s):** Other, Fahs-Beck Fund for Research and Experimentation and Elizabeth Wisner Social Welfare Research Center for Families and Children

**Poster Session and Number:** C, #1119

**Public Reporting and the Evolution of Clinical Quality**

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**Research Objective:** We address three specific questions. First, what drives clinics’ decisions to report quality, and what can consumers infer about the quality of non-reporting providers? Second, how persistent is provider quality across time? Since public reporting is based on historic data, these metrics are only informative if within-provider performance is persistent across time. Finally, we study whether reporting-provider quality increases over time and whether this leads to a convergence or dispersion of provider quality.

**Study Design:** Initial analyses are based on relatively descriptive time series and panel data techniques. Ultimately, we will estimate selection models using clinic market structure and predetermined quality information as instruments. We will also use geo-coded demographic data to explore the consequences of imperfect risk-adjustment in the MNCM outcome measures.

**Population Studied:** We address these questions using data from Minnesota Community Measurement (MNCM) spanning 2007-2012. Data were reported annually by clinics on a voluntary basis through a process called MNCM Direct Data Submission (DDS). Required data elements were assembled from medical records by clinic abstractors. These data describe diabetes outcomes and clinic characteristics for 617 clinics over the 2007 to 2012 period. These measures include the percentage of patients with diabetes (Type I and Type II) ages 18-75 who reached five treatment goals: 1) hemoglobin A1c (A1c) less than 8%, 2) blood pressure (BP) less than 130/80 mmHg, 3) LDL-cholesterol (LDL) less than 100 mg/dL, 4) daily aspirin use unless contraindicated (ages 41-75 only), and 5) documented tobacco-free status. Achieving all five goals is described as optimal diabetes care (ODC). We are in the process of linking these data to detailed geo-coded demographic and economic data.

**Principal Findings:** We find that early reporters are consistently higher quality than late reporters, suggesting that non-reporting clinics have lower quality; however, quality levels in the initial reporting year are quite stable across cohorts. We find a high degree quality persistence within clinics across time, suggesting that publicly reporting historical data may be useful to patients. Despite this persistence, clinic quality increases by
approximately 26% annually (about a 6 percentage point increase in ODC); although, there is still a high degree of persistence in clinic-level quality across time.

Conclusions: Higher quality providers are early responders and appear to realize larger long-run quality improvements.

Implications for Policy, Delivery, or Practice: This suggests that public reporting data are useful to patients despite the rapidly changing quality levels. Finally, we find that reporting clinic quality does not converge over time, rather, quality dispersion increases slightly.

Funding Source(s): RWJF

Poster Session and Number: C, #1120

The Financial Burden of Cancelled Surgeries: Implications for Performance Improvement

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Research Objective: While a number of studies have examined factors contributing to cancellation of elective surgical procedures, little research has examined lost revenue associated with these cancellations. Hospitals and physicians experience unrecoverable losses in revenues even though the cancelled surgery may be performed at a later date. This study examined the characteristics and lost revenues of 329 (6.7%) cancelled elective surgical procedures that occurred over the last 3 quarters of 2009 in an academic medical center.

Study Design: Utilizing the operating room schedule and data from a prior study, the case description, surgical specialty, cause for cancellation (when available), pre-operative visit documentation, and limited patient demographics were collected for cancelled cases. The hospital provided 2009 average revenue per encounter by payer class. The physician practice group provided 2009 average Medicare allowable physician charges by specialty for the primary Current Procedural Terminology (CPT) code. Using this data, annualized lost revenue to the hospital and the physician practice group was estimated.

Population Studied: All elective surgery cancellations at an academic medical center from March through December 2009 were examined. The overall cancellation rate was comprised of cancellations (patient presented but surgery not performed) and "no shows" (patient failed to present).

Principal Findings: Preliminary analysis indicates that, of the 10 specialties examined, the overall cancellation rates ranged from a high of 39.2% in General Surgery to a low of 2.4% in Plastic Surgery. Specialty specific "no shows" as a percentage of specialty specific overall cancellations varied from a low of 4.2% in Thoracic Surgery to a high of 35.7% in Radiology. Meanwhile, 51.3% of the total "no shows" for the facility were attributable to General Surgery. Cancellations also varied by day of the week, with the fewest (13.7%) occurring on Friday and the most (23.7%) on Thursday. Estimated annual hospital revenue losses for cancelled surgeries were approximately $1,150,605 in 2009. The total lost revenue was approximately $309,260 for the physicians. In the 13.8% of cancelled cases where a reason was recorded, 44% of cancellations were due to the patient being ill on the day of surgery, 24% to patient failure to comply with pre-operative instructions, and 31% to institutional issues such as lack of beds or unavailability of proper equipment. Anesthesiology pre-operative clinic visits occurred only 36.5% of the time in cancelled cases but 64.7% of the time in completed cases.

Conclusions: Preliminary findings suggest that cancelled cases are multifactorial but are attributable to institutional and patient issues. Both the hospital and the physicians bear the financial losses associated with these cancellations. There is potential to reduce cancellations by increasing Anesthesiology pre-operative clinic visit rates particularly within certain specialties and improving facility processes that lead to cancellations. These reductions can result in improved financial performance.

Implications for Policy, Delivery, or Practice: More research is needed to understand how to increase patient Anesthesiology pre-operative clinic visits and to reduce cancellations associated with process issues originating in the hospital and physician practice.

Funding Source(s): No Funding

Poster Session and Number: C, #1121
Reducing Medication Errors and Adverse Events: Is Bar Code Medication Administration the Key?

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**Research Objective:** To assess the effects of bar-code verification technology on inpatient, medication related adverse event rates.

**Study Design:** Bar code medication administration systems were implemented across inpatient nursing stations in our hospitals in Rochester, MN, USA in a staggered process with a few stations added every 2-3 months from September, 2008 to December, 2010. To evaluate the new method’s impact on adverse events, error rates were modeled for all inpatient units implementing the new system (n=54).

**Population Studied:** Medication error types were based on our voluntary reporting system and we further examined types expected to be directly affected by the new system: wrong patient, wrong route, wrong dose, wrong medication, and wrong time. The associated levels of harm were classified using the NCC MERP Index for Categorizing Medication Errors. This index assigns a letter to medication errors corresponding to the appropriate level of harm, ranging from A (events only have the capacity to cause error) to I (an error occurred likely contributing to patient death). We focused our attention on those events categorized as E or higher (i.e., events that caused harm to the patient, required intervention or hospitalization, and/or contributed to death).

**Principal Findings:** Time series graphs of the normalized error rates show a decreasing trend from the pre-implementation period to the post-implementation period. The overall rate for all events decreased from 11.62 to 10.32 per 1,000 patient bed days and from 26.86 to 21.17 per 100,000 medications administered. Rates for events with any type of harm (i.e. events classified as E and higher) dropped from 0.255 to 0.147 per patient 1,000 bed days and from 0.589 to 0.302 per 100,000 medications administered. Finally, rates for events with major harm (i.e. events classified as F and higher – rare events) decreased from 0.070 to 0.045 per 1,000 patient bed days and from 0.160 to 0.092 per 100,000 medications administered. Similar decreases were seen in the rates of various error types (i.e. wrong dose, wrong medication, wrong patient, etc.).

**Conclusions:** Crude comparisons of frequencies and overall time series graphs show a decreasing trend in rates from the 18 months prior to implementing this technology to the 18 months following. Further analysis of the interrupted time series models show these decreases occur among the expected error types.

**Implications for Policy, Delivery, or Practice:** The implementation of bar-code verification technology for medication administration holds promise in decreasing the number of adverse events related to hospital administered prescription medications and being a cost-effective method for improving the quality of care of patients.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #1122

Heart Failure In-Hospital Mortality: Does County, Payer or Admission Source Matter?

Preethy Nayar, University of Nebraska Medical Center; Fang Yu, University of Nebraska Medical Center; Ge Lin, University of Nebraska Medical Center

**Presenter:** Preethy Nayar, M.D.,Ph.D., Assistant Professor, Health Services and Research and Administration, University of Nebraska Medical Center, pnayar@unmc.edu

**Research Objective:** Nebraska is a predominantly rural state with over 40% of its 1.8 million population living in rural and frontier areas of the state. The majority of the state’s health care facilities, particularly for specialist services such as cardiology, are located in the metropolitan counties of Douglas, Lancaster and Sarpy. Patients in rural and frontier parts of the state can be faced with having to travel long
distances to see a cardiologist or to receive specialist cardiology services. Considering the high prevalence of heart failure and the economic burden of the disease, factors that influence in-hospital mortality for heart failure patients is certainly of importance for health care providers, as well as patients. The purpose of this study is to examine the determinants of in-hospital mortality in a sample of heart failure patients admitted to hospitals in Nebraska in 2010.

**Study Design:** The study uses the 2010 Nebraska Hospital Discharge dataset to examine the factors that influence the probability of in-hospital mortality for adult heart failure patients. Patient level covariates included in the analysis were: patient age in years; gender; and state of residence (Nebraska/ out-of-state). Hospital level heterogeneity was controlled by using a hospital-specific random intercept. Other covariates included were length of stay, primary payer (Medicare/ non-Medicare); type of admission (urgent/ emergent/elective); source of admission (non-health care facility/ ER) and metropolitan county.

A hierarchical logistic regression model of in-hospital mortality including hospital-specific random intercept was analyzed using Stata 12 software.

**Population Studied:** The study population included 4,412 hospitalizations for adult heart failure patients admitted to 79 hospitals in Nebraska in year 2010.

**Principal Findings:** The odds of dying in hospital for heart failure patients increased with age and length of stay. The admission source being a non-health care facility was associated with a lower probability of in-hospital death. The patient’s gender, state of residence, payer source (Medicare/ non-Medicare) rurality of the county (metropolitan versus non-metropolitan county) and type of admission (elective/ urgent/ emergent) were not significantly associated with the probability of in-hospital death.

**Conclusions:** Rural counties in Nebraska do not have worse outcomes for hospitalized heart failure patients. Older patients and those with a longer length of stay in the hospital were more likely to die in hospital. The source of admission being a non-health care facility was associated with a lower risk of dying in hospital.

**Implications for Policy, Delivery, or Practice:** An understanding of the risk factors for in-hospital death is critical to improving outcomes of care for heart failure patients.

**Funding Source(s):** No Funding

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**Poster Session and Number:** C, #1123

**Comparing the Quality of Physician Care In Rural Vs. Urban/Suburban Areas For A Commercially Insured Population**

John Orwat, Loyola University Chicago; Nadine Caputo, MS, Center for Health Reform and Modernization, UnitedHealth Group; Wayne P. Metfessel, MD MS, Senior Medical Informaticist, Clinical Analytics, UnitedHealthcare Group

**Presenter:** John Orwat, Ph.D., Assistant Professor, Loyola University Chicago, jorwat@gmail.com

**Research Objective:** To characterize urban/rural differences in the quality of care based on physician performance innovation with a special focus on women’s preventive health.

**Study Design:** Aggregate quality scores for 65 conditions were compared for physicians practicing in rural and urban parts of the same hospital referral region (HRR), which were used to approximate geographic markets for health care. A sub analysis was conducted for breast cancer screening as well as cervical cancer screening.

**Population Studied:** Data were drawn from commercial health care claims using UnitedHealthcare’s Premium Designation program, a quality incentive program for physicians.

**Principal Findings:** Physician performance was lower for rural physicians in 75% of the 256 HRRs in this analysis, higher in 5%, and no difference was found in 20% of the HRRs. In the typical HRR, rural doctors were about 3% less likely to provide high-quality care and 6% less likely in HRRs with the lowest relative levels of performance. Rural and urban physician quality scores were comparable for coronary artery disease and asthma, but lower for diabetes, hyperlipidemia, and hypertension. Rural physician scores tended to be higher in the Upper Midwest and Northeast or near regional population and economic centers. Analysis of women’s preventive data are expected by the end of January 2013.

**Conclusions:** The moderate but notable differences were observed in care quality between rural and urban physicians on a national level within specific geographic markets for a commercial population. The comparison of physicians within hospital referral regions greatly
reduces the impact of confounding regional factors that affect the practice of medicine while highlighting the impact of differences between rural and urban areas within the same market.

**Implications for Policy, Delivery, or Practice:** As rural communities are challenged by higher burdens of chronic disease, healthcare workforce pressures, and an aging clinical infrastructure, there is a need to mobilize effort and creativity to ensure that rural Americans get needed care.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #1125

**Case Studies to Better Understand Readmissions in Minority Serving Hospitals**

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**Presenter:** Laura Pannella Winn, M.A., Research Project Manager, Health Policy and Management, Harvard School of Public Health, laura.p.winn@gmail.com

**Research Objective:** The Affordable Care Act requires that the Centers for Medicare and Medicaid Services (CMS) reduce payments to hospitals with high readmission rates starting in 2013. Minority-serving institutions have higher rates of readmissions, and are therefore likely to be financially penalized as a result of this policy. Our objective was to better understand the characteristics, settings, and strategies that differentiate strong and poor performing minority-serving hospitals

**Study Design:** We conducted case studies to understand the factors that minority-serving hospitals face in light of new pressures to reduce readmissions. Chief Medical Officers, Chief Executive Officers, Chief Quality Officers, Case Managers, and other key staff at each site participated in hour-long semi-structured interviews where questions about hospital and patient characteristics, priorities, strategies to reduce readmissions, and general impressions about CMS’s policies were asked. Detailed notes were collected and supplemented by a review of audio tapes. Themes and intensity of comments were coded and prepared as a matrix.

**Population Studied:** U.S. hospitals with a black patient population of over 50 percent comprised the sample. Sites were selected using CMS data identifying hospitals with low and high risk-adjusted readmission rates.

**Principal Findings:** Nearly all of the case study respondents felt that the readmission rate was an important quality metric for CMS to assess, and most respondents felt their hospitals could do better to reduce readmissions. However, few respondents knew if they were going to be penalized by CMS. The majority of respondents reported implementing new programs or procedures to try to reduce readmissions regardless of whether they were going to be penalized. Hospitals that had a low proportion of self-pay patients, high occupancy rates, and high margins had more programmatic efforts around reducing readmissions and improving transitions of care. Some strategies employed were the implementation of call centers, focused attention on discharge planning, and availability of local external resources to support program staff. Nevertheless, all felt that they were unable to reduce the rate to the level they wished because of patient and community factors, including difficulties with paying for and managing medications, literacy, housing stability, and income.

**Conclusions:** Hospitals, on average, view reducing readmissions as an important quality metric. Hospitals with better financial performance and higher occupancy rates are more likely to have targeted programs for reducing readmissions; hospitals that were struggling financially had fewer readmissions reduction programs in place and reported the most concerns about being able to reduce readmissions due to social factors. Many of the programs were new, and their ability to successfully reduce readmissions is still unknown.

**Implications for Policy, Delivery, or Practice:** Previous studies have highlighted a number of strategies that are used in high-performing hospitals to reduce readmission rates. Minority-serving hospitals in our case studies faced substantial challenges to reducing readmissions, including their own financial health as well as community and patient-level factors. Better understanding the strategies and approaches that work in resource-poor settings, or accounting for the poverty of the underlying
patient population, are two potential strategies for ensuring that CMS’s readmissions policies do not inadvertently worsen disparities.

**Funding Source(s):** NIH

**Poster Session and Number:** C, #1126

**The Impact of a Care Transitions Program on Hospitals Readmissions in an Urban Setting**

Urvashi Patel, CMO, Montefiore; Anne Meara, CMO, Montefiore

**Presenter:** Urvashi Patel, CMO, Montefiore, upatel@montefiore.org

**Research Objective:** Objective: As readmission rates remain high across the United States, strategies to reduce inappropriate readmissions are under development. A group of three hospitals systems and two payor organizations in Bronx County, NYC came together to implement a Care Transitions program to reduce the rate of preventable hospital readmissions. Research demonstrates that hospital readmissions can be reduced, with concomitant improvement in patient health status, by addressing and preventing potential problems that arise during transitions of care and by empowering patients and their caregivers to better understand and meet their care needs. The program was designed to demonstrate not only the effectiveness of the intervention, but also the value of multi-organization integration, the utility of a shared electronic care transition record and the use of an innovative predictive model. This study reviews the impact of the program on sixty day readmission rates.

**Study Design:** Study Design: Data were obtained from an in-house claims database at Montefiore Medical Center from as well as clinical information systems at each hospital. These data were used to identify patients with a hospital admission and readmissions and other health services utilization and obtain demographic data for the study period. Univariate and multivariate logistic regression modeling was used to measure the effects of the intervention on 60-day readmissions, after adjusting for covariates.

**Population Studied:** Population Studied: Patients were identified for the program if they were admitted to one of the four participating hospitals and were deemed to be at risk for a readmission using a predictive model. A comparison group was randomly selected using the same criteria from the same hospitals.

**Principal Findings:** Principal Findings: The treatment group consisted of 585 patients vs. 190 in the comparison group; however, 85 patients were dropped from the treatment group because they did not receive the intervention. The treatment group (n=500) and the comparison group (n=190) had similar predictive scores (measuring the likelihood of readmission): mean age, race, gender; and whether they were Spanish speaking. The intervention group experienced a 17.6% 60-day readmission rate which is 39% lower than the 29% baseline rate and 33% lower than the 60-day readmission rate of the comparison group (26.3%). After adjusting for appropriate covariates in the multivariate analyses, the significant independent variables associated with 60-day readmission are as follows: having received the intervention (OR= 0.6, p=.03), Charlson Score >2 (OR=2.6, p=.004), physician office visit within 14 days post-discharge(OR= 0.5, p=.003) and Medicare coverage(OR= 2.6, p=.03).

**Conclusions:** Conclusions: Univariate and multivariate logistic regression analyses indicate that the Care Transitions program had a significant impact on reducing 60-day readmission rate in the four hospitals.

**Implications for Policy, Delivery, or Practice:**

Implications for Policy, Delivery or Practice: This care transitions program identified strengths as well as opportunities for improvements with the care transition strategies that exist at the participating hospitals. Such improvement measures could potentially assist efforts to decrease readmission rates in most other urban hospitals in the US.

**Funding Source(s):** N/A

**Poster Session and Number:** C, #1127

**Measuring Attending Physicians’ Contributions to the Cost-Effectiveness of Acute and Post-Acute Care of Patients after Hospitalization for Specified Medical Conditions and Procedural Interventions**

Michael Pine, Michael Pine and Associates Incorporated; Donald E. Fry, M.D., Michael Pine and Associates Incorporated; Gregory J. Pine, Michael Pine and Associates Incorporated

**Presenter:** Michael Pine, M.D., M.B.A., President, Health Services Resources Administration, Michael Pine and Associates Incorporated, michaelorjoan@yahoo.com
Research Objective: Efforts to reduce healthcare costs by replacing the current patchwork of widely divergent clinical practice patterns with a standard set of evidence-based best practices has met with only limited success. This study explores the potential utility of analytic techniques designed to (1) identify the most-cost-effective local practitioners and currently employed patterns of episode-related hospital and post-discharge care and (2) pinpoint the most promising foci for local performance improvement initiatives. Potential savings associated with uniform adoption of current local best practices and the advantages of custom-tailored approaches to performance improvement are illustrated.

Study Design: Contributions of attending physicians to the cost-effectiveness of care of medical and procedural episodes initiated by acute hospitalizations for heart failure(CHF), myocardial infarction(AMI), gastrointestinal hemorrhage(GIHem), obstructive pulmonary disease(COPD), stroke(CVA), respiratory infections(RInf), coronary bypass graft surgery(CABG), percutaneous coronary procedures(PCI), bowel resection(BOWEL), peripheral vascular procedures(VASC), and hip and knee replacement(JOINT) and continuing for 90 days after discharge were estimated from risk-adjusted inpatient adverse outcome rates (i.e., clinical effectiveness) and episode-related readmissions, risk-adjusted routine costs (i.e., cost-efficiency), and risk-adjusted excess costs of adverse outcomes and readmissions (i.e., warranty-related costs). Prolonged risk-adjusted hospital-specific length-of-stay was equated with serious non-fatal inpatient complications. Hospital costs were derived from cost-to-charge ratios. Best practice performance of the top 20% of attending physicians at an illustrative hospital was compared to average performance of all physicians at that facility.

Population Studied: Medicare patients discharged in 2008 and 2009 from selected hospitals for specified conditions or procedures and their attending physicians or surgeons of record.

Principal Findings: Average episode costs were $24,048 (range=$14,079 (COPD) to $40,963 (CABG)). Hospital costs accounted for an average of 46.2% (range=29.8% (CHF) to 66.1% (CABG)) of total episode costs. Potential savings as a percentage of total episode costs for individual hospitals averaged 24.5% (range=16.3% (PCI) to 36.0% (CHF)) based on best practices at each facility. The contribution of hospital savings to total episode savings averaged 34.8% (range=10.5% (CHF) to 86.2% (JOINT)). Of total episode potential savings, an average of 20.1% (range=0% (CVA) to 86.3% (JOINT)) were attributable to routine cost-efficiency, 34.3% [range=2.6% (JOINT) to 100% (CVA)] to clinical effectiveness, and the remainder to lower warranty-related costs.

Conclusions: For a diverse set of episodes of care initiated by hospital admissions for acute medical conditions or operative procedures and ending 90 days after discharge, substantial savings can be achieved by adopting best practices currently delivered to patients with high-performing attending physicians of record. However, principal sites at which adoption of currently employed best practices would result in greatest savings and the type of interventions that would produce the greatest return on investment vary greatly among individual episodes studied. Careful application of analytic methods such as those used in this study is required to focus performance improvement initiatives on areas in which they will be most productive.

Implications for Policy, Delivery, or Practice: Intelligent application of analytic findings related to current local best practices can substantially reduce healthcare costs arising from clinically unnecessary routine services, from episode-related adverse outcomes, and from failure to manage unavoidable adverse outcomes cost-effectively.

Funding Source(s): No Funding

Poster Session and Number: C, #1128

What Health Quality Indicators in Mississippi Reveal About The Health Care System
Amy Radican-Wald, Center for Mississippi Health Policy

Presenter: Amy Radican-Wald, Dr.P.H.,M.P.H., Senior Policy Analyst, Center for Mississippi Health Policy, aradican-wald@mshealthpolicy.com

Research Objective: Quantify quality measures for acute care and determine implications for improving the system of health care.

Study Design: Mixed methods quantitative analysis of statewide hospital discharge data, review of literature and federal/state policies, and qualitative stakeholder scan.

Population Studied: Acute care hospitalizations (n = 40,753) of Mississippians in 2010 for conditions defined by the Agency for
Healthcare Quality and Research’s Prevention Quality Indicators (PQIs).

**Principal Findings:** Hospital admission rates for select chronic and acute prevention quality indicators are significantly (p<.05) higher in Mississippi compared to the United States. Hypertension rates by 34%; congestive heart failure rates by 6%; diabetes short-term complication rates by 27%; diabetes long-term complication rates by 10%; uncontrolled diabetes rates by 35%; lower-extremity amputations rates for diabetes by 17%; chronic obstructive pulmonary disease or asthma rates in older adults by 11%; asthma rates in younger adults by 9%; bacterial pneumonia rates by 8%; and urinary tract infection rates by 26%. Composite prevention quality indicator scores are significantly (p<.01) higher in Mississippi–acute PQI rates by 12% and chronic PQI rates by 11%. The literature reveals Mississippi ranks poorly in preventable hospitalization and premature death rates.

Baicker and Chandra found associations between health care quality levels, health care spending, and health workforce by depicting these system of care relationships through the examination of data on physician workforce, Medicare spending, and quality rankings. Higher health spending is associated with lower state quality rankings. States with higher concentrations of specialists have lower rankings in care quality. Mississippi clearly illustrates these relationships by ranking low in health care quality, high in Medicare dollars spent, low in per capita general practitioners, and high in per capita specialists. Stakeholder scans indicate recognition of the problem and steps in progress to improve health care quality. Examination of actions in other states reveals a strategy to enact a few comprehensive, interrelated policies to address workforce development and education, payment reform, data collection, and quality measurement.

**Conclusions:** Mississippi’s health care system is heavily weighted toward higher cost, later stage acute care. Utilization of preventive and primary care is low and use of acute care for complications of chronic illnesses and other preventable conditions is high. The challenge is particularly daunting for a state with low penetration of managed care, low investment in public health, and high burdens of chronic disease. The current health system structure creates a burden on resources, not just in terms of cost, but also in regard to excess disability from disease complications such as leg amputations, heart disease, and stroke. Comprehensive system improvements are unlikely to occur without further coordinated efforts to enhance access to preventive and primary care as well as payment reforms to alter financial incentives.

**Implications for Policy, Delivery, or Practice:** Changes are occurring in Medicare and other payment sources, so providers must adapt to new rules and structures. This dynamic environment provides an opportunity for providers, payers, and educators to ensure that changes work in concert to shift the health care system toward prevention and primary care rather than continuing to manage the consequences of delayed care.

**Funding Source(s):** Other, Bower Foundation

**Poster Session and Number:** C, #1129

**The Association of Hospital Characteristics and Quality Improvement Activities in Inpatient Medical Services**

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**Presenter:** Joseph Restuccia, Dr.P.H., M.P.H., B.A., Professor and Senior Investigator, Operations and Technology Management Department, Center for Organizational Leadership and Management Research (COLMR), Boston VA Healthcare System, & and Boston University School of Management, jres@bu.edu

**Research Objective:** Research Objective: Despite the increasing attention to quality of US health care, relatively little is known about the extent to which hospitals engage in quality improvement activities (QIAs) or factors influencing extent of QIAs. The overall objective
of this study was to identify the extent of QIAs in the inpatient medical services of an integrated delivery system, and examine the influence of 1. use of hospitalists, 2. use of other providers (nurse practitioners and physician assistants) and 3. goal alignment and commitment to quality of care in the adoption of QIAs.

**Study Design:** We conducted a cross-sectional, descriptive study of QIAs using a survey administered to Chiefs of Medicine (COMs) at all 124 Department of Veterans Affairs (VA) acute care hospitals. We developed the survey instrument utilizing previously developed surveys of hospital QIAs and conducted pilot tests for face validity with seven VA physicians and one research methodologist. For the 27 QIA items, respondents rated the extent of use of the QIA using a Likert scale ranging from 0 for “not used at all”, to 4 for “used hospital-wide” as well as an option for “Don’t know/not sure.” We conducted an exploratory factor analysis on the 27 QIAs and identified three factors: infrastructure, prevention, and information gathering. We conducted hierarchical regressions of QIA use for each factor and an overall factor from all 27 QIAs on facility contextual variables (operating beds, years in operation, occupancy rate, teaching status, urban/rural distinction, and geographic region), followed by use of hospitalists, use of other providers, and goal alignment/quality commitment. We entered the independent variables in ascending order based on expected magnitude of contribution to the overall model.

**Population Studied:** Inpatient medicine services at all VA acute care hospitals.

**Principal Findings:** Survey response rate was 95% (118/124). The overall QIA factor scale, consisting of all 27 QIAs, showed high internal consistency (k=27; a=.94) as did the other scales: prevention (k=10; a=.92) involving activities aimed at reducing negative incidents (e.g., central line infections, surgical site infections); information gathering (k=9; a=.88) involving assessing performance and learning best practices (e.g., provider profiling, benchmarking); and infrastructure (k=8; a=.89) involving QIAs focused on internal design activities (e.g., case management, clinical collaboratives). QIAs related to prevention were most frequently used (mean=3.38) while information gathering (mean=2.27) and infrastructure (mean=2.25) were used less widely. With the exception of higher occupancy rate and infrastructure, contextual variables were not associated with QIAs. Hospitals using only hospitalists showed a positive association with all four QIA categories [overall QIAs (b=.61; p<.001); prevention (b=.61; p<.001); information gathering (b=.75; p=.01); infrastructure (b=.55; p=.03)] as did alignment/commitment [overall QIAs (b=.31; p<.001); prevention (b=.24; p<.001); information gathering (b=.28; p<.001); infrastructure (b=.42; p<.001)].

**Conclusions:** Hospitalists on inpatient medicine services and goal alignment/quality commitment appear to facilitate implementation of QIAs.

**Implications for Policy, Delivery, or Practice:** As hospitals look to respond to changes (e.g., pay for performance, accountable care organizations), this study suggests that use of hospitalists and efforts to communicate goals and align them throughout the organization may lead to greater implementation of QIAs.

**Funding Source(s):** VA

**Poster Session and Number:** C, #1130

**Patient-, Hospital- and County-Level Determinants of Emergency Department Admission for Deep Vein Thrombosis**

Joshua A. Hilton, Northwestern University, Feinberg School of Medicine; Kristin Rising, University of Pennsylvania; Jason A. Roy, University of Pennsylvania; Joshua P. Metlay, University of Pennsylvania; Daniel Polsky, University of Pennsylvania; Brendan G. Carr, University of Pennsylvania

**Presenter:** Kristin Rising, MD, Research Fellow, Emergency Department, University of Pennsylvania, kristin.rising@uphs.upenn.edu

**Research Objective:** A number of medical conditions treated in emergency departments can be appropriately managed in either the outpatient or inpatient setting. Hospitalization rates for these conditions vary across the United States (US) primarily because of non-clinical patient factors, hospital factors, and community-level resources. We used emergency department (ED) visits for deep venous thrombosis (DVT) to illustrate variability in discretionary hospital admissions and to examine the association between hospital admission and patient, hospital, and community factors.

**Study Design:** This is a retrospective cohort study using state inpatient and ED databases (SID and SEDD) from the Healthcare Cost and Utilization Project (HCUP) at the Agency for Healthcare Research & Quality. Patient-level
HCUP data were merged with hospital- and county-level information using the American Hospital Association Identification Code and the Health Resources and Services Administration Area Resource File, respectively. The primary outcome was patient disposition defined as discharged home or admitted. Hospital admission variation was quantified by the coefficient of variation (COV = standard deviation/mean). We present descriptive statistics and unadjusted analyses using ANOVA and chi2. Hierarchical logistic random effects models were constructed to examine contributions of individual predictors.

**Population Studied:** We included all patients age 18 and older that presented to the ED of any acute, non-federal hospital in California in 2007 and were diagnosed with a DVT (ICD-9 453.40, 453.41, 453.42). Patient who left the ED against medical advice, died in the hospital, or had missing information regarding ED disposition were excluded.

**Principal Findings:** The COV for the population of interest was three times larger than the COV for all medical hospital discharges by state per 1,000 Medicare enrollees in the US (0.547 vs. 0.179). Higher odds of admission was associated with Medicaid (OR 1.53, 95% CI 1.28-1.82), Medicare (OR 1.367, 95% CI 1.190-1.57), or “Other Payer” (OR 1.59, 95% CI 1.26-2.01), all relative to private insurance, increasing patient age in 10-year increments (OR 1.24, 95% CI 1.19-1.28), for-profit hospital status as compared to non-profit (OR 1.83, 1.29-2.59) and increasing hospital size based on 10-bed increases (OR 1.01, 95% CI 1.001-1.012). Significantly lower odds of admission were associated with white race (0.89, 95% CI 0.79-0.999), self-pay patients relative to private insurance (OR 0.67, 95% CI 0.52-0.87), proportion of privately-insured patients in hospital based on 10-bed increases (OR 0.232, 95% CI 0.10-0.53), and increased supply of outpatient physicians measured as general practice physicians per 10,000 people (OR 0.353, 95% CI 0.236-0.529).

**Conclusions:** Admission rates for patients with DVT vary significantly between hospitals, and this variation is associated with a number of patient (age, gender, race, payer), hospital (size, payer-mix, for-profit status) and community (outpatient physician supply) factors.

**Implications for Policy, Delivery, or Practice:** Increased availability of outpatient services combined with improved coordination of care between hospitals and these outpatient services may enable reduction of inpatient treatment for certain conditions. Uniform access to evidence-based standards of care in the outpatient setting is increasingly important as the US health system moves toward a more comprehensive accountable care model, in which patients can move safely, efficiently, and cost-effectively across all providers and settings.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #1131

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**Journey to Recovery after Stroke:**
**Understanding Predictors of Discharge Destination, Functional independence, and Quality of life after Hospital Discharge**

Pamela Roberts, Cedars-Sinai Medical Center; Harriet Aronow, PhD, Cedars-Sinai Medical Center; Tingjian (Jessie) Yan, PhD, Cedars-Sinai Medical Center; Jeff Borenstein, MD, Cedars-Sinai Medical Center

**Presenter:** Pamela Roberts, Ph.D., Manager Rehabilitation and Neuropsychology, Rehabilitation, Cedars-Sinai Medical Center, pamela.roberts@cshs.org

**Research Objective:** Stroke is the leading cause of long-term disability and affects 795,000 people in the U.S. each year. During the journey to recovery after acute onset of a stroke, patients, care providers, and program planners have a mounting need for informed decision-making about professional and functional interventions. The current study is conducted to extend and enhance knowledge of health outcomes during recovery and the options for participating in rehabilitation and preventive care during patients’ transitions to the community. The specific aims of the study are to: (1) expand the knowledge of functional and quality of life outcomes for all stroke patients through the early acute and post-acute phase of recovery; and (2) examine the effects of stroke severity, initial functional impairment, and patient characteristics on discharge destinations, functional independence, and quality of life after hospital discharge.

**Study Design:** Retrospective analysis of an acute stroke quality improvement database from a large urban quaternary medical center. The database includes measures collected by MedTel Outcomes LLC on all stroke patients at one month after discharge from the hospital including the Functional Independence Measure and standardized quality of life and participation measures adopted by the rehabilitation industry.
Added to the database are standardized measures from the acute treatment record such as type of stroke, Modified Rankin score, and acute functional independence measure score.

Population Studied: Seven hundred and nineteen stroke patients and 446 with a 30-day follow-up telephone assessment for functional and quality of life measures from January 1, 2011 to December 31, 2012.

Principal Findings: More than 75% of patients had hemiparesis, and over 90% survived the 30-days post hospital discharge and were living in the community. At follow-up, in terms of the physical functioning measures, the majority of the patients were independent in toileting and self-care activities, and about half were independent in mobility excluding stairs. Persons with right brain involvement had evidence of a more complicated and slower recovery. Compared to those with left brain involvement, patients with right brain involvement had lower functional scores and a higher percentage of them were not living in the community (living in institutions).

Conclusions: This project is based on the premise that all patients experiencing a stroke, no matter the severity, deserve to have evidence-based information on what they may expect during their recovery and what their options and choices are for participating in rehabilitation and preventive care during their transitions into the community. The data base itself will be useful as a source of outcome data for comparative effectiveness and to build a regional collaborative outcomes database for Comparative Effectiveness Research and quality benchmarking.

Implications for Policy, Delivery, or Practice: The data from this study can be used to understand the functional trajectory of recovery based on severity of stroke and other factors. It is important to understand patients’ characteristics to promoting better decision making during the stroke recovery.

Funding Source(s): No Funding

Poster Session and Number: C, #1132

Accreditation of Hospitals in Lebanon: Is it a Worthy Investment?

Shadi Saleh, American University of Beirut; Jihane Bou Sleiman, American University of Beirut; Diana Dagher, American University of Beirut; Hanaa Sbeit, American University of Beirut; Nabil Natafgi, American University of Beirut

Presenter: Shadi Saleh, Ph.D., M.P.H., Associate Professor And Chairman, Health Management and Policy, American University of Beirut, ss117@aub.edu.lb

Research Objective: Although there are mixed views on accreditation’s effectiveness, most agree that accreditation provides hospitals an opportunity to enhance its quality of care. Still, some criticize the financial burden it imposes, especially in developing countries where hospital resources are limited. This study explores the views of Lebanese hospitals on the worthiness of accreditation vis-à-vis its associated expenses in addition to examining the type and source of financial investments incurred during the accreditation process.

Study Design: The study employs an observational cross-sectional design. The survey instrument was comprised of three sections inquiring on perceived value of accreditation processes. The dependent measure included the hospital’s views on the worthiness of accreditation vis-à-vis its associated expenses to the institution. Independent variables included hospital characteristics and areas of associated expenditure increase. In addition, mechanisms of financial coverage in relation to the accreditation process were explored.

Population Studied: The study population comprised all private general short-stay hospitals registered with the Syndicate of Private Hospitals in Lebanon (110 hospitals).

Principal Findings: Three-fifths of responding hospitals (63% response rate) considered accreditation as a worthy investment. Favorable views on accreditation were mostly related to its effect on enhanced quality and safety culture. Unfavorable views regarding the worthiness of accreditation investment were justified by absence of link with enhanced tariffs from payers (25.7%). All hospitals incurred increased expenses due to accreditation. Areas of highest increase included training of staff (95.7%), consultants’ costs (80.0%) and infrastructure maintenance (77.1%). Most of the hospitals covered expenses through internal absorption (52%) or bank loans (45.7%).

Conclusions: The results of the study revealed that an unimpressive majority of hospitals view accreditation as a worthy investment; almost all hospitals faced elevated expenses associated with the accreditation process. Hospitals admitted that accreditation has benefits mostly in enhanced quality and patient satisfaction. Still,
there were a decent proportion of hospitals that did not consider the added value merits the level of increased expenses. This imbalance has to be discussed on a national level where accreditation programs are being implemented as national (versus voluntary) initiatives.

**Implications for Policy, Delivery, or Practice:** The findings from this investigation with regards to the financial burden of accreditation and its perceived value should be factored in the decision of its adoption at a national level, especially in developing countries.

**Funding Source(s):** No Funding
**Poster Session and Number:** C, #1133

**Beyond Accreditation: A Multi-track Quality-Enhancing Strategy for Ambulatory and Primary Health Care in Low- and Middle-Income Countries**
Shadi Saleh, American University of Beirut; Mohamad Alameddine, American University of Beirut; Nabil Natafgi, American University of Beirut

**Presenter:** Shadi Saleh, Ph.D., M.P.H., Associate Professor And Chairman, Health Management and Policy, American University of Beirut, ss117@aub.edu.lb

**Research Objective:** Many define an equitable health care system as one that provides logistical and financial access to ‘quality’ care to the population. Realizing that fact, many low- and middle-income countries (LMICs) started investing in enhancing the quality of care in its health care systems, recently in ambulatory and primary health care settings. Unfortunately, in many instances, these investments have been exclusively focused on accreditation due to available guidelines and existing accrediting structures.

**Study Design:** Methods included a systematic review of literature that assessed the association between accreditation implementation and quality of care/care outcomes. In addition, expert panels were consulted on optimal designs of quality enhancement initiatives and implementation modalities at the systems level.

**Population Studied:** Ambulatory and Primary Health Care Centers

**Principal Findings:** The review of literature in the area of health care accreditation reveals a complex picture of its effectiveness, with mixed views and inconsistent findings in many instances. Researchers, nonetheless, agree on the fact that the preparations for accreditation gives the health care organization a valuable opportunity to reflect on the treatment of patients and on its operational modalities albeit with a limited time effect. In addition, there is no consensus among studies that have examined the relationship between accreditation and health outcomes on the directionality and strength of that link. A multi-track quality enhancing strategy (MTQES) is proposed that includes, in addition to promoting resource-sensitive accreditation, other quality initiatives such as: clinical guidelines, performance indicators, benchmarking activities, annual quality-enhancing projects and annual quality summit/meeting. These complementary approaches are presented to synergistically enhance a continuous quality improvement culture in the ambulatory setting and primary health care sector, taking into consideration limited resources available especially in LMICs. In addition, an implementation framework depicting MTQES in three-phase interlinked packages is presented; each matches existing resources and quality infrastructure.

**Conclusions:** Health care policy makers and managers need to think about accreditation as one process, versus the exclusive one, for systems/organizations’ quest for quality. Enhancing quality should employ a multi-initiative approach that focuses on redefining structure of health delivery organizations and processes of care.

**Implications for Policy, Delivery, or Practice:** The proposed MTQES aims to support the primary care sector in addressing quality challenges in a multi-faceted approach. Although most of the strategies in the proposed MTQES have been previously employed in different healthcare settings, the MTQES approach is novel in the operational scheme of these strategies to realize the maximum impact. Furthermore, MTQES as an approach is not exclusive to the primary health care and ambulatory settings, its design can be contextualized to other health care delivery platforms.

**Funding Source(s):** No Funding
**Poster Session and Number:** C, #1134

**Early Winners and Losers in Dialysis Center Pay-for-Performance**
Milda Saunders, University of Chicago; Haena Lee, MS, University of Chicago Department of Sociology; Marshall H. Chin, MD, MPH, University of Chicago Medical Center
**Presenter:** Milda Saunders, MD, MPH, Assistant Professor, Section of Hospital Medicine, University of Chicago, msaunder@medicine.bsd.uchicago.edu

**Research Objective:** In 2012, the Centers for Medicare and Medicaid Services (CMS) began the End Stage Renal Disease Quality Incentive Plan (ESRD QIP), a pay-for-performance program for dialysis facilities. To determine winners and losers under ESRD QIP, we examined which dialysis facility characteristics, neighborhood demographics and regions are associated with payment reductions.

**Study Design:** Our data sources were the 2012 CMS ESRD QIP Facility Performance File, which contained total performance scores (TPS)—range 1-30—for most CMS certified facilities (n=5005) in the US, linked to US Census data by zip code. Each facility’s TPS is based on weighted clinical performance measures for dialysis adequacy (urea reduction ratio>65) and hemoglobin outside of the targeted range (% of patients with hemoglobin (Hgb)<10g/dL and % patients with Hgb>12g/dL). Per QIP, facilities with a TPS less than 26 (of 30) will have their payments reduced on a sliding scale, ranging from 0.5% to 2%. We dichotomized the outcomes as ‘any payment reduction’ versus ‘no payment reduction’, and ‘large payment reduction’ (>1.5%) versus ‘other’ (<1.5%). We used logistic regression to characterize associations between QIP performance and dialysis facility characteristics, neighborhood demographics, and region. To determine how the QIP impacts facility outcomes, we examined changes in dialysis facility outcomes between 2007 and 2010.

**Population Studied:** CMS certified dialysis facilities that reported data in 2010.

**Principal Findings:** Only 30% of facilities will have any payment reduction in 2012. In multivariable analysis, dialysis facilities with any payment reductions were more likely to have more dialysis stations (OR 1.02 per station, 95% CI 1.01, 1.03), longer operation (OR 1.03 per year, 95% CI 1.02, 1.04) and a greater proportion of African-Americans in the neighborhood (lowest versus highest quartile, OR 1.34, 95% CI 1.08,1.65). Only a small proportion of facilities (8%) had a large payment reduction, >1.5%. Facilities with large payment reductions were less likely to be for-profit (OR 0.69, 95% CI 0.53, 0.89) and less likely to be in the South and West (OR 0.65, 95% CI 0.50, 0.85 and OR 0.40, 95% CI 0.27, 0.59, respectively compared to facilities in the Midwest). For-profit status and increasing proportion of African-Americans in the neighborhood were associated with greater reduction in percentage of patients with hemoglobin above the targeted range (>12g/dL). This decline in the percentage of patients with a hemoglobin >12g/dL was largely responsible for improvement in clinical outcomes between 2007 and 2010.

**Conclusions:** In the first year of CMS pay-for-performance, a large proportion of dialysis facilities met or exceeded national standards and received no payment reduction. Most of the improvement in clinical outcomes was due to the decrease in patients with hemoglobin above the targeted range. Facilities in predominately African-American communities were more likely to receive a payment reduction despite a large improvement in the percentage of patients with hemoglobin within the targeted range.

**Implications for Policy, Delivery, or Practice:** The future success of ESRD QIP is still unknown. Facilities in African-American communities showed improvement in clinical performance which may not be sustained due to their greater likelihood of payment reduction.

**Funding Source(s):** Other, National Center for Research Resources

**Poster Session and Number:** C, #1135

**Rehospitalization to Index Versus Non-Index Facility Following Abdominal Aortic Aneurysm Repair**

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**Presenter:** Richard Saunders, M.D., Research Fellow, Department of Surgery, University of Wisconsin-School of Medicine and Public Health, saunders@surgery.wisc.edu
**Research Objective:** Decreasing early readmissions after major surgery is a current focus of national healthcare quality improvement efforts. As part of a new Medicare policy to reduce vascular surgery readmissions, discharging facilities will incur reimbursement penalties for patients undergoing aneurysm repair who are readmitted within 30 days. Interestingly, a significant number of discharged patients are readmitted to a non-index facility and thus will be out of the control of the primary surgeon and health care system; the consequences of this have not been systematically evaluated. In this study we examine the characteristics and cost of readmission to index vs. non-index facilities following AAA repair.

**Study Design:** Observational cohort study of patients readmitted within 30 days following abdominal aortic aneurysm repair from 2005-2009. Bivariate and multivariate logistic associations with robust variance estimates were used to determine relationships between patient, procedure, and facility characteristics and index versus non-index hospital readmissions. Total payments for 30 days from the date of rehospitalization were analyzed using quantile regression at the 10th (low), 50th (middle), and 90th (high) percentiles with bootstrapped standard errors.

**Population Studied:** A 5% random national sample of Medicare beneficiaries from the Chronic Conditions Warehouse with acute care rehospitalizations within 30 days of discharge following AAA repair.

**Principal Findings:** 884 patients undergoing AAA repair (open or endovascular) were readmitted within 30 days. 70.7% returned to the index facility and 29.3% returned to a non-index facility. Patients from rural areas were more likely to return to a non-index hospital than urban residents (43.0% vs. 23.3%, p<.001). Adjusted predicted payments were marginally higher for the 10th percentile of the cost distribution, with an estimated 894 dollar (95%CI, 7.6-1779.7, p<0.057) predicted increased cost for index versus non-index rehospitalization. Predicted payments were not significantly higher for index readmissions at the middle and high end of the cost distribution.

**Conclusions:** Patients from rural areas undergoing treatment at urban tertiary care centers are more likely to return to local hospitals. Overall, readmission to a non-index facility after AAA repair is common and associated with lower cost than rehospitalization at the index institution for patients at the low end of the cost spectrum. Quality improvement efforts to reduce readmissions following AAA repair will need to account for this greater likelihood of readmission to a non-index hospital.

**Implications for Policy, Delivery, or Practice:** The ultimate goal of studying readmissions is to develop targeted interventions to decrease readmission rates and improve patient outcomes. Efforts to reduce readmissions often occur within single institutions or healthcare systems; however, the prevalence of non-index hospital readmissions among patients who have undergone AAA repair suggests that effective interventions will be multi-institutional and policy driven. Additionally, the findings of lower predicted costs for readmissions to a non-index hospital suggest that, in uncomplicated cases and for patients who live far from the index facility, readmission to a local facility may be more cost effective and convenient when further treatment is necessary.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #1136

**Documentation of Medical Decision-Making for Genetic Testing in the Health Record**

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**Abstract:**

Errors in the laboratory testing process most likely occur in the pre- (ordering) and post-analytic (results interpretation) phases. This may be especially true for genetic tests, which are ordered infrequently. Our goal was to assess documentation of medical decision-making relating to the pre- and post-analytic phases of genetic testing for relatively common genetic tests (cystic fibrosis, HLA-B27, hemochromatosis, and a thrombophilia panel).
their implications raise concerns that clinicians may not recognize the limitations of the testing performed.

**Implications for Policy, Delivery, or Practice:** Our findings suggest that non-geneticists require assistance in making decisions about test ordering and applying the test results, and provide insight to development of strategies to improve clinician behavior and documentation, such as education and clinical tools that prompt appropriate action at the point of care.

**Funding Source(s):** CDC

**Poster Session and Number:** C, #1137

Medication Adherence and Measures of Health Plan Quality

Seth Seabury, RAND; Darius N. Lakdawalla, University of Southern California; J. Samantha Shoemaker, PhRMA; Jeff Sullivan, Precision Health Economics; Dana P. Goldman, University of Southern California

**Presenter:** Seth Seabury, Ph.D., Senior Economist, RAND, seabury@outlook.com

**Research Objective:** There is growing interest in developing performance-based reimbursement contracts in healthcare systems. One key component is measurement of health plan performance. A proposed performance metric is the rate of medication adherence exhibited by plan participants. Past studies have demonstrated the benefit of patient medication adherence on individual health outcomes; however, this association is largely unknown at the plan-level. This study examines the relationship between medication adherence and measured health plan performance for patients with diabetes and congestive heart failure (CHF).

**Study Design:** We conducted a plan-level retrospective analysis using enrollment and claims records for individuals diagnosed with diabetes or CHF and enrolled in private health care plans of more than 40 Fortune 500 companies from 2000-2009. We compared mean adherence to diabetes and CHF medications to mean health outcomes within health plans. Plan performance was measured based on guidelines endorsed by the National Quality Forum, including disease complications, hospitalizations, and use of emergent care. Plan adherence and quality were computed adjusting for average differences in age, gender and co-morbidities using multivariate regression. Medication adherence was calculated as having 80% of days covered for beta blockers, ACE-
Inhibitors, calcium-channel blockers, diabetes medications, and statins for the diabetes sample, or for beta blockers, ACE-Inhibitors and diuretics for the CHF sample. Plans were stratified into low, moderate and high adherence, based on adherence in the bottom quartile, middle two quartiles and top quartile, respectively.

**Population Studied:** Plan-level statistics were computed using patients continuously enrolled in health plans age 18-65 with a diagnosis of diabetes or CHF. Plans were excluded if contained less than 100 enrollees with the relevant diagnosis. Our final sample included 820 plans with an average of 1,599 diabetes patients per plan and 160 plans with an average of 428 CHF patients per plan.

**Principal Findings:** Average unadjusted adherence across plans was 53.4% for diabetes medications (IQR: 47.3% to 59.7%) and 60.6% for CHF medications (IQR: 54.3% to 67.4%). Plans with higher average adherence exhibited lower complication rates for CHF and diabetes. Patients in plans with low adherence to diabetes medications had unadjusted uncontrolled diabetes admission rates of 1,107 per 100,000 patients, compared to 983 per 100,000 in high adherence plans. Adjusted rates were 1,402 per 100,000 patients in low adherence plans compared to 983 per 100,000 in high adherence plans. In the CHF sample, the adjusted rate of hospitalization for CHF was 16.7% in low adherence plans compared to 13.8% in high adherence plans. These patterns were consistent across different types of complications in both the diabetes and CHF samples.

**Conclusions:** Private health plans vary considerably in average enrollee adherence to medications for treating chronic diseases. Plans with higher rates of medication adherence had lower rates of complications from disease.

**Implications for Policy, Delivery, or Practice:** Plan-level medication adherence is a useful correlate of health plan performance and may encourage plans to promote better use of medicines, and consequently, improve outcomes. Policymakers should consider using performance measures to hold plans accountable for quality care in systems such as the Medicare Part D plan rating system and the health insurance exchanges proposed by the ACA.

**Interventions for Reducing 30-Day Hospital Readmission: A Systematic Review**

Hui Shao, Tulane University, Department of Health Systems Management; Lizheng shi, Tulane University, SPHTM

**Presenter:** Hui Shao, M.H.A., Phd Student, GHSD, Tulane University, Department of Health Systems Management, hshao@tulane.edu

**Research Objective:** This systematic review aimed to summarize the studies of interventions on general discharges for reducing 30-day hospital readmission rates on heart failure, heart attack and pneumonia

**Study Design:** The databases of PubMed, EMBASE and Cochrane library in English language were searched from March 2010 through January 2013, and hand searches were performed of the retrieved reference lists. Randomized controlled trials and cohort studies of interventions to reduce re-hospitalizations on general inpatients were extracted for the effects on 30-day re-hospitalization rates on target diseases. We excluded literature reviews, editorials, case reports, and studies of interventions only targeting disease-specific biomedical causes for re-admissions. Two reviewers independently checked each publication for eligibility and tabulated all the relevant data using standardized data abstraction form. A stepwise review process (title review, abstract review, full text review) was used to exclude irrelevant studies and duplicate publications.

**Population Studied:** Since this is a literature review, the population for this paper is the paper we collected. The inclusion and exclusion criteria were mentioned in study design section

**Principal Findings:** Of 6,654 citations reviewed, 55 studies met the selection criteria. A taxonomy developed by the Re-Engineered Discharge (RED) Program was used to categorize interventions into 12 components such as language assistance, follow-up medical appointments, follow-ups of pending or post-discharge tests/labs, coordination of outpatient services and medical equipment, medication management, reconciliation of the discharge plan with the National Guideline Clearinghouse recommendations, patient educations (discharge plan, diagnosis information, follow-up phone call for reinforcement, contingent plan for recurrent problems), and expedited transmission of discharge summary to clinicians accepting post-discharge care. Among these domains,

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discharge planning including reconciliation of the discharge plan with national guideline is the most frequently tested interventions (n=23/55) and a majority of the studies related to discharge planning showed a consistent results for good outcomes (86.96%). Patient educations on discharge plan, diagnosis information and emergency management were tested less frequently (n=4/55), and yet all had favorable effectiveness on reducing readmission (100%). Although only one report ascertaining needs for and obtaining language assistance, this intervention shows significant improvement for reducing readmission rate.

**Conclusions:** Both discharge planning and patient educations targeting on general discharges are currently the most evidence-based ways for reducing readmission rate. The results are different from the previous findings of interventions on select discharges. More studies are needed to investigate comprehensive interventions on re-admission rates in clinical practices.

**Implications for Policy, Delivery, or Practice:**
Discharge planning and patient educations targeting on general discharges are currently the most evidence-based ways for reducing readmission rate.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #1139

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**A History of the Patient Safety/HAI Movement: How Key Complementary HHS Patient Safety Initiatives have Evolved to Combat HAIs, and What it Means for Future Collaborative Efforts**

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**Presenter:** Sari Siegel, Ph.D., Project Director / Practice Area Lead, IMPAQ International, sari.spieler@gmail.com

**Research Objective:** To explore and link overlapping drivers behind five major HHS initiatives that address the elimination of healthcare-associated infections (HAIs), including the HHS Action Plan for the Elimination of HAIs, the national implementation of the Comprehensive Unit-Based Safety (CUSP) and Surgical Unit-based Safety Programs (SUSP), the national deployment of TeamSTEPPS, the 10th Scope of Work for the Quality Improvement Organizations (QIOs), and Partnership for Patients.

**Study Design:** This work is part of an evaluation of key federal HAI activities using the Daniel Stufflebeam Context-Input-Process-Product (CIPP) evaluation model. It included a review of 166 key documents, including HHS newsletters and peer-reviewed articles obtained from PubMed reviews.

**Population Studied:** Federal patient safety activities addressing HAIs.

**Principal Findings:** These five initiatives have an inextricably linked history stemming from the CDC’s establishment of the National Nosocomial Infections Surveillance System in the 1970s. More recently, the Institute of Medicine’s “To Err is Human” report built the political momentum for the national focus on medical errors, elevating the profile of patient safety in hospitals and making HAIs a Federal priority. This set off a domino effect of Administrative actions, followed by the Joint Commission’s National Patient Safety Goals, the Institute for Healthcare Improvement’s “100,000 Lives” and “5 Million Lives” campaigns and, ultimately, congressional action with the Patient Safety and Quality Improvement Act of 2005. We also found commonalities in the specific history of each of the five Federal activities from 2005 to 2012.

**Conclusions:** The overlapping history of these programs gives rise to potential opportunities for these otherwise independent programs to collaborate in the effort to fight HAIs. By tracing the key milestones of HAI prevention and reduction activities across the patient safety movement and understanding the rise and alignment of factors that drove HAI improvement thus far, we identify successful strategies and cross-agency partnerships that, together, helped to overcome formidable challenges to improve HAI-related outcomes.

**Implications for Policy, Delivery, or Practice:** By understanding common the background that link together current HAI activities, our work both a) highlights successful and replicable collaborations, and b) identifies opportunities to foster future coordination among and between multiple stakeholders, from government, hospitals, clinicians, and patients, to combat HAIs.

**Funding Source(s):** AHRQ

**Poster Session and Number:** C, #1140
Implementing Safety Checklists: Variation among Hospitals Participating in the Safe Surgery 2015 Initiative

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Presenter: Sara Singer, Ph.D., M.B.A., Assistant Professor, Health Policy & Management, Harvard School of Public Health, ssinger@hsph.harvard.edu

Research Objective: Though research consistently demonstrates the efficacy of surgical safety checklists, reducing mortality and post-operative complications in the real world requires effective implementation. Implementation research suggests that supportive organizational contexts and deliberate planning and activities are necessary preconditions for implementation effectiveness. While anecdotal accounts indicate many hospitals have struggled to achieve consistent checklist use, no large-scale studies have described the extent to which specific implementation conditions are met or examined the relationship of these conditions and their effects. This study explores these conditions and outcomes in a diverse group of hospitals from the Safe Surgery 2015 initiative.

Study Design: We measured integration factors and outcomes using a 59-item survey, developed with reference to Safe Surgery 2015 recommendations, qualitative research on checklist implementation, and existing implementation research and frameworks describing determinants of effective implementation in healthcare delivery. We calculated nine implementation indices related to contextual factors, team characteristics, implementation processes, and perceived checklist outcomes and compared these and constituent items across hospitals. We also tested for correlation among implementation factors with perceived checklist outcomes.

Population Studied: Thirty-six South Carolina hospitals that have completed a Safe Surgery 2015 implementation program were invited to participate in the study. Currently, 15 hospital systems (representing 23 hospitals) have completed surveys. A team representative from each of the 15 systems completed the survey.

Principal Findings: We found wide variation in implementation among hospitals on all implementation factors. Recommendations most frequently implemented included choosing implementation team members with adequate levels of representation and influence and pilot testing hospitals’ checklists, with two-thirds of hospital systems implementing both. Weaknesses in hospitals’ implementation programs included: at least one professional discipline was considered very resistant to the checklist in eight systems; in eight systems, teams held implementation meetings less than once every two weeks; only two systems hosted kick-off meetings that involved all surgical disciplines; though strongly encouraged, one-on-one conversations to address checklist concerns were held with less than half of surgical team members in four systems; coaching and observations of checklist use occurred in six and seven systems respectively; enforcement for checklist use was lenient in 12 systems, and leaders intervened with less than half of resistant individuals in ten systems. While only seven systems claimed their hospital staffs used checklists properly all or most of the time, 12 of the systems reported that their checklist implementation had resulted in improvements in efficiency, teamwork, or systemic change. Implementation team characteristics and processes significantly correlated with perceived improvements in teamwork and systemic change (p<.05), but not with enhanced efficiency.

Conclusions: Implementation context and processes varied substantially among Safe Surgery 2015 hospitals. Weaknesses included aspects of implementation considered critical in the literature and according to Safe Surgery 2015 designers. Almost all hospitals reported some improvement with outcomes, and those reporting stronger implementation conditions perceived greater improvement.

Implications for Policy, Delivery, or Practice: Our findings highlight the importance of attention to implementation of innovations like safety checklists, even among hospitals eager to adopt. While myriad recommended initiatives have the potential to improve safety, improved performance will depend on the ability of hospitals to implement effectively.

Funding Source(s): AHRQ

Poster Session and Number: C, #1141
Evaluating Ambulatory Practice Safety: Malpractice Risk through the Eyes of the PROMISES Project Practices' Staff and Administrators

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Presenter: Sara Singer, Ph.D., M.B.A., Assistant Professor, Health Policy & Management, Harvard School of Public Health, Harvard Medical School, Massachusetts General Hospital, ssinger@hsph.harvard.edu

Research Objective: Policymakers face imperatives to increase accountability and compensation for patients harmed by malpractice, reform the legal system for adjudicating patient claims, minimize patient harm and safety risks, learn from errors, and hold down costs. AHRQ funded PROMISES (Proactive Reduction of Outpatient Malpractice: Improving Safety, Efficiency and Satisfaction) to investigate how to achieve these goals in primary care practices in Massachusetts. The purpose of this paper is to describe baseline results from staff and administrator surveys developed to assess the level of ambulatory safety and malpractice risk in PROMISES practices.

Study Design: A randomized trial of ambulatory practices participating in a safety-related improvement collaborative, PROMISES is focused on four high-risk areas: lab-test result tracking, referral follow-up, medication management, and communication among staff and with patients. We administered two surveys, covering 11 areas of safety risk, developed using literature review, existing safety climate instruments, and experience from Massachusetts’s two leading malpractice insurers. A 30-item questionnaire targeting practice managers assessed the presence of safety processes, and a complementary 63-item instrument elicited staff and provider perceptions about the quality of safety-related practices. We administered most surveys electronically (with paper as needed) in 2012 to intervention and control practices. Results provide psychometrically sound measures of respondents’ perceptions of the level of safety risk at their practices. We examined differences in perceptions by safety domain and among respondents and professional disciplines using univariate and bivariate regression models.

Population Studied: We sampled one practice manager for the administrator questionnaire and all providers and staff for the provider survey at 25 adult ambulatory practices, employing one to ten physicians.

Principal Findings: After three reminders, 20 of 25 practice managers and 292 of 482 providers (61%) completed surveys (21% to 100% response among practices). Administrators frequently reported that processes and functionality considered important for safety were absent or partially implemented. For example, administrators said that only 16% of practices had a system for following up on referrals, and just 18% had electronic prescription alerts linked to patient-specific information. Providers overall rated positively their systems for tracking test results, electronic medication management, and referral management. However, provider responses also reflected system deficiencies. For example, only 50% of providers agreed that their practice’s system for following up on referrals is effective. Provider responses varied across practices, with ranges in positive responses of up to 80% on individual items. Varying responses among respondents of different disciplines reflected concerns with the areas for which they had responsibility. For example, half of nurses (but far less physicians and physician extenders) indicated that their office had problems exchanging accurate, complete, and timely information with other offices.

Conclusions: Baseline results from novel administrator and provider surveys focusing on high-risk areas for ambulatory safety identified significant opportunities and strategies for improving the reliability of test results, referral, and medication management systems and communication practices.

Implications for Policy, Delivery, or Practice: Safety practices in ambulatory settings have been under-studied despite the bulk of health
Patient Outcomes after 30, 60 and 90 days Post-Discharge in a Community-Wide, Multi-Payer Care Transitions Intervention Program

Alexis Smirnow, Finger Lakes Health Systems Agency; Melissa Wendland, Finger Lakes Health Systems Agency; Patricia Campbell, Rochester Area Community Foundation; Brenda Bartock, Visiting Nurse Service of Rochester and Monroe Co., Inc.; Eva Cohen, Lifetime Care; Jeanne Chirico, Lifetime Care; Howard Beckman, Finger Lakes Health Systems Agency, University of Rochester School of Medicine and Dentistry

Presenter: Alexis Smirnow, M.P.H., Project Manager, Finger Lakes Health Systems Agency, alexissmirnow@flhsa.org

Research Objective: The Care Transition Intervention (CTI) has demonstrated efficacy in reducing hospital readmissions in chronically ill older adults. Based on the positive impact of CTI on decreasing 30 day readmissions, the program has been implemented in many communities. However, to date, little data are available on whether and to what extent there is benefit beyond 30 days, and for more diverse patient populations.

The objective of this community-wide Quality Improvement (QI) project was to explore the impact of CTI on a diverse patient population’s hospital admission rates at 30, 60 and 90 days post index discharge.

Study Design: A prospective cohort design was employed to link and analyze data gathered by CTI coaches with data from insurer-based claims. Data were collected on patient demographics, exposure to CTI and hospital utilization post-discharge for 90 days. Patients were categorized into groups based on their exposure to CTI using three classifications: completed program, partial completion of the program and non-acceptance (did not complete a home visit).

Population Studied: 674 patients were approached in the hospital, Emergency Department or Observation units to participate in CTI between October 2010 and April 2011. Patients were insured by non-HMO government programs, Medicare Advantage and commercial payors. Eligible patients were enrolled with an active diagnosis that included CHF, CAD, Pneumonia, COPD, Diabetes and UTI. Other patients who could potentially benefit from CTI were considered on a case by case basis.

Principal Findings: Of the 674 patients who were approached to participate during an index hospital visit, 27.7% completed the entire CTI program, 16.8% were partial completers and 55.5% did not accept CTI. After 30 days post-discharge, patients who completed CTI had an admission rate of 9.1%, partial completers 18.6% and non-acceptors 20.3%. The admission rate in patients who completed the program was 55.2% less when compared to patients who did not accept CTI. CTI completers had lower hospitalization rates when compared to patients who were partial completers at 60 (17.6% vs. 23.9%) and 90 days post-discharge (22.5% vs. 27.4%). Those not accepting CTI had an admission rate of 28.3% at 60 and 32.6% at 90 days. When compared to those not accepting CTI, CTI completers had a 37.8% lower admission rate at 60 days and 31.0% at 90 days.

Conclusions: While the impact of the CTI is most notable in the 30 day post-discharge admission rate, the effect continues to be notable after 60 and 90 days post-discharge. Partial completion of the CTI program appears to have an intermediate impact on admissions. The results suggest that the intervention is most effective in patients who complete the full program.

The QI methodology used is susceptible to biases regarding patient selection and other factors which may have influenced the results.

Implications for Policy, Delivery, or Practice: The effectiveness of CTI extends beyond the controlled environment of an RCT, demonstrating a lasting impact on admission rates at 30, 60 and 90 days for a heterogeneous patient population.

Funding Source(s): Other, New York State Department of Health

Poster Session and Number: C, #1142

Healthcare Costs of Lung and Colon Cancer Patients Receiving Chemotherapy following FDA Policy Changes

Kevin Stroupe, Department of Veterans Affairs; Denise M. Hynes, MPH, PhD, RN, Department of Veterans Affairs; Elizabeth Tarlov, RN, PhD, Department of Veterans Affairs; Thomas W. Weichle, MS, Department of Veterans Affairs;
Principal Findings: The majority were male (over 97%) with mean age of 65 years. While more lung-cancer patients received transfusions in the POST vs. PRE period (27% vs. 25%, P=0.04), ESA use was lower for both cancer groups in the POST period (lung, 23% vs. 39%, P<0.01; colon, 11% vs. 23%, P<0.01). POST-period ESA costs were lower (lung, $541 lower, P<0.01; colon, $508 lower, P<0.01), but transfusion costs were not significantly different. Consequently, total POST-period anemia treatment costs were lower (lung, $526 lower, P<0.01; colon, $504, P<0.01). However, cancer-related costs were higher in the POST period (lung, $4,500 higher, P<0.01; colon, $10,343 higher, P<0.01) as were non-cancer costs. Consequently, total POST-period healthcare costs were higher (lung, $4,706 higher, P<0.01; colon, $11,414 higher, P<0.01).

Conclusions: Outpatient anemia treatment costs were lower during the period after the FDA policy change. There was no substitution effect of transfusion in place of ESAs. These declines in anemia treatment costs were not enough to offset the higher cancer and non-cancer related costs, resulting in higher total costs.

Implications for Policy, Delivery, or Practice: There was an association between the FDA policy change and the use of ESAs and blood transfusions, with no apparent substitution effect, resulting in lower total outpatient anemia treatment costs among lung and colon cancer patients receiving chemotherapy.

Funding Source(s): VA

Poster Session and Number: C, #1144

Are Postoperative Complications Associated with Variation in Inpatient Tonsillectomy Costs?
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Presenter: Gordon Sun, M.D., M.S., Postdoctoral Fellow, Otolaryngology-Head and Neck Surgery, Robert Wood Johnson Foundation Clinical Scholars Program, gordonsu@med.umich.edu
Research Objective: Tonsillectomy is one of the most common procedures in the United States. We examined whether post-tonsillectomy complications (hemorrhage; use of mechanical ventilation) are associated with variation in inpatient tonsillectomy costs at the individual and hospital levels.

Study Design: We conducted a retrospective cohort study of the 2009 Healthcare Cost and Utilization Project Nationwide Inpatient Sample (NIS). The primary outcome was tonsillectomy cost, calculated by converting encounter charges to costs using hospital-specific ratio data provided by NIS. Major covariates of interest included two postoperative complications acquired at the individual patient and hospital level, post-tonsillectomy hemorrhage and mechanical ventilator (MV) use. Secondary covariates included patient and hospital-level characteristics, surgical indication, selected comorbidities, and length of stay (LOS).

Hierarchical, mixed-effects linear regression modeling was used to determine whether the association between postoperative complications and cost was influenced by clinically relevant covariates. We also estimated the variance in cost attributable to the treating hospital using the intraclass correlation coefficient (ICC).

Population Studied: The cohort comprised all adult and pediatric patients who underwent tonsillectomy with or without adenoidectomy and were subsequently hospitalized. Encounters with missing financial data and encounters in hospitals having done fewer than 10 tonsillectomies were excluded.

Principal Findings: In 2009, 12,512 tonsillectomies were performed in 80 hospitals, with a mean cost of $7,525 per encounter (95% confidence interval (CI) $6,453-$8,597). Patients under 18 years of age comprised 66.1% of the cohort. Airway obstruction was the clinical indication for 73.3% of tonsillectomies. Mean LOS was 2.4 days (95% CI 2.1-2.8 days).

Mechanical ventilator (MV) use was associated with significantly higher unadjusted tonsillectomy cost (incremental cost=$35,620; 95% CI $23,186-$48,055; p<0.001). Post-tonsillectomy hemorrhage was not associated with cost. In hierarchical analyses, MV use remained associated with a $9,428 increase in incremental cost (95% CI $5,305-$13,552; p<0.001), controlling for patient demographics, hospital-based characteristics, clinical diagnoses, concurrent tympanic membrane surgery, LOS, and hospital-specific MV usage rate. The ICC was 0.083.

The MV usage rate per hospital for post-tonsillectomy care was 0-21.4%. Seven hospitals had >10% MV usage rates and 46 hospitals had 0% MV usage rates. After adjusting for key covariates, each 1% increase in the hospital rate of MV use was associated with a $457 increase in mean hospital cost (95% CI $214-$700, p<0.001) of post-tonsillectomy care.

Conclusions: MV use is associated with a significant increase in both individual and mean hospital costs for inpatient tonsillectomy. Over 8% of variation in individual cost is attributed specifically to treating hospitals. Moreover, there is clinically and economically significant variation between hospitals in mechanical ventilator use following inpatient tonsillectomy.

Implications for Policy, Delivery, or Practice: Mechanical ventilation is a proxy for critical care utilization, which incurs costs from intensified staffing levels, continuous monitoring, and other contributing factors compared with surgical ward care. Conditions warranting prolonged MV use may also concurrently prolong hospitalization, which escalates costs further. Risk stratification analyses of inpatient tonsillectomy patients are warranted to help identify common reasons for MV use, which can in turn guide systemic interventions to reduce inpatient tonsillectomy costs.

Funding Source(s): RWJF

Poster Session and Number: C, #1145

Volume of Complex Procedures at Military Treatment Facilities


Presenter: Matthew Sweeney, Ph.D., Researcher, Mathematica Policy Research, Inc., msweeney@mathematica-mpr.com

Research Objective: Previous research has documented a positive relationship between procedural volume and patient outcomes, and this relationship can exist both at the provider- and facility-level. This study measures the volume of high-risk, complex procedures performed at Military Treatment Facilities.
(MTFs). Volume of complex procedures may be an important indicator of the clinical experience of procedure-performing staff within the MTFs, and may have implications for both the quality of care delivered by the MTFs to TRICARE beneficiaries and maintenance of MTF physician skills.

We measure the number of complex procedures performed on TRICARE beneficiaries within each MTF in the United States, and within civilian hospitals located in close proximity to each MTF. This allows us to measure the market-level volume of complex procedures for each MTF, and to simulate potential MTF volume if all procedures performed in nearby civilian facilities were redirected to the MTFs.

**Study Design:** We used four years of Military Health System inpatient discharge data from the Standard Inpatient Data Record (SIDR) and the inpatient claims TRICARE Encounter Data (TED-I) databases to measure the volume of complex procedures performed in 44 US-based MTFs and nearby civilian hospitals, respectively. The analysis is limited to individuals age 18 or older who were discharged between January 1, 2008 and December 31, 2011. We ran the SIDR and TED-I data through AHRQ’s Inpatient Quality Indicator (IQI) software (version 4.3) to calculate six procedural volume measures. We compared market-level volume for each procedure against minimum volume thresholds suggested by AHRQ. The six IQI-related procedures examined were: esophageal resection, pancreatic resection, abdominal aortic aneurysm (AAA) repair, coronary bypass graft (CABG), percutaneous transluminal coronary angioplasty (PTCA), and carotid endarterectomy.

**Population Studied:** TRICARE beneficiaries ages 18 and older.

**Principal Findings:** Market-level procedural volume for most MTFs is generally lower than the minimum volume thresholds suggested by AHRQ. Some market areas may be able to reach AHRQ volume thresholds for AAA repair, CABG, and PTCA. However, the likelihood of directing all patients to any one facility is low, given the emergent nature of some of these procedures and patient choice of providers.

**Conclusions:** The potential for MTFs or surrounding facilities to reach minimum volume thresholds for these six complex procedures on military populations alone is limited. This may be due to the fact that beneficiaries served by MTFs are relatively young and healthy, and may not need these procedures as frequently.

**Implications for Policy, Delivery, or Practice:** Low volume of the IQI-related procedures represents a challenge for maintenance of relevant skills maintenance among military clinicians and care quality at MTFs. MTFs could consider directing these types of cases to local civilian facilities with high volume of these procedures in other populations. However, doing so would have the consequence of taking away experience with complex procedures from the relevant MTF staff, which may have negative impacts on development and maintenance of procedural and case management skills. Other potential solutions include directing cases to achieve higher volume at designated MTFs, or development of strategies for procedure team skill maintenance through approaches that do not rely on the clinical needs of local TRICARE beneficiaries.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #1146

**Is Doing the Right Thing Associated with Patient Satisfaction?**

Gabriel Tajeu, University of Alabama at Birmingham; Abby Swanson Kazley, Medical University of South Carolina; Nir Menachemi, University of Alabama at Birmingham

**Presenter:** Gabriel Tajeu, MPH, National Research Service Award Trainee, Division of Preventative Medicine, University of Alabama at Birmingham, gtajeu@uab.edu

**Research Objective:** To examine whether there is an association between improvements in quality measures and patient satisfaction (PS) over time in a national sample of hospitals.

**Study Design:** We link Hospital Compare and AHA data from 2009-2011 and use a repeated-measures pooled cross sectional study design with year fixed effects. CMS Quality measures from acute myocardial infarction (AMI), heart failure (HF), and pneumonia (PN) served as independent variables. Our dependent variables include measures for overall patient satisfaction at the hospital level extracted from the Hospital Compare dataset. Specific satisfaction items include whether a patient would ‘definitely recommend the hospital’ and whether the patient would ‘rate the hospital a 9 or 10 overall.’ We estimate separate regression for each satisfaction measure while controlling for bed size, system affiliation, teaching status, hospital location (urban/rural), year, and clustering at the hospital level.
**Population Studied:** The Hospital Compare and AHA datasets contain data on quality and demographics for a national sample of hospitals. We analyze results from 442 hospitals.

**Principal Findings:** All three categories of quality were positively associated with PS. These associations were statistically significant. Specifically, a one percentage point increase in AMI quality was associated with a 1.59 percentage point increase in the amount of people who agreed that they would recommend the hospital (p <0.01) and a 1.05 percentage point increase in the amount of people who would rate the hospital a 9 or 10 (p <0.01). A one percentage point increase in HF quality was associated with a 0.31 percentage point increase in the amount of people who agreed that they would recommend the hospital (p <0.01) and a 0.20 percentage point increase in the amount of people who would rate the hospital a 9 or 10 (p <0.01).

**Conclusions:** The positive association between quality measures and PS suggests that hospital interventions aimed at improving quality could result in PS improvements as well.

**Implications for Policy, Delivery, or Practice:** To the extent to which our results have a causal pathway, hospital focus on quality improvement may also positively affect patient satisfaction. More research is needed to gauge the causal nature of this important trend.

**Funding Source(s):** N/A

**Poster Session and Number:** C, #1147

**Predictors of Extended Hospitalization Following Mastectomy**

Lori Uyeno, City of Hope; Leanne Streja PhD, City of Hope; Courtney Vito MD, City of Hope; Steven Chen MD MBA, City of Hope; John Yim MD, City of Hope; Laura Kruper MD, City of Hope

**Presenter:** Lori Uyeno, M.D., M.P.H., Fellow, Surgery, City of Hope, lori_uyeno@yahoo.com

**Research Objective:** To identify predictors and costs associated with extended hospitalizations following mastectomy.

**Study Design:** Observational study using the Healthcare Cost and Utilization Project (HCUP) state inpatient database. Multivariate logistic regression analysis was performed with extended hospital length of stay (LOS) as the main outcome variable. Extended LOS was defined as >= 3 days. Outpatient mastectomy or LOS 0 days was excluded. The reference group for LOS was 1-2 days. Predictors included patient, clinical, and hospital characteristics. Inpatient costs per hospital episode was estimated using total charges from discharge records and all-payer inpatient cost to charge ratios constructed from hospital reports.

**Population Studied:** Women >= 18 years old with a diagnosis of breast cancer who underwent a mastectomy with or without immediate reconstruction in California between 2006-2009.

**Principal Findings:** The median length of stay following a mastectomy for all years was 1 day (95% CI 1-4 days); median test by year was not significant (p<0.086). 82% of all hospital stays following mastectomy are 1-2 days and only 18% are extended stays >= 3 days. In the multivariate model, the following predictors were found to be highly significant (p<0.0001): year, race, payer, comorbidity, bilateral mastectomy, immediate reconstruction, radical mastectomy, complications, and hospital size. African-Americans had higher odds of extended stay compared to Whites (OR 1.59 95% CI 1.41-1.80) while Asians had lower odds (OR 0.74 95% CI 0.66-0.83). Medicaid patients had a higher odds of extended stay in the hospital compared to Medicare (OR 1.17 95% CI 1.04-1.31) while patients with private insurance had lower odds (OR 0.88 95% CI 0.81-0.95). Hospital characteristics such as urban, larger size (>100 beds), and investor-owned versus non-profit were associated with longer stays. More extensive surgery including reconstruction, bilateral, and radical mastectomy were all significant determinants. Women with >= 3 comorbidities had two times higher odds of an extended stay compared to women with none (OR 2.0 95% CI 1.81-2.21). Adverse events during hospitalization had the strongest predictive effect on extended LOS (OR 4.4 95% CI 4.10-4.79). From 2006 to 2009, the total costs for all inpatient mastectomies have almost doubled from $46 million to $82 million a year. The median cost per hospitalization for stay <2 days compared to extended stay was $7,642.24 (95% CI $3,367.11-$19,285.66) versus $15,040.08 (95% CI $5,826.13-$32,925.90); Mann-Whitney test (p<0.0001).

**Conclusions:** The majority of hospital stays for mastectomy +/- immediate reconstruction are 1-2 days. About 18% of inpatient stays remain beyond the average 2 days. While clinical characteristics are important predictors; race, payer, and hospital characteristics are additional strong determinants of extended LOS following mastectomy.
Designing a Care Pathway for Total Joint Arthroplasty: Results of a Method to Ensure Safety, Evidence-based Care, Efficiency, and Patient-Centeredness

Aricca Van Citters, Dartmouth Institute for Health Policy and Clinical Practice; Cheryl Fahlman, Premier, Inc.; Eugene Nelson, Dartmouth Institute for Health Policy and Clinical Practice; Donald Goldmann, Institute for Healthcare Improvement; John Martin, Premier, Inc.; Jay Lieberman, University of Southern California; Kevin Bozic, University of California at San Francisco; Richard Bankowitz, Premier, Inc.

Presenter: Aricca Van Citters, M.S., Research Associate, Dartmouth Institute for Health Policy and Clinical Practice, aricca.d.van.citters@dartmouth.edu

Research Objective: Total joint arthroplasty (TJA) is one of the most widely performed elective procedures and can effectively reduce pain and disability associated with osteoarthritis. However, given wide variation in both cost and quality associated with these procedures, hospitals and orthopedic practices are striving to optimize TJA care. Our objective was to design a Care Pathway that includes safe, effective, efficient, and patient-centered TJA care processes.

Study Design: Content analysis and lean methods were used to identify and map TJA care processes derived from semi-structured provider and patient interviews. Best practices identified by participants were incorporated into a Care Pathway, and supplemented with evidence-based and consensus-based guidelines. A 30-member panel of orthopaedic leaders, patients, and interdisciplinary subject matter experts refined the pathway in a 1-day workshop. A second draft of the pathway was vetted with interviewees and panel members.

Implications for Policy, Delivery, or Practice: Variation in LOS following mastectomy by non-clinical factors such as race, payer, and hospital type warrant further investigation as factors that could be potentially modified through policy changes or incentives and minimize extended lengths of stays and costs.

Funding Source(s): No Funding

Poster Session and Number: C, #1148

Population Studied: Semi-structured interviews were conducted with 10 Premier member hospitals (and affiliated surgical practices) with low costs of inpatient care, high performance on SCIP metrics, and low 30-day readmission rates; 7 nationally-recognized TJA programs (based on expert opinion); and 2 TJA patients. Programs were diverse in size, geographic region, teaching status, and surgical volume. Interviews included surgeons, anesthesiologists, program coordinators, nurses, physical therapists, care managers, and quality directors.

Principal Findings: The Care Pathway targets interactions between patients and an interdisciplinary team of providers. It spans 14 months, beginning with the decision to have surgery and concluding 12-months post-discharge. It identifies 39 high leverage opportunities to improve care, 37 tips to reduce waste, and 54 tips to avoid communication pitfalls. Change ideas target both system redesign and individual patient care. Selected overarching principles include standardizing care protocols; aligning information flow with patient/process flow; standardizing staff roles/responsibilities; identifying a person accountable for care delivery and communication; educating and engaging patients and families; managing patient expectations; using shared decision-making; establishing financial arrangements between hospitals and physicians that encourage high-value care; and following a risk identification, evaluation, and mitigation process to stratify patients into the most appropriate care level. Strengths of the methodology included transparency, engagement of national and local stakeholders, sharing of best practices from top performers, identifying practices that can be applied within diverse settings by diverse providers, and capturing care processes as patients experience them. Challenges included time required to analyze information and build consensus, overcoming organizational resistance to sharing “proprietary” information, and differentiating between waste and value-added processes.

Conclusions: An idealized TJA Care Pathway was developed using qualitative methods and lean principles, and is freely available to the public. Leaders of orthopedic societies, clinicians, patients, patient advocates, and experts in safety and lean consumption have endorsed it.
Implications for Policy, Delivery, or Practice: TJA processes are evolving, and progressive health systems are actively testing initiatives to improve care. Diverse TJA programs can use this Care Pathway to improve delivery of high-value care. The methodology used to develop the Pathway can be applied to a variety of high-volume health care procedures, and can be used to advance the delivery of high-value care.

Funding Source(s): Other, Premier, Inc.

Poster Session and Number: C, #1149

Emergency Department based Observation Units and Care of Patients with Chest Pain: A Statewide Analysis of Georgia and Massachusetts 2009

Arjun Venkatesh, Yale University School of Medicine; Jeremiah Schuur, Brigham and Women's Hospital, Harvard Medical School; Folefac Atem, PhD, Brigham and Women's Hospital; James Ware, PhD, Harvard School of Public Health; Carlos Camargo, MD, DrPH, EMNet / Massachusetts General Hospital

Presenter: Arjun Venkatesh, MD, MBA, Robert Wood Johnson Clinical Scholar, Emergency Medicine and Internal Medicine, Yale University School of Medicine, arjun.venkatesh@yale.edu

Research Objective: Chest pain (CP) is a leading cause of emergency department (ED) visits, hospital observation care (OBS) and inpatient care. Clinical trials have shown ED-based observation units (EDOUs) to be more efficient than inpatient care for ED patients with possible cardiac chest pain. We aim to describe the care of ED patients with non-specific chest pain (NSCP), acute coronary syndromes (ACS), and acute myocardial infection (AMI) including identification of predictors of OBS use. We hypothesize that presence of an EDOU is associated with efficient use of OBS.

Study Design: Retrospective, cross-sectional analysis of Georgia(GA) and Massachusetts(MA) hospital discharge data. We used discharge ICD-9 codes to classify visits by clinical condition into NSCP, or ACS/AMI. We included 106 of 136 hospitals in GA, and 56 of 74 in MA that used OBS for >100 cardiac patients to ensure stable estimates. Presence of EDOU was determined from statewide surveys. We calculated three utilization metrics: “CP evaluation rate”, the proportion of all ED CP patients who were admitted or observed; “ACS/AMI rule-in rate”, the proportion of observed or admitted patients with NSCP or ACS/AMI who were diagnosed with ACS/AMI; and “Observation Use for Low Probability CP”, the proportion of all short stay evaluations (<=2 days) with a final diagnosis of NSCP who were managed in OBS. We report median hospital proportion (25th-75th percentiles). To test the role of EDOU presence, we used multilevel multivariate logistic regression models (SAS 9.2) that account for hospital-level clustering while adjusting for patient age, sex, and comorbidities (Elixhauser), and sequentially adding hospital variables: EDOU presence, ED volume, and teaching status.

Population Studied: All adult ED visits, post-ED observation and inpatient discharges in Georgia(GA) and Massachusetts(MA) in 2009. Patients transferred after an ED visit were excluded.

Principal Findings: In GA there were 2,753,784 ED patient visits, of which 133,203 (4.8%) had a final diagnosis of NSCP; 12,500 (0.45%) had ACS, and 10,606 (0.39%) had AMI. In MA there were 3,838,440 ED patient visits, of which 150,501 (3.92%) had a final diagnosis of NSCP 10,890 (0.28%) had ACS, and 15777 (0.41%) had AMI. Thirteen GA hospitals and six MA hospitals reported having an EDOU. Statewide rates for chest pain utilization measures are reported in the Table. After adjustment for patient variables, hospital EDOU presence was not associated with the CP evaluation rate, the ACS/AMI rule-in rate, or with the Observation Use for Low Probability CP rate in GA or MA. Sequential models adding ED volume and teaching status found neither of these hospital variables to be predictive of any of the three metrics.

Conclusions: Massachusetts EDs use observation and inpatient hospitalization for patients with NSCP, ACS and AMI more than Georgia EDs. Hospitals with EDOUs do not utilize observation or inpatient evaluation for ED patients with nonspecific CP or cardiac conditions differently than hospitals without EDOUs. Further research is needed to understand the implications of this on hospital efficiency and patient outcomes.

Implications for Policy, Delivery, or Practice: While clinical trials have shown that EDOUs reduce inpatient hospitalization for ED patients with chest pain, in two states their presence was not associated with utilization of hospital services among such patients.

Funding Source(s): Other, Society of Chest Pain Centers and the Harvard Catalyst (The Harvard Clinical and Translational Science
Provider's Perception of Point of Care Research (Pragmati Trials)
Charlene Weir, VA SLC; Jorie Butler, SLVAMC IDEAS Center; Iona Thraen, SLVAMC IDEAS Center; Ryan Ferguson, Boston VA MAVERICK; John Hermos, Boston VA MAVERICK; Terri Gleason, VA ORD

Presenter: Charlene Weir, Ph.D., Associate Director, GRECC and IDEAS Center, VA SLC, charlene.weir@hsc.utah.edu

Research Objective: Randomized clinical trials are considered the “gold standard of scientific evidence. Randomization minimizes many threats to the validity of conclusions. However, RCTs are expensive and limited in terms of generalizability to populations, settings and procedures. “Pragmatic trials” are often touted as a research method that ameliorates some of the limitations, by using real-life settings, clinical populations that are more like the population who would receive the intervention and clinicians whose practice patterns and workflow resemble the situations where the intervention would be implemented. The VA is in the process of implementing a variation on the concept of a pragmatic trial, called Point of Care Research (POCR) where the intervention is imbedded in regular care. The clinician would recruit patients, and outcome data would be extracted from the electronic medical record. Provider’s acceptance of this program is critical to success and to the idea of a Learning Organization. The goal is to identify provider’s attitudes toward this kind of research.

Study Design: A qualitative design was used with focus groups. The same script was used for each session. It consisted of an introduction, description of the POCR, how POCR might be used in the VA. Semi-structured questions were then asked about how it might impact clinical care, relationship with patients, ethical issues, workflow questions and general attitudes. The focus groups lasted about an hour. Each was recorded and the recordings were transcribed removing any identifying information. The transcripts were then loaded into ATLAS@ti, a software used for qualitative analysis

Population Studied: Provider focus groups were conducted at 7 VA sites with 51 provider participants, including physicians (75%), psychologists (15%), nurse practitioners (10%) and physician assistants (5%).

Principal Findings: Six themes were extracted after multiple iterations of the text.
1. Uncertainty: Providers have a pervasive sense of uncertainty regarding POCR goals, boundaries, operational structure and applicability. 2. Autonomy versus Compliance. POCR studies (in regular clinical settings) might increase the common tension between professional autonomy and the responsibility to comply with research procedures and policies. 3. Time and Burden: POCR studies are complex and substantial time costs and burden is expected if clinicians are administering them during regular care. 4. Scientific Validity: The quality and validity of the research enterprise will likely be compromised using PODR trials, do to lack of controls and the usual variation in practices. 5. Patient-Provider Relationship: Providers feel a deep sense of responsibility for their patients and want to preserve the trust and respect embodied in the clinical patient-provider relationship. 6. The Value of the Pragmatic Trials: POCR would be a valuable contribution to quality of care by providing evidence that is more generalizable, more available and easier to implement.

Conclusions: Pragmatic trials and Point of Care research has the potential to greatly improve translation of evidence from research into care processes. However, provider’s are generally positive, but have important significant concerns about patient’s rights, the provider-patient relationship, and the validity of the findings

Implications for Policy, Delivery, or Practice: Implementation of POCR research would have significant impact on quality of care improvement.

Funding Source(s): VA

Poster Session and Number: C, #1150

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Providers Perception of Point of Care Research (Pragmati Trials)
Charlene Weir, VA SLC; Jorie Butler, SLVAMC IDEAS Center; Iona Thraen, SLVAMC IDEAS Center; Ryan Ferguson, Boston VA MAVERICK; John Hermos, Boston VA MAVERICK; Terri Gleason, VA ORD

Research Objective: Randomized clinical trials are considered the “gold standard of scientific evidence. Randomization minimizes many threats to the validity of conclusions. However, RCTs are expensive and limited in terms of generalizability to populations, settings and procedures. “Pragmatic trials” are often touted as a research method that ameliorates some of the limitations, by using real-life settings, clinical populations that are more like the population who would receive the intervention and clinicians whose practice patterns and workflow resemble the situations where the intervention would be implemented. The VA is in the process of implementing a variation on the concept of a pragmatic trial, called Point of Care Research (POCR) where the intervention is imbedded in regular care. The clinician would recruit patients, and outcome data would be extracted from the electronic medical record. Provider’s acceptance of this program is critical to success and to the idea of a Learning Organization. The goal is to identify provider’s attitudes toward this kind of research.

Study Design: A qualitative design was used with focus groups. The same script was used for each session. It consisted of an introduction, description of the POCR, how POCR might be used in the VA. Semi-structured questions were then asked about how it might impact clinical care, relationship with patients, ethical issues, workflow questions and general attitudes. The focus groups lasted about an hour. Each was recorded and the recordings were transcribed removing any identifying information. The transcripts were then loaded into ATLAS@ti, a software used for qualitative analysis

Population Studied: Provider focus groups were conducted at 7 VA sites with 51 provider participants, including physicians (75%), psychologists (15%), nurse practitioners (10%) and physician assistants (5%).

Principal Findings: Six themes were extracted after multiple iterations of the text.
1. Uncertainty: Providers have a pervasive sense of uncertainty regarding POCR goals, boundaries, operational structure and applicability. 2. Autonomy versus Compliance. POCR studies (in regular clinical settings) might increase the common tension between professional autonomy and the responsibility to comply with research procedures and policies. 3. Time and Burden: POCR studies are complex and substantial time costs and burden is expected if clinicians are administering them during regular care. 4. Scientific Validity: The quality and validity of the research enterprise will likely be compromised using PODR trials, do to lack of controls and the usual variation in practices. 5. Patient-Provider Relationship: Providers feel a deep sense of responsibility for their patients and want to preserve the trust and respect embodied in the clinical patient-provider relationship. 6. The Value of the Pragmatic Trials: POCR would be a valuable contribution to quality of care by providing evidence that is more generalizable, more available and easier to implement.

Conclusions: Pragmatic trials and Point of Care research has the potential to greatly improve translation of evidence from research into care processes. However, provider’s are generally positive, but have important significant concerns about patient’s rights, the provider-patient relationship, and the validity of the findings

Implications for Policy, Delivery, or Practice: Implementation of POCR research would have significant impact on quality of care improvement.

Funding Source(s): VA

Poster Session and Number: C, #1150

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Associations between Quality Reporting and Receipt of Health Care Services: Findings from the Survey of the Health of Wisconsin
Kristen C Malecki, PhD, MPH, Survey of the Health of Wisconsin, Department of Population Health Sciences, University of Wisconsin, Madison; Lauren Wisk, University of Wisconsin Madison; Lauren E. Wisk, BS, Department of Population Health Sciences, University of Wisconsin, Madison; Matthew Gigt, MPH, Wisconsin Collaborative for Healthcare Quality;
Research Objective: We sought to look at the association between system level quality reporting and patient outcomes for the Wisconsin population and for specific subsets of the population that would be impacted by certain specific health care system quality reporting initiatives and priorities, using a population-based, representative sample of the adult Wisconsin population.

Study Design: Data are from the 2008-2011 Survey of the Health of Wisconsin (SHOW) and Wisconsin Collaborative for Healthcare Quality (WCHQ). Our sample includes 2,183 adults who were matched to their usual provider, 18 of which participated in the WCHQ. WCHQ provider performance on four preventive care and one chronic care quality reporting metrics were used to determine WCHQ provider rankings (low, medium, high performing). Provider type and rankings were used to predict receipt of 9 preventive health services among those who were eligible based on USPSTF guidelines, adjusting for patient gender, age, educational attainment and health insurance status.

Population Studied: Wisconsin adults aged 18 to 74.

Principal Findings: Overall, 46.1% of SHOW participants had a WCHQ provider, 42.5% had a non-WCHQ provider, and 11.5% did not have a usual provider. Multivariable analyses revealed that eligible individuals without any usual provider were significantly less likely to have received all 9 preventive health services compared to eligible individuals with a regular provider. Compared to those with low performing providers, eligible individuals with higher ranking WCHQ providers were more likely to have received a biennial pap smear; and those with the best performing WCHQ provider were more likely to have received a biennial cholesterol check and annual influenza vaccination. Individuals with high performing WCHQ providers were also more likely to have received a biennial general health checkup compared to individuals with non-WCHQ providers. Hypertensives, those with any chronic condition, and high priority individuals with high performing WCHQ providers were more likely receive a biennial blood pressure check, general health checkup and annual flu vaccine, respectively, than their counterparts with low performing WCHQ providers. Overall, a composite quality metric better predicted receipt of services than service- or disease-specific metrics.

Conclusions: Healthcare quality and population health are inextricably linked yet few studies have been designed to adequately address these relationships. We find that quality reporting on the provider and group level appears to correspond to the receipt of some, but not all, priority preventive services on the individual level. Additionally, these results suggests that patients in high quality programs tend to receive the care they need but not too much care; in other words, high quality systems tend to be more efficient.

Implications for Policy, Delivery, or Practice: As the composite/summary metric better correlated with receipt of services than disease-specific metrics, that those wishing to utilize quality reporting tools should carefully consider reliability and validity of metrics for specific purposes and how to operationalize these metrics.

Funding Source(s): NIH

Poster Session and Number: C, #1152
LONG TERM CARE

Organizational Structure, Market Factors, and Outcomes Quality in Home Health Care: A Longitudinal Study [2007-2011]
Ajit Appari, Dartmouth College

Research Objective: 2013 marks two hundred years of home health care in the US. The competitive landscape of home health care has changed dramatically with emergence of new payment models: number of home health agencies (HHAs) rising by two-third during 2001-2011 and quality of service and outcomes are gradually becoming main drivers for reimbursement. In this study we examine the associative relationship of organizational structure and market factors with outcome quality performance of HHAs.

Study Design: We obtained data on the three outcome quality measures (risk-standardized rates of patients receiving any emergency care without hospitalization, discharged from home healthcare; and admitted to an acute care hospital) and agency characteristics (ownership, service mix, tenure in the Medicare program) were obtained from Home Health Compare for the period 2007-2011. Further, for each agency its market penetration was measured by geographic coverage (proportion of area served within HRR) in its primary market, and number of HRRs served. Additionally, data characterizing market (306 hospital referral regions HRR) were obtained from CMS-Healthcare Indicator Warehouse, including market demand (measured as percentage beneficiaries using post-acute care, count of Medicare beneficiaries), direct competition (number of active agencies within HRR), substitutive competition (percentage beneficiaries using post-acute care services from alternative providers – long term care hospitals, skilled nursing facilities, and inpatient rehabilitation facilities). A balanced panel dataset was constructed and analyzed, in STATA-12, using fixed effects linear panel model accounting for temporal and spatial correlation, and beneficiary characteristics including average age, Medicare/Medicaid dual eligibility, and average health risk ratio).

Principal Findings: Patients receiving care at non-profit agencies compared to for-profit had lower hospitalization rate (b=-1.03, 95%CI [-1.44, -0.62]), needed lesser emergency care without hospitalization (b=-0.36, CI [-0.76, 0.04]), and discharged to home (b=1.46, CI [1.23, 1.69]). Likewise, patients cared at agencies with larger service mix had lower hospitalization rate (b=-0.35, CI [-0.42, -0.28]), and discharged to home (0.39, CI [0.24, 0.53]). Further, agencies with higher penetration in primary market had better outcomes (hospitalization: -2.13, CI [-3.49, -0.77]); emergency care:-4.73, CI [-6.15, -3.31]). Agencies operating in markets with higher direct competition have better patient outcomes (hospitalization: -0.67, CI [-0.87, -0.47]); emergency care: -0.42, CI [-0.62, -0.22]; discharged to home: 0.25, CI [0.11, 0.38]).

However, substitutive competition from alternative care providers including inpatient rehabilitation facility, skilled nursing facilities, long term care hospitals had mixed association.

Conclusions: Our findings suggest that home health agencies offering higher service mix, and operated with non-profit orientation provide better home care resulting in better patient outcomes. Furthermore, agencies operating in highly competitive market (i.e., with larger number of active HHAs) also have better patient outcomes. However, the effect sizes are moderate at best.

Implications for Policy, Delivery, or Practice: The study results can inform on the competitive dynamics and quality outcomes of home healthcare market. In particular, the study can help in developing policies and guidelines to manage and improve resource constrained home healthcare in the wake of aging population.

Funding Source(s): No Funding
Poster Session and Number: C, #1159

Benzodiazepine Prescribing Patterns across Ontario Long-Term Care Homes: An Examination of Residents, Prescribers and Facilities
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Presenter: Susan Bronskill, Ph.D., Scientist, Institute for Clinical Evaluative Sciences (ICES), susan.bronskill@ices.on.ca

Research Objective: The objective of this study was to examine benzodiazepine prescribing patterns for those newly admitted to long-term care (LTC) in the context of resident, prescriber and facility characteristics.

Study Design: This retrospective cohort study was conducted using multiple linked population-based health administrative databases in the province of Ontario, Canada. Admission to LTC is a centralized process that is managed through regional waiting lists and these lists were used to identify all older adults newly admitted to a LTC facility between April 1, 2005 and September 30, 2009. This cohort was linked to five other databases related to health service eligibility including demographic information (age, sex, income), drug claims, inpatient care, emergency department visits and physician billings. Prescribing physician and LTC home characteristics were also available. Variation in the use of benzodiazepines was examined across residents, physicians and LTC homes using hierarchical models.

Population Studied: The cohort consisted of 57,504 all older adults aged 66 years and older who were newly placed in 622 LTC homes and prescribed to by 2,190 physicians. In order to correlate prescribing patterns for residents with specific LTC homes, residents were followed until any one of: death; inpatient admission; emergency department visit; placement in another LTC facility; or 180 days after LTC placement date occurred.

Principal Findings: 21,823 (38.0%) residents had been prescribed a benzodiazepine in the 180 days following admission. Among those receiving a benzodiazepine, 40.2% had not been prescribed this drug therapy in the year prior to placement. Among those who had been previously dispensed a benzodiazepine (n=18,232), 28.4% did not receive a benzodiazepine after placement. Among residents prescribed a benzodiazepine in the year following placement, 13.4% received a high dose according to guidelines, 4.1% received the drug for a long duration (greater than 30 days), and 49.0% had prescriptions that fulfilled the definition of chronic use. Over 80% of physicians prescribing benzodiazepines were male and almost all were family physicians. In larger facilities (greater than 199 beds), fewer residents appeared to be dispensed benzodiazepines following placement (regardless of history of benzodiazepine prescription). The rate of benzodiazepine prescribing varied widely across LTC homes – from 5% to over 40% among newly admitted residents with no history of benzodiazepine use.

Conclusions: This study found that the prescribing of benzodiazepines for newly-admitted long-term care residents is not uncommon and among those prescribed, almost half had prescriptions that fulfilled the definition of chronic use. Given that benzodiazepines are a class of drug with documented risks for cognitive impairment and falls among older adults, and that serious adverse events within LTC homes has been associated with high rates of inappropriate prescribing, examining prescribing patterns will help to improve quality of care to a population that already tend to be frail and have complex health conditions.

Implications for Policy, Delivery, or Practice: Inappropriate use of benzodiazepines for the elderly is well-documented in the literature. Highlighting prescribing patterns across LTC homes, and factoring in physician and facility characteristics, might help to target effective educational interventions. Data on regional variations in conjunction with local context can allow for the examination of appropriateness of use.

Funding Source(s): Other, Canadian Institutes of Health Research

Poster Session and Number: C, #1160

Do Elderly Patients with Non-Medical Discharge Delays Have Frequent Contact with the Health System Prior to Hospitalization?

Susan Bronskill, Institute for Clinical Evaluative Sciences (ICES); Nadia Gunraj, Institute for Clinical Evaluative Sciences; Jessica Leah, Institute for Clinical Evaluative Sciences (formerly)

Presenter: Susan Bronskill, Ph.D., Scientist, Institute for Clinical Evaluative Sciences (ICES), susan.bronskill@ices.on.ca

Research Objective: The objectives of this study were to describe the characteristics of older adults with non-medical discharge delay in acute care hospitals and to quantify their health system resource use and transitions across sectors prior to hospitalization. Often referred to as “bed blockers”, these patients no longer
required acute care, but, due to their medical needs, cannot be discharged directly into the community.

**Study Design:** A retrospective cohort study was conducted using multiple, linked, population-based administrative databases from Ontario, Canada. All older adults with non-medical delays who were discharged from acute care hospitals were identified between April 1, 2010 and March 31, 2011. All physician visits, hospital and emergency department visits, home care service use and long-term care home applications in the year prior to admission were measured. Demographic information (age, sex, income), diagnoses, length of hospital stay and discharge destination were observed. Comparisons of prior system use were made between men and women, and those without and without a regular family physician using logistic regression.

**Population Studied:** 35,546 Ontarians aged 65 and older were discharged alive from an acute care hospital, and had a non-medical delay during the hospitalization.

**Principal Findings:** In the year prior to hospital admission, 96.7% of older adults with delayed discharge had visited a family physician, 65.8% had contact with an emergency department, 43.2% had been hospitalized and 48.8% had received government-funded home care services. The majority of patients (50.1%) were women age 75 and older. Falls, fractures and trauma were the most common diagnoses recorded during hospitalization, followed by cardiovascular disease, cerebrovascular disease, and dementia/delirium. Prior to their index hospitalization, women used home care services more than men and individuals with a regular family physician used all acute care resources (home care, ED and hospital) more than those without a regular family physician.

**Conclusions:** Most patients with non-medical delayed discharge accessed the health care system prior to their hospital admission and suggests that they are often known to health care providers. This might introduce opportunities to intervene prior to hospitalization, particularly in the primary care and home care settings where visits are common.

**Implications for Policy, Delivery, or Practice:** The non-medical delay of older adults in acute care hospitals raises important issues about health system coordination, capacity and patient flow across sectors. If these individuals are well-known to health care providers and can be identified prior to hospital admission, then it might be possible to intervene and prevent (or delay) a costly hospitalization or to better direct their care through increased home care service provision or the initiation of long-term care home applications earlier, thereby limiting, or possibly eliminating, the need for non-medical delay.

**Funding Source(s):** Other, Ontario Ministry of Health and Long-Term Care

**Poster Session and Number:** C, #1161

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**The Impact of Competition on the Quality of Home Healthcare Services: Evidence from California, Florida, and Texas**

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**Presenter:** Hsueh-fen Chen, Ph.D., Assistant Professor, Health Management and Policy, University of North Texas Health Science Center, hsueh-fen.chen@unthsc.edu

**Research Objective:** To examine the impact of competition on the quality of home healthcare

**Study Design:** Economic theory provides the conceptual framework for the study. The unit of analysis was individual HHAs. A panel study design from the 4th quarter of 2008 to the 2nd quarter of 2010 is applied. Data sources included CMS Home Health Compare, Provider of Services file and Area Resource File. The dependent variables are eleven quality indicators including the percentage of patients experiencing hospitalization and emergency visit during the episode of care, and the percentage of patients who are better in the following conditions at the end of episode: taking oral medication correctly, getting in and out of bed, bathing, walking or moving around, bladder control, shortness of breath less often; wounds improved or healed after an operation; less pain when moving around, and staying at home after discharge from home healthcare. The key independent variables are three dummy variables based on the quartile of HHI to represent different levels of competition pressure in the market, with very low competition in the reference group. A series of control variables such as ownership and the percentage of aging population are included in the model. Fixed effects models were used to
separately analyze quality indicators for HHAs in the study states.

**Population Studied:** The study samples are all Medicare-qualified HHAs in the states of California, Florida, and Texas. There are 3612, 4980, 10085 quarter-observations in California, Florida, and Texas, respectively.

**Principal Findings:** After controlling confounders, HHAs in highest competitive markets in California have fewer patients experiencing emergency visits and more patients feeling less pain when moving around than HHAs in very low competitive market. In Florida, HHAs in highest competitive markets have better quality performance at taking oral medication correctly and less often for shortness of breath compared to HHAs in very low competitive markets. In Texas, only taking oral medication is better in HHAs in low competitive markets relative to HHAs in very low competitive markets. For other indicators: hospitalization rates, getting in and out of bed, bathing, walking or moving around, and staying at home after discharge from home healthcare, there is not significant differences among different competition markets for any of the study states.

**Conclusions:** The results from our study indicate that increases in competition only have had a limited impact on the quality of home healthcare. Although our findings do not follow economic theory, the results support the statement that "more may not be better" in the home healthcare industry, as MedPAC noted.

**Implications for Policy, Delivery, or Practice:** Asymmetric information is likely to exist in the home healthcare industry, which may explain HHA behaviors deviating from economic theory even if Medicare has implemented several mechanisms such as quality report card to encourage quality competition among HHAs. Additionally, the majority of HHAs are for-profit, for they are likely to maximize their profits. Future studies that focus on different quality measures and home healthcare utilization are recommended to better inform policymakers about market regulation of the home healthcare sector.

**Funding Source(s):** Other, UNTHSC Faculty Seed Grant

**Poster Session and Number:** C, #1162

**Hospice Residential Care: Measuring Each State’s Standing**

Stephan Chung, California State University, Northridge; Joelle In-Ae Jahng, California State University at Northridge; Gabriel Bolivar, California State University at Northridge

**Presenters:** Stephan Chung, Ph.D., Associate Professor, Department of Health Sciences, California State University, Northridge, stephan.chung@csun.edu

**Research Objective:** Hospice care is becoming increasingly important in care of the elderly, accounting for nearly half of Medicare decedents. When the Medicare Hospice Benefit was established over 3 decades ago, it was designed as an in-home care program. By the early 1990s, it was evident that certain patients (e.g., dying homeless people, AIDS patients) required a different model of hospice care based outside the home. By 1995, New York, North Carolina, and Florida had passed legislation authorizing the hospice residence (HR), a group home dedicated to patients where staff members provided round-the-clock care. By the early 2000s, hospices sought new revenue streams, notably freestanding facilities, in which both residential and short-term acute inpatient care could be provided. To address concerns about the diminishing number of residential beds and rising growth in acute inpatient beds in hospice facilities, baseline data is critical in assessing how well each state addresses needs for HR care. HR’s are operated under different types of providers in many states, leading to difficulty in collecting reliable data on HR’s.

**Study Design:** From the 2010 Census, we obtained the daily HR census, or the number of individuals counted on a given day in 2010 at in-patient (both freestanding and units in hospitals) hospice facilities who did not report a home other than HR. For comparison by state, we divided the daily HR census by the Medicare beneficiaries’ hospice daily census, yielding the HR utilization rate. To examine the relationship between HR utilization and state policies, each state’s hospice policies from state administrative codes were compiled.

**Population Studied:** Hospice patients who were receiving HR care on a given day in 2010 in the United States.

**Principal Findings:** New York’s HR utilization rate was ranked 2nd (25%), following Wyoming (28%), over 4 times Florida’s rate, ranked 27th (5.6%), and 2.7 times North Carolina’s rate, ranked 16th. Florida and North Carolina recognize HR by licensure, but their HR beds have been converted to acute inpatient care beds in the past decade. Delaware’s HR
utilization rate was the lowest, although Delaware, where HR’s are not recognized by licensure law, was one of the five states with the highest hospice utilization among Medicare decedents.

**Conclusions:** Though New York is one of the states with the lowest hospice use among Medicare decedents, it was ranked 2nd in meeting HR needs.

**Implications for Policy, Delivery, or Practice:** As Americans increasingly age and live alone, HR needs are expected to rise. New York is considered the exemplar of states’ efforts to increase HR care capacity. Encouraged by savings that HRs have achieved as a lower cost alternative to patients receiving care either in a hospital or nursing home, policy makers in New York have implemented several policies, such as increasing the HR bed limit from 8 to 16, permitting dual (both residential or inpatient) use for up to 2 beds, and passing legislation authorizing room and board payment for Medicaid HR patients, since 1995. States far behind New York in terms of HR utilization rate may benefit from studying New York as a model.

**Funding Source(s):** NIH
**Poster Session and Number:** C, #1163

**Health Service Utilization of Adults in Assisted Living Communities**
Gilbert Gimm, George Mason University; Panagiota Kitsantas, George Mason University; John Cantiello, George Mason University; Andrew Carle, George Mason University

**Presenter:** Gilbert Gimm, Ph.D., M.B.A., Associate Professor, Health Administration and Policy, George Mason University, gilber20@gmail.com

**Research Objective:** Assisted living communities have grown significantly over the past twenty years to provide long-term care for adults who have functional limitations, but prefer a more independent, home-like environment than a nursing home. This study examined whether health service utilization and falls were significantly associated with personal characteristics of residents in assisted living communities and other residential care facilities.

**Study Design:** Using data from the 2010 National Survey of Residential Care Facilities (NSRCF), we conducted weighted logistic regression analyses to examine whether demographic characteristics, Medicaid coverage, health conditions, and functional status influenced the likelihood of three key outcomes: (1) emergency room (ER) visits, (2) overnight hospitalizations, and (3) falls. While ER visits and hospitalizations are measures of health care utilization, falls are adverse outcomes that can lead to injuries. Control variables included facility size, skilled nursing services, and resident length-of-stay.

**Population Studied:** The study sample included 8,094 adult residents living in communities with four or more beds. The sample excluded facilities dedicated to serving adults with several mental illness or developmental disabilities. The majority of residents (54%) in the sample was 85 years or older. Most residents (81%) were in large communities with 26 or more beds.

**Principal Findings:** Less than half of residents experienced any of the three outcomes (35% for ER visits, 24% for hospitalizations, and 15% for falls). Residents with depression (OR 1.31, p<.001), congestive heart failure (1.49, p<.001), chronic obstructive pulmonary disease (1.32, p<.01), and functional limitations (1.23, p<.001) had a greater likelihood of incurring an ER visit. However, residents with cognitive problems such as memory loss (0.96, p<.05) had a lower likelihood of ER visits. Similar results were obtained for overnight hospitalizations. Residents with depression (1.39, p<.001), osteoporosis (1.46, p<.001), cognitive impairments (1.06, p<.01), and functional limitations (1.24, p<.001) had a greater likelihood of a fall. Medicaid coverage was not significantly associated with any outcome measure.

**Conclusions:** Residents with depression, specific chronic conditions, or functional limitations were at higher risk of incurring an ER visit, hospitalization, or fall. Medicaid coverage was not significantly associated with any outcome.

**Implications for Policy, Delivery, or Practice:** These findings suggest that assisted living communities and states can identify adult residents who are at higher risk of ER visits, hospitalizations, or falls. Managing high-risk residents can help to reduce the frequency of falls. As the demand for long-term care grows and Medicaid provides financing of assisted living services in the future, policymakers should continue to support data collection efforts that measure health service use and quality among assisted living residents.

**Funding Source(s):** Other, ALFA
**Poster Session and Number:** C, #1164
**Many Nursing Home Employees Do Not Receive Influenza Vaccine**

David Howard, Emory University; Sarah Blake, Emory University; Jill Daugherty, Emory University; Saad Omer, Emory University; Jessica Grosholz, Emory University

**Presenter**: David Howard, Ph.D., B.S.E., Associate Professor, Department of Health Policy and Management, Emory University, david.howard@emory.edu

**Research Objective**: Influenza in nursing home residents is responsible for 7,300 deaths annually and over $173 million in inpatient Medicare spending. While approximately three-quarters (72%) of nursing home residents receive the influenza vaccine annually, the vaccine offers limited protection in older and immuno-compromised patients. Health care workers can transmit the influenza virus to nursing home residents. Vaccination of health care workers reduces the incidence of influenza-like illnesses among residents. Existing estimates of nursing home employee vaccine rates have serious shortcomings.

**Study Design**: We surveyed nursing employees at 39 nursing homes in Florida, Georgia, and Wisconsin that participated in a larger study to describe nursing homes’ protocols for documenting receipt of resident vaccination. Administrators distributed surveys to employees.

**Population Studied**: 1,965 nursing home employees, of whom 256 were RNs, 342 were LPNs, 837 were nurses aids, and 531 held other positions.

**Principal Findings**: 54% of staff members surveyed received the influenza vaccination during the 2011-2012 flu season. Nursing home-level staff vaccination rates varied widely, from a low of 15% to a high of 97%. Black employees and younger employees were less likely to receive the vaccine. Employee vaccination rates in nursing homes that used some type of incentive were 12 percentage points higher (p = 0.08). Receipt of vaccine by persons in key leadership roles was unrelated to employee vaccination rates.

**Conclusions**: Low vaccination rates among nursing home workers put residents at increased risk for influenza-related morbidity and mortality. **Implications for Policy, Delivery, or Practice**: CMS should consider using employee vaccination rates as a quality indicator in addition to resident vaccination rates. Our findings support the use of a trial to test the use of incentives to increase employee vaccination rates.

**Funding Source(s)**: CDC

**Poster Session and Number**: C, #1165

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**Influence of Antipsychotic and Antidepressant Use on Mortality among Medicare Nursing Home Residents with Alzheimer's Disease and Related Dementias**

Ting-ying Huang, University of Maryland School of Pharmacy; Yu-Jung Jenny Wei, University of Maryland School of Pharmacy; Linda Simoni-Wastila, University of Maryland School of Pharmacy; Patience Moyo, University of Maryland School of Pharmacy; Ilene H. Zuckerman, University of Maryland School of Pharmacy; Judith Lucas, Rutgers University

**Presenter**: Ting-ying Huang, B.S.Pharm., Research Assistant, Pharmaceutical Health Services Research, University of Maryland School of Pharmacy, tjhuang@umaryland.edu

**Research Objective**: Suboptimal use of psychopharmacological medications (PPMs), including antipsychotics (APs) and antidepressants (ADs), places nursing home (NH) residents at increased risk for adverse outcomes, including mortality. This is especially a concern for cognitively impaired patients. However, clinicians, researchers, and policymakers have yet to arrive at a consensus on managing cognitive impairment, including associated behavioral symptoms, and the role of PPMs in such management. Controlling for behavioral symptoms, this study seeks to assess the influence of using APs and ADs in the NH residents with Alzheimer’s disease and related dementia (ADRD) on associated mortality.

**Study Design**: This retrospective cohort study used a 5% random sample of the 2007-2009 Medicare administrative claims data from the Chronic Condition Data Warehouse linked to Minimum Data Set 2.0. Beneficiaries were included in the sample if they had: 1) evidence of at least 1 NH long-stay (>100 days); 2) an ADRD diagnosis at baseline (12 months prior to date of the first observed long-stay [index date]) or during the drug exposure assessment period (6 months after the index date); and 3) survived and remained continuously enrolled in Medicare Parts A (inpatient), B (physician/carrier) and D (prescription drug) services through the 6-month exposure assessment period. We excluded...
beneficiaries who participated in Medicare Advantage programs or who had diagnoses of severe mental illness (schizophrenia-related conditions, psychosis, and mood disorders) at baseline and during exposure assessment period. We assessed use of APs and ADs during the 6-month exposure assessment period and all-cause mortality afterwards up to the end of the study period (12/31/2009). Cox proportional hazards models were used to estimate risk of mortality associated with AP and AD use, adjusting for baseline covariates (demographics, low-income subsidy status, comorbidities, psychiatric conditions, behavior symptoms (physical, verbal, and socially inappropriate behaviors), hospitalization, and physical and cognitive function).

**Population Studied:** Medicare long-stay NH residents diagnosed with ADRD.

**Principal Findings:** The cohort of 35,782 long-stay NH residents with ADRD had a mean age of 83 years and was predominantly female (79.9%). AP and AD prevalence was 28.3% and 58.3%, respectively. Compared to AP non-users, AP users were more likely to have a delirium diagnosis (44.4% vs. 33.8%, p<0.001) and behavioral symptoms (23.9% vs. 10.9%, p<0.001). Similar patterns were observed between AP users and non-users. Almost half (49.6%) of the entire ADRD sample died. After adjusting for covariates, AD users had a lower risk of mortality (relative risk [RR]=0.94, p<0.001) compared with nonusers. We did not observe a significant difference in mortality between AP users and non-users. The significance for AD use remained after AP use was controlled in the model (RR= 0.94, p<0.001).

**Conclusions:** Appropriateness of guideline-suggested use of APs in ADRD residents, with and without behavioral symptoms, should be further explored, as treatment for behavioral symptoms does not appear to influence mortality outcomes. As well, further research on the role of ADs on mortality should be conducted to confirm the apparent protective effect of these medications.

**Implications for Policy, Delivery, or Practice:**

**Funding Source(s):** Other, Research Retirement Foundation

**Poster Session and Number:** C, #1166

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**Nursing Home Referrals within the Veterans Health Administration: Practice Variation According to Facility Type and Payment Source**

Orna Intrator, Brown University; Stephanie Gidmark, Providence VA Medical Center; Emily Gadbois, University of Massachusetts Boston, Providence VA Medical Center; Deborah Burton, Providence VA Medical Center; Edward Miller, University of Massachusetts Boston

**Presenter:** Orna Intrator, Ph.D., Associate Professor, Center for Gerontology and Health Care Research, Brown University, Orna.Intrator@va.gov

**Research Objective:** Veterans may receive nursing home (NH) care in Veteran Health Administration (VHA) operated Community Living Centers (CLCs), state veterans homes (SVHs), or community NHs which may or may not be under contract with the VHA. Federal law requires Veteran Affairs Medical Centers (VAMCs) to provide VHA-paid NH care to highly service-connected (mandatory) Veterans and those whose need for care results from their service-related disability. VAMCs also have discretion to provide VHA paid care to other Veterans if resources allow. This study examines how Veterans’ eligibility for different payment sources informs NH referrals within the VHA.

**Study Design:** Semi-structured interviews were performed. Transcripts were coded to identify recurring themes and patterns in responses. Review of archival sources took place as well.

**Population Studied:** Thirty-five interviews with individuals with in-depth knowledge of the NH referral process at 12 VAMCs chosen to ensure variation in catchment area, available NH options, and region.

**Principal Findings:** Most Veterans that receive CLC care do so after an inpatient VAMC stay. Most CLCs reserve long-term care beds for mandatory placements, though occasionally non-mandatory but difficult to place Veterans are admitted. Post-acute/rehabilitation placements include a mix of mandatory and non-mandatory Veterans, some of whom may be eligible for Medicare-paid care in a community NH. In some cases, this is because mandatory veterans prefer the CLC due to its familiarity and reputation for quality; in others, this is because medical staff believes the resulting care coordination and outcomes will be more successful regardless of service-connected
status. A number of VAMCs report reducing or eliminating long-term care placements in CLCs, even for mandatory Veterans, so that beds are more readily available to hospital transferees. Most Veterans that receive contract NH care do so after an inpatient VAMC stay, though some derive from outpatient clinics and community hospitals. Virtually all referrals are for mandatory Veterans. VAMCs handle those eligible for both Medicare and VA-paid care differently. Some will place them under Medicare first, beginning VA payment when the Medicare co-pay would start; others begin VA payment immediately. VAMCs also handle non-mandatory Veterans differently. Some will place them into a community NH under a 30 day contract, Medicaid pending; others do not. SVHs primarily provide long-term care because most residents transfer there after an intervening stay in another setting due to lengthy waitlists for such services. If geographically convenient, Veterans typically prefer SVHs over other options due to camaraderie amongst Veterans and because they can often move in with their wives. SVHs typically receive payments from the state, VA, and Veteran which may be waived in favor of a larger VA payment for mandatory eligibles.

Conclusions: The NH referral process varies depending on the types of facilities a Veteran can be placed. Variations also occur due to differences in local policies/practices and regional market differences, most notably with respect to payment source (VHA, Medicare, Medicaid).

Implications for Policy, Delivery, or Practice: Variations in the NH referral process are inevitable. Recognizing this implies that the VHA Central Administration must concentrate its efforts on monitoring the care provided in order to ensure that Veterans receive the best care wherever they are placed.

Funding Source(s): VA

Poster Session and Number: C, #1167

Physicians in Nursing Homes: Measuring Facility Control
Orna Intrator, Brown University; Julie C. Lima, PhD, Brown University; Terrie Fox Wetle, PhD, Brown University

Research Objective: It has long been hypothesized that in nursing homes (NHs), as in hospitals, greater control of medical staff will be related to better resident care. This describes a measure of NH control of physicians providing care to its residents.

Study Design: The NH Control of Medical Staff (NHCOMS) measure was developed using primary data collected via a survey of NH administrators (Admin), as well as the national Online Survey Certification and Reporting (OSCAR) of NHs. NHCOMS face validation was assessed by testing the direction of its associations with nursing home size, average number of admissions per bed-year, the proportion of Medicare SNF covered days, as well as several other items reported in the survey including the extent of cross-coverage among physicians and on-site or phone coverage on holidays and weekends.


Principal Findings: NHCOMS was derived from 7 questions asked of NH Administrators addressing the sub-concepts of physician oversight, formal attachment of physicians to the NH, and credentialing. The 3 sub-concept scores were combined into an overall score with a possible range from 0 to 3 in which higher values reflected greater control over physicians. NHCOMS has a mean of 1.58 and scores ranged between 0 and 3. Higher NHCOMS scores were positively related to facility size (NHCOMS=1.40 for facilities with 50 or fewer beds, 1.83 for facilities with >200 beds, p<.001); percent SNF days (NHCOMS=1.43 for facilities in smallest quintile versus 1.70 for those in top quintile, p<.001); and admissions per bed per year (1.42 for bottom quartile versus 1.69 for top quartile). NHCOMS was also higher in NHs that reported a higher frequency of cross coverage (1.46 'none of the time' versus 2.04 'all of the time'; p<.001) and weekend and holiday coverage on-site (1.56 'none of the time' versus 1.93 'all of the time', p<.001) or by phone (1.23 'none of the time' versus 1.69 'all of the time', p<.001).

Conclusions: A measure developed from NH Administrator responses to 7 questions provided a meaningful description of NH's control of medical staff. NHCOMS varied widely across U.S. NHs. This measure will be useful in in improving understanding how control of medical staff relates to NH outcomes such as the rate of hospitalizations and re-hospitalizations or other
measures such as appropriate use of medications.

**Implications for Policy, Delivery, or Practice:**
NHs are responsible for the care of a large number of medically complex and frail residents and therefore NHs must assure effective medical care. Monitoring NH’s control of its medical staff may result in better NH resident outcomes.

**Funding Source(s):** NIH

**Organizations of Medical Staff and Quality in VA Community Living Centers Compared to Community Nursing Homes**

Orna Intrator, Brown University School of Medicine; Shubing Cai, Brown University School of Medicine, Providence VAMC; Stefanie Gedmark, Providence VAMC; Christa Hojlo, VHA Office of Geriatrics and Extended Care; Gary Kokersberger, Canandaigua VA Medical Center, University of Rochester; Jurgis Karuza, University of Rochester; Paul Katz, University of Toronto

**Presenters:** Orna Intrator, Ph.D., Sc.M., Assistant Professor of Research, Center for Gerontology and Health Care Research, Brown University School of Medicine, orna_intrator@brown.edu

**Research Objective:** This study describes Medical Staff Organization (MSO) and quality in VA Community Living Centers (CLCs) relative to MSO in free-standing (FSNHs) and hospital based nursing homes (HBNHs) in the community.

**Study Design:** A survey of VA CLC medical directors, revised from a previously conducted survey of American Medical Directors Association medical directors regarding nursing homes medical staff organization, was sent to the medical directors of all 133 operating VA CLCs in 2009. Responses from 103 CLCs were obtained. CLC responses were compared to responses from 202 FSNHs and 10 HBNHs including a comparison of dimensions of nursing home MSO. Assessment information of residents of CLC, FSNHs, HBNHs in the sample were compared to understand differences in needs. A linear regression model was fit to examine the impact of the MSO dimensions on the average number of hospitalizations per patient per NH among CLCs and FSNHs, adjusting for facility level casemix.

**Population Studied:** VA CLCs (103), FSNHs (202), HBNHs (10).

**Principal Findings:** CLCs had more attending physicians and mid-level practitioners’ hours per resident than FSNHs and HBNHs. CLCs had higher levels of physician cohesiveness (CLC = 0.69, FSNH = 0.60, HBNH = 0.61) and interdisciplinary involvement (CLC = 0.71, FSNH = 0.42, HBNH = 0.49), and had lower levels of leadership turnover (CLC = 0.37, FSNH = 0.47, HBNH = 0.39). The higher volume of more integrated and cohesive medical staff in CLCs was seen regardless of the fact that CLCs provided care to a younger and sicker, but more functionally intact population. In CLCs the average age of residents was lower than in FSNH or HBNHs (73.1, 81.8, 81.2, respectively). CLCs cared for less physically and cognitively impaired individuals than FSNHs and HBNHs (average Activities of Daily Living scores [range 0-28]; 12.4, 16.0, 16.74, respectively; percent of residents with little or no cognitive impairment [66.8%, 38.7%, 55.24%]. Residents in CLCs and HBNHs had higher nursing staff needs than those in FSNH (average RUGS casemix index 0.89, 0.97, 0.80 respectively), CLC residents received more medications compared to FSNHs and HBNHs (13.8, 10.3, 12.1, respectively), and had higher rates of serious mental illness (15.3%, 7.2%, 3.7%). Hospitalization rates varied greatly by setting with CLCs average of 4.5, HBNHs 2.0, and FSNHs 0.8 hospitalizations per patient year. Despite the challenges presented by a sicker population, and a higher rate of hospitalizations, VA CLCs had fewer hospitalizations when they had more supervision and had a higher proportion of their residents cared by a single medical provider.

**Conclusions:** VA CLCs employed fewer medical staff but with more clinical hours than FSNHs and HBNHs, and their medical staff was more integrated. CLCs cared for a sicker but less functionally impaired population, suggesting that medical conditions were more acute in CLCs than in the community NHs studied. MSO played an important role in hospitalizations even within the closed-practice CLCs.

**Implications for Policy, Delivery, or Practice:** Although VA CLCs care for a particular niche of patients, aspects of their MSO may help improve quality of care in community nursing homes.

**Funding Source(s):** VA

**Poster Session and Number:** C, #1169

**Who Are Veterans Newly Admitted to Nursing Homes?**
Orna Intrator, Providence VAMC and Brown University; Shubing Cai, Providence VAMC and
Hospice care reported on the MDS increased in 10.3 in CLCs, and 14.8 to 16.7 in SNFs. Likely to NHs in 2005, in 2009 Veterans were more likely to have cancer and a terminal diagnosis, have serious mental illness, and be functionally impaired (average ADL scale increased from 8.8 to 10.3 in CLCs, and 14.8 to 16.7 in SNFs). Hospice care remained higher than in other settings to 28 scale. Increased from 8.8 to 10.3 in CLCs, and 14.8 to 16.7 in SNFs.

**Principal Findings:** Overall, Veterans admitted to CLCs or CNHs were younger, more likely to be African-American and less likely to be physically impaired than those admitted to SNFs or general NHs. Veterans admitted to CLCs were more likely than Veterans admitted to all other settings to have cancer and a terminal diagnosis, have serious mental illness, and receive hospice care. The clinical profile of veterans admitted to NHs changed between 2005 and 2009. Compared to Veterans admitted to NHs in 2005, in 2009 Veterans were more likely to be functionally impaired (average ADL scores [on a 0-28 scale] increased from 8.8 to 10.3 in CLCs, and 14.8 to 16.7 in SNFs). Hospice care reported on the MDS increased in CLCs from 11.2% in 2005 to 19.1% in 2009. The proportion of Veterans with Congestive Heart Failure increased from 13.3% to 18.3% in CNHs, from 17.4% to 22.9% in general NHs, and from 22.6% to 26.3% in SNFs, while remaining around 12% in CLCs. Interestingly, the proportion of Veterans admitted to NHs with dementia increased in SNFs, CNHs and general NHs (18.6% to 23.3%, 19.6% to 23.6%, and 22.1% to 26.1%, respectively) while it decreased slightly, from 11.2% to 10.2%, in CLCs. More surprisingly, the proportion of African-Americans increased from 13.1% to 16.3% in CLCs, while it decreased from 11.1% to 7.5% in all other NH settings.

**Conclusions:** The profiles of Veteran receiving care in CLCs vs. other VA paid and non-VA paid NH settings appears quite different. It is important to elucidate the special roles CLC plays that lead to these differences.

**Implications for Policy, Delivery, or Practice:** More global factors affecting quality of NH care for Veterans include VA initiatives to increase patient-centered care, improve effectiveness of discharge planning, provide care in the least restrictive environment and improving management of chronic conditions that might require re-hospitalization. Understanding the role of CLCs vis-à-vis other NH settings is a critical step in improving long term care for Veterans.

**Funding Source(s):** VA

**Poster Session and Number:** C, #1170

**Prevalence of Depressive Symptoms as an ‘Actionable’ Nursing Home Quality Measure**

Stephanie Kissam, RTI International; Karen Reilly, ScD, RTI International; Laura Smith, PhD, RTI International; Daniel Barch, MS, RTI International

**Presenter:** Stephanie Kissam, MPH, Health Services Research Associate, RTI International, skissam@rti.org

**Research Objective:** Under-treatment of depression among nursing home (NH) residents has been a concern. Depression rates differ considerably in the research literature. A 2002 report (Datto, et al.) stated 34 percent of residents have clinically significant depressive symptoms as measured by an independent clinical evaluation. Validation testing the NH Minimum Data Set, Version 3.0 (MDS 3.0) development found 17 percent of residents self-reported major depressive symptoms (Saliba,
Implications for Policy, Delivery, or Practice: Staff training regarding use of the PHQ-9 may be warranted. Regarding the question of why higher rates of anti-depression medication use does not have a greater effect on reported rates of major depression symptoms among NH residents, policy implications are obscured until this association is more clearly defined.

Funding Source(s): CMS
Poster Session and Number: C, #1171

Multistate Life Table and a Future Estimate of the Number of Elderly People Eligible for Long-term Care Insurance

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Research Objective: To make a future estimate of the number of people likely to require long-term care, and compare this estimate with the actual number of people who needed long-term care according to data from insurers, then discuss the policy implications.

Study Design: We collected our data from a municipality of Tokyo, Japan. Details obtained included sex, birth year, care need level of long-term care as of October 2010, and care need level as of October 2009. We calculated the probability that the level of care would change over time, and estimated the number of elderly people who would need long-term care in 2011 using the principle of multistate life tables. We then compared these estimates with the actual number of people who needed long-term care in 2011.

Population Studied: We included 190,783 people (91,089 males, 99,694 females) in the study population, with 37,653 (19.7%) aged 65 years or older. In Japan, a public long-term care insurance system was introduced in 2000. People aged 40–64 years pay a premium, which is incorporated into their medical insurance premium. Elderly people (= 65 years) pay a premium determined by their local government based on the estimate of service usage. Those who wish to use a service covered by insurance need to obtain a certificate from their local municipal office outlining the level of care required. Beneficiaries can use the service up to
a determined maximum amount for the level of care stipulated, and with a 10% co-payment. The average premium among elderly people during the study period was approximately US$40 per month.

**Principal Findings:** The estimated total number of people who would need support or long-term care was similar to the actual number of people that received it. However, when examining the results according to level of care, there was a noticeable difference between the estimates and the actual number.

**Conclusions:** The multistate life table principle has potential for estimating the number of people who will need long-term care. To improve the accuracy of future estimates using this principle, it will be necessary to increase the number of subjects and use a longer observation period. The effects of system changes and intentions to use long-term care services should also be considered.

**Implications for Policy, Delivery, or Practice:** The multistate life table principle for estimating the number of people that will require long-term care detects slight changes in the current level of care required, and in patterns for providing long-term care services. Researchers should be aware that when small changes are temporary, or when the number of samples is small, the effects on estimated results are artificially inflated.

**Funding Source(s):** Other, Grant-in-Aid for Scientific Research B

**Poster Session and Number:** C, #1172

**Are Nursing Home Survey Deficiencies Higher in Facilities with Greater Staff Turnover**

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**Presenter:** Nancy Lerner, R.N., Assistant Professor, Organizational Systems and Adult Health, University of Md. School of Nursing, lerner@son.umaryland.edu

**Research Objective:** Turnover of staff is of increasing concern for nursing homes, as high turnover has been associated with increased quality indicator rates and increased rates of re-hospitalization. Most studies evaluate nursing turnover and resident outcomes and neglect the fact that a large majority of day to day care is performed by CNAs and that deficiency citations provide another measure of quality for nursing homes. Our study examined the association between CNA and licensed nurse, RN;LPN, turnover and nursing sensitive facility deficiencies in nursing homes

**Study Design:** Data from the 2004 National Nursing Home Survey (NNHS) and the Online Survey, Certification and Reporting (OSCAR) database were linked by facility. After dividing the total number of CNAs/licensed nurses who left during the past 3 months, full- and part-time, by the number of the positions in terms of FTEs, we defined high turnover as being greater than the 75th percentile of all facilities at 25.3 percent for CNA turnover and 17.9 percent for licensed nurse turnover. OSCAR deficiency data were collected by interdisciplinary surveyors who review care provided to residents at each nursing home every 9-15 months. We defined NHs with high deficiencies as those with numbers of deficiencies above the 75th percentiles vs all the others. Binomial regression models that took the complex sampling design effects into account, also adjusted for staffing, skillmix, bedsize and profit status.

**Population Studied:** From the 1,174 NHs, representative of 16,100 NHs in the US, in the NNHS data, 23 had no deficiency data. Models also removed 140 NHs because of missing turnover data

**Principal Findings:** High CNA turnover was associated with a higher number of Quality of Care, OR at 1.55, CI=1.14-2.11, Resident Behavior, OR at 1.50, CI at1.10-2.03) and total selected deficiencies OR at1.64, CI at 1.22-2.21. Licensed nurse turnover was significantly related to Quality of Care deficiencies, OR at 1.47, C1at1.09-1.98, and total selected deficiencies , OR at 1.83, CI at 1.35-2.47. When both CNA turnover and licensed turnover were included in the same model, high licensed nurse turnover was significantly associated with Quality of Care Deficiencies, whereas Resident Behavior and total deficiencies were more likely in NHs with higher CNA turnover.

**Conclusions:** High staff turnover was moderately associated with the number but not the severity of nursing care sensitive deficiencies. Staff turnover is an ongoing problem in nursing homes and is associated with quality problems. More research is needed on
Research Objective: To examine the association between relational coordination among nursing home (NH) staff and residents’ mental health outcome measured by changes over time in symptoms of depression/anxiety. Relational coordination measures the interpersonal processes between providers (communication and relationships) and has been shown to impact NH care quality. However, to date no empirical study has examined whether these interpersonal processes between caregivers are related to residents’ mental health outcomes.

Study Design: We studied NHs in New York State (NYS) using the following sources of data: NH staff survey (n=7,118) conducted from July 2006 to April 2007; the Minimum Data Set (MDS) for CY2005-2007; and provider of service files from CY2006-2007. For each resident a pair of two consecutive MDS assessments was randomly selected to define the outcome for the time period July 2006 to April 2007. We used the CMS Nursing Home Compare (NHC) definition of deterioration in depression/anxiety symptoms as our primary outcome measure. We also performed a sensitivity analysis by categorizing residents into three groups (symptom improved, deteriorated or no change).

Relational coordination was measured with a 7-item, 5-point Likert instrument (4 items for communication and 3 for relationships) among direct caregivers and then aggregated at facility level (range: 1-5). Psychometric analyses, including inter-item correlation matrix, Cronbach’s alpha, factor analysis, and ANOVA, were conducted to confirm the validity and reliability of relational coordination measure. Relational coordination theory was used as the basis for the theoretical and conceptual models. For the original (NHC) and modified definitions of outcome, we respectively fit logistic and multinomial logistic regression models with facility random-effects. Covariates were selected based on Donabedian’s Structure-Process-Outcome framework.

Population Studied: Study population included 38,954 long-term care residents who were not in coma, were age 65 years and older, and resided in 162 NYS NHs.

Principal Findings: Overall, 11.26% of residents became more depressed or anxious, 10.71% had improved symptoms, and 78.03% stayed the same.

The relational coordination measure showed high reliability with a Cronbach’s alpha of 0.77. All seven items loaded well on one single factor, with factor loadings ranging from 0.50 to 0.63. Psychometric analyses confirmed the construct validity and appropriateness of facility-level aggregation. Relational coordination had a mean of 3.03 (higher is better), with considerable variation across NHs (SD=0.27). Both multivariate analyses showed that for each standard deviation increase in facility level relational coordination, the odds of residents having deteriorated depression/anxiety symptoms decreased by about 10% (logistic regression with NHC QM: OR=0.67, 95%CI=0.48-0.93, effect size of 1SD = 0.90; multinomial logistic regression with modified definition: OR=0.65, 95%CI=0.45-0.94, effect size of 1SD =0.89). Relational coordination was not a statistically significant predictor of improvement in residents’ depression/anxiety symptoms.

Conclusions: Our study showed that residents in facilities with better relational coordination among care providers were less likely to have deteriorated depression/anxiety symptoms.

Implications for Policy, Delivery, or Practice: Interventions to improve caregivers’ communication and to enhance their work relationships may offer opportunities for
maintaining nursing home residents’ mental health status.

**Funding Source(s):** NIH

**Poster Session and Number:** C, #1174

### Medical Staff in Nursing Homes: Measuring Effectiveness of Processes of Care

Julie Lima, Brown University; Denise Tyler, PhD, Brown University; Terrie Fox Wettle, PhD, Brown University; Orna Intrator, PhD, Brown University

**Presenter:** Julie Lima, Ph.D., M.P.H., Senior Research Analyst, Gerontology, Brown University, julie_lima@brown.edu

**Research Objective:** Nursing homes (NHs) care for a frail population with diverse needs requiring interdisciplinary care to achieve best outcomes. Communication problems among NH staff have long been touted to be an impediment to better care. We sought to measure the consequences of communication concerns reported by directors of nursing (DONs). This project developed measures of the effectiveness of processes of care across physicians, nurse practitioners, and physician assistants in the NH setting.

**Study Design:** Responses from a survey of NH DONs was used to develop 2 measures of Effectiveness of Processes of Care (EPOC), one each for physicians and nurse practitioners/physician assistants. The distribution of the derived EPOC measures and their bivariate associations with other survey items as well as NH characteristics derived from the Online Survey Certification and Reporting (OSCAR) were examined.

**Population Studied:** A nationally representative sample of 2,165 U.S. NHs in 2009-2010. NH Administrators and DONs responded to questions regarding several topics including physician practice within the NH.

**Principal Findings:** Separate measures of Effectiveness of Processes of Care (EPOC) were derived for physicians (MDs), and for nurse practitioners (NPs)/physician assistants (PAs). Eleven items formed 3 sub-concepts of MD EPOC which were further combined to create an overall MD EPOC measure ranging from 0 to 3 (internal consistency= 0.85) with a higher score reflecting better quality. A separate EPOC score was developed for nurse practitioners (NPs) and physician assistants (PAs), comprising 6 items, 5 of which were also included in the MD EPOC measure. Each of the 6 items was asked separately for NPs hired by the NH, NPs hired by physicians, PAs hired by the NH, and PAs hired by physicians.

Responses to all questions were on a 5-point likert scale. Responses to each item were averaged across the relevant staff and hiring categories within a NH. The 6 average scores were then added together to create an overall NP/PA EPOC score for each facility with a possible range of 6 to 30 (internal consistency=0.66). For both MD and NP/PA measures, higher EPOC levels reflected more effective processes of care. The measures themselves were correlated at 0.50 (p<.001). Higher levels of control over medical staff in the nursing home were significantly and positively related to both higher MD EPOC and NP/PA EPOC scores.

**Conclusions:** The effectiveness of processes of care, EPOC measure, is internally consistent and has good face validity with other questions relating to the quality of communication and relationships among medical staff in U.S. NHs. Future studies of the EPOC measure will assess its relationship to resident outcomes.

**Implications for Policy, Delivery, or Practice:** NHs are responsible for the care of a diverse group of complex frail residents requiring good interdisciplinary care, especially between nursing and medical staff. If EPOC is shown to be related to resident outcomes it may be possible to use it to target NHs that may require assistance in their communication among staff.

**Funding Source(s):** NIH

**Poster Session and Number:** C, #1175

### Impact of Post-Acute Care Payment Policy on Therapy Intensity: Implications for Patient Recovery of Function

Trudy Mallinson, University of Southern California; Anne Deutsch, PhD, RN, CRRN, Rehabilitation Institute of Chicago; Jillian Bateman, OTD, OTR/L, Rehabilitation Institute of Chicago; Allen Heinemann, PhD, ABPP, Rehabilitation Institute of Chicago; Natalie Leland, PhD, OTR/L, BCg, University of Southern California

**Presenter:** Trudy Mallinson, Ph.D., Assistant Professor, Occupational Science and Occupational Therapy, University of Southern California, trudy.mallinson@usc.edu

**Research Objective:** A primary goal of post-acute care (PAC) is to maximize functional recovery with rehabilitation services. Medicare prospective payment systems (PPS) for PAC
create varying incentives for the provision of therapies. This study is a preliminary, descriptive examination of the intensity and amount of therapy services provided in PACs, the extent to which these differences may reflect Medicare payment incentives, and the relationship of therapy services to recovery of self-care and mobility function.

**Study Design:** Prospective, observational, cohort study.

**Population Studied:** 558 patients with stroke, hip fracture (HipFx), or total joint replacement (TJR) admitted to one of 6 skilled nursing facilities (SNFs), 4 inpatient rehabilitation facilities (IRFs), and 8 home health agencies (HHAs).

**Principal Findings:** All patients were assessed using the IRF-PAI function items within 48 hours of admission and discharge. Number of therapy minutes for occupational therapy (OT), physical therapy (PT), all other therapies, number of days on which therapy occurred, and length of stay were abstracted from the medical charts. Discipline-specific therapy intensity (minutes of OT per day, minutes of PT per day) were examined separately by diagnosis and setting. Greatest variation in OT and PT intensity was for stroke patients in IRFs. OT and PT intensity in SNFs showed modest variation for stroke patients. Therapy intensity was least for HHA patients and there was virtually no variation in intensity. Stroke (OT:72+/−20; PT:68+/−20) and HipFx (OT:77+/−12; PT:83+/−17) patients in IRFs received more intensive therapy than those in SNFs (Stroke OT: 52+/−11; PT 57+/−13; HipFx OT:47+/−8; PT:51+/−10) and HHAs (Stroke OT:49+/−10; PT48+/−8; HipFx OT:50+/−9; PT:48+/−4); TJR patients in SNFs received more intensive therapy (OT:74+/−13; PT:84+/−16) than those in IRFs (OT:46+/−10; PT:57+/−13) or HHAs (OT:59+/−14; PT:66+/−8). Despite the differences in therapy intensity, the total number of therapy minutes received was similar for SNF and IRF patients, reflecting the difference in LOS between IRF and SNF patients. There was a modest relationship between OT intensity and self-care gain in stroke patients in IRFs (IRF r=.39, SNF r=.10, HHA r=.12), and PT intensity and mobility gain for stroke patients in IRFs (IRF r=.36, SNF r=.19, HHA r=.19). There was little relationship between therapy intensity and functional gain for orthopedic patients. There was almost no relationship between total therapy minutes and change in self-care or mobility for any group in any setting.

**Conclusions:** Under PPS, IRFs maximize payment and control costs by managing LOS, SNFs by controlling daily costs, and HHAs with visits per 60-day episode. Patterns of therapy intensity partially reflected expectations. IRFs, did control LOS, provided the most therapy, but showed most variation in OT and PT intensity for stroke and HipFx patients. SNFs had modest variation in therapy intensity, perhaps reflecting that profit margins are highest for patients in high and very high RUGs. Most concerning was the general lack of relationship between therapy intensity or total therapy minutes and functional gain in these unadjusted analyses.

**Implications for Policy, Delivery, or Practice:** Therapy intensity may be related to recovery for stroke and HipFx patients but not for TJR patients. Along with the limited variation in therapy intensity this preliminary descriptive study suggests future opportunities for studying both how to maximize functional recovery and developing payment systems that incentivize providers to deliver the appropriate amount of care to the right patients.

**Funding Source(s):** Other, National Institute of Disability and Rehabilitation Research

**Poster Session and Number:** C, #1176

**The Effect of Race and Ethnicity on Long-Term Care Insurance Ownership**

Brian McGarry, University of Rochester School of Medicine; Helena Temkin-Greener, PhD, University of Rochester School of Medicine; Yue Li, PhD, University of Rochester School of Medicine

**Presenter:** Brian McGarry, M.S., Graduate Student, Public Health Sciences, University of Rochester School of Medicine, brian_mcgarry@urmc.rochester.edu

**Research Objective:** To date, little research has been done to examine how long-term care insurance (LTCI) policy ownership varies across racial/ethnic groups, making it unclear if these products can serve as viable financing alternatives to Medicaid, the single largest payer of custodial long-term care (LTC) services, for traditionally disadvantaged groups like Blacks and Hispanics. This study examined if racial/ethnic disparities exist with regard to LTCI ownership amongst Medicare beneficiaries.

**Study Design:** 2011 wave of the National Health and Aging Trends Survey was used. Bivariate and multivariate logistic regressions were employed to isolate the independent
effects of race/ethnicity on LTCI uptake. The dependent variable of interest was whether or not the respondent owned any form of non-governmental LTCI. The primary independent variable was the respondent's race/ethnicity which was classified into mutually exclusive groups: White, non-Hispanic; Black, non-Hispanic; and Hispanic. Additional independent variables included age, gender, marital status, number of children, education, income, assets, and health status. Stratified multivariate analyses - by age, gender, health status, and LTCI purchase “recommendation” - were used to further examine the effect of race/ethnicity on LTCI ownership. The purchase “recommendation” variable is a composite measure of income, assets and purchasing guidelines from consumer information materials.


Principal Findings: The overall rate of LTCI ownership was 18.3 percent. Compared to Whites (20.2 percent) 12.4 percent of Blacks (P less than 0.001) and 5.8 percent of Hispanics (P less than 0.001) reported having any private LTCI coverage. After controlling for other sociodemographic factors, Hispanics were 49 percent less likely to have LTCI as compared to Whites (P = 0.004) while no difference was found between Blacks and Whites in the odds of having a LTCI policy (adjusted OR = 1.03, P = 0.72). Stratified regression analysis revealed that Hispanic females were 80 percent less likely to be insured in comparison to White females (P less than 0.001) and that this ethnic disparity persisted when looking only at individuals who are recommended to consider private LTCI.

Conclusions: This study demonstrates that ethnic disparities exist in the ownership of LTCI among elderly Americans. This disparity is particularly pronounced amongst Hispanic females. Additional research is needed to determine the precise factors that are driving this underrepresentation of Hispanics in the LTCI market. Namely, it is important to elucidate if the differences in LTCI ownership represent variations in the taste for formal LTC or the availability of informal caregivers across ethnic groups, or if systematic barriers to LTCI awareness or purchase exist for Hispanics.

Implications for Policy, Delivery, or Practice: In light of the relative absence of Hispanics, and Hispanic females in particular, from the private LTCI market, this form of LTC financing may not be a feasible alternative to Medicaid for this growing segment of the elderly population. A better understanding of the reasons behind the lack of LTCI purchase amongst Hispanics is needed if policy makers hope to reduce Medicaid spending on LTC without creating significant barriers to receiving and paying for this widely needed service.

Funding Source(s): AHRQ
Poster Session and Number: C, #1177

The Implications of Home Health Agencies Cost Functions
Dana Mukamel, University of California, Irvine; Richard Fortinsky, University of Connecticut School of Medicine; Alan White, Abt Associates; Charlene Harrington, University of California San Francisco; Laura White, University of California Irvine; Quyen Ngo-Metzger, Agency for Healthcare Research and Quality

Presenter: Dana Mukamel, Ph.D., Professor, Department Of Medicine, Senior Fellow, Health Policy Research Institute, University of California, Irvine, dmukamel@uci.edu

Research Objective: Utilization of and expenditures for Medicare home health care have been increasing steadily since the implementation of the prospective payment system (PPS) in 2000, as have the number of Medicare certified home health agencies. While there have been several studies of home care costs at the individual patient level, there are no known recent studies of costs at the agency level, and no information about their cost structure. The objective of this study was to estimate an empirical cost function for Medicare certified home health agencies.

Study Design: We performed a retrospective statistical analysis of Medicare cost reports data merged with case-mix information from the Outcome and Assessment Information System (OASIS). We estimated a fully interacted (by ownership) hybrid cost function. The log of annual costs was the dependent variable. Independent variables included outputs (number of patients and several variables measuring case mix), a wage index, measures of contract labor use, chain affiliation, and years under Medicare certification. The estimated model included fixed state effects and inference was based on robust standard errors with clustering by state. Predicted costs included the Baser correction to avoid bias. We calculated marginal costs as a percent of total costs for all variables.
**Population Studied:** 7,064 for-profit and non-profit Medicare certified home health agencies nationally in 2010.

**Principal Findings:** The home health industry is dominated by for-profit agencies (90%), which tend to be newer than the non-profit agencies, with most receiving Medicare certification after PPS implementation in 2000. For-profit agencies tend to have smaller scale operations (261 vs. 902 median unduplicated patients per year respectively) and different cost structures, and are less likely to be affiliated with chains (21% vs. 40%). Our estimates suggest diseconomies of scale (p=0.03), a negative marginal cost for contracting with therapy workers (p<0.05), but a positive marginal cost for contracting with skilled nursing (p<0.05).

**Conclusions:** The fiscal environment that home health agencies face has changed since the implementation of PPS, apparently becoming much more attractive to providers as evidenced by the fast growths of the industry. At the same time, our findings suggest a financial structure similar to that found by studies conducted in the 1980s, with agencies exhibiting diseconomies of scale, and an industry dominated by for-profit firms.

**Implications for Policy, Delivery, or Practice:** Our findings suggest that efficiencies might possibly be achieved by promoting relatively small scale agencies with more contract therapy staff and more salaried skilled nursing staff. However, this conclusion should be tested further in future studies, including measures of quality in the cost function as well.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #1178

**Stability of End-of-Life Treatment Preferences among LTC Nursing Home Residents**

Dana Mukamel, University of California, Irvine; Heather Ladd, University of California, Irvine - HPRI; Helena Temkin-Greener, University of Rochester

**Presenter:** Dana Mukamel, Ph.D., Professor, Department Of Medicine, Senior Fellow, Health Policy Research Institute, University of California, Irvine, dmukamel@uci.edu

**Research Objective:** High quality care for long-term nursing home residents should include discussions and follow-up on patients’ end-of-life care wishes. Yet, recent changes to the Minimum Data Set (MDS) data collection, mandated by the Centers for Medicare & Medicaid Services (CMS), exclude this information from routine assessment of patients making the provision of high quality end-of-life care less likely. We examined the stability of cardiopulmonary resuscitation (CPR) and do-not-resuscitate (DNR) orders to offer guidance for policy and care practice developments.

**Study Design:** We examined changes in DNR status of a national long-term care nursing home cohort, following them for 5 years after admission. Initial analysis indicated that residents entering with a DNR status had a very low probability of changing their status. Therefore, the multivariate analysis focused on the subsample entering with CPR status. A competing risk model was estimated to identify covariates predicting changes from CPR to DNR status. Our choice of covariates to predict changes in code status was guided by those found in previous studies, and included patient-level variables, facility characteristics, and states fixed effects.

**Population Studied:** 118,247 long term care residents in all Medicare and Medicaid certified nursing homes in the U.S. who were admitted in 2003 and followed to death either in the nursing home or in the hospital, for 5 years (until 2007).

**Principal Findings:** About half the cohort chose DNR at admission and did not change its status. Of those who entered with CPR status, 40% changed to DNR. Compared with those who chose DNR on admission, those who chose CPR were more likely to be male, younger, Black or Hispanic, and had lower educational attainment. They tended to have fewer comorbidities, depressive symptoms, less aggressive symptoms, and were less likely to have dementia. The most important factors influencing change from CPR to DNR for this group were hospitalizations and nursing home transfers. Nursing home characteristics also influenced the likelihood of changing from CPR to DNR.

**Conclusions:** Long-term nursing home patients who enter with DNR tend to retain that choice. Those entering with full code CPR have a high probability of changing their status to DNR during their stay.

**Implications for Policy, Delivery, or Practice:** High quality care should offer residents the opportunity to revisit their choice periodically, documenting changes in end-of-life choices when they occur, thus ensuring that care will match patients’ wishes. As the MDS plays a prominent role in patients’ care, CMS should
consider reinstating information about advance directive in it. Furthermore, consideration should be given to updating this information more frequently than annually, as has been the case in the past, with MDS 2.

**Funding Source(s):** Other, NINR

**Poster Session and Number:** C, #1179

**The Challenge of Reducing Heart Failure Patient Rehospitalization: A National Profile of Variation in Risk and Care Practices following Hospital Discharge to Home Health Care**

Christopher Murtaugh, Visiting Nurse Service of New York; Timothy Peng, Visiting Nurse Service of New York; Stanley Moore, Independent Contractor; Carolyn Zhu, Mount Sinai School of Medicine, Geriatrics and Palliative Medicine; Yolanda Barron-Vaya, Visiting Nurse Service of New York; Shivani Shah, Visiting Nurse Service of New York; Kathryn H. Bowles, University of Pennsylvania, School of Nursing

**Research Objective:** An increasing number of Medicare beneficiaries hospitalized for heart failure are discharged to home health care with almost half rehospitalized within 120 days. Providing intensive services early in the home health stay -- widely referred to as frontloading of visits -- shows promise as a strategy to reduce rehospitalization but little is known about those who might benefit most and the current extent of frontloading. In addition, an analysis of 10 randomized trials suggests that frontloading in the absence of physician input is likely to be insufficient. The purpose of this paper is to provide new information on: 1. the risk of rehospitalization among the diverse group of heart failure patients discharged to home health care; and 2. the extent of home health nursing and physician visits in the first weeks after hospital discharge to inform the development and evaluation of protocols for early intensive services.

**Study Design:** Medicare data were used to identify all heart failure hospitalizations with discharge to home health care in a one-year period, and to examine health care use and mortality for 30 days after hospital discharge. We estimated for the sample as a whole and for groups of patients defined by measures of heart failure severity and clinical complexity such as MS-DRG, history of chronic kidney disease, and number of comorbidities: 1. the 30-day all-cause rehospitalization rate and timing of rehospitalization; and 2. the average number and timing of home health nursing as well as outpatient physician visits after hospital discharge.

**Population Studied:** Medicare fee-for-service beneficiaries hospitalized for heart failure and then discharged to home health care between 7/1/09 and 6/30/10.

**Principal Findings:** We identified 107,781 index hospitalizations. The overall 30-day rehospitalization rate was 26 percent with over half of readmissions occurring within 14 days. The rate of readmission is strongly related to heart failure severity and patient complexity, but there is almost no variation in the average number of nursing and physician visits provided to different types of patients. Overall, 57 percent received 2 or fewer home health nursing visits in the week after hospital discharge with a mean of 2.5 and median of 2 visits. The first visit occurred within 2 days of discharge over 80 percent of the time, but the timing of subsequent visits was more variable. A little over a third of patients had an outpatient physician visit in the week after hospital discharge and another 23 percent in the second week, while 26 percent had no visit within 30-days or prior to rehospitalization.

**Conclusions:** Most patients, regardless of risk, are receiving 2 or fewer nursing visits in the week after hospital discharge and a substantial minority do not have any outpatient physician visit within 30-days or prior to rehospitalization.

**Implications for Policy, Delivery, or Practice:** Early post-acute intervention may be critical given the high rate of return to the hospital within 2 weeks. Our results indicate that considerable opportunity exists to improve early follow-up and that its effectiveness is likely to vary depending on heart failure severity and other indicators of patient complexity.

**Funding Source(s):** AHRQ

**Poster Session and Number:** C, #1180

**Individual Therapy Contributions to Discharge Outcomes from Skilled Nursing Facilities**

Suzanne O'Brien, University of Rochester; Ning Zhang, PhD, University Of Rochester; Helena Temkin-Greener, PhD, University of Rochester
Presenters: Suzanne O'Brien, Ph.D., Post Doctoral Fellow, Department of Public Health Sciences, University of Rochester, suzanner_obrien@urmc.rochester.edu

Research Objective: Knowledge of the impact of therapy on discharge results from skilled nursing facility (SNF) rehabilitation is not well understood. Few studies have examined the associations between therapy interventions and discharge outcomes from SNFs. This study describes patterns of therapy allocation and the association between therapy allocation and discharge outcomes.

Study Design: Based on a one-year (2008), retrospective study of merged MDS, OSCAR, and RUCA datasets, a risk-adjusted competing hazards model with state fixed-effects was employed. The model compares risks of discharge outcomes for home, hospital, placement, or death by therapy group allocation. A Wald test was employed to test differences in coefficients between allocation groups.

Population Studied: The sample included 300,794 new Medicare admissions in 3,593 SNFs, aged 65 and over, in California, Florida, New York, Ohio, and Texas. Discharge was tracked from either a first discharge assessment after admission or a quarterly assessment after admission.

Principal Findings: Seven therapy allocation groups were identified: physical therapy (PT)/occupational therapy (OT)/speech therapy (ST); PT/OT; PT/ST; OT/ST; PT-only; OT-only, and ST-only. Home discharge was considered the most desirable outcome of SNF rehabilitation and permanent nursing home placement was the discharge reference group. Risk of home discharge was increased in most groups (HR=3.094, 2.642, 2.170, 2.084, 1.580, 1.516, for PT/OT, PT/OT/ST, PT-only, PT/ST, OT-only, and OT/ST, respectively). Risk of death was reduced in most groups (HR=0.321, 0.373, 0.521, 0.563, 0.565, 0.622, for PT/OT, PT/OT/ST, PT-only, PT/ST, OT/ST, OT-only, respectively). Increased risk for hospitalization was found only in the OT-only group (HR=1.138). No significant effect on the risks for home discharge, hospitalization, or death was found in the ST-only group.

Conclusions: A combination of PT/OT/ST and PT/OT were the two most effective therapy allocation strategies resulting in the highest risk of home discharge and the lowest risk of death. PT-only and PT/ST groups were the next most beneficial groups, followed by OT-only and OT/ST, and lastly by ST-only. Risk of hospitalization was not significantly associated with the type of therapy allocation, except for the OT-only group.

Implications for Policy, Delivery, or Practice: In evaluating the efficacy of Medicare post-acute rehabilitation services provided in SNFs, it may be important to take into account how therapies are allocated, as different allocation strategies appear to differentially impact discharge outcomes. Location of discharge following rehabilitation has varied implications for residents, facilities and the Medicare program. This study provides evidence of the allocation pattern of therapy interventions associated with discharge outcomes, with varying desirability of such outcomes.

Funding Source(s): AHRQ
Poster Session and Number: C, #1181

Trends in Use of Medications with Anticholinergic Properties among Medicare Beneficiaries with Dementia Residing in Nursing Homes
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Researchers: Xian Shen, University of Maryland School of Pharmacy; Jacqueline Palmer, Pharm D., Post-Doctoral Fellow, Pharmaceutical Health Services Research, University of Maryland - School of Pharmacy, jbjamesonpalmer@gmail.com

Research Objective: Medications with anticholinergic properties (MAP) have the potential to further decrease cognitive and physical functioning, which is of concern in people with dementia. The objectives of this study were: 1) To evaluate the trends in use of MAP among Medicare beneficiaries with Alzheimer’s disease and related dementias (ADRD) residing in nursing homes (NH) between 2007 and 2008, highlighting differences in use between prevalent and newly-diagnosed ADRD; 2) To identify trends in concomitant use of MAP and cognitive enhancers.
Study Design: A time-series analysis using linked data from the Minimum Data Set 2.0 (MDS) and Medicare administrative claims. Monthly proportions of use were calculated for everyone in a NH with ADRD, and then stratified by timing of first ADRD diagnosis (newly-diagnosed, prevalent, and indeterminate). ADRD diagnoses were determined from the Chronic Condition Warehouse algorithm and MDS assessments. MAP were identified using the Anticholinergic Cognitive Burden scale, which classifies medications as 1, 2, or 3 based on increasing anticholinergic activity. Drug use was defined as days supply covering any part of the month. Cognitive enhancers included acetylcholinesterase inhibitors and memantine. Finally, the Cochran-Armitage trend test was used to determine significant trends over the two-year study period.

Population Studied: Medicare beneficiaries aged 66 years or older with an ADRD diagnosis residing in a NH for any period of time between 1-1-2007 and 12-31-2008.

Principal Findings: The cohort of 93,094 NH residents with dementia were predominantly female with a mean (SD) age of 83.9 (7.4) years. Approximately 74 percent consistently used at least one anticholinergic medication each month. There were 73.5, 19.2, and 7.4 percent classified as prevalent, newly-diagnosed, or indeterminate ADRD, respectively. Those with newly-diagnosed ADRD had a significant increase in any anticholinergic drug use from 60.1 percent in January 2007 to 74.5 percent in December 2008 (p=0.001). This significant increase in use was consistent across level 1 and 3 MAP. Those with an indeterminate diagnosis also had a significant increase in any anticholinergic drug use from 67.4 to 73.5 percent during the same time period (p=0.001), whereas the monthly proportion of use remained stable at approximately 74 percent among those with a prevalent ADRD diagnosis. Approximately 10 percent of the cohort used level 3 anticholinergics and cognitive enhancers concomitantly. There was a significant increase in concomitant use in the newly-diagnosed and indeterminate groups during the study period, from 1.9 to 6.9 percent (p=0.001) and 4.1 to 8.6 percent (p=0.006), respectively. Monthly concomitant use in those with prevalent ADRD averaged at 10.5 percent.

Conclusions: Our analysis illustrates a high prevalence of MAP use in NH residents with ADRD. MAP use in those with newly-diagnosed ADRD quickly increased to approach use in the prevalent population within two years of diagnosis.

Implications for Policy, Delivery, or Practice: More work is needed to assess what factors could be involved in the rising use of MAP post ADRD diagnosis. Also further investigation is needed to determine how MAP affects cognition and function and whether there is a differential impact of these effects based on timing of diagnosis.

Funding Source(s): No Funding
Poster Session and Number: C, #1182

Effect of Chronic Conditions and Long-term Care Use on Healthcare Expenditures of Older Dual Eligible Beneficiaries
Shriram Parashuram, University of Minnesota; Terry Lum, University of Hong Kong; Robert Kane, University of Minnesota; Patricia Homyak, University of Minnesota; Andrea Wysocki, Brown University; Tetyana Shippee, University of Minnesota

Research Objective: The effect of chronic conditions on expenditures of older duals who use long-term care (LTC) has not been studied. We used Medicaid and Medicare claims from seven states to examine how the presence of nine selected chronic conditions and multiple chronic conditions affected annual expenditures towards medical care, LTC and prescription drugs for elderly fee-for-service dual eligible beneficiaries across different LTC and non-LTC settings.

Study Design: We identified beneficiaries with chronic conditions using Medicaid and Medicare claims for 2004 and 2005, employing Centers for Medicare and Medicaid Services Chronic Condition Data Warehouse definitions. We classified beneficiaries into community LTC, institutional LTC and non-LTC groups, using Medicaid enrollment data and claims for 2005, and calculated annual beneficiary expenditures towards medical care, LTC and prescription drugs. Employing two-part models, we estimated the average incremental effect of nine selected chronic conditions and multiple chronic conditions on annual healthcare expenditures for beneficiaries in the three LTC groups.

Population Studied: Dual eligible beneficiaries, aged 65 years and older, from Arkansas,
Principal Findings: The incremental effect of chronic conditions on overall expenditures was more sensitive to LTC group rather than type of chronic condition. The incremental effect of multiple chronic conditions on healthcare expenditures was highest for beneficiaries in the non-LTC group. Beneficiaries in the institutional LTC group had the lowest overall incremental expenditures for both type and number of chronic conditions.

Conclusions: Community dwelling elderly duals with multiple chronic diseases are more vulnerable for higher medical care expenditures, than those in institutions. Medicaid appears to subsidize Medicare by lowering medical care costs for older institutional duals with multiple chronic conditions.

Implications for Policy, Delivery, or Practice: Heterogeneity in the older dual eligible population based on their chronic disease burden and type of LTC they receive, calls for alternative strategies for coordinating care for the different LTC and non-LTC groups.

Funding Source(s): CMS

Poster Session and Number: C, #1183

Challenges to Transition in the Money Follows the Person Demonstration

Julie Robison, University of Connecticut Health Center; Noreen Shugrue, University of Connecticut Health Center; Martha Porter, University of Connecticut Health Center; Dawn Lambert, Connecticut Department of Social Services

Presenter: Julie Robison, Ph.D., Associate Professor Of Medicine, Center on Aging, University of Connecticut Health Center, jrobison@uchc.edu

Research Objective: The Money Follows the Person (MFP) demonstration is an innovative long term service and support (LTSS) model that seeks to improve the quality of LTSS by rebalancing state LTSS systems. This Centers for Medicare and Medicaid Services funded demonstration is underway in 46 states and the District of Columbia. MFP assists Medicaid recipients who meet nursing home or other institution eligibility to receive LTSS in community-based settings if they prefer, through transition programs and other state-specific rebalancing benchmarks. This paper examines the effects of an array of challenges to transition on ultimate transition success.

Study Design: This study utilizes a prospective cohort design to follow participants in the Connecticut MFP program from program enrollment to the time they either transition from an institution to a community setting or their case closes without transitioning. Transition coordinators assigned to each participant document challenges to transition on a standardized checklist throughout the process, resulting in a cumulative list of challenges experienced by each participant. Chi-square analyses demonstrate which challenges relate to cases closing versus those experienced by people who eventually transition successfully. Next, we examine the challenges experienced most frequently by people with particular types of disability: physical, mental health, cognitive or sensory.

Population Studied: Connecticut enrolls every qualified institution resident who requests a transition to a community-based setting in the CT MFP program. Participants can self-refer or be referred to MFP by family, nursing home staff or others. Participants must meet Medicaid financial and functional eligibility criteria and have resided in the institution for at least 90 days. As of 9/30/12, transition coordinators had completed 2100 challenge checklists for participants who either transitioned (n=1159) or closed without a transition (n=951).

Principal Findings: A significantly greater percentage of cases that closed without transitioning had challenges related to physical health, Medicaid waiver program enrollment, mental health, and consumer engagement and skills. On the other hand, consumers who transitioned faced significantly greater challenges to transition with respect to housing, finances and facility issues. Incidence of specific challenges also differ by type of disability. For example, housing was a challenge for people with physical, cognitive and/or sensory disabilities; consumer engagement and problems with other involved people were significant challenges for people with mental health and cognitive disabilities.

Conclusions: The Supreme Court’s Olmstead decision directs states to support people with disabilities to live in the least restrictive environment of their choice. Although Connecticut and other states have significantly reduced transitional barriers for MFP participants, implementing the Olmstead directive in practice remains challenging. The
data from this study reflects LTSS systems
issues that not only prevent transition but also
may result in institutionalization.

**Implications for Policy, Delivery, or Practice:**
Policymakers and service providers can use this
data to correct policy, procedure and service
gaps identified for the benefit of both MFP and
other Medicaid participants. Addressing the
challenges identified will result in 1) greater
success aging in place 2) more
diversions/discharges to community from
hospitals and 3) more successful transitions
from nursing homes.

**Funding Source(s):** CMS

**Poster Session and Number:** C, #1184

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**Trends in Moderate to Severe Pain and Under-Treatment for Pain among Medicare Beneficiaries in Nursing Homes, 2006-2009**

Xian Shen, University of Maryland Baltimore; Ilene Zuckerman, University of Maryland Baltimore; Bruce Stuart, University of Maryland Baltimore

**Presenter:** Xian Shen, M.S., Research Assistant, University of Maryland Baltimore, xshen@umaryland.edu

**Research Objective:** Pain management for older adults residing in nursing homes (NHs) continues to present challenges to health care practitioners and researchers. An overview of trends in pain and under-treatment for pain in NHs is needed. This study aimed to evaluate the trends in annual prevalence of moderate to severe pain and annual prevalence of under-treatment for pain among Medicare beneficiaries in NHs from 2006 to 2009.

**Study Design:** An observational study using linked data from 2006-2009 Medicare Current Beneficiary Survey (MCBS) and Minimum Data Set (MDS). MDS assessments are required by federal law to be completed for NH residents in Medicare certified NHs at admission, at significant change in status, quarterly and annually. Pain level was determined by a validated scale based on two items from MDS regarding frequency and intensity of pain. Moderate pain was defined as having daily mild to moderate pain, while severe pain was characterized as having daily pain at times horrible or excruciating. The unit of analysis for under-treatment was a pair of two consecutive MDS assessments with the first assessment indicating moderate or severe pain. An episode of under-treatment was identified if the moderate to severe pain reported at the first assessment was not alleviated at the subsequent assessment. The Cochran-Armitage trend test was performed to detect trends in moderate to severe pain and under-treatment over the 4-year study period.

**Population Studied:** Medicare beneficiaries residing in NHs who participated in MCBS between 2006 and 2009.

**Principal Findings:** The annual prevalence of moderate to severe pain among Medicare beneficiaries in NHs was 29.3% in 2006, 28.5% in 2007, 25.9% in 2008 and 22.2% in 2009. The decline was statistically significant (trend test, p=0.0001). For the analysis on under-treatment, 1307 pairs of assessments from 685 unique beneficiaries were included. The mean time interval between assessments was 32.9 days. The annual prevalence of under-treatment for pain was 67.3% in 2006, 61.3% in 2007, 60.1% in 2008 and 65.1% in 2009 (trend test, p=0.5047) among the beneficiaries with moderate to severe pain at their first assessment. The probability of an episode of moderate to severe pain being undertreated significantly declined with increasing time interval between MDS assessments from 69.3% for 7 days, 64.8% for 14 days, 61.8% for 30 days, 59.4% for 90 days to 53.4% for more than 90 days (trend test, p=0.0005).

**Conclusions:** The annual prevalence of moderate to severe pain among Medicare beneficiaries in NHs consistently declined from 2006 to 2009. However, the annual prevalence of under-treatment for pain remained high over the study period with more than 60% of the 685 residents with moderate to severe pain being under-treated. The probability of an episode of moderate to severe pain being undertreated was inversely associated with time between MDS assessments.

**Implications for Policy, Delivery, or Practice:** The study findings suggest that pain management in NHs gradually improved between 2006 and 2009 with fewer NH residents reporting moderate to severe pain. However, timely resolution of identified pain among Medicare beneficiaries in nursing homes remains problematic.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #1185
Present on Admission Pressure Ulcers and the Long-Stay Nursing Pressure Ulcer Quality Measure

Laura Smith, RTI International; Karen Reilly, ScD, RTI International; Daniel Barch, MS, RTI International; Audrey Etlinger, MPP, RTI International; Tara McMullen, PhD (c), Office of Clinical Standards and Quality, CMS; Cheryl Wiseman, CAPT, USPHS, MS, MPH, Office of Clinical Standards and Quality, CMS

**Research Objective:** The NQF quality measure (QM) #0679, Percent of High-Risk Residents with Pressure Ulcers (Long-Stay) is intended to encourage nursing homes to prevent pressure ulcers and closely monitor and promote healing of existing pressure ulcers. This QM reports the percentage of all long-stay (LOS over 100 days) high risk residents who have one or more Stage 2-4 pressure ulcers. Residents are considered high risk for pressure ulcer if they are comatose, impaired in bed mobility/transfer, or are malnourished (or at risk). Since this prevalence QM includes pressure ulcers that were present on admission, facilities are accountable for healing ulcers, including Stage 3 and Stage 4 ulcers. Concerns have been raised regarding whether it is reasonable to expect that ulcers, with proper care, should heal within the length of time that long-stay residents are receiving facility services.

**Study Design:** Facility level rates of pressure ulcer prevalence were calculated using MDS 3.0 data and rate differences by pressure ulcer stage and presence at admission; the distribution of resident length of stay explored. A literature review was conducted to identify mean healing times for pressure ulcers by stage.

**Population Studied:** Long-stay nursing home residents at high risk for pressure ulcer development included in the denominator population used to calculate the QM.

**Principal Findings:** Mean healing times for Stage 2s have been reported as ranging from 8.7 to 37 days (Bates-Jensen, 2001), for Stage 3s at 71 days (Bito, 2012). For Stage 4s, mean healing time was not identified, but prior study has shown that after 3 months, 23% of residents admitted to nursing homes with a Stage 4 will have had their ulcer heal (Brandelis, 1990). Analysis of resident episodes (April-June, 2011) showed if all present-on-admission ulcers, including Stage 2 ulcers, were excluded from this measure the mean overall triggering rate, drops by 3 percentage points, from 7.4% to 4.4%. However, only 9.4% of residents counted in the numerator were included solely based on present-on-admission Stage 4 ulcers. There were an additional 6.6% of residents counted solely based on present-on-admission Stage 3 ulcers. Additionally, residents with present-on-admission Stage 3 or 4 ulcers were not evenly distributed across facilities.

**Conclusions:** While the mean national triggering rate would change only a small amount in absolute terms, present-on-admission ulcers account for a large proportion of episodes that trigger the numerator of the measure. However, residents included in the numerator solely because of present-on-admission Stage 3 and Stage 4 ulcers represent a fraction of this shift.

**Implications for Policy, Delivery, or Practice:** Given the mean healing time for Stage 2 pressure ulcers is well within the 101 days required for a resident to be identified as long-stay, it is appropriate to include present-on-admission Stage 2 ulcers in a measure that holds nursing homes accountable for healing. However, mean healing times for Stage 3 and Stage 4 ulcers cited in the literature do fall beyond this range. Additional exclusions and development of a measure that focuses separately on healing may be appropriate refinements to consider when this measure comes up for NQF endorsement maintenance.

**Funding Source(s):** CMS

**Poster Session and Number:** C, #1186

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End-of-Life Care Processes in Nursing Homes: Association with Facility Characteristics

Helena Temkin-Greener, University of Rochester Medical School; Qinghua Li, University of Rochester School of Medicine; Dana B. Mukamel, University of California, Irvine

**Research Objective:** To measure end-of-life (EOL) care processes in US nursing homes (NHs), and to identify facility factors that best characterize good EOL care processes.

**Study Design:** A random, national survey of US nursing homes conducted in 2012. Completed surveys were obtained from 1,201 facilities.
Using 32 Likert-scale (5-point) items, we identified 4 EOL care process measures: symptom assessment, care delivery, communication/coordination among providers, and communication with residents/families. Other variables included information on staff EOL education, medical director, palliative care resources, and staff turnover. Psychometric assessment of the care process measures included principal factor and internal consistency reliability analyses.

Survey data were linked to Nursing Home Compare (NHC) data to obtain structural facility characteristics and staffing information. Multiple imputations were used to deal with missing values. With 50 multiply imputed datasets, we fit four separate OLS regression models for each of the four EOL care process measures.

Population Studied: Directors of Nursing from 1,201 NHs.

Principal Findings: Compared to all US NHs, responding facilities were less likely to be for profit or chain affiliated, more likely to be church affiliated, with higher staffing levels, and fewer health related deficiency citations. Factor analysis confirmed the dimensionality of four measures. Items for each measure loaded well on one single factor, with factor loading of 0.32-0.74, 0.42-0.58, 0.35-0.69, and 0.44-0.57. The four EOL care process measures demonstrated acceptable to high internal consistency reliability, with Cronbach’s alpha ranging from 0.68 (delivery) to 0.82 (communication with residents/families). There was substantial variation in each of the care process measures, with means ranging from 2.67 to 3.77 on a scale from 1 (worst) to 5 (best), and across NHs (SD: 0.56-0.66). Facilities with better staff education on EOL decision making had significantly higher score in all four process measures. While having a medical director was significantly associated with better assessment, it made no difference with regard to the other 3 measures. However, when medical director was a geriatrician, performance on all 4 EOL measures was significantly better. NHs with on-site palliative teams scored better on assessment and communication with residents/families, but NHs contracting for palliative care had significantly worse scores in symptom assessment and communication/coordination among providers. Facilities with higher staff turnover rates had lower scores in assessment and communication/coordination among providers. Facility ownership, religious affiliation, chain membership, number of residents, total nursing hours, and RN/CNA ratios were also significantly related to selected EOL care process measures.

Conclusions: The survey tool provides valid and reliable measures for evaluating EOL care processes in nursing homes. Significant variations in EOL care are present in this national sample of US nursing homes. Several modifiable facility-level characteristics were identified as significant predictors of EOL care processes.

Implications for Policy, Delivery, or Practice: The tool we developed and validated may be useful for assessing and targeting quality improvement efforts in NHs with regard to EOL care provision. Further research is needed to examine if facilities with better EOL care processes produce better risk-adjusted outcomes for residents at the end of life.

Funding Source(s): NIH

Poster Session and Number: C, #1187

The Cost and Potential Savings of Providing Home-Delivered Meals to Older Americans

Kali Thomas, Brown University; Vincent Mor, Brown University

Presenter: Kali Thomas, PhD, Postdoctoral Fellow, Brown University, kali_thomas@brown.edu

Research Objective: While much effort has been geared toward evaluating the cost-effectiveness and role of Medicaid funded home and community based services (HCBS) in preventing or postponing nursing home (NH) placement, little research has evaluated the value of other state funded non-Medicaid services and supports, such as The Older Americans Act (OAA) programs. Previous research has suggested that increased state spending in home-delivered meals programs, through the OAA, is associated with a lower proportion of residents in nursing homes with low-care needs. However, determining the cost-savings to states by increasing the effort toward providing home-delivered meals has proven difficult. The purpose of this study was to examine the relative influence of increasing the proportion of older adults receiving home-delivered meals on the potential cost savings to states.

Study Design: We combined two data sources: State Program Reports (expenditure and utilization data for each OAA service at the state level) and NH facility–level data (including
is associated with lower odds of anti depressant use (ORs ranged from 0.21 to 0.41) and lower number of medications (ORs ranged from 0.35 to 0.60) compared to the minimum.

Is Regulatory Oversight of Certified Nursing Assistants Related to Resident Care Outcomes
Alison Trinkoff, University of Maryland School of Nursing

Research Objective: Despite the increasing complexity of health care offered in nursing homes (NHs), federal regulations covering training and oversight of certified nursing assistants (CNAs) who provide the bulk of the care have not changed in over 20 years. Some states have training requirements that exceed federal minimum hours and/or some form of supplementary CNA regulatory oversight, e.g. license and registry, while others do not. The study aims were to describe the variation in state regulation and to explore potential relationships between regulation and resident care outcomes.

Study Design: A cross-sectional correlational analysis linked 2004 state-level regulatory requirements for CNA oversight, training and continuing education (CE) with NH resident outcomes data. For the CNA regulatory data, a state level database was developed that categorized regulatory oversight and requirements for initial education, certification and training and CE in 2004. The “Shaping Long Term Care in America Project” (released online http://ltcfocus.org) provided facility-level resident outcomes data derived from the CMS Minimum Data Set. NHs with adverse outcomes were defined as those with indicator rates above the 75th percentile vs all other facilities. Binomial logistic regression models accounted for clustering effects of NHs within states and were stratified by facility bedsize.

Population Studied: A large sample included 16,125 NHs operating in 49 US states (No outcomes data were available from NHs in Alaska and the District of Columbia).

Principal Findings: Overall, registries served as licensing or credentialing boards in 47% of states, though only 6 states actually licensed CNAs through the registry or state Board of Nursing. Twenty-two states required only the federal minimum levels of initial and CE training hours. Half of the states (53%) required CNAs to have additional initial training, whereas only 4 states required additional yearly CE hours. Over varying facility sizes, increased initial training plus annual CE hours was significantly associated with lower odds of anti-depressant use (ORs ranged from 0.21 to 0.41) and lower average number of medications (ORs ranged from 0.35 to 0.60) compared to the minimum.
There were also differential effects from nursing home size. Among small NHs, use of a registry as a licensing/credentialing board was significantly related to lower catheter use (OR=0.72; 95%CI: 0.57-0.99); CNA licensure was significantly associated with lower odds of falls (OR=0.60; 95%CI: 0.41-0.89). No associations were found between CNA regulatory oversight and training with bowel or bladder incontinence outcomes.

**Conclusions:** An increase in initial CNA training and CE hours was associated with NHs that reported better outcomes in areas related to medication usage. Findings suggest that regulatory modifications could be beneficial to improve resident care outcomes in NHs. Future research assessing the relative quality of the indicators as well as the impact of current CNA regulatory practices on care can provide an evidence-base upon which to improve CNA quality and perhaps conditions in NHs.

**Implications for Policy, Delivery, or Practice:** Although some states have extended oversight and instituted regulatory modifications, there is considerable variation. Findings suggest that higher requirements for CNA training and CE hours is associated with better resident outcomes. Federal regulations should be explored to ensure that CNAs are well-trained.

**Funding Source(s):** Other, National Council of State Boards of Nursing

**Poster Session and Number:** C, #1189

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**Factors Influencing the Demand for Long-Term Care Insurance**

Mark Unruh, Weill Cornell Medical College; David G. Stevenson, Harvard Medical School; Richard G. Frank, Harvard Medical School; Marc A. Cohen, LifePlans, Inc.; David C. Grabowski, Harvard Medical School

**Presenter:** Mark Unruh, Ph.D., Assistant Professor, Center for Healthcare Informatics and Policy, Weill Cornell Medical College, mau2006@med.cornell.edu

**Research Objective:** To test different demand-side explanations for the limited purchase of private long-term care insurance (LTCi).

**Study Design:** We utilized surveys of purchasers and non-purchasers of individual LTCi policies collected by LifePlans, Inc. in 2000, 2005, and 2010. The surveys were merged with detailed administrative data provided by insurers on policies purchased by individual buyers. Logistic regression models were used to evaluate factors leading to the purchase of LTCi and linear regression specifications were employed to assess the generosity of coverage purchased among buyers. All models included attributes such as income and assets, along with a range of demographic and attitudinal measures, in addition to state and year fixed effects.

**Population Studied:** The study population included a nationwide sample of 5,070 purchasers and non-purchasers of individual LTCi policies over the period spanning years 2000 through 2010.

**Principal Findings:** The findings were consistent with two different explanations for the nonpurchase of LTCi. First, demand was found to be limited by the availability of less costly substitutes such as care from family members or via coverage from Medicaid. Specifically, we found that married individuals were less likely to purchase LTCi. Similarly, higher income and assets were associated with a greater likelihood of obtaining coverage, which is generally consistent with Medicaid “crowding out” the purchase of LTCi for some individuals. Limited consumer rationality — such as difficulty understanding low-probability high-loss events or misconceptions about the extent of public coverage for long-term care — also appears to be associated with the nonpurchase of LTCi. For example, we found that individuals who believed they were more likely to require long-term care were more likely to purchase LTCi. Similarly, those consumers who believed that the government pays for long-term care were less likely to purchase policies.

**Conclusions:** The results of this study suggest that a lack of consumer rationality and the presence of low cost, imperfect substitutes are important demand-side explanations for the limited purchase of LTCi.

**Implications for Policy, Delivery, or Practice:** Future public policies to stimulate demand for LTCi must address the different barriers associated with nonpurchase of these policies. Potential approaches might include Medicaid reform and enhanced informational campaigns.

**Funding Source(s):** Other, National Institute on Aging

**Poster Session and Number:** C, #1190

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**Association between Short-Term Nursing Home Stays and Individuals with Cancer Receiving Long Term Services and Supports**

Janet Van Cleave, New York University; Brian L. Egleston, Fox Chase Cancer Center; Katherine
Abbott, University of Pennsylvania School of Nursing; Karen Hirschman, University of Pennsylvania School of Nursing; Aditi Rao, University of Pennsylvania School of Nursing; Cynthia Zubritsky, University of Pennsylvania; Janice Foust, University of Massachusetts Boston; Mary D. Naylor, University of Pennsylvania School of Nursing

Presenter: Janet Van Cleave, Ph.D., Assistant Professor, College of Nursing, New York University, janet.vancleave@nyu.edu

Research Objective: Prior research studies indicate that older adults living with cancer may have greater functional limitations than those without cancer. However, little is known about short-term stays in nursing homes for respite services or rehabilitation center visits among chronically ill older adults with cancer. The purpose of this study was to conduct a descriptive analysis of the association between short-term stays and cancer diagnosis among older adults enrolled in Long-Term Services and Supports (LTSS), a broad range of services provided for persons unable to perform self-care activities.

Study Design: This study is a retrospective analysis of a subset of data from a prospective study entitled Health Related Quality of Life: Elders in Long Term Care (R01-AG025524; Mary D. Naylor, PI). The dependent variable, number of short-term stays, was defined as a short stay in nursing home or rehabilitation center, including post-acute care stays. Data on short-term stays were abstracted from medical records at study baseline, and then 3, 6, 9, and 12 months. Cancer diagnosis, chronic medical conditions, and demographics were abstracted at baseline from medical records. Symptoms, Function (Activities of Daily Living), Mental Health (Geriatric Depression Scale), and financial worry were obtained by self-report at baseline. Latent variable analysis, a technique similar to cluster analysis, classified patterns of co-existing medical conditions except cancer. Poisson regressions using Generalized Estimating Equations (GEE) were then used to assess the association between short-term stays and cancer diagnosis while controlling for patterns of co-existing medical conditions, demographics, number of symptoms, function, mental health, financial worry, and type of LTSS site.

Population Studied: 470 individuals ages 60 and older newly enrolled in LTSS residing in Assisted Living Facility (ALF) (n=156), Nursing Home (NH) (n=158), Home and Community Based Services (HCBS) (n=156). Among all study participants, 86 individuals had a cancer diagnosis.

Principal Findings: Latent class analysis indicated three patterns of co-existing medical conditions among the study population—low, medium, and high burden of disease. Low burden of disease pattern showed no conditions present in over 50% of the class population, whereas medium and high burden of disease patterns included 2 and 3 conditions, respectively. GEE regression analysis demonstrated that medium disease burden (p=.04), worse function (p<.01), worse mental health (p=0.05), and fewer symptoms (p=0.04) were associated with higher number of short-term stays. In contrast, type of LTSS service (p<.1) and cancer diagnosis (p=.02) were associated with fewer short-term stays. Demographic factors, high or low disease burden, and financial worries were not associated with the number of short-term stays.

Conclusions: The findings of this study suggest that presence of cancer, burden of disease, and site or structure of care influences referral for short-term nursing home stays or rehabilitation center visits.

Implications for Policy, Delivery, or Practice: Services across multiple health care sectors, including LTSS and short-term stays, may benefit frail older adults with complex care needs. More research is needed to better understand the optimal mix and site of service for this population.

Funding Source(s): NIH

Poster Session and Number: C, #1191

Is Policy Well-Targeted to Remedy Financial Strain among Caregivers of Severely Injured U.S. Service Members?

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**Research Objective:** The Caregivers and Veterans Omnibus Health Services Act of 2010 (Public Law: 111-163) aims to reduce financial strain for caregivers by providing financial stipends to those who care for severely injured Operation Enduring Freedom and Operation Iraqi Freedom Veterans. This study evaluated the prevalence of financial strain as measured by asset depletion and/or debt accumulation, and labor force exit among caregivers of Veterans with polytrauma and traumatic brain injury (TBI). Factors associated with financial strain also were examined to establish whether the Act targets caregivers experiencing financial strain.

**Study Design:** Cross-sectional data from a mailed survey of family caregivers. Bivariate analysis measured whether financial strain differed by caregiver tasks provided. Logistic regression or general linear models examined the association of caregiver tasks and other caregiver and patient covariates with the financial strain measures.

**Population Studied:** Caregivers were family members of U.S. service members and Veterans (n=1,046) who had received care for TBI and polytrauma, been discharged for at least 3 months from one of four VA Polytrauma Rehabilitation Centers between 9/2001-2/2009, and who were alive when the survey was fielded. 538 caregivers returned a survey including the financial questions (51%).

**Principal Findings:** Financial strain is common for caregivers: 62% reported depleted assets and/or accumulated debt, and 41% reported leaving the labor force. The latter finding stands in sharp contrast to studies in other populations internationally, where between 2% and 27% of caregivers left the labor force. If a severely injured Veteran needed intensive help with activities of daily living, the primary caregiver faced 4.6 higher odds of leaving the labor force, and used $27,576 more assets and/or debt to help care for the Veteran compared to caregivers of Veterans needing little or no help.

**Conclusions:** Our study provides a unique insight into the unintended costs of war by profiling the financial strain of caregivers of severely injured U.S. service members. We found that financial strain was common for caregivers and most pronounced for intensive caregivers. Given the young age of the caregivers and care recipients, the likely permanence of the injuries, and the high proportion of them reporting financial strain, it seems plausible that short-term financial strain may make this group especially vulnerable to lifelong financial instability. Our findings suggest that those targeted by the new federal legislation are also those reporting the highest levels of financial strain—caregivers whose veterans have intensive caregiving needs. In that these people are also the most likely to be long-term caregivers, the legislation appears to be particularly well-targeted to reach those caregivers most at risk of negative financial outcomes.

**Implications for Policy, Delivery, or Practice:** Financial strain can act as a barrier to the recovery of severely injured veterans if it impedes the quality of care provided by their caregivers. Clinicians should be aware of financial strain as a source of distress for caregivers, and look for signs that financial strain may be impeding the caregivers’ health and the quality of care they provide to veterans.

**Funding Source(s):** VA

**Patterns of Hospice Care among Veterans and Non-Veterans**

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**Presenter:** Melissa Wachterman, M.D.,M.M.Sc.,M.P.H., Clinician Investigator, Section of General Medicine, Department of Medicine, VA Boston Healthcare System / Brigham and Women's Hospital / Harvard Medical School, melissa.wachterman@va.gov

**Research Objective:** To determine if demographics, primary diagnosis, location of care, and service utilization differed by Veteran status in a nationally representative sample of hospice patients.

**Study Design:** Observational study of hospice users. We compared Veterans and non-Veterans by demographic characteristics, primary diagnosis, and location of hospice care and used multivariate regression to assess whether differences in primary diagnoses and
Veterans had fewer home health aide visits than non-Veterans. Further study is needed to understand the sources of this difference and to assess if it is associated with worse experiences among Veteran hospice users.

Implications for Policy, Delivery, or Practice: Historically, hospice use by military Veterans lagged behind that of non-Veterans. In 2002-2003 the VHA responded to this disparity by expanding end-of-life care services. Our findings raise the possibility that important differences may exist both in the kind of patients who use hospice and in their service utilization. Thus it is essential that we ensure that Veterans’ needs for hospice at the end of life are being met.

Funding Source(s): VA

Impact of Psychopharmacological Medication Use and Quality on Mortality among Medicare Nursing Home Residents

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Presenter: Yu-jung Jenny Wei, Ph.D., Postdoctoral Fellow, Pharmaceutical Health Services Research, University of Maryland School of Pharmacy, ywei@rx.umaryland.edu

Research Objective: Use of psychopharmacological medications (PPMs), including antipsychotics, antidepressants, and anxiolytics/sedative hypnotics, places nursing home (NH) residents at increased risk for adverse consequences, including mortality. This risk may be heightened if these PPMs are used without evidence of appropriate indications. Many studies have examined the effect of use of PPMs, but few have focused on the quality of PPM use. The research objective of this study is to assess the risk of death associated with poor quality PPM prescribing in nursing home residents.

Study Design: Using 2006-2009 Medicare administrative claims data linked to the Minimum Data Set 2.0, we conducted a retrospective, longitudinal cohort study among long-stay (101 days or longer) NH residents who used PPMs.
For each user, we used the 12 months prior to the date of the first observed long-stay (index date) to assess the quality of PPMs filled over the 6 months after the index date. PPM quality was ascertained by determining indication appropriateness, based on FDA-labeling, practice guidelines, and relevant clinical literature. We assessed all-cause mortality after the 6-month post-index period up to the end of study period (12/31/2009). For each user, an appropriateness score was calculated as the percentage of appropriate PPM fills divided by the total number of fills. The score ranged from 0 ("fully inappropriate") to 1 ("fully appropriate"); values in between were defined as "partially appropriate". Cox proportional hazards models were used to assess the risk of mortality associated with PPM quality, adjusting for covariates at the 6-month post-index date (age, gender, race, region, low-income subsidy status, comorbidities, hospitalization, and physical and cognitive function).

**Population Studied:** A 5% random sample of Medicare beneficiaries who 1) had at least one long-stay NH episode; 2) used at least one PPM; and 3) survived and remained continuously enrolled in Medicare Parts A, B, and D during the 6-month post-index period. We excluded residents with Medicare Advantage/Health Maintenance Organization insurance or who had no Parts A and B claims data in the 12-month pre-index and the 6-month post-index period.

**Principal Findings:** We identified 52,781 long-stay NH with at least one PPM use during 6-month post-index period (average follow-up=18 months); of these, 44.9% patients used APs, 80.9% used ADs, and 20.7% used anxiolytics/sedative-hypnotics. Among the entire sample, mortality was 44.1%, and ranged from 42.5% to 45.4% across antipsychotic, antidepressant and anxiolytic/sedative-hypnotic users. Relative to fully inappropriate PPM users, residents with evidence of fully or partially appropriate use had lower mortality risks (relative risk [RR]=0.94, p<0.001 for both groups). In particular, fully appropriate antidepressant users enjoyed the greatest mortality risk reduction (RR=0.91, p<0.001). Differences in quality of antipsychotic use failed to demonstrate statistical significance for mortality.

**Conclusions:** In a Medicare nursing home cohort, residents with evidence of appropriate PPM use experienced a 6% reduction in mortality, with much of this reduction driven by fully appropriate antidepressant use.

**Implications for Policy, Delivery, or Practice:** Our study suggests the need for continued monitoring of PPM use and quality in nursing homes.

**Funding Source(s):** Other, Research Retirement Foundation

**Poster Session and Number:** C, #1194

**MDS 3.0 Functional Improvement among Postacute Nursing Home Residents**

Andrea Wysocki, Brown University; Kali Thomas, Brown University; Vincent Mor, Brown University

**Presenter:** Andrea Wysocki, Postdoctoral Fellow, Center for Gerontology and Healthcare Research, Brown University, andrea_wysocki@brown.edu

**Research Objective:** The latest revision to the Minimum Data Set (MDS) for nursing homes – the MDS 3.0 – was implemented in October 2010. This version requires specific assessment items to be collected at discharge. With this new requirement, it is possible to analyze residents’ functional change between admission and discharge for a number of measures, including improvement in functional status, or the ability to perform activities of daily living (ADLs). Improvement in ADL performance assesses postacute care performance viz. an individual’s health status and ability for self-care. We sought to examine resident and facility characteristics associated with improvement in ADL performance among new nursing home residents admitted from the hospital.

**Study Design:** Online Survey Certification and Reporting (OSCAR) data from nursing facilities’ annual certification inspections were linked to assessment data from the MDS for individuals in the study sample. Hierarchical linear models were used to analyze resident and facility characteristics associated with ADL improvement to account for the nesting of individuals within facilities.

**Population Studied:** The sample included all residents who were new admissions to a nursing home from an acute hospital from July 2011 to July 2012 with corresponding admission and discharge assessments during this period. Our final sample included 1,394,961 individuals across 13,810 facilities.

**Principal Findings:** Residents had an average ADL improvement of 3.3 points (on a 0-28 ADL
encourage NHs’ investment in labor. Our objective is to examine NHs’ behavior in responding to these reimbursement changes, and the impact on quality of care.

**Study Design:** We examined changes in time trends for quality indicators before and after AB1629 implementation using longitudinal (2002-2008) logistic regression models. Quality was measured by risk-adjusted physical restraints, pressure ulcers, incontinence, functional decline, and potentially avoidable hospitalizations (PAH). For each quality indicators we examined data 3 years before and 3 years after the legislation, to look for an “interruption” or “shift” in the time series at the time the policy was introduced, and to check whether the shift was sustained over time. We also examined whether structural investments (staffing levels and wages) increased after AB1629. To test whether changes in quality of care were related to AB1629, we stratified our analyses by the proportion of Medi-Cal revenues in each facility.

**Population Studied:** We focused our analysis on NH residents receiving long-term care because AB1629 only affected Medicaid payment. Long-term care residents were defined as those who stayed in NHs longer than 90 days.

**Principal Findings:** Multivariable regression results showed that quality of care improved after the launch of AB1629 for some, but not for all measures. The odds of incontinence decreased about 8% and the improvement persisted throughout the post-period (2006-2008). The odds of pressure ulcers decreased at 5% per year in the post period. For physical restraints, a declining trend was already occurring in the pre-period (2002-2004) (odds declining at 7% per year). However, this trend significantly accelerated in the post-period with the odds declining at 28% per year. Functional decline and PAH did not exhibit any significant changes attributable to AB1629. These observed changes in quality appear to have been significantly associated with increased staffing for registered nurses (RN) and licensed practical nurses (LPN), both of which came in response to the new payment incentives. Furthermore, the relative decline in physical restraints after AB1629 was significantly larger for high Medi-Cal revenue NHs than for low Medi-Cal revenue NHs. As the former also exhibited a significant increase in RN wages, this suggests that NHs potentially more
impacted by AB1629 may have reacted more strongly.

**Conclusions:** AB1629 is associated with improvement in some quality dimensions but not in others.

**Implications for Policy, Delivery, or Practice:** To achieve more robust quality improvement, refinements of current Medicaid reimbursement policy might be needed to encourage NHs to make larger investments (e.g. reduce the time lag between investment and increase in reimbursement rate; set higher spending caps). Maximizing NH’s spending on direct care labor should not be relied on as the only policy strategy to improve quality of care.

**Funding Source(s):** Other, National Institute of Nursing Research

**Poster Session and Number:** C, #1196

**Healthcare Acquired Infections in Nursing Homes: National Survey of Policies and Practices**

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**Presenter:** Zhiqiu Ye, PhD student, Division of Health Policy and Outcomes Research, University of Rochester, Zhiqiu_ye@urmc.rochester.edu

**Research Objective:** To date, there has been no national-level data on the prevalence of healthcare-acquired infections (HAIs) in nursing homes (NHs), and the practices that they adopt to address this critical issue. In this study, we examined the prevalence of HAIs and variations in HAI-related prevention patterns and policies in US NHs.

**Study Design:** In 2012, we conducted a national survey of randomly-selected US NHs, focusing on the most common HAIs in institutional settings: methicillin-resistant Staphylococcus aureus (MRSA), Clostridium difficile (C diff), and Extended Spectrum Beta-Lactamase producers (ESBLs). The survey included questions regarding known HAI prevalence, admission and screening policies to actively detect HAI carriers, contact precaution strategies, decolonization, and cleaning practices.

**Population Studied:** Respondents on behalf of 1,002 participating facilities included infection control specialists and directors of nursing. Responding facilities were not significantly different from non-responders in bed size, percent of Medicare patients and the presence/absence of an infection control deficiency citation. Responders were significantly less likely to be for-profit, more likely to be rural, and had a slightly lower percent of Medicaid patients.

**Principal Findings:** For MRSA, overall carrier prevalence was 4.04% (SD=6.00%) and infection was 0.71% (SD=1.41%). Only 14.2% of NHs were less likely to accept residents with MRSA than those without. The principal reason for denying admission was lack of single or cohort rooms. The vast majority of NHs (96.4%) did not perform routine admission screening. The primary reasons offered for not screening were: it was not required by regulatory agencies (56.2%); would not change the way care was provided (30.7%); and due to concerns about screening costs (17.5%). Isolation practices (e.g. use of protective equipment in resident room) differed widely - 50.6% adhered to national guidelines by using contact precautions for infected patients with draining wounds; 39.0% went beyond guidance, with 34.5% using precautions for non-draining infections and 4.5% using it for any carrier state. In fact, 12.8% of residents were decolonized with mupirocin and/or chlorhexidine, but the standard deviation was large (31.4%). Despite no guidance for differential cleaning of rooms of MRSA carriers, 59.3% of NHs reported increased cleaning, including more frequent cleaning (21.8%) or cleaning more items (44.6%) per room. Cdiff carrier prevalence was 1.7% (SD=2.7%) and infection was 0.7% (SD=1.2%). ESBL carrier prevalence was 0.7% (SD=1.7%) and infection was 0.2% (SD=0.8%). Similar information about policies and practices with respect to Cdiff and ESBL are not included in the abstract due to word limitation, but will be presented.

**Conclusions:** HAIs are frequently found in NHs, but policies denying admission to HAI carriers did not appear to be common. Nursing homes lack standardized approaches to infection prevention, and large variations in such practices were observed. Many facilities have adopted isolation, decolonization and cleaning practices that extend beyond current guidance.

**Implications for Policy, Delivery, or Practice:** Currently, there are no nursing home-specific guidelines for infection prevention. Further research and clinical trials are needed to identify
most effective policies and practices for reducing transmissions and infections due to HAIs in this care setting.

**Funding Source(s):** NIH

**Poster Session and Number:** C, #1197

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**Family Satisfaction with Nursing Home Care in Massachusetts**

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**Presenter:** Zhiqiu Ye, PhD student, Division of Health Policy and Outcomes Research, University of Rochester, Zhiqiu_ye@urmc.rochester.edu

**Research Objective:** Consumer satisfaction is increasingly measured and publicly reported in many healthcare settings to increase accountability and drive quality improvement. In an effort to promote consumer-centeredness of nursing home care, Massachusetts has developed and reported nursing home family satisfaction ratings since 2005. We analyzed these reports to gain insights into the experiences of nursing home residents and the ways in which these reported experiences relate to several common nursing home quality indicators.

**Study Design:** Satisfaction ratings, including three overall satisfaction measures and six rating scores on individual domains of care, were obtained from the state government website. All ratings, except the one for willingness to recommend the nursing home to friends/ family members, were measured on a 5 point-likert scale. We linked the satisfaction reports to the On-line Survey, Certification, and Reporting (OSCAR) databases of corresponding years. We compared the overall and individual satisfaction ratings across years, and for each year’s report, examined correlations among overall and individual satisfaction domains. We analyzed the associations between nursing home characteristics and satisfaction scores, focusing on four widely-accepted quality indicators (licensed nurse staffing, CNA staffing, deficiency citations, and ownership status). Regression models with county fix-effects were used for multivariate analyses. Lastly, we examined county-level geographic variations in adjusted satisfaction ratings.

**Population Studied:** A voluntary group of nursing homes (n=297) for 2005 (the “voluntary reporting” year) and all eligible nursing homes (n=430 approximately) for 2007 and 2009 (the “mandatory reporting” years).

**Principal Findings:** The annual response rate for surveyed family members was above 60 percent. In 2009, overall satisfaction with the nursing home, satisfaction that overall resident needs were met and recommendation rate of the nursing home was 4.25 (range: 3.24-5.00), 4.12 (range: 3.09-5.00) and 89.9% (range: 32-100%), respectively. For individual domains of care, the average satisfaction score was highest for administrative and direct care staff (4.22, range: 3.49-4.95) and lowest for activities available (3.85, range: 2.91-4.80). No significant change of ratings over years was identified. Correlations among overall satisfaction measures (r=0.76-0.95) and satisfaction with individual domains (r>0.6) were very high. Higher level of CNAs per resident-day (p<0.001), less deficiency citations (p=0.05), and non-for-profit status (p<0.001) were associated with better overall and individual satisfaction ratings after controlling for other facility characteristics. Average adjusted scores of satisfaction showed wide geographic variations across counties.

**Conclusions:** Consumer ratings of care are highly variable across facilities and regions. Currently published nursing home quality indicators (e.g. nurse staffing, deficiency citations and facility ownership) by the CMS are correlated with but do not fully explain consumer-reported ratings.

**Implications for Policy, Delivery, or Practice:** Nursing home performance data from consumers’ perspective are able to supplement and enhance CMS’ current reporting efforts. Given evidence of the positive impacts of public reporting on quality improvement, future national publication of consumer-reported satisfaction ratings is expected to catalyze improvements in patient-centered care in nursing homes.

**Funding Source(s):** NIH

**Poster Session and Number:** C, #1198
IMPROVING QUALITY AND VALUE

Patient and Hospital Characteristics Associated with Adverse Events in Aortic Valve Replacement: Volume is Not the Strongest Predictor
Tina Hernandez-Boussard, Stanford University Department of Surgery; Nicole Arkin; Peter H.U. Lee, Stanford University, Department of Cardiothoracic Surgery; Kathryn McDonald, Stanford University; Jay Bhattacharya, Stanford University

Presenter: Nicole Arkin, B.A., Medical Student, narkin@stanford.edu

Research Objective: This study was designed to examine hospital resources associated with patient outcomes for aortic valve replacement (AVR), including inpatient adverse events and mortality.

Study Design: We used the Nationwide Inpatient Sample to identify AVR discharges in the US. These data were linked to the 2008 Annual Hospital Association (AHA) survey to augment hospital characteristics. Our primary outcome was the development of an in-hospital adverse event, identified using the standardized Patient Safety Indicators (PSI). Patient and hospital characteristics associated with PSI events and mortality were evaluated using univariate and multivariate analyses.

Population Studied: AVR procedures were identified using ICD-9-CM codes (352.1, 352.2, 352.3, 352.4, 351.2) in adult patients. Patients who underwent other cardiac procedures in addition to AVR, such as coronary artery bypass grafting or mitral valve repair, were excluded.

Principal Findings: A weighted estimate of 429,185 AVRs at 12,898 hospitals were identified in the US between 1998 and 2009. The number of AVRs increased annually by 4.68% (p<0.0001), with the majority of the increase occurring in hospitals with high AVR procedure volume (HVH). HVH had higher proportions of whites, males, and patients with private payers (p<0.05). They also had higher average comorbidity indexes compared to low procedure volume hospitals (LVH; p=0.0003).

HVH had a greater proportion of PSIs compared to mid- and low- volume hospitals (4.37%, 4.34%, and 3.55%; p=0.0150). Univariate analysis indicated inpatient mortality was lowest in HVH (referent), with increased odds in medium volume hospitals (MVH; OR: 1.13, CI: 1.02-1.25) and highest odds in LVH (OR: 1.28, CI: 1.21-1.47). Risk-adjusted rates of PSI events were not significant across hospital volume categories (p>0.05). In the multivariate logistic regression analysis, hospital volume was not associated with PSI development (p=0.0733) or mortality (p=0.3595). The risk of inpatient PSI events was associated with higher hospital occupancy (beds filled to >75% capacity; OR: 1.29, CI: 1.18-1.41), increased hospital bedsize (OR: 1.16, CI: 1.07-1.27), and inversely associated with higher nurse-to-patient ratio (OR: 0.97, CI: 0.96-0.98). Similarly, risk of inpatient mortality was associated with increased hospital bedsize (OR: 1.24, CI: 1.02-1.52) and inversely associated with higher nurse-to-patient ratio (OR: 0.97, CI: 0.95-0.98).

Conclusions: Patients undergoing AVRs in hospitals with high levels of resources have improved patient outcomes, independent of hospital volume. In our data, the volume-outcomes relationship dissipated after accounting for important hospital resources, such as nurse-to-patient ratios, hospital size, and hospital occupancy.

Implications for Policy, Delivery, or Practice: Our findings shed light on the volume-outcomes gap for a common and costly procedure, identifying structural differences between high and low volume hospitals indicative of high quality outcomes. The interactions between hospital resources and quality of care delivered, as measured by PSI events and inpatient mortality, suggest that hospital procedure volume is likely a proxy measure for differences in important resources, such as nursing staff and over-crowding. Consistent with other studies, our data suggest that the number of patients being treated in high volume centers has increased and this increase is among white patients and those with private payers. Understanding disparities in access to these high-resource centers will identify means of improving this outcomes gap.

Funding Source(s): Other, Med Scholars Grant, Stanford University School of Medicine; A portion of this project was supported by grant number K01 HS018558 from the Agency for Healthcare Research and Quality.

Poster Session and Number: B, #666

Developing Quality Performance Benchmarks for Physician Group Practice Transition Demonstration
Olivia Berzin, RTI International; Musetta Y. Leung, RTI International; Sherry Grund, RN, Telligen
**Presenter:** Olivia Berzin, B.A., Health Policy Analyst, RTI International, oberzin@tri.org

**Research Objective:** To develop performance benchmarks for quality of care measures against which participating physician group practices will be evaluated.

**Study Design:** The Physician Group Practice Transition Demonstration (PGPTD) is a Medicare value-based purchasing initiative that measures the quality and efficiency of care for ten large PGPs. It uses both Medicare claims and clinical record data to evaluate PGP performance on quality indicators in nine areas, including 5 modules from the original demonstration: diabetes (DM), heart failure (HF), coronary artery disease (CAD), hypertension (HTN), and preventive care (PREV), as well as additional measures based on CMS priority areas. For the 22 measures carried over from the original demonstration, performance benchmarks were derived from data collected in the fifth performance year (PY) of the original demonstration, using an algorithm that takes into account best and median performance in PY5. Median performance was used in PGPTD’s PY1 if the median PGP score exceeded 90 percent. If the median performance in PY5 was below 90 percent and the best performance was above 90 percent, a flat benchmark of 90 percent was used as a benchmark. If the median performance in PY5 was below 90 percent and the best performance was also below 90 percent, the best performance score in PY5 was used as a benchmark. A minimum threshold of 50 percent was applied to these 22 measures. Results in PY2 will be developed using benchmarks derived from data collected during PY1.

**Population Studied:** For each module, Medicare fee-for-service beneficiaries assigned to the ten PGPs were included if they had two or more evaluation and management visits to the PGP, and met module-specific criteria. For the 22 measures from the original demonstration, a random sample of 615 eligible beneficiaries was drawn for each of the modules, so that PGPs could abstract medical record information into a clinical data collection tool for performance evaluation.

**Principal Findings:** Median performance was used as the benchmark on 8 of the measures, including 6 HF measures and 2 CAD measures (range from 90.1 to 97.3 percent). Best performance was used as the benchmark on 9 of the measures, including 3 PREV measures, 4 DM measures and 1 CAD and 1 HTN measure (range from 68.9 to 88.9 percent). The benchmarks defaulted to a 90 percent flat rate on 5 measures, including 2 DM measures, and 1 measure each from the PREV, CAD, and HTN modules.

**Conclusions:** The PGPs, having performed well in PY5 on a number of measures, have set challenging benchmarks for themselves in the first year of the PGPTD. These high benchmarks may motivate the PGPs to maintain high quality in patient care, since their incentive payments will be partially determined by how well they perform against the benchmarks.

**Implications for Policy, Delivery, or Practice:** Quality of care measurement and reporting allows physician practices to evaluate their patterns of care for patients with chronic conditions, improve care delivery, and track improvements over time. Paying for increased quality of care may provide additional resources or incentives for physician groups or accountable care organizations to implement interventions to improve care.

**Funding Source(s):** CMS

**Poster Session and Number:** B, #667

**Quality and Cost Conundrum: Exploring the Association between Hospital Value-Based Purchasing Score and Medicare Spending Per Beneficiary Measure**

Bijan Borah, Mayo Clinic; Daniel L. Roellinger, Mayo Clinic; James M. Naessens, Mayo Clinic

**Presenter:** Bijan Borah, Assistant Professor, Division of Health Care Policy and Research, Mayo Clinic, borah.bijan@mayo.edu

**Research Objective:** Medicare has recently published the actual hospital value-based purchasing (HVBP) payment adjustment factors applicable to all participating hospitals in financial year (FY) 2013. Medicare Spending per Beneficiary (MSPB) measure for a hospital is a ratio of price-standardized, risk-adjusted sum of all Medicare payments for an inpatient episode to the median MSPB of all U.S. hospitals. Medicare intends to include MSPB as another domain in HVBP measure from FY2015 to incentivize hospitals to provide quality care at lower cost. However, it is not clear how the HVBP measure, as calculated currently, is related to MSPB measure. This study explores this relationship and its policy implications.
Study Design: This retrospective study design considers a HVBP-eligible hospital as unit of analysis. Multiple data sources for the relevant time periods were linked to construct the analytic dataset for the study: Actual HVBP payment adjustment factors for the financial year (FY) 2013 were extracted from CMS website; HVBP-related process of care and patient satisfaction measures were collected from Medicare Hospital Compare database and so was the MSPB measure; American Hospital Association survey data provided information on hospital structural characteristics including profit status, bed size, geographic location and nursing staff level; and Medicare Impact File provided disproportional share hospital (DSH) index and the ratio of Medicare to total inpatient days. The association between MSPB and HVBP measures was assessed through linear regression that adjusted for hospital-specific characteristics described above.

Population Studied: The analytic sample comprised of 2,984 hospitals for which HVBP incentive payment will apply in FY2013.

Principal Findings: MSPB measure varied between 0.66 and 1.53 implying that the cheapest and the costliest hospitals cost 34% less and 53% more than the national median, respectively. HVBP varied between -0.009 and 0.0083, indicating that the worst (best) performing hospital will receive a penalty (bonus) of 0.9% (0.83%) for FY2013. Hospitals in the bottom and the top10th percentile of MSPB distribution had mean HVBP multiplier of 0.0005 and 0.0003, respectively. Regression adjustment indicates that HVBP multiplier is negatively associated with MSPB measure albeit with only negligible impact (beta=-0.02). Other potential predictors were DHS (beta=0.03), Medicare inpatient days (beta=0.09), profit status (beta=-0.04 for government and non-government hospitals with reference to private hospitals), number of clinical process measures reported (beta=0.004) and whether urban hospital (beta=0.04). Except hospitals in New South Central, hospitals from other regions appeared to have impacted MSPB negatively (reference: New England). Also, compared to small hospitals (beds<100), larger hospitals were positively associated with MSPB (beta=0.03-0.04).

Conclusions: VBP multiplier, which may be conceived as a proxy for quality of care provided by a hospital, is found to be negatively associated with MSPB measure. That is, higher quality hospitals, on average, provided low-cost care compared to the national median cost.

Implications for Policy, Delivery, or Practice: Our finding that MSPB is negatively associated with HVBP is in concert with Medicare’s overarching goal of incentivizing providers to deliver quality care in low cost. However, while determining the weight for MSPB to calculate new the HVBP from FY2015 onwards, this association needs to be monitored in the next two years.

Funding Source(s): No Funding

Poster Session and Number: B, #668

Validating the 3M™ Potentially Preventable Readmissions Software in a Cohort of Veterans with Pneumonia
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Presenter: Ann Borzecki, M.D., M.P.H., Physician-Researcher, Center for Quality, Outcomes and Economic Research, Bedford VAMC, amb@bu.edu

Research Objective: The 3M™ Potentially Preventable Readmissions (PPRs) software was developed in response to demand for a measure that could accurately identify the proportion of readmissions that is potentially preventable using administrative data. It matches clinically-related All Patient Refined Diagnosis Related Groups (APR-DRGs) from the index admission and readmission that may indicate process of care problems occurring during the index admission or post-discharge period. Although, CMS uses 30-day all-cause readmissions for selected conditions as their performance measures, individual states are increasingly adopting PPRs for hospital reimbursements. Because the PPRs have undergone face validation only, we examined whether software-flagged PPR cases were more likely to experience process of care problems than non-
flagged cases using electronic medical record (EMR) abstraction.

**Study Design:** We used 2006-2010 Veterans Health Administration (VA) administrative data and EMR data from all acute-care VA hospitals. We identified all index discharges of veterans with a pneumonia principal discharge diagnosis associated with a 30-day readmission, per CMS’ all-cause pneumonia readmission measure methods. We then applied the PPR software to flag cases as a PPR (yes/no). To obtain a final sample of 100 linked index admission-readmission cases for full analysis, we randomly selected 200 linked cases; we anticipated excluding cases based on coding errors, having preceding pneumonia admissions or intervening readmissions to non-VA hospitals not captured in our database. We developed EMR abstraction tools to assess processes of care during the index admission and post-discharge period. Explicit criteria were selected and refined by an expert clinical panel following the RAND/UCLA Appropriateness Method. The final chart-abstraction tool used by our 2 trained nurse-abstractors contained 46 items organized into 4 sections: admission work-up (n=10), evaluation and treatment during the stay (n=9), readiness for discharge (n=17), and post-discharge period (n=10). We scaled scores to a maximum of 25 per section, (the maximum obtainable quality score was 100). We compared PPR-flagged and non-flagged cases on total and section-specific mean quality scores using t-tests.

**Population Studied:** Veterans discharged from VA acute inpatient care with pneumonia during 2006-2010 who had a 30-day readmission.

**Principal Findings:** To date, 87 cases have been abstracted; we excluded 23, leaving 64 for analysis. Of these, 47 were PPR-flagged (54%). The overall mean quality score for the sample was 51.2±20.3. Mean quality scores, both overall and by section, were slightly lower, although not significantly, among non-PPR flagged cases compared to flagged cases (44.0±20.9 vs. 53.8±19.6, overall; p=0.087). Comparisons approached statistical significance only for the admission work-up and post-discharge period (11.9±8.6 vs. 16.2±7.4, p=0.055, and 1.9±3.9 vs. 5.5±7.3, p=0.058, respectively).

**Conclusions:** Our preliminary findings suggest the PPR software categorization does not reflect expected differences in quality of care received during the index admission or post-discharge period. We intend to investigate this further by abstraction of additional pneumonia cases and other study cohorts.

**Implications for Policy, Delivery, or Practice:** The PPRs are an important step toward a fairer measure for hospital reimbursements. However, until further information on their validity is available, and based on findings to date, we think they may be best used as a screen for potential quality of care problem areas requiring further investigation.

**Funding Source(s):** VA

**Poster Session and Number:** B, #669

**Drivers of Regional Spending Variation in Medicare Enrollees with Advanced Cancer**

Gabriel Brooks, Dana-Farber Cancer Institute; Ling Li, Dana-Farber Cancer Institute; Hajime Uno, Dana-Farber Cancer Institute; Michael J. Hassett, Dana-Farber Cancer Institute; Jane C. Weeks, Dana-Farber Cancer Institute; Deborah Schrag, Dana-Farber Cancer Institute

**Presenter:** Gabriel Brooks, MD, Fellow, Dana-Farber Cancer Institute, gabrooks@partners.org

**Research Objective:** There is substantial regional variation in medical spending for patients with advanced cancer, but spending variation is not associated with differences in survival. We sought to identify service categories that were drivers of regional variation in advanced cancer spending.

**Study Design:** We studied spending in patients diagnosed with advanced stage cancer between 2002 and 2007, using Surveillance, Epidemiology and End Results (SEER) cancer registry data linked to Medicare claims records. We measured all spending in 2009 dollars. Claims were assigned to one of 14 service categories: acute inpatient care, sub-acute care, chemotherapy, radiation therapy, imaging, laboratory diagnostics, outpatient procedures, outpatient physician fees, part B medications, hospice, home health, durable medical equipment, other part B, and unclassified. Definitions for spending categories that were drivers of regional variation in spending power and is expressed in 2009 dollars. Claims were assigned to one of 14 service categories: acute inpatient care, sub-acute care, chemotherapy, radiation therapy, imaging, laboratory diagnostics, outpatient procedures, outpatient physician fees, part B medications, hospice, home health, durable medical equipment, other part B, and unclassified. Definitions for spending categories were based on Berenson-Eggers Type of Service (BETOS) codes.

**Population Studied:** 61,083 fee-for-service Medicare recipients age 65 and older who were diagnosed with advanced stage cancer between 2002 and 2007. Patients had stage IV colorectal, breast, or prostate cancer, stage IIIB...
or IV non-small cell lung cancer and stage III or IV pancreas cancer. Patients lived in one of 80 hospital referral regions (HRR’s) that substantially overlap with SEER areas. Patients were assigned to quintiles of regional spending based on mean advanced cancer spending within the HRR of residence.

**Principal Findings:** Total advanced cancer spending increased by 33% from quintile 1 (lowest spending) to quintile 5 (from $28,729 to $38,120). Acute inpatient care was the main driver of regional spending variation, accounting for 50% of all advanced cancer spending and 75% of the spending increase from quintile 1 to quintile 5. Three other service categories demonstrated interquintile spending increases greater than their share of total spending, including sub-acute care, part B medications (other than chemotherapy) and home health. However, these three categories together accounted for only 6% of total spending. Hospice spending exhibited an inverse relationship with total spending, comprising 5% of all spending and decreasing by 34% from quintile 1 to quintile 5.

**Conclusions:** Acute inpatient care accounts for 50% of all medical spending in the six months after diagnosis of advanced stage cancer, and is also the main driver of regional variation in advanced cancer spending. Regional spending for hospice care exhibits an inverse relationship with total advanced cancer spending.

**Implications for Policy, Delivery, or Practice:** We found that regional variation in advanced cancer spending is primarily driven by differences in spending for hospitalization. Programs targeted at identifying and reducing potentially avoidable hospitalizations in patients with advanced cancer may substantially reduce costs without impacting quality of care. Additionally, our findings suggest that low-spending regions sometimes substitute hospice services for acute hospital care, with substantial associated savings. Programs to further bolster hospice services for patients with advanced cancer should be explored.

**Funding Source(s):** No Funding

**Poster Session and Number:** B, #670

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**Research Objective:** Quality indicators are used to identify potential areas of concern regarding the quality of clinical care. Good indicators have sufficient variability to identify poor performers, are relatively insensitive to severity adjustment, and reflect what providers do rather than patients’ characteristics. It is uncertain which potential ICU quality indicators meet these standards. We therefore examined the extents to which several ICU outcome and process measures possess these attributes.

**Study Design:** We examined two process and six outcome measures: veno-thromboembolic (VTEP) and stress ulcer prophylaxis (SUP), ICU readmission, ICU and in-hospital mortality, failure to rescue, ICU complications, and prolonged, conditional, and conventional ICU length of stay. For each, we assessed: (1) the frequency and variability of the indicator across ICUs; (2) the differences in model discrimination and fit, using area under the receiver operating characteristic curve (AUC) and R2, between models containing ICU and year as fixed effects along with patient variables and models containing only ICU and year fixed effects; and (3) the amount of variability contributed to the models by patient characteristics relative to ICU and hospital characteristics, using the Omega statistic.

**Population Studied:** 268,824 patients admitted to 138 ICUs in 99 geographically diverse U.S. hospitals. The ICUs studied reflected U.S. critical care delivery in the distribution of medical and surgical ICUs, community versus academic or state hospitals, and whether they employed open or closed physician staffing models.

**Principal Findings:** The indicators with the widest ranges between the highest and lowest ICU-specific values were failure to rescue (96%), VTEP (86%) and SUP (75%); ICU readmission had the smallest range (12%). ICU readmission and ICU mortality had median frequencies of 2.3% and 7.8%; other outcomes such as failure to rescue (24.8%) and prolonged length of stay (35.8%) were more common. The indicators most sensitive to severity adjustment included mortality (ICU: 29.6%, in-hospital: 28.5%), failure to rescue (21.3%), and length of stay (conventional: 74.7%; conditional: 75.4%); process measures (VTEP: 3.4%; SUP: 2.1%)
and ICU readmission (3.5%) were the least. Four quality indicators had omega < 1, indicating ICU and hospital characteristics contributed more to the variance of those models than patient characteristics: SUP (omega: 0.43 (0.34, 0.54)), VTEP (omega: 0.57 (0.53, 0.61)), ICU readmissions (omega: 0.69 (0.52, 0.90)), and ICU complications (omega: 0.73 (0.69, 0.78)). The measures with the largest omega were: ICU length of stay (omega: 60.85 (55.85, 66.30)), ICU mortality (omega: 33.14, (28.71, 38.26)), and in-hospital mortality (omega: 31.14 (27.69, 35.01)).

**Conclusions:** No indicator performed well across all three metrics. Mortality was highly influenced by patient mix relative to process measures and ICU readmissions. ICU readmissions fared better on those measures, but were rare with a narrow range. Process measures did very well on sensitivity to severity adjustment and degree explained by ICU characteristics, but only average on variability. Limitations include the possibility that unmeasured patient variables could affect our results. Future research should examine whether other ICU processes have utility as quality indicators, and their construct validity.

**Implications for Policy, Delivery, or Practice:** Process measures may have greater utility as ICU quality indicators than commonly used outcome measures.

**Funding Source(s):** NIH

**Poster Session and Number:** B, #671

Hospital Acquired Conditions and Length of Stay-Chicken and Egg?

Graham Atkinson; Sule Calikoglu, Maryland Health Services Cost Review Commission

**Presenter:** Sule Calikoglu, Ph.D., M.A., M.P.P., Associate Director Of Performance Evaluation, Maryland Health Services Cost Review Commission, sule.calikoglu@maryland.gov

**Research Objective:** The analysis of hospital acquired conditions (HAC) and length of stay (LOS) is complicated by the fact that there is a complex interaction between the length of stay and the occurrence of the HAC. The presence of a HAC often dramatically increases the length of stay, but it is also possible that a longer length of stay increases the probability of acquiring a HAC, particularly those involving infections. A recent paper entitled "How dangerous is a day in hospital?" used a structural equation model to examine the influence of length of stay on the frequency of adverse events, but it did not consider the influence in the other direction. The analysis to be described in this paper also uses a structural equation model but allows influences in both directions. Seven complications (mostly acquired infections) were examined and the two effects are separated.

**Study Design:** A structural equation model was constructed allowing for the two-way interaction between HAC and length of stay and adjusting for the influence of age and case mix. We measured HAC using 3M Potentially Preventable Complications (PPC) software. For each APR DRG/SOI the proportion of the cases in that class with a PPC was calculated. This proportion was used as an independent variable in the regression equation in which the PPC was the dependent variable. The mean length of stay by APR DRG/SOI was also used as an independent variable in the regression equation specifying the length of stay.

**Population Studied:** The data used for this analysis was hospital discharge data from Maryland hospitals for the three years ended June 2012 grouped with admission APR DRGs and severity of illness and also with the 3M PPC grouper.

**Principal Findings:** Infections, and other complications, as expected have a substantial and statistically significant influence on length of stay. However, contrary to expectations, for only two of the seven PPCs studied did the length of stay have a statistically significant influence on the probability of acquiring the PPC while in the hospital. In all the models age had a statistically significant influence on both the length of stay and the probability of acquiring a PPC.

**Conclusions:** The presence of a complication added to the LOS, sometimes very substantially. In five of the complications studied the probability of experiencing a complication was not statistically significantly related to the LOS, but for the other two it was.

**Implications for Policy, Delivery, or Practice:** The issue of whether the risk of experiencing a complication increases with increased LOS is important for both patients and policy makers. Also, the impact of the occurrence of a complication on the length of stay is important is assessing the potential cost savings from reducing the incidence of complications.

**Funding Source(s):** No Funding

**Poster Session and Number:** B, #672
Development and Cost Implications of Quality of Care Indicators for Shoulder and Back Injuries
Renan Castillo, Johns Hopkins Bloomberg School of Public Health; Sara Heins, Johns Hopkins Bloomberg School of Public Health; Dorianne Feldman, Johns Hopkins Bloomberg School of Public Health; Eric Roberts, Johns Hopkins Bloomberg School of Public Health; Albert Wu, Johns Hopkins Bloomberg School of Public Health; Molly Simmons, Johns Hopkins School of Medicine; Arielle Medford, Johns Hopkins Bloomberg School of Public Health; Antonio Trujillo, Johns Hopkins Bloomberg School of Public Health

Research Objective: Back and shoulder injuries are two of the most costly occupational injuries. Clinical practice guidelines have been developed for these injuries, yet the effect of adhering to these guidelines on cost has not yet been well established. The purpose of this study to examine the contribution of adherence to occupational health guidelines to medical and indemnity costs.

Study Design: Secondary analysis of claims data from a large national workers compensation insurer. A total of 19 shoulder injury and 21 back injury practice guideline indicators were developed from a combination of existing published guidelines and expert panel recommendations. Not all indicators applied to all individuals in the dataset (ranging between 12% and 100%). Indicators were then evaluated against the outcomes of total medical and indemnity costs. Key covariates were treatment, injury severity scores, and demographic data available in the claims dataset. Analyses are presented separately for each of 45 shoulder and 24 back clinical diagnosis group/practice guideline combination.

Population Studied: Included in this analysis were workers compensation claimants with data from 2000-2010 who met the following criteria: they were work time-loss cases, lived in the US, had sufficient data coverage, and were classified as having a back (N=117,084) or shoulder (N=53,223) injury by a condition assignment algorithm.

Principal Findings: Average costs for shoulder and back injured patients were $15K and $16K, respectively. Among shoulder injuries, five practice guideline indicators were identified that contributed to both higher medical and indemnity costs: unnecessary homecare, inappropriate steroid injections, time on opioids in excess of three months, inappropriate bracing, and repeat surgeries. Among back injuries, four practice guideline indicators were identified that contributed to both higher medical and indemnity costs: unnecessary homecare, inappropriate epidural steroid injections, time on opioids in excess of three months, and repeat surgeries. Among shoulder injury patients, after controlling for covariates, failure to adhere to these practice guidelines was associated with statistically significant total cost increases. These cost increases ranged between $14K and $127K.

Conclusions: Our results demonstrate that failure to adhere to a subset of these treatment guideline indicators is a significant predictor of increased medical and indemnity costs for two important occupational injuries.

Implications for Policy, Delivery, or Practice: These indicators may also serve as the basis for the development of quality indicators for future claims based analyses. Development of systems and policies to help validate, support and enforce evidence-based guidelines may help reduce health care costs in this setting.

Funding Source(s): Other, American International Group

Poster Session and Number: B, #673

How Consistent is the Reliability of Hospital Performance Based on Simulation and Multilevel Approaches?
Dave Chen, Fu Jen Catholic University; Kuopiao Chung, National Taiwan University

Presenter: Dave Chen, Ph.D., Assistant Professor, Department of Public Health, Fu Jen Catholic University, ttchen11@gmail.com

Research Objective: Many studies have used the hierarchical logistic model to estimate the reliability of provider/insurer performance. In this study we compare the reliability of individual diabetes mellitus (DM) process measures based
on simulation and hierarchical logistic approaches. Process measures based on simulation and hierarchical approaches.

**Study Design:** We derive the individual measures from 5 evidence-based process measures. The reliability index is defined as the ratio of the true score variance to the observed score variance. To estimate the reliability of the simulation approach, we compute the two variances above from 1,000 bootstrap samples (replicates). To estimate the reliability of the hierarchical logistic model, we apply the hierarchical logistic model to estimate the true score variance and then use the intraclass correlations (ICC) as the reliability index.

**Population Studied:** This study utilizes data from Taiwan’s National Health Insurance (NHI) database for 2008. Our DM sample size is 1,276,114.

**Principal Findings:** The reliability estimated from the hierarchical logistic model always has a significantly lower reliability, especially for cases with smaller intraclass correlations (ICC). Three of the five measures achieve reliability based on the simulation method when a reliability of 0.70 or higher is typically considered acceptable for psychometric purpose, whereby only one measure achieves reliability based on the hierarchical logistical model.

**Conclusions:** Our analysis has shown that the reliability derived from the simulation method is not consistent with the reliability estimated from the hierarchical logistic model.

**Implications for Policy, Delivery, or Practice:** When using the hierarchical logistic model to estimate the reliability of provider performance, one should be aware of its limitations.

**Funding Source(s):** Other, 100-2410-H-030-067

**Poster Session and Number:** B, #674

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**A Patient-Centered Strategy to Improve Palliative Care: A Qualitative Approach**

Elizabeth Ciemins, Billings Clinic; Jeannine Brant, PhD, APRN, AOCN, Billings Clinic; Diane Kersten, MSW, Billings Clinic; Betty Mullette, RN, CDE, MSN, Billings Clinic; Dustin Dickerson, MS, Billings Clinic

**Presenter:** Elizabeth Ciemins, Ph.D., M.A., M.P.H., Director, Center for Clinical Translation Research, Billings Clinic, eciemins@billingsclinic.org

**Research Objective:** To discover the perceptions based on recorded experiences that influence patient and family satisfaction with palliative care services at end-of-life or during serious illness in order to identify necessary health care team competencies to improve patient care.

**Study Design:** In-depth, structured patient and family interviews were conducted and transcribed. Five qualitative investigators independently reviewed data using methodological and theoretical memos and preliminary interpretations. A combined deductive and inductive iterative qualitative approach was used to identify recurring themes following five steps: (1) develop a priori template of codes; (2) test codes for reliability; (3) define emerging themes; (4) identify meaningful units of text to represent themes; and (5) compare and contrast themes across interviews. Themes and patterns were further refined and new themes co-generated. The process was facilitated by the Atlas.ti data analysis software.

**Population Studied:** A convenience sample of three patients and 11 family members of patients who received palliative care services were interviewed alone or with their families for a total of 12 interviews. Interviewees ranged in age from 25 to 89; patients of families interviewed were perinatal through elderly.

**Principal Findings:** Presence, Reassurance, and Honoring Choices emerged as central themes linked to satisfaction with palliative care services. Presence included both physical, i.e., showing up, and emotional/behavioral, i.e., how one shows up, components and was defined by participants as including the attributes of respect, approachability, genuineness, empathy, connectedness, compassion, sensitivity, and an ability to listen. Reassurance was defined by good communication, provision of information, empowerment, and timeliness. Honoring Choices included those pertaining to treatment, spirituality, and family needs and needed to be action-oriented.

**Conclusions:** At the end-of-life or during times of serious illness, patients and families feel it is important for providers and other health care professionals to demonstrate a sense of presence while in the room, provide reassurance regardless of expected outcome, and honor individual choices. These traits are accomplished through a show of respect for the patient and family, positive and successful communication with the patient and family, and provision of necessary information including prognosis and treatment or non-treatment options. To be successful from the patient and
family perspective, it is necessary for health care providers to be compassionate and empathetic and possess skills in listening, connecting and interacting with patients and families. 

Implications for Policy, Delivery, or Practice: This work has profound implications for how health care services are provided to patients and their families in times of serious illness or at the end of life. Characteristics that are important to patients and families must be strived for and incorporated into patient care. Health care providers must be trained in what is important to patients and families in order to provide the best patient- and family-centered care possible. This might be achieved using role modeling, improvisation, education and other methodologies that focus on the patient-health care provider interaction. This also has a potential impact on patient satisfaction, which is very important to health care systems.

Funding Source(s): No Funding

Poster Session and Number: B, #675

Assessing Hospital Quality via the Pridit Method

Robert D. Lieberthal, Jefferson School of Population Health; Dominique Comer, Jefferson School of Population Health

Presenter: Dominique Comer, Pharm.D., Postdoctoral Research Fellow, Jefferson School of Population Health, dominique.comer@jefferson.edu

Research Objective: Objective measures of hospital quality have not been uniformly accepted and remain controversial. Typical performance measures that are typically collected demonstrate their importance, however in a limited scope; Pridit is an innovative method provides a method to combine different types of data to depict an overall picture of relative hospital quality. The goal of this study was to explore validation of Pridit as a method to objectively determine which hospital measures are indicators of quality and which hospitals perform best on these measures.

Study Design: Hospital demographics, structural characteristics, Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) patient satisfaction scores, process and outcomes measures from the Center for Medicare and Medicaid Services’ Hospital Compare database were collectively analyzed by the Pridit method. Pridit provides a score from -1 to 1 for each of the measures based on their relative performance amongst all hospitals (the higher the score, the better the performance). A final composite score of -1 to 1 was given to each hospital representing its overall quality. Annual Pridit scores from 2008-2011 were compared in order to assess the stability and predictive abilities of Pridit; these aspects have not been explored previously.

Population Studied: All 4,655 hospitals within the Hospital Compare database in October 2011.

Principal Findings: Overall, the range of hospital quality scores amongst studied hospitals was fairly even, with a slight tendency for hospitals to be worse than average. Across the range of PRIDIT scores, small, independent non-teaching hospitals tended to be at the lower end and larger health systems with some degree of teaching were towards the higher end. Very few hospitals were of extremely high or low quality. Hospitals that saw a larger number of patients or had lower risk adjusted mortality rates tended to receive higher quality scores. Hospitals with higher risk adjusted readmission rates tended to be of higher overall quality. Top performance on HCAHPS variables was negatively associated with quality. When hospital Pridit scores were analyzed over time, it was found that scores remained steady with little variation.

Conclusions: Pridit demonstrates the value in utilizing many types of data to determine the specific drivers of quality. The link between higher readmission rates and higher quality supports prior findings by a small number of other studies in the literature. The negative relationship between HCAHPS and quality scores may imply that the hospitals with characteristics that patients favor may not necessarily reflect overall high quality.

Implications for Policy, Delivery, or Practice: Pridit scores allow for the benchmarking of hospitals to measure overall quality, both at a local and at the national level. Our results suggest that the penalization of hospitals for higher readmissions and the payment of bonuses for high patient satisfaction may not be appropriate. Insurance companies now have Pay-for-Performance programs that collect similar data from hospitals. By applying Pridit, insurance companies could pay for improvements in Pridit scores rather than individual measures, or use Pridit scores to reward high-performing hospitals. Hospitals may also benefit from comparing their Pridit scores from insurance companies and government.
Does Higher Quality Diabetes Care Cost Payers More?

Daniel Crespin, University of Minnesota; Jean Abraham, University of Minnesota; Jeffrey McCullough, University of Minnesota; Jon Christianson, University of Minnesota

Presenter: Daniel Crespin, M.S.P.H., Student/Research Assistant, Health Policy and Management, University of Minnesota, daniel.crespin@gmail.com

Research Objective: Purchasers of diabetes care are making substantial investments to improve the quality of care received by their diabetic populations. While programs such as pay-for-performance and disease management lead to improved care management, relatively little is known about the resultant consequence for medical expenditures. We investigate whether higher quality diabetes care in Minnesota is associated with greater costs to health care payers.

Study Design: We used administrative data from the University of Minnesota’s “UPlan” medical insurance program from 2006 to 2009 to conduct a patient-level and longitudinal multivariate analysis of diabetes-related medical expenditures paid by the university to providers. Medical expenditures were classified into five payment categories: 1) total, 2) ambulatory, 3) prescription drug (Rx), 4) inpatient, and 5) emergency department (ED). To determine the cost of quality to this payer we included three categories of quality measures: 1) outcomes, 2) processes, and 3) patient adherence. We used the clinic-level optimal diabetes care (ODC) score, publicly provided by Minnesota Community Measurement, to measure outcome quality. The ODC incorporates each patient’s HbA1c level, LDL-C level, blood pressure rate, daily aspirin use, and tobacco-free status to provide a composite measures reflecting optimal diabetes care. Utilizing our administrative data we created patient-level process measures corresponding to HEDIS guidelines for HbA1c testing, LDL-C screening, medical attention for nephropathy, and eyes exams. We measured patient adherence by calculating each patient’s medical possession ratio for commonly used diabetes-related prescription drugs including insulin, hypoglycemic agents, and cholesterol reducing medications. In all analyses we controlled for patients’ age, sex, and health status.

Population Studied: We constructed a sample of 1,531 diabetics enrolled in the UPlan at any time between 2006 and 2009. We selected patients of ages 18-75 who met HEDIS diabetic inclusion criteria and who had at least one outpatient visit for diabetes care.

Principal Findings: Outcome quality as measured by the ODC had no effect on total, ambulatory, Rx, inpatient, or ED payments over the 2006-2009 time period. HEDIS process measures were associated with higher ambulatory payments and had no effect on any other category of payment. Greater adherence to hypoglycemic agents was associated with higher Rx payments, while insulin and cholesterol medication adherence had no effect on Rx costs. Patients’ medication adherence had no effect on non-Rx payments.

Conclusions: As expected process measures and patient adherence were associated with great costs in the short- to mid-term, likely through the additional utilization of screening and prescription drugs. Surprisingly, better outcomes came at no additional cost to the payer.

Implications for Policy, Delivery, or Practice: Results from this analysis generate insights into how payers can obtaining higher quality diabetes care for their enrollees while considering possible additional costs. In particular, because outcome quality was not associated with additional medical expenditures, payers may be incentivized to use publicly reported quality, such as the data provided by MNCM, to make decisions regarding provider networks.

Funding Source(s): Other, University of Minnesota

Poster Session and Number: B, #676

Modeling the Cost-effectiveness of Heart Valve Replacement: A Comparative Analysis of Life-Time Complication Rates and Costs Associated with Prosthetic Choice

Steven Culler, Rollins School of Public Health at Emory University

Presenter: Steven Culler, Ph.D., M.A., B.A., Associate Professor, Health Policy and Management, Rollins School of Public Health at Emory University, sculler@sph.emory.edu
**Research Objective:** Increasingly, healthcare cost sensitivity calls for cost-effectiveness examinations comparing treatment strategies. The purpose of this study is to report results of an economic model predicting incremental differences in lifetime healthcare services costs consumed following heart valve surgery by prosthesis type. Patients receiving artificial heart valves have well documented additional lifetime costs. This model examines artificial valve types: Mechanical Valve (MV), Stented Tissue (ST) and the emerging Transcatheter Valve used in replacement surgery. Particularly in younger patients ST valves require a second replacement surgery between 10 and 15 years after initial surgery.

**Study Design:** Key inputs for the economic model were as follows. Estimated complication event rates were obtained from peer reviewed journals and average annual event rates were estimated for each complication separately by prosthesis type. For patients receiving initial ST prosthesis, the model estimated costs for two different types of valve replacement procedures in year 15 (second ST surgery or ST with a transcatheter valve in valve (ViV) approach). Cost estimates for all clinical events modeled were converted into 2012 dollars assuming an average 3% medical care cost inflation. Clinical events modeled included: initial valve surgery; thrombotic events; bleeding events; warfarin and monitoring; echo monitoring; paravalvular leak; endocarditis; pacemaker insertion following valve surgery; re-operation due to structural valve deterioration; and clinical complications following transcatheter procedures.

**Population Studied:** The economic model was developed for the typical 55 year old patient with valve disease requiring valve surgery. In addition, lifetime costs estimated in this model assume all patients survive for 25-year following their initial valve surgery.

**Principal Findings:** Our model estimates 25-year lifetime cumulative healthcare cost for modeled events to be $124,200 using the Lowered INR MV during initial surgery; $183,600 using ST at initial surgery with ST surgical replacement; and $478,048 using ST at initial surgery with ST with ViV replacement procedure. Additionally, our model estimates lower expected annual healthcare costs every year if the Lowered INR MV is used for initial surgery versus either ST approaches. Further, using MV in the initial surgery results in a $59,400 lifetime cost saving compared to using ST with surgical ST replacement and $353,882 compared with ST with ViV procedure for replacement. The model finds the Lowered INR MV approach results in annually larger cost savings after a patient undergoes re-operation due to structural valve disease.

**Conclusions:** This study finds that the choice of prosthesis used in the initial heart value surgery is estimated to result in lifetime healthcare cost savings of at least $59,000 and up to as much as $350,000 for patients surviving 25 years.

**Implications for Policy, Delivery, or Practice:** Our model estimates that changing the choice of initial prosthesis to the Lowered INR type MV in the estimated 20,000 ST valve surgeries performed annually in the U.S. among patients below age 65 would result in approximately $1.2 billion lifetime reduction in direct healthcare expenditures over the next 25 years and the majority of this savings would occur when these patients would be Medicare Beneficiaries.

**Funding Source(s):** Other, On-X Life Technologies, Inc.

**Poster Session and Number:** B, #678

**Leaving It to Chance: The Effects of Random Variation in Shared Savings Arrangements**

Derek DeLia, Rutgers, The State University of New Jersey

**Presenter:** Derek DeLia, Ph.D., Associate Research Professor, Center for State Health Policy, Rutgers, The State University of New Jersey, ddelia@ifh.rutgers.edu

**Research Objective:** Shared savings arrangements are used often in Accountable Care Organizations (ACOs) and Patient Centered Medical Homes (PCMHs) to reward providers who improve the efficiency of care. These arrangements depend heavily on a reliable method for separating true savings (or losses) from random variation in per capita healthcare spending. Because of random variation, savings measurement is plagued by the potential for Type I error (rewarding providers who did not achieve real savings) and Type II error (failing to reward providers who did achieve real savings). To avoid Type I error, many arrangements require providers to achieve a minimum savings rate (MSR) before providers are credited with savings. These MSRs, however, do not account fully for all sources of random variation and often ignore the potential for Type II error. This paper develops rigorous methodologies for assessing and minimizing the probabilities of both types of errors in the context
of shared savings arrangements currently evolving in the public and private sectors.

**Study Design:** The study focuses on the average savings rate (ASR) defined as the percentage reduction in per capita spending relative to a baseline amount, adjusted to reflect expected or targeted spending growth. Using closed form equations and simulations, we calculate the probabilities of Type I and II errors under different savings scenarios and approaches to savings measurement that determine whether the 3 main ASR components (i.e., per capita spending in baseline and performance years, adjustment factor) are random or deterministic. For each approach, we use MSR thresholds that have recently been established by the Medicare Shared Savings Program.

**Population Studied:** Payers and providers contemplating shared savings arrangements.

**Principal Findings:** Across all scenarios examined, the probability of Type I error is greatly reduced with a predetermined (i.e., deterministic) adjustment factor. With only a few exceptions, a predetermined adjustment factor would also generate a smaller Type II error probability. With a predetermined adjustment factor, the probabilities of Type I and II errors would be reduced even further if the correlation of healthcare spending by the same patients over time exceeds 0.5 and this parameter is incorporated into the measured savings formula. If this correlation is less than 0.5, then greater statistical precision is achieved by calculating the ASR conditional on baseline spending, which can be done by measuring the baseline spending amount and making it known with certainty to payers and providers before they execute a shared savings agreement. The probabilities of Type I and II errors are highest when all 3 main ASR components are random and unobservable before the commencement of a shared savings agreement.

**Conclusions:** The design of measured savings formulas has a huge influence on random variation in the ASR, and therefore, the likelihood that true savings performance will be misclassified.

**Implications for Policy, Delivery, or Practice:** The likelihood of misclassification can be minimized by measuring or specifying key variables (e.g., baseline spending, adjustment factor as a predetermined growth target) in advance of executing shared savings arrangements. Minimizing random variation in the ASR is especially important for PCMHs and smaller ACOs where statistical precision cannot be achieved by large patient panels.

**Funding Source(s):** AHRQ

**Poster Session and Number:** B, #679

**Quality Improvement in Acute Care Hospitals: Identifying Exemplary Performers and Learning from their Experiences**

Christian Evensen, American Institutes for Research; Steven A. Garfinkel, Ph.D., American Institutes for Research; Brenna Raines, MHA, American Institutes for Research

**Presenter:** Christian Evensen, M.S., Senior Researcher, Health Policy and Research, American Institutes for Research, cevensen@air.org

**Research Objective:** Categorize hospitals based the quality of care they deliver and use their experiences to inform quality improvement.

**Study Design:** Much emphasis is currently being placed on pay-for-performance in healthcare. Maryland has been implementing a Quality Based Reimbursement (QBR) program since 2009 with acute care hospitals. A good deal of work has been done in measuring various indicators of quality, tracking quality improvement over time, and in trying to determine if adjusting payments based on quality improvement actually has the intended effect. What is less developed is an understanding of how to discover, develop, and implement quality improvement strategies that move quality indicators in the desired direction. We acquired and synthesized individual patient discharge data from acute care hospitals in Maryland. These data include indicators of the occurrence of potentially preventable complications over 12 quarters for discharges that took place from 2009 to 2011. A cluster analysis on a subset of these measures was used to examine the patterns of scores across selected measures. This approach identifies a set of hospital ‘types’ that vary by these quality measures. Further analyses on these groupings of hospitals were used to establish profiles for each cluster based on hospital size and revenue, demographic and insurance characteristics of their patient populations, teaching status, and other hospital characteristics.

**Population Studied:** Patient discharges from 46 acute care hospitals from 2009 to 2011.

**Principal Findings:** Cluster analysis on 47 complications revealed six distinct clusters that
explain over 50 percent of the variance in a subset of 15 complications. One group of 11 hospitals consistently shows lower than average complication rates; a second cluster of 24 hospitals have average complication rates. The remaining 4 clusters have higher than average rates for most complications examined, but still show distinct patterns of performance. Compared to the average hospital, the top performing cluster was smaller and had patient populations with a higher percentage of non-whites, a lower percentage of males, shorter stays, more admissions to the medical line of service and fewer to the surgical line, and a lower severity-of-illness. The lower performing hospitals tended to be bigger, have patients with longer stays, and tended to have more male patients. The results with respect race, payer, and age were mixed. The low performers had a higher percentage of surgical patients and fewer medical patients.

**Conclusions:** Cluster analysis can be used to identify exemplary hospitals using existing quality indicators. In depth study of the culture and practices of high performing hospitals may be a valuable tool for quality improvement.

**Implications for Policy, Delivery, or Practice:** The analysis will be replicated with patient experience and clinical process measures. Pending those results, a next step is to interview hospital staff at both high and low performing hospitals to identify strategies used by those hospitals to improve and maintain quality, to help identify barriers to quality improvement. This information could potentially be used to inform a toolkit for quality improvement. This research will provide valuable concrete empirical data about quality improvement strategies, opportunities, and barriers that can inform hospitals across the country.

**Funding Source(s):** RWJF

**Poster Session and Number:** B, #680

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**Oncology Nursing Society Develops Evidence-Based, Patient-Centered Breast Cancer Chemotherapy and Survivorship Quality Measures**

Kristen Fessele, Oncology Nursing Society; Susan Yendro, RN, BSN, The Joint Commission Department of Quality Measurement; Gail Mallory, PhD, RN, NEA-BC, Oncology Nursing Society

**Presenter:** Kristen Fessele, MSN, RN, AOCN, Research Associate, Research Department, Oncology Nursing Society, kfessele@gmail.com

**Research Objective:** Quality measures (QM) focused on areas illustrating high-quality cancer care valued by nurses and patients are needed to complement existing national benchmarking measures in the ambulatory oncology setting. The Oncology Nursing Society (ONS) developed and tested a reproducible process for performing validity and reliability pilot testing on two sets of evidence-based QM in the breast cancer population, drawing on evidence from ONS Putting Evidence into Practice (PEP), Institute of Medicine (IOM) recommendations and other resources.

**Study Design:** The ONS Foundation supported teams of expert nurses to review evidence, draft and prioritize topic areas for potential QM. Final QM were selected after soliciting national public comment from stakeholders, and were judged on importance to clinical care, prevalence and potential for impact, scientific basis and link between process and outcome. Two measure sets were drafted: The Breast Cancer Care (BCC) QM set, tested in 2010, focused on symptom management for patients receiving intravenous chemotherapy. The Breast Cancer Survivorship (BCS) set, tested in 2012 evaluates the consistency of provision of education and clinical follow-up needs in the first year post-treatment. The Joint Commission (TJC) was contracted to conduct testing, and 40 pilot sites per measure set were recruited with diverse geographic and practice type characteristics to perform retrospective data abstraction on patient charts. TJC and ONS staff co-managed development of QM specifications, abstractor training, clinical and technical support of pilot sites, and re-abstracted 20 percent of submitted cases for reliability testing.

**Population Studied:** Diversity of characteristics among pilot sites was deliberately sought to ensure that the QM perform reliably in a variety of practice settings. BCC set patient case population were diagnosed with stage I through IV breast cancer, with an intravenous chemotherapy regimen start date between January and June 2009. Data was abstracted from all chemotherapy cycles within a six month observation period. BCS set population were diagnosed with stage 0 through III breast cancer with completion of single or multimodal adjuvant or neoadjuvant treatment plan between January 1, 2010 and December 31, 2010. The observation period from which data elements were abstracted was the 12 month post-treatment period.
**Principal Findings:** There are clear opportunities to improve the consistency of symptom assessment and management. Less than one third of patients received recommended assessments on all cycles/recommended post-treatment time points, or had interventions documented for clinically significant symptoms. Receipt of recommended post-treatment education and engagement in patient-centered health related goal setting were similarly low.

**Conclusions:** Audit and feedback to practices using valid and reliable QM provide a strategy to link high-level evidence-based interventions and practice changes to improve quality cancer care. National testing across diverse practice sites illustrates a strong need to improve the consistency of symptom assessment/management and post-treatment survivorship interventions.

**Implications for Policy, Delivery, or Practice:** Symptom intensity, trajectory over time, success/failure of interventions are frequently undocumented, impacting coordination of care. Post-treatment/transition to survivorship education and resource provision as recommended by the IOM are lacking.

**Funding Source(s):** Other, National Philanthropic Trust Breast Cancer Fund

**Poster Session and Number:** B, #681

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**Emergency Department Crowding and Short-Term Outcomes Following Discharge**

Gelareh Gabayan, West Los Angeles VA and UCLA; Stephen F. Derose, Kaiser Permanente Southern California; Benjamin C. Sun, Oregon Health and Science University

**Presenter:** Gelareh Gabayan, M.D., M.S.H.S., Assistant Professor, Medicine, West Los Angeles VA and UCLA, gelareh@gabayan.com

**Research Objective:** Although Medicare will soon begin reporting Emergency Department (ED) length-of-stay (LOS), the impact of ED crowding is unclear. We hypothesized that a set of system and visit level measures of ED crowding are associated with bounce-back admission within 7 days of ED discharge.

**Study Design:** We conducted a retrospective cohort study using data from a regional integrated health system, Kaiser Permanente Southern California (KPSC) for years 2008-2010. We assessed system and visit level measures of ED crowding. System level metrics included exposures to ED occupancy, boarding time, and external length-of-stay. Visit metrics included waiting and evaluation time, as well as total LOS experienced by an index visitor. Covariates included demographic characteristics, comorbidities, Emergency Severity Index level, vital signs, ED discharge diagnosis, time variables, and ED site. For each crowding measure we fit multivariable logistic regression models using linear and non-linear terms for ED crowding measures.

**Population Studied:** KPSC members age 18 and over were eligible for the study. We excluded visits by non-members, transfers to and from other hospitals, visits to non-KPSC hospitals, and placement in observation status.

**Principal Findings:** The study cohort contained a total of 625,096 ED visits among 625,096 patients. The unit of analysis was an ED visit. There were 16,957 (2.7%) patients with a 7-day bounce-back admission. Compared to a median evaluation time of 2.2 hrs, an evaluation time of 10.8 hrs was associated with a relative risk of 3.9 (95% CI 3.7-4.1) of getting admitted. Compared with a median ED LOS of 2.8 hrs, an ED LOS of 11.6 hrs, was associated with a relative risk of 3.5 (95% CI 3.3-3.7) of getting admitted. None of the other ED measures were associated with the outcome.

**Conclusions:** Our study is the first to measure and compare a number of system-level and visit-level metrics of ED crowding and their association with outcomes following ED discharge. We found evaluation time and ED Length of Stay to be associated with increased 7 day bounce-back admissions. This suggests that the clinically complicated patients who require a lengthy management bounce-back as a result of their disease severity.

**Implications for Policy, Delivery, or Practice:** Our findings suggest that the Medicare measure of ED Length of Stay in discharged patients is confounded by illness severity and is an unreliable measure of ED quality.

**Funding Source(s):** AHRQ

**Poster Session and Number:** B, #682

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**Using Computerized Extracts from Electronic Health Records to Measure the Quality of Adolescent Well-Care**

William Gardner, Ohio State University; Suzanne Morton, National Committee for Quality Assurance; Sepheen Byron, National Committee for Quality Assurance; Aldo Tinoco, MD, National Committee for Quality Assurance; Benjamin Canan, Nationwide Children's Hospital; Karen Leonhart, Nationwide Children's
The implementation of structured fields varied by site, from 55 percent to 83 percent of data elements (p < .001). Seventy-eight percent of data elements were captured as structured fields for immunizations, compared to 72 percent for screening, and 65 percent for risky-behavior assessments. Across all sites, performance of quality measures measured via computerized EHR data extraction was 27 percent, compared to 53 percent for manual data. Manual performance measures were greater than or equal to computerized measures for every measure at every site, and these differences were statistically significant for 26 of 36 possible measure x site comparisons. The overall agreement between manual and computerized results was kappa = 0.36 (95 percent CI = [0.34, 0.38]). Agreement varied by site from kappa = 0.54 (CI = [0.50, 0.58]) to 0.29 (CI = [0.26, 0.32]. Agreement for the immunization measures was 0.90 (CI = [0.87, 0.93]); for screening it was 0.57 (CI = [0.51, 0.62]); and for risky behavior assessments it was 0.34 (CI = [0.31, 0.36]). Agreement was highest at the site with the greatest proportion of data elements in structured fields.

Conclusions: Agreement between performance rates based on manual and computerized extracts is variable, with many computerized measures indicating substantially lower quality of care. Disagreements were smallest at the site with the greatest number of data elements in structured fields and for immunization measures, which are straightforward to record and are long-established quality targets.

Implications for Policy, Delivery, or Practice: The accuracy of quality reporting through computerized EHR extraction depends on the presence and use of structured data fields. We should increase structured documentation of care, data extraction, and adaptation to practice workflow before computer-extracted quality data can be considered reliable for judging performance.

Funding Source(s): AHRQ
Poster Session and Number: B, #683

Do Ratings of Internists Gathered Through Internet Searches Predict the Quality of Care They Deliver to Patients with Diabetes or Hypertension?
Bradley Gray, American Board of Internal Medicine; Jonathan L. Vandergrift, American Board of Internal Medicine; Guodong (Gordon) Gao, University of Maryland; Jeffrey McCullough, University of Minnesota; Rebecca S. Lipner, American Board of Internal Medicine

Presenter: Bradley Gray, Ph.D., Health Services Researcher, Department of Psychometrics, American Board of Internal Medicine, bgray@abim.org

Research Objective: Considering the growing use of the internet to obtain information about physicians, consumers should understand whether internet ratings of physicians by patients relate to physician quality. Our objective is to address this need.
Methodology
We estimated the relationship between internists' PIM-QMs and having any website rating using a probit regression. PIM based physician QMs were evaluated as dependent variables using binomial-regression (with a Logit link) where a website mean rating was the explanatory variable controlling for sub-specialization, PIM type, website and accounting for physicians being rated on multiple websites.

Principal Findings:
Physicians with a greater share of patients rating them highly on either patient satisfaction PIM-QM were more likely to be rated on the internet (p-stat<.01). No chart based QM predicted having a rating (p-stat>.24).
Among physicians rated on the internet, we found a bottom score predicted a statistically significant 5.3% decrease in share of patients with LDL controlled (p-stat<.05). No other association between website-rating measures and PIM-QMs were statistically significant (p>.05).

Study Design: Physician quality measures (QMs) were drawn primarily from patient charts for 1,042 internists who completed a diabetes or hypertension practice improvement module (PIM). Completing a PIM is part of the American Board of Internal Medicine’s maintenance of certification process. PIM-QMs mirror measures applied by CMS and NCQA. PIM completion included abstracting 25 charts and collecting 25 patient survey responses for patients with the applicable chronic condition. We constructed a composite, heavily weighted by chart based QMs, using an expert panel's assessment of the relative value of the PIM-QMs. Individual PIM-QMs applicable to both patient cohorts from charts included: share of patients with blood pressure/LDL controlled and providing smoking cessation advice. Patient survey PIM-QMs included patient assessment of care quality/physician self-care support as very good or excellent.
To mimic typical consumer searches, we entered each internist's name and location into a Google search and extracted ratings from the first two websites on the search list. Searches captured 1,007 ratings for 599 internists(57% of our sample). We limited our analysis to the first two websites: Healthgrades(n=465), Ucomparehealthcare(n=192), Vitals(n=243), Avvo(n=56), and Wellness(n=51). Websites had about 6 patient reviews per physician. We normalized website-ratings by dividing each website-rating by that website’s maximum possible score. A mean web-rating of 2 out of 5 stars yields a normalized rating of 40%. We categorized a website-rating as top score if the normalized website-rating was >=80% (59% of website-ratings) and bottom score <=40% (12% of website-ratings).

Population Studied: Internists who complete a diabetes or hypertension PIM between 08/01/2011 and 11/12/2012.

Principal Findings: Physicians with a greater share of patients rating them highly on either patient satisfaction PIM-QM were more likely to be rated on the internet (p-stat<.01). No chart based QM predicted having a rating (p-stat>.24).
Among physicians rated on the internet, we found a bottom score predicted a statistically significant 5.3% decrease in share of patients with LDL controlled (p-stat<.05). No other association between website-rating measures and PIM-QMs were statistically significant (p>.05).

Conclusions: Our analysis indicates that patients with diabetes or hypertension would obtain limited information from internet searches regarding which physicians to avoid (only bottom website-rating predicted patient share with LDL control) but not whom to choose (normalized website rating or having a top website-rating was not associated with any PIM-QM and only 6 raters per website).

Implications for Policy, Delivery, or Practice: Information currently available from the internet has limited effectiveness in informing consumers of physician quality. Considering the use of the internet by consumers, more rigorously drawn patient surveys need to be made accessible to the public.

Funding Source(s): No Funding

Poster Session and Number: B, #684Quality of Care Results from Performance Year 1 of the Medicare Physician Group Practice Transition Demonstration
Sherry Grund, Telligen; Musetta Y. Leung, RTI International; Olivia Berzin, BA, RTI International

Presenter: Sherry Grund, R.N., Director, Special Projects, Telligen, SGrund@telligen.org

Research Objective: To measure and compare quality performance among participating physician groups in their care of Medicare beneficiaries.

Study Design: The Physician Group Practice Transition Demonstration (PGPTD) is a two-year
extension of the original Medicare value-based purchasing initiative that measures the quality and efficiency of care for ten large PGPs. It uses both Medicare claims and clinical record data to evaluate PGP performance on quality indicators in nine areas. The condition modules included measures from the original demonstration – in diabetes (DM), heart failure (HF), coronary artery disease (CAD), hypertension (HTN), and preventive care (PREV) – as well as additional measures based on CMS priority areas, such as chronic obstructive pulmonary disease, frail elderly, care coordination, and the Health Information Technology Meaningful Use program. For the 22 measures carried over from the original demonstration, performance targets were derived from the last year of data collected. The remaining 19 measures were pay for reporting (P4R) only in PY1 of the PGPTD. Performance rates within the modules were averaged to yield a module score, which was then weighted and summed across the modules to yield one single quality score for each PGP.

Population Studied: For each module, Medicare fee-for-service beneficiaries assigned to the ten PGPs were included if they had two or more evaluation and management visits to the PGP, and met topic-specific criteria. A random sample of 615 eligible beneficiaries was drawn for each of the 9 modules, so that PGPs could abstract medical record information into a clinical data collection tool for further performance evaluation.

Principal Findings: Performance Year One (PY1) captured care provided between January 1 and December 31, 2011. Between the mix of P4R and pay-for-performance (P4P) measures, all PGPs attained a quality score above 90 percent. Of the 22 measures that were P4P in PY1, the PGPs performed above 80 percent on average for 13 measures (e.g., all HF measures). In fact, there were two measures where all PGPs met or exceeded the benchmark threshold, and 9 measures where at least five PGPs met or exceeded the target. However, a number of measures continue to be challenging or have lower than expected performance across all sites, including blood pressure control in HTN (72 percent), LDL-C control in DM (65 percent), and the PREV measures (71 to 81 percent).

Conclusions: PGPs performed well on the majority of P4P metrics used to evaluate the quality of care provided to Medicare beneficiaries with chronic conditions. Nevertheless, there is room for improvement in patient care within each PGP, especially in preventive care, as well as keeping blood pressure or cholesterol levels within recommended guidelines.

Implications for Policy, Delivery, or Practice: Quality of care measurement and reporting allows physician practices to evaluate their patterns of care for patients with chronic conditions, improve care delivery, and track improvements over time. Paying for increased quality of care may provide additional resources or incentives for physician groups or accountable care organizations to implement interventions to improve care.

Funding Source(s): CMS
Poster Session and Number: B, #685

Perhaps Less Bad Alternatives to Diagnosis-based Denominators for Addiction Treatment Quality Measures

Alex Harris, VA Palo Alto Health Care System - Stanford School of Medicine; Katherine J. Hoggatt, Veteran Affairs Greater Los Angeles Health Care System

Presenter: Alex Harris, Associate Director, Program Evaluation and Resource Center, Center for Health Care Evaluation (MPD:152), VA Palo Alto Health Care System - Stanford School of Medicine, alexander.harris2@va.gov

Research Objective: Process quality measures are usually formulated as a ratio of the number of patients who receive some type of care divided by the number of patients likely to benefit, usually defined by particular diagnoses. Because diagnosing patterns vary widely, many process measures of treatment quality are sensitive to case finding/identification effort. Some health care facilities only diagnose patients who are interested or involved in treatment. Other facilities have active programs of screening that identify broader groups of patients with particular disorders, only some of whom are interested in treatment. Such differences in case finding and identification effort dramatically affect the calculation of quality measures and seriously impact the subsequent validity of cross-facility comparisons. The objective of this study was to examine the impact of alternative denominators on measured performance.

Study Design: To demonstrate the impact of case identification in quality measure performance, three versions of several addiction treatment quality measures were calculated: 1)
the usual method including a denominator with all substance use disorder (SUD) diagnosed patients, 2) an alternative “population-based” denominator including the entire facility census (all patient with and without SUD), and 3) an epidemiologically derived estimate of the expected prevalence of SUD based on case mix characteristics and geographic region.

Differences in facility percentile rank under the three specifications were calculated and compared.

**Population Studied:** Patients and facilities of the US Veterans Health Administration

**Principal Findings:** The percentile rank of many facilities shifted dramatically. For example, for a quality measure of medication treatment for alcohol dependence, the mean difference in percentile rank was zero and half of the facilities shifted percentile rank less than 6 percent. However the other half of facilities changed percentile rank between 7 and 33%.

**Conclusions:** These results imply that much of the observed between-facility differences in performance on denominator-based metrics may be sensitive to diagnosing patterns or case finding efforts. Choosing between these imperfect choices is not simple and may be of greater consequence in clinical areas where diagnosing patterns are more discretionary, stigmatized and variable.

**Implications for Policy, Delivery, or Practice:**

Quality managers and other stakeholders must decide if the validity threats introduced by diagnosing patterns are greater or less than the validity threats introduced with the population-based denominator or the epidemiological approach described here.

**Funding Source(s):** VA

**Poster Session and Number:** B, #686

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**Research Objective:** The VA Offices of Mental Health Services (OMHS) and Mental Health Operations very recently operationalized a suite of 18 quality metrics to monitor substance use disorder (SUD)-related elements of the VA Uniform Mental Health Services Handbook. A second source of 18 newly proposed and high-profile metrics are those that were developed and used in the congressionally-mandated, VA Office of Policy and Planning commissioned RAND/Altarum evaluation of VA mental health services. Third, the Washington Circle, a policy group that develops and disseminates addiction-related quality measures, has recently formulated 5 new measures that await further validation. Our primary aim is to evaluate the predictive validity of these new process quality measures by determining the extent to which they are associated with outcomes.

**Study Design:** The predictive validity of the process measure were evaluated in four samples of patients with SUD for which the quality measures could be calculated and for whom we had pre-existing outcome survey data (e.g., pre and post-treatment symptom improvement data) and/or administrative outcome data (e.g., readmissions, ER utilization, number of detoxification episodes, etc). Propensity score weighted, mixed effect regression was used to account for pre-index imbalances between patients who did and did not meet the measure criteria and clustering of patients within facilities.

**Population Studied:** Patients and facilities of the Veterans Health Administration

**Principal Findings:** Several of the quality measures had consistent associations to diverse outcomes across the samples. For example, patient who received at least one week of intensive SUD treatment, defined as 9 hours of treatment contact, had more improvement in alcohol and drug outcomes and 2-year mortality compared to patients not receiving intensive treatment. The number of weeks of intensive treatment was not linearly related to outcomes. Several measures, such as receiving an outpatient SUD visit within 14 days of discharge from a residential addiction program, had less reliable or weaker associations to various outcomes across samples. Other measures had no observable link to outcomes.

**Conclusions:** Some of the newly developed and implemented measures of addiction treatment quality have consistent links to diverse outcomes across different samples. However, other measures appear to lack predictive validity.
Implications for Policy, Delivery, or Practice: Enthusiasm for quality measures often has led to their being formulated and implemented without careful empirical validation. Implementing quality measures without sufficient validation exposes all stakeholders to many risks, including promoting poor or incomplete care, diverting effort and attention from potentially more important activities, and creating skepticism and ill will toward the entire quality management enterprise. These results can be used by diverse stakeholders to focus attention on the measures and underlying processes that are most tightly linked to outcomes.

Funding Source(s): VA
Poster Session and Number: B, #687

Procedure Related Readmissions Following Cataract Surgery
Tina Hernandez-Boussard, Stanford University; Suzanne Pershing, Stanford University; Doug Morrison, Stanford University

Research Objective: An important area in patient safety is understanding and preventing readmissions. A large number of surgical procedures are now performed in the outpatient setting and ambulatory surgery has increased over 200% in the past decade. Ophthalmology dominates ASC, in particular cataract surgery—with approximately 2 million procedures performed annually. Our objective was to determine the overall and complication-related readmission rates within 7 and 30 days after cataract ambulatory surgery.

Study Design: We used the Agency of Healthcare Research and Quality (AHRQ) statewide ambulatory, inpatient, and emergency department datasets for California, Florida, and New York between 2008-2010, which allow longitudinal follow-up. Statistical models identified predictors for 7-day, and 30-day unexpected hospitalizations, controlling for different patient and facility characteristics. Population Studied: Adult patients receiving a cataract procedures were identified in state ambulatory setting databases using ICD-9 and CPT codes: CPT: 66984, CPT: 66982, and ICD-9-CM: 13*. Thirty-day readmissions were identified in the inpatient, emergency department, and ambulatory setting.

Principal Findings: A total of 904,330 cataract surgeries were identified in adults. All-cause readmissions were low: 7-day 1.62% and 30-day 6.10%, Complication-related readmissions for 7-day were 0.42% and 1.08% for 30-day. Cataract fragments after surgery, obscured vision, and lens prosthesis malfunction were the most common reasons for readmission and represented 49.45% of procedure-related readmissions. Univariate analyses of procedure-related 7-day readmissions indicated a greater proportion of readmissions occurred in males vs. females (1.24% vs. 0.97%, p<.0001), Blacks and Hispanics vs. Whites (1.49%, 1.24% vs. 1.12%, p<.01), and in patients with Medicare and Medicaid payers vs. private (1.10%, 1.27%, vs. 1.06%, p<.01). Multivariate analyses were generated to identify predictors of readmission. The strongest predictors for 7-day procedure-related readmissions were: Black race vs. white (odds ratio [OR]: 1.397, 95% Confidence Interval [CI]: 1.212-1.564) and gender, Male vs. female (OR: 1.319, CI: 1.233-1.402). Patients self paying had the greatest reduction in odds of readmission compared to Medicare payer (OR: 0.7304, CI: 0.636-0.8624) followed by private payers (OR: 0.9159, CI: 0.8013-0.9456).

Conclusions: These data are the first to our knowledge to assess quality in cataract surgeries, a common surgery dominating ambulatory centers, at a population level. The rate of procedure-related complications affected 1.08% of patients receiving cataract surgery, supporting the view that these surgeries are safe. However, our data suggest that disparities exist in the quality of care received, with racial and payer differences as strong predictors of readmissions. Due to the volume of these procedures, further research is warranted to better understand these events and identify areas where quality improvement efforts can be focused.

Implications for Policy, Delivery, or Practice: Our findings provide evidence that ambulatory cataract surgery is safe, with approximately 1% 30-day procedure specific readmission rate. Our data also suggest that disparities exist in
readmission rates, including race and payer. Further investigations into these disparities will help close the quality in care gap.

**Funding Source(s):** Other

**Poster Session and Number:** B, #688

**Relationship of Hospital Volume to Risk-Standardized Readmission Rate**
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**Presenter:** Leora Horwitz, MD, MHS, Assistant Professor of Internal Medicine, General Internal Medicine, Yale School of Medicine, leora.horwitz@yale.edu

**Research Objective:** Extensive literature has demonstrated a positive association of hospital or operator volume with patient outcomes. Large volume hospitals have lower rates of complication and death following surgical procedures, and lower mortality from certain medical conditions. We examined whether there is a similar relationship to patient readmission.

**Study Design:** We used the National Quality Forum-endorsed hospital-wide readmission measure to calculate all-condition unplanned risk-standardized readmission rates (RSRRs) for all hospitals. The RSRR is a composite score of standardized readmission ratios (SRRs) for five mutually exclusive specialty cohorts: surgery/gynecology, cardiorespiratory, cardiovascular, neurology and medicine. We calculated RSRR and the five SRRs for each hospital, adjusted for age, principal diagnosis and comorbidity. An SRR greater than 1 indicates having a greater than expected readmission rate. For the all-condition analysis, we classified hospitals into six strata based on number and percentile of index discharges: less than 25 discharges, 25 discharges-25th percentile, 25-50th, 50-75th, 75-90th and 90-100th. For specialty cohort analysis, we used five volume strata: less than 25 cases, 25 cases-50th, 50-75th, 75-90th and 90-100th. We compared RSRRs and SRRs across the corresponding strata.

**Population Studied:** All Medicare fee for service patients over 65 hospitalized in 2010 who were discharged alive, not against medical advice, and not transferred out. We excluded patients admitted for medical treatment of cancer or primary psychiatric disease.

**Principal Findings:** We included 7,678,216 discharges from 4,821 hospitals. Overall, RSRR increased monotonically with hospital volume. In the smallest volume hospital group with at least 25 discharges (N=1,073, median 127 discharges), the mean RSRR was 16.12 and 39.0% of hospitals had SRR greater than 1. In the group with the largest volume (N=482, median 5,782), the mean RSRR was 16.34 and 50.6% of hospitals had SRR greater than 1. Within specialty cohorts, the positive relationship between hospital volume and readmission rates held for cardiorespiratory, neurology and medicine patients. However, the surgery/gynecology cohort showed no relationship and the cardiovascular cohort showed an inverse relationship. The largest difference between volume strata in specialty cohorts was in the cardiorespiratory cohort, where the mean SRR in the smallest volume group with at least 25 discharges (N=1,185) was 0.99 and 39.5% of hospitals had SRR greater than 1. The mean SRR in the largest volume group (N=200) was 1.02 and 57.1% of hospitals had SRR greater than 1. By contrast, in the cardiovascular cohort, the mean SRR for hospitals in the smallest volume group with at least 25 discharges (N=943) was 1.00 and 51.5% of hospitals had SRR greater than 1. In the largest volume group (N=456), the mean SRR was 0.98 and 43.4% of hospitals had SRR greater than 1.

**Conclusions:** In contrast to findings for other outcomes, higher volume hospitals have slightly worse overall risk-adjusted unplanned readmission rates than lower volume hospitals. This relationship is modest and not consistent across all specialty cohorts.

**Implications for Policy, Delivery, or Practice:** High quality transitional care may be more difficult to achieve in high volume institutions, resulting in higher readmission rates. Other factors may also play a role, such as geographic distance, propensity to admit, or access to outpatient clinical care.
**Using Medicare Claims to Identify Mammography Facilities Performing Below Guideline Targets**

Rebecca Hubbard, Group Health Research Institute; Joshua J Fenton, Department of Family & Community Medicine and Center for Healthcare Policy and Research University of California, Davis; Weiwei Zhu, Group Health Research Institute; Tracy Onega, Department of Community and Family Medicine, Norris Cotton Cancer Center, Dartmouth Medical School; Rebecca Smith-Bindman, Departments of Radiology, Epidemiology/Biostatistics, and Obstetrics, Gynecology, and Reproductive Medicine, University of California San Francisco; Rhondee Benjamin-Johnson, The Lewin Group

**Research Objective:** Twice as many U.S. women are recalled for further testing after screening mammography as in European programs, although breast cancer detection rates are equivalent. Meanwhile, observed variability in screening mammography interpretation in the U.S. has prompted calls for performance benchmarking at the mammography facility level with targeted quality improvement for outlying facilities. Our objective was to develop and validate Medicare claims-based measures for screening mammography recall and cancer detection rates and to evaluate their performance in accurate identification of facilities with outlying recall or cancer detection rates.

**Study Design:** Our design combined: 1) validation analyses of performance measures based on Medicare mammography claims compared to gold-standard measures from linked Breast Cancer Surveillance Consortium (BCSC) data; and 2) subsequent statistical simulations to evaluate the performance of claims-based facility classification across a range of facility volumes. Claims-based algorithms were derived using classification and regression tree analyses and validated using reference standards based on BCSC mammography interpretation and breast cancer incidence data. We used statistical simulations to generate a sample of 1000 facilities and evaluated the ability of the claims-based algorithms to identify facilities with exceedingly high recall rates (>12%) or low cancer detection rates (<2 breast cancers per 1000 screening mammograms).

**Population Studied:** Female fee-for-service Medicare enrollees age 66 years and older who underwent screening mammography from 1999 to 2005 in BCSC registries in four states (N=391,204 mammograms from 151,808 women).

**Principal Findings:** An algorithm based on claims with procedure codes for diagnostic breast imaging and diagnosis codes for breast signs or symptoms, abnormal mammography, or breast cancer identified abnormal mammography interpretation (recalls) with sensitivity of 82.6% (95% CI, 82.0-83.2) and specificity of 96.7% (95% CI, 96.6-96.8). Using diagnostic or procedural codes for breast cancer diagnoses, breast surgeries, and diagnostic mammograms, we identified screen-detected breast cancers with sensitivity of 93.3% (95% CI, 91.5-95.2) and specificity of 99.9% (95% CI: 99.9-99.9). Simulations revealed that the recall algorithm would identify 96% of facilities that truly exceeded the 12% recall rate threshold. Despite algorithm sensitivity of 82.6% and specificity of 99.9%, the cancer detection algorithm was unable to correctly identify any of the facilities with true cancer detection rates below 2 per 1000 mammograms.

**Conclusions:** Claims-based algorithms have the potential to identify facilities with recall rates lying outside guideline thresholds, but could not identify facilities with low breast cancer detection rates. For a rare outcome such as breast cancer, even slightly imperfect specificity leads to erroneous inflation of cancer detection rates and poor classification accuracy.

**Implications for Policy, Delivery, or Practice:** Medicare claims are a promising source for evaluating mammography facility recall rates but are unlikely to be useful for assessing breast cancer detection rates. Claims-based approaches to estimation of facility quality measures must be validated and carefully assessed for classification accuracy before being considered for use in targeted quality improvement.

**Funding Source(s):** NIH

**Impacts of Nurse Staffing on Quality in Rural Nursing Homes**

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**Presenter:** Peiyin Hung, MSPH, Ph.D. Candidate, Division of Health Policy and Management, University of Minnesota, Minneapolis, Minnesota, hungx068@umn.edu

**Research Objective:** To evaluate how staffing levels, as mediated by hospital ownership, impact quality in rural nursing home settings

**Study Design:** This study used two sets of quality indicators to examine how staffing levels relate to quality in hospital-based and freestanding rural nursing homes. The first sets of quality indicators were long-stay measures (activities of daily living, moderate to severe pain, pressure sores, physical restraint use, catheter inserted/left in the bladder, mobility decline, and urinary tract infection), short-stay measures (moderate to severe pain and pressure sores), and composite long-stay and short-stay measures. For these outcomes, we used ordinary least squares models to examine the relationships between nurse staffing levels and each quality measure for hospital-based and freestanding facilities. An additional set of quality indicators included facility-level deficiencies (based on annual inspection surveys and complaint investigations)-total and categorized by the level of harm. For these indicators, we used negative binomial count data models. Covariates included facility characteristics, residents’ acuity, and state fixed effects. Separate models were used to examine the differences in quality indicators by nurse staffing between hospital-based and freestanding rural nursing homes.

**Population Studied:** This study included 485 hospital-based and 4,340 freestanding rural nursing homes nationwide in 2011. Staffing characteristics and quality indicators came from the 2011 Nursing Home Compare data. The average Resource Utilization Group Nursing Case Mix Index for all residents admitted to a facility was obtained from the Minimum Data Set.

**Principal Findings:** Relationships between staffing and quality in rural nursing homes were mixed. Among freestanding nursing homes, nurse staffing levels were associated with lower process and outcome scores. Freestanding nursing homes with an additional registered nurse (RN) hour per resident day had 0.73 and 0.95 more moderate to severe pain rates and urinary tract infection rates, respectively. However, higher nurse staffing was associated with approximately 4 fewer deficiencies in freestanding facilities. In rural hospital-based nursing homes, RN staffing consistently served as a positive factor on deficiency reductions and reduced the number of residents who needed help with daily activities. RN staffing levels in rural hospital-based facilities had more optimal impacts on quality than in freestanding ones.

**Conclusions:** Staffing and quality relationships vary depending on the quality measures investigated. Registered nurse staffing did not show a consistently positive contribution to the quality of care in rural nursing homes. However, deficiencies were reduced when nurse staffing was increased in both rural hospital-based and freestanding nursing homes.

**Implications for Policy, Delivery, or Practice:** Health care reform has increased attention on potential ways to identify and reward high performing nursing homes. These mixed results suggest that much additional work is necessary before quality indicators can be used in pay for performance systems in rural nursing home settings.

**Funding Source(s):** HRSA, Office of Rural Health Policy

**Policy Session and Number:** B, #691

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**Policy and Measurement Considerations for Reducing Early Elective Deliveries Prior to 39 weeks**

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**Presenter:** Reside Jacob, Sc.M., Research Specialist, Center for Health Systems Effectiveness, Oregon Health & Science University, jacobl@ohsu.edu

**Research Objective:** Elective term delivery prior to 39 completed weeks of gestation is a
priority area in healthcare, since infants born before 39 weeks of gestation experience an increased risk of negative outcomes. The March of Dimes recently launched a campaign to reduce the incidence of elective inductions of labor, especially those before 39 weeks gestation. The objectives of the study were to 1) compare rates of elective deliveries using different metrics and 2) test whether rates of elective deliveries changed following a hard-stop policy implemented region-wide in November, 2011.

**Study Design:** We performed a retrospective cohort study of all births at a single academic medical center between June 16, 2009 and July 17, 2012. All data come from the electronic health record. We identified patients who had elective inductions or cesareans using ICD-9 procedural codes in the electronic medical record. Patients were considered to have an elective delivery if they received an induced or cesarean delivery but did not have an indication for delivery defined by the Joint Commission’s list of indications justifying elective delivery prior to 39 weeks of gestation. The rates of elective induction and cesarean deliveries at 37 and 38 weeks were calculated using two methods: (1) the Joint Commission method, where the denominator is all births 37-38 completed weeks without medical indications for labor; and (2) a modified denominator, where the denominator is all births between 37 and 42 weeks without a medical indication for labor, reflecting all births at risk for elective induction at 37 and 38 weeks. Next, we compared rates of elective delivery before and after the hard-stop policy to measure the effectiveness of the regional policy change on reducing rates of elective deliveries.

**Population Studied:** We determined the rate of elective induction and elective cesareans among 7,072 women who gave birth between June 16, 2009 and July 17, 2012 at a single academic medical center in Oregon.

**Principal Findings:** Using the Joint Commission definition, the rate of elective inductions at 37-38 weeks was 3.7%, and the rate of elective cesarean deliveries was 8.6%. Using the modified denominator, the rate of elective induction was 0.3% and the rate of elective cesareans before 39 weeks (0.9% to 0.3%, p < 0.05) and elective cesareans before 39 weeks (1.6% to 0.7%, p < 0.05), using the modified denominator method. There was not a statistically significant association when using the Joint Commission method, with estimates of (7.4 to 3.7%, p = 0.22) for elective induction and (13.3 to 8.6%, p = 0.25) for elective cesareans.

**Conclusions:** The standard Joint Commission method of measuring elective induction and elective cesarean generated higher rates than the modified method. The modified method captured the true at-risk population, taking into account women who were at risk for elective delivery at 37-38 weeks but went on to deliver at a later week. At this academic medical institution, the hard-stop policy was associated with a decrease in elective induction and elective cesarean rate.

**Implications for Policy, Delivery, or Practice:** This study has two important implications. First, our modified denominator, which reflects clinical practice and takes into account all susceptible individuals in a population, yields a substantially lower rate of elective inductions and cesareans when compared to the standard Joint Commission method. Second, the widely publicized March of Dimes initiative appears to have been partially successful in reducing elective inductions and cesareans before 39 weeks.

**Funding Source(s):** Other, OHSU Healthcare

**Poster Session and Number:** B, #692

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**Dangerous Mismatch: A Comparison of National Healthcare Expenditure Values Used to Implement and Assess Cost-Cutting Reforms**

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**Presenter:** Kari Jones, Ph.D., Health Economist, Lehigh Valley Health Network, kjones@qhr-econ.com

**Research Objective:** Multiple data sources are used to both assess and affect U.S. health care costs. Health Affairs’ annual health care spending projections use Centers for Medicare and Medicaid Services’ (CMS) National Health Expenditure Accounts (NHEA), and the White House website uses NHEA figures to justify and show the success of the Affordable Care Act (ACA). The NHEA methodology white paper states these cost estimates can be used to study the mix of health care expenditures for various...
types of goods and services as well as changes over time in this mix. However, for business decisions regarding delivery of healthcare, such as providers and payors accepting financial risk under health care reform, as well as undertaking cost cutting measures, the more detailed information available in large claims databases is often used. Truven’s (formerly Thomson Reuters) MarketScan database is a popular example of such commercially available claims data. Because different databases are being used by those gauging the success of healthcare reforms and those implementing these reforms, a comparison and reconciliation of these data sources is needed. Thus, we present a comparison of the cost component figures generated alternately by the NHEA and MarketScan data, and discuss the potential implications of their differences.

Study Design: We discuss the methodology behind the calculation of the NHEA values, compare and contrast them to their counterparts calculated from the MarketScan data, and reconcile the different accounting approaches.

Population Studied: 2010 NHEA National Health Expenditures figures and 2010 MarketScan data were used in our analysis.

Principal Findings: The NHEA and MarketScan data produce very different relative percentages of costs among the categories of expenditures that are directly relevant to the ACA initiatives to reduce cost through better patient management and payment innovations. For example, the 2010 NHEA estimates of hospital costs are only about 1.2 times higher than estimates of outpatient physician care costs, while the MarketScan 2010 data shows hospital costs are nearly 3.5 times those of outpatient physician costs. NHEA data show hospital costs as less than half of the total relevant costs (hospital, physician and other healthcare professional services, home health care, prescription drugs, and durable medical equipment), while MarketScan estimates them to be nearly 2/3 of these total costs.

Conclusions: Significant discrepancies, such as baseline percentage of inpatient costs to outpatient costs, exist between the NHEA National Health Expenditures figures and their counterparts estimated from MarketScan data.

Implications for Policy, Delivery, or Practice: One goal of ACA is to reduce the costs of acute care by encouraging better patient management, thus, reducing hospital care costs relative to costs of outpatient care provided by physicians and other healthcare professionals. Because policymakers and providers may be operating from different information about cost mix, improvements may be hard to detect and incentives to continue to change cost mix may result in greater inefficiencies. This is but one example of the implications of the cost estimate discrepancies between these data sets, which should be made explicit to both policymakers and providers as healthcare reforms continue.

Funding Source(s): Other, Internal grant

Impact of HCAHPS Survey Response Rates on Patient Experience Scores
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Presenter: Karen Joynt, MD, MPH, Instructor, Health Policy and Management, Harvard School of Public Health, kjoynt@partners.org

Research Objective: Optimizing patient experience has become a priority for both clinical leaders and policy makers. The Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey is widely used as a marker of patient experience during hospitalization, and under the Centers for Medicare and Medicaid Services (CMS) new hospital pay-for-performance program, Value-Based Purchasing, HCAHPS score is a key factor in hospitals’ payment determination. Any survey’s precision and reliability are heavily influenced by response rates, and surveys with low response rates may suffer from significant bias. However, little is known about response rates on the HCAHPS survey, or how this may relate to hospital performance on this metric. Therefore, we sought to understand what kinds of hospitals have low response rates and how response rates relate to patient experience measures.

Study Design: We used national HCAHPS survey data from 2010. We linked this data to the 2010 American Hospital Association (AHA) survey to obtain hospital characteristics including, size, ownership, location, percentage of patients with Medicaid insurance, and percentage of patients with Medicare insurance, and we used national Medicare data from 2010 to calculate the proportion of Medicare patients at each hospital that were black and Hispanic. We examined how hospital characteristics
varied across quartiles of HCAHPS survey response rates. We then used multivariate linear regression models to determine if there was a relationship between response rate and score on each of the 10 HCAHPS domains.

**Population Studied:** 3,651 acute care US hospitals that reported in the HCAHPS and AHA surveys in 2010.

**Principal Findings:** HCAHPS survey response rates ranged from 2% to 82%, with a median response rate of 32%. Compared to hospitals in the highest quartile of response rates, those in the lowest quartile of response rates were more often large (12.8% versus 10.0%, p<0.001), located in the South (58.9% versus 16.4%, p<0.001), teaching hospitals (9.5% versus 5.7%, p<0.001), and for-profit in ownership (25.1% versus 11.7%, p<0.001). Low-response-rate hospitals also cared for a higher proportion of Medicaid patients (23.5% vs. 13.8%, p<0.001), black patients (18.3% vs. 2.9%, p<0.001), and Hispanic patients (4.1% versus 0.6%, p<0.001). Even after adjusting for hospital characteristics, low-response-rate hospitals had significantly worse performance on each patient experience measure than high-response-rate hospitals. For example, 62.4% of respondents at low-response-rate hospitals stated that they would recommend the hospital, compared with 75.8% of respondents at high-response-rate hospitals (p<0.001). These patterns were identical for each of the 10 HCAHPS domains examined.

**Conclusions:** Hospitals with low response rates to the HCAHPS survey scored significantly worse on each HCAHPS metric than hospitals with high survey response rates.

**Implications for Policy, Delivery, or Practice:** Our findings suggest that response rate may play a significant role in determining hospital performance on metrics of patient experience. Given that the HCAHPS survey is being used to determine hospital reimbursement, understanding the impact of potential non-response bias on hospital performance is an important issue.

**Funding Source(s):** Other, internal departmental funds

**Poster Session and Number:** B, #694

**Assessing the Reliability of Complex Measures of Performance**

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**Research Objective:** The reliability of a facility-level measure reflects the extent to which the measure assesses the true variation between facilities as opposed to random variation of patient outcomes within the facilities. The Inter-unit Reliability (IUR) is defined as IUR=B/B+W, where B and W are respectively the between facility and within facility variance. If the facility-level measure is a simple or weighted average of individual patient measurements, this quantity is easily estimated from the mean squares in a (weighted) one-way ANOVA. As part of its quality incentive program (QIP), the Center for Medicare and Medicaid Services (CMS) uses a total performance score (TPS) to evaluate the performance of dialysis facilities. The TPS is a non linear combination of several clinical measures taken at the patient level, and cannot be expressed as an average of measurements from individuals, so that a new approach to calculating the IUR is needed. This project proposes a sampling scheme to estimate the IUR for more general complex measures such as the TPS.

**Study Design:** We consider M facilities of approximately equal size, and suppose that a complex measure, denoted by t, is of interest. The denominator of the IUR is the total variance (across facilities) of t, which can be estimated as the sample variance, V, of the measures for these M facilities. We propose to estimate the within-facility variance of t using a bootstrap procedure. Specifically, for each facility, N (say, N=100) bootstrap samples are made by resampling individuals with replacement within that facility. We compute the measure $t^*$ for each bootstrap sample and obtain the sample variance of the $t^*$'s for each facility. The average of these variances, across facilities, provides an estimate, $V_w$, of the within facility variance. The IUR can be estimated as $(V-V_w)/ V$. 

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**Population Studied:** Based on Medicare claims data from July 2010 through June 2011, the TPS for the 2014 QIP is calculated for all 5,085 dialysis facilities with 11 or more patients. In order to compute IURs, the facilities are stratified by number of patients into 10 strata of equal size. Each stratum comprises facilities with similar numbers of patients, and the IUR is obtained for each stratum.

**Principal Findings:** The IUR of the TPS varies somewhat across facility-size strata and, as expected, increases with sample size from a minimum value of 61% to a maximum of 80% in the stratum containing the largest facilities. For the largest facilities, this means that approximately 80% of the variation in the TPS is accounted for by the true differences between facilities. The balance of the variation in the TPS can be attributed to random variation among patients within facilities.

**Conclusions:** Using a bootstrap resampling approach, we have generalized the one-way ANOVA-based IUR to accommodate complex measures such as the TPS, and potentially other non-linear risk adjusted measures.

**Implications for Policy, Delivery, or Practice:** Estimates of reliability are often requested in measure presentations. These methods extend the IUR to a much broader class of measures.

**Funding Source(s):** Other, Centers for Medicare and Medicaid Services

**Poster Session and Number:** B, #695

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**Evaluating the Construct Validity of Hospital Quality Indicators: A Case Study on Breast Cancer and Hip Replacement**

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**Presenter:** Niek S Klazinga, Dept. of Social Medicine, AMC Amsterdam Medical Centre, n.s.klazinga@amc.uva.nl

**Research Objective:** Hospital quality indicators (QIs) are internationally increasingly used to increase transparency on the value of healthcare. As these indicators progressively determine policy decisions (e.g. the use of QIs by Medicare in the US), insight in their ability to validly measure quality of care is crucial. However, for many currently used QIs no empirical evidence about their validity exists. We investigated the construct validity of a series of nationally reported QIs on the quality of hospital care related to patients undergoing breast cancer surgery (11 indicators) or undergoing total hip replacement (19 indicators) in the Netherlands. The hospital QIs embedded in a structure, process, outcome framework were tested whether their scores make sense within the framework. We explored whether associations between hospital QI scores are in accordance with what would be clinically expected.

**Study Design:** We studied construct validity as a method of assessing the value of QIs by using indicator scores from Dutch hospitals over the year 2009 registered in a national database for hospital performance (DHTP database), the Dutch medical register (LMR database), and data based on patient experience information (CQIndex). The QIs under evaluation are all related to health care provided to patients both pre- and post-operatively and cover domains such as patient safety, patient centeredness, timeliness, effectiveness or efficiency.

**Population Studied:** The performance indicators under evaluation are all related to health care provided to patients both, pre- and post-operatively, undergoing breast cancer surgery or total hip replacement.

**Principal Findings:** The QIs tested revealed signs of construct validity. A limited number of significant and theoretically meaningful associations were found, and none of these showed a direction contradicting clinical theory (6 out of 39 breast cancer correlations, 13 out of 91 hip replacement correlations). Within the breast cancer QI set we found for instance significant associations between provider volume and the number of infections (R: -0.31, P: 0.025), as well as between “length of stay” and “irradicality” (R:0.43, P:0.006). Among the hip replacement QI set analysis revealed significant associations between the indicators measuring the number of reoperations due to infections and complications and the indicator measuring the antibiotic administration 60-15 minutes before incision (R: -0.37, P:0.023).

**Conclusions:** Though systematic data quality issues remain, a number of indicator scores were associated in a way that are consistent with clinical expectations and the existing evidence in the literature. However data
reliability remains problematic, therefore tackling data issues (100% perfect scores, indicator definitions, patient matching, coding patterns, lack of patient level data, improving hospital self reporting system) should become a key aspect for future research. Our findings raise the question on the balance needed between indicators validity and data reliability in light of the purpose of the hospital quality indicator use. **Implications for Policy, Delivery, or Practice:** Although questions remain about construct validity 19 significant and clinical relevant associations could be revealed. This highlights the importance for other countries to investigate their data systems and evaluate their indicators. Especially since studies testing construct validity are scarce and methods used vary to a large extent. However, in order to be able to execute such studies, the databases themselves are required to be of good quality. This involves the introduction of regulation and controlling mechanisms with regards to medical registry and data quality in the currently used self-reporting data system. **Funding Source(s):** N/A, Dutch Ministry of Health, Welfare and Sport **Poster Session and Number:** B, #696 **The Capability of Hospitals to Report Reliable Hospital Performance Indicators on the Quality of Care** Niek Klazinga, Amsterdam Medical Centre (AMC) - University of Amsterdam; Dionne S Kringos, Amsterdam Medical Center (AMC) - University of Amsterdam; Helen A Anema, Amsterdam Medical Center (AMC) - University of Amsterdam; Augustinus HA ten Asbroek, Amsterdam Medical Center (AMC) - University of Amsterdam; Claudia Fischer, Erasmus Medical Center (ErasmusMC), Amsterdam Medical Center (AMC) - University of Amsterdam; Daan Botje, Netherlands Institute for Health Services Research (NIVEL); Job Kievit, Leiden University Medical Center (LUMC); Ewout W Steyerberg, Erasmus Medical Center (ErasmusMC) **Presenter:** Niek Klazinga, M.D.,Ph.D., Professor Of Social Medicine, Dept. Social Medicine, Amsterdam Medical Centre (AMC) - University of Amsterdam, niek.klazinga@oecd.org **Research Objective:** Countries increasingly base their policy decisions on performance indicators that aim to measure the quality of care provided. The most recent example indicating the importance of sound indicators is Medicare (in the US) which provides bonuses and penalties to hospitals based on performance information. Also outside the US, e.g. the Netherlands, governments are moving towards a more transparent health care system to stimulate patient choice, influence provider’s behaviour, and increase the role of health insurance companies to buy health care services based on the quality of care. Given this increasing importance of hospital performance indicators, a study was performed to evaluate the reliability of hospital performance indicators in the Netherlands. **Study Design:** A mixture of qualitative and quantitative methods were used. Data resulted from: 1) indicator scores from Dutch hospitals over the years 2009 to 2011 registered in a national database for hospital performance (DHTP database); 2) a survey completed by quality officers in 42 Dutch hospitals in 2010 covering questions on the collection, calculation and reporting of indicator data; and 3) interviews and visits with quality officers, care coordinators, (oncological) surgeons, orthopaedists, and nurses in fourteen Dutch hospitals at eleven surgery and eleven orthopaedic departments. The performance indicators under evaluation are all related to health care provided to patients both, pre- and post-operatively and cover domains such as patient safety, patient centeredness, timeliness, effectiveness or efficiency. **Population Studied:** We investigated the reliability of a series of nationally reported performance indicators on the quality of hospital care related to patients undergoing breast cancer surgery (7 indicators) or undergoing total hip replacement (15 indicators) in the Netherlands. **Principal Findings:** Dutch hospitals (are obliged to) register their own indicator scores in the DHTP database. The results show that self-reported scores have a limited reliability. Both breast cancer and hip and knee replacement indicators are interpreted differently, which evokes significant differences in the indicator values. Hospitals vary largely in the way they register, retrieve, and report indicator scores. It is costing hospitals increasingly more resources to collect indicator scores. The limited reliability of performance indicators affected their applicability negatively. Most performance indicators related to breast cancer and hip and knee replacement are only used for external
accountability purposes, instead of internal quality improvement at hospital level.

Conclusions: The reliability of a self-reported indicator delivery system is influenced by differences in indicator interpretation, registration, retrieving, and reporting. The limited reliability is resulting in a decreased useability of the performance indicators.

Implications for Policy, Delivery, or Practice:

To improve the reliability (and applicability) of hospital performance indicators, a feeling of ownership and responsibility is required among all stakeholders. Furthermore, other solutions to reduce reliability problems are: standardisation of indicator definitions and hospital information systems; introduction of quality checks of hospital information systems; national registries; and the establishment of minimum quality requirements for software systems used to register performance indicators.

Funding Source(s): N/A, Dutch Ministry of Health, Welfare and Sport

Poster Session and Number: B, #697

Factors Influencing the Variation in Hospital Inpatient Prices between Public and Private Payers
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Presenter: Jared Lane Maeda, Ph.D., M.P.H., Research Scientist, Mid-Atlantic Permanente Research Institute, Kaiser Permanente, jared.l.maeda@kp.org

Research Objective: The large variation in the payments hospitals receive for similar services has captured the attention of payers and policymakers looking for ways to curb excess health care spending. There is little empirical evidence regarding the specific role that patient, population, and market factors might have in driving the price variation across small geographic areas and how these factors vary by payer. The purposes of this study is to: (1) to provide insight into the relationship between patient, population, and market factors and payer-specific prices for several common conditions, and (2) to examine the factors that influence the differences in the inpatient price per discharge between public (Medicare) and private payers among different hospital services.

Study Design: We measured price per discharge at the county-level for all discharges, an acute condition (acute myocardial infarction), and an elective condition (knee arthroplasty). Payer-specific inpatient prices (net revenue) were estimated by applying the Agency for Healthcare Research and Quality Healthcare Cost and Utilization Project (HCUP) price-to-charge ratio (PCR) to total hospital charges. Ordinary least squares regression models were used to identify factors significantly associated with the inpatient price per discharge by payer.

Population Studied: We extracted hospital data from six states where an HCUP PCR was available from the 2006 HCUP State Inpatient Databases (SID). Even in the states with PCR data, the PCR was not available for Kaiser Permanente hospitals so those discharges were excluded. The SID data were linked with the Area Resource File, American Hospital Association Annual Survey, and U.S. Census Bureau data files. Patients aged 40–64 years with private insurance as the primary expected payer were classified as having private insurance. Patients aged 65 years and older with a primary expected payer of Medicare were classified as having Medicare. Maternal discharges were excluded.

Principal Findings: Hospitals charged significantly higher prices to private payers compared to public payers. There was more variation in price per discharge for private payers compared to public payers for most hospital services. Specific market factors, including hospital competition, were associated with the price variation between payers.

Conclusions: The larger variation in the price per discharge identified among private payers necessitates further exploration. It may stem from differences in negotiated prices and market power across small geographic areas, or the price restraints of public payers.

Implications for Policy, Delivery, or Practice: Findings from this study have implications for the implementation of the Affordable Care Act (ACA). The payment reductions in the Medicare program under the ACA are expected to result in higher payments made to hospitals by private payers. Because the payment policies from Medicare ultimately affect private payers, public policy efforts that are aimed at increasing competitive forces or consider payment reforms may help to moderate hospital price variation and price increases.
Funding Source(s): AHRQ
Poster Session and Number: B, #699

National Trends in the Management of Neck and Back Pain
John Mafi, Beth Israel Deaconess Medical Center; Ellen P. McCarthy, Beth Israel Deaconess Medical Center; Roger B. Davis, Beth Israel Deaconess Medical Center; Bruce E. Landon, Department of Health Policy, Harvard Medical School

Presenter: John Mafi, M.D., Fellow In General Internal Medicine, General Medicine and Primary Care, Beth Israel Deaconess Medical Center, jmaf@bidmc.harvard.edu

Research Objective: Back and neck pain are among the most common reasons for visiting a physician and cost the healthcare system approximately $86 billion annually. Studies suggest that treatment of back pain frequently involves the overuse of diagnostic or treatment modalities that are not supported by national guidelines including use of advanced imaging, referrals to other physicians, and narcotics. Few studies have evaluated national trends in the quality of the management of spine-related disease.

Study Design: We evaluated trends in guideline concordant and discordant treatment of routine spine problems over 10 years from 2001-2010. Our primary outcome was guideline discordant care defined as prescriptions for narcotics, referrals to another physician, or radiologic testing including plain films or advanced imaging such as MRIs or CT scans. We also studied guideline concordant care defined as prescriptions for NSAIDs or acetaminophen, or referral to physical therapy and none of the discordant indicators. To examine trends, we used SUDAAN to estimate logistic regression models focusing on a linear trend for the survey year, and adjusting for age, sex, race, insurance status, physician specialty, whether the visit was with the patient’s PCP, located in a metropolitan area, and region. Results are weighted to reflect national estimates.

Population Studied: We used nationally-representative data on visits to physicians from the National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey. We studied outpatient visits with a chief complaint or primary diagnoses of back or neck pain, as well as those with secondary complaints and diagnoses of back or neck pain, but unrelated primary reasons for the visit (e.g., hypertension). We excluded visits with concomitant red flag diagnoses or complaints including fever, neurologic symptoms, and cancer as well as diagnoses or complaints with similar treatments (e.g. knee pain, fractures, or trauma).

Principal Findings: We identified 17,438 visits for spine problems, representing an estimated 306 million visits. Mean age was 52.1 years and 57% were female, with both remaining stable over time. The proportion of visits reflecting guideline discordant care remained stable from 22% and 27% in 2001-2002 to 28% and 29% in 2009-2010 (p=0.2 for trend). The proportion of visits with guideline discordant care increased from 46% and 40% to 47% and 52% for the same time period (p=0.0006 for trend). These latter results were primarily driven by a rise in narcotic prescriptions, which increased from 22% and 21% to 30% and 29% for the same time period (p=0.0006 for trend). In a sub-analysis, the odds of ordering a CT or MRI over the 10-year interval increased by 1.82 [1.39, 2.38].

Conclusions: Despite numerous published national guidelines, management of spine problems has increasingly relied on advanced diagnostic imaging and prescriptions for narcotics.

Implications for Policy, Delivery, or Practice: Improvements in management of spine-related disease represent an area of potential costs savings for the health care system while also maintaining or improving the quality of care.

Funding Source(s): Other, NRSA training grant (T32HP12706) from the U.S. Health Services and Research Administration (HRSA)

Poster Session and Number: B, #700

Risk-Adjusting Hospital-Acquired Pressure Ulcer Rates from Claims Data: Teaching Hospitals Beware
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**Principal Findings:** After adjusting for age and gender, the HAPU risk factors with the largest odds ratios in 2010 (p < 0.01 in both years) included respirator dependence (OR 7.5), shock/collapse (2.7), neurologic conditions involving paralysis or spinal cord injury (2.7), feeding disorders/malnutrition (2.5), hip fracture or dislocation (2.3), and pneumonia (2.2). The admission’s categorization as elective surgical (OR 2.0), or non-elective surgical (4.0) was also statistically significant, compared to medical admissions without surgery. The residual between-hospital variation in risk was larger in magnitude than many patient-level risk factors, indicated by the median odds ratio being greater than 2.0 in both years. C-statistic was 0.86 in 2009 and 0.87 in 2010. In 2010, after risk-adjustment, 173 hospitals’ ranks improved and 116 hospitals’ ranks worsened; teaching hospitals’ ranks worsened by 15 (median) and non-teaching hospitals’ ranks improved by 5 (median, p = 0.0037). Of 74 hospitals in the highest quartile of hospital rates before risk-adjustment, 11 hospitals (1 teaching, 10 non-teaching) were reassigned to better (lower) quartiles using risk-adjusted rates. In 2010, teaching hospitals listed a mean of 9.47 (95%CI: 9.45, 9.49) diagnoses compared to 10.93 (95%CI: 10.92, 10.94) for non-teaching hospitals; both teaching and non-teaching hospitals had a mean Charlson/Deyo comorbidity score of 1.70.

**Conclusions:** Unexpectedly, teaching hospitals did not benefit from risk-adjustment of HAPU rates using models developed from patient-level risk factors in claims data. It is unclear if the fewer number of diagnoses per discharge and similar Charlson/Deyo comorbidity scores reflect less complex patients or less complete claims data documentation in teaching hospitals compared to non-teaching hospitals.

**Implications for Policy, Delivery, or Practice:** With an increasing number of hospital quality measures (such as HAC rates) anticipated to use claims data for risk-adjustment, hospitals are advised to assess how well patient comorbidities/complexities are reflected in claims data.

**Funding Source(s):** AHRQ

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**Poster Session and Number:** B, #701

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**Presenter:** Henry Michtalik, M.D., M.H.S., M.P.H., Assistant Professor, General Internal Medicine, Johns Hopkins University, hmichtalik@jhmi.edu
**Research Objective:** Performance measures are increasingly being used to rank physicians and determine reimbursement. The Center for Medicare and Medicaid Services has undertaken several pay-for-performance pilots and the Patient Protection and Affordable Care Act explicitly requires value-based purchasing to reward quality of care through payment incentives and transparency. However, systematic methods to identify quality measures attributable to individual hospitalists have been limited. The objectives of this study were to: 1. Determine criteria for selecting measures that can be attributed to individual hospitalists. 2. Apply these criteria to currently collected and reported quality and safety measures to generate attending-physician-level metrics. 3. Assess the distribution and variability of these metrics to compare individual hospitalist providers and programs.

**Study Design:** We used a mixed-methods approach to evaluate and select inpatient performance measures. First, we used a series of interviews to perform a multi-stakeholder analysis with 2 hospitalists, 3 hospital administrators, and 2 quality improvement experts to determine qualitative criteria for selecting appropriate attending-physician-level measures. Next, we applied these criteria to 64 mandated, publicly reported Maryland Potentially Preventable Complications (PPCs) and 50 Joint Commission Core measures to determine a set of quality metrics. Finally, we examined both metric distribution and variability. For the PPCs, we examined the number of events from 2011-12 in 4 hospitalist programs within our network; for the Core measures, we compared 45 Maryland hospitals during a performance period (2010-11) against a baseline period (2008-9) and scored each measure on achievement of benchmarks and improvement to determine a final performance score ranging from 0 to 100.

**Population Studied:** Hospitalists within a statewide healthcare network in Maryland.

**Principal Findings:** Stakeholders reached consensus that measures should be actionable, attributable, and accountable. Actionable was defined as a measure which could be actively intervened upon during a single hospital admission or a preventable adverse event. Attributable was defined as measures associated with, or under the supervision of, an attending physician. Accountability was defined as being within the direct or indirect responsibility of an attending physician. Thirty-four of the 64 Maryland PPCs and 19 of the 50 Joint Commission Core measures reviewed met all three criteria. Regional review of PPCs over time showed variation both between and within 4 hospitalist programs in our network, with a range of 0 to 54 events per month. Statewide examination of the Core measures showed a near normal distribution with a performance score ranging from 18 to 100, indicating good discrimination amongst hospitals.

**Conclusions:** Our analysis identified criteria to assign commonly collected, standardized quality and safety measures to individual hospitalists. Regional and statewide analysis of these measures suggests adequate variation to assess quality.

**Implications for Policy, Delivery, or Practice:** Attending physician performance measures should be actionable, attributable, and accountable. Selected administrative data measures may be used in the future to compare individual hospitalists and programs both within and between institutions.

**Funding Source(s):** NIH

**Poster Session and Number:** B, #702

**Comparing Two Methods of Assessing 30-Day Readmissions in the Veterans Health Administration: What is the Effect on Hospital Reporting and Pay-for-Performance?**

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**Presenter:** Hillary Mull, Ph.D., M.P.P., Investigator, COLMR, VA Boston Healthcare System, hillary.mull@va.gov

**Research Objective:** Hospital readmissions are an important measure of quality, and are currently used to evaluate trends, target quality improvement efforts, and compare hospitals on quality performance. The Centers for Medicare and Medicaid Services’ (CMS) and the 3M™ Health Information System Division have both developed hospital readmission measures. The CMS all-cause 30-day readmission measures for acute myocardial infarction (AMI), heart failure (HF), and pneumonia (PN) and the 3M Potentially Preventable Readmissions (PPR)
measure differ on the patient population considered eligible for a potential readmission, the risk-adjustment methodology, and the definition of which hospitalizations can be considered as readmissions. The measures have not been compared in terms of how they identify high- and low-performing hospitals for public reporting or pay-for-performance. We examined correlations in 30-day readmissions rates between the CMS and PPR measures across the three CMS conditions (AMI, HF and PN). In addition, we isolated the effect of the PPR preventability component on hospital readmission rates, outlier identification for public reporting on CMS Hospital Compare, and pay-for-performance under the CMS Hospital Readmission Reduction Program (HRRP).

**Study Design:** We applied the CMS all-cause readmission model and PPR software to VA administrative data and calculated 30-day observed FY08-10 hospital readmission rates. We compared the differences in observed and risk-adjusted CMS and PPR readmission rates for each of the CMS condition cohorts. We then examined the effect of preventability on hospital readmission rates, public reporting, and pay-for-performance by replacing the dependent variable in the CMS all-cause model (Yes/No readmission) with the dichotomous PPR outcome (Yes/No PPR).

**Population Studied:** All Veterans discharged from VA hospitals (n=131).

**Principal Findings:** The CMS and PPR methods had moderate to high correlation in readmission rates (r=0.42 for AMI, r=0.80 for HF and r=0.63 for PNA, p<0.0001 for all comparisons). After controlling for all methodological differences between the models except preventability, correlations increased to >.90. The assessment of preventability yielded different outlier results for public reporting in 7% of hospitals; while for 30% of hospitals there would be an impact on HRRP reimbursement rates.

**Conclusions:** We confirmed that there are differences in CMS- and PPR-generated 30-day hospital readmission rates. Much of the discordance stems from how the two measures identify index hospitalizations, risk-adjust, and identify hospitalizations that “count” as readmissions. After isolating the effect of the PPR’s preventability component, there were differences in which hospitals were considered high performing. Inclusion of preventability in the definition of readmissions has a significant impact on which hospitals will suffer payment penalties.

**Implications for Policy, Delivery, or Practice:** Although we cannot conclude whether one measure is superior to the other with respect to evaluating hospital quality, there appears to be a measurable effect of preventability using the PPR software on hospital profiles. Future research should focus on validating the PPRs; if they accurately measure preventable readmissions, hospitals and policy makers can use them to monitor trends, develop effective quality improvement initiatives, and reduce preventable readmissions.

**Funding Source(s):** VA

**Poster Session and Number:** B, #703

**Hospital-level Variation in Potentially Preventable Hospital Readmission Rates within the Veterans Health Administration**

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**Presenter:** Hillary Mull, Ph.D., M.P.P., Investigator, COLMR, VA Boston Healthcare System, hillary.mull@va.gov

**Research Objective:** Hospital readmission is an important measure of quality and efficiency as demonstrated in the recent health reform legislation. In contrast to the all-cause readmission measure used by the Centers for Medicare and Medicaid Services (CMS), the 3M™ Health Information System Division developed a methodology to identify potentially preventable readmissions (PPRs) using administrative data. The PPRs may be a better tool for measuring hospital readmissions related to poor quality because they exclude readmissions that are not clinically related to the index hospitalization. To date, the PPRs have been used by several healthcare systems and state Medicaid programs to assess hospital quality, but not yet on a nationwide basis. Furthermore, little is known about hospital-level variation in PPR rates. We sought to examine hospital-level PPR rates in the Veterans Healthcare Administration (VA) and to test the relationship between hospital characteristics and hospital-level PPR rates.

**Study Design:** We applied the 3M PPR software to VA FY 2008-2010 administrative
data and calculated 30-day risk-adjusted PPR rates for all VA hospitals. We obtained hospital characteristics from the FY10 VA Hospital Quality and Safety Report, including size (number of discharges per year), complexity (whether the hospital had the ability to treat emergencies), staffing (number of full-time physicians per patient), staff satisfaction (nurse turnover), and average length of stay. We developed a linear regression model to predict hospital-level PPR rates using hospital characteristics.

**Population Studied:** All Veterans discharged between FY08-10 from VA hospitals providing medical and/or surgical care.

**Principal Findings:** Among 124 VA hospitals, the average risk-adjusted PPR rate was 10.8% (standard deviation=1.8%); the inter-quartile range was 9.8%-11.9%. Hospital characteristics, such as complexity and staffing, were significantly associated with a decrease in hospital-level risk-adjusted PPR rates (coefficient= -0.037 and 0.007, respectively, both p-values significant at p< 0.05). Hospital size was related to higher hospital-level PPR rates (every 1,000 increase in patient volume was associated with a 26.1% increase in the risk-adjusted PPR rate) (p=0.0001). We did not detect a significant relationship between staff satisfaction and readmissions. Overall, our model explained 24% of the variation in hospital-level PPR rates.

**Conclusions:** Hospital-level PPR rates varied in the VA healthcare system. Although our model did not include all relevant predictors of PPR variation across hospitals, we found that hospitals equipped for complex care and staffed with a high ratio of physicians to patients had lower PPR rates. We also found that as the number of discharges in a hospital increased, the rate of PPRs also increased.

**Implications for Policy, Delivery, or Practice:** Our findings reveal that the PPRs can be applied to a national healthcare system to detect hospital-level variation in readmission rates. Since the PPRs exclude “unpreventable” readmissions, they may be more suitable for quality improvement activities. We found significant associations between hospital-level PPR rates and hospital complexity, staffing, and patient volume. Future research should explore additional hospital characteristics to better understand the variation in PPR rates before using PPR rates to compare quality across hospitals.

**Funding Source(s):** VA

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**Poster Session and Number:** B, #704

**Medical Ecosystems**
Marcela Munoz-Reales, Treo Solutions LLC

**Presenter:** Marcela Munoz-Reales, M.S., Analyst, Research and Development, Treo Solutions LLC, mmunoz@treesolutions.com

**Research Objective:** The aim of this project is to study medical claim referrals within health care networks to discover naturally occurring Medical Ecosystems defined by referral patterns among providers who share similar characteristics.

**Study Design:** We are applying complex network methods to analyze millions of data points using commercial health plan claims data to uncover patterns in medical care, and aggregating those patterns to form a foundation for defining these Medical Ecosystems. As we learn these ecosystems, we are working towards demonstrating these relationships graphically and numerically which will allow for a more complete understanding of true medical patterns and key influences to a network’s health care delivery system.

**Population Studied:** Commercially insured individuals.

**Principal Findings:** From introductory analyses we have found across different health plans that primary care physicians with similar practice style and referral patterns also have comparable performance in terms of cost and quality. Another finding is that primary care physicians have preferential attachment to specific specialists and facilities, moreover at a larger scale, the distributions of total referrals in the system are driven by a small number of physician groups and facilities forming major hubs in the network creating core patterns of care.

**Conclusions:** Ultimately, the insight into relationships learned from this study could be valuable in identifying opportunities and areas of improvement, and thus improving quality and reducing cost of care at multiple levels of the system.

**Implications for Policy, Delivery, or Practice:** The result is a network information tool that outlines natural associations between primary care physicians, specialists, facilities and other medical providers at multiple levels, and offers opportunities for designing health care initiatives and incentives that help deliver more efficient care in terms of quality and cost.
Funding Source(s): Other, Treo Solutions LLC
Poster Session and Number: B, #705

Measure for Measure: What Kind of Performance Are We Seeking?
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Research Objective: Clinical performance measures, designed to evaluate and motivate clinicians’ performance over a variety of domains, have the potential to markedly sway the direction of health care practice. We sought to evaluate the direction of measurement of clinical performance measures -- specifically, to what extent they are designed to measure whether patients receive enough care or too much care.

Study Design: We examined all process measures intended for use in the outpatient clinic or emergency department setting and part of a major national clinical performance measurement program or clearinghouse in the United States in 2012. Measures were excluded if not concerned with direct patient care. Five hundred twenty-one measures (50 percent) out of a total of 1037 unique measures across 16 measure sets met criteria. Three coders independently categorized each measure according to target problem (underuse or overuse) and type of clinical service measured. Underuse measures were defined as those asking “Has the patient received enough care?” and overuse measures as those asking “Has the patient received too much care?” Measures not fitting either category were considered misuse measures. Measures were also categorized according to whether or not measure fulfillment involved a provider time input. Inter-rater reliability of measure categorization was assessed; discrepancies were resolved by consensus and expert consultation.

Population Studied: Measure sets included, among others, the National Quality Forum database, the Center for Medicare and Medicaid’s public reporting and Meaningful Use (Stage 1) programs, the Joint Commission’s Oryx program, the Healthcare Effectiveness Data and Information Set (HEDIS), and the American Medical Association’s Physician Consortium for Performance Improvement (PCPI) measures.

Principal Findings: Application of our underuse-overuse taxonomy demonstrated excellent inter-rater reliability (kappa=0.75). Overall, 477 of 521 measures (91.6 percent) targeted underuse while just 34 measures (6.5 percent) targeted overuse. Underuse measures outnumbered overuse measures by more than 10:1 in most (13 of 16) measure sets. Nearly half (7 of 16) of all measure sets contained no overuse measures. Underuse measures most commonly addressed the provision of services such as medication use (119 of 477, or 24.9 percent) and laboratory testing (99 of 477, or 20.8 percent), while overuse measures most commonly addressed imaging (18 of 34, or 52.9 percent) and medication use (10 of 34, or 29.4 percent). Measures that required provider time input comprised 300 of 477 (62.9 percent) underuse measures and 10 of 34 (29.4 percent) overuse measures.

Conclusions: Using a newly developed and reliable taxonomy to assess the direction of clinical performance measures, we found that underuse is a preferential target of performance measures, outnumbering overuse measures by more than 10:1. We believe that clinical performance measurement encourages overutilization by outpatient clinicians as a result of this imbalance. Performance measures also carry a substantial time cost for providers.

Implications for Policy, Delivery, or Practice: Current clinical performance measurement programs encourage overuse of health care and frequently consume valuable provider time. Greater oversight of performance measurement programs and clearinghouses is needed to ensure balance and avoid unintended and undesirable aggregate effects such as encouraging overutilization. Prospective use of an underuse-overuse taxonomy in designing clinical performance measurement programs is recommended.

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Poster Session and Number: B, #706

Does Hospital Process Compliance Predict Changes in Patient Functional Status?
Lauren Nicholas, University of Michigan

Presenter: Lauren Nicholas, Ph.D.,M.P.P., Faculty Research Fellow, Institute for Social
The Role of the Nurses in Israel’s National Quality Measurement Program

Rachel Nissanholtz-Gannot, Mayer-JDC-Brookdale institute; Ariel University Center; Bruce Rosen, Mayer-JDC-Brookdale institute

Research Objective: The National Quality Monitoring Program was initiated in 2000 as a research project and in 2004, it was adopted by the Ministry of Health as a national program. It allows for the ongoing assessment of the quality of selected preventive, diagnostic, curative and rehabilitation services supplied by the health plans (Israel's HMOs). Community nurses play a major role in that program, in such areas as: immunization, measuring BMI, give guidance for diabetes patients and take care of diabetic wounds. The aim of our study was to examine how managers and primary care physicians throughout Israel perceive the role of nurses in measuring quality and how they experience the partnership with them.

Study Design: Cross-sectional national surveys of senior managers (via face-to-face in-depth interviews) and of primary care physicians (via mail, e-mail or phone).

Population Studied: 1. 70 senior managers in the health plans, the Ministry of Health, and the Israel Medical Association 2. 1,000 randomly selected primary care physicians (response rate of 70%)

Principal Findings: The in-depth interviews revealed that the nurses have a significant role in the Quality Monitoring Program, particularly in the areas of diabetes and preventive medicine, with regard to planning interventions and implementing them. The program increased the nurses' workload but it also provided them with additional tools and expanded the types of roles available to them. Further, the program accelerated the transfer from reactive to tasks to proactive, planned work.

Most of the doctors (75%) viewed the health plan nurses as sharing in the responsibility for improving the quality of medical care to a great or very great extent. In addition, many doctors (60%) felt that the nurses actually enhanced the quality of their practice to a great or very great extent.

Research Objective: Recent public reporting initiatives have focused on measures of hospital compliance with evidence-based processes of care. Studies increasingly show that these measures fail to correlate with important patient outcomes such as mortality and surgical complications. At the same time, these adverse events are rare and may mask important relationships with other outcomes important to patients. We tested for associations between hospital process compliance for heart attack, heart failure and pneumonia and changes in patient functional status among patients treated in high vs. low compliance hospitals.

Study Design: Health and Retirement Study survey responses were linked to Hospital Compare reports from the hospitals where respondents were hospitalized for medical admissions between 2003 - 2008. Multivariate regression assessed the relationship between respondents' change in functional status and being treated in a hospital in the lowest, middle, or highest tertile of process compliance. Functional status was assessed with counts of activities of daily living (ADL) and instrumental activities of daily living (IADL) limitations.

Population Studied: 7,895 Health and Retirement Study respondents with linked Medicare claims. The sample was 60% female and 15% Black, mean age at hospitalization was 75.6.

Principal Findings: Patients averaged 0.88 ADL limitations and 0.37 IADL limitations before hospitalization. All patients averaged higher levels of functional limitation after hospitalization, though the increase for patients treated in the highest compliance hospitals was 0.16 fewer ADL limitations (p < 0.01) and 0.06 IADL limitations (p < 0.01).

Conclusions: Medical process compliance measures reported in Hospital Compare were associated with differential changes in functional status among patients treated in high vs. low compliance hospitals.

Implications for Policy, Delivery, or Practice: Hospital report cards may be able to crosswalk currently collected hospital data to changes in patient functional status and other measures that may be more meaningful for patients. Variation in post-hospitalization outcomes should be explored as a way of profiling hospitals.

Funding Source(s): NIH

Poster Session and Number: B, #707
Conclusions: The nurses constitute an important and meaningful component of the Quality Monitoring Program in the community. Consideration should be given to allocating to them more direct responsibility for the measures that are part of their work. A study examining the views of nurses on this issue is scheduled to begin shortly.

Implications for Policy, Delivery, or Practice: For Israeli policymakers, the study shows that community doctors have an appreciation for the nurses, and serves as a stepping stone to continuing the process of empowerment of nurses in the community and expansion of their authority. For policymakers abroad, the study illustrates the importance of examining physician perceptions regarding quality measurement in general, and their perceptions regarding the role of nurses in this area, in particular. This may provide a significant contribution to quality measurement in the United States.

Funding Source(s): Other, The Israel National Institute for Health Policy and Health Services Research (NIHP)

Poster Session and Number: B, #708

Comparing Risk-Adjusted vs. Indexed Methods for Characterizing Home Health Agency Performance

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Research Objective: Problem: Value-based purchasing decisions about quality use the national predicted value to risk-adjust HHA performance. This does not take into consideration regional or state-to-state differences in policy, practice, patient population, available resources, or geography. The core question is: does the current risk-adjusted approach truly identify the best or worst performing HHAs or are the results an artifact of the current method used to risk-adjust performance?

Study Design: Research Methods: The research provides an empirical comparison of three different methods to risk-adjust HHA performance and an indexed value approach to characterize HHA performance. HHA observed performance on hospitalization rates was risk adjusted using national, regional, and state predicted values for each of three calendar years (CY07-CY09), resulting in nine risk-adjusted values for each HHA. Currently, the national predicted values are used to risk-adjust HHA quality outcome rates. Index values were computed by dividing each of the resulting nine HHA risk-adjusted values by the national, regional, and state observed values for each calendar year, respectively.

Population Studied: Home health agencies nationally (10,289 HHAs that were active during CY2007 - CY2009).

Principal Findings: Risk-Adjusted Method Results: Descriptive statistics for the nine risk-adjusted values for each HHA were computed for all HHAs active during the period with at least 20 episodes of care each year. These statistics reveal that two CMS regions (2—NY area and 6—TX area) consistently scored higher (worse) than the national rate, and three CMS regions (8, 9, 10—states in the Rocky Mountain region and West) consistently performed lower (better). When state risk-adjusted performance was compared, western states (UT, OR, ID, WA, SD) held the top five spots (best performers) across the nine risk-adjusted values, and the bottom five spots (worst performers) across the nine risk-adjusted values are HHAs from LA, OK, MS, AR, and NY, TN, TX (tied). Finally, at the agency level based on percentage of HHAs in a state, the top performing ventile (top 5% = “best”) HHAs are from UT, ID, OR, SD, and CO while the bottom performing ventile (“worst”) HHAs are from LA, OK, MS, TX, and AR. Regardless of which predicted value (national, regional, or state) was used to risk adjust the HHA’s observed score, the results were the same with distinctive geographic differences.

Index Method Results: A different pattern was identified when the Index method was used to identify HHAs that were the “best of the best (BoB)” or “worst of the worst (WoW)” (i.e., top 5% of the “best” and bottom 5% of the “worst” performers in each state; n= approx. 25 in each group). Fifty percent of the BoB HHAs and 57.7% of the WoW were from Region 6. The risk-adjusted hospitalization rate for the BoB group had a median of 0.052 and a maximum of 0.269, while the WoW group rate had a median of 0.562 and a maximum of 0.746. The Index method identified very high or very low performing HHAs that would not be identified using the current or modified risk adjustment approach.

Conclusions: The current risk adjustment approach where the national predicted value is
used to risk-adjust HHA performance may not adequately address differences that are attributable to regional or state differences in policy, practice, patient population, available resources, or geography. An index value method was shown to be effective in identifying extremely high or low performing HHAs without apparent biases in the geographic location of the HHA.

Implications for Policy, Delivery, or Practice: Current methods used to risk-adjust HHA outcomes should be examined and possibly modified to include the use of higher-order variables (e.g., agency characteristics and state/regional policies, resources, and practices) in the prediction model development process. Comparative metrics based on index values should also be developed to aid in the identification of high/low performing HHAs as part of any value-based purchasing effort.

Funding Source(s): CMS, MedPAC
Poster Session and Number: B, #709

Alternative Approaches to Composite Quality Measurement for Ambulatory Diabetes Care
Shriram Parashuram, University of Minnesota; Beth Virnig, University of Minnesota; Bryan Dowd, University of Minnesota; Robert Kane, University of Minnesota

Presenter: Shriram Parashuram, M.P.H., M.S., Doctoral Candidate, Division of Health Policy and Management, University of Minnesota, para0092@umn.edu

Research Objective: Alternate approaches can be employed to develop quality composites for ambulatory diabetes care, based on contrasting theoretical considerations that observed indicator measures are either effects (reflective) or causes (formative) of the latent quality construct. We developed composite measures for ambulatory diabetes care for Medicare beneficiaries using reflective (factor analysis weighting) and formative approaches (physician judgment weighting and outcomes-based weighting), and compared how weights for specific indicator measures differed across these alternative composites.

Study Design: We identified the receipt of specific indicator measures, viz. hemoglobin A1c (HbA1c) testing, low density lipoprotein cholesterol testing (LDLC) testing, eye exams and testing for nephropathy by Medicare beneficiaries in 2006. We developed a factor analysis weighted composite, based on the average loading of indicator measures on a single underlying factor after confirmatory factor analysis with two beneficiary half-samples. We developed the physician judgment weighted composite, based on ratings of the importance of the indicator measures for ambulatory diabetes care, by an expert panel of physicians in leadership roles in state or national level professional organizations. The outcomes-based composite was developed by examining how receipt of specific indicator measures by beneficiaries lowered their risk for hospitalization in the subsequent year for (i) micro and macro vascular complications of diabetes (MMVC) and (ii) ambulatory care sensitive conditions (ACS), using multivariate logistic regression, and controlling for observed confounding using propensity score inverse probability treatment weighting, and both observed and unobserved confounding using instrumental variables with two stage residual inclusion.

Population Studied: Medicare fee-for service beneficiaries with diabetes in 2006 and 2007, aged 18-75 years, identified from 5 percent Chronic Condition Data Warehouse Medicare Files. Medicare claims were linked to Small Area income and education data sets from the Census Bureau and Area Resource File.

Principal Findings: Physicians weighted all four indicator measures as equally important for the quality of ambulatory diabetes care. In the factor analysis weighted composite, HbA1c testing and LDLC testing loaded more strongly on the underlying quality factor (with weights of 1.4 out of 4), while dilated eye exams had the lowest loading. None of the indicator measures in the prior year were associated with lower risk of hospitalizations for MMVC. LDLC testing and HbA1c testing in the prior year lowered the risk of ASC hospitalizations by 56 percent and 49 percent respectively, while eye exams and testing for nephropathy did not.

Conclusions: Differences exist between physician perception (of all indicator measures as equally important for ambulatory diabetes care), and physician practice- which is supported by empirical evidence.

Implications for Policy, Delivery, or Practice: Approaches currently employed in practice for measuring composite quality for ambulatory diabetes care treat all indicator measures as equally important. This needs to be better supported by evidence from patient outcomes.

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Poster Session and Number: B, #710
A Novel Approach to Specialty Physician Profiling to Encourage Population Health Management and Health System Alignment

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Presenter: Michael Paustian, Ph.D., Senior Healthcare Analyst, Clinical Epidemiology & Biostatistics, Blue Cross Blue Shield of Michigan, mpaustian@bcbsm.com

Research Objective: Our goal was to build upon existing Patient-Centered Medical Home (PCMH), PCMH-Neighborhood, and Accountable Care Organization efforts by creating a novel approach for profiling specialty physicians that 1) emphasizes population health management, 2) aligns incentives for specialists and primary care physicians, and 3) rewards both quality of care and efficiency of care.

Study Design: We developed specialty profiles for Michigan physicians in seven non-primary care specialties based on data from July 2010 to June 2012. For each specialty, we reviewed national clinical guidelines and quality measures, assessed available measures used in primary care physician profiling and then consulted with both subject matter expert specialty physicians practicing in Michigan and Blue Cross Blue Shield of Michigan (BCBSM) senior medical leadership to identify measures for use in specialist profiling. Selected measures were calculated at either the practice level or population level using available data resources, primarily administrative claims data. Practice level measures were derived based on the care provided directly by the physicians in the practice. Population level measures were calculated first at the primary care physician organization for its attributed membership and then weighted based on the shared patient population between specialists and primary care physician organizations to generate a population-based score for the specialty practice.

Population Studied: This specialty physician profiling approach was constructed around seven non-primary care physician specialties (cardiology, emergency medicine, gastroenterology, nephrology, obstetrics/gynecology, oncology and orthopedics).

Principal Findings: We created a uniform strategy for specialty physician profiling that aimed to encompass cost, quality, and efficiency of care and emphasize population-level health management. However, there were specialty specific considerations required to address issues such as defining specialists, sub-specialization, pediatric specialists, populations of focus, sample size and risk adjustment for each specialty. Administrative claims data alone were insufficient to measure many clinical quality indicators. While most measures were population-based rather than practice-based, specialty physicians routinely expressed a need for greater emphasis on what they could do in their practice suggesting a potential need for balance between the two types of measures.

Conclusions: Specialty physician profiling offers a substantial challenge, and previous approaches may not adequately align with future health system related goals. As health transformation efforts continue to expand, methods that better align incentives and increase focus on population health management may be achieved with specialty physician profiling.

Implications for Policy, Delivery, or Practice: Previous methods of profiling specialty physicians may not be adequate to achieve the goals of large scale health system transformation efforts, increase physician communication or change the culture from individual patient care to population health management. The system we propose here measures populations and rewards physicians contributing most to their quality of care, regardless of whether the individual physician is themselves considered ‘good’ or ‘bad’. This approach makes the specialist reliant on the performance of the community of caregivers for their patients, challenging them to interact with that community and work towards high quality and efficient care at the population level.
process will serve as a foundation for future expansion to additional specialty profiles.

**Funding Source(s):** N/A, Blue Cross Blue Shield of Michigan

**Poster Session and Number:** B, #711

**Matching Patients across Institutions without Definitive Patient Identifiers**

Stephanie Peterson, Mayo Clinic; James Naessens ScD, Mayo Clinic; Ahmed Rahman MHI, Mayo Clinic; Michael Pine MD MBA, Michael Pine Associates; Jaclyn Roland, Minnesota Hospital Association; Diane Olson MA, Mayo Clinic; Sue Visscher PhD, Mayo Clinic; Matthew Johnson MPH, Mayo Clinic

**Research Objective:** Test algorithms for identifying readmissions within 30-days across Minnesota Hospitals.

**Study Design:** Using a cross-sectional dataset covering one year, we used date of birth (DOB), gender, 5-digit zip code, 9-digit zip code, last 4 Social Security Number (SSN) digits, and individual hospital patient identifier to determine the feasibility of correctly identifying the same patient across multiple institutions without a unique identifier. Actual readmissions were based on linking hospital-specific identifiers with a system-wide unique identifier, Mayo Patient Identifier, across the hospitals. We calculated the sensitivity, positive predictive value (PPV), specificity, and negative predictive value (NPV) of finding a readmission for each algorithm.

**Population Studied:** One year of inpatient administrative data from the Mayo Clinic System was used to test the accuracy of six different algorithms to identify readmissions. This discharge data from twelve Minnesota hospitals, including Methodist and St. Mary’s in Rochester, was obtained from the Minnesota Hospital Association (MHA). All hospitalizations discharged alive were considered for subsequent readmission.

**Principal Findings:** Overall, there were 7,767 30-day readmissions among 56,522 hospital discharges. An algorithm using only unique hospital identifier failed to find 1,724 readmissions to other facilities. This algorithm has a sensitivity of 77.8%, the PPV and Specificity were 100% because the algorithm found no false positives. The NPV was 96.58% in this first algorithm. Adding to the algorithm the ability to match on sex, date of birth and 5-digit zip code increases the sensitivity to 99.19%, since our false negatives drop to 63, however we have 169 false positives (99.65% specificity). This algorithm has a PPV of 97.85%, and an NPV of 99.87%. Nine digit zip code was not always complete – but if we use the available values sensitivity drops slightly (98.88%), but specificity increases (99.89%) with only 55 false positives found. The PPV raises 1.5%, and NPV declines .05%. The complete matching was obtained from an algorithm including DOB, gender and either last 4 SSN digits or most complete zip code where 8 false negatives (99.9% sensitivity), and 16 false positives (99.97% specificity) were found. The PPV and NPV both increase in this algorithm as well. Algorithms for 90 day readmissions had similar results.

**Conclusions:** The best algorithm currently allowable is matching on hospital, hospital identifier, DOB, gender, and either 9-digit or 5-digit zip code, which gives a sensitivity of 98.88%, specificity 99.89%, PPV 99.29%, and NPV 99.82%. Sensitivity could likely increase to above 99% if all hospitals began submitting the last four SSN digits and a complete nine-digit zip code for all patients. Further research is required to determine if these same measures can be achieved with other data.

**Implications for Policy, Delivery, or Practice:** Successful matching algorithms will enable MHA to identify readmissions across institutions, enhancing hospital performance measures. A similar approach matching to death certificates would enable the identification of post-discharge mortality. Hospitals should begin reporting last four digits of Social Security Number, as well a complete 9-digit zip code to help enable successful matching across hospitals.

**Funding Source(s):** AHRQ

**Poster Session and Number:** B, #712

**Panacea or Pandora’s Box? The $1000 Genome is Here – Now What Do We Do?**

Kathryn Phillips, University of California, San Francisco; Julie Ann Sakowski, PhD, University of California San Francisco, Dept of Clinical Pharmacy; Julia Trosman, PhD, UCSF and Center for Business Models in Healthcare; Michael P. Douglas, MS, McKing Consulting Corporation; Su-Ying Liang, PhD, UCSF, Dept of Clinical Pharmacy and Palo Alto Medical Foundation Research Institute; Peter Neumann, ScD, Center for Evaluation of Value and Risk in
improve Whether WGS can achieve its potential to

Health, Institute for Clinical Research and Health Policy Studies, Tufts Medical Center

**Presenter:** Kathryn Phillips, Ph.D., Professor Of Health Economics & Hsr, School of Pharmacy and Institute for Health Policy, University of California, San Francisco, phillipsk@pharmacy.ucsf.edu

**Research Objective:** Our objective is to evaluate the potential benefit-risk tradeoffs of whole genome sequencing (WGS) from the perspectives of patients, providers, the health care delivery system, and society by using systematic and quantitative approaches. New technologies are enabling the arrival of the much awaited “affordable genome”—the ability to sequence an individual’s or a tumor’s entire genome quickly and inexpensively. WGS is now being offered in clinical care and is expected to become more widely used in the near future, particularly in cancer.

**Study Design:** We are (1) analyzing how patients and physicians evaluate WGS benefit-risk tradeoffs using stated preferences surveys (conjoint analysis), (2) conducting a policy analysis of how benefit-risk tradeoffs are considered in health care decision making for WGS, including coverage/reimbursement decisions and clinical guidelines, and (3) developing a framework to conceptualize, identify, and define data needed to assess the economic value of WGS.

**Population Studied:** Patients and physicians in a clinical trial of WGS and a nationally representative sample; stakeholders

**Principal Findings:** Very early findings suggest that this technological advance threatens to outpace our ability to use it effectively in clinical practice and to address the associated health policy issues. Assessing the value of WGS is complex because it is a technology that provides not just one test result, but a multitude of results that range from clinically actionable findings (treatable or preventable), to not directly actionable findings (with unclear treatment implications), to findings of unknown significance. There are also concerns that some information could be harmful if there are no available or acceptable treatments or if the information leads to confusion or unwarranted health care.

**Conclusions:** TBD

**Implications for Policy, Delivery, or Practice:** Whether WGS can achieve its potential to improve patient outcomes will depend on how patients and providers value the information provided, whether WGS will be covered by payers and recommended in guidelines, and whether the economic value to the health care delivery system outweighs the costs.

**Funding Source(s):** NIH

**Poster Session and Number:** B, #713

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**Concordance between Patient Experience and Clinical Quality Measures for Diabetics Receiving Care in Community Health Centers**

Dylan Roby, UCLA Fielding School of Public Health; Ana E. Martinez, UCLA Center for Health Policy Research; Nigel Lo, UCLA Center for Health Policy Research; Xiao Chen, UCLA Center for Health Policy Research; Sean Wu, UCLA Center for Health Policy Research; Hector Rodriguez, UCLA Fielding School of Public Health, Department of Health Policy and Management

**Presenter:** Dylan Roby, Ph.D., Assistant Professor, Health Policy and Management, UCLA Fielding School of Public Health, droby@ucla.edu

**Research Objective:** Examine the concordance between patient reports of health care experience and accepted process measures of clinical quality for diabetic patients receiving primary care through community health centers.

**Study Design:** We collected twelve months of clinical data on diabetics receiving care at 14 community clinics in the Bay Area of Northern California during 2010. Among the patients receiving services, a sample of 2,300 who had at least 2 clinic visits over the year was chosen to complete a questionnaire based on their current experiences as a patient of one of the clinics. The survey contained several question sets, including the Patient Assessment of Care for Chronic Conditions (PACIC), the Clinician and Group CAHPS (CG-CAHPS), and Problem Areas in Diabetes (PAID-5) scale. We merged the clinical quality and patient experience results to compare quality reported by the patient to the clinical process measures for each patient. We then modeled the composite scores on the PACIC, CG-CAHPS, and PAID-5 domains using random effects tobit regression models for each composite score and clinical quality measure.

**Population Studied:** Approximately 1,100 diabetic patients (during 2010) with completed surveys who had at least two visits to community clinics scheduled to participate in the Innovative
Care Approaches through Research and Education (iCare) Diabetes project.

**Principal Findings:** Of survey respondents, 67% had at least one HbA1c test over the 12 month period while only 60% received a one or more LDL lab tests in the past year. When comparing the mean values for each composite patient experience score, patients with one or more HbA1c test were more likely to report lower scores: 51.82 in PACIC for patients with no HbA1c tests vs. 46.60 for those with 2 or more HbA1c tests. However, when regression is used to predict the score and examine the independent relationship of clinical process and patient experience, new considerations became apparent. The PACIC model showed no significant relationship between clinical quality and composite score. However, the communication and PAID-5 domains of the survey appeared to be linked to clinical quality. The models indicated that the interaction between race and language and clinical quality is an important predictor of experience scores. It appears that when compared to whites, Chinese speaking patients are more likely to experience appropriate clinical quality, yet have a negative perception of that care as evidenced by lower patient experience composite scores.

**Conclusions:** Higher levels of self-reported health status appears to be a significant predictor of improved patient experience scores, while actually receiving the appropriate number of HbA1c or LDL tests is negatively associated with higher scores. A significant mitigating factor appears to be the interaction of clinical quality and race/language, with Chinese speaking populations being more likely to report worse patient experience despite receiving the appropriate clinical process measures.

**Implications for Policy, Delivery, or Practice:** There is disagreement in the literature on the value of patient experience and patient satisfaction in measuring quality. This paper supports the idea that patient satisfaction may be discordant from clinical measures of quality, but that the difference could be related to racial/ethnic, language and health status differences between populations.

**Funding Source(s):** AHRQ

**Poster Session and Number:** B, #714

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**Assessing the Impact of Serious Mental Illness and Substance Use Disorders on Risk of Readmission for Patients with Acute Myocardial Infarction, Heart Failure, and Pneumonia in the Veterans Health Administration (VA)**


**Presenter:** Amy Rosen, Ph.D., Senior Research Scientist, Dept. of Surgery, Boston University School of Medicine, Center for Leadership, Organization and Management Research, VA Boston Healthcare System, akrosen@bu.edu

**Research Objective:** The Centers for Medicare and Medicaid Services (CMS) publicly reports 30-day readmission rates for acute myocardial infarction (AMI), heart failure (HF), and pneumonia (PN). Previous literature suggests that the presence of co-occurring medical conditions and serious mental illness (SMI) or substance use disorder (SUD) can lead to suboptimal outcomes. Thus, average readmission rates for medical conditions may underestimate risk of readmission for patients with both medical and psychiatric conditions. Among patients admitted with AMI, HF, or PN, for each cohort, we compared the rates and likelihood of readmission between those admitted with and without SMI or SMI+SUD. Although the Veterans Health Administration (VA) is an integrated healthcare system providing care across treatment settings, we hypothesized that within each cohort, patients with SMI only or SMI+SUD would be at increased likelihood of 30-day readmission compared to those with medical conditions only because of their greater disease severity and need for specialized mental health treatment.

**Study Design:** Retrospective cohort study using VA administrative data. We calculated 30-day,
all-cause readmission rates for each of the 3 disease cohorts, identifying patients with and without the presence of a co-occurring principal diagnosis of SMI or SMI+SUD one year prior to admission or a secondary diagnosis of SMI or SMI+SUD in the index admission. SMI was defined by one of four ICD-9-CM fields (schizophrenia, schizoaffective disorder, bipolar disorder, or post-traumatic stress disorder); SUD was defined using ICD-9-CM-codes indicating substance abuse/dependence. Within each cohort, we estimated hierarchical logistic regression models, adjusting for patients' demographics and comorbidities (based on CMS' medical Condition Categories), to assess the impact of SMI only and SMI+SUD on readmission rates.

**Population Studied:** Veterans discharged from VA acute-care hospitals from 2008-2010 with a principal diagnosis of AMI (17,963), HF (51,673), or PN (45,777).

**Principal Findings:** The prevalence of SMI ranged from 9.4%-12.8% across the 3 cohorts, with a smaller range for the subset with SMI+SUD (3.3%-5.5%). Readmission rates were slightly higher for HF and PN patients with SMI compared to their counterparts without SMI (HF, 22.3% vs. 21.9%; PN, 16.9% vs. 16.7%, respectively). Among AMI patients, readmission rates were highest for those with SMI+SUD (20.1%) compared to those with SMI only (17.5%) or AMI alone (18.4%). HF patients with SMI+SUD also had higher rates (26.3%) compared to HF patients with SMI only (22.3%) or HF alone (21.9%). For all 3 cohorts, the presence of SMI+SUD increased the likelihood of readmission compared to those with medical conditions only [for AMI, OR=1.32 (95% CI, 1.07-1.63); HF, OR=1.24 (95% CI, 1.11-1.40); and PN, OR=1/16 (95% CI, 1.03-1.30)].

**Conclusions:** These findings support our hypothesis that patients with co-occurring medical and psychiatric illnesses are at increased likelihood of readmission compared to those with medical conditions only. In particular, patients with AMI, HF, or PN and SMI+SUD were at highest risk of readmission.

**Implications for Policy, Delivery, or Practice:** Despite the integration of medical and mental health services, Veterans that need care in multiple treatment settings may be "falling through the cracks." Specific interventions targeted to this population are warranted in order to reduce the rates of readmissions within these subgroups.

**Funding Source(s):** VA

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**Poster Session and Number:** B, #715

**Specialty Provider Profiling: Approaches to Overcoming Small Sample Size and Case-Mix Challenges**

Elin Schlemmer, Blue Cross Blue Shield of Michigan; Amanda Markovitz, MPH, Blue Cross Blue Shield of Michigan; Min Tao, MD, PhD, Blue Cross Blue Shield of Michigan; Michael Paustian, PhD, Blue Cross Blue Shield of Michigan; Elizabeth Wasilevich, PhD, Blue Cross Blue Shield of Michigan; Elizabeth Wasilevich, PhD, Blue Cross Blue Shield of Michigan; Chelsea Wellman, MPH, Blue Cross Blue Shield of Michigan; Erin Schmidt, MS, Blue Cross Blue Shield of Michigan

**Research Objective:** Specialty physician profiling presents a number of analytic challenges, including case mix differences and small sample sizes. This study describes key methodological approaches Blue Cross Blue Shield of Michigan (BCBSM) used to overcome these challenges when profiling specialty practices to receive enhanced reimbursement as part of a fee-for-value model.

**Study Design:** Population-based metrics may help promote our vision of encouraging collaboration among physicians in caring for shared patient populations. These population-based metrics could address two of the primary analytic challenges in specialty physician profiling: case-mix differences (often due to subspecialization) and small sample sizes. For these reasons, most of the quality, utilization, and efficiency metrics we calculated for specialty practices were population-based rather than practice-based. Population-based metrics were first calculated for physician organizations based on patients attributed to their primary care physicians. These physician organization metrics were then weighted based on shared patient populations with specialty practices to calculate metrics for each specialty practice. Metrics were percentile ranked, then combined into a final composite score using predetermined weights.

**Population Studied:** Uplift metrics were calculated for 1,289 specialty-specific practices across seven specialties. The number of specialists in a practice ranged widely from 1 to...
65, with over half of practices containing only one specialist.

**Principal Findings:** For population-based metrics, specialty practices received scores based on a median of 18 (Interquartile range (IQR): 12-27) physician organizations, and from <1% to 97% of their score came from a single physician organization. By basing the specialty practice score on larger populations with a more uniform risk distribution than those directly seen by the practice, we reduced the impact of differential case-mix at the specialty practice level. The coefficient of variation ranged from 2.2% to 16.6% for population-based metrics, suggesting that modest variation remained after accounting for case-mix differences.

Using population-based metrics also improved sample sizes. For example, the median obstetrics/gynecology practice had 403 attributed female patients ages 15-64 (IQR: 164-842), while the median physician organization had 2,854 (IQR: 640-9,050).

Additional methodological approaches included (1) adjusting metrics via direct standardization for age, sex, and risk score as appropriate, (2) improving sample size for quality metrics through an overall percentage composite measure, and (3) developing rules for substituting values for metrics with low sample size.

**Conclusions:** Population-based metrics are a novel approach to overcome common analytic challenges in specialty profiling, such as small sample size and case mix differences. Widely used methods such as composite scores and direct standardization can address many of the remaining methodological issues.

**Implications for Policy, Delivery, or Practice:** Since population-based metrics are a novel approach to specialty profiling, further research and evaluation are required. In the coming years, we will assess physician acceptance of population-based metrics and evaluate the impact of enhanced reimbursement in encouraging collaboration among specialists and PCPs to promote high-quality, efficient care for patients. We see potential for this approach to encourage greater quality, efficiency, collaboration and alignment in healthcare delivery.

**Funding Source(s):** Other, Blue Cross Blue Shield of Michigan

**Poster Session and Number:** B, #716

**Every Specialty is Special: Lessons Learned from Practice Profiling Across Seven Specialties**

Erin Schmidt, Blue Cross Blue Shield of Michigan; Chelsea Wellman, MPH, Blue Cross Blue Shield of Michigan; Michael Paustian, PhD, Blue Cross Blue Shield of Michigan; Min Tao, MD, PhD, Blue Cross Blue Shield of Michigan; Elizabeth Wasilevich, PhD, Blue Cross Blue Shield of Michigan; Darshan Pawar, MS, Blue Cross Blue Shield of Michigan; Erin Schlemmer, MPH, Blue Cross Blue Shield of Michigan; Amanda Markovitz, MPH, Blue Cross Blue Shield of Michigan

**Presenter:** Erin Schmidt, M.S., Health Care Analyst, Epidemiology and Biostatistics, Blue Cross Blue Shield of Michigan, eschmidt@bcbsm.com

**Research Objective:** Blue Cross Blue Shield of Michigan (BCBSM) designed a process to recognize and financially reward specialist practices for their contribution to population level performance of healthcare delivery. This study identified specialty-specific challenges and the similarities and differences between methods used to profile specialty practices.

**Study Design:** We profiled specialty practices using practice-level and population-based metrics focused on cost, efficiency, and quality. Metrics were selected based on clinical guidelines, physician consultation, and data availability. While consistency was emphasized across the seven specialties, the number and types of metrics that could be calculated using claims data varied by specialty. Consequently, both study populations used for metric calculation and standard populations used for direct standardization were defined differently for certain specialties and metrics. One of two approaches was used to calculate population-based metrics depending on the specialty.

**Population Studied:** Specialty practices in Michigan from seven different specialties: 225 cardiology practices, 75 emergency medicine practices, 124 gastroenterology practices, 72 nephrology practices, 451 obstetrics/gynecology (OB/GYN) practices, 122 oncology practices and 220 orthopedic practices.

**Principal Findings:** While the approach to profiling across specialties was similar, each specialty encountered unique challenges. Available metrics varied by specialty, ranging from two (oncology) to ten (OB/GYN) metrics with a mean of five. Cardiology, nephrology and...
OB/GYN had several quality metrics that aligned with primary care physician quality metrics. Commercially insured adults (18-64 years) served as the denominator for most metrics for most specialties, except for OB/GYN’s focus on females (15-64 years). However, we modified the study population to account for disease-specific populations used in clinical quality indicators and specialty-specific efficiency metrics.

For risk adjustment via direct standardization, we used a standard population with 49 strata. These strata were redefined into 18 strata for metrics focused on subpopulations. Specialties with unique study populations required additional modifications to the standard population.

To calculate population-based metrics, two methods were developed to determine the magnitude of shared patient populations between specialty practices and primary care physician organizations. We used an episode grouper to identify these shared patient populations for cardiology, emergency medicine, gastroenterology and orthoepedics while specialty-specific patient-to-physician care relationship assignment processes were developed for the remaining three specialties. These specialty-specific attribution methods were necessary because of concerns about the reliability of the episode grouper data for nephrology and oncology and the need to distinguish between obstetrical care relationships and gynecological care relationships for OB/GYN.

**Conclusions:** There can be a consistent approach to specialty practice profiling, but methods should account for specialty-specific differences in populations and available metrics. Related to these differences, some specialties are more conducive to practice profiling.

**Implications for Policy, Delivery, or Practice:**

The availability of specialty metrics that align with primary care metrics may enable some specialty physician groups to more easily integrate into current healthcare transformation efforts. Consequently, specialty practice profiling may have differential impacts on changing physician practice behaviors. Future efforts to expand this process to a greater number of physician specialties may identify additional specialty-specific considerations.

**Funding Source(s):** Other, Blue Cross Blue Shield of Michigan

**Poster Session and Number:** B, #717

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**Regional Variation in the Quality of Prostate Cancer Care**

Florian R. Schroeck, University of Michigan, Dept of Urology; Florian Schroeck, University of Michigan; Samuel R. Kaufman, University of Michigan, Dept of Urology; Bruce L. Jacobs, University of Michigan, Dept of Urology; Ted A. Skolarus, University of Michigan, Dept of Urology; John M. Hollingsworth, University of Michigan, Dept of Urology; David C. Miller, University of Michigan, Dept of Urology; Anne M. Suskind, University of Michigan, Dept of Urology; Brent K. Hollenbeck, University of Michigan, Dept of Urology

**Presenter:** Florian Schroeck, M.D., M.S., Fellow, Health Services Research, Urology, University of Michigan, florian.schroeck@gmx.net

**Research Objective:** Prostate cancer is the most common malignancy in US men with more than 240,000 new cases every year. Given this high incidence and prevalence, providing high quality care to these men is of significant importance. To measure quality of care, several quality indicators have been endorsed by the National Quality Forum and the Physician Consortium for Performance Improvement. We evaluated regional variation in performance on these quality measures to identify potential targets for quality improvement.

**Study Design:** In this retrospective cohort study, our primary outcomes were regional adherence rates to a wide range of quality measures encompassing the domains of effectiveness, patient-centeredness, and timeliness. Effectiveness was evaluated by assessing the rate of overuse of unnecessary bone scans, the rate of recommended use of adjuvant androgen deprivation therapy for high risk patients undergoing radiotherapy, and the rate of treatment by a high volume provider. Patient-centered care was examined by calculating the proportion of patients who got counseled by both a urologist and radiation oncologist prior to treatment and the proportion of patients who had two or more follow-up visits with the treating physician after treatment.

Timely care was defined as treatment within 90 days of diagnosis. To calculate adherence rates, we first assigned patients to regions (Hospital Service Areas, n=661) based on their home zip codes. Next, we used hierarchical generalized linear models to calculate reliability adjusted...
There's No Such Thing as a High Quality Region

Jason Shafrin, Acumen, LLC; Hani Bashour, Acumen, LLC; Camille Chicklis, Acumen, LLC; Shahin Saneinejad, Acumen, LLC; Elen Shrestha, Acumen, LLC; Sajid Zaidi, Acumen, LLC; Jayanta Bhattacharya, Acumen, LLC & Stanford University; Thomas MaCurdy, Acumen, LLC & Stanford University

Researcher: Jason Shafrin, PhD, Policy Researcher, Acumen, LLC, jason.shafrin@gmail.com

Research Objective: The Centers for Medicare and Medicaid Services (CMS) have begun implementing a number of policies to incentivize providers to improve the quality of care Medicare and Medicaid beneficiaries receive. One approach CMS could consider is adjusting provider payments based on the regional-level quality of care. Research to date, however, has not established whether high-quality regions consistently perform above average across a broad set of quality measures. Using claims data for 100 percent of Medicare and Medicaid beneficiaries enrolled between 2007 and 2009, this analysis evaluates whether regions with high-quality care along one dimension are more likely to provide high-quality care across other dimensions.

Study Design: This study also measures regional quality of care using three AHRQ composite metrics: Inpatient Quality Indicators (IQI), Patient Safety Indicators (PSI) and Prevention Quality Indicators (PQI). In addition to measuring overall quality, this study also calculates quality of care for the treatment of beneficiaries with one of 13 conditions. These conditions include acute conditions (e.g., acute/ischemic stroke, acute myocardial infarction (AMI), pneumonia, incident cancers) as well as chronic conditions (e.g., chronic obstructive pulmonary disease (COPD), congestive heart failure (CHF), diabetes, low back pain). Regions are defined as hospital referral regions (HRRs). Where appropriate, measures are risk-adjusted to account for regional differences in patient case mix.

Population Studied: All Medicare fee-for-service beneficiaries enrolled between 2007 and 2009 as well as all Medicaid fee-for-service beneficiaries enrolled over the same time period.

Principal Findings: HRRs that are high-quality on one measure of care are no more likely to be high-quality on other quality dimensions than any other HRR. The average correlation between an HRR’s quality of care provided to Medicare beneficiaries on one measure and their Medicare quality score on any other measure is only 0.09. Measuring the quality of care a region provides to Medicaid beneficiaries provides similar results; the average correlation between any two HRR-level Medicaid quality metrics is only 0.06. Further, the correlation across payers is similarly low; the correlation

Principal Findings: There was wide variation in regional adherence to established measures of prostate cancer quality, ranging from 2% for treatment by a high-volume provider to 96% for use of adjuvant androgen deprivation therapy in high-risk cancer. Most variation in compliance was observed for measures of effectiveness, such as treatment by a high volume provider (range 2% to 93%, p less than 0.001) and overuse of bone scans in low risk patients (range 17% to 96%, p less than 0.001). Variation was substantial in the proportion of patients counseled by both a urologist and radiation oncologist prior to treatment (range 7% to 86%, p less than 0.001) and in the proportion of patients having recommended follow-up (range 18% to 90%, p less than 0.001). Timeliness of care was also subject to significant variation in compliance, although this variation was of lower magnitude (range 20% to 84%, p less than 0.001).

Conclusions: Variation in adherence to a wide range of established prostate cancer quality of care measures was substantial and more than initially expected.

Implications for Policy, Delivery, or Practice: Based on our results, aspects of effective and patient-centered care are the most important targets for future quality improvement efforts. Our results may be used to guide further mixed-methods research focused on quality improvement interventions.

Funding Source(s): Other, NIDDK T32 DK07782 and American Cancer Society PF-12-118-01-CP PB

Poster Session and Number: B, #718

There's No Such Thing as a High Quality Region

Population Studied: We used Surveillance, Epidemiology, and End Results (SEER) – Medicare data from 2001 through 2009 to identify 84,045 patients diagnosed with prostate cancer.

Principal Findings: There was wide variation in regional adherence to established measures of prostate cancer quality, ranging from 2% for treatment by a high-volume provider to 96% for use of adjuvant androgen deprivation therapy in high-risk cancer. Most variation in compliance was observed for measures of effectiveness, such as treatment by a high volume provider (range 2% to 93%, p less than 0.001) and overuse of bone scans in low risk patients (range 17% to 96%, p less than 0.001). Variation was substantial in the proportion of patients counseled by both a urologist and radiation oncologist prior to treatment (range 7% to 86%, p less than 0.001) and in the proportion of patients having recommended follow-up (range 18% to 90%, p less than 0.001). Timeliness of care was also subject to significant variation in compliance, although this variation was of lower magnitude (range 20% to 84%, p less than 0.001).

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Poster Session and Number: B, #718

There’s No Such Thing as a High Quality Region

Jason Shafrin, Acumen, LLC; Hani Bashour, Acumen, LLC; Camille Chicklis, Acumen, LLC; Shahin Saneinejad, Acumen, LLC; Elen Shrestha, Acumen, LLC; Sajid Zaidi, Acumen, LLC; Jayanta Bhattacharya, Acumen, LLC & Stanford University; Thomas MaCurdy, Acumen, LLC & Stanford University

Presenter: Jason Shafrin, PhD, Policy Researcher, Acumen, LLC, jason.shafrin@gmail.com

Research Objective: The Centers for Medicare and Medicaid Services (CMS) have begun implementing a number of policies to incentivize providers to improve the quality of care Medicare and Medicaid beneficiaries receive. One approach CMS could consider is adjusting provider payments based on the regional-level quality of care. Research to date, however, has not established whether high-quality regions consistently perform above average across a broad set of quality measures. Using claims data for 100 percent of Medicare and Medicaid beneficiaries enrolled between 2007 and 2009, this analysis evaluates whether regions with high-quality care along one dimension are more likely to provide high-quality care across other dimensions.

Study Design: This study also measures regional quality of care using three AHRQ composite metrics: Inpatient Quality Indicators (IQI), Patient Safety Indicators (PSI) and Prevention Quality Indicators (PQI). In addition to measuring overall quality, this study also calculates quality of care for the treatment of beneficiaries with one of 13 conditions. These conditions include acute conditions (e.g., acute/ischemic stroke, acute myocardial infarction (AMI), pneumonia, incident cancers) as well as chronic conditions (e.g., chronic obstructive pulmonary disease (COPD), congestive heart failure (CHF), diabetes, low back pain). Regions are defined as hospital referral regions (HRRs). Where appropriate, measures are risk-adjusted to account for regional differences in patient case mix.

Population Studied: All Medicare fee-for-service beneficiaries enrolled between 2007 and 2009 as well as all Medicaid fee-for-service beneficiaries enrolled over the same time period.

Principal Findings: HRRs that are high-quality on one measure of care are no more likely to be high-quality on other quality dimensions than any other HRR. The average correlation between an HRR’s quality of care provided to Medicare beneficiaries on one measure and their Medicare quality score on any other measure is only 0.09. Measuring the quality of care a region provides to Medicaid beneficiaries provides similar results; the average correlation between any two HRR-level Medicaid quality metrics is only 0.06. Further, the correlation across payers is similarly low; the correlation
Epidemiology, and End Results (SEER) and modalities for HCC in a population for which it is survival associated with various treatment cumula enrolled HCC patients in 1999. We examine dollars) in healthcare costs related to Medicare estimated nearly 406 million dollars (US 2006 newly diagnosed with HCC. One study Several treatments are available for patients expected to contiue rising in coming decades. Several treatments are available for patients newly diagnosed with HCC. One study estimated nearly 406 million dollars (US 2006 dollars) in healthcare costs related to Medicare enrolled HCC patients in 1999. We examine cumulative Medicare-paid expenditures and survival associated with various treatment modalities for HCC in a population for which it is most treated.

Study Design: Data are from the Surveillance, Epidemiology, and End Results (SEER) and linked Medicare databases, with claims generated from Parts A and B. Multivariate Cox proportional hazards models were used to estimate risk and calculate mean all-cause/HCC-related survival associated with the following treatment modalities: transplant, resection, liver directed therapy (includes transarterial chemoembolization and/or ablation), radiation, systemic chemotherapy, or no treatment. Partitioned inverse probability-weighted least squares regression estimated cumulative Medicare-paid expenditures adjusted for censoring and covariates. Bootstrapping was used to obtain 95 percent Confidence Intervals for cost estimates.

Population Studied: Medicare enrollees with an initial diagnosis of primary HCC between 2000-2007 were followed through 2009.

Principal Findings: Cancer stages I, II, III and IV represented 24, 9, 14, and 17 percent of the 11,047 patients, respectively. Nearly one-third (37 percent) were unstaged, 66 percent were male, 75 percent Caucasian, 10 percent African American. A majority (60 percent) of patients were untreated, 16 percent liver directed, 8 percent chemotherapy, 8 percent resection, 4 percent radiation, and 4 percent transplant. Using all-cause (HCC-related) mortality, transplant patients incurred an average 263,296 dollars [95CI: 244,200-282,392] in Medicare expenses over an average 5.47 (6.9) years survived after diagnosis; resection patients incurred 131,812 dollars [126,770-136,854] over 3.5 (5.1) years, liver directed therapy patients 91,488 dollars [88,749-94,227] over 2.2 (3.8) years, chemotherapy 55,379 dollars [53,442-57,316] over 1.2 (2.8) years, radiation 58,308 dollars [55,355-61,261] over 1.2 (2.6) years, and no treatment 27,937 dollars [27,355-28,519] over 0.6 (1.1) years.

Conclusions: On average, cumulative Medicare expenditures were over 9x higher for transplant versus no treatment, nearly 5x for resection, over 3x for liver directed, and nearly double for chemotherapy or radiation, even after adjusting for cancer stage and other confounders. Differences in Medicare spending between treatment modalities were nearly proportional to differences in (all-cause) years survived after HCC diagnosis.

Implications for Policy, Delivery, or Practice: In an era dedicated to reducing wasteful spending in the healthcare sector, physician/patient decisions should be balanced with consideration of efficient use of limited...
resources. Yet, payers’ intervention in physician discretion may not be important in this setting.

**Funding Source(s):** Other, Bayer HealthCare Pharmaceuticals, Inc.

**Poster Session and Number:** B, #720

**Multidisciplinary Physician Care and Mortality in Hepatocellular Carcinoma**

Viktor V Chirikov, University of Maryland School of Pharmacy; Fadia Shaya, University of Maryland School of Pharmacy; C Daniel Mullins, University of Maryland School of Pharmacy; Nader Hanna, University of Maryland School of Medicine; Ian Michael Breunig, University of Maryland School of Pharmacy; Brian Seal, Bayer HealthCare Pharmaceuticals, Inc.; Fadia T Shaya, University of Maryland School of Pharmacy

**Presenter:** Fadia Shaya, Ph.D., M.P.H., Professor; Director Of Research And Outreach Cips, CIPS: Center for Innovative Pharmacy Solutions, University of Maryland School of Pharmacy, fshaya@rx.umaryland.edu

**Research Objective:** Multidisciplinary physician care has increased for many cancers yet little evidence exists for hepatocellular carcinoma (HCC). The study objective was to evaluate the association between multidisciplinary care and mortality in HCC.

**Study Design:** Multidisciplinary care was operationalized as the number of distinct specialists seen pre-treatment, including surgeons, radiology oncologists, intervention radiologists, hematologists/medical oncologists, gastroenterologists, and generalists. We built survival analysis models controlling for treatment, demographics, and clinical characteristics, and adjusted for selection/survival bias using inverse probability weighting and time-dependent covariates.

**Population Studied:** Non-transplant treated patients with an HCC primary diagnosis in 2000-07 were followed-up in SEER-Medicare data.

**Principal Findings:** Of 3320 treated HCC patients, 1323 (40 percent) saw one, 1250 (38 percent) saw two, and 747 (23 percent) saw three or more disciplines. Liver directed therapy and radiation was administered to a greater proportion of patients who encountered multiple specialists compared to those who saw a single discipline, who received more resection and chemotherapy. Multidisciplinary care was associated with stage 3 HCC and hepatitis C presence. In contrast, patients from rural areas and those diagnosed with stage 4 HCC saw fewer specialists prior to treatment. In time-dependent, propensity score adjusted survival analysis, patients who saw three or more disciplines had 10 percent (P=0.05) reduced mortality, compared to those who saw one discipline. When stratified by treatment received, patients on chemotherapy who saw three or more disciplines had 28 percent (P=0.002) reduced mortality.

**Conclusions:** Multidisciplinary care for non-transplant HCC patients was associated with reduced mortality, particularly among chemotherapy recipients. While adjusting for selection and survival bias, our study may not fully capture the confounding effects of referral patterns among specialists on treatment and survival.

**Implications for Policy, Delivery, or Practice:** Our findings provide evidence that may further support the development of models for accountable care organizations (ACOs).

**Funding Source(s):** Other, Bayer HealthCare Pharmaceuticals, Inc.

**Poster Session and Number:** B, #721

**Deconstructing and Measuring Hospital-Physicians’ Performance**

Prof. Ran Lachman, School of Business Administration, College of Management Academic studies; Shirley Shlefer

**Presenter:** Shirley Shlefer, Scholar, shlefer@012.net.il

**Research Objective:** Many studies have focused on the issue of measuring hospital-physicians’ performance, yet there is little consensus as to the operational definition and measurement of this opaque concept. The present study focuses on “unpacking” the specific dimensions comprising the construct of physician’s performance, and constructing an appropriate measure of it.

**Study Design:** The study was conducted in stages. First, an exploratory study of in-depth interviews with hospital-physicians was conducted to explore the elements they regard as comprising the construct of physician’s performance. Based on the interviews, 30 elements of performance were detected, of which a complex measure was developed. The measure is a self-reported questionnaire measuring dimensions of the medical care itself, relatedness to the patient, and the cooperation...
with the hospital stuff. This was reviewed and evaluated by other physicians, revised accordingly and validated by peer evaluation. The second stage was to empirically test the composite measure via an internet survey questionnaire, e-mailed through hospitals’ mailing lists to all their physicians. Responses were anonymous and voluntary. Different control variables were included and carefully examined for their effects.

**Population Studied:** The measure questionnaire was e-mailed to all physicians, of all specializations, working at 27 Israeli hospitals. 428 valid questionnaires were returned. The responding physicians were of 32 different medical specializations, at different stages of their medical career. The average age was 49, average work tenure was 16, and 41 percent were women.

**Principal Findings:** Factor analyses performed indicated that all performance items loaded on a single factor (scale reliability alpha is 0.89). Performing rotations analyses revealed two latent structures: items related to direct medical care (alpha is 0.84) and items on service and human relations at the hospital (alpha is 0.82). These two correlated moderately, and hence, it is justified to treat each as a separate scale. Unexpectedly, the items on professional update loaded together on a third separate factor. The self-reported performance scale, and the two sub-scales constructed, were validated vis-à-vis the control variables and found consistent with expectations.

**Conclusions:** Physician’s performance at the hospital is a concept comprised of two main dimensions: Direct Medical Care and Service and Human relations at the hospital. Each dimension includes a wide spectrum of different activities. Thus, a Valid and reliable measure was constructed that can be used to measure performance of Hospital-physicians. Unexpectedly, physicians’ perception of performance at the hospital doesn’t include professional updating.

**Implications for Policy, Delivery, or Practice:** Performance evaluation of hospital-physicians for organizational or research purposes should not be one-dimensional (i.e. the direct medical care). At the hospital setting, it should also include the service and human relations. When there’s a requirement to measure a physician’s performance at the hospital, it is recommended to use this study’s valid and reliable index.

**Funding Source(s):** Other

**Poster Session and Number:** B, #722

**HAC-POA Program: Unintended Consequences on Hospital Quality**

**Pamela Spain, RTI International**

**Research Objective:** The HAC-POA program prevents Medicare from paying more for a discharge when the patient had a hospital-acquired condition than it would have paid if the patient did not acquire the in the hospital. Stakeholders expressed concerns that unintended consequences could result from hospitals’ focus on HAC-POA program metrics and mandatory reporting, particularly with respect to quality of care. We analyzed associations between hospital HAC rates and quality performance measures on a subset of measures focused on infection prevention and control.

**Study Design:** Descriptive analyses were used to examine trends in two hospital-level HACs: catheter-associated urinary tract infections (CAUTI) and central line associated blood stream infections (CLABSI), and to examine their relationship to three Surgical Care Improvement Program (SCIP) scores (in which higher scores indicate higher quality): Surgery patients given the right kind of antibiotic within 1 hour before surgery; Surgery patients given the right kind of antibiotic; and Surgery patients whose preventive antibiotics were stopped within 24 hours. We tested whether mean SCIP infection prevention rates differed for hospitals that did or did not report a CAUTI or CLABSI using Satterthwaite test for unequal variances, and whether the relationship differed by hospital and market characteristics.

**Population Studied:** Our population was U.S. acute care hospitals in 2009 and 2010 paid under IPPS. The sample consisted of 1,978 hospitals that reported CAUTI or CLABSI and reported SCIP scores during the study period. Comparison hospitals included a sample of 1,558 hospitals that reported SCIP scores but not a CAUTI or CLABSI during the study period. HACs per 10,000 discharges were calculated using Medicare MedPAR claims. Hospital-level SCIP scores were obtained from the Inpatient Quality Reporting data. Hospital and market
characteristics were obtained from the Medicare Provider of Services and the Area Resource Files.

**Principal Findings:** HAC rates per 10,000 discharges were highest among academic medical centers and for-profit hospitals, and lowest among large and rural hospitals. Increases in CAUTI and CLABSI rates were noted in for-profit hospitals between FY09 and FY10, but these increases were not likely clinically relevant. For all hospitals, SCIP infection prevention scores were relatively high during the study period and were approximately five percentage points higher in hospitals that reported a CAUTI and/or CLABSI in FY2009 or FY2010 than in hospitals that did not. SCIP infection prevention scores increased during the study period irrespective of whether the hospital reported a CAUTI or CLABSI.

**Conclusions:** Infection prevention quality scores are higher in hospitals that have a clear focus on HAC reporting. However, there is a secular trend of increasing hospital quality, regardless hospital HAC status. Quality measure scores were high for most hospitals, so ceiling effects likely impact our ability to detect change over time and to evaluate the impact of the HAC-POA program on changes in hospital quality.

**Implications for Policy, Delivery, or Practice:** Research focusing on additional HACs and newer SCIP infection prevention measure scores is needed to examine whether hospital quality increases where there is a focus on HAC prevention, or decreases due to emphasis on the HAC-POA clinical areas at the expense of other quality performance areas.

**Funding Source(s):** CMS

**Poster Session and Number:** B, #723

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**What is the Measure of a Medical Home? A Comparison of the Two Leading Instruments**

Nancy Swigonski, Indiana University School of Medicine; Kavitha Nutakki, Indiana University School of Medicine; George Eckert, Indiana University School of Medicine; Bwana Brooks, Indiana University School of Medicine; Fitsum Baye, Indiana University School of Medicine; Marc Rosenman, Indiana University School of Medicine

**Presenter:** Nancy Swigonski, M.D., M.P.H., Pediatrics, Indiana University School of Medicine, nswigons@iupui.edu

**Research Objective:** As payers, policymakers, and practices seek to determine whether investment in the medical home model can improve the quality and efficiency of health care in the United States, there is a need for a valid means for measuring whether a particular pediatric practice has the capacity to serve as a medical home. Currently, there are two leading instruments in use to measure the “medical homeness” of practices. The objective of this research is to find the association between the Primary Care Medical Home (PCMH) self-assessment tool and the Medical Home Index (MHI). We hypothesized that scores on the PCMH tool would be correlated with scores on the MHI.

**Study Design:** Cross-sectional study

**Population Studied:** Primary care pediatric practices in the state of Indiana were randomly selected for this study (n=48). The lead physicians at each practice completed the PCMH self-assessment tool and the MHI. Each instrument is organized to measure “medical homeness” in 6 domains. The PCMH self-assessment tool domains include Enhanced Access & Continuity, Identify & Manage Patient Populations, Plan & Manage Care, Self-Care Support & Community Resources, Track & Coordinate Care, Measure & Improve Performance. The MHI domains include Organizational Capacity, Chronic Condition Management, Care Coordination, Community Outreach, Data Management and Quality Improvement. PCMH self-assessment tool has a possible range of 0-100 and MHI has a possible range of 25-200. We calculated means and standard deviations, and Spearman correlations to evaluate associations between the 36 (6x6) combinations of domains in the two instruments, and between the total scores. Statistical analysis used SAS 9.3.

**Principal Findings:** Total score on the PCMH self-assessment tool ranged from 18.3 to 99 with a mean of 60.1 (+ 17.6), whereas the MHI total score ranged from 50 to 148 with a mean of 94.3 (+ 22.4). The data management domain of the MHI was moderately correlated with four of the PCMH self-assessment tool domains – Enhance Access & Continuity (.4), Identify & Manage Patient Populations (.51), Track & Coordinate Care (.45), Measure & Improve Performance (.56), and the PCMH total score (.52). Other correlations were weak at best (correlation <.4). The correlation between the total scores of the two instruments was 0.29 with no statistical significance.
Conclusions: Contrary to our hypothesis, there is no significant association between the total scores of the two instruments. Although the two instruments purporting to measure “medical homeseness” may have some similarities, they are not measuring the same concepts.

Implications for Policy, Delivery, or Practice: The four major primary care associations (AAP, ACP, AFP & AOA) have agreed on the joint principles of a primary care medical home but it is unclear whether either of these existing instruments or combination of instruments best measures a medical home. It is unknown if higher scores on either instrument is linked to better child health outcomes. Widespread adoption of these instruments for pediatric practice may not be warranted.

Funding Source(s): AHRQ

Poster Session and Number: B, #724

Measures of Medical Home: Do They Have a Relationship with Child Health Outcomes?

Nancy Swigonski, Indiana University School of Medicine; Kavitha Nutakki, Indiana University School of Medicine; Jeannie McAllister, Center for Medical Home Improvement; Bwana Brooks, Indiana University School of Medicine; Fitsum Baye, Indiana University School of Medicine; George Eckert, Indiana University School of Medicine; Marc Rosenman, Indiana University School of Medicine

Presenter: Nancy Swigonski, M.D., M.P.H., Dept of Pediatrics, Indiana University School of Medicine, nswigonsi@iu.edu

Research Objective: The objective of this study is to test for the association of pediatric outcomes with scores on two leading assessment instruments – the Medical Home Index (MHI) and the Primary Care Medical Home self-assessment tool (PCMH-SAT). We hypothesized that those practices that scored high on both instruments would have the best outcomes.

Study Design: This is a cross-sectional analysis of claims and survey data. Practices were divided into 4 groupings based on whether their total scores on the two tools were above or below the mean. Outcomes were % of patients with ambulatory sensitive conditions. The inclusion / exclusion definitions of the AHRQ PDIs were used for the numerator; the denominator was number of patients in the practice. Since patients are clustered within provider groups, generalized estimating equation logistic models were used to explore the association between MHI (high, low), PCMH-SAT (high, low) and the interaction with outcomes.

Population Studied: Primary care pediatric practices in Indiana were randomly selected (n=50). The lead physician & staff at each practice completed the PCMH-SAT and the MHI. Using 2011 claims data from 5 sources, 92,801 patients matched to the 50 practices (mean 1,856; range 65-6913/site) were included in this study.

Principal Findings: 41% of patients were in practices that scored high on both the MHI and PCMH-SAT; 21% in practices that scored low on both instruments; 21% in practices with high MHI but low PCMH-SAT; and 17% had high PCMH-SAT with a low MHI. The overall ACS admission rates were 2.2% (n=1992) for asthma, 0.03% (n=26) diabetes, 0.54% (n=501) gastroenteritis (GE); 0.11% (n=102) perforated appendix; 0.54% (n=500) UTI. Scoring high on both PCMH-SAT and MHI was associated with higher likelihood of an admission for asthma (OR=24.4; CI 11.9-50.0), GE (OR=34.1; CI 15.1-76.9), and UTI (OR=12.6; CI 5.3-29.8) compared to high MHI but low PCMH-SAT, whereas scoring low on PCMH-SAT but high on MHI lowered the odds for admission for asthma (OR=0.2; CI 0.1-0.4), GE (OR=0.1, CI0.04-0.3), and UTI (OR=0.2, CI 0.1-0.5) compared to low on both MHI and PCMH-SAT. Diabetes acute admission was not associated with scores. High MHI decreased the odds of admission for perforated appendix (OR=0.6, CI 0.3-0.8).

Conclusions: Contrary to our hypothesis scoring high on both the PCMH-SAT and MHI is associated with poorer pediatric outcomes. High MHI scores with low PCMH-SAT scores had better pediatric outcomes as measured by ambulatory care sensitive conditions. The PCMH-SAT is a check of activities that are in place and is highly dependent on having an EHR; the MHI measures a progression of applied capacity focusing on children with special health care needs. Further analysis is needed to determine if any specific domains account for the outcomes.

Implications for Policy, Delivery, or Practice: It is unclear whether a single tool, i.e. the MHI or parts of the tool, should be recommended to measure pediatric medical homes. It is also unclear why practices that score high on both instruments have the poorest outcomes and whether that may be related to other practice or patient characteristics. Wide spread adoption of
the PCMH-SAT to measure pediatric medical homes is not warranted. 

**Funding Source(s):** AHRQ  
**Poster Session and Number:** B, #725

### Exploring Methodologic Challenges in using Multi-Source Data for Population Studies
Marc Rosenman, Indiana University School of Medicine; Nancy Swigonski, Indiana University School of Medicine; Kavitha Nutakki, Indiana University School of Medicine; Bwana Brooks, Indiana University School of Medicine; Nancy Swigonski, Indiana University School of Medicine

**Presenter:** Nancy Swigonski, M.D.,M.P.H., Dept of Pediatrics, Indiana University School of Medicine, nswigons@iupui.edu

#### Research Objective:
Regional health information exchanges allow the merging of disparate data sources. There is huge potential to use these data for population studies. However, the methodologic challenges are substantial and tend to be underappreciated. While the limitations of particular types of data (claims, electronic medical records) are often described, there are additional complexities in using multi-source data. We describe some of the challenges in measuring ER visit rates across populations attributed to different pediatric practices, based on data in one of the nation’s leading regional health information exchanges.

#### Study Design:
This is a retrospective analysis of data from several healthcare payers.

#### Population Studied:
Primary care pediatric practice sites in Indiana were randomly selected (n=50). Using claims data from 2011, we found 92,801 patients with at least one visit to a pediatrician in the study practices (mean 1856/practice; range 65-6913). The data sources included commercial and public healthcare payers and managed care entities.

#### Principal Findings:
Among the 92,801 patients, the gender distribution was female 49%, male 51%. Only one patient had a missing value for gender. The race distribution was African-American 13%, Asian <1%, Hispanic 9%, Other <1%, White 20%, and Missing 57%. At the practice site level, the range for missing race was <1% to 98%. Among 159 pediatricians in the 50 sites, the merged data contained 379 variants of the physicians’ names (mean 2.4/physician). To find the 379 variants, several thousand physician names in the database were reviewed by the investigators. Patients were attributed to sites based on an encounter record with a physician at the site, but some sites (e.g. in a large multi-site clinical practice) bill some encounters to the group practice rather than to the site where the visit occurred. ER visits may also be defined or coded differently by different institutions which send data into a health information exchange. In this study, the percentage of patients in the pediatric practices who visited the ER during 2011 ranged from 8% to 76%. Rates in the high end of this range may reflect an artifact of the multi-source data, which requires additional review of records to sort out. Among patients with a missing value for race, 11% visited an ER in 2011. Among patients with a stored value for race, 52% visited an ER in 2011.

#### Conclusions:
The observation above may reflect that the presence/absence of race data is a proxy for true differences between groups which are related to ER visit rates. But the observation may also reflect differences in data completeness (or other variation in data quality) across institutions, which contribute to artifactual results.

#### Implications for Policy, Delivery, or Practice:
As the nation moves toward accountable care organizations, it will be increasingly necessary to understand populations across disparate data sources. The practice of excluding records with missing data for pertinent variables may become increasingly problematic in analyses of data from multiple sources -- in health information exchanges, or in other national merged-data initiatives. Systematic bias is likely. Adherence to data standards helps but may not, in and of itself, prove sufficient for the challenges ahead.

**Funding Source(s):** AHRQ  
**Poster Session and Number:** B, #726

### Are Process Indicators Related to Outcomes?: A Focused Literature Review
Annette Totten, Oregon Health and Science University; Jesse H. Wagner, Oregon Health and Science University; David A. Dorr, Oregon Health and Science University

**Presenter:** Annette Totten, Ph.D.,M.P.A., Investigator, Oregon Health and Science University, annette.totten@gmail.com

#### Research Objective:
Although measurement of processes of care is advocated as a way to improve outcomes, the relationship between process indicators and important patient
outcomes is unclear. This review was undertaken to determine: 1. To what extent are process quality indicators related to important patient outcomes? 2. What factors affect the relationship between process indicators and outcomes?

**Study Design:** A focused literature review was conducted including a targeted search strategy, iterative abstract triage, and abstraction. Analyses included: a) description of evidence identified; b) distribution of positive, negative or lack of relationship across identified indicators and outcomes; c) comparison of relationships across subgroups based on condition, outcomes and measurement characteristics; and d) classification of factors that may affect these relationships.

**Population Studied:** MEDLINE articles published after 1990 examining the magnitude or nature of process indicator-outcome relationships for inpatient or outpatient care.

**Principal Findings:** 1,435 articles were identified by our search; 1,193 were excluded after abstract review, leaving 222. After full text review, 38 studies (34 individual studies and four systematic reviews) were included for analysis and an additional 13 articles were included to address the second research objective as they addressed factors that potentially affect the indicator-outcome relationships. Of 209 potential process indicator-to-outcome relationships examined, no relationship was found in most cases (61.6 percent), one third (33.8 percent) identified a positive or, as expected, relationship and very few (4.6 percent) had a negative or counterintuitive relationship (i.e., the indicator improved and outcomes worsened or vice versa). We then grouped studies by conditions addressed in at least four studies, outcomes, unit of analysis, and whether the indicator was a composite or individual measure. Studies of cancer treatment and overall hospital quality based on core measures have the most positive relationships (65.5 and 52.3 percent, respectively). Positive relationships are more common when the outcome is readmission rather than mortality (46.7 compared to 37.5 percent). Composite measures had higher levels of positive relationships (50.0 percent) compared to individual indicators (28.8 percent). Factors affecting the indicator-outcome relationships included factors specific to patients, such as severity of illness (8 studies), multi-factor risk adjustment (6), and age/sex (4); specific to clinicians/clinical care, including specialty (3) and care that included transitions across care settings (3); specific to the organization, such as size/ownership/location (15); and characteristics of the measures, such as a mismatch between the process and measured outcome (6) and documentation issues (5).

**Conclusions:** Less than half of the studies show any relationship between process indicators and important outcomes. Composite measures and measuring at larger units of analyses, such as hospitals, may strengthen the relationship. Many factors may impact these relationships.

**Implications for Policy, Delivery, or Practice:** Many current policies reward or penalize providers based on measured processes of care. The lack of a consistent relationship between process indicators and the outcomes they are intended to produce suggests room to improve measurement and policy. Increased consideration of factors that affect these relationships and incorporation of these into measurement may improve the ability to link process indicators to patient outcomes.

**Funding Source(s):** AHRQ

**Poster Session and Number:** B, #727

**Variation in U.S. Hospital Emergency Department Admission Rates by Clinical Condition, 2009**

Arjun Venkatesh, Yale University School of Medicine; Ying Dai, PhD, Yale New Haven Hospital/Center for Outcomes Research and Evaluation; Joseph S. Ross MD, MHS, Section of General Internal Medicine, Yale University School of Medicine and Yale New Haven Hospital/Center for Outcomes Research and Evaluation; Jeremiah D. Schuur MD, MHS, Department of Emergency Medicine, Brigham and Women’s Hospital; Roberta Capp MD, Robert Wood Johnson Clinical Scholars Program, Yale University School of Medicine; Harlan M. Krumholz MD, SM, Section of Cardiovascular Medicine, Yale University School of Medicine and Yale New Haven Hospital/Center for Outcomes Research and Evaluation

**Presenter:** Arjun Venkatesh, M.D., M.B.A., Robert Wood Johnson Foundation Clinical Scholar, Emergency Medicine and Internal Medicine, Yale University School of Medicine, arjun.venkatesh@yale.edu

**Research Objective:** As the source of over half of hospital admissions, emergency departments
(EDs) are an important contributor to hospitalization patterns. Variation in hospital admission rates have been described for decades, yet little is known about variation in ED admission rates across clinical conditions. We described 1) variation in ED risk-standardized admission ratio (RSAR) for frequently admitted conditions and 2) the degree of correlation between condition-specific ED RSAR within hospitals.

**Study Design:** Cross-sectional analysis of the 2009 National Emergency Department Sample (NEDS). The primary outcome was the condition-specific ED RSAR, calculated using hierarchical logistic regression models that account for patient age, gender, Charlson Comorbidity Index, insurance status, median zipcode income and a hospital intercept to account for clustering. Admissions were defined as patients either admitted to the same hospital or transferred to another hospital (1.4 % of sample) from the ED. The RSAR is a ratio of predicted to expected admissions for a hospital of similar case-mix: a ratio >1 indicates a higher than expected admission rate. We report two measures of variation: the variation ratio (ratio of the 75th to the 25th percentile hospital RSAR) and the coefficient of variation (ratio of the standard deviation to the mean RSAR) as a normalized measure of dispersion. We report Spearman correlation coefficients to assess the degree of within-hospital condition-specific ED RSAR correlation.

**Population Studied:** We studied 28,861,047 ED visits at 964 U.S. hospitals in 2009. We grouped visits based on discharge diagnosis using Clinical Classification Software (CCS) to identify the 15 most frequently admitted conditions. We excluded visits for patients with age <18y; those who died in ED, left AMA, or had unknown disposition status; and EDs with <25 visits per condition.

**Principal Findings:** Of 21,885,845 included ED visits, 4,470,105 (20.4%) resulted in admission. There was significant variation in condition-specific ED-RSAR with high model performance (C-statistic >0.8 for all conditions). Of the 15 most frequently admitted conditions, the five with the highest variation ratio and coefficient of variation were: mood disorders (variation ratio: 6.97, coefficient of variation: 0.81), nonspecific chest pain (2.68, 0.66), skin and soft tissue infections (1.82, 0.51), urinary tract infections (1.58, 0.43) and COPD (1.57, 0.33). Condition-specific, within-hospital ED RSAR correlations were uniformly positive (p<0.0001). Of the five most variable conditions, the RSAR for urinary tract infections and skin and soft tissue infections was most correlated (r>0.7) with correlations for all other pairs of conditions greater than 0.4 except for mood disorders, which was poorly correlated with all other conditions (r<0.3).

**Conclusions:** There is significant variation across the US in ED admission patterns for some of the most frequently admitted conditions. Except for mood disorders, hospital admission rates for the most variable conditions were highly correlated.

**Implications for Policy, Delivery, or Practice:** The measurement of condition-specific variation in admission rates indicates the need to evaluate the impact of ED care patterns on the efficient use of hospital resources. There appears to be a hospital effect that crosses conditions and suggests the need for interventions to address hospital practice patterns in addition to condition-specific care pathways to improve the value of hospital care.

**Funding Source(s):** NIH

**Poster Session and Number:** B, #728

**The Association Between Patient Reported Access to Care and Subsequent Cancer Prevention, Chronic Disease Management and Resource Utilization Outcomes**

Charlotte Ward, Massachusetts General Hospital; Jeffrey Ashburner, Massachusetts General Hospital; Wei He, Massachusetts General Hospital; Steven J. Atlas, Massachusetts General Hospital

**Presenter:** Charlotte Ward, M.P.H., Research Analyst, Massachusetts General Hospital, cward0@partners.org

**Research Objective:** Assessing patient experience, using surveys such as the Consumer Assessment of Healthcare Providers and Systems (CAHPS), is increasingly part of performance measurement efforts. Our goal was to examine the relationship between patient experience of care, using the Clinician and Group (CG) CAHPS survey and measures of quality of care and resource utilization within a large, academic primary care network.

**Study Design:** Subjects included adults seen in any of 13 practices affiliated with Massachusetts General Hospital who completed a CG-CAHPS survey after an outpatient visit between August, 2008 and December, 2010. CG-CAHPS individual item measures were assessed within
Implications for Policy, Delivery, or Practice: As the Affordable Care Act extends insurance coverage to 30 million new patients in 2014, access to primary care will become a greater challenge. In light of our findings and other studies, it will be vital that health care organizations focus efforts around increasing access to primary care.

Funding Source(s): No Funding
Poster Session and Number: B, #729

Quality Measurement: The Spectrum and Spectre of Alignment
Miriam Drapkin, Acting Deputy Executive Director, Center for Health Information and Analysis; Catherine West, Center for Health Information and Analysis; Cristi Carman, Senior Policy Analyst, Center for Health Information and Analysis

Research Objective: Although data on the quality of healthcare are more available today than ever before, providers, payers and policymakers frequently reference the lack of standardization in quality measures as an administrative burden and source of confusion for consumers of healthcare quality information. This study examines and quantifies the alignment (or lack thereof) in quality measurement among public and private improvement initiatives, incentive programs, and public reporting in Massachusetts.

Study Design: Through interviews with key program staff at state agencies and stakeholder organizations, we compiled a census of quality measures used in 11 major programs and initiatives. We validated our census of quality measures using databases that track state and national evaluation and endorsement of quality measures, detailed information on federal programs, and the literature on data source and healthcare domain provided by the measure developer. We compiled descriptive statistics detailing the current dispersion of quality measures across programs.

Population Studied: The programs surveyed fell into one of four categories: Incentive programs from large Massachusetts-based insurers, both commercial and the state employee insurance purchasing agent (the

Principal Findings: After adjusting for patient characteristics, only 1 item within the access composite was significantly associated with HEDIS outcomes and 3 items were significantly associated with resource utilization outcomes. Patients who reported seeing the physician within 15 minutes of their appointment time were less likely to receive a mammogram (RR, 0.98; 95% CI, 0.95-1.00; P = 0.04), and less likely to receive a colonoscopy (RR, 0.97; 95% CI, 0.95-1.00; P = 0.02). Patients who reported getting an urgent care appointment as soon as they needed it were less likely to have had a high cost imaging test completed (RR, 0.82; 95% CI, 0.71-0.94; P = .006) and were less likely to have an ED visit (RR, 0.87; 95% CI, 0.75-1.00; P = .06). Patients who reported getting a routine care appointment as soon as they needed it were less likely to have had a readmission (RR, 0.65; 95% CI, 0.47-0.91; P = 0.01). Patients who reported getting an answer to their medical question after regular office hours were less likely to have had a high cost imaging test completed (RR, 0.68; 95% CI, 0.49-0.92; P = 0.01).

Conclusions: Better access to outpatient care was associated with decreased subsequent high cost imaging tests, ED visits and hospital readmissions. However, patient reported access was not associated with subsequent chronic disease management outcomes, and was inversely associated with preventive cancer screening.

the access domain (5 items) by taking the percentage of respondents reporting the most positive response ('Always') for the question item, commonly referred to as the 'Top Box' score. Outcomes assessed through December 2011 included outpatient Healthcare Effectiveness Data and Information Set (HEDIS) items for cancer screening completion (breast, cervical and colorectal), screening and goal attainment measures for diabetes (LDL and HbA1c) and CAD (LDL), and resource utilization measures including high cost imaging tests (computed tomography, magnetic resonance imaging, and nuclear cardiology), emergency department (ED) visits, and inpatient admissions or readmissions. We examined the association among CG-CAHPS items and subsequent outcome measures using generalized linear models controlling for age, gender, race, insurance status, language and Charlson score. Population Studied: 16,760 patients who completed a CG-CAHPS survey and had at least one outcome measure.

Population Studied: The programs surveyed fell into one of four categories: Incentive programs from large Massachusetts-based insurers, both commercial and the state employee insurance purchasing agent (the...
Factors Associated with Quality and Costs for Elderly Patients with Acute Myocardial Infarction Who Present to Emergency Departments
Michael Wilson, Brigham and Womens Hospital and Harvard Medical School; Jonathan Welch, MD, M.Sc., Brigham and Women's Hospital and Harvard Medical School; Jeremiah Schuur, MD, MHS, Brigham and Women's Hospital and Harvard Medical School; Kelli O'Laughlin, MD, MPH, Brigham and Womcn's Hospital and Harvard Medical School; David Cutler, PhD, Harvard University and National Bureau of Economic Research

Presenter: Michael Wilson, M.D., Ph.D., Attending Physician, Instructor of Medicine, Emergency Medicine, Brigham and Womens Hospital and Harvard Medical School, mwilson18@partners.org

Research Objective: While high-quality care for acute myocardial infarction (AMI) depends upon high-quality emergency department (ED) care, little is known about ED and hospital factors that systematically affect ED quality and costs.

We sought to jointly measure the cross-sectional variation in quality of care and costs for elderly Medicare patients who presented to EDs nationwide with an AMI and to identify the hospital and ED characteristics associated with this variation. We considered several ED factors (board certification, years of clinical experience, chest pain patient volume) and hospital factors (cardiac specialization, academic status, hospital size, amount of technology available) as predictors of quality and cost.

Study Design: We identified our patient cohort using 2004-2005 Medicare inpatient and outpatient records. We developed two indicators of poor quality ED care: (1) AMI hospital admission and (2) out-of-hospital or ED death - both within 7 days of an ED discharge for a condition suggestive of cardiac ischemia. Costs were defined as Medicare hospital payments. We estimated the impact of ED and hospital characteristics on quality of care and costs using logistic and log-linear models with hospital random effects.


Principal Findings: 397,811 elderly AMI patients were included in the study, of whom
31,122 had a relevant prior ED visit: 4,707 were subsequently admitted and 26,415 died out-of-hospital. The median unadjusted hospital-level rate for any adverse outcome was 8.7% (IQ 3.6–33.3%). Hospital characteristics protective of adverse outcomes included higher ED chest pain acuity (OR = 0.22 for admission and 0.28 for death after ED discharge), emergency medicine board-certification (OR = 0.59 and 0.77), larger hospital size (OR = 0.44 and 0.52) and academic status (OR = 0.65 and 0.73). These characteristics were associated with higher costs as well.

Conclusions: The quality and cost of care for elderly patients presenting to EDs with AMI varies widely across hospitals and is related to the capabilities and staffing of the ED. The same hospital characteristics – EM board certification, chest pain acuity, hospital bed size, and academic status – predicted better care when using either quality indicator. Finally, all hospital characteristics associated with better ED care were associated with higher costs as well.

Implications for Policy, Delivery, or Practice: As more attention is placed on health care value, policy makers should recognize that increasing the quality of ED care may increase costs as well. In addition, given the surprisingly large number of deaths that occur soon after ED discharge, more research is needed to better understand this concerning issue.

Funding Source(s): NIH

Poster Session and Number: B, #731

Measuring the Health and Cost Consequences of Emergency Department Overcrowding
Michael Wilson, Brigham and Womens Hospital and Harvard Medical School

Presenter: Michael Wilson, M.D.,Ph.D., Attending Physician, Instructor of Medicine, Medicine, Division of Emergency Medicine, Brigham and Womens Hospital and Harvard Medical School, mwilson18@partners.org

Research Objective: Emergency department (ED) overcrowding is widely seen as having a negative impact on the quality of care offered in hospital based emergency departments. Despite the importance to health care policy makers and others of identifying and responding to such unintended consequences of ED overcrowding, the relative dearth of research about such consequences has left critical questions unanswered. This paper attempts to answer more conclusively some of the remaining questions about what health and cost of care consequences result from ED overcrowding.

Study Design: This is a cohort study of elderly patients admitted to the hospital from the ED with pneumonia, acute coronary syndrome (ACS) and sepsis. The primary independent variable in this study is the presence of ambulance diversion, which is used as a proxy for ED overcrowding. The types of ambulance diversion used in this study are yellow alert (when the ED is unable to safely care for more ED patients) and red alert (when the hospital does not have additional beds with telemetry capabilities). We estimated the impact of ED overcrowding on 30-day in-hospital mortality and hospital costs using logistic and log-linear models with hospital fixed effects.

Population Studied: Medicare fee-for-service enrollees admitted to the hospital from an ED in the state of Maryland between January 2002 and December 2005

Principal Findings: ED overcrowding is a pervasive problem in the state of Maryland with hospitals spending 44.6% of the days of the year with some time on yellow alert, corresponding to 12.8% of their entire operating time. These results vary widely between hospitals; Maryland hospitals spend between 0.3% to 87.1% of the days, and 0.2% and 40.2% of the hospital’s total operating time on yellow alert.

Sepsis patients in the state of Maryland exposed to yellow alert have a 7.99% (p=0.03) increase in mortality, ranging from 1.65% (p=0.72) to 36.20% (p=0.10) with increasing exposure to yellow alert. For sepsis patients in the Baltimore City market, the increase in mortality is 12.14% (p=0.13). There are no significant differences between patients (in terms of the number or type of comorbidities) present on days when the ED is on yellow alert, and the days the ED is not on yellow alert. This suggests that endogeneity is not likely responsible for the association.

Mortality rates for ACS and pneumonia patients are not changed as a result of exposure to ED overcrowding.

Conclusions: Even in a state with a well-developed emergency medical services system, ED overcrowding is a pervasive problem and one that leads to excess mortality for patients at most risk of harm. While ambulance diversion serves as a way for overcrowded emergency departments to limit the number of new patients exposed to these conditions, it is not an adequate solution to the problem. Patients are still harmed as this study demonstrates.
**Implications for Policy, Delivery, or Practice:**
These results will allow clinicians to focus their efforts on subsets of patients most at risk of harm when the ED is overcrowded and hopefully encourage local and national policymakers to continue to work toward solutions to this pervasive national problem.

**Funding Source(s):** NIH

**Poster Session and Number:** B, #732

**Associations between Quality Reporting and Perceived Quality of Care: Findings from the Survey of the Health of Wisconsin**
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**Presenter:** Lauren Wisk, B.S., Doctoral Candidate, Department of Population Health Sciences, University of Wisconsin Madison, wisk@wisc.edu

**Research Objective:** We sought to look at the impact of system level quality reporting on patient perceived quality of care using a population-based, representative sample of the adult Wisconsin population.

**Study Design:** Data are from the 2008-2011 Survey of the Health of Wisconsin (SHOW) and Wisconsin Collaborative for Healthcare Quality (WCHQ). Our sample includes 2,183 adults who were matched to their usual provider, 18 of which participated in the WCHQ. WCHQ provider performance on four preventive care and one chronic care quality reporting metrics were used to determine WCHQ provider rankings (low, medium, high performing). Provider type and rankings were used to predict patient report of quality of care and satisfaction with care, both for the last encounter and overall during the last year, adjusting for patient gender, age, educational attainment, health insurance status, chronic condition status, and receipt of nine preventive services based on patient eligibility.

**Population Studied:** Wisconsin adults aged 18 to 74.

**Principal Findings:** Individuals who received more services rated the quality of care at their last encounter more favorably than did individuals who received fewer services, irrespective of whether or not those services were necessary. Those with better performing providers were both more likely to rate their last encounter favorable and unfavorably, while those with worse performing providers were more likely to feel neutral about their last encounter. Individuals with no usual provider were more likely to rate their last encounter poorly but less likely to say that they were dissatisfied with their care overall. Provider ranking were not associated with ratings of care overall. Patient age, education, and health insurance status were the strongest predictors of overall ratings of care.

**Conclusions:** Our results suggest that patients demonstrate better satisfaction with the quality of their care when they receive a greater number of services, even if those services are not medically necessary. Patients appear to have more extreme responses, both favorably and unfavorably, to providers with better performance on quality metrics; while providers with worse performance are viewed more neutrally by patients.

**Implications for Policy, Delivery, or Practice:**
As patient respond favorably when they receive more services, irrespective of medical necessity, and better providers are rated more extremely than worse providers, patient satisfaction appears to disincentivize efficient care. Both patient reported quality of care and objectively determined quality of care are important metrics to evaluate provider performance and their striking discrepancy suggest then need to reconcile the conflicting measures when trying to assess quality in a holistic sense.

**Funding Source(s):** NIH

**Poster Session and Number:** B, #733

**Understanding the Role of the Professional Practice Environment on Quality of Care in Magnet and Non-Magnet Hospitals**
Amy Witkoski Stimpfel, University of Pennsylvania; Matthew McHugh, PhD, JD, MPH, RN, FAAN, University of Pennsylvania

**Presenter:** Amy Witkoski Stimpfel, PhD, RN, Post Doctoral Research Fellow, Center for
Research Objective: Magnet hospitals are recognized for nursing excellence and retention of nursing staff. Research suggests that patient outcomes, such as mortality and failure-to-rescue, are superior in Magnet hospitals. A supportive professional practice environment for nurses, such strong nursing leadership, nurses’ who participate in hospital affairs, and have good relationships between nurses and physicians, may explain part of this Magnet effect on outcomes. This study explores the relationship between Magnet hospital status and quality of care. A single, nurse-reported item of quality of care was used, which has been shown to be a reliable measure of objective patient outcomes. We explore not only the direct effect of Magnet on quality of care using propensity score matching techniques but also the indirect effect of the practice environment on quality of care using mediation analyses.

Study Design: This study was a retrospective secondary analysis of cross-sectional data that were linked through common hospital identifiers: The Multi-State Nursing Care and Patient Safety Study (2006-2007), which studied nursing care in hospitals, the American Hospital Association Annual Survey (2006), which provided structural characteristics of the hospitals and data from the American Nurses’ Credentialing Center (2006-2007), which indicated which hospitals were Magnet recognized. Multivariate linear regressions were modeled before and after propensity score matching (greedy 1:1 nearest neighbor matching) to assess the effect of Magnet on quality of care. Next, a mediation model was constructed to assess the indirect effect of the practice environment on quality of care. All analyses were conducted at the hospital-level.

Population Studied: The analytic sample included 551 hospitals from California, New Jersey, Pennsylvania and Florida. There were 56 Magnet hospitals and the remaining 495 hospitals were not Magnet.

Principal Findings: Prior to propensity score matching, Magnet hospitals were associated with an additional 10% of nurses reporting excellent quality of care. This relationship persisted even after propensity score matching and adjustment for hospital structural characteristics, showing an additional 7% of nurses’ reporting excellent quality of care in Magnet recognized hospitals. The mediation model indicated that the total effect of Magnet on quality of care was 7.2%, that is, Magnet hospitals had an additional 7.2% of nurses reporting excellent quality of care. The mediating effect (or indirect effect) of the practice environment on quality of care was 5.2%. However, when holding the practice environment constant, the Magnet effect on quality of care was not significant.

Conclusions: Nurses’ reports of quality of care were significantly associated with Magnet recognition in matched samples of Magnet and non-Magnet hospitals. The quality of the professional practice environment mediates the relationship between Magnet and quality of care.

Implications for Policy, Delivery, or Practice: One feature of Magnet hospitals, a professional practice environment that is supportive of nursing, plays a role in explaining why Magnet hospitals have better nurse reported quality of care. Improving these features has the potential to enhance patient quality, regardless of Magnet status.

Funding Source(s): NIH

Poster Session and Number: B, #734


Edwin Wong, Department of Veterans Affairs; Chris L. Bryson, MD MS, Department of Veterans Affairs, Health Services Research and Development; Paul L. Hebert, PhD, Department of Veterans Affairs, Health Services Research and Development; Chuan-Fen Liu, PhD, Department of Veterans Affairs, Health Services Research and Development

Presenter: Edwin Wong, Ph.D., Postdoctoral Fellow, Health Services Research and Development Service, Department of Veterans Affairs, eswong@uw.edu

Research Objective: Despite existing evidence demonstrating clinical benefits of oral hypoglycemic agents (OHAs) for treating diabetes, patients generally exhibit poor adherence to OHAs. Prior studies show that adherence to OHAs is associated with lower healthcare costs. However, the presence of unobserved confounding variables that affect both adherence and costs may result in underestimating the true impact of OHA adherence. This study assessed the relationship between OHA adherence and total healthcare costs.
costs among patients using an instrumental variables (IV) approach to address unobserved confounding.

**Study Design:** This is a retrospective cohort study in the Veterans Affairs Healthcare System (VA) among primary care patients with diabetes who were randomly selected for the 2007 VA Survey of Health Care Experiences of Patients (SHEP) using VA administrative data. We calculated total VA healthcare costs in fiscal year (FY) 2007. We measured OHA adherence using the medication possession ratio (MPR) indicating the proportion of days covered in FY2007. We then classified patients as adherent if MPR >= 80%. We employed an exponential conditional mean model to address positive skewness in the distribution of costs. Adjustment variables included patient demographics, baseline health status, comorbidity and the number of prior VA encounters. We applied an IV procedure to address the presence of unobserved confounding variables that affect both OHA adherence and costs. We constructed a binary variable indicating whether patients responded to the 2007 SHEP as an IV. We also analyzed whether the impact of adherence differed across the distribution of costs using IV quantile regression. For all regression models, we calculated the average incremental effect for adherence.

**Population Studied:** The study sample consisted of 40,094 VA primary care patients with diabetes who were users of OHAs in FY2006 and received the 2007 SHEP. Among the study sample, 62% responded to the SHEP survey. The sample was weighted to represent the population of all VA diabetes patients taking OHAs in FY2006.

**Principal Findings:** Total costs ranged from $6 to $494,206. On average, costs were lower among adherent patients compared to non-adherent patients ($5,792 vs. $6,817, p<0.001). After covariate adjustment, adherence to OHAs decreased costs by $1,298 (p<0.001). After applying IV, OHA adherence decreased costs by $9,561 (p=0.001). At the 95th percentile of costs, the IV estimate for adherence was -$28,235 (p=0.074), but was smaller in magnitude and not statistically significant at lower quantiles.

**Conclusions:** Consistent with prior studies, adherence to OHAs was associated with lower healthcare costs. Our results suggest that after accounting for unobserved confounding, estimates of the average impact of OHA adherence on total healthcare costs were seven times larger than non-IV estimates. Furthermore, cost decreases associated with improved adherence appear to be concentrated among high cost patients.

**Implications for Policy, Delivery, or Practice:** Assessment of the economic value of interventions to improve OHA adherence should carefully consider heterogeneity in treatment effects. Interventions targeted to high cost patients may yield the highest value.

**Funding Source(s):** VA

**Poster Session and Number:** B, #735

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**Efficiency of Developmental Screening and Follow-up Measures in the Pediatric Population**

Donna Woods, Northwestern University; Ramesh Sachdeva, MD, MPH, MBA, Medical College of Wisconsin; Lindsay DiMarco, MPH, Northwester University; Nicole Muller, BS, Northwestern University; Fan Tait, MD, American Academy of Pediatrics

**Presenter:** Donna Woods, Ph.D., Ed.M., M.A., Assistant Professor, Feinberg School of Medicine, Northwestern University, woods@northwestern.edu

**Research Objective:** Developmental screening and appropriate follow-up is a critical aspect of pediatric care. Between 12-18% of US children may have a developmental and behavioral problem yet fewer than 2% of children with developmental delays, from 0-2 years of age, will receive necessary early intervention services. Our research objective was to assess the gaps in the framing and specification of existing developmental screening and follow-up quality measures to improve pediatric care.

**Study Design:** A rigorous literature review was conducted in PubMed and Pediatrics using search terms “pediatric developmental screening measures”, “pediatric developmental follow-up measures”, “developmental delays” and “developmental disorders”. Articles were retained if they were published in a well-respected, peer-reviewed, scholarly journal and were published in the last 12 years. Sources such as the CDC, Encyclopedia of Children’s Health, Bright Futures, Early Intervention, CMS, NASHP, CAHMI, EPSDT, IL-HFS, The Commonwealth Fund, NCQA, NQMC, the CHIPRA Initial Core Measures, and Smart Start were also reviewed with the goal of determining current existing measures and gaps in measurement.
**Population Studied:** Literature related to developmental screening and follow-up quality metrics and care for children 0-3 years of age. Publications were stratified by age group, race, ethnicity, and language to assess differences.

**Principal Findings:** Current guidelines recommend the use of standardized tools based on the current HEDIS developmental screening measure was implemented. This literature review revealed that only about 20% of physicians use standardized developmental screening tools, despite supporting evidence and national recommendations for their use. Further, data from large-scale, national research indicate that only 9% of eligible children born in 2001 received Early Intervention (EI) services at 12 months and only 12% of eligible children received EI services at 24 months underscoring the need for effort to improve this area of pediatrics. In addition, disparities in developmental screening and follow-up existed by race/ethnicity, insurance status, and income level. States difficulty in implementing the existing measures has been highlighted by a NASHP report that indicates existing measures are not functioning as intended due to the challenge of chart review requirements. Reliance on parent-reported surveys and the inability to distinguish between validated and non-validated tools also affect the functioning of existing measures.

**Conclusions:** Despite national recommendations and supporting evidence, standardized, validated developmental screening tools are infrequently used by pediatricians. Furthermore, up to 70% of developmental delays may not be diagnosed until children enter school, which means by the time kindergarten begins, these children have already fallen behind their peers. As developmental screening is a crucial part of pediatrics and existing measures are not functioning as intended, new measures must be developed based on current best evidence to improve the quality of care provided.

**Implications for Policy, Delivery, or Practice:** Delivering quality pediatric care for developmental delays includes early detection, early intervention, and treatment during the critical early years of childhood in which detection and intervention can have greatest impact. Given the importance of developmental screening and follow-up, it is recommended that quality measures be developed based on current best evidence and specified in a manner that can be applied by State Medicaid programs and other payers/purchasers.

**Funding Source(s):** No Funding

**Poster Session and Number:** B, #736

**Robust Approaches to Profiling Hospitals on Costs of Care Delivery**

Steven Zeliadt, University of Washington; Chuan Zhou, PhD, Seattle Children's Research Institute; Michael K. Chapko, PhD, VA Puget Sound Health Care System; Evercita C. Eugenio, MS, VA Puget Sound Health Care System; Jonathan L Wright, MD MS FACS, VA Puget Sound Health Care System; Michael P. Porter, MD MS, VA Puget Sound Health Care System; Xiao-Hua Andrew Zhou, PhD, VA Puget Sound Health Care System

**Presenter:** Steven Zeliadt, Ph.D., M.P.H., Research Assistant Professor, Health Services, University of Washington, szeliadt@u.washington.edu

**Research Objective:** Robust methods to profile hospitals based on costs and efficiency are needed to accurately identify facilities with outlier costs of care delivery. Our objective is to examine the performance of including hospital-level shrinkage estimators for cost models.

**Study Design:** We compare the approach recommended by Centers for Medicare and Medicaid Services (CMS), which incorporates hospital-level variability through a random effect estimator in order to stabilize measures of hospital performance with traditional observed/expected ratios for risk-adjusting using patient characteristics. The primary outcome is each cancer patient's cost profile in the 12 month period following diagnosis. Costs were identified from internal VA accounting databases and a linkage with Medicare to capture costs for dual-eligible Veterans. All costs were geographically standardized into 2008 dollars using Medicare wage-adjusters. Patient characteristics included cancer pathology information at time of diagnosis, initial treatment type, other comorbidity, and demographic and socioeconomic characteristics. Hospitals with fewer than 25 patients were excluded. Cost models included hierarchical linear regression, hierarchical linear regression with log-transformed costs, and gamma generalized linear model with a log-link.

**Population Studied:** The study included 28,672 Veterans newly diagnosed with prostate cancer between 2005 and 2007 who were treated at
106 Veterans Affairs Medical Centers (VAMCs). Veterans were identified from the VA Central Cancer Registry.

**Principal Findings:** The mean patient age was 66.8 years and 34.0 percent of Veterans were identified as dual-eligible, having utilized at least 50 dollars in Medicare coverage in the year prior to diagnosis. Mean hospital volume was 367 patients over the three year study period, with a minimum of 38 and maximum of 923. The mean total cost in the treatment period following diagnosis was 28,003 dollars (SD 28,695) and the median cost was 21,963 dollars. The average cost across VAMCs ranged from 12,791 dollars at the lowest-cost facility to 53,693 dollars at the facility with the highest average cost. Both the CMS hierarchical approach and the traditional O/E ratio approach identified 35 VAMCs with costs statistically below national average and 22 VAMCs with costs statistically above the national average after accounting for variation in patient characteristics across VAMCs. When costs were logged, both approaches identified a total of 36 high-cost outliers. The CMS approach identified 7 outlier VAMCs costs that were more than 25 percent below the national average, and 8 outlier VAMCs above the national average, while the traditional approach identified 4 additional below average outliers and the same 8 above average outliers.

**Conclusions:** A hospital-specific hierarchical approach helps ensure that each hospital is compared to a population with the same case-mix, helping protect against extrapolation outside of the hospital’s case-mix. However, in the cost-setting, appropriately accounting for specific patients with extreme outlier costs appears to be more important than protecting against inefficient case-mix adjustment.

**Implications for Policy, Delivery, or Practice:** Generally, all approaches identify the same high- and low-performing facilities. Including shrinkage estimators when profiling hospitals on costs may be important when absolute precision is needed in profiling facilities, potentially when a determination of outlier status would impact a facility’s reimbursement level.

**Funding Source(s):** VA

**Impact of Patient Satisfaction Ratings on Clinicians’ Practice Satisfaction and Clinical Care: Findings from Multispecialty Clinician Survey**

Aleksandra Zgierska, University of Wisconsin; David Rabago, University of Wisconsin, School of Medicine and Public Health; Michael Miller, University of Wisconsin, School of Medicine and Public Health

**Presenter:** Aleksandra Zgierska, M.D., Ph.D., Assistant Professor, Family Medicine, University of Wisconsin, alexsandra.zgierska@fammed.wisc.edu

**Research Objective:** Patient satisfaction ratings can be a driving force behind positive changes in health care delivery. However, they may paradoxically also promote inappropriate clinical practices. The study goal was to evaluate the self-reported effects of patient satisfaction ratings on clinicians and clinical care.

**Study Design:** An online survey developed by a state medical society in the U.S. was sent to all active society members in 2012. The 26 quantitative and qualitative items asked clinicians about the impact of patient satisfaction surveys on their job satisfaction and practice patterns. Descriptive statistics described cross-sectional quantitative data; standard qualitative research methods identified themes in the qualitative data.

**Population Studied:** Physicians.

**Principal Findings:** Among 155 respondents, the majority (85 percent) were male physicians practicing in diverse clinical settings: 45 percent in solo or private practice, 43 percent in hospital and 15% in academia. The majority of respondents (57 percent) were emergency department physicians, followed by primary care (16 percent) and a variety of medical and surgical specialties. Ninety-six percent of respondents indicated that patient satisfaction surveys were implemented in their institutions, with 59% reporting the results of surveys were tied to their financial compensation. Seventy-eight percent reported the surveys moderately or severely affected their job satisfaction. Twenty-eight percent considered quitting their current jobs and twenty eight percent considered leaving the medical profession. Twenty percent reported that their employment had been threatened on at least one occasion because of patient satisfaction surveys. When asked about general impact on clinical practice, almost half felt they provide inappropriate patient care.
sometimes (34 percent) or often (14 percent) because of patient satisfaction scores. Approximately half reported inappropriate opioid and antibiotic prescribing, and ordering inappropriate tests, thirty-four percent reported unnecessarily admitting patients to the hospital, and eighteen percent acknowledged performing procedures they were not needed in direct response to patient satisfaction surveys. None reported unnecessarily operating on a patient because of the patient satisfaction surveys. Among fifty-two clinicians who provided qualitative responses, only three described using patient satisfaction survey results to make positive practice changes.

**Conclusions:** These state-level data suggest patient satisfaction surveys may lead to physician job dissatisfaction, attrition and inappropriate clinical care, and have policy and clinical practice level implications. The most worrisome issue raised by these data is that the culture surrounding the use of patient satisfaction surveys may promote care that is not evidence-based in pursuit of higher scores, threatening patient outcomes.

**Implications for Policy, Delivery, or Practice:** These findings are concerning, especially in the context of widespread and progressive utilization of patient satisfaction ratings as an integral element of quality of care metrics, and call for further investigation of the appropriate, paced introduction of such measures into clinical care.

**Funding Source(s):** Other, University of Wisconsin

**Poster Session and Number:** B, #738
those of the privately insured in the descriptive statistics (ranging from 2.8% to 16.7% lower (p<.05)), however the rates were generally insignificantly different after controlling for state effects and sociodemographic variables. However, the uninsured were significantly less likely than those on Medicaid (and private insurance) to receive preventive care both in the descriptive statistics and in the multivariate models after controlling for state and sociodemographic characteristics. In the descriptive statistics, the effect size varied from a low of 9.6 percentage points for colorectal cancer screening to a high of 34.5 percentage points for breast cancer (p<.05 for all differences). In the multivariable model, the effect size varied from a low of 8.0 percentage points for colorectal cancer screening to a high of 24.8 percentage points for breast cancer (p<.01 for all five coefficients).

**Conclusions:** Our results suggest that the Medicaid expansion will substantially increase the use of USPSTF recommended preventive care services among new Medicaid enrollees.

**Implications for Policy, Delivery, or Practice:** Our findings suggest that the newly enrolled individuals will still have lower raw rates of use of preventive care – as do current Medicaid enrollees – but that these differences will be caused by factors other than insurance coverage.

**Funding Source(s):** NIH

**Poster Session and Number:** A, #417

**Patterns of Outpatient Drug Utilization and Expenditure in State Medicaid Programs**

Brian Bruen, George Washington University; Katherine Young, Kaiser Family Foundation

**Presenter:** Brian Bruen, MS, Lead Research Scientist & Lecturer, Department of Health Policy, George Washington University, bkbruen@gwu.edu

**Research Objective:** This study assesses prescription drug utilization and expenditure trends in Medicaid over the 2000 to 2012 period, at the aggregate, individual, and drug class levels.

**Study Design:** A retrospective, cross-sectional analysis of prescription drug utilization and expenditure trends in state Medicaid programs. We look at trends both nationwide and by state. These analyses draw on multiple data sources including Form CMS-64 (expenditure data) from the Centers for Medicare & Medicaid Services (CMS), Medicaid drug utilization data reported to CMS by states, and Medicaid Statistical Information System (MSIS) person-level summary data.

**Population Studied:** Our analyses focus on the number of outpatient prescription drugs and payments made to retail pharmacies by Medicaid programs. We provide some estimates for drugs provided by Medicaid managed care plans outside the claims system. Provider-administered drugs (e.g., those administered in a hospital or clinical setting are generally excluded, with the exception of drugs that the patient has independently acquired and subsequently brings in to the provider.

**Principal Findings:** Previous research indicated that patterns of outpatient prescription drug use and expenditures changed significantly when Medicaid-Medicare “dual eligible” beneficiaries moved to Part D in 2006. Between 2002 and 2005, prescription drug spending (after rebates) comprised about 10 percent of total Medicaid spending. However, between 2006 and 2009, it comprised only about 5 percent of total Medicaid spending. Prescription drug spending (including Medicaid) has increased at historically low rates in recent years, in part due to a shift to greater use of generic drugs. In FFY 2007, Medicaid programs spent $471 per capita on prescription drugs for beneficiaries who received at least one service, while in FFY 2009 they spent $488 per capita. Overall patterns of utilization and expenditure across drug classes have been relatively stable in recent years. Mental health and behavioral treatments continue to account for large shares of Medicaid prescription drug spending and corresponding large shares of utilization. Treatments for chronic conditions such as hypertension, high cholesterol, and diabetes also continue to contribute to significant amounts of utilization and expenditures. “Specialty” and biologic drugs account for a small percentage of prescriptions but a rapidly growing share of Medicaid drug expenditures.

**Conclusions:** As state pharmacy administrators continue to face state budget deficits, various options for obtaining pharmacy savings are currently under consideration in their states. This analysis provides needed comparative information about levels of utilization and cost of Medicaid prescription drug benefits that can help to inform these decisions. The implementation of Medicaid expansions authorized by the Affordable Care Act could alter the profile of patients and medication needs in Medicaid
Poisson models estimate whether post-outpatient visits. Individual (ED) visits, inpatient hospitalizations, and categories of utilization: emergency department use, however, suggests that this reduction in hospitalizations may reflect the increased ability to refer to specialty care, or may reflect an improvement in the health of the previously indigent population entering the program with a high utilization profile and high rates of chronic disease. They substantially increased use of the emergency department, mostly for ambulatory care sensitive reasons. Hospitalizations for this group showed remarkable decline, as did preventable hospitalizations. The large increase in the number of outpatient visits is driven by increased use of specialty care, with smaller increases in primary and preventive care. These results from this high need formerly indigent population await comparison to our broader urban and rural analytic samples. 

Conclusions: The BadgerCare Core Plan appears to have had a significant effect on the utilization of health care by a specific group of low-income, uninsured, childless-adults – a previously indigent population entering the program with a high utilization profile and high rates of chronic disease. They substantially increased use of the emergency department, mostly for ambulatory care sensitive reasons. 

Implications for Policy, Delivery, or Practice: Wisconsin’s experience covering high-need uninsured childless adults offers lessons for the upcoming ACA expansion. Public insurance coverage has the potential to reduce hospitalizations, while increasing utilization of ambulatory specialty care. The reduction in hospitalizations may reflect the increased ability to refer to specialty care, or may reflect an improvement in the health of the previously uninsured population. Increases in emergency department use, however, suggests that this population still faces challenges with access to appropriate outpatient care.

Funding Source(s): RWJF
Poster Session and Number: A, #419
The Effect of Public Insurance Eligibility for Childless Adults on Their Labor Supply
Thomas DeLeire, University of Wisconsin-Madison; Laura Dague, Texas A&M University; Lindsey Leininger, University of Illinois Chicago

Research Objective: Assess the labor market impacts of expanding health coverage to a group not previously covered by state-sponsored programs -- low-income adults without dependent children ("childless adults") -- a significant target for coverage expansion under the ACA.

Study Design: We exploit a policy reversal in Wisconsin, during which a major public insurance expansion for childless adults was implemented and, several months later, abruptly frozen. Individuals who applied after the program, BadgerCare Core Plan, was frozen were placed on a waitlist. Social security numbers from enrolled and waitlisted Core Plan applicants were merged with records from Wisconsin's unemployment insurance (UI) system. UI data track quarterly earnings and employment at all covered firms. We account for UI's omission of self-employed firms using the Current Population Survey and the American Community Survey to analyze trends in self-employment among the target population over the study period.

We use two analytic methods to compare the labor supply of Core Plan enrollees with applicants placed on a waitlist. A regression discontinuity design compares the labor supply of those who applied in the 10 days prior to the enrollment freeze, with the labor supply of those who applied in the 10 days after the enrollment freeze. The second analysis employs propensity score weighting, making the Core group and waiting list groups as comparable as possible based on observable characteristics, then measuring differences in differences. This approach uses the entire sample and is thus relatively better-powered, while the regression discontinuity approach exhibits superior internal validity.

Population Studied: The study population includes 94,160 uninsured childless adults with incomes below 200% of the federal poverty level. The two analytic groups include 36,971 Core Plan members who enrolled in the program prior to the October 9, 2009 cut-off date, and 57,189 persons on the wait list who applied after the cut-off date and were placed on the wait list.

Principal Findings: Childless adults enrolled in public insurance were 3.9 percentage points less likely to be employed 29 months later (adjusting for observable differences), relative to those on the wait list. Those individuals who applied and gained eligibility for the public insurance program in the days just prior to the cut-off were fully 10 percentage points less likely to be employed 29 months later, compared to those who applied in the 10-days following the cut-off and thereby just missing their enrollment opportunity.

Conclusions: The availability of public insurance coverage for childless adults leads to reductions in their participation in the workforce. It may reduce their need for private employer-sponsored insurance and thus their incentive to remain in or return to the workforce.

Implications for Policy, Delivery, or Practice: This study provides the first plausibly causal estimates of the effect of public insurance eligibility on the employment and earnings of non-elderly, non-disabled adults without dependent children ("childless adults"). This population constitutes the predominant share of persons who will gain coverage under the ACA-related Medicaid expansions. The labor supply reduction that results from their coverage may be more pronounced than effects previously reported for low-income parents who, compared to childless adults, have relatively greater labor force attachment.

Funding Source(s): N/A, UC Davis Poverty Center / Upjohn Institute

Poster Session and Number: A, #420

Coverage of Medicaid Preventive Services for Adults - A National Review
Elizabeth Gray, The George Washington University; Sara Wilensky, The George Washington University

Presenter: Elizabeth Gray, J.D., Research Associate, Health Policy, The George Washington University, egray11@email.gwu.edu

Research Objective: The Patient Protection and Affordable Care Act (ACA), requires Medicare and many private insurance plans to cover United States Preventive Services Task Force (USPSTF) A and B rated services without cost sharing requirements. Medicaid programs are not required to provide this coverage, but the ACA includes a small financial incentive for
states to do so. This study evaluates Fee-For-Service (FFS) and managed care Medicaid coverage across the country for 24 of the USPSTF A and B rated services that focus on care for non-pregnant adults.

**Study Design:** This study reviewed coverage policies in Medicaid programs in all 50 states and the District of Columbia. The initial review included examination of publicly available documents such as provider manuals, policy bulletins, state statutes and regulations, and managed care contracts. Follow-up interviews were conducted with Medicaid officials to clarify or fill-in missing information.

**Population Studied:** Medicaid programs.

**Principal Findings:** There is significant variation in Medicaid coverage for preventive services for adults. This variation includes whether a service is covered as well as whether prior authorization or cost sharing requirements exist. Given how states present information, it is often difficult to ascertain exactly which preventive services are covered. For example, several states cover unspecified adult exams based on generally accepted standards of care. Confusion exists among Medicaid personnel regarding the difference between preventive care and medically necessary care and this confusion adds to the difficulty of understanding which services are covered and under which circumstances. There was less variation than expected between FFS and comprehensive managed care program coverage. Personnel in most state Medicaid programs were not aware of or had not evaluated the cost-benefit of adding the USPSTF A and B rated services in exchange for the financial incentive included in the ACA.

**Conclusions:** Given the variation in coverage and difficulty in assessing some Medicaid programs, it is difficult to make broad generalization about coverage of preventive services for adults. This is often true when discussing the Medicaid program because state variation is a hallmark of Medicaid. Even so, the results of this study provide both information not previously available about coverage of adult preventive services as well as concrete steps for policymakers to consider in this area.

**Implications for Policy, Delivery, or Practice:** There are opportunities for policymakers at all levels to improve coverage of adult preventive services. Federal official could fill in knowledge gaps regarding this ACA Medicaid provision as well as provide guidance so states understand how federal officials will determine whether they are complying with the requirements. State officials have several opportunities to clarify whether and when adult preventive services are covered in their program. In addition, access to preventive services is more likely in states with a well-adult exam instead of relying on providers to add preventive services in acute care visits. Policymakers and advocates on all levels can work to clarify the difference between preventive care and medically necessary care that may cause confusion about coverage among providers and patients alike.

**Funding Source(s):** Other, American Cancer Society Cancer Action Network

**Poster Session and Number:** A, #421

**Characteristics of U.S. Emergency Departments that Offer Insurance Linkage for Uninsured Patients**

Mia Kanak, Stanford University School of Medicine; M. Kit Delgado, MD, Stanford University School of Medicine Center for Primary Care and Outcomes Research; Stanford University School of Medicine Division of Emergency Medicine; Ewen Wang, MD, Stanford University School of Medicine Division of Emergency Medicine

**Presenter:** Mia Kanak, M.P.H., Medical Student, Stanford University School of Medicine, mkanak@stanford.edu

**Research Objective:** Millions of U.S. citizens who are currently uninsured and use emergency department (ED) services are expected to be eligible for health insurance under the Affordable Care Act. ED insurance linkage programs have the potential to both increase access to care for patients and reduce uncompensated care costs for hospitals. Although the 2009 National Survey of Preventive Health Services in U.S. EDs found that 40% of EDs report having an insurance linkage program, the types of EDs that offer these programs remain unknown. We hypothesized that EDs of publicly-owned teaching hospitals with a high proportion of uninsured patients that also offer other preventive services would be the most likely to offer insurance linkage services.

**Study Design:** This was a secondary analysis of data collected from the National Survey for Preventive Health Services in U.S. EDs conducted in 2008-09. We used multivariable logistic regression to determine which ED operational and demographic characteristics were associated with the availability of insurance...
linkage services. We also tabulated the proportion of EDs that reported insufficient staff and funding to offer an insurance linkage program.

**Population Studied:** The survey randomly sampled 350 EDs (7%) of 4,874 EDs from the 2007 National Emergency Department Inventory (NEDI)-USA database. The response rate of 80% (277) amounted to a nationally representative sample of 6% of EDs in the United States.

**Principal Findings:** We found 38% of EDs surveyed routinely offered insurance screening and linkage services. After adjustment with multivariate regression, EDs with insurance linkage programs were more likely to be located in the West (RR= 2.06, 95% CI = 1.33 – 2.72), have 24-hour social worker availability (RR = 1.71, 95% CI = 1.12–2.33), and have greater than the average number of preventative services (RR = 1.87, 95% CI = 1.38–2.35). Teaching hospital and ownership status, and the proportion of uninsured patients in an ED were not found to be associated with availability of insurance linkage programs. Of the 73% of EDs reporting that they could not offer an insurance program with existing staff and funding, more than a third (37%) reported a patient mix of greater than 25% uninsured.

**Conclusions:** The ED is uniquely situated to serve as an effective intervention site for insurance linkage, including for the upcoming Medicaid expansion under the Affordable Care Act. Surprisingly, insurance linkage availability is not associated with the proportion of uninsured patients within an ED.

**Implications for Policy, Delivery, or Practice:** We recommend that policymakers seeking to increase insurance enrollment target the 27% of EDs which not only have a greater than 25% uninsured patient load but also lack the necessary staff and funding for an insurance linkage program, as these EDs have the greatest potential benefit to be derived. Increasing ED resources for social workers may be an effective strategy to increase the number of ED insurance linkage programs. Further research on the efficacy and return on investment from insurance linkage programs may also help to facilitate increased adoption of these programs.

**Funding Source(s):** AHRQ: M. Kit Delgado was supported by Agency for Health Care Research and Quality training grant T32HS00028 to the Center for Primary Care and Outcomes Research, Stanford University.

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**Poster Session and Number:** A, #422

**Dental Service Quality Measurement in a Medicaid Population: Testing Measure Sensitivity to Continuous Enrollment Requirements**

Paul Kirby, University of Massachusetts Medical School; Bruce Barton, University of Massachusetts Medical School; David Tringali, University of Massachusetts Medical School; Brent Martin, University of Massachusetts Medical School

**Presenter:** Paul Kirby, Senior Research Analyst, MassHealth Quality Office, University of Massachusetts Medical School, paul.kirby@state.ma.us

**Research Objective:** Measures of dental service utilization and quality are still in the developmental stages. Since the number of American children receiving dental care through Medicaid is expected to grow substantially in the coming years, testing and validation of dental service measures are a priority. This project, therefore, tests the sensitivity of a set of children’s dental quality measures to different denominator requirements for continuous Medicaid plan enrollment.

**Study Design:** Using dental claims data from MassHealth (the Massachusetts Medicaid program), the study calculates measure scores (percentages) for a developmental set of dental service measures are a priori defined for different definitions of continuous enrollment (CE). We compare results based on: 1) the HEDIS definition (CE throughout the measurement year with only one gap of no more than 45 days allowed); and 2) the less stringent CE definition used for federal EPSDT reporting (one continuous 90-day period of enrollment, meaning that any member eligible for the HEDIS denominator is also eligible for the EPSDT denominator). As additional comparisons, we also include results for all members having a single day of enrollment in a measurement year, and calculate change in the probability of receiving services as the total length of enrollment increases. We report results of Chi-square tests of the differences in the measure proportions produced by the different denominators. However, since our population is so large (between roughly 400,000 and 700,000 depending on the CE definition), observed
Implications of Rhode Island’s Global Consumer Choice Compact Medicaid Waiver for Block Granting Medicaid

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**Research Objective:** Rhode Island’s Global Consumer Choice Compact Medicaid Waiver has been implemented in the context of proposals to repeal the Affordable Care Act, including the Medicaid expansion, and to turn Medicaid into a block grant which would give state’s substantially more flexibility administering the program in exchange for receiving an upfront federal allotment or block grant that would no longer require a federal match. Proponents have held up the Global Waiver as a successful example of what might be achieved nationally if all states received block grants to run Medicaid. This study draws lessons from Rhode Island’s Global Waiver for the Medicaid block grant debate.

**Study Design:** Semi-structured interviews were undertaken with subjects chosen through a combination of purposeful and snowball sampling. Transcripts were coded to identify recurring themes and patterns in responses. Review of more than 325 archival resources took place as well.

**Population Studied:** Twenty-six semi-structured interviews with 30 individuals with in-depth knowledge of Rhode Island’s Medicaid program and the Global Waiver.

**Principal Findings:** Rhode Island’s Global Waiver is not a block grant but a capped federal match where the state is required to spend its own money before receiving the federal contribution. Moreover, the state did not receive unlimited discretion to administer the Global Waiver nor achieved nearly as much savings as has been claimed. Indeed, most savings obtained by Rhode Island during this time period derive not from efficiencies stemming from the Global Waiver but from increased spending on the part of the federal government and from measures the state could have implemented independently of the waiver authority negotiated with the federal government. Increased federal spending in Rhode Island has been due to the generosity of the federal funding cap and to the ability of the state to receive federal matching funds for populations and services previously covered by state-only funded programs, and due to the enhanced matching rate provided under the federal stimulus package.

**Conclusions:** Although unique, Rhode Island’s Global Waiver is not a model that supports the block grant approach to Medicaid reform. The generosity of Rhode Island’s waiver agreement is in marked contrast to most block grant proposals which would substantially reduce the
level of federal fiscal support, nor permit states to back out via an escape clause, as is permitted under the Global Waiver.

**Implications for Policy, Delivery, or Practice:**
Neither turning Medicaid into a block grant nor repealing the ACA is going to occur in light of President Obama’s reelection. Furthermore, the Budget Control Act of 2011, enacted August 2011 to end the debt ceiling crisis, excludes Medicaid from automatic budget sequestration. The Act, however, does not prevent Congress and the President from including Medicaid in a deal to lower the federal budget deficit. Major proposals to block grant Medicaid have made four times since 1980. Identifying the true implications of Rhode Island’s experience for the block grant debate is important because proponents will continue to propose this approach to Medicaid reform, both in future budget proposals and presidential party platforms.

**Funding Source(s):** RWJF

**Poster Session and Number:** A, #424

**Medicaid Managed Care: Its Impact on Beneficiary Access and Experiences with Health Plans**
Adele Shartzer, JHSPH; Gerard Anderson, JHSPH; Bradley Herring; JHSPH

**Research Objective:** The recent trend in enrollment growth in Medicaid managed care (MMC) is projected to continue following Medicaid expansions under the Affordable Care Act in 2014, leading to new dynamics in the MMC marketplace. This study seeks to examine the relationship between market structure and Medicaid beneficiaries’ self-reported access to care and experience with their health care plan.

**Study Design:** To assess whether MMC market competition impacts beneficiary experiences, this study merges measures of local market concentration with data on consumer experiences from the Medical Expenditure Panel Survey (MEPS). The primary concentration measure is the Hefndahl-Hirschman Index (HHI) for MMC, developed using data from the Centers for Medicare and Medicaid Services and HealthLeaders-Interstudy for years 2003 to 2009. This study addressed the relative competitiveness of MMC to hospitals, using the ratio of the two HHIs and also categorizing markets into four groups based on whether the one or both of the MMC and hospital HHIs were competitive (<2500). We estimated the effect of market structure on overall health plan satisfaction, reports of administrative problems with health plans, problems finding a doctor, and access measures such as delaying care or not getting care and travel time to the usual source of care. The regression models controlled for individual demographic and health status characteristics, MMC program design, and local health care market characteristics along with state and year fixed effects. Instrumental variables models were tested to address potential endogeneity of the HHI.

**Population Studied:** The sample population included nonelderly MEPS respondents in years 2003-2009 enrolled in a Medicaid HMO during the rounds when the Consumer Assessment of Health Plans (CAHPS) questions were fielded (n=23,928).

**Principal Findings:** MEPS respondents reported high levels of satisfaction and low levels of administrative problems or access barriers. On a 1 to 10 scale, the mean overall rating was 8.62 (se 1.72) in 2009. In the full model controlling for individual and local factors, measures of insurance market competition were largely insignificant predictors of the outcomes. Neither the MMC HHI nor the number of plans available to Medicaid beneficiaries were associated with higher plan satisfaction, reduced access to care, or higher rates of administrative problems. Compared to markets where both MMC and hospitals were competitive, beneficiaries were more likely to report it was difficult to get to their usual source of care in markets with a concentrated MMC but competitive hospital market (OR 1.46, p=0.01 ) and where both markets were concentrated (OR 1.79, p = 0.036). Individual factors such as self-reported physical and mental health, age, and race/ethnicity were significantly associated with the outcomes of interest.

**Conclusions:** Individual factors rather than local market supply factors dominate consumers’ reported experiences with their health plan and access to care. Various approaches to defining market structure resulted in consistent findings about the minimal effect of market structure on self-reported health plan experiences and access to care.

**Implications for Policy, Delivery, or Practice:** As policymakers strive to enhance quality in MMC, efforts to improve beneficiary access and
experiences through increased competition are likely to have little effect.

**Funding Source(s):** Other, Health Assessment Laboratory (Dissertation Research Award)

**Poster Session and Number:** A, #425

**Disease Modifying Therapy and the Risk of Hospitalization in Patients with Heart Failure: A Contemporary Medicaid Cohort Analysis**

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**Presenter:** Fadia Shaya, Ph.D., M.P.H., Professor; Director Of Research And Outreach Cips, CIPS: Center for Innovative Pharmacy Solutions, University of Maryland School of Pharmacy, fshaya@rx.umaryland.edu

**Research Objective:** Heart failure (HF) is one of the highest morbidity and cost conditions among state Medicaid enrollees. Increasing prevalence of HF, increasing enrollment in state programs, sparse literature on population-based HF studies, and the burden of hospitalization among Medicaid patients necessitates an analysis of risk factors for HF hospitalization in a contemporary Medicaid population.

**Study Design:** Using claims from Maryland State Medicaid, we examine the prevalence of comorbidity and first-line therapy use among patients diagnosed with HF. We estimated the effects of comorbidity and first-line therapy use on the risk of any hospitalization by using multivariate Weighted Cox Regression to address non-proportional risks over the follow-up period. According to the Agency for Healthcare Research and Quality’s HCUPnet query system, the mean cost of primary HF hospitalization for non-dually enrolled Maryland Medicaid patients was approximately 16,963 dollars (US 2011 dollars). We assessed the budget impact of potential modification of risk factors in the HF population.

**Population Studied:** Claims from Maryland State Medicaid, for 14,149 non-dually enrolled, 18-64 year olds with a diagnosis of HF between July 1st, 2005 and December 31st, 2009, followed for at least six months.

**Principal Findings:** Most HF patients were 45 years or older (71 percent), female (56 percent), and black (60 percent). Use prevalence for first-line HF therapies was: beta-blockers (26 percent), ACE-inhibitors/ARB (29 percent), aldosterone receptor antagonists (AA, 5 percent), and other cardiovascular drugs including nitrates+hydralazine combination (37 percent). Nearly all patients (98 percent) were diagnosed with one or more comorbidities. Prevalence of comorbidities was: hypertension (73 percent), psychological disorder (55 percent), ischemic heart disease (43 percent), diabetes mellitus (41 percent), hyperlipidemia (37 percent), chronic obstructive pulmonary disease (27 percent), renal dysfunction (27 percent), stroke (21 percent), and other cardiovascular disease (78 percent). Relative risk (95 percent CI) for any hospitalization after HF diagnosis was 1.43 (1.36-1.51) renal dysfunction, 1.40 (1.31-1.50) other cardiovascular, 1.33 (1.26-1.40) COPD, 1.28 (1.22-1.35) chronic ischemic heart disease, 1.27 (1.20-1.34) stroke, 1.26 (1.20-1.32) diabetes, 1.11 (1.05-1.17) hypertension, 0.81 (0.77-0.85) hyperlipidemia, 0.77 (0.73-0.81) psychological disorder; 0.77 (0.73-0.81) ACE inhibitor/ARB use, 0.83 (0.79-0.87) beta-blocker, 0.76 (0.72-0.80) other cardiovascular drugs. AA and/or nitrates+hydralazine combination had no impact. The C-statistic for predicted 1-year hospitalization risk within the sample was 0.80. As an example of the conservative budget impact for Maryland Medicaid: A 20 percent increase in COPD prevalence in the current sample increased expected Medicaid expenses by 97 dollars per HF patient per year, while a 20 percent increase in ACE-inhibitor/ARB prescription rates in the sample decreased expected Medicaid expenditures by 89 dollars per HF patient per year.

**Conclusions:** Our findings elicit the specific risk attributable to lead risk factors in HF patients enrolled in Medicaid plans, and show how certain disease modifying therapies can quantifiably mitigate the risk for hospitalization in those patients.

**Implications for Policy, Delivery, or Practice:** The growing ranks of state Medicaid plans and the rise of national health and other entitlement programs call for more deliberate, proactive and cost-effective disease and risk management of plan enrollees. Substantive savings to Medicaid can be achieved with small changes in the prevalence of these conditions or prescribing rates.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #426
Medicaid Crowd-out and the Disabled Under 65: Implications for the Affordable Care Act
Kathryn Wagner, University of Notre Dame

Presenter: Kathryn Wagner, B.A., Graduate Student, Economics, University of Notre Dame, kwagner5@nd.edu

Research Objective: A growing fraction of the U.S. population is disabled. In general, advocates for the disabled population argue that it can be challenging for people with disabilities to obtain treatment due to the expense of their medical conditions. One potential solution to this problem is to provide health insurance publicly through Medicaid. A concern of providing Medicaid, however, is the take-up of public coverage by those who would have purchased or possessed private insurance in the absence of public offerings, an event that is often referred to as crowd-out. Many studies have investigated the impact of Medicaid eligibility expansions on insurance coverage through the large Medicaid expansions for children and pregnant women initiated in the late 1980s. Though children and pregnant women constitute the majority of Medicaid recipients, they are less costly to insure than the disabled population. The disabled population is responsible for nearly half of all Medicaid spending. Despite their large cost, few studies have investigated the effects of Medicaid expansions for disabled individuals. My main research objective is to re-examine Medicaid crowd-out through the more expensive Medicaid population.

Study Design: I take advantage of a Medicaid eligibility expansion for disabled individuals that took place during 1996-2007 to identify an effect of a Medicaid eligibility expansion on crowd-out. This expansion allowed states the opportunity to provide Medicaid coverage to disabled individuals with incomes less than 100 percent of the federal poverty level. Prior to this expansion, most disabled individuals qualified for Medicaid through the Supplemental Security Income program which had stricter eligibility standards. Using state Medicaid eligibility standards, I impute Medicaid eligibility for individuals in the Survey of Income and Program Participation. I measure the effect of the eligibility expansions on Medicaid participation and private coverage using a two stage least squares analysis.

Population Studied: The population is individuals between the ages of 20 and 65 who report a work disability.

Principal Findings: I find that for every 100 disabled individuals made eligible through the expansions, 38 chose to take-up Medicaid coverage. The increase in Medicaid participation is accompanied by a similar reduction in private health coverage. Defining crowd-out as the decrease in private coverage relative to the increase in Medicaid coverage, these results indicate a crowd-out rate of 100 percent.

Conclusions: My results indicate a substantial amount of Medicaid crowd-out, suggesting that for every individual who took-up public coverage through the eligibility expansion another lost private coverage. Using Medicaid expenditure data, this suggests a $1,559 per Medicaid eligible person increase in Medicaid costs. These results are important given the Medicaid eligibility expansions set to occur in 2014 under the Affordable Care Act. Though these results imply a large fiscal impact of Medicaid eligibility expansions for the disabled, they do not say anything about any potential health benefits resulting from Medicaid’s expansions. I delay analysis of health benefits to future work.

Implications for Policy, Delivery, or Practice: Understanding the impact of crowd-out for this group is important for understanding the fiscal consequences of Medicaid eligibility expansions and will help to inform budgetary decisions in Medicaid policy for the disabled.

Funding Source(s): No Funding

Poster Session and Number: A, #427

Failure-to-Rescue in Safety-Net Hospitals: Does Availability of Hospital Resources Explain Differences in Performance?
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Presenter: Elliot Wakeam, M.D., Surgical Resident, General Surgery, Center For Surgery and Public Health, Brigham and Women's Hospital, elliot.wakeam@gmail.com

Research Objective: Failure to rescue (FTR) – the mortality rate among hospitalized patients with serious complications -- is an emerging quality indicator. Safety net hospitals provide a disproportionate share of medical care to vulnerable populations and have been shown to have lower quality of care using other performance measures, possibly due to lack of resources. We sought to assess the impact of safety-net status and hospital resources on FTR.

Study Design: Retrospective cohort using the Nationwide Inpatient Sample (NIS).

Population Studied: A cohort of 46,519 patients who underwent any of 8 primary high risk procedures from among general, thoracic and vascular surgeries from 2007 to 2010 was assembled. Complications, overall mortality and FTR were compared by safety-net status. Interviews with experts identified resources likely to influence FTR and available from the AHA Survey and included advanced cardiology, fully implemented electronic medical record, intensivists in the ICU, high respiratory therapist-to-bed ratio, high nurse-to-bed ratio, and others. Multivariate regression analyses were used to analyze associations between safety-net status, hospital resources, and FTR, with control for patient demographics, teaching status and bed size. Lastly, the impact of resources and safety-net status were assessed for individual procedures.

Principal Findings: High safety-net burden hospitals had similar odds of complications but higher FTR rates compared with other hospitals. Individual hospital resources were unevenly distributed among hospital types, but a summative score of the total number of resources was approximately equal across hospitals of varying safety-net burden (p=0.11). Total resources had a protective effect, with very high resource hospitals having lower odds of FTR (0.75, CI 0.62 – 0.91, p=0.003). After controlling for patient and hospital variables, including total resources, safety-net status was still associated with higher odds of FTR for high (OR 1.36, CI 1.20 – 1.54, p<0.0001) and moderate (OR 1.16. CI 1.05 – 1.28, p= 0.004) safety-net burden compared to lowest safety-net burden hospitals, respectively, but no higher odds of complications (OR 0.997, CI 0.92 – 1.08, p=0.9).

Conclusions: Despite access to a similar number of resources that can improve patient rescue rates, high safety-net burden hospitals had higher odds of failure to rescue suggesting that access to hospital resources alone does not explain increased FTR rates. Patient rescue after high-risk surgery in safety-net hospitals needs further study to elucidate root causes and mechanisms for this disparity.

Implications for Policy, Delivery, or Practice: Recent Medicaid expansions and cuts to disproportionate-share payments associated with the Affordable Care Act, as well as the Supreme Court decision to allow states to opt out of the expansion, may exacerbate resource shortages in safety-net hospitals leading to greater disparities in surgical safety. Interventions targeting the rescue pathway and the impact of safety culture, processes of care, and organizational arrangements that improve rescue are needed in safety-net hospitals.

Funding Source(s): CWF

Poster Session and Number: A, #428

Specialists and Accountable Care Organizations: Can Self-Referral Influence This Relationship?
Oluseyi Aliu, University of Michigan; Gordon H Sun, University of Michigan; James Burke, University of Michigan; Kevin C Chung, University of Michigan; Matthew M Davis, University of Michigan

Presenter: Oluseyi Aliu, M.D., Research Fellow, University of Michigan, oluseyi@umich.edu

Research Objective: Specialists’ participation in Accountable Care Organizations (ACOs) can provide them a referral base and may also facilitate care coordination. However, patients’ self-referrals to specialists may undermine care coordination and diminish the incentive for specialist participation in ACOs for access to a referral base. We examined recent national trends in self-referrals and the association between market share of managed health plans and self-referral trends.

Study Design: We conducted a descriptive study with data from the most recent ten
consecutive years (2000-2009) of the National Ambulatory Medical Care Survey (NAMCS). Our outcome was the source of referral for ambulatory visits to specialists i.e. a provider referral vs. patient self-referral. Approximately 11.5% of surveyed observations had missing values for the referral item. Hence, we used logistic regression multiple imputation to predict the missing values based on patient clinical, demographic and geographic variables. Then, we estimated the percentages of new visits from self-referral in Medicare and private insurance populations. To accomplish the 2nd objective, we obtained the percentage penetration of different health plan types for privately insured employees nationwide during 2000-2009. Using Pearson’s pair-wise correlation statistic, we examined whether trends in the percentage of private insurance beneficiaries enrolled in managed care plans are associated with trends in self-referrals. Similarly, in the case of Medicare beneficiaries, we obtained the percentage enrolled in Medicare Part C plans each year from 2000 to 2009. Also using pair-wise correlation, we examined whether trends in the percentage of Medicare beneficiaries in Part C plans are associated with trends in self-referrals.

**Population Studied:** We selected new adult ambulatory visits to the 10 specialties most identified by respondents in the NAMCS namely: neurology, otolaryngology, dermatology, orthopedics, urology, general surgery, ophthalmology, cardiology, obstetrics/gynecology and psychiatry.

**Principal Findings:** We examined 32,784 new visits surveyed between 2000 and 2009. Medicare was the primary payer in 19% of these visits and private insurance was the primary payer in 59% of the visits. Over the study period, there was an overall decline of 13% in self-referrals among Medicare beneficiaries, from 32% (24%-40%) to 19% (14%-23%). Among private insurance beneficiaries, the overall decline was 8%, from 32% (28%-37%) to 24% (19%-29%). Although there was an overall increase in the percentage of Medicare beneficiaries enrolled in Part C from 17% to 23%, the correlation between increasing Part C participation and the trend of self-referrals among Medicare beneficiaries was low and not statistically significant (r = -.21; p = 0.5). Among employer-based private health insurance beneficiaries, there was an overall increase in enrollment in preferred provider organization (PPO) plans, from 42% to 60%. This increase in PPO plan enrollment was strongly negatively correlated with the trend in the percentage of self-referrals among private insurance beneficiaries (r = -.88, p < 0.01).

**Conclusions:** We observed a marked decline in self-referrals among both Medicare and private insurance beneficiaries. Among private insurance beneficiaries, the decline may be due to the increased market share of managed care plans.

**Implications for Policy, Delivery, or Practice:** The decline in self-referrals may have implications for the ability of ACOs to engage specialist providers and facilitate ACO-based care coordination efforts.

**Funding Source(s):** RWJF

**Poster Session and Number:** B, #746

**Medication Therapy Management and Intervention Priority Score**

Ognian Asparouhov, MEDaiELSEVIER; Anton Berisha, MEDaiELSEVIER

**Presenter:** Ognian Asparouhov, Ph.D., Chief Scientist, R&D, MEDaiELSEVIER; oasparouhov@medai.com

**Research Objective:** Study objective is selection of the most appropriate intervention group for Medication Therapy Management (MTM) programs as mandated to Pharmacy Benefit Managers (PBM) sponsoring Medicare Part D. Medicare mandates selection criteria assuming that members with expected annual Rx costs equal or greater than $3000, two or more chronic diseases and being on two or more Part D chronic medications are the best candidates for intervention. Goal is to significantly improve selection criteria and provide a simple score, easy to use and understand, that will rank and prioritize the membership based on potential for intervention - Intervention Priority Score (IPS).

**Study Design:** IPS was developed using demographics and pharmacy claims data from a health plan with large Medicare Part D membership. 249 variables were created from the following 6 categories: demographics, cost, guideline compliance, severity, utilization and motivation. IPS targets the subpopulation with the highest potential for intervention defined as presence of the following target events: drug-drug interactions of higher severity, duplications in therapy, prescription of high-risk medications in elderly, non-compliance to dosing regimens, non-compliance to chronic drugs from
Clinical event. This can be easily translated into preventing one hospitalization or other undesired interaction before it happens can potentially improve both clinical and financial outcomes.

Implementation of IPS at pharmacies and physician offices should allow for easy and efficient management initiatives. Modeling process resulted with IPS as a percentile score from 1-100 with higher scores representing higher risk.

Population Studied: Training was done on 6 months dataset from second half of 2009 with the 748,346 user members, 60.9% female, average age 68.1 (M-64.9, F-70.2) with average Per Member Per Month (PMPM) Rx cost of $207 (M-$220, F-$198). Users are defined as members that had at least one pharmacy claim during dataset period. Validation was done on 12 months dataset (different from the training one) from January 1st to December 31th of 2010 with approximately 1M user members.

Principal Findings: Comparison of impactable events for top 10% of highest risk population selected independently by Medicare’s mandated criteria vs. Intervention Priority Score (IPS) methodology revealed higher percentages of all target events in subpopulation selected by IPS. Top 10% or 95,658 members on validation dataset selected by IPS had the following characteristics in comparison to the same number of members selected by Medicare’s approach: average of 90.24% more contraindicated drug-drug interactions, 77.10% more drug-drug interactions of high severity, 119.18% more duplications in therapy, non-compliance with dosing recommendations or prescriptions for high-risk medications in elderly, and 89.57% more noncompliance to chronic drugs from selected classes.

Conclusions: IPS is a step toward improving the high risk selection methodologies based on Rx claims data. It offers much better intervention group selection compared to traditional methods. Greater number of impactable events per member provides greater potential to improve both clinical and financial outcomes.

Implications for Policy, Delivery, or Practice: Implementation of IPS at pharmacies and physician offices should allow for easy prioritization of care management and intervention efforts. Preventing one drug-drug interaction before it happens can potentially prevent one hospitalization or other undesired clinical event. This can be easily translated into potential savings of millions of dollars across entire Medicare population.

Funding Source(s): Other, MEDai’s fund
Poster Session and Number: B, #747

Hospital Responses to Medicare Nonpayment for Hospital Acquired Conditions
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Presenter: Gloria Bazzoli, Ph.D., Bon Secours Professor of Health Administration, Department of Health Administration, Virginia Commonwealth University, gbazzoli@vcu.edu

Research Objective: On October 1, 2008, Medicare implemented a new policy that denied incremental payment associated with eight hospital acquired conditions (HACs) deemed preventable. We examined the impact of Medicare’s new nonpayment rule on hospital behavior for four of the eight conditions identified by CMS: injurious falls, (grade 3/4) pressure ulcers, central-line associated blood stream infections (CLABSI) and catheter-associated urinary tract infections (UTIs). We also assessed how hospital responses might vary depending on particular circumstances, such as hospital financial health and market conditions. These four conditions represent more than 99% of the Medicare patient discharges that had at least one of the eight potentially preventable conditions present in the patient record (Rosenthal 2007).

Study Design: Our study capitalized on National Database of Nursing Quality Indicators (NDNQI) data, a unique resource established in 1998 by the American Nurses Association. Participating hospital units report monthly and quarterly data on nurse staffing, nurse processes and patient outcomes that conform to National Quality Forum consensus standards. Thus, NDNQI provides outcomes data that are conceptually consistent with CMS HACs, but not tied to payment (with all the reporting problems that introduces). NDNQI data merged with American Hospital Association Annual Survey
Readmission Rates among Dual Eligible Beneficiaries

Kevin Bennett, University of South Carolina School of Medicine; Jan Probst, University of South Carolina; Rob Chen, University of South Carolina; Sam Towne, University of South Carolina; Deshia Leonhirth, University of South Carolina

Presenter: Kevin Bennett, Ph.D., M.S., B.S., Assistant Professor, Family & Preventive Medicine, University of South Carolina School of Medicine, kevin.bennett@sc.edu

Research Objective: This is a cross-sectional analysis of 2009 Medicare Claims, including inpatient hospital stay claims, physician encounter claims, beneficiary demographic information, and chronic illness diagnoses. Initial analysis described the population by basic demographics including race/ethnicity, gender, age groups, and chronic conditions categorized by dual eligible status. Subsequent analysis examined the hospitalization rate of the population; these rates were further subset across dual eligible status. Among those with a hospitalization, we then examined the rate of follow up physician encounters, the time to such an encounter, and subsequent re-hospitalizations. Time to follow up was divided into 30 day increments; 0-30 days, 31-60 days, 60 or more days and no follow-up. All analyses were subset by rurality and/or dual eligible status. Differences were tested using Wald Chi Square tests at the p < 0.05 level.

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Population Studied: The population of interest for this analysis is rural residents as defined by the 2003 Urban Influence Codes (UIC). Rural residence was classified at the county level using the 2003 Urban Influence Codes; codes of 1 and 2 levels of rurality were classified as “Urban” while all other UICs were classified as

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rural. Analysis across levels of rurality used three groups: “micropolitan rural” (UICs 3 5 and 8) “small adjacent rural” (UICs 4 6 and 7) and “remote rural” (UICs 9 10 11 and 12). The study population was limited to beneficiaries who did not die during the year and did not have one of the following diagnoses: Alzheimer’s disease, dementia, schizophrenia, depression, chronic kidney disease or end stage renal disease. Beneficiaries were also excluded if they were discharged to a long term care facility, another hospital, hospice or with home health services. We also excluded beneficiaries discharged from the hospital in January 2009 and after November 30, to allow for an adequate 30-day follow-up period. The final study population was comprised of 984,810 beneficiaries.

**Principal Findings:** Overall, 10.0% of the population was enrolled in both Medicare and Medicaid (98,792). The percentage of beneficiaries who were dually eligible increased as rurality increased; overall, 10.6% of rural residents were dually eligible, compared to 9.8% of urban residents. This proportion increased to a high of 12% among small adjacent rural beneficiaries. 14.1% of the population (n=138,847) had at least one hospital visit in 2009. More dual eligible beneficiaries had at least one visit (18.0%) than Medicare only beneficiaries (13.7%). More than twice as many dual eligibles had three or more visits (1.5%) than Medicare only beneficiaries (0.7%). A slightly smaller proportion of dual eligible beneficiaries living in rural areas had one or more inpatient visits in the study year (14.4%) compared to urban beneficiaries (14.9%). The proportion with at least one inpatient visit decreased as rurality increased, to 11.8% in remote rural areas. Dual eligible beneficiaries had a consistently higher rate of inpatient admissions (20.1%) than Medicare only beneficiaries (13.6%); this difference persisted across all levels of rurality. Dual eligible beneficiaries living in remote rural counties had a readmission rate of 24%, nearly 10 percentage points higher than other beneficiaries. Preliminary results from the multilevel multivariate models indicate being an dual eligible beneficiary remained more likely to have a readmission than other beneficiaries. Rural residents were also more likely to be readmitted. Final analyses will be completed by February 2013.

**Conclusions:** More rural residents were classified as dual eligible beneficiaries. These beneficiaries were more likely to have at least one hospitalization during the year, and were more likely to be readmitted post discharge than Medicare only beneficiaries. These differences were greater among rural residents, particularly among remote areas.

**Implications for Policy, Delivery, or Practice:** Dual eligible beneficiaries are high utilizers of health care services, and are responsible for higher overall expenditures. With an increasing focus on Medicare and Medicaid spending, decreasing these costs are growing in importance. Reducing hospitalization rates, and in particular readmission rates, could play a large role in this reduction. Readmissions are also important to examine within this group, as the reimbursement will be reduced in coming years. If dual eligible beneficiaries in rural areas continue to have higher readmission rates, then rural hospitals may be at a greater risk for financial loss. Programs aimed specifically for rural dual eligible beneficiaries may alleviate many burdens.

**Funding Source(s):** HRSA

**Poster Session and Number:** B, #749

**Analyzing the Implementation of the Senior Risk Reduction Demonstration**

Nicholas Bill, IMPAQ International, LLC

**Presenter:** Nicholas Bill, M.P.P., Research Associate, Labor and Human Services, IMPAQ International, LLC, nbill@impaqint.com

**Research Objective:** The objective of the SRRD demonstration vendor site visits was to gather specific details about how each vendor was implementing SRRD in each of the three years of the demonstration. Using a series of qualitative research methods – document review, site visits and interviews – the evaluation team developed detailed descriptions of each vendor’s implementation process. The information obtained from these visits provided additional context for the impact evaluation results.

**Study Design:** Site visit protocols and interview guides were developed to collect information from the vendor staff on a number of relevant topics. These topics included the background of the vendor organization and SRRD project; staffing roles and responsibilities; recruitment and retention strategies; health risk assessment (HRA) questionnaire design and implementation;
the risk stratification process; intervention services; implementation of the local versus national SRRD components; data management and reporting; and, any lessons learned from the SRRD pilot or other similar health risk reduction initiatives. A number of relevant documents, such as the HRA tool, intervention materials, matrices of intervention services, etc., were also collected and analyzed.

**Population Studied:** In conjunction with the evaluation team, the vendor staff arranged interviews with pertinent SRRD staff members, which included program directors, account managers, health coaches/advisors and their supervisors, IT managers, and representatives of ADRCs.

**Principal Findings:** Overall, the recruitment strategies selected supported a successful engagement effort for the demonstration – the enrollment goals were exceeded for both vendors in all categories except for one local area which posed unique recruitment challenges.

The findings from the site visits suggested that both vendors were responsive to the specifications in CMS’ described work plans, yet tailored their programs based on previous organizational experience, or lessons learned from the pilot programs. Because of extensive organizational experience administering similar health risk reduction programs, one vendor was able to customize their SRRD program using previously developed models whereas the other vendor’s program was created without any preexisting models to use.

Coordinating the local component of the program with the ADRCs, with which neither vendor had a history of working, presented some unique challenges including coordinating referrals effectively, and collecting and reporting data.

One of the most notable and important differences observed between the vendors’ programs was how interventions were assigned to beneficiaries in the different treatment ARMs. The types of intervention services used, and their levels of intensity, differed considerably between the two vendors based on their proprietary risk stratification algorithms.

**Conclusions:** Understanding the differences in vendor interventions overall, and as a function of their proprietary risk stratification algorithms, is extremely important in order to discriminate the extent to which changes in outcomes measured by HRA and claims are associated with underlying differences in the study cohorts (e.g., national, local, or by vendor), differences in interventions used, or differences in the thresholds used for initiating interventions. Findings from the SRRD implementation analysis proved to be invaluable for providing context and additional perspective for appropriately interpreting the results from the impact analyses.

**Implications for Policy, Delivery, or Practice:**

**Funding Source(s):** CMS

**Poster Session and Number:** B, #750

**Learning about 30-day Readmissions from Patients with Repeated Hospitalizations**

Jeanne Black, Cedars-Sinai Medical Center

**Presenter:** Jeanne Black, Ph.D., M.B.A., Manager, Health Policy Research, Resource & Outcomes Management, Cedars-Sinai Medical Center, blackjt@cshs.org

**Research Objective:** To examine characteristics of adult patients with multiple hospital admissions at a large urban teaching hospital in order to quantify their contribution to 30-day readmissions and understand the types of patients at highest risk of 30-day readmission. Multiple studies have examined 30-day readmissions using hospital discharges as the unit of analysis, with most focused on Medicare patients. Few studies have looked at the entire adult population or used the patient as the unit of analysis to investigate repeated admissions on a longitudinal basis.

**Study Design:** Descriptive retrospective cohort study using hospital administrative data.

**Population Studied:** A cohort of 19,490 unique adult patients was identified with index discharge dates from July 1, 2009 - December 31, 2010 and a medical MS-DRG. Two subgroups were defined based on total hospital stays, including the index and same hospital admissions within 180 days after each index discharge: patients with three to five stays (“frequent readmissions”); patients with six or more hospitalizations (“super-frequent readmissions”). The comparison subgroup was patients with one or two hospitalizations during the follow-up period.

**Principal Findings:** Patients with frequent hospitalizations comprised 10.8% of the total cohort but were responsible for 72.5% of 30-day readmissions. Patients with super-frequent readmissions were younger (mean age 53.4 years vs. 64.8 years for those with frequent readmissions and 62.2 years for comparison
patients, p < 0.001). A higher percentage was male (52.5% vs. 49.6% and 46.9% for those with frequent readmissions and the comparison, p < 0.001), and Latino (15.4% vs. 10.9% and 10.5%, respectively, p < 0.001). Both frequent readmissions subgroups had higher proportions of African American patients (27.4% for super-frequent, 21.0% of frequent, vs. 17.3% of comparison patients, p < 0.001 and p < 0.01, respectively), and a higher proportion of non-English speakers (16.3% for both frequent readmissions subgroups vs. 13.2% for the comparison, p < 0.001). Patients with Medicaid coverage alone made up 29% of the super-frequent readmissions subgroup, more than double the proportion among those with three to five hospitalizations (13%).

Conclusions: Most 30-day readmissions were experienced by patients who had multiple, frequent hospital admissions.

Implications for Policy, Delivery, or Practice: Patients with a pattern of repeated hospitalizations differ from other patients in significant ways, indicating that efforts to reduce 30-day readmissions should consider different approaches to care management, transitional care, and community-based services. Identifying which interventions are likely to be effective for specific patients should have higher priority than developing algorithms to predict which patients are at risk of a single 30-day readmission. Patients with frequent readmissions in a six month period may benefit from improved care management, e.g. the Patient Centered Medical Home model as well as better coordination between hospitals and skilled nursing facilities. Reducing resource utilization among patients with super-frequent readmissions will require hospitals to collaborate with other community-based organizations and may require development of community resources that do not currently exist, such as outpatient programs that integrate medical and mental health care, rehabilitation programs, transitional living centers for medically fragile patients, and so on.

Funding Source(s): No Funding

Poster Session and Number: B, #751

Patient Centered Care for Falls in Medicare Advantage Plans
Darryl Brown, Drexel University School of Public Health

Presenter: Darryl Brown, Ph.D., M.P.A., Assistant Professor, Health Management and Policy, Drexel University School of Public Health, darryl.brown@drexel.edu

Research Objective: To investigate the impact of Patient-Centered Care (PCC) in Medicare Advantage Plans to reduce 2nd falls among elderly enrollees.

Study Design: A quasi-experimental, matched case-control groups design was employed. Random allocation to PCC and non-PCC groups was determined using a greedy algorithm Propensity Score (PS) method in which observations were matched on demographic variables, health status and functioning. Analytic methods included bivariate tests of fall likelihood attributable to PCC and multivariate logistic regression to assess PCC effect in when controlling for baseline health and balance risk factors.

Population Studied: Medicare (MC-HOS) public use longitudinal data files from 2006-2008, 2007-2009 and 2008-2010 a baseline and follow cohort of a 527,034 Medicare Advantage Plan enrollee was developed Enrollees reporting a fall in only the baseline year, in addition to, balance and health issues were assigned to case/control groups based on reported experience of patient-centered care. The PCC intervention is defined as a YES response to the MC_HOS survey question “Have talked with Doctor about Falling or Balance Problems.

Principal Findings: Analysis of 12-month follow-up data showed reduced odds of falling among cases who reported receiving PCC for only a baseline year fall (OR = 0.3816 [CI @95%, 0.3445 – 0.4227]). Control observations were restricted to enrollees reporting a fall in the baseline year but no PCC for falls during the entire 24 month period.

Conclusions: • When controlling for age and balance issues, PCC significantly reduces the odds reported a fall on follow-up
• Primary care visits should include evaluation of risk factors for initial fall injury

Implications for Policy, Delivery, or Practice: From an economic perspective, focused communication in the primary care visit that relates to precursors of 2nd falls can generate cost savings due to avoided clinical sequelae attendant to falling subsequent times among community dwelling Medicare managed care enrollees.

In terms of access to care, survey data on PCC for falls reported by Medicare Advantage plan enrollees suggests that a huge number of at risk elderly in the community are not receiving the
type of interpersonal care that can reduce the likelihood of first falls. Of enrollees reporting a fall at baseline, only 3 percent indicated having a talk with their physician about falls.

**Funding Source(s):** No Funding

**Poster Session and Number:** B, #752

### Regional, Hospital, and Patient Factors Associated with Acute Myocardial Infarction Readmission Rates

Jeremiah Brown, Dartmouth College and Geisel School of Medicine; Chiang-Hua Chiang, PhD, The Dartmouth Institute for Health Policy and Clinical Practice; Weiping Zhou, MS, The Dartmouth Institute for Health Policy and Clinical Practice; David J. Malenka, MD, MS, Section of Cardiology, Dartmouth-Hitchcock Medical Center; David C. Goodman, MD, MS, The Dartmouth Institute for Health Policy and Clinical Practice

**Presenter:** Jeremiah Brown, Ph.D., Assistant Professor Of Health Policy And Clinical Practice, The Dartmouth Institute for Health Policy and Clinical Practice, Dartmouth College and Geisel School of Medicine, jeremiah.r.brown@dartmouth.edu

**Research Objective:** Previous studies of hospital readmission have examined primarily patient and health care factors during the illness episode that resulted in the index admission. One study also found an association of 30-day readmission rates to regional hospital discharge rates, but may have been confounded by differences in health status. This study examined the association of diverse patterns of care with 30-day readmission rates at regional and hospital-specific levels following an acute myocardial infarction (AMI) while controlling for patient characteristics.

**Study Design:** We studied 100% fee-for-service Medicare beneficiaries hospitalized for an AMI between 2008 and 2009 with no prior admission within three months of the index AMI and alive at discharge. We examined the association between regional (per capital medical admission rate, bed supply, primary care and cardiologists physician supply) and hospital measures (discharge planning care quality and measures of care intensity during the last six months of life from preceding years) on patient adjusted 30-day readmission rates. Associations were tested using multilevel mixed-effects regression models with patient as the unit of analysis, adjusting for HRR or hospital level patterns of care based on the Centers for Medicare and Medicaid Services AMI readmission model.

**Population Studied:** Medicare beneficiaries (100% fee for service) hospitalized for an acute myocardial infarction (AMI).

**Principal Findings:** There were 63,288 readmissions at 30-days (21.9%) among 289,285 AMI discharges across 306 HRRs and 3,849 hospitals. Controlling for patient characteristics, better discharge quality was associated with lower 30-day readmission rates at both the HRR and hospital-level. At the HRR-level, regional measures (per capita rates of medical admissions, bed supply, primary care and cardiologists supply) were significantly associated with higher 30-day readmission rates. Measures of regional HRR care intensity measured in a separate end-of-life cohort (last 6 months total hospital days, intensive care unit days, number of physician visits, and ten or more different physicians seen) were associated with higher 30-day readmission rates. Test for linear trend at the HRR-level was significant for all measures. At the hospital-level, regional medical admission rate was positively associated and hospital bed size was inversely associated with rates of 30-day readmission. At the hospital-level, the associations were absent or inconsistent with those found at the regional level. Test for linear trend at the hospital-level was significant for regional medical admission rate and for hospital size but not for other measures.

**Conclusions:** Among over-65 population hospitalized for an AMI, measures of system level performance at the HRR level were associated with 30-day readmission rates while controlling for patient characteristics. The findings were not replicated at the hospital level, although the possibility of insufficient sample size may need further examination.

**Implications for Policy, Delivery, or Practice:** Improving care of AMI patients discharged from hospitals may also need to consider the influence of hospital and regional patterns of care and care intensity.

**Funding Source(s):** RWJF, and United Health Foundation, WellPoint Foundation

**Poster Session and Number:** B, #753

### The Impact of Increasing Observation Services on Medicare Beneficiaries with Chest Pain

Susannah Cafardi, Centers for Medicare and Medicaid Services; Jesse M. Pines, MD, MBA, Centers for Medicare and Medicaid Services;
The hospital (including ED, observation, or status, the relative risk (RR) of 30 for demographic characteristics and health compared with inpatients in less for those treated under observation services index stay payments by Medicare were $3502 were unchanged. In addition to this, average outcomes for patients with chest pain diagnoses a shift in t

During the study period, despite the identified inpatient hospital admissions in Medicare beneficiaries from 2006; this fell to 20.0% in 2009. Conversely, 30.3% with chest pain were treated as inpatients in 2006; this fell to 20.0% in 2009. Population Studied: We performed a beneficiary-level analysis using a 20% nationally representative sample of fee-for-service (FFS) Medicare beneficiaries from 2006-2009. We studied the first visit of those presenting to the hospital with a primary or secondary diagnosis of chest pain without myocardial infarction or any other serious pulmonary or cardiovascular condition.

Principal Findings: In 2006, 15.4% of patients with chest pain received observation services; this rose steadily to 23.5% of patients in 2009. Conversely, 30.3% with chest pain were treated as inpatients in 2006; this fell to 20.0% in 2009. During the study period, despite the identified shift in treatment care setting, aggregate clinical outcomes for patients with chest pain diagnoses were unchanged. In addition to this, average index stay payments by Medicare were $3502 less for those treated under observation services compared with inpatients in 2009. After adjusting for demographic characteristics and health status, the relative risk (RR) of 30-day revisit to the hospital (including ED, observation, or inpatient service) was 0.96 (95% confidence interval [CI] 0.94-0.98) for index observation services compared to inpatients, and adjusted 30-day Medicare payments were 13.8% lower (CI 12.1%-15.5%).

Conclusions: From 2006-2009, rates of observation service use increased while inpatient hospitalization rates decreased. Observation services appear to serve as a substitute for inpatient admissions for Medicare beneficiaries with chest pain.

Implications for Policy, Delivery, or Practice: Medicare payments were lower for observation services, and health outcomes were no worse. This suggests that appropriate use of observation services can reduce insurer payments without impacting outcomes.

Funding Source(s): No Funding

Poster Session and Number: B, #754

The Impact of Community Context on Thirty-Day Hospital Readmission for Acute Myocardial Infarction, Heart Failure, and Pneumonia

Hsueh-fen Chen, University of North Texas Health Science Center; Taiye Popoola, University of North Texas Health Science Center; José A. Pagán, University of North Texas Health Science Center

Research Objective: To examine the impact of community context on 30-day readmission for Medicare patients with acute myocardial infarction (AMI), heart failure, and pneumonia.

Study Design: Individual hospital data from the CMS FY 2013 IPPS Final Rule Hospital Readmissions Reduction Program (HRRP) Supplemental Data File was merged with data from the County Health Rankings, the American Hospital Association Annual Survey, and the Area Resource File. The dependent variables are excess 30-day readmission for AMI, heart failure, and pneumonia. The key independent variables are quartile dummy variables describing the relative ranking of each county within its respective state on four health-contributing factors—health behaviors, clinical care, social and economic status (SES), and physical environment—extracted from the County Health Rankings database. A series of control variables for community and hospital
characteristics were included in the model. Multilevel linear regression was used to estimate the model given that hospitals are nested within counties.

**Population Studied:** The study sample included all community and critical access hospitals. Following CMS guidelines, hospitals with zero cases in any of the disease or with less than 25 cases for the sum of three diseases were excluded from the analyses. There were 3,103, 3,125, and 3,125 hospitals in the model for AMI, heart failure, and pneumonia, respectively.

**Principal Findings:** Compared to hospitals located in counties with abundant clinical care resources, hospitals in counties with poor clinical care resources were more likely to have excess 30-day readmissions for heart failure and pneumonia, but less likely to have excess 30-day readmissions for AMI. Hospitals located in counties with a good physical environment were less likely to have excess 30-day readmissions for all the three diseases studied compared to hospitals located in counties with a poor physical environment. Finally, hospitals in the counties with low SES were less likely to have excess 30-day readmissions for heart failure and pneumonia, but were more likely to have excess 30-day readmissions for AMI than hospitals in the counties with high SES. Health behaviors did not have significant impact on excess 30-day readmissions.

**Conclusions:** The results indicate that the 30-day adjusted readmission rates utilized for the CMS HRRP may need further adjustment to take into variation in health-contributing factors across communities.

**Implications for Policy, Delivery, or Practice:** The 30-day readmission rates utilized in the CMS HRRP to determine Medicare reimbursement penalties are adjusted for the age, sex and clinical conditions of patients, but these adjustments do not take into account community-level factors that are likely to be associated with readmissions. Most of these community-level factors are beyond the control of hospitals, for they choose communities to locate in order to fulfill hospitals' mission. The end result is that, ironically, CMS readmission penalties most likely weaken the ability of hospitals to provide high quality health care services to the people who live in deprived communities by disproportionately penalizing hospitals for factors that are outside their control and, thus, exacerbate health disparities. Future studies that investigate potential adjustment factors from communities to make these penalties more effective and reduce disparities are needed.

**Funding Source(s):** No Funding

**Poster Session and Number:** B, #755

**Association of Substance Abuse and Outcomes in Elderly Prostate Cancer Patients**

Sumedha Chhatre, University of Pennsylvania; David S. Metzger, University of Pennsylvania; George Woody, University of Pennsylvania; S. Bruce Malkowicz, University of Pennsylvania; Ravishankar Jayadevappa, University of Pennsylvania

**Presenter:** Sumedha Chhatre, Ph.D., Res. Assistant Professor, Psychiatry, University of Pennsylvania, rasu@mail.med.upenn.edu

**Research Objective:** To analyze the prevalence and incremental burden of substance abuse in elderly prostate cancer patients.

**Study Design:** A retrospective cohort design was used for SEER-Medicare linked database between 1995 and 2008. From those diagnosed with prostate cancer between 1995 and 1998, we identified those with and without a diagnosis of substance abuse (ICD-9 codes: alcohol dependence syndrome-303.xx, drug dependence 304.xx and non-dependent abuse of drugs 305.xx). (ICD-9: 303.xx, 304.xx, 305.xx) in the ten year post-diagnosis period. The incremental cost of different types of substance abuse in follow-up period was assessed using GLM log-link model. Cox regression was used to assess the hazard of mortality associated with different types of substance abuse in follow-up period.

**Population Studied:** Elderly Medicare patients with prostate cancer

**Principal Findings:** We identified a cohort of the 50,147 men newly diagnosed for prostate cancer, 7.2% of these had a diagnosis of substance abuse (alcohol dependence syndrome, drug dependence and Non-dependent abuse of drugs) in follow-up phase. Most frequent diagnosis was Non-dependent abuse of drugs (5.65%). Also, 1.81% and 5.26% and were diagnosed with substance abuse/ dependence in the treatment phase and in follow-up phase, respectively. In the follow-up period, the incremental cost of substance abuse was 30%. Incremental cost was highest for drug dependence (88%). Also, those with substance
Groups with advanced stage prostate cancer. The magnitude of burden varies by type of and time of substance abuse. This emphasizes the need for care coordination and additional research on effects of early diagnosis and treatment of substance abuse in elderly prostate cancer patients.

**Implications for Policy, Delivery, or Practice:**
This emphasizes the need for care coordination and additional research on effects of early diagnosis and treatment of substance abuse in elderly prostate cancer patients.

**Funding Source(s):** NIH

**Poster Session and Number:** B, #756

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### Racial and Ethnic Disparity in Health Resource Utilization and Cost among Advanced Stage Prostate Cancer Patients

Ravishankar Jayadevappa, University of Pennsylvania; Sumedha Chhatre, University of Pennsylvania; Sanford Schwartz, University of Pennsylvania; S. Bruce Malkowicz, University of Pennsylvania

**Presenter:** Sumedha Chhatre, Res. Assistant Professor, University of Pennsylvania, rasu@mail.med.upenn.edu

**Research Objective:** We sought to analyze racial and ethnic disparity in phase specific health resource utilization (HRU) and medical care cost (MCC) of advanced stage prostate cancer patients.

**Study Design:** In this retrospective case control study of SEER-Medicare databases, prostate cancer patients diagnosed with advanced stage between 2001 and 2004 were identified and followed for one year pre and up to five years post diagnosis. Racial and ethnic variation in HRU and cost was analyzed across phases (pre-diagnosis, treatment, post-treatment and terminal) after adjusting for Elixhauser comorbidity and socioeconomic status (SES). To analyze the incremental cost of prostate cancer, cancer free controls were selected from Medicare data. GLM log-link and Poisson regression models were used to analyze the association of racial and ethnic groups with HRU and MCC.

**Population Studied:** Elderly with advanced stage prostate cancer

**Principal Findings:** We identified 15,054 men with advanced stage prostate cancer. Mean age of the cohort was 74.3 years (sd=6.8). Of these, 75% were White, 12% were African American, 8% were Hispanic and 5% were Asian. Twenty-eight percent were treated with surgery, 21% with radiation, 18% with combination therapy and 33% had no treatment. Unadjusted cost comparison across follow-up phases showed significant racial and ethnic differences. Poisson regression indicated that for ER and outpatient visits, African American group was associated with higher odds of ER visit (odds ratio (OR) =1.43, 95 CI: 1.39-1.46), and lower odds for outpatient visits (OR= 0.78, CI: 0.76-0.80). Hispanic group had higher odds of ER visit (odds ratio (OR) =1.09, 95 CI: 1.06-1.13), and lower odds of outpatient visits (OR=0.86, CI= 0.83-0.89). Asians had lower odds of both ER visit (OR=0.88, CI: 0.77-0.84) and outpatient visits (OR=0.90, CI:0.86-0.94). The GLM model showed that compared to Caucasians, African American group and Hispanic group had comparable total cost of care across all phases. Also, hazard of long-term mortality was higher for African American (Hazard ratio (HR)=1.15, CI: 1.07-1.24) and Hispanic patients (HR=1.12, CI:1.02-1.24).

**Conclusions:** Racial and ethnic variation in health resource utilization, cost and mortality is substantial and is driven by treatment choice and comorbidity. Opportunities exist for addressing over-use and under-use of care so as to improve outcomes and quality of care.

**Implications for Policy, Delivery, or Practice:**

**Funding Source(s):** N/A

**Poster Session and Number:** B, #757

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### Association of Multiple System Use with Health Outcomes among Veterans Enrolled in Medicare Advantage Plans

Alicia Cooper, Providence VA Medical Center; Lan Jiang, Iowa City VA Medical Center; Jean Yoon, Palo Alto VA Medical Center; Mary Charlton, University of Iowa; Vincent Mor, Brown University; Kenneth Kizer, University of California Davis; Amal Trivedi, Brown University

**Presenter:** Alicia Cooper, M.P.H., Ph.D., Research Health Science Specialist, Health Services Research & Development, Providence VA Medical Center, alicia_cooper@brown.edu

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**Research Objective:** Many veterans enrolled in the VA health care system have alternative sources of insurance coverage and rely on non-VA providers for some portion of their health care needs. Although receiving services across multiple systems may fragment care, little is known about the health consequences of dual use of VA and non-VA care. We characterized the population of veterans who were dually enrolled in both the VA and a Medicare Advantage (MA) plan, and compared the quality of care among those exclusively receiving care in the VA with those receiving care in both managed care systems.

**Study Design:** Using merged VA and MA quality and administrative data, we used propensity score methods to determine the association between dual use and five VA External Peer Review Program quality measures. Outcomes included control of cholesterol, blood pressure and glycosylated hemoglobin among persons with diabetes, cholesterol among persons with coronary heart disease (CHD), and blood pressure among persons with hypertension.

**Population Studied:** 8,226 veterans concurrently enrolled in the VA and an MA plan during 2008 and 2009 with diabetes, hypertension, or CHD.

**Principal Findings:** Of 8,226 dually-enrolled individuals, 2,001 (24.3%) exclusively received outpatient care in the VA. The remaining 6,225 (75.7%) received outpatient services in both the VA and MA. VA-only users were more likely to be younger (68.6 years vs. 71.3), female (9.4% vs. 7.8%), and non-white (20.7% vs. 10.5%) than dual VA-MA users. They were also more likely to have high VA priority enrollment status (77.9% vs. 61.4%). VA-only users had more comorbid conditions than dual VA-MA users (4.5 conditions vs. 3.7), and lived approximately one mile closer to a VA medical center (11.0 miles vs. 11.9) (p<0.01 for all comparisons). Among dual users, the mean number of annual outpatient visits was 24.4; of this total, 15.7 occurred in VA and 8.7 in MA. In propensity score analyses, intermediate outcomes were comparable for VA-only users (n=1,971) and matched dual VA-MA users (n=1,971) (p>0.05 for all differences). The differences ranged from a 3.9 percent difference (95% CI: -2.0 to 9.8) favoring VA-only users with CHD in the proportion of controlled cholesterol <100 mg/dL to a 1.1 percent difference (95% CI: -3.8 to 5.1) favoring dual users with diabetes in the proportion of controlled cholesterol <100 mg/dL.

**Conclusions:** The VA was the primary source of outpatient care in this sample of dual VA-MA enrollees, even among those receiving care in both systems. For the five intermediate outcome measures assessed in this sample, dual use was not associated with poorer patient outcomes.

**Implications for Policy, Delivery, or Practice:** The high intensity of VA outpatient service use among dual users may explain why intermediate health outcomes are comparable to those achieved by VA-only users, despite the potential for multiple system use to fragment care. The Affordable Care Act will expand the number of VA-enrollees with alternative sources of coverage and care. Policymakers and clinicians should promote efforts to coordinate care and share information across VA and non-VA settings, particularly for dually-enrolled veterans with chronic conditions.

**Funding Source(s):** VA

**Poster Session and Number:** B, #758

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**Changes in Patient-Reported Health Status among Elderly Medicare Advantage Beneficiaries Exposed to High-Risk Drugs**

Alicia Cooper, Providence VA Medical Center; David Dore, Brown University; Lewis Kazis, Boston University School of Public Health; Vincent Mor, Brown University; Amal Trivedi, Brown University

**Research Objective:** The use of high-risk medications in the elderly has been widely disseminated as a valid measure of clinical quality without clear evidence that exposure to these agents increases the likelihood of an adverse outcome. We assessed the association between high-risk prescribing and changes in patient-reported health status using the Zhan, HEDIS, and Beers criteria.

**Study Design:** Our study population was derived from the 2006-2008 Medicare Health Outcomes Survey (HOS) sample. We employed a new-user cohort study design to examine changes in patient-reported health status between matched exposed and unexposed individuals before and after exposed individuals received a prescription for a high-risk medication, using the HEDIS, Zhan, and Beers criteria to define high-risk prescribing. Exposure
to high-risk drugs was ascertained from Medicare Part D claims. We used propensity score methods to match exposed and unexposed enrollees based on observable baseline characteristics, and calculated the absolute changes in patient-reported health measures from baseline measurement to two-year follow-up. We examined changes in the Veterans RAND 6 Dimensional (VR-6D) score, a preference-based measure of general health with death coded as 0 and 100 representing perfect health. Scores are calculated based on individuals’ responses to a subset of survey items, spanning six dimensions of physical and mental health. We compared the Beers, Zhan, and HEDIS criteria overall, and specific classes of high-risk drugs.

**Population Studied**: 78,794 Medicare Advantage enrollees age 65 or older in the 2006-2008 Medicare HOS sample.

**Principal Findings**: 5,777 individuals, 6,653 individuals and 7,376 individuals were identified as new users of Zhan, HEDIS, and Beers criteria high-risk drugs, respectively. New users of high-risk drugs experienced greater declines in VR-6D scores after two years than propensity-score matched unexposed individuals. New users of Zhan criteria high-risk drugs experienced a 8.24 point decrease in VR-6D score, while unexposed individuals experienced a 5.97 point decrease during the same interval (difference -2.27, 95% CI -3.24 to -1.29). The difference between new users of HEDIS high-risk drugs and unexposed individuals was -2.33 (95% CI -3.24 to -1.42), and the difference between new users of Beers high-risk drugs and unexposed individuals was -1.72 (95% CI -2.58 to -0.87). In an analysis of the most commonly prescribed high-risk drug classes, opiate use was found to be associated with the greatest decline in VR-6D scores, while skeletal muscle relaxant use was not associated with any significant change in patient-reported health. Approximately 60% of new users of high-risk medications received only one dispensing during the study period.

**Conclusions**: We found only minor differences in the two-year change in self-reported general health between new users of high-risk medications and unexposed individuals. The three most commonly used criteria sets for defining high-risk prescribing did not differ in their ability to predict changes in patient-reported health.

**Implications for Policy, Delivery, or Practice**: Evidence linking these agents to relevant adverse outcomes may be needed to justify the continued mandatory collection and public reporting of high-risk drug use among the elderly. Given the heterogeneous nature of these agents and the typically short duration of exposure, the extent and type of exposure may be important to capture in a quality indicator.

**Funding Source(s)**: Other, Health Assessment Lab

**Poster Session and Number**: B, #759

**Do Medication Therapy Management (MTM) Programs Improve Patient Adherence in Medicare? An Analysis of MTM Programs on Use of Evidence-Based Medications in Chronic Disease Patients**

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**Presenter**: Anjali Dixit, M.P.H.; (M.D. in progress at Stanford University School of Medicine), Policy Associate; Medical Student, Acumen, LLC; Stanford University School of Medicine, adixit@acumenllc.com

**Research Objective**: Medication therapy management (MTM) programs have been part of Medicare Part D since its inception in 2006. These programs, targeted at high-cost, chronically-ill beneficiaries, aim to optimize therapeutic outcomes and reduce the risk of adverse events through improved medication use, including increased medication adherence. This study aimed to identify the effects of 2010 Part D MTM programs on Medicare beneficiaries diagnosed with congestive heart failure (CHF) or chronic obstructive pulmonary disease (COPD).

**Study Design**: A retrospective cohort design was used to estimate the effect of MTM programs on adherence to evidence-based medications for chronic diseases during a 180-day outcome period. Effects were calculated for patients who did or did not receive an annual comprehensive medication review (CMR) as part of the program. The main outcome measure was adherence to evidence-based medications for CHF and COPD as measured by achieving medication adherence of greater than 80 percent of days covered. Intervention groups were comprised of all Medicare beneficiaries newly-enrolled in a Part D MTM program in 2010 with a CHF or COPD diagnosis recorded in the
claims data in 2009. The program’s effect on adherence was evaluated relative to a comparison group, constructed by exploiting variations in MTM eligibility rules set by Part D sponsors to identify beneficiaries with CHF or COPD who were not eligible for MTM in their plan, but who would have been eligible had they been enrolled in another Part D plan. Multivariate regression models adjusted outcome measures for individual-level sociodemographic, health, and regional differences. Analyses were stratified by disease condition, by CMR receipt or not, and by patient enrollment in a fee-for-service Part D plan (PDP) or Medicare Advantage managed-care plan (MA-PD).

Population Studied: The population was Medicare patients with claims evidence for CHF and COPD and for use of evidence-based medications. Patients were required to have 100-percent Medicare Parts A, B, and D claims data available from 2009-2011.

Principal Findings: In 2010, 3,506,350 individuals enrolled in Part D were identified as having CHF; 3,973,578 were identified with COPD. Of these, 8.3 percent with CHF and 8.7 percent with COPD participated in an MTM program, of which 10.4 percent and 11.5 percent received an annual CMR, respectively. CHF patients in PDPs not receiving CMRs had an odds ratio (OR) for achieving medication adherence of 1.036 (95-percent CI: 1.009-1.064) as compared to controls; CHF patients in PDPs receiving CMRs had an OR of 1.41 (95-percent CI: 1.065-1.222); COPD patients in PDPs not receiving CMRs had an OR of 1.119 (95-percent CI: 1.059-1.183); COPD patients in PDPs receiving CMRs had an OR of 1.296 (95-percent CI: 1.160-1.449). Results were similar for those enrolled in MA-PDs.

Conclusions: MTM programs improved evidence-based medication adherence in Medicare patients with CHF and COPD, with beneficiaries who received CMRs more likely to benefit. MTM programs administered to patients with PDP and MA-PD plans had similar effects.

Implications for Policy, Delivery, or Practice: Further research is needed to determine whether improved adherence in this population is maintained over longer periods of time and whether MTM programs are cost-effective and lead to improved health.

Funding Source(s): CMS

Poster Session and Number: B, #760

Risk Adjusting the Hospital Readmission Measure for Skilled Nursing Facilities: A Comparison between Cohort and Non-Cohort Modeling Approaches

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Presenter: Zhanlian Feng, Ph.D., Senior Research Public Health Analyst, RTI International, zfeng@rti.org

Research Objective: Hospital readmissions among Medicare patients from skilled nursing facilities (SNFs) are frequent, costly and often associated with adverse patient experience and outcomes. Existing SNF readmission measures in the research literature vary in risk-adjustment methods used, which have not been rigorously assessed. Currently, the Centers for Medicare and Medicaid Services (CMS) is developing a 30-day SNF readmission measure which is to harmonize with its 30-day all-cause hospital-wide readmission (HWR) measure that uses a cohort stratified, risk adjustment methodology. While this strategy works well for the HWR measure, it is unclear whether it is appropriate for SNF patients. The purpose of this analysis was to evaluate the predictive ability of the cohort model relative to the non-cohort model for readmission risk.

Study Design: We stratified all SNF stays into seven cohorts based on clinical input: cardiovascular/pulmonary; infections/skin; medical/cancer/other systemic; medical/metabolic, including drug related; neuropsychiatric; orthopedic/trauma/musculoskeletal; and miscellaneous. We fit a hierarchical linear model separately for each cohort, controlling for the patient’s primary discharge diagnosis, past hospital stays and comorbidities and additional risk adjusters. Estimates from separate cohort models were combined creating an aggregate, risk standardized readmission rate (RSRR) per SNF. We compared the estimates from this approach to a non-cohort approach that used the same set of risk-adjusters to calculate the RSRR for each SNF (pooling of estimates across cohorts was unnecessary). We conducted Hosmer-Lemeshow tests to assess the cohort and non-cohort risk-adjustment models in terms of calibration and discrimination.
of readmission risk for the same patients in each cohort.

**Population Studied:** All 2009 Medicare fee-for-service covered SNF stays admitted within 1 day of discharge from a prior acute hospitalization, taking exclusions into account (N=2,032,874).

**Principal Findings:** The non-cohort model yielded an overall C-statistic of 0.67, which approximated that from all of the cohort-specific models. Calibration analyses across cohorts and levels of risk (deciles) for readmission was more favorable for the non-cohort model (with predicted/observed ratios closer to 1, indicating more accurate prediction) than for the cohort model. The cohort model overestimates the readmission risk for low-risk patients in each cohort. The facility-level RSRRs generated from the cohort and non-cohort models are highly correlated (Spearman correlation >0.95) but differ in absolute values on a facility-specific basis. The Receiver Operating Characteristic (ROC) curves generated from the non-cohort model virtually overlaps those from all of the cohort-specific models.

**Conclusions:** The non-cohort model is more suitable than the cohort model in risk-adjusting the SNF readmission measure, providing a much simpler yet statistically robust approach. The non-cohort model performs consistently better than does the cohort model in terms of calibration and just as well in discrimination.

**Implications for Policy, Delivery, or Practice:** The non-cohort model is conceptually more intuitive and straightforward and computationally less intensive than the cohort model. It also avoids potential ascertainment errors in assigning and grouping patients into separate cohorts. Given the substantial time and resources required to maintain and update quality measures on a frequent and ongoing basis, we recommend using the non-cohort model in CMS' efforts to develop and fine-tune the SNF readmission measure.

**Funding Source(s):** CMS

**Poster Session and Number:** B, #761

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**Outpatient Hospital Stay Trends between 2007 and 2011 among Medicare Beneficiaries**

Daniel Gregory, General Dynamics Information Technology; Peter J. Hickman, M.S., M.A., Centers for Medicare & Medicaid Services; Daniel J. Duvall, M.D., Centers for Medicare & Medicaid Services

**Presenter:** Daniel Gregory, Ph.D., Principal Statistician, Health Analytics and Fraud Prevention, General Dynamics Information Technology, daniel.gregory@gdit.com

**Research Objective:** The authors (herein referred to as “we”) aimed to describe recent trends in outpatient stays, differentiate types of outpatient stays that included (1) observation stays and (2) multiday stays following a major outpatient procedure, and also describe outpatient stays lasting more than 3 days.

**Study Design:** We conducted a cross-sectional study of 100% Medicare claims from the Centers for Medicare & Medicaid Services’ Chronic Condition Data Warehouse (CCW) between 2007 and 2011. We derived outpatient stays from outpatient claims with (1) an observation procedure code (i.e., G0378 – hospital observation per hour and/or G0379 – direct admission for hospital observation) and/or (2) one of 131 select ambulatory payment classification (APC) codes when a service was also billed on the day following the APC procedure (i.e., a multiday stay). We used these criteria to describe three types of outpatient stays: “observation stays” had an observation code and not the select APCs, “procedure stays” had a select APC and no observation code, and “mixed stays” had both an observation code and a select APC. Lastly, we described long stays which encompassed procedure and mixed stays that were at least 4 days and observation stays that exceeded 72 hours under observation.

**Population Studied:** We included Medicare fee-for-service beneficiaries who had Part B coverage during any month within a given calendar year if they did not have Medicare Advantage coverage within that calendar year.

**Principal Findings:** The rate (i.e., number of outpatient stays per 1,000 Medicare beneficiaries) increased from 36.2 in 2007 (n=1,233,467 stays) to 52.6 in 2011 (n=1,832,421 stays), a compound annual growth rate (CAGR) of 9.8%. Observation stays were most common with rates of 24.4 in 2007 and 35.9 in 2011 (CAGR 10.1%). Procedure stays had a larger growth rate increasing from 6.5 in 2007 to 10.4 in 2011 (CAGR 12.8%). Mixed stays increased from 5.4 in 2007 to 6.3 in 2011 (CAGR 3.8%). Long stays increased from a rate of 0.5 in 2007 (n=16,886 stays) to 1.4 in 2011 (n=47,739 stays; CAGR 28.9%).

**Conclusions:** Medicare beneficiaries increasingly received hospital care on an outpatient basis. Outpatient hospital care extended over multiple days and in a small but
growing number of cases, lasted longer than 3 days.

**Implications for Policy, Delivery, or Practice:**
Outpatient hospital stays do not apply toward the 3-day inpatient hospitalization requirement for Medicare Part A coverage of postacute care in a skilled nursing facility (SNF). Therefore, more care provided on an outpatient basis raises the possibility that some beneficiaries, who would qualify for SNF care under Medicare Part A if admitted on an inpatient basis, will not qualify. Medicare’s benefit structure, which dates back to the start of the program, should be reviewed so that beneficiaries are not disadvantaged by this shift in how hospital services are provided and billed.

**Funding Source(s):** CMS

**Poster Session and Number:** B, #762

**Transition to Medicare and Surgical Utilization: Pent Up Demand?**

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**Research Objective:** Uninsured, near-elderly adults increase their use of basic medical services after gaining Medicare coverage. Acquisition of Medicare is also associated with improved trends in self-reported health for previously uninsured adults. Further studies have documented disparities in access for surgical procedures based on payer status and changes in utilization patterns with Medicare policy changes. Many uninsured patients require surgical care that they cannot afford. A change in insurance status may result in access to surgery that would have otherwise been too expensive. We hypothesize that there exists a pent up demand for elective surgical services among uninsured, near-elderly adults that results in increased utilization of elective services after gaining Medicare.

**Study Design:** We used data from the 2001-2010 Nationwide Inpatient Sample (NIS) to identify admissions with the primary procedure being either elective (eight medically necessary procedures across specialties, deferrable for up to five years) or emergent (three procedures, non-deferrable) surgery. To evaluate the different utilization of elective surgery, ratios of elective to emergent procedures were generated for patients 1) under 65 and uninsured (uninsured), 2) under 65 with private insurance (private) and 3) 65 and over with Medicare (Medicare). To assess for deviation of linearity within the age ranges, a Chi Square for Linear Trend was performed. Comparison between groups was performed using a Rao-Scott Chi Square test for sample weighting in the NIS.

**Population Studied:** 2,311,566 procedures were identified. 2,001,914 (87pct) were elective. The most frequent elective procedure was joint replacement (63pct) and the most frequent emergent procedure was open reduction/internal fixation (69pct). The distribution of procedures between groups was: uninsured (27,488; 1pct), private (933,244; 40pct) and Medicare (1,350,834; 59pct).

**Principal Findings:** Within the Medicare group age ranges there was no deviation from linearity (65-69: 6.81 v 6.87 v 6.91 v 6.77 v 6.62; p=0.167). Similar results were obtained for the uninsured and privately insured groups (p > 0.4). The age ranges were then collapsed. There was a significant difference in the elective to emergent ratio between the uninsured and private groups (0.88 vs 6.66; p < 0.001) and between the uninsured and Medicare group (0.88 vs 6.8; p < 0.001). There was no significant difference between the private and Medicare groups (6.66 vs 6.8; p= 0.118).

**Conclusions:** Elective procedures are far more likely to be performed in the privately insured and Medicare group than in the uninsured group. There appears to be similar utilization of elective surgery between privately insured patients and patients over 65 with Medicare. As the there was no deviation of linearity in the Medicare group, we are unable to demonstrate any increase in utilization of Medicare services immediately after acquisition.

**Implications for Policy, Delivery, or Practice:** The uninsured receive less elective surgery than both the privately insured group and the Medicare group. Though we are unable to demonstrate it in this study, pent up demand in the previously uninsured population would represent a burden upon the Medicare system. It also can contribute to the increased morbidity and mortality of the uninsured population. Future study with longitudinal data will be helpful to
both further elucidate the relationship and evaluate outcomes.

**Funding Source(s):** NIH

**Poster Session and Number:** B, #763

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**The Role of Medicare Part D in Coverage of Injected Medications: The Case of Erythropoiesis-Stimulating Agents in Myelodysplastic Syndromes**

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**Presenter:** Franklin Hendrick, Graduate Student, Pharmaceutical Health Services Research, University of Maryland School of Pharmacy, fhend001@umaryland.edu

**Research Objective:** Medicare Part D prescription drug benefits implemented in 2006 cover injected medications normally covered under Part B when they are administered outside of physician offices. Part D out-of-pocket (OOP) cost-sharing is substantial, but is lower in patients receiving the low income subsidy (LIS). Erythropoiesis stimulating agents (ESAs) are used for chronic anemia management in myelodysplastic syndromes (MDS), among other conditions. MDS are a group of hematologic malignancies common in older adults. ESAs can be administered safely at home, but due to historical reimbursement policies, ESAs are usually injected in a physician office, up to 3X weekly. This study examined prevalence, patient costs, and factors associated with receipt of Part D-covered ESAs in a Medicare beneficiary population with MDS.

**Study Design:** This observational study used Medicare enrollment and claims data, and Part D plan characteristics. A 2-part modeling strategy examined receipt of any ESA, and any Part D covered ESA among beneficiaries who received ESAs. Logistic regression models included measures of LIS receipt, Part D cost sharing, patient demographics, and health status. Models were re-estimated stratifying by LIS receipt, with the expectation that LIS recipients would not be responsive to variations in cost-sharing, from which they were generally exempted.

**Funding Source(s):** NIH

**Poster Session and Number:** B, #763

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**Impact of Firm Market Share on Part D Plan Premiums: 2008-2011**

Benjamin Howell, Centers for Medicare & Medicaid Services; Jesse Levy, Centers for Medicare & Medicaid Services / Center for Medicare and Medicaid Innovation; Partha Deb, Centers for Medicare & Medicaid Services / Center for Medicare and Medicaid Innovation; Rachel Reid, University of Pittsburgh School of Pharmacy
average total premium charged by Part D plans rose from $39.96 to $55.36 (2011 dollars). In our regression analysis, we found that each percentage point increase in lagged firm market share was associated with a $0.04 (95% CI: - $0.10, $0.18), $0.24 ($0.11, $0.36), $0.37 ($0.23, $0.52), and $0.51 ($0.34, $0.68) increase in plan premiums in 2008, 2009, 2010, and 2011, respectively.

Conclusions: Overall, we found that firm market share had a significant and substantive impact on beneficiary Part D premiums, with larger firms charging higher premiums, holding all else equal. We also found that this effect grew more pronounced over time. If the Part D Program's market-based approach were functioning well, beneficiaries' efforts to maximize the value of their coverage through switching away from higher cost options would have prevented large firms from leveraging their market share into higher premiums in the out years of the program. The inherent complexity of Part D coverage decisions may be a significant barrier to beneficiaries being effective consumers in the Part D marketplace, causing them both to rely too heavily on heuristics, such as brand recognition, in making plan selections and to avoid reevaluating prior decisions, even in the face of rising costs.

Implications for Policy, Delivery, or Practice: Policies and interventions aimed at promoting better competition among Part D plans could yield significant savings to both Medicare beneficiaries and to the Part D program as a whole.

Funding Source(s): No Funding

Presenter: Yvonne Jonk, Ph.D., M.S., Senior Research Associate, Division of Health Policy and Management, University of Minnesota Rural Health Research Center, yjonk@umn.edu
Research Objective: To examine patterns in prescription coverage across rural and urban areas before and after implementation of Medicare Part D, and analyze out of pocket drug expenditures, adherence, plan satisfaction and access to pharmaceutical care.

Study Design: We used data from the Medicare Current Beneficiary Survey (MCBS) 2004-09 Cost and Use and Access to Care files to examine patterns in prescription coverage across rural and urban areas, analyze out of pocket expenditures, and access to prescriptions pre and post Part D enrollment. The MCBS is a longitudinal panel survey of a nationally representative sample of Medicare beneficiaries sponsored by the Centers for Medicare and Medicaid Services. Beneficiaries were classified as having the following types of prescription coverage: Medicare Part D either through a stand-alone prescription drug plan or a Medicare Advantage prescription drug plan, and Retiree Drug Subsidy plans where employers receive a subsidy from Medicare to maintain drug benefits. MCBS respondents also self-reported whether they had drug coverage through private health insurance plans that were either employer sponsored insurance or self-purchased plans (i.e. Medigap), private or Medicare health maintenance organizations, or Medicaid drug coverage. Nonexclusive categorization of prescription drug coverage was used to analyze annual trends. Logistic regression was used to predict part D enrollment.

Population Studied: A nationally representative sample of Medicare beneficiaries.

Principal Findings: Over half of Medicare beneficiaries have enrolled in Part D since its inception in 2006. Overall Part D enrollment rates increased one to five percentage points annually from 2006-09. Enrollment in the Part D program has successfully reduced rural prescription drug uninsurance rates from 35% in 2004 to less than 10% in 2009. With continuous uninsurance rates for prescription drugs less than 5% in urban areas, rural areas persistently lag behind urban areas. Rural beneficiaries, women, minorities, less educated, single or divorced, chronically ill and beneficiaries in poor to fair health were more likely to enroll in Part D. Ten percent of urban and 19% of rural beneficiaries transitioning onto Part D previously lacked drug coverage. Previously uninsured Part D enrollees realized the largest reductions in total prescription and out of pocket prescription expenditures post enrollment, were less likely to purchase prescriptions via mail or internet, request samples, and delay or skip doses.

Conclusions: The Medicare Part D program has been particularly effective in reducing rates of uninsurance for prescription drugs in rural areas, and improving adherence and access to prescriptions. While the phasing out of Medigap policies for prescription coverage has decreased rates of private prescription drug coverage, similar increases in private HMO prescription coverage along with significant reductions in drug uninsurance rates dispel concerns that the Medicare Part D program may be crowding-out private prescription coverage. Independent of geographic location, we found strong evidence of adverse selection occurring among Part D enrollees.

Implications for Policy, Delivery, or Practice: With rural and chronically ill Medicare beneficiaries being more likely to enroll in Medicare Part D than their urban counterparts and uninsurance rates for prescription drug coverage dropping to all-time lows, the Part D program has significantly improved access to prescriptions.

Funding Source(s): Other, Office of Rural Health

Poster Session and Number: B, #766

Differences in Skilled Nursing Facility Care and Associated Outcomes among Medicare Advantage and Fee-for-Service Beneficiaries

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Presenter: Hye-young Jung, Graduate Student, Department of Health Services, Policy and Practice, Brown University, hye-young_jung@brown.edu

Research Objective: Medicare spending on skilled nursing facilities (SNFs) has reached $32 billion annually, while approximately one in four beneficiaries in the federal program is now enrolled in a Medicare Advantage (MA) plan. The primary objective of this study is to evaluate how the dissimilar financial incentives associated with Medicare fee-for-service (FFS) and MA impact post-acute care.

Study Design: We compared the use of SNF care and the likelihood of returning home following SNF discharge among MA and
Medicare FFS beneficiaries. A longitudinal cohort study was undertaken using initial Minimum Data Set assessments merged with the Medicare enrollment file for years 2003 through 2007. **Population Studied:** Study participants included 101,693 Medicare beneficiaries admitted to a SNF for the first time following a hospitalization for either hip fracture or stroke. **Principal Findings:** In 2003, 8% of patients admitted to SNF following a hip fracture were enrolled in MA plans, increasing to 15% in 2007. For stroke patients admitted to SNF, 6% and 14% had MA coverage in 2003 and 2007, respectively. For both diagnoses, MA and FFS enrollees received similar duration of daily rehabilitation therapy. Compared to FFS enrollees, MA participants stayed in SNFs 5.5 fewer days (95% CI 5.1 to 5.8) following hip fracture and 5.9 fewer days (95% CI 5.3 to 6.6) following stroke. Among patients with hip fracture, 85.2% of MA enrollees and 75.7% of FFS enrollees were discharged home (adjusted difference 4 percentage points 95% CI 0.026 to 0.054). Among stroke patients, 67.0% of MA enrollees and 57.6% of FFS enrollees were discharged home (adjusted difference 6 percentage points 95% CI 0.036 to 0.078). **Conclusions:** MA enrollees appear to achieve better post-acute care outcomes with less intensive care. Further study is required to identify the mechanism by which MA plans achieved lower length of stay and greater likelihood of discharge home. **Implications for Policy, Delivery, or Practice:** Greater efficiency associated with MA coverage has the potential to generate substantial savings without compromising patient outcomes. **Funding Source(s):** AHRQ **Poster Session and Number:** B, #767

**Estimating the Incremental Costs of Hospital-Acquired Conditions**

Amy Kandilov, RTI International; Nicole Coomer, RTI International; Kathleen Dalton, RTI International

**Presenter:** Amy Kandilov, Ph.D., Research Economist, Health Care Payments and Financing, RTI International, akandilov@rti.org

**Research Objective:** Hospital-acquired conditions, or HACs, can result in additional costs to patients and to third parties who pay for health care. These costs can be generated both in the hospitalization in which the HAC occurs and in subsequent health care encounters, which might not have been necessary or as resource-intensive, if that patient did not have a HAC. This report presents estimates of the incremental effect of a HAC on Medicare spending for healthcare services, both in terms of Medicare program outlays and beneficiary liabilities for deductibles or coinsurance. **Study Design:** Both descriptive and multivariate analyses were used to examine the differences between the Medicare program costs and beneficiary liabilities among episodes of care for patients who had a HAC during their initial hospitalization and episodes of care for clinically comparable patients who did not have a HAC. Episodes of care included the initial hospitalization, with or without the HAC, and all inpatient, outpatient, home health, and hospice care that occurred within 90 days of the initial hospital discharge. The descriptive analysis relied on a multivariable matching procedure to define an appropriate comparison group for the HAC episodes, and the multivariate analysis further controlled for characteristics related both to HACs and to higher healthcare costs. **Population Studied:** The population of interest was the set of all Medicare patients who were discharged from a hospital between October 1, 2008, and June 30, 2010, and whose hospitals claims contained diagnosis codes for one of the Medicare selected HACs. To create a comparable control group, a multivariable matching procedure was used, where for each hospital claim with a HAC, five comparison hospital claims with the same diagnosis group, sex, race, and age that did not have the HAC were selected. **Principal Findings:** For nine of the ten Medicare selected HACs, the episode payments are significantly higher for the HAC episodes than for the non-HAC episodes. From the descriptive analysis, the costliest selected HACs for in terms of total excess Medicare payments are fractures and vascular catheter-associated infections. The multivariate analysis of seven of the larger selected HACs suggests that Medicare paid an additional 285 million dollars across these episodes of care compared with what it would have paid if none of the HACs had occurred. For beneficiaries, the incremental liability associated with the HACs in our multivariate analysis was 36 million dollars. **Conclusions:** Preventable infections and other conditions that are hospital acquired create a significant financial burden for both the Medicare program and Medicare beneficiaries. Programs
and policies that reduce the occurrence of these HACs have the potential to both improve health and reduce costs.

**Implications for Policy, Delivery, or Practice:** Current Medicare payment penalties for HACs are an important first step in countering the excess financial burden created by preventable HACs. However, these payment penalties are insufficient to offset the significant increased costs of HACs to Medicare across episodes of care. The Affordable Care Act mandates that Medicare transition to a rate-based payment penalty for HACs in 2015, with the intent to reduce HACs and generate Medicare savings.

**Funding Source(s):** CMS

**Poster Session and Number:** B, #768

**Emerging Dual Eligibles: Older Medicare Beneficiaries’ Initial Enrollment in Medicaid**

Laura Keohane, Brown University; Orna Intrator, Brown University; Momotazur Rahman, Brown University; Vincent Mor, Brown University

**Presenter:** Laura Keohane, M.S., Phd Student, Brown University, laura_keohane@brown.edu

**Research Objective:** The wide range of health needs and costs among the Medicare-Medicaid population raises questions about pathways to dual eligibility. Understanding which individual and policy factors influence whether Medicare beneficiaries will enroll in Medicaid is important for ensuring these programs efficiently target and integrate services. This study identifies the characteristics associated with initial enrollment in Medicaid among Medicare beneficiaries age 65 and above. We also examine cross-state variation in Medicaid conversion rates in relation to states’ Medicaid eligibility policies.

**Study Design:** Using Medicare enrollment records, we studied all Medicare beneficiaries age 65 and older in 2007 who had no record of Medicaid enrollment from 2007-2008. We linked these beneficiaries’ residential zip codes to Census data on elderly poverty levels. We followed the cohort until the end of 2009 to identify if individuals enrolled in limited or full Medicaid benefits. Limited Medicaid provides Medicare premium and cost-sharing support; full Medicaid finances additional services, such as long term care. To examine individual factors associated with Medicaid enrollment, we selected a random twenty percent sample and estimated a multinomial logistic regression model on the likelihood of enrolling in full or limited Medicaid benefits. We compared Medicaid enrollment rates across states for the entire cohort after using indirect adjustment to standardize for age, sex and race. Data from Kaiser State Health Facts provided information on variation in states’ Medicaid eligibility rules.

**Population Studied:** We identified 27,514,688 Medicare beneficiaries age 65 and over who were enrolled in Medicare from 2007-2008 with no history of Medicaid enrollment during that period.

**Principal Findings:** Among Medicare beneficiaries with no recent history of Medicaid enrollment, 1.1% initially enrolled in full Medicaid benefits by the end of 2009. An additional 0.4% of Medicare beneficiaries enrolled in limited Medicaid benefits. In the multinomial regression results, individuals who were older, female, black, previously enrolled in Medicare Part D or lived in a zip code with higher elderly poverty levels were significantly more likely to enroll in full Medicaid benefits. Except for age, the same factors were associated with enrollment in limited Medicaid benefits. Results for previous participation in Medicare managed care were mixed: individuals with a history of HMO enrollment in 2007 or 2008 were more likely to enroll in limited but not full Medicaid benefits.

States’ unadjusted initial Medicaid enrollment rates among Medicare beneficiaries ranged from 0.6% to 3.8%. After adjustment for age, race and sex distribution, Medicaid enrollment rates were higher in states with medically needy programs that had more generous income limits (mean 1.9%) compared to states without medically needy programs (mean 1.4%).

**Conclusions:** Except for age and previous HMO participation, similar characteristics are associated with an increased likelihood of initial enrollment in full or limited Medicaid benefits. Rates of how many Medicare beneficiaries convert to dual enrollment vary across states, which may partly be due to a state’s Medicaid eligibility criteria.

**Implications for Policy, Delivery, or Practice:** Better knowledge of the characteristics of new Medicare-Medicaid enrollees can guide strategies for improving benefit coordination and targeting Medicaid to individuals who would benefit most from additional coverage.

**Funding Source(s):** AHRQ

**Poster Session and Number:** B, #769
**There is No Such Thing as a High Cost Region**
Thomas Macurdy, Stanford University, Acumen LLC; Brandy Lipton, Acumen LLC; Jay Bhattacharya, Stanford University, Acumen LLC, National Bureau of Economic Research; Jason Shafrin, Acumen LLC; Sajid Zaidi, Acumen LLC; Shahin Saneinejad, Acumen LLC; Camille Chicklis, Acumen LLC

**Presenter:** Brandy Lipton, Ph.D., Senior Policy Associate, Research, Acumen LLC, brandy.lipton@gmail.com

**Research Objective:** To determine whether regions with high Medicare resource utilization also use resource intensive methods to treat Medicaid patients.

**Study Design:** We use the universe of Medicare and Medicaid claims with dates of service between 2007 and 2009 to compute monthly costs per beneficiary at the HRR level. We price standardize costs to remove regional variation due to differences in payment policies. We risk adjust price-standardized spending to account for a variety of beneficiary demographic characteristics, including health status. Pearson and Spearman correlations are computed to measure the association between HRR-level monthly Medicare and Medicaid spending per beneficiary. Correlation coefficients are also computed within beneficiary health condition categories.

**Population Studied:** All fee-for-service Medicare and Medicaid beneficiaries enrolled during the period 2007-2009.

**Principal Findings:** The correlation between HRR-level, price-standardized, risk-adjusted Medicare and Medicaid resource use is 0.02. The correlation between Medicare and Medicaid resource use within beneficiary condition cohorts ranges from ~0.12 (breast cancer) to 0.20 (lung cancer), with most correlations near zero.

**Conclusions:** There is little association between Medicare and Medicaid resource utilization, even after adjusting for a variety of beneficiary characteristics and examining utilization for beneficiaries with similar health conditions.

**Implications for Policy, Delivery, or Practice:** Efforts to reduce unnecessary health care spending in high cost regions must address Medicare and Medicaid spending separately.

**Funding Source(s):** Other, Institute of Medicine

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**A Profile of the Oldest Old: The Burden and Cost of Health Care**
Hongji Liu, Westat

**Presenter:** Hongji Liu, Ph.D., Survey Operations, Department of Survey Operations, Westat, liuh1@westat.com

**Research Objective:** The oldest old Medicare beneficiaries, aged 85 years old and over, grow at a much faster rate. Total number of the oldest old increased by 60% between 1992 and 2009. The majority of them are the highest-cost users of health care resources. Understanding their unique characteristics and their need for informal and formal care is critical to public health administrators. This paper intends to examine the following aspects of the oldest old: Demographics and health status, Living arrangement, Informal and formal help needed by community dwellers; and Mean personal health care expenditures (PHCE) and financing of health care.

**Study Design:** Data come from Medicare Current Beneficiary Survey (MCBS). Medicare beneficiaries are classified as: 85-89 years old; 90+ years old; and 65-84 years old: included as the comparison group.

**Population Studied:** Medicare beneficiaries 65 years old and over.

**Principal Findings:** The oldest old (5.7 million) were over-represented by females, white, widowers, and people living in/near poverty. They showed significantly higher prevalence of: Alzheimer's disease, cancer, heart disease, hypertension, osteoporosis, and stroke, along with severe cognitive and physical disabilities. The majority of them lived full year in community: 87% of 84-89 years old and 72% of 90+; whereas 13% of the former and 28% of the latter were institutionalized. Data trends were showing increases in the rates of living in community and decreases in institutionalization. Of those who lived in community, the need for informal (family and friend) and formal (home health care agencies) help was substantial. For those aged 85-89, 79% needed at least one informal helper and for those aged 90+, 87%; whereas 29% of the former and 32% of the latter group used formal help. The informal help mostly needed were help with going to the doctor, and help with IADL and ADL. Informal helpers were most likely the children (over 41%), followed by a spouse for those aged 85-89 (22%).
Beneficiaries aged 85-89 had a mean PHCE of $23,369 and 90+ $27,616, compared with $14,121 for those aged 65-84. Mean expenditures did not change much for users of services across age groups. 79% of those aged 85-89 and 95% of those aged 90+ belonged to the top 25 percentile of total PHCE. For those aged 85-84, Medicare financed 62% of the PHCE, followed by OOP (18%) and Medicaid (9%). For those aged 90+, Medicare paid 50%, followed by OOP (25%) and Medicaid (19%).

Conclusions: The oldest old represent one of the most vulnerable groups of the Medicare population. Their frail health status necessitates extensive informal and formal care and help. For the majority who still live in community, the burden of informal help is growing as more elderly choose to live in a community setting. Their disproportionate share of PHCE has enormous financial implications for public payers.

Implications for Policy, Delivery, or Practice: Public programs finance the bulk of health care for the oldest old Medicare beneficiaries. With the fast growth of this subgroup, the cost and burden for the public and the family will continue to increase. These data can help health care administrators in predicting future needs and cost of caring for this subgroup and designing support for the families and agencies.

Funding Source(s): CMS

Poster Session and Number: B, #771

The Role of Observation Services in 30 Day Recidivism amongst Patients with Congestive Heart Failure

Sean Lowe, Emory University School of Medicine; Jason Hockenberry, Rollins School of Public Health; Ryan Mutter, Agency for Healthcare Quality and Research; Michael Ross, Emory University School of Medicine

Research Objective: To determine the contribution of observation services to 30 day recidivism in heart failure (HF) patients.

Study Design: We performed a retrospective observational analysis of Healthcare Cost and Utilization Project (HCUP) data from states with requisite HF data fields (Tennessee and South Carolina) from 2007 to 2009 to determine the proportion of 30 day recidivism attributed to observation care.

Population Studied: We defined an index visit for congestive heart failure as either an inpatient or observation service stay with a primary diagnosis of HF without a previous inpatient or observation visit within the past 30 days. We defined a revisit as all cause returns to the hospital that resulted in either an inpatient or observation stay.

Principal Findings: Over the study period there were 56,156 index inpatient admissions. For these admissions, the number of inpatient revisits was 4066, 3558, and 2935 while the number of observation service revisits was 235, 233, and 268 in 2007, 2008, and 2009, respectively. Over the entire period, the rate of a 30 day readmission after an inpatient index visit was 18.8% and an after observation index was 13.5%. The proportion of 30 day HF revisits managed in observation was 5.4% (95% CI: 4.78%-6.14%), 6.1% (95% CI: 5.38%-6.91%) and 8.3% (95% CI: 7.41%-9.33%) in 2007, 2008, and 2009, respectively. Between 2007 and 2009 there was a 54% relative increase and a 2.9% (95% CI: 1.7%-4.1%) absolute increase in the proportion of HF patients subsequently managed in observation.

Conclusions: Although there is a downward trend in HF readmissions, observations services played a growing role in managing these patients within 30 days of their index visit.

Implications for Policy, Delivery, or Practice: Reducing 30 day readmissions is the primary goal of many provisions of the Affordable Care Act (ACA). There has been a paucity of literature on the role observation services will play in how hospitals respond to many of these ACA provisions. Within this light, the details and implications of our results merit further study.

Funding Source(s): No Funding

Poster Session and Number: B, #772

Effect of Payment Changes for Pressure Ulcers from the Hospital-Acquired Conditions Initiative: A Statewide Analysis

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Medical Center, Ann Arbor, MI, United States; Laurence F. McMahon MD, MPH, Internal Medicine, University of Michigan Medical School, Ann Arbor, MI, United States

**Presenter:** Jennifer Meddings, M.D., M.S., Assistant Professor, Internal Medicine, Division of General Medicine, University of Michigan Health System, meddings@umich.edu

**Research Objective:** Hospital-acquired pressure ulcers are painful, common, costly, and often preventable complications. Since the 2008 Hospital-Acquired Conditions (HAC) Initiative, Medicare uses claims data to deny extra hospital pay for treating certain HACs including pressure ulcers; this policy rapidly expanded to other payers. By the HAC Initiative, advanced stage pressure ulcers (stages 3 or 4) no longer can generate extra pay when hospital-acquired. A lesser-known detail of the HAC Initiative is that earlier stage (stages 1 or 2) and unstageable pressure ulcers no longer generate extra pay whether present-on-admission (POA) or hospital-acquired (HA). Whether hospital pay actually decreases with removal of pay for pressure ulcers depends on whether the patient’s other comorbidities justified the higher pay without the ulcer diagnosis. Our objective was to assess the impact of the pressure ulcer pay changes by evaluating pressure ulcer rates and hospital payments before and after the 2008 policy.

**Study Design:** Utilizing a before-and-after study of all-payer statewide claims data, we assessed pressure ulcer rates using the Healthcare Cost and Utilization Project State Inpatient Dataset. To assess financial impact, we assessed how often and by how much the 2008 payment changes for pressure ulcers affected hospital pay.

**Population Studied:** More than 2.4 million annual adult discharges from 305 nonfederal acute care California hospitals in 2007 and 2009.

**Principal Findings:** Pressure ulcers were listed as POA diagnoses for 54,820 (2.27%) discharges in 2007 and 73,908 (2.95%) discharges in 2009; HA pressure ulcers were listed for 6,522 (0.27%) discharges in 2007 and 6,573 (0.26%) discharges in 2009. By clinical stage of pressure ulcer (available in 2009), stage 3-4 HA ulcers occurred in 586 cases (0.02%); stages 1, 2 or unstageable ulcers (including HA or POA) occurred in 56,383 cases (2.25%). Removal of pay for stage 3-4 HA ulcers reduced pay in 71 (12.1%) cases with an average pay decrease of 5503 dollars, for a total statewide all-payer pay decrease of 390,698 dollars (0.001%) for all payers and 226,045 dollars (0.002%) for Medicare. Removal of pay for stage 1, 2, and unstageable ulcers reduced hospital pay in 19,123 (33.9%) cases including 17,867 (93.4% of 19123) cases with present-on-admission ulcers; this resulted in a mean pay decrease of 3,213 dollars for a total statewide pay decrease of 61,435,536 dollars (0.20%) for all payers and 46,156,024 dollars (0.31%) for Medicare.

**Conclusions:** The financial impact of the 2008 pay changes for pressure ulcers was very small on all-payer or Medicare statewide hospital payments. Unexpectedly, the largest proportion of pay change for pressure ulcers resulted from the lesser-known non-payment of all earlier stage and unstageable ulcers (including 93.4% described as present-on-admission ulcers) which was 200 times greater than pay reductions for hospital-acquired stage 3-4 ulcers. Hospital-acquired pressure ulcers rates remained low and unchanged in claims data over the study period; pressure ulcers recorded as present-on-admission increased.

**Implications for Policy, Delivery, or Practice:** This study suggests that the most significant impact regarding pressure ulcers from the Hospital-Acquired Conditions Initiative was no extra payment for cases with present-on-admission earlier stage and unstageable pressure ulcers – rather than prevention or reduced pay for hospital-acquired advanced stage pressure ulcers.

**Funding Source(s):** AHRQ

**Poster Session and Number:** B, #773

**Hospice Cost Reports: Benchmarks and Trends**

Brant Morefield, Abt Associates; Anjana B Patel, Centers for Medicare and Medicaid Services; Katherine E Lucas, Centers for Medicare and Medicaid Services; Mollie Knight, Centers for Medicare and Medicaid Services; Michael R Plotzke, Abt Associates

**Presenter:** Brant Morefield, Ph.D., Economist, Abt Associates, brand_morefield@abtassoc.com

**Research Objective:** We analyze FY 2004-2011 cost reports from freestanding hospice providers to describe the reported sources and trends of costs for hospice providers. In particular, we use this information to determine:
how much the cost centers contribute to total costs for a 'typical' provider; how sources of costs vary across providers; and how the average total costs per election period have changed over time. Additionally, benchmarks for cost sources are determined and whether these benchmarks are appropriate for the broader population of providers is discussed.

**Study Design:** We use a trimmed sample of hospice cost reports to examine the drivers of costs for a 'typical' provider. Cost sources (cost centers) are generally grouped into one of four broad categories for analyses: Inpatient Care, Visiting Services, Other Hospice Services, and Non-reimbursable Services. Alternative measures of "average", including weighted and unweighted means, are used to determine whether the measures of central tendency describe the typical experience for providers.

**Population Studied:** We analyze FY 2004-2011 cost reports from freestanding hospice providers. The set of cost reports used for analyses was trimmed of cost reports that contain missing or unusual data values that may cause measures of "average" to be misleading.

**Principal Findings:** Results for each of the broad cost centers provide specific inferences. The typical proportion of total costs attributed to visiting services is roughly two-thirds and has trended upward over time. The costs of other hospice services—drugs, medical supplies, and durable medical equipment—constitute 20-25% of total costs. However, declining drug costs are reducing the proportion of expenses attributed to these cost centers. Non-reimbursable services, on average, are a small proportion of total costs for the typical provider. Furthermore, a high proportion of facilities report zero costs under the non-reimbursable costs centers, despite the requirement for provision of bereavement services. Typical inpatient costs are difficult to capture. For instance, although 12% of all costs in the sample are attributed to inpatient care, roughly one-third of providers do not report incurring any inpatient care costs. Furthermore, a significant numbers of providers list a non-zero number of days of inpatient care, GIP or IRC, but do not report costs for inpatient care. A smaller proportion report non-zero costs and zero inpatient days. The total costs per election period have not significantly increased since 2007, in real dollars, for the sample.

**Conclusions:** Although a number of cost reports must be excluded prior to analyzing the data and large variance remains in individual measures, the HCRIS reports for freestanding providers yield useful information on the experience of 'typical' providers, including average costs, sources of costs, and trends over time.

**Implications for Policy, Delivery, or Practice:**

Funding Source(s): CMS

**Poster Session and Number:** B, #774

**An Emergency Room Decision Support Program That Increased Physician Office Visits, Decreased Emergency Room Visits and Reduced Costs**

Jessica Navratil-Strawn, OptumHealth; Kevin Hawkins, PhD, OptumInsight; Timothy S. Wells, MPH, PhD, OptumInsight; Stephen K. Hartley, BS, OptumHealth; Ronald J. Ozminkowski, PhD, OptumHealth Care Solutions; HungChing Chan, MPH, OptumHealth; Richard J. Migliori, MD, UnitedHealth Group; Charlotte S. Yeh, MD, AARP Services Inc.

**Presenter:** Jessica Navratil-Strawn, M.B.A., M.S., Senior Research Analyst, , OptumHealth, jessica.navratil-strawn@optum.com

**Research Objective:** To evaluate an Emergency Room Decision Support (ERDS) program designed to promote the use of physician’s office visits among frequent users of emergency room services in an attempt to improve quality of care while reducing costs.

**Study Design:** Program-related benefits were estimated by comparing the difference in downstream healthcare utilization and expenditures between participants and non-participants after using propensity score matching to adjust for case mix differences between these groups.

**Population Studied:** Adults with an AARP® Medicare Supplement Insurance plan insured by UnitedHealthcare Insurance Company (for New York residents, UnitedHealthcare Insurance Company of New York) were eligible to participate in the program. These included 7,499 individuals who elected to enroll in the ERDS program and an equal number of non-participants, who were eligible but either declined or were unreachable.

**Principal Findings:** Compared with non-participants, participants experienced greater quality of care, evidenced by an increase in physician office visits (p<0.001) and a greater reduction in emergency room visits (p<0.001). The program was cost effective, with a return on investment (ROI) of 3.65:1, which was
calculated by dividing the total program savings ($5.95 million) by the total program costs ($1.63 million), implying that for every dollar invested in this program, $3.65 was saved, most of which was attributable to Medicare.

**Conclusions:** This study focused on the quality and cost benefits associated with an ERDS program. The increase in physician office visits and decrease in emergency room visits may indicate the program helped participants establish relations with a primary care provider, which in turn may have led to reduced emergency room visits. The program resulted in significant cost savings for Medicare.

**Implications for Policy, Delivery, or Practice:**
Emergency room decision support programs improve quality of care and reduce healthcare expenditures while shifting non-emergent care from the emergency room to a more appropriate care setting.

**Funding Source(s):** No Funding
**Poster Session and Number:** B, #775

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**The Impact of Competitive Bidding on Medicare Advantage Enrollment**

Lauren Nicholas, University of Michigan

**Presenter:** Lauren Nicholas, Ph.D., M.P.P., Faculty Research Fellow, Institute for Social Research, University of Michigan, lnichola@umich.edu

**Research Objective:** Designing a payment system that attracts managed care plans and fairly reimburses their participation has been a long-standing challenge in the Medicare program. In 2006, Medicare implemented a competitive bidding system for Medicare Advantage (MA) plans in a new attempt to rein in spending on plans and offer additional benefits to Medicare beneficiaries. Plans bid to provide a standard benefit package relative to a county benchmark. If a bid exceeds the benchmark, plans must make up the difference through beneficiary premiums. Plans bidding below the benchmark are rebated 75 percent of the difference between the benchmark and their risk-adjusted bid. Rebates must be used to provide additional benefits or reduced premiums to enrollees. It is unknown whether rebates to plans, and consequently more generous benefit packages, attracted sicker patients to Medicare Advantage plans.

**Study Design:** Retrospective, secondary data analysis of Medicare administrative enrollment and payment data from 2006 – 2010. County fixed effect regressions examined the association between change in the average risk score (with higher scores indicating sicker or most costly enrollees) of a county’s MA population and changes in benchmarks and average plan rebates.

**Population Studied:** 3,140 United States counties. Average MA penetration ranged from 19% in 2006 to 26% in 2010. Plan rebates ranged from an average $72.80 per enrollee per month in 2009 to $58.21 in 2010, though there was considerable variation across counties and over time. On average, Medicare Advantage enrollees were healthier than the average Medicare beneficiary, with a risk score of 0.95 (relative to average risk 1).

**Principal Findings:** Higher rebates to plans were associated with MA enrollment by higher-risk (sicker) enrollees. An additional $10 per enrollee per month rebate (compared to a mean rebate of $44) was associated with a 0.16 increase in average risk score (p < 0.001)

**Conclusions:** More generous managed care benefit packages encourage higher-risk beneficiaries to enroll in Medicare Advantage plans, though MA enrollees remained healthier than average Medicare beneficiaries.

**Implications for Policy, Delivery, or Practice:** On average, MA plans were able to provide a standard benefit package for significantly less than the county benchmark, suggesting that lower payments to MA plans may be a source for future Medicare savings. Higher payments to MA plans do not appear to target the sickest Medicare beneficiaries, though the rebate mechanism appears to help attract higher-risk enrollees.

**Funding Source(s):** CWF
**Poster Session and Number:** B, #776

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**Abdominal Aortic Aneurysm Screening: The Impact of the SAAAVE Act of 2007**

Natalia Olchanski, Tufts Medical Center; Aaron Winn, Center for the Evaluation of Value and Risk in Health, Tufts Medical Center; Joshua T. Cohen, Center for the Evaluation of Value and Risk in Health, Tufts Medical Center; Peter J. Neumann, Center for the Evaluation of Value and Risk in Health, Tufts Medical Center

**Presenter:** Natalia Olchanski, MS, Project Director, Center for the Evaluation of Value and Risk in Health, Tufts Medical Center, nolchanski@tuftsmedicalcenter.org
Research Objective: Abdominal aortic aneurysm (AAA) is typically asymptomatic, but over time may lead to a rupture of the aorta, with a high fatality rate. Following adoption of the 2007 SAAAVE Act, Medicare offers AAA screening as part of its Welcome to Medicare visit. The one-time benefit is available to men with smoking history, and both men and women with family history of AAA. This study aims to estimate utilization of the new benefit and its impact on AAA diagnostics and treatment.

Study Design: We analyzed Medicare claims data to estimate utilization of the Welcome to Medicare examination (CPT codes G0344 and G0402) among new enrollees and use of the new AAA screening benefit (CPT code G0389). We also examined utilization of AAA-related diagnostics and treatment from 2005 to 2009, i.e., two years prior to and following the 2007 adoption of the new benefit. We included AAA-related procedures that took place during the same quarter as diagnosis of AAA (ICD-9 codes 441.3, 441.4), or during the prior or following quarter.

Population Studied: Newly enrolled Medicare beneficiaries and beneficiaries with AAA.

Principal Findings: Medicare data revealed very low uptake of AAA screening among newly enrolled Medicare beneficiaries, with rates of less than 1% each year, and under 1% among those eligible for the screening benefit. The number of newly enrolled beneficiaries newly diagnosed with AAA ranged from 6,660 to 9,260 per year, increasing slightly over time. AAA-related use of abdominal ultrasound has decreased from 13 per 100 AAA patients in 2005 to 10 per 100 AAA patients in 2009. Overall AAA repair procedure rates have remained constant at 7 per 100 AAA patients, with endovascular repair use increasing and open repair use decreasing.

Conclusions: Medicare data revealed that the Welcome to Medicare visit for new enrollees and the AAA screening benefit established by the 2007 SAAAVE Act have been underutilized and have not affected diagnostic and repair procedure rates for AAA. At the same time, prevalence and treatment rates of AAA have remained steady.

Implications for Policy, Delivery, or Practice: Further steps are needed to both promote awareness of the benefits of AAA screening and eliminate disincentives to its use. Policymakers should review patient and physician financial incentives, as well as how AAA screening fits into the flow of patient-provider interactions.

Making this benefit available beyond the Welcome to Medicare visit, while continuing to limit its provision to one time only, could increase utilization by providing beneficiaries more flexibility and time to be screened. Finally, low levels of awareness may reflect the fact that there are no vocal patient advocacy groups AAA. Programs to increase both patient and health care provider awareness may help remedy this situation.

Funding Source(s): Other, Medtronic

Poster Session and Number: B, #777

Abdominal Aortic Aneurysm Screening: How Many Life Years Lost from Underuse of the Medicare Screening Benefit?

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Presenter: Natalia Olchanski, MS, Project Director, Center for the Evaluation of Value and Risk in Health, Tufts Medical Center, nolchanski@tuftsmedicalcenter.org

Research Objective: Abdominal aortic aneurysm (AAA) is typically asymptomatic, but over time may lead to a rupture of the aorta, with a high fatality rate. Starting in 2007, Medicare offers a new preventative service as part of its Welcome to Medicare visit (WTM), a free one-time AAA screening for men with smoking history, and both men and women with a family history of AAA. However, screening utilization rates are extremely low, at less than 1% of the eligible population. This study aims to estimate how increased utilization could affect population health as measured in terms of additional life years. We also explore the impact of extending the screening benefit to women with smoking history.

Study Design: We created a simulation model to estimate the effects of AAA screening newly enrolled Medicare beneficiaries with risk factors in the primary care setting. Parameter estimates for AAA epidemiology, treatment patterns, and outcomes were based on published medical literature, including population studies of AAA and clinical trials of AAA screening. Estimates of background or non-AAA-related mortality adjusted by risk factors associated with smoking history were based on National Vital Statistics.
and National Health Interview Survey. For the simulated cohort, the base case screening rate was 80%, and some individuals with AAA were also discovered incidentally. For any aneurysm, detected or missed, there was a chance of rupture, subsequent emergency repair, and possible death. Rupture rates for medium and large aneurysms were higher in women than in men. We performed univariate and multivariate probabilistic sensitivity analyses to test model robustness.

**Population Studied:** Newly enrolled 65 year old Medicare beneficiaries with smoking history or family history of AAA

**Principal Findings:** We estimate that screening populations currently included in the Medicare benefit could increase life expectancy by 0.10-0.11 and 0.26 life years for men with smoking history, men with family history of AAA, and women, respectively. For individuals with detected AAA, screening saved 1.79-2.01 for men and 2.88 life years for women, and boosted 10-year survival 9.9-11% and 14.5%, respectively. For women with smoking history, currently excluded from the benefit, potential gains were 2.39 life years among individuals with AAA and 0.09 life years across all screened individuals. When we extrapolate population-level health gains from screening per current Medicare benefit from 2007-2012 through to the year 2025, estimated life years saved total nearly 399,969. There is opportunity to save additional 289,717 life years by the year 2025 if screening rates increased between 2013 and 2018. These findings were robust over a range of scenarios.

**Conclusions:** Increasing utilization of AAA screening would yield substantial gains in life expectancy. Expanding the AAA screening benefit to women with smoking history also has the potential for substantial health benefits.

**Implications for Policy, Delivery, or Practice:** The results of this study require action from policy makers to improve adoption of AAA screening and to ensure it is available to all populations for which it represents good value. Policymakers should review patient and physician awareness of AAA, benefits and financial incentives of screening.

**Funding Source(s):** Other, Medtronic

**Poster Session and Number:** B, #778

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**ICD-10, It’s Coming Definitely! Preparing for ICD-10-CM Implementation in the CMS-HCC and RxHCC Risk Adjustment Models**

Lindsey Patterson, RTI International; Sara Freeman, RTI International; Melvin Ingber, RTI International; Gregory Pope, RTI International; John Kautter, RTI International; Andrew Pearlman, RTI International

**Presenter:** Lindsey Patterson, Research Analyst, RTI International, lpatterson@rti.org

**Research Objective:** The U.S. implementation of ICD-10-CM, International Classification of Diseases, Tenth Revision, Clinical Modification, has been delayed multiple times and is currently scheduled for October 2014. The purpose of this study is to evaluate the changes in coding systems, ICD-9 and ICD-10, and to map ICD-10-CM diagnosis codes into the classification system used in the risk adjustment models for Medicare Part C and Part D.

**Study Design:** The Medicare risk adjustment model classification system begins by classifying all diagnosis codes into approximately 900 diagnostic groups, known as DXGs. The DXGs are further aggregated into larger clinically-similar disease groupings used to predict medical spending, the HCCs, Hierarchical Condition Categories, or drug spending, the RxHCCs. In this study we first identify differences between ICD-9 and ICD-10 diagnosis codes in terms of structure, quantity, clinical terminology, and disease classifications. Next we use the General Equivalence Mappings, or GEMs, and input from clinicians and professional coders to map ICD-10 codes to ICD-9 codes and to DXGs, and then on to the CMS-HCCs and RxHCCs.

**Population Studied:** ICD-10-CM diagnosis codes and GEMs, FY2009-FY2013; risk adjustment model classifications applicable to Medicare beneficiaries in Part C Medicare Advantage plans and Part D drug plans

**Principal Findings:** ICD-10-CM codes, 3-7 characters, are longer than ICD-9-CM codes, 3-5 characters, and include more alpha characters, allowing for greater clinical detail and specificity. There are 69,832 FY2013 ICD-10-CM codes compared to 14,567 ICD-9-CM codes. ICD-10-CM codes have undergone significant changes in the past five years, averaging 3,800 code changes per year through FY2011 but decreasing to only 54 code changes in FY2013. In our FY2011 analysis, we mapped 75 percent of ICD-10 codes to a single ICD-9...
code and 20 percent directly to a DXG because there was no single equivalent ICD-9 code. Approximately 5 percent of ICD-10 codes have multiple concepts that require mapping to two or more ICD-9 codes or DXGs. We created or revised 49 DXGs to account for increased specificity of ICD-10 codes, classification changes between ICD-9 and ICD-10, or new concepts. For example, ICD-10-CM fracture codes have several thousand aftercare codes based on variations of fracture site, fracture type, and pattern of healing.

**Conclusions:** The scope of change moving from 14,500 ICD-9-CM codes to nearly 70,000 ICD-10-CM codes requires extensive analysis and planning. Ongoing changes to ICD-10 codes and the corresponding GEMs necessitate continual evaluation and revision of the mappings to the risk adjustment classifications.

**Implications for Policy, Delivery, or Practice:** Transitioning from ICD-9 to ICD-10 is a major challenge for providers that will affect the submission of diagnosis codes and require an extensive learning curve. Coding practices may change after progressing from the initial implementation stage to more established understanding and usage. Increased specificity may lead to further refinement of the risk adjustment classifications and more accurate predictions of associated costs for specific conditions.

**Funding Source(s):** CMS

**Poster Session and Number:** B, #779

**Understanding Variation in Utilization of Hospice Inpatient Care**

Alyssa Pozniak, Abt Associates; Anjana B Patel, MPH, CMS; Katherine E Lucas, PhD, CMS; Zinnia Ng Harrison, MHS, CMS; Michael R Plotzke, PhD, Abt Associates

**Presenter:** Alyssa Pozniak, PhD, US Health Associate, Abt Associates, Alyssa_Pozniak@abtassoc.com

**Research Objective:** Over 1.1 million people used Medicare’s hospice benefit in 2010, with approximately 13 billion dollars in expenditures. The vast majority (95 percent) of hospice days are for “routine home care”, which before regional adjustments is currently reimbursed at 153.45 dollars/day. However, a small and rapidly increasing share of hospice days are for “general inpatient care” (GIP), which is currently reimbursed at 682.59 dollars/day before regional adjustments. It is at the provider’s discretion to determine when and for how long a hospice patient receives inpatient care, but it is intended only for short-term inpatient care for pain control or acute or chronic symptom management which cannot be managed in other hospice settings. As CMS considers payment reform for the entire hospice program, our objective is to better understand the variation in length of stays on the GIP level of care across different sites of service, providers, and geographic location.

**Study Design:** We used Medicare hospice claims data to analyze utilization of GIP. Factors examined include: volume, GIP length of stay (LOS), site of service, transitions to and from GIP, and characteristics of providers who provide GIP.

**Population Studied:** All Medicare beneficiaries who received hospice care in 2010-11.

**Principal Findings:** 500,579 beneficiaries had 553,397 GIP stays comprised of 3,134,952 GIP days. The majority of GIP stays were provided at inpatient hospices units (65 percent), a quarter were provided in hospitals (25 percent), and 10 percent in a skilled nursing facilities (SNF). Average GIP LOS was 5.7 days (median =4 days), but varied by site (6.3 days at inpatient hospice units; 4.7 days at hospitals; 5.3 at SNF). Furthermore, almost a quarter of inpatient stays were over seven days. The timing of inpatient stays is clustered at the beginning and end of a beneficiary’s hospice episode: nearly two-thirds of GIP stays occurred within three days of the start of the beneficiary’s hospice episode, and three quarters of the GIP stays ended within three days of the end of the beneficiary’s hospice episode. For 65 percent of GIP stays, the beneficiary began hospice with inpatient care (that is, they were not in hospice the day immediately preceding their first GIP day). Nearly 80 percent of hospices provided at least one GIP day. On average, only 1.5 percent of providers’ days were for GIP, although a small number of providers exceeded 20 percent. A higher proportion of older hospices provide GIP than newer hospices, and nearly all large hospices provide GIP compared to half of small hospices. Nearly all New England providers provided GIP vs. three-quarter of Southern providers.

**Conclusions:** Despite the relatively narrow intent of inpatient care for hospice patients, there is considerable variation in inpatient care, including LOS, diagnosis, site of service, and provider characteristics. Most beneficiaries who had a GIP stay began their hospice episode receiving GIP level of care raises.
Implications for Policy, Delivery, or Practice: Ongoing analyses seek to better understand the underlying causes of variation and factors that influence utilization and transition to hospice inpatient care.

Funding Source(s): CMS

Poster Session and Number: B, #780

Influence of Urologists’ Practice Affiliations with Medical Schools on the Use of Androgen Deprivation Therapy for Prostate Cancer

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Research Objective: Physician academic affiliations and changes in drug reimbursement rates have been shown to influence physician practice patterns regardless of clinical guidelines, patient clinical or sociodemographic factors. We examined the association between urologists’ practice affiliations with medical schools and the utilization of medical androgen deprivation therapy (ADT) before and after reductions in medical ADT reimbursement rates resulting from the 2003 Medicare Modernization Act (MMA).

Study Design: Multilevel regression analyses were used to evaluate the influence of urologists’ practice affiliations with medical schools on primary medical ADT use on patients within 6 months of diagnosis – a treatment regimen that is at variance with clinical guidelines and has not been shown to improve survival or other patient-centered outcomes.

Population Studied: Using the Surveillance, Epidemiology and End Results – Medicare linked database and the American Medical Association Physician Masterfile, we conducted a retrospective cohort study of 10,301 patients aged 66 years or older who were diagnosed between 2003 and 2005 with localized, low-to-intermediate grade prostate cancer, and the 1,577 urologists who saw them.

Principal Findings: Overall, 3,763 (37%) patients received medical ADT. After adjusting for patient, tumor and urologist characteristics, patients who saw urologists with no practice affiliation with medical schools were significantly more likely to receive medical ADT (odds ratio [OR], 2.03; 95% confidence interval [95% CI], 1.57-2.63, p<0.0001). Compared to 2003, when the MMA went into effect, the odds of receiving medical ADT were significantly lower in 2004 (OR, 0.76; 95% CI, 0.68-0.85, p<0.0001) and 2005 (OR, 0.51; 95% CI, 0.45-0.57, p<0.0001).

Conclusions: Even though the overall odds of patients receiving unnecessary medical ADT decreased after the MMA reimbursement reduction, urologists without practice affiliations with medical schools were still significantly more likely to prescribe medical ADT; such treatment patterns are not consistent with patient-centered clinical guidelines and unlikely to have significant survival benefit.

Implications for Policy, Delivery, or Practice: Ultimately, the decision of whether to utilize medical ADT should result from an informed decision between the urologist and the patient. While the majority of urologists are undoubtedly motivated by patient-centered outcomes, the significant differences in medical ADT use as a function of urologists’ practice affiliations with medical schools are a cause for concern. In addition to increased health care spending, patients who receive primary medical ADT for localized prostate cancer have been shown to suffer from a worse overall quality-of-life compared to those not receiving this treatment. The significant associations found in this study between urologists’ practice affiliations with medical schools and the utilization of medical ADT provides further insights into what efforts may be successful in reducing overtreatment of localized prostate cancer patients with primary medical ADT following Medicare reimbursement reductions. This study also provides additional evidence for clinicians and policy makers regarding factors including, physician reimbursement, that may influence adherence to evidence-based guidelines.

Funding Source(s): Other. This study was supported by the American Cancer Society, Intramural Research Department, Atlanta, Georgia.

Poster Session and Number: B, #782

Determinants of the Combined Use of External Beam Radiation Therapy and Brachytherapy for Low-Risk Localized Prostate Cancer

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Presenter: Ruben Quek, Emory University, American Cancer Society, ruben.quek@emory.edu

Research Objective: Prostate cancer treatment patterns have been shown to vary by physician and patient characteristics. For patients with low-risk localized prostate cancer, we examined the association between their region of residence and their radiation oncologists' practice affiliations with medical schools on the likelihood they would receive both external beam radiation therapy (EBRT) and brachytherapy (BT) – a treatment regimen that is at variance with clinical guidelines and has not been shown to improve survival or other patient-centered outcomes.

Study Design: Multilevel regression analyses were used to evaluate the influence of patients' region of residence and radiation oncologists' practice affiliations with medical schools on the combined use of EBRT and BT on patients within 6 months of diagnosis.

Population Studied: Using the Surveillance, Epidemiology and End Results – Medicare linked database and the American Medical Association Physician Masterfile, we conducted a retrospective cohort study of 4,479 patients aged 66 years or older who were diagnosed between 2004 and 2007 with low-risk localized prostate cancer, and the 401 radiation oncologists who saw them.

Principal Findings: Overall, 231 (5.2%) patients received combined EBRT and BT. After adjusting for patient, tumor and radiation oncologist characteristics, patients who saw radiation oncologists with no practice affiliation with medical schools were significantly more likely to receive combined EBRT and BT (odds ratio [OR], 3.14; 95% confidence interval [95% CI], 1.50-6.59, p = 0.003). In addition, regional variations were observed; the odds of receiving combined therapy for patients residing in California (OR, 0.1; 95% CI, 0.03-0.33, p<0.0001) were significantly less than those residing in Georgia (OR, 1.0; referent).

Conclusions: Low-risk localized prostate cancer patients residing in Georgia were significantly more likely to receive combined EBRT and BT when compared to patients residing in other SEER Regions. Radiation oncologists without practice affiliations with medical schools were significantly more likely to treat patients with combined EBRT and BT; such treatment patterns are not consistent with patient-centered clinical guidelines and unlikely to have significant survival benefit.

Implications for Policy, Delivery, or Practice: Ultimately, the decision of whether to utilize combined EBRT and BT should result from an informed decision between the radiation oncologist and the patient. While the majority of radiation oncologists are undoubtedly motivated by patient-centered outcomes, the significant differences in combined radiation therapy use as a function of radiation oncologists’ practice affiliations with medical schools are a cause for concern. Likewise, more research is required to understand the significant disparity between treatments received by patients residing in Georgia versus other SEER regions so as to reduce geographic variation.

In addition to increased health care spending, patients who receive combined radiation therapy for localized prostate cancer have been previously shown to suffer from a worse overall quality-of-life compared to those not receiving this combined treatment. The significant associations found in this study provide additional evidence for clinicians and policy makers regarding areas to target to reduce the overtreatment of low-risk localized prostate cancer patients and increase adherence to evidence-based guidelines.

Funding Source(s): Other, This study was supported by the American Cancer Society, Intramural Research Department, Atlanta, Georgia.

Poster Session and Number: B, #783

The Role of the Urologist in Whether Locoregional Prostate Cancer Patients Consult with a Radiation Oncologist

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Presenter: Ruben Quek, Emory University, American Cancer Society, ruben.quek@emory.edu
Research Objective: Multiple treatment options exist for prostate cancer patients, and therapeutic recommendations may differ depending on characteristics of the specialist consulted. The clinical judgment of specialists who advise patients can play a critical role in the initial treatment choice, especially in cases where there is no professional consensus regarding the optimal treatment strategy. We examined the association between the medical school affiliation of a prostate cancer patient’s urologist and the likelihood the patient would consult a radiation oncologist.

Study Design: Multilevel regression analysis was used to evaluate the influence of patients’ urologists’ practice affiliations with medical schools on the patients’ consultation with a radiation oncologist within 9 months of diagnosis.

Population Studied: Using the Surveillance, Epidemiology and End Results – Medicare linked database and the American Medical Association Physician Masterfile, we conducted a retrospective cohort study of 39,915 patients aged 66 years or older who were diagnosed between 2004 and 2007 with locoregional prostate cancer, and the 2,404 urologists who performed the patients’ diagnostic biopsies.

Principal Findings: Overall, 25,110 (62.9%) patients consulted with a radiation oncologist. After adjusting for patient, tumor and urologist characteristics, patients who saw urologists practicing within non-institutional settings were significantly more likely to consult with a radiation oncologist (odds ratio [OR], 1.19; 95% confidence interval [95% CI], 1.05-1.34, p = 0.006) when compared to those who saw urologists practicing within settings with a major medical school affiliation. In addition, patients who saw urologists aged 58 years or older were significantly more likely to consult with a radiation oncologist (OR, 1.71; 95% CI, 1.16-2.50, p = 0.006) when compared to those who saw urologists younger than 43 years old.

Conclusions: Locoregional prostate cancer patients who received their diagnostic biopsy by urologists practicing in non-institutional settings and those who saw older urologists were significantly more likely to eventually consult with a radiation oncologist.

Implications for Policy, Delivery, or Practice: Previous studies have shown that prostate cancer patients receive varied information stemming from a lack of consensus regarding optimal treatment and a tendency for specialists to overwhelmingly recommend treatments that they themselves deliver. Ultimately, the decision of whether to consult with a radiation oncologist should result from an informed decision between the urologist and the patient. While the majority of urologists are undoubtedly motivated by patient-centered outcomes, the significant differences in patients’ eventual consultation with a radiation oncologist post-diagnosis as a function of their diagnostic urologists’ practice settings and urologists’ age are a cause for concern.

Seeking opinions from multiple types of specialists may increase the breadth of information and the multidisciplinary care that prostate cancer patients receive and reduce specialty bias. Nevertheless, this study provides additional evidence for clinicians and policy makers regarding where the in-office ancillary exception to the Federal Stark Law (that allows physicians in some circumstances to refer patients for additional services to a facility in which the physician has a financial interest) may have led to different likelihoods of patient consultation with radiation oncologists after diagnosis; and how to potentially reduce the health care costs and risk of radiation therapy over-utilization on prostate cancer patients.

Funding Source(s): Other, This study was supported by the American Cancer Society, Intramural Research Department, Atlanta, Georgia.

Poster Session and Number: B, #784

Medication Adherence, Medicare Costs, and Targeting Medication Therapy Management Services

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Presenter: Pamela Roberto, M.P.P., Senior Director, Policy & Research, PhRMA, proberto@phrma.org

Research Objective: To (1) estimate potential cost savings to the Medicare program associated with improving long term adherence to medications recommended for diabetes, heart failure, and chronic obstructive pulmonary disease (COPD); and (2) assess the sensitivity of current Medicare Part D medication therapy management (MTM) eligibility criteria in identifying beneficiaries with suboptimal adherence.
medication patterns associated with the greatest potentially avoidable medical and hospital costs.

**Study Design:** We tracked adherence to ACE inhibitors/ARBs, beta blockers, and COPD medications over a three year period for beneficiaries diagnosed with diabetes, heart failure, and COPD, respectively. The extended observation period allowed us to examine the impact of consistently high (PDC greater than or equal to 0.80) and low (PDC less than 0.80) adherence, as well as a variety of other dynamic suboptimal adherence patterns such as delayed initiation, discontinuance of therapy, and long treatment gaps. To determine whether beneficiaries were eligible for MTM services, we relied on the CMS eligibility criteria thresholds most commonly used by Part D plans in 2011, which included annual drug spending of at least $3000, three or more chronic conditions, and a minimum of eight monthly medications. Finally, we used multivariate regression models to assess (1) the association between adherence and monthly Part A and B spending for beneficiaries in each adherence category and MTM eligibility group; and (2) the effectiveness of current MTM criteria in targeting beneficiaries with the greatest potential for Medicare savings. All models controlled for potential confounding due to healthy adherer bias.

**Population Studied:** Random 5 percent sample of beneficiaries diagnosed with diabetes, heart failure and COPD and continuously enrolled in fee for service Medicare Parts A and B, and Part D stand alone prescription drug plans (PDPs) between 2006 and 2008.

**Principal Findings:** Beneficiaries with poor adherence to ACE inhibitors/ARBs, beta-blockers, and COPD medications had significantly higher Medicare Part A and B costs, but were not uniformly more likely to be eligible for MTM services. Multivariate analyses indicated that monthly Medicare spending was lowest among consistently high adherers across all conditions and MTM eligibility groups; however, the marginal impact of suboptimal adherence varied by type. The most costly beneficiaries were episodic medication users including discontinuers, delayed initiators and those with long gaps in use. Relative to beneficiaries with consistently high adherence over the entire study period, suboptimal medication use was associated with higher monthly Part A and B costs of between 49 and 840 dollars.

**Conclusions:** Better medication adherence can reduce future medical and hospital costs for Medicare beneficiaries with chronic disease. Patterns of suboptimal adherence in the Medicare population are highly heterogeneous and the costs associated with problematic utilization are generally, but not consistently higher among beneficiaries who meet the current MTM eligibility criteria, compared to those who do not.

**Implications for Policy, Delivery, or Practice:** A substantial share of beneficiaries who are currently ineligible for MTM services display suboptimal adherence patterns associated with high future Medicare costs. Realigning MTM eligibility with a metric such as potentially preventable future costs holds potential to both improve quality of care and reduce Medicare spending.

**Funding Source(s):** Other, NACDS/PhRMA

**Poster Session and Number:** B, #785

**The Medicare STAR Adherence Measure Excludes Patients with Poor Risk Factor Control**

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**Presenter:** Julie Schmittdiel, Ph.D., M.A., Research Scientist, Division of Research, Kaiser Permanente Division of Research, julie.a.schmittdiel@kp.org

**Research Objective:** The Centers for Medicare and Medicaid Services (CMS) STAR program rates Medicare plan quality of care and provides monetary incentives to high-performing health plans. CMS introduced adherence to antihypertensive, antihyperlipidemic, and oral antihyperglycemic medications to its STAR quality metrics in 2012. STAR adherence measurement specifications exclude patients who never fill their prescription or obtain only one fill, and users of oral antihyperglycemics who also use insulin. This study examines the proportion of non-adherent patients and concurrent insulin users excluded from STAR adherence metrics; assesses variation in STAR adherence by patient and prescription.
characteristics; and examines the association of both STAR adherence and exclusion from the STAR metric with cardiovascular disease (CVD) risk factor control.

**Study Design:** The proportion of patients excluded from STAR adherence metrics based CMS specifications due to early non-adherence and concurrent insulin use was calculated for 2010. We used Poisson regressions to examine predictors of STAR adherence, and predictors of CVD risk factor control in 2010.

**Population Studied:** The study sample consisted of diabetes patients in 2010 age >= 65 from Kaiser Permanente Northern California (KPNC), Kaiser Permanente Colorado (KPCO), and Kaiser Permanente Northwest (KPNW).

**Principal Findings:** 129,040 patients were included. The STAR metrics excluded 9% of patients from the antihypertensive adherence measure, 10% from the antihyperlipidemic measure, and 28% from the oral antihyperglycemic measure. Significant predictors of poor STAR adherence were older age, non-white race/ethnicity, and being prescribed < 90 days’ supply of medication (RR=1.64, 1.63, 1.65 for antihypertensives, antihyperlipidemics, and oral antihyperglycemics respectively, p<.001). While non-adherence based on the STAR metric was negatively associated with CVD risk factor control (RR=0.95, 0.84, 0.96 for A1c, LDL-C, and SBP control respectively, p<.001), exclusion from the measure for filling medications less than twice was also associated with poor control (RR=0.95, RR=0.71, RR=0.93 for A1c, LDL-C, and SBP control respectively, p<.001.) Exclusion for insulin use was also associated with poor control A1c control (RR=0.78, p<.001).

**Conclusions:** A significant percentage of diabetes patients prescribed medications are excluded from the STAR adherence metrics, and these metrics may underestimate the true level of non-adherence in the population. Day’s supply is a strong driver of CMS-defined adherence, suggesting system-level efforts to increase days’ supply may improve STAR performance. While CMS-defined adherence is linked to CVD risk factor control, quality improvement efforts should also focus on decreasing CVD risk for those patients not monitored through STAR adherence metrics.

**Implications for Policy, Delivery, or Practice:** Stakeholders should seek to define patient-centric quality measures that include all patients at risk for poor CVD outcomes, and develop and evaluate programs to improve all types of medication adherence.

**Funding Source(s):** AHRQ, Kaiser Permanente Center for Safety and Effectiveness Research

**Poster Session and Number:** B, #786

**Measuring Variation in Hospital Resource Use within Medicare’s Hospital Value-Based Purchasing System**

Jason Shafrin, Acumen, LLC

**Presenter:** Jason Shafrin, PhD, Policy Researcher, Acumen, LLC, jason.shafrin@gmail.com

**Research Objective:** As part of its hospital inpatient quality reporting (IQR) Program, Medicare is now measuring hospital resource using the Medicare Spending per Beneficiary (MSPB) measure. The measure will also be used as a part of the Hospital Value-Based Purchasing (VBP) Program for fiscal year (FY) 2015 payment adjustments. This study uses the publicly-reported MSPB measure to answer the research, “Which types of hospitals provide care most efficiently?”

**Study Design:** This study assesses the cost of services performed by hospitals and other healthcare providers during an MSPB hospitalization episode, which comprises the period immediately prior to hospital admission, during the hospital stay, and throughout the 30 days following discharge from the hospital. The MSPB measure uses standardized prices to control for regional differences in Medicare reimbursement rates and applies a variant of the hierarchical condition category (HCC) risk adjustment model to control for differences in patient case mix. A hospital’s MSPB score is equal to the ratio of their average price-standardized, risk-adjusted spending divided by the median spending amount per episode nationwide. In the Hospital VBP Program, hospital quality of care is measured using hospitals’ Total Performance Scores (TPSs).

**Population Studied:** All Medicare fee-for-service beneficiaries discharged from short-term acute hospitals between May 1, 2011 and December 1, 2011.

**Principal Findings:** The average spending during an MSPB hospitalization episode is $18,358, but there exists significant variation in resource use across hospitals. Hospitals at the 90th percentile use 24 percent more resources than hospitals at the 10th percentile. Resource use is lower for: rural hospitals, hospitals with
fewer beds, hospitals where Medicare patients make up a large share of their patients, and non-teaching hospitals.

**Conclusions**: There exists significant variation in resource use across different types of hospitals. Although Medicare pays hospitals a flat rate through the inpatient prospective payment system (IPPS) hospitals could improve overall efficiency on the MSPB measure by reducing the likelihood of re-hospitalizations or using post-acute care more efficiently.

**Implications for Policy, Delivery, or Practice**: Medicare can incorporate the MSPB measure into the Hospital VBP Program and incentivize hospitals to reduce resource use. Further research on the relationship between resource use and quality will be possible once the Hospital VBP Program TPSs are available.

**Funding Source(s)**: CMS

**Poster Session and Number**: B, #787

The Role of Health Shocks in Late Part D Enrollment

J. Samantha Shoemaker, PhRMA; Amy Davidoff, AHRQ; Bruce Stuart, University of Maryland; Ilene Zuckerman, University of Maryland; Eberechukwu Onukwugha, University of Maryland; Christopher Powers, CMS

**Research Objective**: Enrollment in Medicare Part D is voluntary; however, mechanisms exist to encourage early enrollment and improve risk pooling, including a permanent premium penalty associated with delayed enrollment and restricted enrollment periods. Nevertheless, 5 million eligibles did not enroll at their first opportunity in 2006 and a persistent 10% of beneficiaries remain without prescription drug coverage. This study examined whether a substantial health shock would create adequate incentives to overcome the penalties associated with late enrollment.

**Study Design**: Using enrollment and claims from a random 5% sample of Medicare beneficiaries from 2006 to 2008, we observed Part D enrollment decisions among beneficiaries who had failed to enroll in Part D at first eligibility. A health shock was defined as a hospital admission due to a drug-intensive chronic condition. Multivariable logistic regression examined the impact of a health shock on the probability of late Part D enrollment, controlling for beneficiary demographics, pre-existing chronic conditions, preventive service use, and admission to a skilled nursing or long term care facility. We also examined whether timing of the hospitalization relative to the next available enrollment period influenced the likelihood of Part D enrollment.

**Population Studied**: The sample included Medicare beneficiaries who did not obtain Part D or have other creditable coverage either following their initial enrollment opportunity or as of July 1, 2006 (N=207,674). We excluded beneficiaries who obtained non-Part D coverage, enrolled in Medicare Advantage prior to hospitalization, or who experienced a hospitalization during the initial enrollment period.

**Principal Findings**: 18% of beneficiaries in the cohort enrolled late into Part D. Initial and subsequent hospitalizations for drug-intensive conditions were associated with 5 and 7 percentage point increases in the probability of Part D enrollment, respectively (p<0.01). Coverage began in January for the majority of enrollees (69%) and a spike in enrollment was observed in July 2007 (13%), coinciding with a policy change for a major state pharmacy assistance program. A gap from the time of hospitalization to the next coverage period was associated with a lower likelihood of enrollment among non-Low Income Subsidy (LIS) recipients, but had no relationship for LIS enrollment, which is not restricted to open enrollment periods.

**Conclusions**: Health shocks were associated with an increased likelihood of late Part D enrollment, but many beneficiaries remained without Part D coverage despite deterioration in their health status and expected increased need for prescription drugs.

**Implications for Policy, Delivery, or Practice**: The threat of premium penalties and limited enrollment periods may encourage early Part D enrollment among most beneficiaries. Our results suggest that penalizing the initial decision to decline Part D may deter later enrollment. Non-enrollees were forced to either absorb the full cost of medications or forgo them, which can have negative effects on health and the potential to increase Parts A and B spending. Findings should be considered in related policies under the Affordable Care Act, in which penalties are only associated with current year failure to participate in mandated health coverage.
Funding Source(s): AHRQ
Poster Session and Number: B, #788

Episodes of Rehabilitation Care: A Model for Redesigning Therapy Reimbursement Under Medicare Part B
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Research Objective: The Centers for Medicare & Medicaid Services (CMS) is exploring payment reforms for outpatient rehabilitation services covered by Medicare Part B. Currently, FFS payment for outpatient rehab services allows for access to care, but statutory annual expenditure limits are uniform and not sensitive to severity or need. A potential area for exploration is payment for an episode of rehab care instead of individual services. This research builds upon Computer Science Corporation’s past approach to simulating Medicare rehab episodes (Ciolek D, Hwang W. CY 2006 outpatient therapy services utilization report. Baltimore, MD: Centers for Medicare & Medicaid Services; 2008) by testing new, more specific definitions. In the revised approach, emphasis is placed on differentiating specific courses of therapy within short periods of time using markers for underlying need created from combinations of HCPCS codes and ICD-9 codes. We then investigate which definitions are most effective in identifying rehab episodes and how currently collected information can begin to predict episode-level utilization.

Study Design: Observational Retrospective Study: We began with a baseline measurement of the Medicare population using both CSC’s episode definition and a beneficiary calendar year model. We then created episode-level files using more-specific episode definitions that focus on identifying additional clinical descriptors, indicators of episode termination, and concurrent but distinct courses of therapy. Each file contains rehab episode length, provider type(s), diagnosis classifications, claim lines, billed units, total payment, total allowed charges, and frequency of HCPCS codes. Multivariate analysis was then performed for each episode definition to understand which clinical descriptors are statistically significant predictors of expenditures and utilization patterns.


Principal Findings: Baseline analysis showed that 2010 mean annual Medicare payment per beneficiary was $1,201 across a mean of 16 treatment days. Mean annual payment for physical therapy (PT) was $981 across 13.3 visits; for occupational therapy (OT), $1,044 across 13.8 visits; and for speech-language pathology (SLP), $905 across 11.0 visits. Mean payment for PT episodes was $847 across 11.5 visits; for OT episodes, $920 across 12.2 visits; and for SLP episodes, $804 across 9.8 visits. We found that age, female gender and diagnosis classification groupings were predictive of expenditures in all three disciplines and have potential to be used in future risk-adjustment models.

Conclusions: Differences in payments and utilization between calendar year and episode-level statistics indicate that at least some beneficiaries have multiple episodes during the year. Episode-level statistics also showed a high standard deviation under the CSC definition when broken out by clinical descriptors and it is possible that other episode definitions will capture distinct courses of therapy within these episodes.

Implications for Policy, Delivery, or Practice: A more effective method of identifying distinct courses of therapy in Medicare FFS claims will help CMS to better gauge the cost of different types of beneficiaries and move away from a volume-driven system. Efforts are currently underway to collect measures of impairment in this population at the episode level. Such data, when paired with the episode methodologies used here, could allow Medicare to risk-adjust for functional impairment in a future payment system.

Funding Source(s): CMS
Poster Session and Number: B, #789

Variation in Inpatient Consultation among Older Adults in the United States
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were performed using Student’s t test. Tests of differences between consult density and hospital and admission and examined the relationship density as the number of consulting services per association survey. We defined average consult were extracted from the 2009 American Hospital Characteristics, including ownership status, location, number of beds, and teaching status were extracted from the 2009 American Hospital Association survey. We defined average consult density as the number of consulting services per admission and examined the relationship between consult density and hospital and geographic characteristics. Tests of difference were performed using Student’s t test.

**Research Objective:** For hospitalized patients, inpatient consultation holds significant implications for both costs and quality of health care. Consultation costs include not only a consulting physician’s direct costs but also the diagnostic testing and procedures that arise downstream as a result of the consultation. Patient-level clinical factors play a major role in the use of consultation, but other nonclinical drivers of variation in use of consultation services may be meaningful. We hypothesized that inpatient specialty consultation would vary based on hospital- and geographic-level factors. **Study Design:** We performed a cross-sectional analysis of inpatient consultation using 2009 data for a 20% sample of Medicare beneficiaries aged 65 or older who were continuously enrolled in fee-for-service Part A and Part B, excluding patients with end stage renal disease. Because inpatient consultations are not clearly captured by specific billing codes, we defined consults based on the number of distinct specialties billing during the hospitalization, minus one to account for the specialty of the attending physician of record. We identified hospitalizations based on dates of admission and discharge and included claims for inpatient physician services within one day of admission and discharge. Beneficiary demographic characteristics were obtained from the Medicare Beneficiary Summary File. Hospital characteristics, including ownership status, location, number of beds, and teaching status were obtained from the Medicare Beneficiary Summary File. We defined average consult density as the number of consulting services per hospital admission and examined the relationship between consult density and hospital and geographic characteristics. Tests of difference were performed using Student’s t test.

**Population Studied:** Medicare beneficiaries greater than 65 years old

**Principal Findings:** We studied 1,552,582 admissions of Medicare patients to 3,375 U.S. hospitals. The mean number of consults per admission ranged from 0.4 for hospitals in the lowest decile of consult density to 2.1 for hospitals in the highest decile (p<0.0001). Hospital characteristics associated with higher consult density included region (1.5 for hospitals in the Northeast versus 1.2 for those in the South, p<0.0001), location in urban versus rural areas (0.9 for rural hospitals versus 1.4 for urban hospitals, p<0.0001), teaching status (1.4 for teaching hospitals versus 1.2 for nonteaching hospitals, p<0.0001), and bed size (1.5 for hospitals with more than 250 beds versus 0.9 for hospitals with fewer than 100 beds, p<0.0001). Multivariable analyses are in progress to confirm these relationships. **Conclusions:** Substantial variation exists in the use of inpatient consultation, with more than 5-fold variation among highest- and lowest-utilizing hospitals. **Implications for Policy, Delivery, or Practice:** As the health care system begins to transition from rewarding volume to rewarding value, further research is necessary to understand the scope of the opportunity to optimize resource use related to inpatient consultation. **Funding Source(s):** No Funding

**Poster Session and Number:** B, #790

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**Regional Variation in Use of Generic Drugs and Medicare Part D Cost Sharing**

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**Research Objective:** Regional variation in Medicare prescription drug spending varies from $2125 to $3774 across hospital referral regions. This spending variation is largely driven by differences in the cost per prescription filled, and particularly the use of expensive brand name drugs in some areas. One factor that may affect the share of prescriptions filled for brand vs. generic drugs is Medicare Part D plan benefit.
design. Medicare Part D is administered by over 1,000 plans with different formularies and cost-sharing, and enrollment in these plans varies by region. Little is known about the impact of Part D plan features on regional variation in choice of brand vs. generic drugs. We sought to examine the relationship between Part D cost sharing and use of generic drugs overall and in the drug class of statins, which are commonly used for lowering cholesterol.

**Study Design:** Data were from the Centers for Medicare and Medicaid Services for a 10% random sample of Medicare beneficiaries, who were continuously enrolled in fee-for-service Medicare Parts A and B and a stand-alone Part D plan in 2009 (approximately 1.6 million individuals). We assigned beneficiaries to one of 306 hospital-referral regions (HRRs) based on zip code. Our outcome measures, constructed at the HRR-level, were the share of prescriptions filled for generic drugs, overall and for statins. Key independent variables were the absolute dollar difference for the mean copayment between a brand name drug and a generic drug (overall and for statins). Copayment for a drug was standardized to the cost per 30-day prescription. All estimates were adjusted for the demographic and health status differences at the HRR-level. We used both OLS regression and spatial lag model for estimation to account for spatial autocorrelation of HRR-level data. Diagnostic testing favored the maximum likelihood estimation of spatial lag model for this study.

**Population Studied:** Medicare beneficiaries 65 or older. We excluded low-income subsidy recipients and dual eligible individuals because they face low or no cost-sharing.

**Principal Findings:** The share of all prescriptions filled for generic drugs ranged across HRRs from 59.1% to 80.3% for drugs overall, and from 43.8% to 84.2% for statins. The absolute difference for the mean copayment between a brand name drug and a generic drug was $32.6 (with a range from $28.9 to $58.0 across HRRs) for drugs overall and $31.2 (from $28.0 to $33.7) for statins. Controlling for all other covariates, the copayment difference between brand and generic drugs had a strong positive association with share of prescriptions filled for generic drugs overall (coefficient: 0.19; p<0.05) and for statins (coefficient: 0.81; p<0.01).

**Conclusions:** Regions with Part D plans that had a larger differential in cost-sharing between generic and brand name drugs had higher rates of generic drug use than regions where plans had smaller differences in copayments.

**Implications for Policy, Delivery, or Practice:** Increasing the cost-sharing difference between generic and brand name drugs could be an effective way to encourage greater use of less-expensive generic drugs in high-cost regions. This change in benefit design could generate substantial savings for the Medicare program and for beneficiaries.

**Funding Source(s):** Other, The RAND-University of Pittsburgh Health Institute (RUPHI) pilot grant

**Poster Session and Number:** B, #791

**Medication Oversupply in Medicare Part D and Privately Insured Patients with Diabetes**
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**Presenter:** Carolyn Thorpe, Ph.D.,M.P.H., Assistant Professor, Pharmacy and Therapeutics, University of Pittsburgh School of Pharmacy, ctthorpe@pitt.edu

**Research Objective:** Refill adherence studies in integrated healthcare systems and Medicaid suggest that patients with chronic conditions often accumulate excess supplies of prescribed medications, which is associated with higher healthcare costs and hospitalization risk. However, predictors of oversupply are poorly understood, with no studies of Medicare Part D beneficiaries. We sought to describe prevalence and predictors of oversupply of antidiabetes, antihypertensive, and antihyperlipidemic medications in diabetes patients managed by a large, academic physician group and enrolled in Medicare Part D or local private (non-Medicare) health plan.

**Study Design:** Electronic health record data were linked to claims/enrollment data for 2006-2008 to construct a longitudinal, patient-quarter dataset. Diabetes patients were included after meeting inclusion criteria for 4 contiguous baseline quarters and at least one follow-up quarter: age 18+; not pregnant; medical and prescription benefits from a local private insurer OR Medicare Parts A and B plus stand-alone
Part D Prescription Drug Plan; met criteria for being managed by the provider group; treated with at least one antidiabetes, antihypertensive, or antihyperlipidemic medication during baseline. Quarterly refill adherence was calculated separately for each medication sub-class using the ReComp algorithm. Values were averaged across sub-classes and categorical cutoffs applied: under .80 = Undersupply, .80-1.20 = Appropriate Supply, over 1.20 = Oversupply. Time invariant predictors included baseline year ACG-Predictive Risk score, diabetes complications, cognitive/mental health impairments, number of prescribed medications; age; insurance status; sex; race/ethnicity. Time variant factors included quarterly number of providers seen and HbA1c, LDL cholesterol, and blood pressure control, based on most recent lab values. Multinomial logistic regression with standard errors adjusted for clustering within patients was used and adjusted predicted probabilities were calculated using the recycled predictions approach.

Population Studied: 2,519 adults with diabetes (51% female; 88% White), representing 5 age/insurance groups: 32% privately insured; 7% under age 65 Medicare; 38% aged 65+ Medicare; 14% under age 65 dual Medicare/Medicaid; and 9% aged 65+ dual Medicare/Medicaid.

Principal Findings: 20% of patients had at least 1 quarter with oversupply of antidiabetes, antihypertensive or antihyperlipidemic agents, and 6% of all quarters had average ReComp values indicating oversupply. The strongest predictor of oversupply was coverage by Medicare Part D, versus the local private plan. The adjusted predicted probability of quarterly oversupply in patients with private insurance was 1.8% (95% CI=0.9%-2.7%), compared to 6.5% (95% CI=3.4%-9.6%) in patients <65 in Medicare, 6.1% (95% CI=4.7%-7.5%) in patients 65+ in Medicare, 8.0% (95% CI=5.0%-10.9%) in patients <65 in Medicare/Medicaid, and 10.8% (95% CI=6.9%-14.8%) in patients 65+ in Medicare/Medicaid. The effect of age/insurance status was substantively unchanged in models stratified by complicated vs. uncomplicated diabetes and ACG-Predictive risk score. ACG risk score, dementia, and greater number of providers were significant predictors of oversupply in bivariate, but not multivariate, models. The only other independent predictor of oversupply was psychotic disorder diagnosis (OR=1.9, 95% CI=1.3-2.9).

Conclusions: Diabetes patients enrolled in Medicare Part D had 3-6 times the odds of oversupply compared to privately insured individuals.

Implications for Policy, Delivery, or Practice: Future research should examine the role of utilization management practices employed by Part D versus private health plans that may affect oversupply.

Funding Source(s): NIH
Poster Session and Number: B, #792

Observation Encounters and Subsequent Nursing Facility Stays

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Research Objective: Hospital-based observation services allow short-term evaluation, treatment, and assessment of patients as an alternative to inpatient admissions. Time spent in observation does not count towards the 3-day inpatient stay Medicare requires to cover skilled nursing facility stays, raising concerns that beneficiaries may become responsible for costly, nursing care following an observation service. To investigate the impact of this payment policy on beneficiaries, we assess the frequency with which community-dwelling Medicare beneficiaries are discharged to nursing facilities after observation encounters and describe characteristics of beneficiaries and observation services that ultimately result in discharge to nursing facilities.

Study Design: We linked observation service encounters to a Medicare administrative file
which describes beneficiaries' daily location of care: hospital, nursing facility, skilled nursing facility, community with home health services, community without services, and deceased. Our primary outcome of interest was the rate of nursing facility utilization directly following observation services for community-dwelling Medicare beneficiaries. We calculated descriptive statistics for the overall sample and utilization rates of covered and non-covered nursing facilities. Unadjusted differences in beneficiary and encounter characteristics were calculating using standard comparative statistics (t-tests and chi-squared tests).

**Population Studied:** We performed a beneficiary-level analysis of a 20% nationally representative sample of fee-for-service, community-dwelling Medicare beneficiaries in 2010. We studied all beneficiaries whose adjudicated level of care was observation services.

**Principal Findings:** In 2010, 196,428 community-dwelling beneficiaries received observation services, approximately 2.8% of Medicare fee-for-service beneficiaries. Following an observation encounter, beneficiaries were overwhelmingly (97.5%) discharged back to the community, whereas only 1.5% (3,109) were discharged to nursing facilities. Among beneficiaries discharged to nursing facilities, 27.9% were covered by Medicare. The remaining 72.1% were not covered by Medicare, representing 1.1% of the overall sample. Beneficiaries discharged to non-covered nursing facilities were older than those with covered stays (83.0 years vs. 78.9 years, p<0.01) and more likely to be male (72.7% vs. 64.9%, p<0.01). Beneficiaries discharged to a non-covered nursing facility stay experienced longer lengths of observation services than those with covered stays (32.4 hours vs. 23.7 hours, p<0.01). In fact, 22.2% of beneficiaries discharged to a non-covered nursing facility had an observation length of stay exceeding 48 hours, compared to less than 10% of beneficiaries with covered nursing stays and those discharged to the community with and without services.

**Conclusions:** Of those community-dwelling Medicare beneficiaries receiving observation services in 2010, only 1.1% were discharged to a non-covered nursing facility stay. These results may overestimate actual non-coverage rates as Medicaid may cover these services for patients who are dually eligible for Medicare and Medicaid. Beneficiaries with non-covered nursing facility stays experienced long length of stays, frequently exceeding 48 hours.

**Implications for Policy, Delivery, or Practice:** When considering future changes to observation service policies, policy makers should consider both the number and type of beneficiaries impacted.

**Funding Source(s):** No Funding

**Poster Session and Number:** B, #793

**Recruitment Strategies and Participation in the Senior Risk Reduction Demonstration**
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**Research Objective:** In the Senior Risk Reduction Demonstration (SRRD), the Medicare program partnered with two vendors to implement risk reduction programs for a sample of Medicare beneficiaries. The programs are comprised of health questionnaires, tailored health reports, customized educational materials, health counseling, self-management tools and referrals to national and local community resources. A key component of the demonstration is a Health Risk Assessment (HRA) administered yearly to demonstration participants so that high risk individuals can be identified, risk reduction interventions can be optimally adapted to the individual and changes in health and health behaviors can be tracked. The purpose of this paper is to describe the participants of the demonstration in the context of the varying recruitment strategies used by vendors.

**Study Design:** Vendors were given some discretion on the exact format of the HRA, but they were required to collect information from participants on 17 health risks, including physical inactivity, poor nutrition, smoking, excessive alcohol consumption, high blood pressure, and other risk factors. Within those receiving the treatment (HRA plus tailored follow-up), beneficiaries were randomly assigned to one of several “arms,” which differ in the intensity of the risk reduction program. We examined participation rates, retention rates and participant characteristics for each of the arms (standard, enhanced and no treatment) and
related differences to recruitment strategies used by the vendors.

**Population Studied:** Demonstration participants must be eligible Medicare beneficiaries between the ages of 67 and 74 at the start of the demonstration, enrolled in Parts A and B and not Part C, not currently or recently institutionalized and not enrolled in Medicare before age 65.

**Principal Findings:** Analyses indicate that participation rates were highest among non-Hispanic Whites, non-dual eligibles, individuals with certain chronic conditions, and beneficiaries with Medicare expenditures in the middle two quartiles. Highest re-enrollment occurred among beneficiaries participating in the placebo arm, and one vendor’s participants were more likely to be minorities and had higher Medicare expenditures than the other vendor’s participants. Despite active recruiting efforts, participation among dual eligibles was lower than that of non-duals, but this difference was much higher for one vendor (13 percentage points) than for the other (6 percentage points).

**Conclusions:** With limited exceptions, participation rates, participant characteristics, and retention were similar across the two vendors, despite their taking unique approaches to recruitment. For example, one vendor recruited beneficiaries using a wave approach, focused on Year 1 participants during Year 2 recruiting to enhance re-enrollment, and made interpreters available during phone calls if necessary. Another vendor sent recruitment materials to all potential participants in a single mailing and used automated phone calls for a portion of recruiting calls.

**Implications for Policy, Delivery, or Practice:** Participation patterns observed in SRRD provide lessons for other initiatives having voluntary participation such as the Medicare Annual Wellness Visit and Medicaid Incentives for Prevention of Chronic Disease.

**Funding Source(s):** CMS

**Poster Session and Number:** B, #794

The Federalist Approach to Track and Report Hospital-Acquired Conditions: A Review of Federal and State Initiatives and Closer Look at Four States’ Experiences

Nathan West, RTI International; Terry Eng, RTI International; Pam Spain, RTI International

**Presenter:** Nathan West, M.P.A., Research Health Analyst, Department of Health Economics Research, RTI International, nathanwest@rti.org

**Research Objective:** Medical errors and other serious adverse events acquired in the hospital are a leading cause of preventable death in the U.S. This study describes state- and federal-level initiatives to track and report Medicare’s select list of hospital-acquired conditions, or HACs, and investigates how four states used the collected data for statewide patient safety and quality improvements in hospitals and other inpatient settings.

**Study Design:** Used a mixed-method approach to the study. First, performed document reviews of existing reports, databases, and other sources on federal policies and state-level reporting systems for Medicare’s selected HACs. Next, conducted semi-structured telephone interviews with state health department officials in four states and examined the characteristics of their reporting systems, such as type of reviews, level of data, and public reporting. Finally, performed quantitative analyses of HAC rates during a two-year period using Hospital Compare public use files.

**Population Studied:** State governments and Medicare beneficiaries hospitalized between June 2009 and July 2011

**Principal Findings:** Findings showed that 28 states have reporting systems authorized and operated by state governments to collect information from facilities on the occurrence of adverse events, with the intent to improve patient safety. For a more in-depth review, we selected four states - California, Connecticut, Pennsylvania and Nevada - whose reporting systems collect data on at least eight of the ten Medicare selected HACs. In addition to meeting regulatory requirements for reporting, the four states also take innovative approaches in using these data to promote patient safety interventions. All four states publicly disclose HAC rates, but there is wide variability in the level of specificity of the disclosed information and how these data are used to promote patient safety improvement statewide. Our quantitative analysis of publicly reported HAC rates revealed that rates in these four states between July 2009 and June 2011 were lower for most Medicare selected HACs than the national average. For example, California’s rate per 1,000 discharges for vascular catheter-associated infections was 0.337 compared to the national average of 0.372. However, there were some cases where the state HAC rate was higher than the national
average such as the rate of falls and trauma in Nevada.

**Conclusions:** State-based reporting systems serve a significant role collecting and reporting data for Medicare HACs and other adverse events. Federal initiatives have bolstered adverse event reporting activities at the state level, but the four-state analysis indicates a lack of standardization across state reporting systems. While it is too early in the HAC-POA reporting program to make definitive conclusions about the relationship between state-based patient safety initiatives and hospital-level HAC rates, Hospital Compare data on HAC rates could be used as baseline data to measure performance improvement in over time.

**Implications for Policy, Delivery, or Practice:** The lack of standardization across states makes their records unsuitable for identifying national incidence and trends for HACs. Under-reporting of HAC data may also present difficulties for drawing inferences or tracking improvement over time. Despite these setbacks, both the federal government and states are continuously looking for innovative ways to provide meaningful data to improve patient safety and reduce incidences of HACs.

**Funding Source(s):** CMS

**Poster Session and Number:** B, #795

**Trends in Observation Care among Medicare Fee-for-Service Beneficiaries at Critical Access Hospitals versus Prospective Payment Hospitals, 2007 – 2009**

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**Presenter:** Brad Wright, Ph.D., Department of Health Management and Policy, University of Iowa College of Public Health, brad-wright@uiowa.edu

**Research Objective:** Observation care is used to evaluate patients prior to admission or discharge. Often beneficial, such care also imposes greater financial liability on Medicare beneficiaries. While the use of observation care has increased recently, critical access hospitals (CAHs) face different policies than prospective payment (PPS) hospitals, which may influence their observation care use. Therefore, this study examines the likelihood, prevalence and duration of observation care from 2007 to 2009 and compares trends among CAHs to trends among other short-term general PPS hospitals in both metro and non-metro areas.

**Study Design:** We use 100 percent Medicare inpatient and outpatient claims files and enrollment data for years 2007 to 2009, and the 2007 American Hospital Association data to compare trends in the likelihood, prevalence and duration of observation stays between CAHs and PPS hospitals in metro and non-metro areas among fee-for-service Medicare beneficiaries over age 65. For each hospital, we defined observation care prevalence as the annual number of observation stays per 1,000 inpatient admissions, and observation stay duration as the average hours per stay.

**Population Studied:** All non-metro CAHs and both metro and non-metro PPS hospitals with a dedicated emergency department and at least 25 annual Medicare inpatient admissions. Our sample included approximately 4,300 hospitals per year.

**Principal Findings:** While PPS hospitals are more likely to provide any observation care, the 3-year increase in the proportion of CAHs providing any observation care is approximately 5 times as great as the increase among PPS hospitals (19.1 percentage points versus 3.4 percentage points). Among hospitals providing any observation care in 2007, the prevalence at CAHs was 35.7 percent higher than at non-metro PPS hospitals and 72.8 percent higher than at metro PPS hospitals. By 2009, these respective figures had increased to 63.1 percent and 111 percent. Average stay duration increased more slowly for CAHs than for PPS hospitals. In 2007, 29.6 percent of CAHs had average stays in excess of 24 hours, compared to 58.9 percent of PPS hospitals. By 2009, this had increased to 34.2 percent for CAHs, and 72.0 percent for PPS hospitals.

**Conclusions:** These data suggest that while PPS hospitals remain more likely than CAHs to provide any observation care, this gap is shrinking as a growing proportion of CAHs are providing observation care. The data also demonstrate that, among hospitals providing any observation care, CAHs provide relatively more observation care than PPS hospitals, but have shorter average stays.

**Implications for Policy, Delivery, or Practice:** These findings suggest that, due in part to Medicare policy differences between CAHs and PPS hospitals, Medicare beneficiaries living in areas served by CAHs may be more likely to be held in the hospital as outpatients, and may be responsible for a larger proportion of total costs.
This also raises questions about the appropriateness of observation care use, and the health care outcomes it yields, neither of which our study addresses.

**Funding Source(s):** Other, Retirement Research Foundation

**Poster Session and Number:** B, #796

**Medicare Reimbursement Attributable to Catheter-Associated Urinary Tract Infection among Beneficiaries with an Intensive Care Unit Stay in 2009: A Retrospective Cohort Analysis**

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**Presenter:** Sarah Yi, Ph.D., M.S., Health Scientist, Division of Healthcare Quality Promotion, Centers for Disease Control and Prevention, sarahyi@cdc.gov

**Research Objective:** Catheter-associated urinary tract infections (CAUTIs) consist of approximately one-quarter of healthcare associated infections reported to the National Healthcare Safety Network (NHSN) surveillance system by intensive care units (ICUs) in acute care hospitals. Most CAUTIs are considered preventable, and thus a potential target for healthcare cost savings. The primary objective of this analysis was to determine Medicare reimbursement attributable to CAUTI among beneficiaries with an ICU stay at an acute care hospital in 2009. Secondary objectives were to estimate length of stay and inpatient death associated with CAUTI in the same population.

**Study Design:** Using a retrospective cohort design, we compared Medicare reimbursement between Medicare beneficiaries with and without CAUTIs. Inpatient hospitalization reimbursement amounts for Medicare beneficiaries were obtained from 2009 Medicare and Provider Analysis and Review (MedPAR) claim data. To identify beneficiaries with CAUTI, CAUTIs reported to NHSN in 2009 were linked to corresponding MedPAR claims. Variables linked included admission date, date of birth, sex, and hospital. To control for potential confounding, up to five beneficiaries without CAUTI were matched to each beneficiary with CAUTI by Clinical Classifications Software category of the primary International Classification of Diseases, Ninth Revision, Clinical Modification procedure code. Reimbursement and length of stay attributable to CAUTI were estimated using multivariable median regression; the estimated reimbursement was adjusted to 2011 US dollars using the Employment Cost Index for all civilian employees working in hospitals. The odds ratio of inpatient death for those with versus without CAUTI was estimated using multivariable logistic regression. Age, race, sex, comorbidity score, number of secondary procedure codes prior to infection, Centers for Medicare & Medicaid Services (CMS) wage index, CMS case mix index, number of hospital and critical care beds, and teaching status were included as covariates for each model.

**Population Studied:** Medicare beneficiaries, ages 65 years and older, with or without end stage renal disease, residing in one of eight states, who were discharged from an acute care hospital in 2009 were included. Claims were limited to beneficiaries with an ICU stay who were admitted to a hospital with at least one CAUTI reported to NHSN.

**Principal Findings:** Of the 553 and 28,002 beneficiaries with and without CAUTI who met inclusion criteria, 549 and 2,728 were selected in the frequency matching process, respectively. The incremental outcomes attributable to CAUTI were 8,281 dollars (95 percent confidence interval: 5,978 – 10,585) in Medicare reimbursement and 7.6 days (6.4-8.7) of hospitalization. Those with CAUTI had 1.5 times the odds (1.15-1.96) of inpatient death compared with those without CAUTI.

**Conclusions:** Beneficiaries with CAUTI had higher Medicare reimbursement, length of stay, and odds of inpatient death compared with those without CAUTI.

**Implications for Policy, Delivery, or Practice:** Most cases of CAUTI are preventable and CAUTI is associated with increased Medicare reimbursement, length of stay, and inpatient death; prevention strategies implemented to reduce CAUTI may result in improved health outcomes for patients and healthcare cost savings to the Medicare program.

**Funding Source(s):** Other, Centers for Disease Control and Prevention, Division of Healthcare Quality Promotion

**Poster Session and Number:** B, #797
Are the Performance Ratings of Medicare Part D Plans Influenced by the Socio-Economic Composition of Their Enrollees?
Gary Young, Northeastern University; Nathan Rickles, Northeastern University; Chia-Hung Chou, University of Chicago; Eli Raver, Northeastern University

Presenter: Gary Young, J.D., Ph.D., Executive Director And Professor, Northeastern University Center for Health Policy and Healthcare Research, Northeastern University, ga.young@neu.edu

Research Objective: This study had two objectives: examine the relationship between the socio-economic composition of a Medicare Part D contractor’s enrollee population and its medication adherence ratings, and simulate the impact of adjusting for differences in socio-economic composition among contractors on their adherence ratings. The study is one of the first investigations of whether the population characteristics of Part D plans influence their performance ratings.

The Centers for Medicare and Medicaid Services (CMS) contracts with over 500 plans to offer the Part D prescription drug benefit to beneficiaries. CMS evaluates contractors on a set of performance measures that include medication adherence for three clinical conditions: hypertension, cholesterol, and diabetes. For each condition, contractors receive between 1 and 5 stars based on their relative performance for the average level of adherence among their enrollees. These ratings have generated controversy as to whether some contractors are unfairly disadvantaged because of the socio-economic composition of their enrollee population. Studies suggest that adherence is associated with patient socio-economic characteristics.

Study Design: This was an observational study for which Part D contractors were the unit of analysis. We used 2009 data from CMS and U.S. Census. The CMS data included performance ratings, raw adherence scores (based on prescription refill data) used to determine ratings, number and residence of enrollees for each contractor. Our study focused on three socio-economic characteristics: proportion of low-income enrollees (based on income subsidies), proportion of minorities, and proportion of enrollees with less than a high school education. CMS data included for each contractor the number of enrollees with subsidies. Proxies were constructed for minority status and education level by matching enrollees’ residence with census data.

We performed multivariate regression to examine the relationship between socio-economic composition and adherence scores. Our simulation used regression coefficients to adjust for differences in socio-economic composition among contractors.

Population Studied: The population studied comprised all contractors participating in the Medicare Part D plan who had sufficient numbers of enrollees for rating adherence. The study included over 500 contractors.

Principal Findings: The regression results indicated that socio-economic composition had a significant effect on contractors’ ratings for the three conditions. Contractors’ scores were negatively associated with the proportion of enrollees who were low income, minorities, and had less than a high school education. Socio-economic composition explained over 40% of the variation in contractors’ adherence scores. The results of the simulation revealed that adjustment for socio-economic composition would materially affect the performance rating of many contractors. Depending on the clinical condition, between 42% and 49% of the contractors would move one star in the direction of a positive or negative rating if raw adherence scores were adjusted for socio-economic composition. Between 5% and 14% would move two stars in one direction or the other.

Conclusions: Considerable variation exists among Medicare Part D contractors regarding the socio-economic composition of their enrollee populations and this variation is substantially associated with their performance ratings for medication adherence.

Implications for Policy, Delivery, or Practice: An important policy issue is whether to adjust contractors’ performance scores for the socio-economic composition of their enrollee population to ensure fair evaluations.

Funding Source(s): RWJF

Poster Session and Number: B, #798
METHODS

Using Quantitative and Qualitative Methods to Evaluate Survey Item Quality: A Demonstration of Practice Leading to Item Clarity
Kelly Alanis-Hirsch, Treatment Research Institute

Presenter: Kelly Alanis-Hirsch, Ph.D., Project Coordinator, Center for Policy Research & Analysis, Treatment Research Institute, kalanis@tresearch.org

Research Objective: The Client Evaluation of Self and Treatment (CEST), a self-administered survey used in drug/alcohol treatment agencies, was used to evaluate a mixed methodology designed for revising an existing self-administered survey that is in need of item revision and/or scale reduction while maximizing validity and reliability. The methodology included psychometric evaluation, cognitive interviewing with respondents, expert panels, and respondent feedback.

Study Design: Evaluation of the CEST included psychometric analyses, readability analyses, and cognitive interviewing of CEST respondents. The cognitive interviews (CIs) revealed a number of issues that confused respondents (e.g., items with two concepts embedded, items containing absolutes/qualifiers, misinterpreted items). A scoring rubric of item problem categories was created using CEST CIs and was used to score a subsequent set of CIs. From this scoring procedure, a measure of item quality was created—accessibility—that represents the proportion of respondents who encountered no item difficulties. Based on evaluation of the CEST, a new survey—the Brief Assessment of Self in Context (BASIC) was constructed. First, factor analyses of the CEST and advice from experts were used to determine scale retention. Next, quantitative analyses, CIs, and accessibility scores were employed to determine which CEST items to retain, revise, or delete. New items were constructed as needed. With feedback from experts and respondent CIs, a final draft was prepared and the BASIC was administered to a representative sample.

Population Studied: Quantitative evaluation of the CEST was conducted using 2,216 substance use (SU) patients who completed the CEST in 2003 and represented 61 SU treatment agencies in Texas and Louisiana. Respondents who participated in CIs with the CEST (n=24) or the BASIC (n=14) were SU patients in one of three treatment programs in Dallas and Austin, Texas. Psychometric evaluation of the BASIC was conducted using surveys completed by 291 SU patients in 2009 and represented nine treatment facilities across Texas.

Principal Findings: Most CEST scales had acceptable alpha reliabilities, but factor structure was not fully supported. CEST CIs revealed that many respondents appeared to have difficulties with many of the items. The BASIC scales demonstrated strong reliability and a favorable factor structure given the small sample size. CIs with the BASIC revealed that most respondents were able to understand, interpret, and respond to the items.

Conclusions: Quantitative item/scale assessments may be inadequate indicators of item/scale quality. Experts provide unique insight about the population and what they need as users of survey results. Cognitive interviewing is valuable for uncovering problems that may not be discovered using psychometric analyses. The methodology yielded a revised instrument that is psychometrically sound and straightforward for respondents.

Implications for Policy, Delivery, or Practice: Policymakers and practitioners often make decisions that are based, to some degree, on the results of self-administered surveys (e.g., quality improvement/assurance, funding, accountability). When doing so, one must be prepared to evaluate data quality based not only on summary information (e.g., alpha reliability estimates) but on how the survey was developed and evaluated. For those who must create or revise a survey, it is best to use an evidence-based mixed methodology to ensure the quality of data collected.

Funding Source(s): Other, self

Poster Session and Number: B, #804

Using Photovoice to Explore Perceptions on Patient-Centered Care in the Veterans Affairs Health Care System
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**Research Objective:** Improving the quality of patient-centered care and its delivery necessitates a comprehensive understanding of its impact on patients and employees. Although the benefits of patient-centered care are well-documented in prior research, few studies have explored patient and employee perceptions on patient-centered care with the use of visual and participatory research techniques. Using an innovative qualitative research technique known as photovoice, the objective of this study was to explore perceptions on patient-centered care by examining (1) how patients and employees conceptualize patient-centered care and (2) the contextual elements that drive these perspectives. The visual and participatory approach provides an opportunity to advance quality improvement efforts as well as engage patients and employees in a discussion around the topic of patient-centered care.

**Study Design:** This study was guided by the Social Ecological Model as well as prior research on photovoice and patient-centered care. Study procedure consisted of three stages that were tailored around two participant samples, patients and employees. During the first stage, patients and employees attended an orientation in which they learned about the study, completed a demographics survey, were given camera and were trained on their use. Participants were provided three prompts in order to facilitate their photography, and were asked to capture salient features in their environment that may describe how they feel about patient-centered care. In the second phase, the research team conducted in-depth follow-up interviews with each patient to learn more about their intended meaning. In the third phase, data collected from the shared pictures and the interview process were analyzed collectively by the research team to establish central themes and patterns emerging from the data.

**Population Studied:** (1) Veterans/patients who obtain health care services at a VA facility that has implemented patient-centered care initiatives and (2) VA employees who have participated in patient-centered care initiatives (including front-line staff, health care providers, etc.)

**Principal Findings:** The use of photovoice to explore the opinions of patients and employees on patient-centered care was a valuable method for the purpose of this study. Follow-up in-depth interviews provided detailed narratives that (1) built upon visual data and (2) identified characteristic differences between those who felt positively or negatively about patient-centered care. Ultimately, these findings were beneficial in building a knowledge base for the VA regarding perceptions on patient-centered care.

**Conclusions:** This study is an innovative but initial step in learning about the needs and perceptions of patients and employees around the topic of patient-centered care in the VA. Many of our findings may be applicable to patient-centered care outside of the VA as well.

**Implications for Policy, Delivery, or Practice:** Understanding the underlying drivers of patient and employee perceptions is essential in order to advance patient-centered care initiatives. As patient-centered care delivery becomes more prevalent, it will be critical to address the needs and perceptions of those affected by it.

**Funding Source(s):** VA

**Poster Session and Number:** B, #805

**Community-Based Participatory Research: Involving Residents in Qualitative Coding**

Chanel Bea, Virginia Commonwealth University; Emily Zimmerman, Virginia Commonwealth University; Amber Haley, Virginia Commonwealth University; Albert Walker, Virginia Commonwealth University; Marco Thomas, Virginia Commonwealth University

**Presenter:** Chanel Bea, Engaging Richmond Project, Virginia Commonwealth University, chanelbea@att.net

**Research Objective:** Engaging Richmond is a community-based participatory research (CBPR) project based in Richmond, Virginia. VCU’s Center on Human Needs received NIH funding to create a community-university partnership to engage the Richmond community as partners in ranking locally important social and environmental contributors to health outcomes and disparities; build community capacity; and develop bi-directional relationships of trust and collaboration between the community and the university. This paper reviews the methodology utilized by the team to collaboratively code and analyze data from 17 focus groups.

**Study Design:** CBPR is one approach that can engage residents and other stakeholders to
learn about community conditions and develop and implement action plans that reflect the needs and situation of the local community. It strives to involve community partners in an action-research process: selecting the topic or issue of interest, gathering information, analyzing and interpreting data, disseminating information and developing and implementing action plans. Given that residents and stakeholders are actively engaged in the entire process, the issues and outcomes identified reflect resident needs, interests, and circumstances and can increase resident interest and engagement in working towards community change.

**Population Studied:** The Engaging Richmond CBPR team is composed of residents of an urban, predominantly African American community in which over half of resident live below the poverty level, as well as service providers working in that community and university faculty/staff. The team recruited focus group participants from their own community, including men, women, parents, seniors, homeless, employed, and unemployed residents. In addition, there were focus groups with a wide representation of local service providers. There were approximately 170 focus group participants in all.

**Principal Findings:** The team members received training in focus group methodology and helped plan and facilitate the focus groups. They also received training in qualitative coding so that we could collaboratively code and analyze the focus group data. All team members reviewed and coded focus group transcripts using both inductive and deductive approaches. Final coding decisions were based upon group discussions about the appropriateness of themes and the wording of key terms. A coding guide was developed and continuously updated throughout the process. Transcripts were then coded a second time by faculty members of the CBPR team, using the guidebook.

**Conclusions:** This paper describes the process of involving CBPR team members in qualitative coding and analysis, with a focus on the logistics and the advantages/disadvantages of collaborative coding. Many themes emerged from the coding process and it was one of the best opportunities for co-learning to transpire over the course of the project as team members shared and interpreted the local meanings, insights and perspectives that emerged in the transcripts. While the methodology was new to the community team members, they contributed their expertise in understanding local conditions and cultural influences.

**Implications for Policy, Delivery, or Practice:** CBPR team members with no prior qualitative coding experience can contribute meaningful analysis and insights to the research process when given the opportunity to review and code transcripts and discuss the meaning of participant comments and the appropriateness of proposed codes.

**Funding Source(s):** NIH

**Poster Session and Number:** B, #806

**A New Method for Using Data Envelopment Analysis Confidence Intervals via Bootstrapping to Estimate Composite Quality Measurement**

James Burgess, Boston University School of Public Health; Michael Shwartz, VA Boston Healthcare System and Boston University School of Management; Joe Zhu, Worcester Polytechnic Institute School of Business

**Presenter:** James Burgess, Ph.D., Professor, Health Policy and Management, Boston University School of Public Health, jburges@bu.edu

**Research Objective:** Composite quality measurement is difficult because most quality measures are uncorrelated with each other. Data Envelopment Analysis (DEA) is an empirical approach commonly used to attempt to measure inefficiency; however, its "benefit-of-the-doubt" characteristics make it useful for composite quality measurement. Nursing homes and other providers have multiple patients, creating an opportunity to use sampling variation in the patients in a bootstrapping approach to create confidence intervals for composite measurement. For policy purposes, we have intense interest in knowing whether facility level differences are significant.

**Study Design:** The bootstrap offers a way to provide statistical inference and hypothesis in data envelopment analysis (DEA). To bootstrap DEA efficiency scores, based upon the observed set of decision making units (DMUs), one needs to generate a pseudo data set of DMUs or her nursing homes. The current paper describes situations where we can re-sample from patient level data within nursing homes to construct estimates for inputs and outputs, as if we resample from input-output pairs. The newly proposed DEA bootstrapping approach arises from an application to measuring patient care...
Visualizing Relationships Between Health Expenditures, Poor Housing, and Crime with Mapping
Maureen Canavan, Yale University School of Public Health; Jessica Holzer, Ph.D., M.A., Yale University School of Public Health; Elizabeth Bradley, Ph.D., M.B.A, Yale University School of Public Health

Presenter: Maureen Canavan, Ph.D., M.P.H., Associate Research Scientist, Health Policy and Management, Yale University School of Public Health, Maureen.canavan@yale.edu

Research Objective: Our objective in this project was to demonstrate that Geographic Information System (GIS) mapping technology can be applied to visualize the association between healthcare expenditures, poor-quality housing, and crime.

Study Design: We mapped health expenditures, violent crimes, and poor-quality housing to identify geographic variation in health concerns and selected social determinants. We received all hospital admissions data for Yale New Haven Hospital (YNHH), the major health care provider in the area, for 2011. Each admission was linked with a street address for the patient. Addresses were geocoded and entered into ArcGIS, a GIS mapping program. A heat map, which presents expenditures by color (e.g., green=lowest expense, red=highest expense), was generated showing areas of the city where high health expenditures collected. Poor quality housing locations for 2011, identified by New Haven Action, were geocoded and added to the heat map of expenditures. Finally, addresses for violent crimes (homicides, non-fatal shootings, aggravated assaults, armed robberies) occurring throughout 2011 were geocoded and added to the heat map.

Population Studied: Residents of the city of New Haven.

Principal Findings: Mapping health expenditures by the address of the patient receiving care showed uneven geographic distribution of healthcare concerns and needs across the New Haven community. Six of the 22 neighborhoods in the city were identified as having higher-than-average costs. Among those neighborhoods, health concerns were not evenly distributed. In one neighborhood, Dixwell, we found the top three primary diagnoses for admissions were blood and circulatory system diseases (22.44%), followed by complicated pregnancies and neonatal care (14.57%), and...
respiratory diseases (10.43%), accounting for 51% of costs for the neighborhood. By contrast, in another neighborhood, the Hill, the most frequent diagnosis was mental illness (16.51%), followed by complicated pregnancies (16.35%), and blood and circulatory system diseases (15.23%), which consumed 49% of neighborhood costs. Furthermore, within the neighborhoods themselves, we were able to identify specific geographic locations where healthcare expenditures were highest, demonstrating that even within neighborhoods, healthcare expenditures do not distribute evenly. We also found that 56% of all poor quality housing was within the boundaries of hotspots (those areas that together comprise 27% of healthcare expenditures). By contrast, crimes did not cluster in the same areas as high health expenditures, but rather occurred primarily in business districts and along thoroughfares.

**Conclusions:** Mapping health expenditures is a powerful tool to visualize differences in the distribution of health and health resource utilization. Such visualizations highlight potential targets for interventions. By mapping social determinants of health that cluster with healthcare hot spots, researchers and communities may be better equipped to develop interventions that are tailored to the neighborhood-level challenges and assets.

**Implications for Policy, Delivery, or Practice:**
Our findings confirm expectations that poor housing is correlated with poor health. Further, we found that crimes collect where business assets are located. By mapping these relationships, practitioners and policy-makers can identify targets for intervention to reduce or prevent further healthcare expenditures.

**Funding Source(s):** AHRQ

**Poster Session and Number:** B, #808

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**Validly interpreting patients’ reports: Using bifactor and multidimensional models to determine whether surveys and scales measure one or more constructs**

Adam Carle, Cincinnati Children’s Hospital Medical Center; Robert Weech-Maldonado, Ph.D., University of Alabama at Birmingham

**Presenter:** Adam Carle, Ph.D., M.A., Assistant Professor of Pediatrics, University of Cincinnati School of Medicine, Cincinnati Children’s Hospital Medical Center, adam.carle@cchmc.org

**Research Objective:** Validly interpreting scores based on patients’ reports of their experiences using scales depends on a valid scoring system. The possibility exists that, although the creators of a scale intended to create a scale measuring a single construct, the questions may appear to measure more than one construct. However, the possibility also exists that the questions do generally measure one construct, but several “nuisance” constructs influence the measurement of the construct indirectly. Unidimensional, multidimensional, and bifactor factor analytical models offer a method for establishing scale dimensionality and subsequently developing valid scoring systems. In this paper, we take an applied perspective, discuss these models and their implications, and use real data to provide an example.

**Study Design:** We used unidimensional, multidimensional, and bifactor analyses to examine the measurement structure of the Consumer Assessments of Healthcare Providers and Systems Cultural Competence (CAHPS®-CC) Survey.

**Population Studied:** Participants came from a 2008 sample of two Medicaid managed care plans, in New York and California.

**Principal Findings:** Both unidimensional and bifactor models failed to fit the data well. A multidimensional model, with 7 factors corresponding to 7 cultural competence domains fit the data well (RMSEA = 0.064; TLI = 0.98; CFI = 0.97).

**Conclusions:** Results indicate that users of the CAHPS-CC does not appear to measure a single construct. Rather, the CAHPS-CC appears to measure 7 separable domains, suggesting the need for 7 separate scale scores. Our findings highlight the importance of conducting dimensionality analyses.

**Implications for Policy, Delivery, or Practice:** Our results demonstrate that policymakers, clinicians, investigators, payors, and others must critically evaluate the validity of creating summary scores or scales based on sets of questions. Failing to use an appropriate measurement model to create scores will lead to biased and potentially spurious results and conclusions. As discussed in the current example, this could affect payors’ evaluations of physicians’ and institutions’ cultural, leading to inappropriate conclusions about poor or quality delivery of culturally competent care.

**Funding Source(s):** The Commonwealth Fund

**Poster Session and Number:** B, #809
The Community Forum Public Deliberation Experiment Study Design and Methods
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Presenter: Kristin Carman, Ph.D., Co-director, Health Policy & Research, Health Division, American Institutes for Research, kcarman@air.org

Research Objective: Public deliberation methods are designed to obtain informed perspectives from the general public on complex topics like those that arise in health care and research. Deliberation is distinguished from other forms of public input such as opinion polling and focus groups by three components: provision of an ethical or values-based dilemma, an “educational component,” and engaging participants in a reason-based discussion of the issue where they are asked to also assume the perspective of a “social decisionmaker.” The Community Forum experiment used a randomized controlled trial to evaluate the effectiveness deliberative methods designed and implemented for the study to identify the impact of deliberation and to elucidate the effects of the different methods and components of those methods on issues related to comparative effectiveness research (CER).

Study Design: We developed four distinct deliberative methods drawing on literature and experts in the field of public deliberation. The final methods varied in duration, number of participants, use of experts, facilitation, and mode (in-person, online, or both). The fifth experimental condition (control) received only the educational materials.

We drew on the literature and experts to determine which components of deliberation could affect the outcomes of deliberation (e.g., duration) to identify and develop the methods used on the study. In addition, we developed specific criteria based on our review of the literature to develop and implement all methods, including: topics that affect the common good; expectation-setting regarding participants role, proposed activities, and use of findings; unbiased, accurate, and balanced information; equal opportunities to participate; and facilitation that fosters respectful discussion, open-mindedness, and a safe environment for sharing and reason-giving. Finally, we prioritized internal validity over external validity in that the final deliberative methods were selected because they had been used effectively previously. We ensured that our processes are replicable and that the topics for discussion would be meaningful for policymakers, researchers, and the public.

Population Studied: A total of 1,774 participants were randomized to a method or the control condition. The sample included representation of participants from AHRQ-defined priority populations and reflected a diverse population similar to the local demographic population distribution in the four geographic locations (Raleigh, NC; Sacramento, CA; Chicago, IL; and Washington, DC).

Principal Findings: Details of each method and a description of the implementation process will be presented. The presentation will address: the development of the topic, the methods, including similarities and differences, the tailored website for use in the experiment, and the use of training protocols and facilitation materials. We will also describe the design of the outcome measures to determine the effectiveness of deliberation which included changes in knowledge and attitudes and participants’ self-rated quality of their experience during the deliberative sessions. Finally, we will describe our novel sampling and randomization procedure.

Conclusions: Deliberative methods offer a unique opportunity to assess informed public views regarding fundamental questions related to the role of medical evidence.

Implications for Policy, Delivery, or Practice: This study, the largest systematic evaluation of deliberative methods, will provide a wealth of information regarding the use of these methods.

Funding Source(s): AHRQ
Poster Session and Number: B, #810

Diagnosis Codes for Cancer Metastasis on Medicare Claims have Limited Accuracy and Completeness
Neetu Chawla, National Cancer Institute; K. Robin Yabroff, National Cancer Institute; Angela Mariotto, National Cancer Institute; Timothy S. McNeel, IMS, Inc.; Deborah Schrag, Dana
Research Objective: There has been growing use of health claims to study cancer treatment and outcomes and Researchers are increasingly using diagnosis codes on health claims to identify cancer patients with metastatic disease. However, the validity of cancer metastasis codes on claims has not been established in population-based data. In this study, we assessed the completeness and validity of metastasis codes from Medicare claims around the time of initial diagnosis for three common cancers in the U.S.

Study Design: The linked Surveillance, Epidemiology and End Results (SEER)-Medicare data were used to compare coding of metastatic cancer on health claims with information about metastatic disease reported to one of the SEER population-based cancer registries. Information about metastasis from SEER historic stage was considered the gold standard. From Medicare claims, patients were classified as having regional or distant disease at diagnosis if they had one hospital claim with a metastasis code or two physician claims with metastasis codes on separate days within 3 months of diagnosis. Patients without claims with metastases codes were classified as having local disease. We calculated sensitivity, specificity, positive and negative predictive values and conducted multivariate logistic regression analysis to evaluate patient factors associated with stage misclassification for each cancer site.

Population Studied: The study included 80,052 breast, lung, and colorectal cancer patients diagnosed with localized, regional, or distant disease in the SEER data between January 1, 2005 and December 31, 2007.

Principal Findings: For patients with distant disease in the SEER data, the sensitivity and PPV of the Medicare claims was: breast (50.6 percent, 67.3 percent), colorectal (72.2 percent, 68.8 percent) and lung cancer (42.1 percent, 88.6 percent). None of the measures for stage simultaneously exceeded 80 percent for sensitivity, specificity, and PPV for any of the cancer sites. In adjusted analysis, older, lower-income, and African American patients were more likely to have stage at diagnosis misclassified from Medicare claims.

Conclusions: Use of diagnosis codes alone in Medicare claims will misclassify and undercount whether patients have metastatic disease at diagnosis. These findings demonstrate that use of diagnosis codes alone from Medicare claims cannot be used to determine stage at diagnosis for cancer patients. Further, these findings suggest that use of metastases codes from Medicare claims will likely have limited accuracy for identifying recurrence.

Implications for Policy, Delivery, or Practice: Our findings highlight that metastases codes should not be used to identify stage at cancer diagnosis or cancer recurrence since this strategy results in substantial misclassification, particularly for some socio-demographic groups. Alternate data sources, such as information from the electronic medical record, may provide more accurate information about the presence of metastatic disease.

Funding Source(s): Other, NCI

Poster Session and Number: B, #811

Instrumental Variable Methods for the Comparative Safety of Second-Generation Antipsychotic Medications

Portia Cornell, Harvard University; Mary Price, Harvard Medical School; John Hsu, Harvard Medical School; Bruce Fireman, Kaiser Foundation Research Institute; Mary Beth Landrum, Harvard Medical School; Vicki Fung, Mid-Atlantic Permanente Research Institute

Research Objective: Clinical trial evidence indicates that second-generation antipsychotic medications (SGAs) have adverse metabolic outcomes, which increase cardiovascular risks and mortality. With growing use of SGAs, particularly in young patients, it is important to assess their comparative risks in real world settings. Because a physician’s drug choice will be partly determined by patient characteristics that are unobserved in most data sets, traditional observational methods produce biased inferences. We sought to refine a novel method for comparing the metabolic effects of SGAs in mentally ill patients using real world data.
**Study Design:** We use physician prescribing preference as an instrumental variable (IV) to predict SGA drug choice and arrive at unbiased estimates of the comparative safety between different SGAs with respect to body mass index (BMI). To address differences between physician panels that could act as confounders, we include in the instrument physician-level case-mix measures and stratify by physician specialty. We use two-stage least squares regression to estimate the local average effect of SGA choice on changes in BMI. We control for age, sex, payer, mental health diagnosis, and co-morbidities. Data are from electronic health records from a prepaid, integrated delivery system.

**Population Studied:** 1,433 patients aged 20-35 who received a new prescription for one of five SGAs (aripiprazole, olanzapine, quetiapine, risperidone, and ziprasidone) between 2008–2009, had no antipsychotic use in the previous 12 months, and for whom we had BMI measurements before and at least 90 days after the prescription fill. We restrict the analysis to physicians with four or more new SGA prescriptions in the study period.

**Principal Findings:** Preliminary analyses indicated that preference among SGAs for a new antipsychotic prescription is a strong predictor of treatment. A physician’s previous choice of aripiprazole, olanzapine, or risperidone for the plurality of previous prescriptions in the study period increases the probability that the next patient will receive a prescription for that drug by 20.1, 21.0, 10.1, and 4.6 percentage points respectively, controlling for patient characteristics (p<0.05). We examine the balance of pre-prescription BMI, mental health diagnosis, and co-morbidities, and find that the instrument achieves better balance on these characteristics than actual treatment status. Thus far our estimates suggest no statistically significant differences in BMI effects between SGAs.

**Conclusions:** The physician preference IV represents a promising approach for assessing the comparative safety of existing therapies in real world settings. We will proceed to examine the performance of this instrument in different sub-groups (e.g., younger and elderly patients, and by mental health diagnosis) and for other outcomes including blood pressure and LDL cholesterol. We will also test IV assumptions by comparing balance on clinically relevant baseline characteristics such as LDL cholesterol and systolic blood pressure.

**Implications for Policy, Delivery, or Practice:** To our knowledge, this is the first study to use physician preference as an instrument to compare the metabolic effects between second-generation antipsychotic therapies. By testing the IV assumptions using a clinically rich database, this study will suggest analyses that can be applied to larger administrative databases, where these assumptions cannot be as carefully tested.

**Funding Source(s):** NIH

**Poster Session and Number:** B, #812

**Consequences for Healthcare Quality and Research of the Exclusion of Records from the Death Master File**

Briget Da Graca, Baylor Health Care System; Giovanni Filardo, PhD, MPH, Baylor Health Care System; David Nicewander, Baylor Health Care System

**Presenter:** Briget Da Graca, M.S., Medical Writer, Baylor Health Care System, brigetd@baylorhealth.edu

**Research Objective:** In November 2011 the Social Security Administration (SSA) removed ~5% of death records from its Death Master File (DMF) and started excluding ~40% of new death records, having determined that data submitted electronically by states cannot be publicly shared. We describe the origins of the DMF and the basis for excluding electronically-submitted state data. We then examine the consequences for healthcare research and operations, consider alternative sources, and evaluate possible mechanisms to restore a timely national data source.

**Study Design:** Prospective study.

**Population Studied:** U.S. population.

**Principal Findings:** Prior to November 2011, the DMF provided an accessible source of national vital status data, with a short time lag, and high specificity and sensitivity, and was routinely used by healthcare researchers and hospitals to determine study participants’ survival and to monitor post-discharge outcomes. Alternative sources of vital status data include the 57 vital status records jurisdictions (which require separate applications for data and have variable restrictions on data accessibility), the National Death Index (which has an 18-24 month time lag, and charges a service fee plus a fee per record for each year searched), and, the Medicare Master Beneficiary Summary File or Vital Status File (which, aside
from only covering Medicare beneficiaries, require new applications to be submitted any time the data are re-used for a different purpose, and which carry variable costs depending on the nature and size of the cohort for which data are requested. Investigators involved in such long-term influential studies as the Nurses Health Study and the Framingham Heart Study already report increased difficulty in ascertaining participants’ outcomes.

Conclusions: There are no currently available alternative sources of timely national vital status data available at equivalent cost. The SSA’s action will substantially hamper healthcare research and quality.

Implications for Policy, Delivery, or Practice: The Death Master File’s effective loss means comparative effectiveness studies will be unnecessarily delayed, more costly, or unfeasible. Likewise, timely identification and correction of poor hospital performance will be more difficult, undermining the safety and quality of care, and threatening hospitals’ financing as the Centers for Medicare and Medicaid launched their Readmissions Reduction Program in October 2012, and will link reimbursement to 30-day mortality under the Value-based Purchasing Program in 2013. Congressional action may be needed to extend the permissible uses of death data provided by the states to the SSA to include health care research and quality monitoring initiatives.

Funding Source(s): Other. This work was supported in part by the Bradley Family Endowment to Baylor University Medical Center.

Poster Session and Number: B, #813

Hospital Readmission Causes among Heart Failure Patients
Manjiang Duan, Premier Incorporated; Eugene Kroch, Premier Inc.; Richard Bankowitz, Premier Inc.

Presenter: Manjiang Duan, Statistician, Premier Incorporated, michael_duan@premierinc.com

Research Objective: It has been reported in several studies that the cause of readmission is often different from the index discharge. The implication leaves hospitals without a clear path to reduce readmissions. Based on large scale electronic database of hospital inpatient claims, we use patient-centric approach to examine the diagnosis codes of index and subsequent admissions, and explore how coding variation may have influenced the conclusion in previous studies.

Study Design: We track readmissions such that the patient, rather than the encounter, is the unit of analysis. This application of the algorithm looks for individuals that survived at least one hospitalization for heart failure (HF) during the reference period. Establishing the first HF hospitalization as the unique index, the algorithm then links each of these patients to all hospitalizations for any reason up to one year before and one year after the index hospitalization. Linked to the reference HF patients are nine commonly reported diseases – septicemia, AMI, pneumonia, COPD, renal failure, respiratory failure, stroke, cardiac dysrhythmias, and other ischemic heart disease – to track their frequency in the prior and subsequent admissions. The algorithm generates frequency rankings of associated conditions, especially when they occur in combination with HF in the same hospitalization.

Population Studied: Hospitalizations from 761 acute-care hospitals in the Premier Alliance all-payer data base, anchored in calendar year 2010 and linked to the previous year (2009) and subsequent year (2011). The data base includes about 23.5 million inpatient discharges over the three years, which includes 169,070 heart failure patients with at least one hospital episode in 2010.

Principal Findings: Limiting patient readmission cause to principal diagnosis gives HF only 32% of re-hospitalizations, and the other nine conditions 26%. The remaining 42% are widely scattered among diagnoses, consistent with other studies. Nevertheless 84% of all readmissions do have HF when secondary diagnoses are counted. When both heart failure and one of the other nine conditions are present in the same hospitalization, the ranking appears influenced by the clinical significance of each condition. For example when both septicemia and heart failure are present, septicemia is ranked as principal in 61% of cases, HF just 7%. In combination with stroke HF gets 9% and with AMI HF gets 20%. When heart failure presents along with pneumonia, COPD, and renal failure, its frequency of being principal diagnosis bums up to 30-40% range. In fact, cardiac dysrhythmias and other ischemic heart disease are rarely coded as principal diagnosis even though they are extremely common in the HF population.

Conclusions: Principal diagnosis is a misleading way to track the causes of
readmissions for HF patients, since PDx assignment depends on the perceived acuity of the clinical condition. Rather, all diagnoses must be included to adequately track the reasons for readmission. Such analysis helps identify opportunities for managing readmissions.

**Implications for Policy, Delivery, or Practice:**
Readmissions reveal both common and special cause of variation in care. Measuring readmissions in meaningful segments can provide actionable information on how to improve hospital care and reduce readmissions.

**Funding Source(s):** No Funding

**Propensity Score Estimation to Address Calendar Time-Specific Channeling in Comparative Effectiveness Research of Second Generation Antipsychotics**

Stacie Dusetzina, University of North Carolina at Chapel Hill; Christina D. Mack, MSPH, University of North Carolina at Chapel Hill, Department of Epidemiology; Til Sturmer, MD, PhD, University of North Carolina at Chapel Hill, Department of Epidemiology

**Presenter:** Stacie Dusetzina, PhD, Assistant Professor, General Medicine and Clinical Epidemiology, University of North Carolina at Chapel Hill, stacie_dusetzina@unc.edu

**Research Objective:** To demonstrate channeling among new users of second generation antipsychotics following a Food and Drug Administration safety advisory and to evaluate the impact of channeling on cardiovascular risk estimates over time. Channeling occurs when a medication and its potential comparators are selectively prescribed based on differences in underlying patient characteristics. Drug safety advisories can provide new information regarding the relative safety or effectiveness of a drug product which might increase selective prescribing. In particular, when reported adverse effects vary among drugs within a therapeutic class, clinicians may channel patients toward or away from a drug based on the patient’s underlying risk for an adverse outcome. If channeling is not identified and appropriately managed it might lead to confounding in observational comparative effectiveness studies.

**Study Design:** A retrospective cohort of new second generation antipsychotic users was constructed using Florida Medicaid data from 2001-2006. We used propensity scores to match olanzapine initiators with other second generation antipsychotic initiators. To evaluate channeling away from olanzapine following an FDA safety advisory, we estimated calendar time-specific propensity scores. We compare the performance of these calendar time-specific propensity scores with conventionally-estimated propensity scores on estimates of cardiovascular risk.

**Population Studied:** Adults (ages 18-64) who had a new prescription for a second generation antipsychotic medication between January 1, 2001 and December 31, 2006 and who were continuously enrolled in the Florida Medicaid program for at least 6 months prior to their index prescription fill date.

**Principal Findings:** Increased channeling away from olanzapine was evident for some, but not all, cardiovascular risk factors and corresponded with the timing of the FDA advisory. Covariate balance was optimized within period and across all periods when using the calendar time-specific propensity score. Hazard ratio estimates for cardiovascular outcomes did not differ across models (Conventional PS: 0.97, 95%CI: 0.81-3.18 versus calendar time-specific PS: 0.93, 95%CI: 0.77-3.04).

**Conclusions:** Among our sample of new second generation antipsychotic users, channeling away from olanzapine was evident for several covariates but had limited impact on cardiovascular risk estimates, possibly due to unmeasured confounding in this setting. While both PS estimating strategies improved covariate balance overall, investigators who are concerned with investigating within-year differences need to implement calendar time-specific propensity scores. Specific limitations include a lack of information on important unmeasured confounders (e.g., smoking, BMI, family history of cardiovascular disease) or poorly measured confounders (e.g., diabetes, hyperlipidemia and obesity) that likely influence prescribing, and the heterogeneous composition of our comparison group (e.g., including all non-olanzapine second generation antipsychotic agents, which vary in metabolic risk).

**Implications for Policy, Delivery, or Practice:** Researchers should consider using calendar time-specific propensity scores to identify and potentially reduce calendar time specific channeling bias in studies where prescription drug prescribing practices might have changed over time.

**Funding Source(s):** AHRQ
Poster Session and Number: B, #815

Let's Talk! Patient Attitudes about Telephone-Based Alternatives to Follow-up Office Visits with Specialists
Jessica Eng, San Francisco VA Medical Center; Cecily J. Hunter, UCSF School of Medicine; Laura B. Cantino, UCSF School of Medicine; Christy K. Boscardin, UCSF School of Medicine; Margaret A. Handley, UCSF School of Medicine; Ralph Gonzales, UCSF School of Medicine; Sara L. Ackerman, UCSF School of Nursing

Presenter: Jessica Eng, M.D., M.S., Va Quality Scholar Fellow, Geriatrics, San Francisco VA Medical Center, jessica.eng@gmail.com

Research Objective: The number of specialty care visits in the US is rising, contributing to increased health care costs and delayed access to specialty care. There is a need for new models of care that are less costly and offer alternatives to office visits. However, if not designed with patient attitudes in mind, new models of care could result in significant patient resistance and dissatisfaction. In the context of a clinical operations project aimed at increasing the availability of new patient appointments by reducing unnecessary follow-up visits, we explored patient attitudes about telephone-based specialty follow-up.

Study Design: We observed physician-patient interactions in an urban academic endocrinology clinic from June to October 2012. Observations were discussed at regular team meetings. We subsequently conducted semi-structured interviews from October to November 2012. Interviews were conducted in clinic with a convenience sample of patients following their physician encounter. Interviews included questions on satisfaction with clinic experience and attitudes about a new pilot program consisting of patients leaving office visits with a scheduled follow-up phone call with the clinic medical assistant (MA) instead of a scheduled office visit with the physician. Interviewers explained that information gathered during the MA phone call would be conveyed to the physician, who would then decide whether patients should have another scheduled MA phone call or office visit. Interviewed patients were provided free parking as compensation. Interview notes were iteratively reviewed and discussed by 5 research team members, followed by a conference in which consensus was reached on key findings and themes.

Population Studied: For observations and interviews, we used a convenience sample of patients attending clinic visits at an urban academic endocrinology outpatient practice.

Principal Findings: Team members spent 43 hours observing physician-patient interactions, and 24 patients (71% female, aged 22 to 64) were interviewed. Overall, patients were very satisfied with their clinic experiences, in particular their interactions with physicians and office staff. Patients also expressed enthusiasm for alternatives to office-based follow-up. The dominant theme that emerged about the telephone-based follow-up program was patient convenience, including the possibility of saving time and money for travel and not missing work. Other themes supporting this program included communication facilitation—the anticipation of improved communication with the clinic—and altruism—the potential to contribute to increased office visit access for other patients. Patient endorsement of telephone-based follow-up was predicated upon the expectation that physicians continue to have primary responsibility for clinical care. A minority of patients expressed reservations about MA phone follow-up, including concerns about their care potentially “falling through the cracks” and whether physicians would continue to be in charge of medical decisions. Another consideration that emerged was the value of family members or friends in office encounters and how their participation in care might be affected by telephone-based follow-up.

Conclusions: This study reveals positive patient attitudes towards the concept of telephone-based alternatives to specialty clinic follow-up. Unexpected findings include patient interest in the program’s ability to facilitate communication with the clinic and improve clinic access for other patients.

Implications for Policy, Delivery, or Practice: Future studies of telephone-based follow-up visits should examine physician attitudes and include patient collaboration early in redesign efforts to ensure acceptability.

Funding Source(s): CMS

Poster Session and Number: B, #816

Translating Knowledge into Action: A Cognitive Perspective to Information Needs of Decision-Makers in Healthcare
Negin Fouladi, University of Texas School of Public Health; Stephen H. Linder, PhD, University of Texas School of Public Health; Charles E. Begley, PhD, University of Texas
Research Objective: The objective of this study was to assess the healthcare information needs of decision-makers in a local US healthcare setting in efforts to promote the translation of knowledge into action. The focus was on the perceptions and preferences of decision-makers regarding usable information in making decisions as to identify strategies to maximize the contribution of healthcare findings to policy and practice.

Study Design: A qualitative data collection and analysis approach was used to identify the information needs of decision-makers in the Houston/Harris county safety net. Data was collected via open-ended key-informant interviews from a sample of 37 public and private-sector healthcare decision-makers in September and October of 2011. Decision-makers were asked to identify the types of information, the level of collaboration with outside agencies, useful attributes of information, and the sources, formats/styles, and modes of information preferred in making important decisions and the basis for their preferences.

Population Studied: The study sample was comprised of high-level decision-makers, including legislators, executive managers, service providers, and healthcare funder.

Principal Findings: When confronted with a myriad of healthcare facts, data, and perspectives, decision-makers acquire information, categorize information as usable knowledge, and select information for use based on the application of four cross-cutting thought processes or cognitive frameworks primarily related to time orientation, followed by information seeking directionality, selection of validation processes, and centrality of credibility/reliability. In applying the frameworks, decision-makers are influenced by numerous factors associated with their perceptions of the utility of information, the importance of collaboration with outside agencies in making decisions, and professional and organizational characteristics.

Conclusions: An approach based on a cognitive framework may be valuable in identifying the perceptive and contextual determinants of information use by decision-makers in US healthcare settings.

Implications for Policy, Delivery, or Practice: Such an approach can facilitate active producer/user collaborations and promote the production of mutually valued, comprehensible, and usable findings leading to sustainable knowledge translation efforts long-term.

Funding Source(s): No Funding

Poster Session and Number: B, #817

Analysis of Multivariate Longitudinal Healthcare Utilization Outcomes Using Multivariate Generalized Linear Mixed Models

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Presenter: Mulugeta Gebregziabher, Ph.D., Associate Prof, Public Health Sciences-Biostatistics, MUSC and Charleston VA, gebregz@musc.edu

Research Objective: Many health outcomes are observed longitudinally and their evaluation is interdependent. Modeling these outcomes separately ignores the interdependencies and could lead to wrong inference. The objective of this study is to develop methodology for modeling multivariate longitudinal health outcomes that accounts for the interdependence.

Study Design: The response variables are a vector of longitudinal cost outcomes (inpatient, outpatient and pharmacy cost) measured in 2006 US dollars. We used a joint modeling approach that links the generalized linear mixed models for each longitudinal outcome through a joint distribution of the random coefficients (intercepts and slopes) to study the association between key covariates and the outcomes.

Population Studied: We use data from a national cohort of 740,195 veterans with diabetes who were followed from 2002 to 2006.

Principal Findings: Parameter estimates of healthcare cost differences by covariates from the joint modeling approach have smaller standard errors and are in the expected direction than those from independent models.
Conclusions: Modeling each cost category separately leads to wrong conclusions due to failure to account for the interdependence among the multiple cost outcomes. The proposed multivariate generalized linear mixed model (mGLMM) approach allows for joint modeling of longitudinal cost data from multiple sources accounting for the correlation among the multiple cost outcomes.

Implications for Policy, Delivery, or Practice: Cost analysis studies should allow for shared correlation across cost variables by using the proposed joint modeling approach when examining differences in healthcare cost by covariates.

Funding Source(s): VA

Poster Session and Number: B, #819

Pragmatic Measures: What Are They and Why Do We Need Them?
Russell Glasgow, National Cancer Institute; William T. Riley, PhD, National Cancer Institute

Presenter: Russell Glasgow, Ph.D., Deputy Director, Implementation Science, Division of Cancer Control & Population Sciences, National Cancer Institute, glasgowre@mail.nih.gov

Research Objective: To propose necessary and recommended criteria for pragmatic measures, provide examples of projects to develop and identify such measures, address potential concerns about these recommendations, and identify areas for future research and application.

Study Design: There is a pressing need to have practical, brief, standardized measures of key health issues that are feasible to collect longitudinally for purposes of both research and quality improvement. Such measures would benefit and help advance comparative effectiveness research (CER), dissemination and implementation science, knowledge integration and systematic reviews, practice and policy. Few such measures exist today and there is both opportunity and an important need for many more. First however, there must be agreement on what constitutes a pragmatic measure and concrete examples would be instructive.

Key criteria for pragmatic measures proposed include importance to stakeholders in addition to researchers, low burden, broad applicability, sensitivity to change and being actionable. Additional recommended, but not required criteria include theoretical basis and use for benchmarking purposes.

Population Studied: Not Applicable.

Principal Findings: Three projects, including one to identify pragmatic measures that can be routinely collected in primary care via electronic health records; the PROMIS program to use computer adaptive testing and item-response theory procedures to create brief, valid standardized measures; and research on short forms of depression screening (e.g. the PHQ-2, 4 and 9) will be used to illustrate key elements of the proposed criteria. The strengths and limitations of both these example instruments, and implications of the proposed criteria, including anticipated concerns and unanticipated consequences will be addressed and session participants will be engaged in dialogue about the criteria proposed.

We do not view our recommended criteria for pragmatic measures as mandates that should be applied rigidly or unthinkingly, but rather as a concrete starting point to initiate discussion in a complex area. We attempted to balance the need for basic core criteria, without letting “the perfect become the enemy of the good”, or creating completely impractical standards for pragmatic measures, especially since there are so few currently available. We hope that these criteria, or a modification of them, can serve as guidelines for selecting the most appropriate measure for a given pragmatic study, and help to identify the additional research gaps that need to be filled for a measure to be optimized for pragmatic research and practice.

Conclusions: These criteria, examples and the ensuing discussion illustrate approaches to stimulate development of new pragmatic measures and broader scale dissemination of brief, standardized pragmatic measures.

Implications for Policy, Delivery, or Practice: There is an important need for pragmatic measures to facilitate pragmatic research and CER, guide quality improvement, and inform progress on public health goals, but few examples are currently available. Development and evaluation of pragmatic measures and metrics would provide useful resources to advance science, policy and practice.

Funding Source(s): No Funding

Poster Session and Number: B, #820
Development and Evaluation of a Classification System for Occupational Back and Shoulder Injuries
Sara Heins, Johns Hopkins University; Dorianne Feldman, Johns Hopkins University School of Medicine; Eva DuGoff, Johns Hopkins School of Public Health; Stephen Wegener, Johns Hopkins University School of Medicine; Renan Castillo, Johns Hopkins School of Public Health

Presenter: Sara Heins, B.A., Research Assistant, Johns Hopkins University, sheins@jhsph.edu

Research Objective: Administrative claims datasets could be an important tool to health services researchers who wish to evaluate patient care on a large scale, but classification of patients into diagnostic groups from these data can be challenging. The goal of this work is to describe and evaluate a methodology to assign workers compensation claimants to clinically meaningful diagnostic groups within back and shoulder injuries using claims data.

Study Design: Claims data were used to assign eligible claimants to diagnosis groups using available ICD9 codes. Certainty Ratings were also developed to designate the level of certainty that assignments were correct. Assignments were evaluated against body part indicators, severity indicators, and resource utilization. Clinical treatments specific to certain diagnostic groups were selected and compared against assignments.

Population Studied: Workers compensation insurance claimants from a large multi-state workers compensation insurance dataset.

Principal Findings: Of the 575,967 claimants who met inclusion criteria, 54,066 claimants were designated as shoulder injuries and 118,772 were designated as back injuries. Within back and shoulder injuries, claimants were assigned to more specific diagnostic groups. For both of these condition categories, increasing assignment certainty ratings were consistently superior against body part indicators when compared to lower certainty ratings (p<0.01). Furthermore, for both categories, there were statistically significant differences between diagnosis groups in overall medical costs, opioid utilization, number of surgeries, and rehabilitation use (p<0.01 for all). In each of nine clinical treatment validators developed, the hypothesized diagnostic group had statistically significantly higher utilization than other diagnostic groups (p<0.01).

Conclusions: Back and shoulder injury assignments, specific diagnostic group assignments, and certainty ratings performed well against body part indicators, severity indicators, resource utilization, and specific clinical interventions. Further research is needed to validate this methodology using a gold standard measure, such as a physician specialist's assessment. Consideration should also be given to revising the methodology for the transition to ICD10 coding.

Implications for Policy, Delivery, or Practice: This methodology could be an important tool to health services researchers who wish to target interventions or examine trends in cost and service utilization among clinically meaningful groups of claimants.

Funding Source(s): Other, American International Group

Poster Session and Number: B, #821

Qualitative Comparative Analysis: A Systematic Review of Application within Healthcare and Public Health
Leila Kahlwati, RTI International; Caroline Shlager, MPH, RTI, International; Heather Kane, PhD, RTI, International; Megan Lewis, PhD, RTI, International

Presenter: Leila Kahlwati, M.D.,M.P.H., Sr. Research Scientist, Social and Health Organization Research and Evaluation, RTI International, lkahlwati@rti.org

Research Objective: Qualitative comparative analysis (QCA) is case-oriented technique based on set-theoretic relationships that uses quantitative and qualitative data to enhance understanding of complex phenomenon. Unlike probabilistic statistics, QCA can be used with small numbers of cases and, unlike qualitative research, QCA systematizes qualitative judgments and produces results through a process of logical minimization using Boolean algebra. We conducted a systematic review of the use of QCA to identify strengths, opportunities, and challenges for this method's application within public health and health care settings.

Study Design: QCA-related terms were used to search 16 bibliographic databases for studies indexed between January 1980 and October 2012. Two investigators independently reviewed included studies. Abstracted data included study aims and setting, numbers and descriptions of cases and conditions (i.e., independent
variables), outcomes, methods of calibration and type of QCA analysis, results, and strengths and limitations of the method as described by study authors.

**Population Studied:** English-language studies that used QCA methods within a health, health care delivery, or public health context were eligible for inclusion. We reviewed 1,105 citations and 72 full-text articles, of which 30 met inclusion/exclusion criteria (26 peer-reviewed publications and 4 doctoral dissertations).

**Principal Findings:** Preliminary findings: Two-thirds of included studies were published in 2007 or later and 45% were conducted in the US. 38% of studies used individuals as the unit of analysis while 17% used countries, 14% used state or public health authority regions, and 14% used clinics or hospitals as the unit of analysis. Five studies used other units of analysis (e.g., policy or legislation enactments). The median number of cases per study was 28; the median number of conditions was 6. Included studies used both quantitative and qualitative data to operationalize conditions. Almost half of studies used QCA to complement traditional qualitative or quantitative methods. Strengths reported by authors included the ability to preserve configurations of conditions and uncover multiple pathways to the outcome of interest. Few authors commented on limits of this method. Selected studies will be highlighted to illustrate features of the QCA method.

**Conclusions:** QCA has been applied in diverse health care contexts, but the use of this method is not yet common. It can be applied at the individual, organizational, or geopolitical unit of analysis, and it accommodates both quantitative and qualitative data. QCA seems to be most useful for research involving complex systems or processes or as a complement to traditional probabilistic or qualitative methods used by health services researchers. QCA study validity and dissemination would be enhanced by more rigorous application of available best practices for QCA study design, execution, and reporting.

**Implications for Policy, Delivery, or Practice:** QCA offers a unique approach to health services researchers, policy makers, and practitioners for making causal inferences about complex systems or processes.

**Funding Source(s):** No Funding

**Poster Session and Number:** B, #822

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**Estimating Hospital Readmission Risk Associated with Diabetes Comorbidity after Hip/Knee Joint Replacement**

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**Presenter:** Amol Karmarkar, Ph.D., Assistant Professor, Rehabilitation Science, The University of Texas Medical Branch, amkarmar@utmb.edu

**Research Objective:** Examine the association between diabetes comorbidity and 90-day hospital readmission after inpatient rehabilitation stay for patients with hip/knee joint replacement.

**Study Design:** Secondary analysis of Medicare data. We identified diabetes-related ICD-9CM codes in the Medicare Provider Analysis and Review (MEDPAR) and Inpatient Rehabilitation Facilities Patient Assessment Instrument (IRF-PAI) data files. We created a three-level variable based on the tier comorbidity structure of the inpatient rehabilitation prospective payment system: no diabetes, non-tier diabetes (controlled diabetes), and tier diabetes (uncontrolled diabetes). Hip and knee cohorts were analyzed separately. Hospital readmission (yes/no) was determined only for those patients who were discharged to community settings after rehabilitation stay, and returned to acute hospitals within 90 days. Readmission rates were computed using Cox-proportional hazard regression models, with diabetes status as a primary covariate, controlling for other patient-level factors such as sociodemographic variables, functional status, rehabilitation length of stay, and Elixhauser comorbid conditions.

**Population Studied:** We selected patients after hip/knee joint replacement procedures who were admitted to inpatient rehabilitation facilities from acute hospitals in the years 2007-2008, and were completing their initial rehabilitation stay, living in the community prior to acute hospitalization, age 66 or older, on Medicare fee-for-service, entitled for Medicare due to age, and who did not experience a program interruption during their rehabilitation stay (N = 70,203; knee=47,916; hip=22,287).

**Principal Findings:** The prevalence of controlled diabetes in the hip and knee cohorts
was 17% and 21%, respectively; uncontrolled diabetes was identified in 3% and 4% of patients, respectively. Unadjusted 90-day hospital readmission rates were highest in the hip cohort with uncontrolled diabetes (18%) and lowest in the knee cohort with no diabetes (10%). In the multivariable models, using no diabetes as the reference group, the risk of hospital readmission in the hip cohort was 19% higher for those with controlled diabetes (HR=1.19, 95% CI=1.08-1.30) and 31% higher for those with uncontrolled diabetes (HR=1.31, 95% CI=1.08-1.59). In the knee cohort the risk was 22% higher for those with controlled diabetes (HR=1.22, 95% CI=1.14-1.30) and 43% higher for those with uncontrolled diabetes (HR=1.43, 95% CI=1.26-1.61).

**Conclusions:** The prevalence of diabetes and its impact on hospital readmission were more pronounced in patients with knee replacement. Future research should assess interactions of diabetes with other comorbidities such as obesity and/or cardiovascular conditions in order to better estimate risk of poor health outcomes, like hospital readmission.

**Implications for Policy, Delivery, or Practice:** Diabetes-related hospital readmission is a prevention quality indicator (PQI) by the Agency for Healthcare Research and Quality (AHRQ). Our findings indicate diabetes is an important comorbid condition across the continuum of care. Strategies to better manage diabetes, both prior to elective procedures such as joint replacement and throughout the rehabilitation and recovery stages could improve the overall efficiency and quality of care.

**Funding Source(s):** NIH

**Poster Session and Number:** B, #823

**Narrative Outperforms Summary in Promoting Recall of Policy Recommendations**

**Research Objective:** To compare the efficacy of narrative versus summary (standard) content in promoting recall of an evidence-based clinical policy regarding opioid prescribing in the emergency department.

**Study Design:** The study was a mixed-methods randomized controlled dissemination experiment. Two recommendations were selected from the opioid policy. Using grounded theory, we coded this summary passage and identified six themes. From these themes, we constructed a fictional narrative that matched the summary in total word count and word count of individual themes. At a regional conference of emergency physicians, the attendees were randomized to receive either the summary passage (control) or narrative (intervention). Participants read the passages individually. One hour later, participants listed any content that they could recall. The written responses were scored by two independent reviewers. For each response, either the presence or absence of the six themes was recorded using strict criteria established prior to review. A third reviewer adjudicated discrepancies. The proportion of responses that recalled each theme was determined, and the data were analyzed using logistic regression and chi-square tests. A sample size of 70 participants was required to detect 40% differences in proportion, with power of 0.9 and type 1 error of 0.05.

**Population Studied:** The study population consisted of emergency medicine resident and attending physicians.

**Principal Findings:** 95 surveys were distributed with a response rate of 86%. The two reviewers had 96.75% agreement after initial assessment. For each theme, inter-rater reliability was calculated with kappa ranging from 0.76 to 1.00. For three themes, there were statistically significant improvements in recall in the narrative arm (p < 0.05). The proportion of responses that recalled the theme “prescription drug monitoring program” was 73.7% in the narrative arm compared to 22.7% in the summary arm (OR = 9.52, 95% CI: 3.47 – 26.11). The proportion that recalled the theme “trial of non-opioid therapies” was 86.8% in the narrative arm compared to 52.3% in the summary arm (OR = 6.03, 95% CI: 1.98 – 18.3). The proportion that recalled the theme “risks of opioid abuse and misuse” was 34.2% in the
narrative arm compared to 13.6% in the summary arm (OR = 3.29, 95% CI: 1.1 – 9.8). Recall was greater in the summary arm for one theme, “American College of Emergency Physicians,” the author of the clinical policy. The proportion that recalled the theme was 0% in the narrative arm and 11.4% in the control (p = 0.03). For two themes, “acute low back pain” and “prescriptions for low doses and short durations,” there were no statistically significant differences in recall between the arms. 

**Conclusions:** Physicians exposed to a narrative, or story, were more likely to recall policy recommendations than those exposed to a standard summary.

**Implications for Policy, Delivery, or Practice:** Healthcare providers have been shown to adopt guidelines with variable effectiveness. Dissemination strategies that incorporate narratives, or stories, may improve the adoption of clinical evidence. Narratives offer a novel strategy for enhancing communication of health policy to both providers and patients.

**Funding Source(s):** AHRQ

**Poster Session and Number:** B, #824

**What Drives Hospital Readmissions?**

Eugene Kroch, Premier Incorporated and University of Pennsylvania; Michael Duan, MS, Premier Research Institute; Richard A. Bankowitz, MD, MBA, Premier Research Institute

**Presenter:** Eugene Kroch, Ph.D., Vice President & Chief Scientist, Health Care Systems, Premier Incorporated and University of Pennsylvania, ekroch@wharton.upenn.edu

**Research Objective:** Using a standard administrative/clinical database of all-cause hospitalizations, we illustrate how to analyze readmissions to characterize any subpopulation of those patients. The algorithm is a means to identify factors that account for variation in readmissions rates, enabling hospitals to monitor and anticipate readmissions over time in reference to a national benchmark.

**Study Design:** We track readmissions such that the patient, rather than the encounter, is the unit of analysis. This application of the algorithm looks for individuals that survived at least one hospitalization for heart failure (HF) during the reference period. Establishing the first HF hospitalization as the unique index, the algorithm then links each of these patients to all hospitalizations for any reason up to one year before and one year after the index hospitalization. This tracking method enables the analyst to answer a wide range of epidemiological questions about how the frequencies of readmissions are related to patient attributes and treatment choices – clinical, socio-economic, financial, etc. A major objective of this type of analysis is to understand how and why high-frequency patients differ from others. Modeling those frequencies provides a mechanism to predict readmission rates for patient types (readmission risk) and to compare those expected rates to the actual experience of the hospital, thus providing a benchmark to judge the success of interventions designed to lower readmission rates.

**Population Studied:** Hospitalizations from 761 acute-care hospitals in the Premier Alliance all-payer data base, anchored in calendar year 2010 and linked to the previous year (2009) and subsequent year (2011). The data base includes about 23.5 million inpatient discharges over the three years, which includes 169,070 heart failure patients with at least one hospital episode in 2010.

**Principal Findings:** Frequency distribution of HF readmissions based on days post index discharge is largely flat and is mirrored by the distribution of admissions prior to the index discharge. The implication is that the 30-day cutoff under the CMS definition (and associated 20% readmission rate) is arbitrary. The frequency distribution of HF readmissions is highly skew with only 15% of patients accounting for 60% of all subsequent admissions and a similar skewed proportion of the hospitalizations prior to the index admission. A minority of patients (about one-third) had neither previous nor subsequent admissions. The Pearson correlation between previous admission count and subsequent admission count was 0.316 (<0.0001). Definite patterns emerged for the effect of age (non-monotonic), comorbidity severity (strong monotonic effect), sex, race and index admission type. Taken together SES played a major role in characterizing variation across the HF population. One of the strongest effects was that index admissions via the ER were significantly associated with higher readmission frequency.

**Conclusions:** A simple algorithm for tracking the frequency distributions of hospitalizations reveals patterns that identify which population segments drive readmissions and a means to
judge the success of interventions to lower them.  

**Implications for Policy, Delivery, or Practice:** 
Readmissions reveal both common and special cause of variation in care. Measuring readmissions in meaningful segments can provide actionable information on how to improve hospital care and reduce readmissions. 

**Funding Source(s):** No Funding 

**Poster Session and Number:** B, #825 

**Classifying Dialysis Facilities based on the Standardized Hospitalization Ratio** 
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**Research Objective:** On average, dialysis patients have 2 hospital admissions and spend 12 days in the hospital per year (USRDS, 2011). The Standardized Hospitalization Ratio (SHR) for a given facility is the number of hospital admissions for patients at that facility divided by the expected number of hospital admissions based on national hospitalization rates and risk-adjusted for patient characteristics. As larger SHRs typically imply greater risks for unnecessary and costly hospital utilization, we propose a SHR-based method for classifying dialysis facilities as better than, no different from or worse than expected based on the national norm. 

**Study Design:** The SHR’s expected number of admissions is estimated from a two-stage proportional rates model (Lin et al., 2000; Kalbfleisch and Prentice, 2002), and the standard error (SE) of the log SHR is obtained from a general linear model. A test that the admission rate for a given facility conforms to the national standard is conducted by comparing the z-score (i.e. log SHR/SE) to the standard normal distribution, N(0,1). However, the observed histogram of the z-scores is more diffuse than the N(0,1), even in the center where facilities that are most likely to conform to the national standard are represented; this argues against use of the N(0,1) as the reference distribution to conduct tests. In other contexts, Efron (2004) suggests consideration of an empirical null distribution (END), which is a robust estimate based on the central part of the histogram of z-scores; he notes that the END better reflects the intrinsic variation among facilities. Therefore we propose to identify facilities as extreme based on a comparison of its z-score with the END. 

**Population Studied:** With 2010 Medicare claims data for Medicare dialysis patients in the United States (n=408,119), SHRs and associated z-scores were calculated for 5,362 Medicare certified dialysis facilities. 

**Principal Findings:** Substantial overdispersion exists in the z-scores compared to the N(0,1). The overall END (Normal with mean=-0.12, SD=1.81) provided a good fit to the center of the z-score histogram for all facilities. Since the overdispersion of the z-scores is more pronounced among larger facilities, we also stratified our analysis by facility size. Indeed for the largest quartile of facilities, the END had mean=-0.13, SD=2.22, which is much more diffuse than N(0,1). 

A facility was classified as worse than expected if its z-score was in the upper 2.5% of the END. With this criterion, 5.1% of the facilities were flagged as worse than expected compared to 15.2% based on N(0,1). After stratification, the END method flagged 7.4% of large facilities as worse than expected compared to 19.7% based on N(0,1). 

**Conclusions:** Reference to the N(0,1) as the null distribution fails to account for intrinsic and unexplained variations among facilities, and identifies too many facilities as being extreme. Taking account of such intrinsic variations, the END more correctly assesses whether a facility’s outcomes are extreme. 

**Implications for Policy, Delivery, or Practice:** 
In classifying facilities based on the SHR, the END-based approach adjusts for intrinsic and unexplained inter-facility variation, and identifies extremes in quality of care in a more appropriate fashion.
Funding Source(s): Other, Centers for Medicare and Medicaid Services
Poster Session and Number: B, #826

Using Natural Language Processing Tools to Identify Use of OncotypeDx Breast Assay in Veterans Diagnosed with Breast Cancer
Julie Lynch, Veterans Health Administration & Research Triangle Institute; Michael Kelley, MD, Veterans Health Administration; Ann Borzecki, MD, Veterans Health Administration

Research Objective: Inaccurate and inconsistent data about use of genetic diagnostic (GDx) testing has made it difficult for researchers to study access, clinical utility, comparative effectiveness, and health outcomes of GDx tests. Even with its nationally integrated electronic medical record (EMR), the VHA has experienced problems capturing use of GDx tests in its datasets. The sheer volume and rapid pace of development of GDx tests has made it difficult to develop timely updates to the EMR to capture and integrate GDx tests. We chose to first test natural language processing (NLP) tools in Veterans diagnosed with breast cancer. Breast cancer patients were chosen for 3 reasons: 1) In 2011, there were 231 Veterans discharged from a VHA acute care facility who had a primary or admitting diagnosis of breast cancer during calendar year 2011. This number of patients made it possible to conduct chart abstraction on all records. 2) We chose to analyze use of OncotypeDx breast assay because this test is included in clinical practice guidelines published by National Comprehensive Cancer Network (NCCN) and American Society of Clinical Oncology (ASCO) with level 1 evidence recommending use of the test. 3) OncotypeDx is a proprietary test provided by one laboratory, Genomic Health. Using data provided by Genomic Health, we could validate that we had captured all tests. Therefore, the purpose of this study was to validate the feasibility of NLP tools to identify and extract variables associated with use of OncotypeDx breast assay in the VHA. Once we confirmed the feasibility of the NLP tools to identify use of GDx tests, we automatically extracted patient demographics, clinical characteristics, site and location of care characteristics associated with use of OncotypeDx.

Study Design: This was a cross sectional, retrospective, observational study. We used 2011 VHA administrative and EMR data from all acute care VA hospitals. We identified all index discharges of veterans who had a primary or admitting diagnosis of breast cancer. We conducted manual chart abstraction, obtaining text files of patient demographic data, surgical pathology reports, oncology consults, and clinical notes during 2011. We used NLP tools to extract information that identified patient, regional, site of care characteristics, and use of OncotypeDx. We compared data obtained from use of NLP tools to data obtained from Genomic Health.

Population Studied: Veterans discharged from VA acute inpatient care with a primary or admitting diagnosis of breast cancer during calendar year 2011.

Principal Findings: Based on the data provided to us by Genomic Health, 113 Veterans diagnosed with breast cancer, underwent OncotypeDx testing. Of these, 55 tests were ordered by non VA clinicians who conducted fee-based services for the VHA. To date, we have conducted manual chart abstraction on 92 patient records. Of these records, in all but 4 records, NLP tools accurately identified whether OncotypeDx was ordered. In these 4 records, NLP tools identified patient records that OncotypeDx was considered but not ordered.

Conclusions: NLP tools are an efficient and effective method for retrospectively identifying use of OncotypeDx in Veterans diagnosed with breast cancer. We intend to use these tools to investigate whether OncotypeDx testing was appropriately ordered, whether test results guided treatment, and whether there is patient, regional, or site of care differences in access.

Implications for Policy, Delivery, or Practice: There is a growing demand for policies to improve research on access, cost, quality and health outcomes of genetic diagnostic testing. Until such policies are implemented, NLP tools may be one method for accurately identifying use of GDx testing.

Funding Source(s): Other, Veterans Healthcare Administration
Poster Session and Number: B, #827
Evaluating the Real-World Implementation of Evidence-Based Childhood Asthma Management Practices in Primary Care
Anne Markus, George Washington University; Maya Gerstein, George Washington University; David Stevens, George Washington University; Herman Mitchell, Rho Inc.; Suzanne Kennedy, Rho Inc.; Ryan Bailey, Rho Inc.; Avi Dor, George Washington University; Kristina West, George Washington University

Research Objective: Implementation research is the study of methods to promote the uptake of research findings into routine practice. A barrier to implementation research is the lack of agreed-upon, scientifically-grounded evaluation methods that assess both the outcomes from implementation of evidence-based practice and the process by which successful implementation occurs. We offer a viable approach to the evaluation of implementation activities in primary care through our experience investigating the translation of evidence-based childhood asthma interventions in federally qualified health centers (FQHCs).

Study Design: We weighted and applied evidence-based selection criteria to invite three FQHCs to join this study that represented a shared FQHC model of care but with differing contextual and organizational features (e.g., state policy/reimbursement approaches, capacity, readiness, leadership). We engaged FQHC partners in planning to identify a minimum set of evidence-based activities (consisting of environmental risk assessments, tailored asthma counseling, and environmental remediation supplies and education), review and agree to uniform measures for evaluation, and tailor staffing and workflow to their own needs and culture. Using a case study approach with strengthened external validity, we are gathering concurrent and prospective qualitative and quantitative data from multiple sources over multiple points in time to assess the context and the process of implementation at each FQHC, while simultaneously evaluating patient-level outcomes.

Population Studied: Targeting 600 low-income and underserved pediatric patients with poorly controlled, moderate to severe asthma, many of whom are typically excluded from randomized trials; 50 health center providers, staff, and leadership at intervention FQHCs and a smaller sample at comparison FQHCs; 6 FQHCs; 3 states.

Principal Findings: Preliminary findings demonstrate relatively seamless integration of consensus-driven asthma interventions into all three FQHCs due in large part to the successful and continual engagement of FQHCs in key decision making points. For example, FQHCs were able to collaborate with investigators and with one another to design a common intervention protocol that aligned both with research priorities and existing clinic workflow processes. However, our approach is not without its challenges. Our experience so far suggests that traditional resources, systems, and processes for research are not fully suited to support pragmatic studies of this nature. For example, parallel institutional review protocols, complex contracting arrangements, and variable information systems create inefficiencies in project management, which need to be continually addressed.

Conclusions: The case study approach has traditionally been emphasized as a data collection method for exploratory research rather than as a research strategy for explanatory inquiries. Our design, with strengthened external validity and a common research and intervention protocol across study sites, offers a rigorous and pragmatic design for implementation research by balancing external validity with fidelity to the evidence base.

Implications for Policy, Delivery, or Practice: By triangulating contextual and process data with clinical and cost effectiveness measures, we will characterize how successful implementation occurs across varying jurisdictions to help inform what practitioners and policymakers might replicate and disseminate to benefit the system at large. Our methodology provides a systematic way to achieve this result and also offers an alternative for consideration by the field of implementation research.

Funding Source(s): Other, Merck Childhood Asthma Network

Poster Session and Number: B, #828

Hospital Culture of Transitions in Care: Survey Development
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Jenny Twesten, George Washington University; Suzanne Stone-Griffith, Hospital Corporation of America; Jesse Pines, George Washington University

Presenter: Mark McClelland, R.N., Nurse Researcher, Nursing Research and Innovation, Cleveland Clinic, mcclellandmark2@gmail.com

Research Objective: Hospital boarding of admitted patients in the emergency department causes crowding. Crowding has been shown to have serious consequences for patient safety and quality of care. To this end the Joint Commission has recently included a stronger focus on patient flow emanating from the emergency department in their leadership standards and the Center for Medicare and Medicaid Services has added emergency department throughput measures to their quality data reporting program. Previous research suggests that hospital capacity (bed and staff availability) is often not the primary driver of boarding, and that organizational inefficiencies may play a significant role. We posit that an organization’s culture, specifically its culture related to transitions in care (patient flow throughout the hospital), may be a significant driver of high or low value organizational characteristics. The purpose of this article is to describe our initial work in developing a survey designed to assess how hospital employees perceive, approach, and conduct, care transitions in their hospital.

Study Design: DOMAIN IDENTIFICATION: We convened a 10-member, multidisciplinary, multidepartmental hospital technical expert panel (TEP) and used a variety of methods to explore the question, “What attitudes, customs, values, beliefs and shared practices, facilitate or hinder high quality transitions in care?” ITEM DEVELOPMENT: Informed by the TEP’s work we developed the initial set of 53 survey items. ITEM TESTING: We used a two-round, 29-member Delphi technique to critique the potential survey items for clarity and importance. SURVEY TESTING: The formatted survey was Pilot Tested for flow, ease of use, and appropriateness of response categories in a midsize New England hospital. After modifications were made we performed reliability testing using a Test/Retest methodology in a large hospital in a western state.

Population Studied: The survey will be applicable to all hospital staff involved in transitions in patient care.

Principal Findings: Based on the work of the TEP we identified 54 Transition Factors associated with eight domains: Shared Goals, Leadership, Work Ethic, Communication, Transitions-Planning-Operations, Workload, Patient Centeredness, and Organizational Priorities. The research team developed 53 potential survey items. The results of the Delphi panel included the addition of one item, the elimination of eight items and improvement in several other items. The Pilot Testing resulted in the refinement of the survey format and response categories. We received 67 initial tests and 54 retests (80.6%). All items had a kappa value greater than .21 and 72% of the items scored greater than .40.

Conclusions: Our work has demonstrated the feasibility of developing a survey instrument whose purpose is to enable hospital staff, leaders, administrators and researchers to assess and improve the attitudes and practices of staff about transitions in patient care. The next and final step is to perform validation testing.

Implications for Policy, Delivery, or Practice: As health care reimbursement increasingly favors the production of value over the quantity of services provided the efficiency and efficacy of smooth patient flow throughout the hospital will affect hospitals’ financial viability. The Hospital Culture of Transitions in Care Survey holds promise to fill a gap in the knowledge of how organizational dynamics affect patient care.

Funding Source(s): RWJF
Poster Session and Number: B, #829

Response Rates, Non-Response Bias, and Data Quality: Results from a National Survey of Senior Healthcare Leaders
Mark Meterko, VA Boston Healthcare System (152M); Joseph Restuccia, Center for Organization, Leadership and Management Research (COLMR), VA Boston Healthcare System, Boston, MA; Kelly Stolzmann, Center for Organization, Leadership and Management Research (COLMR), VA Boston Healthcare System, Boston, MA; David Mohr, Center for Organization, Leadership and Management Research (COLMR), VA Boston Healthcare System, Boston MA; Justin Glasgow, Comprehensive Access and Delivery System Research and Evaluation (CADRE) Center, Iowa City VA Healthcare System, Iowa City, IA; Caitin
Principal Findings: Of 124 COMs, 118 (95%) responded, 35 (29.7%) to the initial contact, followed by 23 (19.5%), 14 (11.9%), 12 (10.2%) and 34 (28.8%) in response to the four subsequent reminders, respectively. Respondent waves did not differ with regard to demographic or facility characteristics, or proportion of missing data. The response distributions on two categorical factual report questions did differ by wave, but the differences were not systematic. No significant differences were observed on either the single or multi-item scale measures of attitudes by wave; “what if” analyses of successive cumulative results by wave indicated that the same conclusions would have been reached if the data collection had been halted at any point. However, as expected, the precision and statistical power of the survey results increased steadily as the number of respondents accumulated over the course of the study.

Conclusions: The almost perfect response rate achieved on this survey made it ideal for studying the relationship between response rate and non-response bias. High response rates are certainly desirable because of their important effect on precision and power of survey results. However, as survey fatigue increases among potential respondents in all fields, absolute thresholds representing “adequate” survey response rates may be unrealistic, and survey results should be considered on their merits rather than being uniformly disqualified for failing to meet a threshold rate.

Implications for Policy, Delivery, or Practice: While it has a direct incremental effect on the precision of survey data, response rate may be overestimated as an indicator of data quality as surveys may accurately represent the attitudes of the target population even if response rates are below levels typically believed to be desirable. Certainly efforts should always be made assess the degree of non-response bias in any survey dataset, but response rate alone should not be used to dismiss results as uninformative.

Funding Source(s): VA
Poster Session and Number: B, #830

Healthcare Employee Surveys: Reporting Methods that Improve Quality of Services
Jan Beckstrand, Veterans Health Administration; Katerine Osatuke, Veterans Health Administration; Emily Crowe, Veterans Health Administration; Kelley Carameli, Veterans Health Administration; Katerine Osatuke, Veterans Health Administration

Presenter: Katerine Osatuke, Ph.D., Health Scientist, Veterans Health Administration, katherine.osatuke@va.gov

Research Objective: In data-driven healthcare systems, the ultimate goal of sharing information
is to effectively support improvements in costs and quality of services. Towards these ends, data must be delivered in a form well fitted to its appropriate use (Harris, 1999). Visual displays are often superior in communicating complex information contained in data. Graphs facilitate appropriate and rapid use of results, if they explicitly depict information in ways that both facilitate visually-based cognitive processing and make relevant trends visually salient to all audiences (Cleveland & McGill, 1987; Shah & Hoeffner, 2002). For example, the structure of graphs should reduce demands on short term memory and enable rapid and accurate visual encoding into long term memory (Lane & Sandor, 2009). While healthcare employee survey data have proven their relevance to optimizing healthcare organization outcomes (e.g. Benzer et al., 2011; Osatuke et al., 2009; Warren et al., 2007), optimal methods of summarizing survey results have not been studied. We rated graphics commonly used to communicate employee survey results on criteria that research literature identified for assessing quality of visual data displays (Friel et al., 2001; Lane & Sandor, 2009; Peebles, 2008; Shah & Hoeffner, 2002). Using Veterans Health Administration All Employee Survey (VHA AES) and three additional public data sources, we applied several known strategies (Friel, et al., 2001; Lane & Sandor, 2009; Peebles, 2008; Shah & Hoeffner, 2002; Tufte, 1983, 1990) to construct alternative displays that better convey the survey results, thus supporting their use for healthcare system improvements.

Study Design: Graphics used to disseminate results from four large employee surveys were evaluated based on research recommendations for data displays. We used similar data from the VHA AES to replicate the commonly used graphs and construct alternative displays that, by our criteria, made relevant trends visually more salient for their intended purposes (health care system improvement). We present methods of optimizing the graphics and principles for graph construction, statistical preprocessing of the data and personnel resources required.

Population Studied: Data from VHA AES and other publicly available employee surveys

Principal Findings: Commonly used graphs typically visually convey only the numerical order in results stratified by functional groups. Thus they only improve on data tables by visually representing the order by size which omits pictorially key actionable results revealed by alternative graphs. The alternative graphs require more intensive and informed preprocessing of data by highly knowledgeable staff, but afford specifying the sources of problems for well-targeted interventions (e.g. to facilitate staff development, system effectiveness, and retention).

Conclusions: Commonly used data displays often depict qualitative and quantitative information in ways that neither facilitate visually-based cognitive processing nor make relevant trends visually salient. This negatively impacts consumption of results that can potentially guide targeted system improvements.

Implications for Policy, Delivery, or Practice: Alternative graphs require greater investment, both in data analysis and in optimal graphical representations, but provide better information and reduce time required for comprehension. Healthcare executives need to evaluate the investments required to optimize data presentations against costs of erroneous interpretations when data are displayed in ways that do not promote optimal use by all audiences.

Funding Source(s): VA
Poster Session and Number: B, #831

A Mosaic of Methods to Develop a National Position Paper on Chronic Care
Dominique Paulus, Belgian Health Care Knowledge Centre; Koen Van den Heede, Belgian Health Care Knowledge Centre; Sophie Gerkens, Belgian Health Care Knowledge Centre; Anja Desomer, Belgian Health Care Knowledge Centre; Raf Mertens, Belgian Health Care Knowledge Centre

Presenter: Dominique Paulus, M.D.,Ph.D,MSc., Senior Expert Physician, , Belgian Health Care Knowledge Centre, dominique.paulus@kce.fgov.be

Research Objective: This paper presents the combination of methods used to draft a national position paper in collaboration with patients associations. Our health care systems are now at a turning point with an urgent need to develop better care for the chronically ill instead of focusing on acute conditions in hospital settings.

Study Design: In a first step, the researchers elaborated a scientific report based on a theoretical and on a more practical, inductive approach. The first theoretical approach included (1) a review of the main international papers (e.g. World Health Organization, United Nations) that advocate for national policies for
chronic care; (2) a review of 4 selected national or regional policies for chronic care (Pennsylvania, Québec, Denmark, The Netherlands); (3) the development of a conceptual framework inspired by the previous sources, outlining the vision of an ideal health care system oriented towards chronic care. The inductive approach included: (1) a systematic literature review on patient empowerment; (2) a review of the grey literature on new professional roles; (3) a scrutiny of reports of the Belgian Health Care Knowledge Centre on the organization of care for the chronically ill; (4) an analysis of the Belgian situation (inventory of ongoing initiatives, review of the existing coordination structures, SWOT analysis of the situation by the patient associations and by other key stakeholders)

**Population Studied:** The target population of this position paper are the chronically ill with care needs linked to their disease.

**Principal Findings:** We identified shortcomings and room for improvement by confronting the conceptual framework with the analysis of the Belgian situation. Consequently in a second step, we drafted the position paper based on the content of the scientific report. This position paper includes 20 policy recommendations subdivided into 50 action points to overcome the identified shortcomings. The draft was further tailored to the Belgian context by submitting it to more than 100 stakeholders from diverse backgrounds: representatives of patients associations, of health professionals, of sickness funds and of the authorities.

**Conclusions:** This research illustrates the value of combining diverse methods when drafting a blueprint for major healthcare reform.

**Implications for Policy, Delivery, or Practice:** The combination of methods in health services research has a unique value to draft health care reforms that are in line with the international developments and with the concrete national situation. Stakeholders’ consultation and in particular the consultation of patients associations are key elements to make sure that these reforms genuinely address patient needs.

**Funding Source(s):** Other, Belgian Health Care Knowledge Centre

**Poster Session and Number:** B, #832

**Predicting Informed Consent Preferences for Participating in Population-based Research**

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**Presenter:** Jody Platt, M.P.H., Doctoral Student, Department of Health Management and Policy, University of Michigan, jeplatt@umich.edu

**Research Objective:** Biobanks are an increasingly common mechanism for storing and sharing vast quantities of health data for multiple research uses and for a variety of researchers. In some cases, biobanks that house biospecimens and health information for research seek broad consent from participants, while others re-consent for specific new studies. Understanding research participants’ attitudes and preferences about broad and narrow consent may improve recruitment, retention, and public support for health research.

**Study Design:** A 177-item online survey was developed to collect data on public opinions about a national cohort study proposed by the National Human Genome Research Institute. The questionnaire included 22 likert scales that measured attitudes about research and researchers both generally, and in the context of the cohort study. Based on the hypothesis that 1) trust, 2) privacy, 3) concerns specifically about participating in the proposed NHGRI research project, and 4) values of research shape choices about what type of consent an individual would prefer, we grouped related variables into one of these four categories. We also included demographic variables in our models

This presentation examines relationships between consent preferences and demographic factors, beliefs about privacy, the value of research, and the perceived trustworthiness of researchers.

**Population Studied:** The survey was conducted among a representative sample of 4,659 US adults.

**Principal Findings:** Participants preferred broad consent (52%) over study-by-study consent models (48%). Higher preferences for study-by-study consent observed among Black non-Hispanic respondents, and respondents with lower income and education were explained
by differences in the prevalence of one or more beliefs about the study. Respondents with fears about research and those that would feel respected if asked for permission for each research use preferred study-by-study consent. Preference for broad consent was related to the desire not to be bothered with multiple requests and the belief that the study could lead to improved treatments, cures, and lives saved.

**Conclusions:** These data suggest that work with research participants and community leaders to understand, respond to, and influence opinions about a given study may improve uptake of broad consent.

**Implications for Policy, Delivery, or Practice:**
The ability to communicate, operate transparently, and demonstrate active respect for research participants appear to be fundamental to robust consent and research enterprises. To the extent that participant- and community-engagement work is feasible prior to and across the life of biobank-based resources, it should be considered as a valuable tool in the recruitment and retention of participants. The practicality and acceptability of electronic and web infrastructures to support the contact of participants in biobanks and long-term cohort studies according to their preferences could be explored as an avenue for making both models accessible.

**Funding Source(s):** NIH

**Poster Session and Number:** B, #833

**Development of an Unique Approach for the Reliable Abstraction of Unstructured Data within Clinical Provider-to-Provider Communication Documents**

Brook Polnaszek, University of Wisconsin School of Medicine and Public Health; Andrea Gilmore-Bykovskyi, University of Wisconsin Madison School of Nursing; Melissa Hovanes, University of Wisconsin Madison School of Nursing; Roger Brown, University of Wisconsin Madison School of Nursing; Amy Kind, University of Wisconsin School of Medicine and Public Health

**Presenter:** Brook Polnaszek, Bachelor of Science, Research Specialist, Department of Medicine - Geriatrics, University of Wisconsin School of Medicine and Public Health; bepolnas@medicine.wisc.edu

**Research Objective:** Clinical provider-to-provider communication documents are increasingly used in health services research to examine how written communication influences care quality, patient outcomes, and care coordination. Yet, much of the content is often recorded as free text, leading to unstructured data. Clinicians record what they perceive as critical to patient care delivery during initial documentation. The application of traditional abstraction methods developed for the reliable collection of structured data may not be appropriate for unstructured data. As part of an on-going NIH-funded project to assess the quality and impact of hospital-nursing home discharge communication, a reliable strategy for the abstraction of unstructured, expert-recommended discharge summary components from the electronic medical record (EMR) was needed. The objectives in developing these strategies were: to increase reliability and accuracy of EMR abstraction of unstructured, clinical provider-to-provider communication of expert-recommended discharge summary components; and, to examine the utility of these strategies by comparing changes in inter-rater reliability over time.

**Study Design:** Reliable assessment of the unstructured data regarding instructions for post-hospital medical follow up was needed. Medical follow-up data lacked standardization, contributing to considerable differences within and across each hospital’s EMR. This non-uniformity was further complicated by evolutions in the EMRs over time. To ensure reliable abstraction of the unstructured data in this fluctuating environment, the following steps were developed and implemented over the course of the study: recruitment of clinically-experienced abstractors who had familiarity with clinical provider-to-provider communication documents and the structure of each hospital’s EMR; involvement of all members of the abstraction team in the creation and on-going revision of abstraction tools, manuals, and protocols; daily inter-abstractor communication, especially on complex components; extensive piloting and abstractor training phases; blinding abstractors to one another but not to the study hypotheses; and, interval review of inter-rater reliability after every 100 records.

**Population Studied:** All patients 18 years or older discharged with primary diagnoses of stroke or hip fracture to a skilled nursing or inpatient rehabilitation facility from either of two Midwestern hospitals, one academic, one community-based, during the years 2003-2008 for a total of 2,079 subjects.
**Principal Findings:** Initial abstractions were carried out using traditional abstraction approaches for structured data, however these were found to produce lower than desired reliabilities in unstructured data elements like the targeted medical follow-up data. The new abstraction protocol was applied as it was developed, and, once fully implemented, yielded superior reliability ratings, as demonstrated by Cohen’s Kappa and percent agreement. For example, the abstraction reliability of the unstructured component “how medical follow up is to be arranged” increased from kappa of 0.60 and 98.49 percent agreement using the traditional approach, to 0.98 and 98.68 percent, respectively, using the new approach.

**Conclusions:** This abstraction protocol resulted in increased levels of inter-rater reliability for unstructured data components within clinical provider-to-provider communication documents.

**Implications for Policy, Delivery, or Practice:** As health services research continues to assess how clinical communication may serve as a tool to increase care quality and coordination, it is critical to identify effective research protocols to accurately and reliably assess this communication. This protocol shows promise as becoming one such tool.

**Funding Source(s):** Other, National Institute on Aging Paul B. Beeson Patient-Oriented Research Career Development Award K23AG034551 [PI Kind]

**Poster Session and Number:** B, #834

**Feasibility of Automated Quality Measurement of Adolescent Well Care by Electronic Health Records**

Aldo Tinoco, MD, MPH; Stephanie Rodriguez, National Committee for Quality Assurance; Mohua Choudhury, National Committee for Quality Assurance; Stephanie Rodriguez, National Committee for Quality Assurance; Suzanne Morton, MPH, National Committee for Quality Assurance; Andrea Ireland, PhD, MPH, National Committee for Quality Assurance; William Gardner, PhD, Nationwide Children’s Hospital; Kelly Kelleher, MD, MPH

**Presenter:** Stephanie Rodriguez, B.S., Health Care Analyst, Performance Measurement, National Committee for Quality Assurance, rodriguez@ncqa.org

**Research Objective:** The use of data from electronic health records (EHRs) has the potential to improve clinical quality measurement. However, the feasibility of reporting clinical quality measures (CQMs) varies across measures and EHR systems. We assessed the feasibility of collecting data elements for CQMs of adolescent well-care from EHRs.

**Study Design:** We administered an online survey to health care institutions for the availability of the electronic data elements that make up target quality indicators. Questions were related to the type of EHR system, the capacity of the EHR to capture required data elements, the location of these elements in the EHR, use of structured data fields, and characteristics of the adolescent patient population.

**Population Studied:** Nine large institutions that provide pediatric primary care services participated in the study. Because EHR installations vary by site, we included three EHR vendor systems to determine whether the EHR system or the extent of its use influenced the availability of required data elements.

**Principal Findings:** All sites reported the ability to capture diagnosis (9/9) either from the encounter or billing form (8/9), problem list (8/9) or past medical history section (7/9). However, only six organizations reported that they both required clinicians to maintain diagnoses in the problem list and that they considered the problem list to be a reliable source for patients’ diagnoses.

Sites reported that patient referrals could be documented, including whether a referral appointment was made and the reason for referral by most organizations; however 4 out of 9 organizations reported that request for referrals and results of referral visits were not available in structured fields.

The use of EHR systems to electronically exchange data was very low; Few organizations used their EHR system for reporting to immunization registries (5/9) and public health reporting (4/9); however, only one could document whether a prescription was filled. When asked about barriers to extract data elements, sites reported that values were missing in the majority of cases because of failure to input the data, use of unstructured fields, and inability to report from the EHR database.

**Conclusions:** To realize the promise of EHR-enabled clinical quality measurement and adolescent quality reporting, the documentation and extraction of required data elements in EHR systems can be improved through increased
capture of data in structured fields, increased access to data stored in the EHR system for reporting purposes, and the ability to use unstructured data such as provider notes.

**Implications for Policy, Delivery, or Practice:** Variations in clinical workflow, EHR system implementation, and degree of use of structured data have a significant impact on CQM and other meaningful uses of EHR technology. Additional attention to CQM should be made during implementation and clinical user training to ensure that existing EHR capabilities are configured to support both clinical workflow and quality improvement.

**Funding Source(s):** AHRQ

**Poster Session and Number:** B, #835

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**Using Qualitative Data Analysis Software for Health Record Abstraction**


**Research Objective:** Abstracting data from health records can be challenging and tedious. With an aim to improve the quality of record abstraction, we developed and evaluated a method using ATLAS.ti, a qualitative data analysis software package. Our objective was to report documentation regarding the pre-analytic (ordering tests) and post-analytic (results and interpretation) phases of testing for four genetic tests (cystic fibrosis, HLA-B27, hemochromatosis and thrombophilia).

**Study Design:** This was an observational study using mixed methods. Outcomes of interest included documentation of four pre-analytic (indication for testing, name of the test, relevant family history, and informed consent) and three post-analytic (the test result, implications for the patient and family, and management recommendations) domains. Using ATLAS.ti, codes were created for each domain and applied to text from medical records. To validate the ATLAS.ti abstraction method, 20 records were selected in chronologic order from patients who had a genetic test of interest (5 for each of the 4 tests). Each record included progress notes for a 6-month period both prior to and after the test collection date. Manual data abstraction was performed by two researchers (CA, EM) who read through each record and highlighted text pertaining to each domain using the comment function in Microsoft Word. ATLAS.ti data abstraction was performed by two researchers (TS, AJ) using the auto-coding tool in “confirm always” mode, which identified key words for each domain and allowed the reviewer to confirm or reject the text. Both pairs of coders reconciled their results, and results from the data abstraction for the two methods were compared.

**Population Studied:** Health records from patients at the VA Greater Los Angeles Healthcare System who had one of the genetic tests of interest ordered between April and September 2011. Tests ordered by the geneticist were included. Tests ordered by all other providers (including trainees) were included.

**Principal Findings:** Records reviewed had a median length of 39.5 pages (range 3-283) and documented a mean of 12.6 (range 0-38) active problems per patient. There were 47 unique data elements identified with the manual method and 72 with ATLAS.ti, which found all elements identified manually. ATLAS.ti identified more data in 65% of the 20 records; on average ATLAS.ti found 3.6 (range 1-6) data elements per record compared to 2.4 (range 1-5). If present, usually the pre- and post-analytic data were documented by one provider in one note, respectively. However, family history (pre-analytic) and management recommendations (post-analytic) were sometimes found in other notes. Family history was found in 6 records compared to only one using manual methods. Management recommendations were found in 7 records using ATLAS.ti and only two using manual methods.

**Conclusions:** ATLAS.ti identified more data than manual abstraction methods; facilitating more complete data abstraction, particularly when data existed across multiple notes.

**Implications for Policy, Delivery, or Practice:** Qualitative data analysis software can be a useful tool for abstracting data from medical records.

**Funding Source(s):** CDC

**Poster Session and Number:** B, #836
Beyond Comorbidity: Expanding the Definition and Measurement of Complexity among Older Adults Using Administrative Claims Data  
Elizabeth A. Chrischilles, The University of Iowa College of Public Health; Kathy Schneider, Schneider Research Associates; Kathy Schneider, Schneider Research Associates; June Wilwert, Buccaneer - GDIT; Greg Lessman, Buccaneer - GDIT; Brian E. O'Donnell, Buccaneer - GDIT; Brian Gryzlak, University of Iowa College of Public Health; Kara Wright, University of Iowa; Robert Wallace, University of Iowa

Presenter: Kathy Schneider, Ph.D., Epidemiologist, Schneider Research Associates, schneidilc@aol.com

Research Objective: Older adults who are at the highest risk of cardiovascular events are paradoxically less likely to receive cardiovascular treatments. We sought to identify indicators of geriatric syndromes and serious illness from administrative claims data, beyond the commonly measured comorbidity indexes, that may help explain treatment decisions and outcome.

Study Design: Two sets of models were estimated for the following dependent variables: receipt of cardiac catheterization during index hospitalization (yes/no) and 12 month mortality. For each dependent variable, a base model included age, sex, race and the following baseline medical covariates: acute myocardial infarction (AMI), stroke, transient ischemic attack (TIA), congestive heart failure (CHF), atrial fibrillation, peripheral vascular disease (PVD), chronic kidney disease (CKD), diabetes, hypertension, hyperlipidemia, non-AMI ischemic heart disease, history of revascularization, and a modified Charlson score - that removed coronary heart disease (CHD) risk equivalents (PVD and diabetes), and established cardiovascular disease (CVD) (AMI, stroke, CHF). We examined whether indicators of geriatric syndromes or severe illnesses added value to the base model. Indicators included mobility limitations (claims for cane, walker, wheel chair, hospital bed, etc.) blood transfusion, supplemental nutrition, use of oxygen, hip fracture, chronic skin ulcer, pneumonia, delirium/dementia, bone marrow failure, depression, urinary incontinence, respiratory failure, sepsis, malnutrition/unintentional weight loss, and dehydration. Separate models examined indicators individually, as a count of indicators, and as two summary indicator variables: any mobility limitation (yes/no) and any of the other indicators (yes/no).

Population Studied: Random sample (n=20,000) US Medicare beneficiaries aged 65 or older with Part A, B fee-for-service and Part D coverage, who were hospitalized for an AMI during 2007.

Principal Findings: Modified Charlson comorbid conditions were identified among 52 percent of the study population. Nearly 60 percent of the study population had at least one indicator of geriatric syndromes or severe illness. The most common were: delirium or dementia (23% of the study population), pneumonia (17.9%), depression (16.9%), mobility limitation (15.9%), chronic skin ulcers (12.6%), malnutrition or unintentional weight loss (11.4%), oxygen use (10.8%), and respiratory failure (10.5%). The new indicators of geriatric syndromes or severe illness added significantly to the base models. People with a greater number of indicators (median 1, range 0-12) were less likely to receive cardiac catheterization for the index AMI (odds ratio [OR] 0.74; 95% confidence interval [CI] 0.72, 0.75) and had greater 12-month mortality (OR 1.26; 95% CI 1.24, 1.29). The binary measures of mobility limitation and any other geriatric syndrome or severe illness also added significantly to base models for cardiac catheterization (mobility limitation OR 0.83; 95% CI 0.75, 0.91; other indicators OR 0.42; 95% CI 0.39, 0.45) and 12-month mortality (mobility limitation OR 1.21; 95% CI 1.11, 1.32; other indicators OR 1.92; 95% CI 1.78, 2.06).

Conclusions: An expanded definition of multiple chronic conditions may capture patient heterogeneity better than common comorbidity measures alone in claims data studies.

Implications for Policy, Delivery, or Practice: Investigators using administrative claims data for studying heterogeneity in treatment effects for older adults should include an expanded set of conditions and characteristics.

Funding Source(s): AHRQ
Poster Session and Number: B, #837

Generalizing Observational Study Results: Applying Propensity Score Methods to Complex Surveys
Eva DuGoff, Johns Hopkins Bloomberg School of Public Health; Megan Schuler, Johns Hopkins University of Iowa College of Public Health

Research Objective: Among older adults who are at the highest risk of cardiovascular events are paradoxically less likely to receive cardiovascular treatments. We sought to identify indicators of geriatric syndromes and serious illness from administrative claims data, beyond the commonly measured comorbidity indexes, that may help explain treatment decisions and outcome.

Study Design: Two sets of models were estimated for the following dependent variables: receipt of cardiac catheterization during index hospitalization (yes/no) and 12 month mortality. For each dependent variable, a base model included age, sex, race and the following baseline medical covariates: acute myocardial infarction (AMI), stroke, transient ischemic attack (TIA), congestive heart failure (CHF), atrial fibrillation, peripheral vascular disease (PVD), chronic kidney disease (CKD), diabetes, hypertension, hyperlipidemia, non-AMI ischemic heart disease, history of revascularization, and a modified Charlson score - that removed coronary heart disease (CHD) risk equivalents (PVD and diabetes), and established cardiovascular disease (CVD) (AMI, stroke, CHF). We examined whether indicators of geriatric syndromes or severe illnesses added value to the base model. Indicators included mobility limitations (claims for cane, walker, wheel chair, hospital bed, etc.) blood transfusion, supplemental nutrition, use of oxygen, hip fracture, chronic skin ulcer, pneumonia, delirium/dementia, bone marrow failure, depression, urinary incontinence, respiratory failure, sepsis, malnutrition/unintentional weight loss, and dehydration. Separate models examined indicators individually, as a count of indicators, and as two summary indicator variables: any mobility limitation (yes/no) and any of the other indicators (yes/no).

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Principal Findings: Modified Charlson comorbid conditions were identified among 52 percent of the study population. Nearly 60 percent of the study population had at least one indicator of geriatric syndromes or severe illness. The most common were: delirium or dementia (23% of the study population), pneumonia (17.9%), depression (16.9%), mobility limitation (15.9%), chronic skin ulcers (12.6%), malnutrition or unintentional weight loss (11.4%), oxygen use (10.8%), and respiratory failure (10.5%). The new indicators of geriatric syndromes or severe illness added significantly to the base models. People with a greater number of indicators (median 1, range 0-12) were less likely to receive cardiac catheterization for the index AMI (odds ratio [OR] 0.74; 95% confidence interval [CI] 0.72, 0.75) and had greater 12-month mortality (OR 1.26; 95% CI 1.24, 1.29). The binary measures of mobility limitation and any other geriatric syndrome or severe illness also added significantly to base models for cardiac catheterization (mobility limitation OR 0.83; 95% CI 0.75, 0.91; other indicators OR 0.42; 95% CI 0.39, 0.45) and 12-month mortality (mobility limitation OR 1.21; 95% CI 1.11, 1.32; other indicators OR 1.92; 95% CI 1.78, 2.06).

Conclusions: An expanded definition of multiple chronic conditions may capture patient heterogeneity better than common comorbidity measures alone in claims data studies.

Implications for Policy, Delivery, or Practice: Investigators using administrative claims data for studying heterogeneity in treatment effects for older adults should include an expanded set of conditions and characteristics.

Funding Source(s): AHRQ
Poster Session and Number: B, #837

Generalizing Observational Study Results: Applying Propensity Score Methods to Complex Surveys
Eva DuGoff, Johns Hopkins Bloomberg School of Public Health; Megan Schuler, Johns Hopkins University of Iowa College of Public Health
Propensity score methods and survey data from the 2008 Household Expenditure Panel Survey (MEPS). Principal Findings: Expenditure Panel Survey. The simulation compares the relative performance of survey weights alone, propensity score adjustment alone, and the combination thereof when the goal is to estimate population treatment effects. The second example demonstrates a real world application and emphasizes appropriate interpretations of results.

Population Studied: US adults who report either a generalist or a specialist as their usual source of healthcare in the 2008 Medical Expenditure Panel Survey (MEPS).

Principal Findings: Appropriately combining propensity score methods and survey weights can ensure that results are both generalizable to the original target population and corrected for treatment selection bias. Survey weights alone and particularly propensity score adjustment alone resulted in larger point estimates and incorrect standard errors. Using MEPS, we estimated the effect of having a specialist, compared to a generalist, as one’s usual source of care was an increase ranging from $1,118 and $3,614 on one’s annual healthcare spending. Propensity scores were used to adjust for differences between those who saw specialists and generalists on factors including age, race, education, health status, marital status, and type of insurance coverage. The choice of propensity score methods determines to whom the results generalize, the interpretation of these results, as well as the subsequent inference regarding healthcare policy.

Conclusions: Propensity scores methods can easily and effectively be integrated into the analysis of complex surveys in ways that can yield accurate estimates of population treatment effects.

Implications for Policy, Delivery, or Practice: When using survey data, researchers should carefully consider the population they would like effect estimates to be generalizable to as well as the potential for treatment selection bias when determining which analysis methods to use.

Funding Source(s): N/A

Poster Session and Number: B, #838

The Comparative Effectiveness of Intraoperative Cholangiography in the Prevention of Common Bile Duct Injury

Kristin Sheffield, University of Texas Medical Branch at Galveston; Taylor S. Riall (Co-first author with Sheffield), University of Texas Medical Branch at Galveston; Yimei Han, University of Texas Medical Branch at Galveston; Yong Fang Kuo, University of Texas Medical Branch at Galveston; James S. Goodwin, University of Texas Medical Branch at Galveston

Presenter: Kristin Sheffield, Ph.D., Assistant Professor, Department of Surgery, University of Texas Medical Branch at Galveston, kmsheffi@utmb.edu

Research Objective: The use of intraoperative cholangiography (IOC) during cholecystectomy remains controversial, with wide variation in use...
across hospitals. Previous studies using administrative data report increased risk of common bile duct (CBD) injury in patients who do not undergo IOC, but these studies are potentially confounded by lack of clinical information regarding the indication for or ability to perform IOC. Our objective was to investigate the effectiveness of IOC using an instrumental variable (IV) analysis to adjust for suspected unmeasured confounding.

**Study Design:** We used 100% Medicare claims for Texas beneficiaries (2001-2008). Patients with claims for bile duct repair operations within one year of cholecystectomy were considered to have had CBD injury. IOC use was determined at the level of the patient (yes/no) and hospital (% IOC use for all cholecystectomies at hospital). Hospital % IOC use was selected as the IV because IOC use is strongly influenced by facility preference (0.98% across hospitals), even after adjusting for case mix differences. We compared results from multilevel logistic regression models (patients clustered within hospitals), as done in prior studies, to IV analysis results. Sensitivity analyses were performed using an additional IV (surgeon % IOC use) and a secondary outcome associated with IOC but not expected to be subject to unmeasured confounding (use of procedures to remove CBD stones).

**Population Studied:** Medicare beneficiaries age = 66 who underwent inpatient or outpatient cholecystectomy for biliary colic, acute cholecystitis, or chronic cholecystitis (N = 83,455).

**Principal Findings:** 252 patients (0.30%) had CBD injury. Patients with CBD injury were older, more likely to be male, to have ≥3 comorbid conditions, and to have been operated on by lower volume surgeons. In a logistic regression model adjusting for patient, surgeon, and hospital characteristics, the odds of injury were 82% higher for cholecystectomies performed without IOC compared to those performed with IOC (OR = 1.82, 95% CI= 1.37-2.44). In the IV analysis, the odds of injury were 24% higher for cholecystectomies performed without IOC, and the association was no longer significant (OR = 1.24, 95% CI= 0.79-1.95; P = 0.34). Similar results were obtained when including surgeon % IOC use as the IV, either alone or in combination with hospital % IOC use. As expected, procedures to remove CBD stones were significantly associated with IOC (OR = 1.47, 95% CI= 1.38-1.56), and the IV analysis did not attenuate the association.

**Conclusions:** Using hospital % IOC use as an IV attenuated the estimated effect of IOC on CBD injury. Clinical situations that prompt (suspected CBD injury) or prevent IOC use (severe inflammation/obscured anatomy) may also contribute to increased rates of injury, and cannot be captured in Medicare data. The previously observed association between IOC and CBD injury may be the result of unmeasured confounding in studies using administrative data.

**Implications for Policy, Delivery, or Practice:**
The results of this study demonstrate the limitations of using observational data to investigate the role of IOC in prevention of CBD injury. Consequently, more research is necessary, and policymakers should proceed with caution regarding the implementation of regional or national quality initiatives requiring routine IOC use.

**Funding Source(s):** No Funding

**Poster Session and Number:** B, #839

**Estimating Mental Health Utilization using the Medical Expenditure Panel Survey**
Eric Slade, University of Maryland

**Presenter:** Eric Slade, Ph.D., Associate Professor, Psychiatry/Division of Services Research, University of Maryland, eslade@psych.umd.edu

**Research Objective:** The Medical Expenditure Panel Survey (MEPS) is a critical data resource for assessing U.S. health care use and expenditures and for evaluating the impacts of health policy changes. However, a potential limitation of using MEPS for some types of policy analyses is that it may under-represent health care use and expenditures for persons with serious mental illnesses, alcohol and illicit substance abuse, hepatitis, and certain other chronic conditions. As MEPS is a household-based survey conducted in-person or by phone, persons who have unstable housing and persons who are difficult to contact for interviews may be under-sampled. In addition, MEPS respondents may underreport service events linked with stigmatized conditions and illegal activities. This study examines the magnitudes of these biases in MEPS by comparing MEPS-based estimates of inpatient hospital utilization to parallel estimates obtained from the Health Care Utilization Project (HCUP) State Inpatient Databases (SID).
Study Design: Data on inpatient stays during calendar years 2005 to 2010 were obtained from the MEPS and from SID files. The SID contains population-level data derived from hospital discharge record abstracts for essentially all hospitalizations in all general hospitals excluding Department of Veterans Affairs hospitals, residential treatment facilities, state psychiatric hospitals, and certain other specialty care hospitals. We obtained SID data for all twelve SID states that provide an individual-level identification number. An identification number was necessary in order to calculate inpatient utilization distributions for a calendar year at the individual level, and only these states provide such a number. Inpatient stays in both datasets were then sorted into major condition categories defined by Clinical Classification Software (CCS) code. CCS is a diagnosis categorization scheme that collapses ICD-9 diagnosis codes into 288 major condition categories. We then constructed, for each of 35 selected conditions, annual measures of number of inpatient stays and number of inpatient days. MEPS-based weighted population estimates for these categories were compared to population-level estimates from the SID.

Population Studied:

Principal Findings: Estimates of total numbers of hospitalizations based on the MEPS underestimate national estimates based on the SID for many conditions, and the magnitude of bias varied by condition. Underestimation bias is greatest for substance-related disorders (83% fewer hospitalizations), HIV infection (76% fewer hospitalizations), alcohol-related disorders (75% fewer hospitalizations), schizophrenia and other psychotic disorders (73% fewer hospitalizations), adjustment disorders (59% fewer hospitalizations), phlebitis (48% fewer hospitalizations), and mood disorders (38% fewer hospitalizations). Although MEPS underestimates hospitalizations for most mental health conditions, hospitalizations for some mental health conditions—anxiety, suicide attempts, ADHD and other conduct-related disorders, developmental disorders, and disorders usually diagnosed during childhood—are not underestimated relative to the SID. We are currently developing bias estimates for other measures of inpatient utilization. Weights that can improve the accuracy of MEPS estimates will be developed in the next project phase.

Conclusions: Inpatient stays for many mental health conditions, alcohol and substance use disorders, and several physical illnesses are substantially underestimated in MEPS data.

Implications for Policy, Delivery, or Practice: MEPS data users should exercise caution when interpreting estimates of total utilization or expenditures for mental health or substance abuse treatment services.

Funding Source(s): NIH

Poster Session and Number: B, #840

Incident User Cohorts for Assessing Medication Cost-Offsets
Bruce Stuart, University of Maryland Baltimore; Ellen Loh, University of Maryland Baltimore; Pamela Roberto, PhRMA; Laura Miller, NACDS

Presenter: Bruce Stuart, Ph.D., Professor, PHSR, University of Maryland Baltimore, bstuart@rx.umd.edu

Research Objective: The advent of large, population-based computerized claims and medical records databases has led to an explosion of observational studies of medication effects in real-world settings. Yet, despite significant efforts to codify “good research practices” in observational designs, policymakers and many researchers remain skeptical about the validity and reliability of even the most carefully developed observational studies. One relatively recent advancement may help change that attitude. Known as incident-user or new initiator designs, the basic idea is to mimic clinical trials by measuring a drug’s impact on patient outcomes from first use onward and comparing the results to a sample of nonusers (or users of an alternative therapy) who share the same indication. The objective of this paper is to develop and apply an incident drug user design to assess potential cost savings from evidence-based medication use among diabetics enrolled in Medicare Part D plans.

Study Design: The paper takes readers through a six-step process designed to assess the impact of statin initiation on subsequent Medicare spending: (1) unadjusted pre/post initiation test, (2) unadjusted difference-in-difference (DID) test with a comparison series of nonusers, (3) adjusted DID test controlling for drug indication and potential confounders, (4) propensity score (PS) matched DID test with static and dynamic baseline covariates, (5) PS matched DID test by drug adherence strata, and (6) PS matched DID test for high adherers controlling for healthy adherer bias. We then
conducted a replication test that used identical procedures to assess the impact of initiation of ACE-inhibitors/ARBs in the same group of diabetics.

**Population Studied:** Subjects were identified from a random 5% sample of Medicare beneficiaries with prevalent diabetes and no statin use between January—June 2006 and statin initiation between July 2006—January 2008. Comparators were nonusers of statins with a random “potential initiation” month. Monthly Medicare spending was tracked up to 24 months pre-initiation and up to 30 months post-initiation. Static controls included baseline demographics, comorbidities, and diagnosis of hyperlipidemia. Pre-initiation monthly Medicare spending patterns provided dynamic controls.

**Principal Findings:** Statin initiation was followed by higher mean monthly Medicare spending through step (4). Cost-offsets were detected in step 5 for high adherers (proportion of days covered 0.80 or better). Findings were insensitive to healthy adherer bias (step 6). The replication test produced similar results. Post-initiation monthly Medicare spending was 10%-12% lower than pre-initiation spending for high adhering initiators with statins and ACEIs/ARBs and the savings exceeded the cost of the drugs. Savings were not observed for beneficiaries with poor adherence.

**Conclusions:** Medicare Part D enrollees with diabetes who are highly adherent with evidence-based medications used in diabetes treatment save the program more in reduced spending on Part A and Part B services than the cost of the drugs.

**Implications for Policy, Delivery, or Practice:** Drug initiator designs are more robust to confounding than prevalent user designs in assessing cost-offsets from drug use in observational studies. The paper discusses strengths and limitations of the design elements in other applications including comparative effectiveness research and studies of drug discontinuation.

**Funding Source(s):** Other, NACDS/PhRMA

**Poster Session and Number:** B, #841

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**A Comprehensive Evaluation of Factors Associated with Breast Cancer Survival in Florida Using Competing Risk Model**

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**Presenter:** Fei Tan, Assistant Professor, Mathematical Sciences, Indiana University-Purdue University Indianapolis, ftan@math.iupui.edu

**Research Objective:** This research was to determine significant predictors of breast cancer-specific-survival among female breast cancer patients while allowing competing risk for other causes of death.

**Study Design:** 4220 patients identified in Florida cancer registry database were linked with their electronic medical records from a hospital system. Competing risk survival model was used to assess effect of variables on breast cancer-survival while allowing possibility of death from other reasons.

**Population Studied:** Female breast cancer patients diagnosed in Florida between 2007 and 2010.

**Principal Findings:** Two year cumulative breast cancer death was 4.83 percent, while that for death due to other causes was 2.89 percent. Median follow up for patients died from breast cancer was 569 days, while that for those who died due to other reasons was 642 days. Accounting for possibility of death from other reasons, bivariate breast cancer mortality comparison indicated that cumulative incidence among Blacks was the highest, p less than 0.001. Allowing possibility of death due to breast cancer, there was no racial difference in death due to other causes, p=0.780. Multivariate competing risk model showed that increased chance of breast cancer death was associated with triple negative status, this effect increased over time. Other factors included unknown biomarker receptor status, black race, being unmarried, Medicare reliance, having poorly- or un-differentiated tumor grade, regional diagnosis stage, larger tumor size, and more positive nodes detected. Negative effects of more comorbidity, distant diagnosis stage and positive effect of more nodes examined attenuated over time. In multivariate model, higher probability for death from other causes was associated with having more comorbidity, being diagnosed at an older age, being Medicaid recipients or Medicare beneficiaries, having moderately-differentiated

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tumor grade, and larger tumor size. Having poorly- or un-differentiated tumor grade was also associated with death due to other causes, but this effect gradually decreased over time. Having chemotherapy, being married, and having more lymph nodes examined were associated with reduced risk of death due to other causes.

**Conclusions:** Being married and having more nodes examined were associated with reduced risk of death due to both breast cancer and other reasons. Medicare beneficiaries had higher risk of dying from breast cancer and other causes. The temporal increase of detrimental triple negative effect on breast cancer survival appeared in competing risk model but was not observed in Cox model. Although not as widely known as the Cox survival model, competing risk model may be a better tool in examining factors associated with cancer survival among complex patients.

**Implications for Policy, Delivery, or Practice:** Caring for breast cancer patients should not only focus on the management of breast cancer but also take into consideration of other factors that are associated with the survival as revealed in this study. The finding that being married and having more nodes examined are associated with reduced risk of death may suggest the importance of familial support and access to care for breast cancer patients.

**Funding Source(s):** AHRQ

**Poster Session and Number:** B, #842

**Scaling Up Qualitative Methods for Translational Research**

Susan Tavernier, University of Utah; Susan L. Beck, University of Utah College of Nursing; Jaqueline Eaton, University of Utah College of Nursing; Jia-Wen Guo, University of Utah College of Nursing; Jeannine Brant, Billings Clinic Cancer Center; Patricia Berry, University of Utah College of Nursing

**Presenter:** Susan Tavernier, PhD, APRN-CNS, AOCN, Post-doctoral Research Fellow, College of Nursing, University of Utah, susan.tavernier@nurs.utah.edu

**Research Objective:** The goal of this mixed-method study was to implement and evaluate an innovative translational research program to measure and improve pain care processes and outcomes in a sample of hospitals across the United States. The project included dissemination, implementation and evaluation activities. There were two main phases to the project. In Phase 1 we disseminated a set of Pain Quality Indicators to hospitals that were part of the National Database for Nursing Quality Indicators. In Phase 2, we evaluated three levels of quality improvement strategies targeted at improving pain care quality and outcomes. This paper addresses the second phase of the study, evaluating the barriers and facilitators to measuring and improving pain management at the nursing unit level. We specifically address the methodological approaches used to effectively scale-up qualitative methods in a large, rapid cycle translational study.

**Study Design:** We tested the efficacy of three levels of implementation aimed to promote adoption of key elements of established clinical practice guidelines for pain management. A qualitative approach involving baseline and post-implementation interviews with the nurse leading the effort from each participating unit addressed the following:

1. What factors facilitate participation in improving pain management practices?
2. What barriers do units face in improving pain management practices?
3. What strategies were implemented and effective in addressing these barriers?

Systematic training was provided to project staff who conducted telephone interviews using open-ended, semi-structured interview guides. The interviews were audio recorded, transcribed, coded and analyzed for themes using ATLAS.ti qualitative data management software. Data collection and analysis was conducted by 17 people residing in six states.

**Population Studied:** There were 206 six units from 135 hospitals eligible for the implementation study; 148 consented to participate and were randomized into one of the three levels of implementation. Nurse team leaders from 125 nursing care units were interviewed at baseline and 124 were interviewed post-implementation for a participation rate of 83.7%. Reasons for non-participation in interviews included unit closure, inability to contact or schedule an interview and staff turnover.

**Principal Findings:** A systematic and iterative process to data analysis was employed. The complexities of conducting 249 interviews and the subsequent processes of transcription and analysis while maintaining methodological rigor was challenging, requiring creativity, flexibility and responsiveness to issues surrounding multiple technologies, data security, scheduling,
coding reliability and standardization. Project completion was resource-intensive. The team met weekly and included three study investigators, one post-doctoral fellow, nine doctoral students, one graduate student, one research staff member and four undergraduate students.

**Conclusions:** The scalability and speed inherent in translational research requires new methods and skills. Conducting a large qualitative study is complex yet possible. Frequent and open communication among team members, centralized study organization and clear, concise procedural standardization were critical elements to the successful completion of the qualitative component of this study.

**Implications for Policy, Delivery, or Practice:** Using qualitative methods in translational research involving a large sample size is a complex process, requiring adequate human and technological resources, training and systematic approaches.

**Funding Source(s):** RWJF

**Poster Session and Number:** B, #843

**Chemotherapy Treatment Route Following Incident Surgery for Breast Cancer and Patterns of Cancer-Related Severe Events**

Elizabeth Wasilevich, Blue Cross Blue Shield of Michigan; Charles Given, Michigan State University

**Research Objective:** This study examined variations in administration of chemotherapy among women with incident breast cancer surgery to determine the association between route (oral versus infused) and inpatient and emergency department admissions related to cancer and cancer-sensitive conditions.

**Study Design:** We conducted a retrospective, cross-sectional analysis using administrative claims. Women with incident breast cancer surgery were identified based on the following criteria: [1] breast cancer surgical procedure performed with a primary diagnosis of breast cancer (ICD-9-CM: 174.XX or 233.0X) and [2] a negative 6-month history of breast cancer surgery. We identified chemotherapy treatments after surgery using medical and pharmacy claims and a selected list of HCPC codes and national drug codes for chemotherapy medications. The duration of chemotherapy treatment was determined using the first date of treatment and the last date of treatment, defined by the last date of service before January 2012 where there was a 6-month period post treatment date free from chemotherapy treatment. Chemotherapy characteristics were measured across the treatment period: [1] oral versus infused chemotherapy use at first treatment and throughout the treatment period, [2] number of unique medications, [3] duration of treatment, and [4] use of specialty pharmacy treatments. Outcomes also determined during the treatment period included total cost of care and the frequency of inpatient and emergency department visits with a primary or secondary diagnosis of cancer or cancer-sensitive severe events, such as thrombocytopenia, infection, and pain. We analyzed bivariable relationships between treatment characteristics and the outcomes using chi-square test or t-test testing for statistical significance; multivariable logistic regression was conducted to assess these relationships, controlling for confounders such as evidence of metastatic cancer and comorbidities.

**Population Studied:** We studied women with an index breast cancer surgery during January 2009 through June 2011 who had chemotherapy treatment period post surgery. Analysis was restricted to women 18-64 years as of 6 months after the last chemotherapy treatment date and were continuously enrolled in commercial Blue Cross Blue Shield of Michigan from 6 months before index breast cancer surgery through 6 months after last treatment date.

**Principal Findings:** There were 1,289 women in our study population. Among them, 36.4% received an oral chemotherapy medication after surgery. The average treatment length for oral chemotherapy users was significantly different than non-oral chemotherapy users, 269 days versus 151 days, respectively (p<0.01). Chemotherapy treatment route (oral versus infused) was not significantly associated with having one or more severe events related to cancer or cancer-sensitive conditions (p=0.36).

**Conclusions:** Our results suggest that chemotherapy treatment mode is related to treatment duration, yet not related to cancer and cancer-sensitive severe events among women with incident breast cancer surgery. Further research is needed to evaluate treatment characteristics that may be useful in risk stratification and to target oncologist-driven, member-facing case management programs.
Implications for Policy, Delivery, or Practice: Results of these analyses will be used as the basis for information sharing with the provider community, developing provider incentive initiatives, and targeting case management outreach. Specifically, these results will inform the development and implementation of a provider delivered case management program for oncology.

Funding Source(s): No Funding

An Interrupted Time Series Study to Evaluate the Impact of Adding Level II & III Trauma Centers on Volume and Severity of Disease at a Nearby Level I Facility

Brendan G. Carr, MD, MS, University of Pennsylvania; Douglas Wiebe, University of Pennsylvania; Juliet Geiger, RN, MSN, Pennsylvania Trauma Systems Foundation; Nathan McWilliams, MPA, RHIA, Pennsylvania Trauma Systems Foundation; Patrick M. Reilly, MD, University of Pennsylvania

Presenter: Douglas Wiebe, Ph.D., Associate Professor, Department of Biostatistics and Epidemiology, University of Pennsylvania, dwiebe@exchange.upenn.edu

Research Objective: Although the interrupted time series study is a powerful and versatile design, it is used infrequently in health services research. Yet in situations when an outcome has been measured repeatedly over time and the outcome may have been affected by an exposure, it may be the design that is best suited for testing whether an effect did occur. We applied an interrupted time series design to better understand the trauma system in Pennsylvania. As trauma system planners, we seek to optimize trauma care by providing rapid access to trauma centers (TCs) while ensuring that TC providers maintain proficiency by caring for an adequate volume of critically injured patients. This study examined whether the accreditation of new level II and III trauma centers resulted in a change in the trauma patient census and severity at a nearby level I trauma center.

Study Design: An interrupted time series study was conducted by fitting an autoregressive integrated moving average (ARIMA) model to a monthly time series of trauma patients.

Population Studied: Monthly counts of Pennsylvania Trauma Outcomes Study (PTOS)-qualifying patients treated at 5 nearby TCs in Pennsylvania over 10 years were obtained from the PA Trauma Systems Foundation. The level I trauma center (TC-A) was active for the entire period. A level II trauma center 39 miles away was accredited after 70 months (TC-B), one level III trauma center 46 miles away was accredited after 95 months but lost accreditation after 11 months (TC-C), and two other level III trauma centers 40 miles and 45 miles away were accredited after 107 months (TC-D, TC-E). Interrupted ARIMA modeling was used to test whether reductions occurred in volume at the level I TC.

Principal Findings: Monthly patient counts at the level I TC increased over the study period and summed to 25,029 patients total. The time series for the level I TC was fit with an ARIMA (0,1,1)(0,1,1,12) model. The number of patients treated monthly at the level I TC decreased 10.8% (p<0.05) when TC-B was accredited and increased an additional 12.9% (p<0.05) when TC-D and TC-E were accredited simultaneously. No change stemmed from the temporary accreditation of TC-C. As a result of the accreditations, the level I TC treated 1,903 fewer patients than expected over a 51-month period, an 11.9% reduction in volume. The percent of patients at the level I TC with ISS>15 was statistically but not clinically significantly higher during the last 13 months after TC-D and TC-E were accredited compared to the 69 months before the first new accreditation occurred (30.1% vs 28.4%, p<0.05).

Conclusions: Accrediting level II and level III TCs reduced patient volume and increased severity but not meaningfully at a level I TC nearby.

Implications for Policy, Delivery, or Practice: Strategic planning of statewide trauma systems can help balance rapid access to care with maintenance of adequate annual patient volumes of critically injured patients. Interrupted time series designs can inform decisions for this and other health services planning.

Funding Source(s): AHRQ

Sensitivity of Medicare Claims to Identify Cancer Recurrence

K. Robin Yabroff, National Cancer Institute; Angela Mariotto, National Cancer Institute; Danielle Melbert, Information Management Services; Deborah Schrag, Dana Farber Cancer Institute; Paul Doria-Rose, National Cancer Institute; David Penson, Vanderbilt University
Medical Center; Joan Warne, Ph.D., National Cancer Institute

**Presenter:** K. Robin Yabroff, Ph.D., M.B.A., Epidemiologist, Health Services and Economics Branch, National Cancer Institute, Robin_yabroff@nih.gov

**Research Objective:** Cancer registries do not collect recurrence data. As a result, researchers have used administrative data to impute recurrence for cancer patients based on claims with dates for initiation of cancer therapy or diagnoses of metastatic disease after initial treatment. The validity of this approach has not been established.

**Study Design:** We used cancer registry data linked to Medicare claims (SEER-Medicare data) to assess the sensitivity of claims to identify recurrence of colorectal (CRC) and female breast cancers. Although the SEER-Medicare data do not explicitly capture recurrence, we developed criteria to identify patients highly likely to have had a recurrence. This was defined as patients diagnosed with Stage II/III colorectal cancer or female breast cancer from 1994-2003 with initial cancer surgery, who had a treatment free interval of at least 90 days, and then died from cancer in 1994-2008. We reviewed claims from the end of the treatment free interval to cancer death to identify treatment or diagnoses indicating recurrence, both first indicators or ever in the claims. There were three mutually exclusive types of recurrence indicators: additional cancer therapy, (defined as cancer procedures/surgery, chemotherapy, or RT); diagnosis codes for metastasis, and hospice/supportive care. We used multivariate logistic regression analyses to evaluate whether patient characteristics were associated with receipt of any additional cancer therapy after the treatment-free interval and prior to cancer death.

**Population Studied:** Patients aged 65 and older diagnosed with Stage II/III colorectal cancer (n=6,910) or female breast cancer (n=3,826).

**Principal Findings:** The first indicator of recurrence for CRC and breast cancer patients was additional therapy (38.8 percent and 35.2 percent), metastasis diagnosis codes (36.0 percent and 45.7 percent), or hospice/supportive care (16.7 percent and 12.8 percent). About 8 percent of patients had no indicator of recurrence prior to cancer death. Forty percent of patients had no additional cancer therapy before death. Patients who were ages 70 and older were less likely to have additional cancer therapy (p < 0.05), in adjusted analyses.

**Conclusions:** Identifying recurrent cancer based on Medicare claims for additional cancer therapy will miss about 40 percent of patients with recurrences; particularly those who are older. Recurrences first identified late in the disease course, e.g., hospice/supportive care, offer little information as to when the recurrence truly occurred. Patients identified by hospice/supportive care or with no indicator of recurrence accounted for 19.1 percent of breast cancer patients and 25.2 percent of CRC patients. We conclude that Medicare data have limited potential to identify cancer recurrence.

**Implications for Policy, Delivery, or Practice:** Researchers should consider the limitations of using Medicare claims to identify cancer recurrence. Study using this approach should be viewed with great caution. These findings may not apply to younger cancer patients, who are more likely to undergo additional cancer treatment for a recurrence.

**Funding Source(s):** No Funding

**Poster Session and Number:** B, #846
**ORGANIZATIONAL BEHAVIOR AND MANAGEMENT**

**Gender Issues in Physician Group Practice Leadership**
Douglas Anderson, George Mason University

**Presenter:** Douglas Anderson, Student, Ph.D. Program in Public Policy, George Mason University, dandersy@masonlive.gmu.edu

**Research Objective:** Women comprise the majority of medical students currently being trained in the United States, and the percentage of female physicians has been steadily increasing over the past decade. While the workforce continues to mirror gender shifts in the larger society, female physicians are statistically less likely to hold positions of leadership in physician organizations. This analysis aims to determine the factors that are predictive of physician leadership. It examines whether gender differences arise primarily within the organizational context or are reflective of larger societal constraints.

**Study Design:** Utilizing physician practice ownership as a proxy for organizational leadership, a logistic model is developed that predicts factors determinant of physician group practice ownership. Model differences controlling for gender examines the strength of predictive characteristics for group practice leadership.

**Population Studied:** The population is a subset of the 2008 nationally representative physician survey data, "Health Tracking Physician Survey" (n = 1,844) that includes physicians practicing in medical groups of 3 or more physicians.

**Principal Findings:** In the survey sample, male physicians were significantly more likely to have full or partial ownership status in their medical group practice (68% vs. 45%). A logistic regression model was developed to correlate factors of ownership (Pseudo R2 = .2257). Factors include organizational characteristics (size, resources, complexity of services, compensation systems, managed care contracts), physician characteristics (age, years in practice, specialty, work volumes, satisfaction) and patient characteristics (insurance coverage, care coordination protocols). Chow analysis of gender-specific logistic regression models of ownership did not refute the null hypothesis of significant differences of these predictive models.

**Conclusions:** While ownership, and by organizational construct, leadership, of physician group practices does vary by gender, it appears that the significant explanatory factors are exogenous to the organizational environment as represented within this data set. Gender differences in physician practice leadership do not appear to be explained within the context of the attributes of group practice organizations.

**Implications for Policy, Delivery, or Practice:** These findings suggest that social constraints continue to determine leadership roles for women in medical organizations. Specific training for organizational awareness and understanding, as well as leadership development curriculum should be considered as components of graduate medical education programs.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #1203

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**Implementing a Tracking and Feedback Innovation to Improve Coordination of Adjuvant Therapies in Breast Cancer**
Nina Bickell, Mount Sinai School of Medicine; Rebeca Franco, Mount Sinai School of Medicine; Allie Moss, The Ohio State University; Zoe Lawrence, Mount Sinai School of Medicine; Ann Scheck McAlearney, The Ohio State University College of Medicine, Department of Family Medicine

**Presenter:** Nina Bickell, M.D., M.P.H., Professor Of Health Evidence & Policy And Medicine, Department of Health Policy, Mount Sinai School of Medicine, nina.bickell@mssm.edu

**Research Objective:** Adjuvant breast cancer treatments are delivered by different specialists. Underuse may be worsened by fragmented care and improved by coordinating across outpatient specialties. An innovative Tracking & Feedback tool eliminated racial disparities in and reduced underuse of needed adjuvant breast cancer treatments but uptake of the tool was poor. As a first step toward improving coordination and delivery of needed adjuvant therapies, we assessed the challenges to and feasibility of implementing a web-based Tracking and Feedback (T&F) innovation in hospitals that serve large proportions of minority women with breast cancer.

**Study Design:** Semi-structured interviews with key informants were audiotaped and transcribed. We used the constant comparative method of qualitative data analysis and standard
techniques to code the key informant interview data.

**Population Studied:** We interviewed 49 key informants (n=29 clinical; n=20 administrative) from 6 inner-city hospitals with high volumes of minority breast cancer patients to better understand how organizational characteristics might impact coordination of care, implementation and success of the T & F innovation.

Interviewees included breast cancer physician, nursing, clinical & administrative leadership, surgical, medical and radiation oncologists, schedulers and patient navigators.

**Principal Findings:** We found considerable variability across hospitals with respect to their reported abilities and approaches to coordinate tracking and delivery of adjuvant therapies for women with breast cancer. All sites have multi-disciplinary Tumor Board meetings and active Quality Improvement departments focused on improving transitions in care. Yet, in several sites, specialty care remains siloed and communications systems across specialties are poor. Many have patient navigators but their functions differ across sites. All hospitals have electronic medical records (EMRs) but not all EMRs can “talk” to scheduling software to track requested referrals. Many physicians rely on follow-up appointments to ascertain adjuvant treatment receipt but sites vary in their ability to address “no-shows.” Several sites rely on staff to manually identify and follow up with “no-shows,” but many of these staff are overwhelmed with ever increasing tasks and responsibilities. Lack of resources, compounded by patient populations who often differ from their providers in language and cultural beliefs, coupled with frequent incorrect contact information make it difficult to follow through with no-shows. While quality and change were important to all, several interviewees felt they were bucking an inflexible system and devised ways to work around the obstacles. Perceived successful coordination factors included strong clinical leadership, designated accountabilities, and flexibility for both clinicians and administrators to work within and around inflexible organizational systems of care. Few sites implemented a functional multidisciplinary approach creating a seamless system of breast cancer care.

**Conclusions:** Barriers to coordinating cancer care include poor communication systems, limitations of EMRs and competing priorities.

Facilitators include leadership, accountability and flexibility.

**Implications for Policy, Delivery, or Practice:** As care integration across sites and specialties are encouraged by federal law and regulation, specialty care silos and rigid communication systems still pose barriers to change. Our results suggest that implementing a web-based T&F innovation must be responsive and tailored to individual hospital characteristics, and flexible enough to permit modification of care processes at the organization level.

**Funding Source(s):** NIH

**Poster Session and Number:** C, #1204

**Physician Leadership and Teamwork in Primary Care Groups**

**Donna Bright, Health Leads**

**Presenter:** Donna Bright, Ph.D., National Director Of Program Development, Research & Development, Health Leads, dmbright589@gmail.com

**Research Objective:** Research Objectives: 1) To test the validity of a 3-dimensional ‘care team’ construct (empowerment, relational coordination and patient-centered quality improvement effort) in primary care groups, exploring the extent to which primary care group staff exhibit these characteristics; and 2) To explore physician leadership behaviors/styles and their relation to care teams in the organization.

**Study Design:** Study Design: Quantitative survey data were collected from a state-wide sample (MA) of primary care physician group staff to assess the physician leader’s behaviors and outcomes using the Multifactor Leadership Questionnaire, and staff’s perceptions of care team characteristics within the group. Cronbach alpha's and exploratory factor analysis were used to test the reliability of the care team and leadership scales and construct. Regression analysis were performed to explore the relationship between leadership factors and care team dimensions and were matched with secondary measures of organization structure as controls. ANOVA results suggest that organization effect is not a factor of influence.

**Population Studied:** Population Studied: A stratified random sample of primary care physician groups in Massachusetts, with two or more physicians (n=72). Organization-level sample (n=126) includes 1) the primary care
physician group leader, 2) a nurse manager, 3) an office manager and 4) a secretary.

Principal Findings: Principal Finding:
Physician leaders exhibit transformational leadership behaviors (TLB) less than half the time (48%), Transactional behaviors over a third of the time (39%) and Passive leadership behaviors 13% of the time. Exploratory factor analysis reveals support for the proposed 3-dimensions (psychological empowerment, relational coordination, quality improvement effort) being characterized as a single construct – care team. TLB was found to be a significant predictor of care teams, and care teams were also found to positively predict physician leaders' transformational behaviors and leader outcomes (staff satisfaction with the leader, staff extra effort, and leader effectiveness), where TLB mediates the relationship between CTE and leader outcomes. This suggests a reinforcing, perhaps mutually empowering dynamic between physician leaders who exhibit TLB and staff who engage with each other in care team work – where all parties, including the physician leader, learn/change/grow.

Conclusions: Transformational leadership is the only leadership style that predicts care teams; thus, efforts to increase Transformational leadership behaviors may produce more effective care teams. That care team effectiveness also predicts leader outcomes and TLB mediates the relationship are very important findings, challenging the notion of a cascading effect of Transformational leadership and suggest a mutually empowering effect, where all parties grow to new levels of performance in organizations. These are compelling reasons for primary care organizations to adopt strategies to increase Transformational leadership skills in physician leaders.

Implications for Policy, Delivery, or Practice: Implications: Pilot study findings can inform health care organization policies regarding 1) leadership recruitment, training and monitoring and 2) care team characteristics, protocols and supports, and 3) adoption of QI strategies to facilitate better coordination and flexibility to meet individual client needs. Findings could also inform health policies regarding 1) the development of payment structures that reward providers for shared decision making and patient-centered care and 2) medical school curricular requirements. Lastly, methodological contributions include a leadership framework and a 'care team' construct for future hypotheses testing.

Funding Source(s): AHRQ
Poster Session and Number: C, #1205

A Virtual Learning Collaborative to Facilitate Organizational Change at the Veterans Health Administration: Views from Frontline Primary Care Staff
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Research Objective: As part of the Department of Veterans Affairs' Patient Centered Medical Home (PCMH) initiative, a Virtual Learning Collaborative (VLC) was launched in January 2012. The VLC targeted primary care staff across one Veterans Integrated Service Network (VISN) consisting of 56 primary care clinics serving over 300,000 patients. Participants attended semimonthly virtual learning sessions and completed between-session action steps. We conducted an anonymous Survey of Learner Experiences as part of a multi-method formative evaluation of the VLC. Research objectives were to (1) assess the effectiveness of the VLC from the perspective of participants; (2) identify opportunities to enhance the impact of the VLC; and (3) extract lessons learned to inform future organizational learning efforts in VA and non-VA settings alike.

Study Design: The Survey of Learner Experiences was an anonymous online survey designed to elicit individual learners' perspectives regarding the VLC, including its acceptability and effectiveness as an organizational learning strategy and means of facilitating practice change. Survey aims and items were developed in consultation with VLC organizers and pilot-tested with frontline primary care staff. The survey comprised 38 items, including 4 open-ended write-in questions. It was fielded twice during the first 9 months of the VLC, once at mid-point and again at 9 months. Responses to scaled items were dichotomized and compared using Chi square tests; write-in responses were reviewed and summarized.
using ATLAS.ti to identify positive feedback and suggestions for improvement, and to further illuminate quantitative findings.

**Population Studied:** All registered VLC participants were eligible to participate in the survey; however, the survey was chiefly aimed at core team members (primary care providers, nurses, and clerical support staff), reflecting the VLC’s primary target audience. Surveys were sent to a total of 819/820 participants in Rounds 1/2, respectively; the response rate for each Round was just over 40 percent.

**Principal Findings:** Participation in the VC benefited frontline staff by increasing knowledge about PCMH concepts and strategies, access to tools and resources, and peer-to-peer exchange of ideas. However, benefits were not equally distributed across types of facilities or staff roles. Potential benefits of the VC were hampered by persistent issues around time, staffing, and local leadership support that impede PCMH implementation more broadly. Several opportunities for improving impact of the VLC were identified.

**Conclusions:** Participant feedback confirmed that the VLC increased knowledge about PCMH. However, complete penetration to all sites and team members was not seen due to constraints in time, staffing, and leadership support. These issues must be acknowledged and addressed head on to secure the engagement – at all levels and across all roles – needed to fully implement the PCMH model.

**Implications for Policy, Delivery, or Practice:** Despite widespread use of learning collaboratives to facilitate an organizational improvement, evidence supporting their effectiveness is mixed, and little is known about the use of virtual modalities in this context. Our findings suggest that a virtual learning collaborative can be an effective strategy for organizational learning, provided that local conditions support full engagement by staff. Findings further highlight the value of seeking constructive criticism from those working at/near the frontlines of patient care.

**Funding Source(s):** VA

**Poster Session and Number:** C, #1206

**Provision of Community Benefit by Not-for-Profit Hospitals, 2009-2010**

Henry Carretta, Florida State University

**Presenter:** Henry Carretta, Ph.D., M.P.H., Assistant Professor, Family Medicine and Rural Health Division, Florida State University, henry.carretta@med.fsu.edu

**Research Objective:** A change in IRS requirements effective tax year 2009 requires not-for-profit hospitals (NFPHs) to provide standardized reporting of community benefits (CB). The change in IRS regulations occurs in an era of uncertainty created by health reform legislation and Medicare payment reform. Definitions and criteria for CB reporting are still in flux. Baseline values for CB provision are needed to guide policymakers & researchers during the transition. Establish baseline values for CB by hospital/community characteristics. Research Question: How does provision of CB vary among NFPHs by hospital, market, and community characteristics?

**Study Design:** Longitudinal and pooled cross-sectional analysis of CB reporting by general short-term hospitals using newly available IRS Form-990 Schedule H reports by not-for-profit hospital organizations. A paired analysis of hospitals with records in both time periods will also be conducted. Descriptive statistics and multivariable analysis will be conducted.

**Population Studied:** Hospital organizations with IRS Subsection 501(c)(3) status as a tax exempt organization with a Form 990 on file for tax years 2009 or 2010.

**Principal Findings:** Preliminary results for 1099 hospitals for tax year 2009; and 1478 hospitals for tax year 2010. Among 700 general short-term hospitals with a matched 2009 and 2010 Schedule H, the mean net community benefit expense reported increased approximately $1 million per hospital. Mean CB expense as a percentage of all hospitals expenses increased from 7.2% to 7.6%. Many F990 records are for complex organizations with multiple associated legal entities and enterprises including multiple hospitals. There are significant methodological challenges associated with attributing CB reporting to every not-for-profit hospital in the U.S. as an approach to benchmarking expectations commensurate with the tax benefit.

**Conclusions:** Community benefit reporting is still in an early stage of development. How to measure CB and what to count towards the economic value of community benefits is still in flux. Longitudinal tracking of reporting will be an important tool for assessing policy for the future. More detailed results for a larger pool of matched hospitals will become available as this study progresses.
Implications for Policy, Delivery, or Practice:
Hospitals are the target of various financial and regulatory incentives to take increased more responsibility for the health of the surrounding community. Community benefit measurement and how to benchmark provision commensurate with tax exemption status is a key issue particularly as the amount of charity care declines as with the number of uninsured
Funding Source(s): RWJF
Poster Session and Number: C, #1207

Validation of a Single-Item Burnout Measure in a Sample of VHA Primary Care Clinical Staff
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Research Objective: The Maslach Burnout Inventory (MBI) is a widely used measure. Rohland et al. have reported that a single item measured concepts similar to the emotional exhaustion subscale of the MBI (MBI-EE) which is often considered to be the most salient scale. Our aim was to compare the single item burnout measure to the MBI-EE from data collected from primary care staff in the Veterans Health Administration during national implementation of a patient-centered medical home transformation.
Study Design: We fielded a survey in 2012 (2 years into implementation) that focused on the medical home transformation activities and primary care employee experiences. The survey included a shortened 9-item version of the MBI (in an effort to reduce survey burden) and the single-item burnout measure. We tested the single item measure against the MBI using the available cut-off for high burnout based on the validated 16-item MBI, and dichotomized the single item. We also tested whether the single item loaded on the same latent factor as the MBI-EE.

Population Studied: VHA primary care providers and staff.

Principal Findings: The survey yielded 5,404 respondents (approximately 30% response rate). 40% of respondents reported symptoms of burnout as measured by the MBI-EE and 38.5% reported symptoms of burnout as measured by the single item ($r=.77$). The kappa value was 0.66, indicating substantial agreement. We calculated the sensitivity of the single item to burnout on the MBI-EE to be 77.8% and the specificity to be 87.7%. The positive predictive value was 0.81 and the negative predictive value was 0.86. We performed a principal factors analysis using an oblique rotation and found that the single item loaded onto the same factor as that of the items that contribute to the MBI-EE. The uniqueness of the single item was 32% indicating only modest variance not associated with the factor.

Conclusions: These results suggest that the single-item measure of burnout performs moderately well as a surrogate to the MBI-EE among VHA primary care staff.

Implications for Policy, Delivery, or Practice: Assessing employees’ experiences during any shift of policy that changes work roles poses challenges. Clinician survey response rates tend to be low, and increased burnout may contribute to non-response. Using a valid burnout measure with only a single-item would significantly reduce survey length and potentially improve response rates. Further, the single-item burnout measure, unlike the MBI, has no licensing cost.

Funding Source(s): VA
Poster Session and Number: C, #1208

Organizational and Market Factors Associated with Hospitals’ Utilizing Hospitalists: A Longitudinal Analysis 2007-2010
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Hospitals using hospitalists are less likely to be government hospital (O.R. = 0.04, p = 0.001). Hospitals not using hospitalists are less likely to be teaching (O.R. = 0.22, p = 0.031), for-profit (O.R. = 0.25, p = 0.005), or government hospital (O.R. = 0.04, p = 0.001). Hospitals using hospitalists are less likely to be located in rural areas (O.R. = 0.02, p = 0.001) and are less likely to have a higher proportion of Medicaid patients (O.R. = 0.03, p = 0.001). Hospitals using hospitalists are more likely to be located in the Northeast (O.R. = 27.34, p = 0.001), South (O.R. = 15.65, p = 0.001), and West (O.R. = 41.34, p = 0.001) compared to the Midwest.

Conclusions: Results suggest that hospitals using hospitalists have more slack resources (larger hospitals with higher occupancy rate and lower Medicaid) and tend to be located in more urban areas. This suggests that hospitals may be using hospitalists as a differentiation strategy for competitive advantage.

Implications for Policy, Delivery, or Practice: Policymakers and managers attempting to encourage the use of hospitalists should consider the organizational and market factors that may be associated with its use. Further longitudinal studies are needed to examine whether the use of hospitalists is associated with better quality of care and financial performance.

Funding Source(s): No Funding

Research Objective: Among private not-for-profit hospitals, a sub-group of hospitals appears to be unique: faith-based hospitals. Little is known about this group of hospitals despite their history of providing holistic care to vulnerable populations and reaching out to their community. Using Institutional Theory, our study explores the organizational and market factors associated with faith-based hospitals in comparison to other private not-for-profit hospitals.

Study Design: This longitudinal study (2000-2010) of all U.S. medical/surgical acute care private not-for-profit hospitals used data from the American Hospital Association (AHA) Annual Survey and the Area Resource File (ARF). Our dependent variable is ownership status (1 if...
processes, and adaptive reserve) and included a single item to measure respondents’ professional satisfaction. After cognitive testing, the survey was administered in June-August 2011 to the full census of 781 clinicians and staff in 30 California CCHCs. After reserving a confirmation sample of 200 randomly selected survey responses, we performed exploratory factor analyses, treating survey responses as categorical and using a Geomin rotation. We

Principal Findings: Results show that compared to other not-for-profit hospitals, faith-based hospitals were more likely to provide care to a higher proportion of Medicare (O.R = 4.36, p = 0.001) and Medicaid (O.R = 3.37, p = 0.006) patients, but less likely to have an emergency department (O.R = 0.51, p = 0.003). On the other hand, faith-based hospitals were more likely to have diversity orientation (O.R = 2.54, p = 0.001) and provide chaplaincy/pastoral services (O.R = 2.85, p = 0.001), more likely to be located in markets with a higher supply of physicians (OR =1.14, p = 0.021), and less likely to be located in rural areas (OR = 0.28, p = 0.002) compared to other not-for-profit hospitals.

Conclusions: Results provide partial support for our institutional theory expectations that faith-based hospitals are more likely to provide care to vulnerable populations and provide more holistic care when compared to other not-for-profit hospitals. However, contrary to our expectations, faith-based hospitals were more likely to locate in more munificent markets.

Implications for Policy, Delivery, or Practice: Faith-based hospitals are an important component of our health care delivery system as they provide improved access to Medicare and Medicaid patients, and provide more holistic care compared to other not-for-profit hospitals. Furthermore, their greater diversity orientation may have implications for reducing health disparities in care. Further research is needed to examine the barriers to faith-based hospitals locating in underserved communities.

Funding Source(s): No Funding

Poster Session and Number: C, #1210

Relationships between Workplace Culture and Clinician and Staff Professional Satisfaction in California Health Centers

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Presenter: Mark Friedberg, M.D., M.P.P., Natural Scientist, RAND, mfriedbe@rand.org

Research Objective: Community clinics and health centers (CCHCs) serve disproportionately shares of sociodemographically disadvantaged patients and play key roles in medical home demonstrations and other national efforts to improve the quality of care for vulnerable populations. However, the effectiveness of these quality improvement efforts may depend on CCHCs’ workplace cultures and levels of professional satisfaction at baseline. Our objective was to identify distinguishable dimensions of workplace culture in CCHCs and characterize their relationships to professional satisfaction.

Study Design: Using a combination of new items and items drawn from existing surveys, we devised a new survey instrument to assess CCHC culture. This instrument was intended to assess aspects of care team functioning (e.g., team composition, stability, and culture) and organizational readiness for change (e.g., communication openness, organizational learning processes, and adaptive reserve) and included a single item to measure respondents’ professional satisfaction. After cognitive testing, the survey was administered in June-August 2011 to the full census of 781 clinicians and staff in 30 California CCHCs. After reserving a confirmation sample of 200 randomly selected survey responses, we performed exploratory factor analyses, treating survey responses as categorical and using a Geomin rotation. We
determined the optimal number of factors based on magnitude of eigenvalues, shape of the scree plot, and the fit for each solution. We dropped items with redundant content, weak loadings on all factors (<0.40), or high loadings (>0.30) on two or more factors. We then performed confirmatory factor analysis in the confirmation sample. We created scales based on the final factor solution, calculated Pearson correlations between scale scores and job satisfaction, and computed the number of responses required to achieve clinic-level scale reliability >0.7 using the Spearman-Brown Prophesy formula.

**Population Studied:** 624 clinicians and staff (80% response rate) responded to the survey.

**Principal Findings:** Six factors emerged from the exploratory analysis of survey responses, and 44 survey items were retained. Two factors (Clinic Workload and Teamwork Attitude) were independent from the others. The remaining four factors (Staff Relationships, Quality Improvement Orientation, Managerial Readiness for Change, and Staff Readiness for Change) were highly correlated, indicating that these represented dimensions of a higher-order factor we called “Clinic Functionality.” This two-level, six-factor model fit the data well in the exploratory (CFI = 0.958, TLI = 0.956, RMSEA = 0.056) and confirmation samples (CFI = 0.935, TLI = 0.932, RMSEA = 0.065). Correlation coefficients between scores on the six scales and greater professional satisfaction ranged 0.21-0.47 (P<0.001 for each). The number of responses required to achieve clinic-level reliability >0.7 ranged 12-18.

**Conclusions:** Three overall dimensions of clinic culture (with one containing four sub-dimensions) can be distinguished by surveying CCHC clinicians and staff. All are correlated with professional satisfaction and have high reliability when clinic samples exceed 20 respondents.

**Implications for Policy, Delivery, or Practice:** Evaluators of quality improvement initiatives can use the survey we developed to stratify their analyses by baseline clinic culture. In addition, measuring clinic culture may allow health system innovators to tailor their interventions (e.g., by providing greater resources and support to CCHCs with worrisome scores).

**Funding Source(s):** AHRQ

**Poster Session and Number:** C, #1211

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**Organizational Influences on the Expansion of Primary Care Nursing Responsibilities**

Karleen Giannitrapani, UCLA Fielding School of Public Health; Hector Rodriguez, UCLA and VA HSR&D Center of Excellence for the Study of Healthcare Provider Behavior; Susan Stockdale, UCLA and VA HSR&D Center of Excellence for the Study of Healthcare Provider Behavior; Elizabeth Yano, UCLA and VA HSR&D Center of Excellence for the Study of Healthcare Provider Behavior; Lisa Rubenstein, UCLA and VA HSR&D Center of Excellence for the Study of Healthcare Provider Behavior

**Presenter:** Karleen Giannitrapani, M.A., M.P.H., B.A., Phd Student, Health Policy and Management, UCLA Fielding School of Public Health, giannitrapani@ucla.edu

**Research Objective:** To identify barriers and enabling factors impacting the expansion of job responsibilities for Licensed Practical Nurses (LPNs) as part of the implementation of Patient Aligned Care Teams (PACT), the VA healthcare system’s version of the Patient Centered Medical Home (PCMH) model.

**Study Design:** To identify barriers and enabling factors of LPN nursing role expansion, we used a combination of deductive and inductive approaches. We developed a logic model, which delineated primary care practice and team influences on improving Veteran-centered care; we simultaneously used a grounded theory approach to capture emergent themes relevant to nursing role expansion and nursing experiences of PACT implementation. Finally, we performed a content analysis using Atlas.ti of the domain “role expansion,” identified the most common themes, and organized the themes into barriers and enabling factors.

**Population Studied:** A major objective of PACT is to employ a team-based approach in primary care to achieve high quality, Veteran-centered, and coordinated care. Under PACT, primary care staff are re-organized into “teamlets” consisting of a primary care clinician (PCP), a registered nurse care manager (RN), a licensed practical nurse (LPN), and medical support assistant or clerk. The PACT LPN role requires building relationships with Veterans and other PACT staff and is expanded to include panel management and health coaching responsibilities. We conducted 38 in-person semi-structured interviews of teamlet members in quality improvement demonstration lab sites in three southern California primary care settings.
practices, capturing the perspectives of LPNs (n=9), PCPs (n=13), RNs (n=9), and Clerks (n=7).

**Principal Findings:** The barriers identified by LPNs include being a member of an incompletely staffed teamlet, underdeveloped staffing coverage mechanisms across teamlets, challenging relations with nursing supervisors, insufficient communication from leadership about PACT changes, insufficient role clarity and role overload. The enabling factors LPNs identified include PACT training participation, belonging to a teamlet with consistent membership, having clear roles within and across teamlets, and routine communication from facility leadership. PCPs, RNs, and clerks reinforced the barriers and enabling factors to nursing role expansion identified by LPNs. In addition to the themes identified by LPNs, RNs indicated that high teamlet member turnover has impeded LPN role expansion under PACT.

**Conclusions:** Strategies to support nurses in expanding their professional roles in primary care should ensure: 1) nursing and non-nursing teamlet members have a shared knowledge and understanding of expanded responsibilities under PACT, 2) nursing professionals have access to educational and professional development resources to support the execution of their expanded responsibilities, and 3) facility leadership and nursing management elicit feedback from nurses and provide support and resources for expanding their role.

**Implications for Policy, Delivery, or Practice:** Achieving high quality, patient-centered, continuous care, a principal goal of the PACT model, is contingent upon building relationships between PCPs, nursing teamlet members, and patients. Given the central role that LPN's play in fostering continuous relationships under PACT, identifying and sharing best practices for LPN role expansion should be a high priority for VA primary care practices. Clarifying the factors that impact LPN role expansion may inform strategies for nursing role transformation under other PCMH models.

**Funding Source(s):** VA

**Poster Session and Number:** C, #1212

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**Can We Lower Health Care Costs by Constraining ICU Bed Supply? A Hospital Level Analysis**

Rebecca Gooch, University of Pittsburgh School of Medicine; Tri Q. Li MPH, University of Pittsburgh Graduate School of Public Health; Jeremy M. Kahn MD MS, University of Pittsburgh School of Medicine and Graduate School of Public Health

**Presenter:** Rebecca Gooch, M.D., Assistant Professor, Critical Care Medicine, University of Pittsburgh School of Medicine, goochra@upmc.edu

**Research Objective:** Critical care expenditures exceed 60 billion dollars annually in the United States and are expected to rise as the population ages. One potential determinant of critical care utilization is the supply of intensive care unit (ICU) beds. International studies show that countries with fewer ICU beds tend to admit fewer patients to the ICU, restricting admissions to only very sick patients with a significant chance for survival. However, the degree to which ICU bed supply influences utilization at the hospital level is unknown. In this study we examine the relationship between ICU bed supply, ICU utilization and case-mix in US hospitals.

**Study Design:** We performed a cross-sectional analysis of US hospitals using 2006 data from the Centers for Medicare and Medicaid Services (CMS). We obtained hospital characteristics from the CMS Healthcare Cost Reporting Information System and patient characteristics from the CMS Medicare Provider Analysis and Review File. For each acute care hospital with at least 50 beds we calculated ICU bed supply as the percentage of hospital beds dedicated to the ICU. We then examined the relationship between ICU bed supply and utilization along three domains: (1) ICU admissions as a proportion of hospital admissions, a marker of overall utilization; (2) percentage of ICU admissions requiring mechanical ventilation, a marker of how severely ill ICU patients are in that hospital and (3) percentage of patients with advanced cancer that die in hospital without ICU care, a marker of how often the ICU is used in high-risk patients at the end of life.

**Population Studied:** We studied fee for-service Medicare beneficiaries aged 65 or older admitted to an eligible US hospital. We identified ICU admission using ICU-specific revenue codes, mechanical ventilation using ICD-9-CM procedure codes, and cancer using ICD-9-CM diagnosis codes in the manner of Elixhauser.

**Principal Findings:** 2413 hospitals were in the final analysis. The percentage of hospital beds dedicated to the ICU ranged from 2.1 percent to 25 percent (median: 9.9, IQR: 7.4-13.0) Compared to hospitals in the highest quartile of
ICU bed availability, hospitals in the lowest quartile of bed availability had fewer overall ICU admissions (16 percent of hospitalizations vs. 19.9 percent of hospitalizations, p less than 0.001), more ICU admissions receiving mechanical ventilation (18.5 percent vs. 16.0 percent, p less than 0.001) and more advanced cancer admissions dying without ICU care (78.6 percent vs. 75.5 percent, p less than 0.001).

**Conclusions:** We demonstrate evidence of demand elasticity in the ICU, in that ICU bed supply is tightly linked to ICU utilization: hospitals with greater ICU bed supply admit more patients to the ICU, admit patients with lower illness severity, and are less successful at preventing ICU admission in very sick patients at the end of life.

**Implications for Policy, Delivery, or Practice:** ICU utilization is a powerful driver of health care costs and appears to be related to the supply of ICU beds. Limiting ICU bed supply, potentially through certificate of need legislation, may be a strategy to reduce hospital-related health care spending without impacting health care quality.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #1213

**Inter-Rater Reliability and Criterion Validity of the Organizational Readiness to Change Assessment in Four Implementation Studies**

Christian Helfrich, VA Puget Sound Health Care System; Dean Blevins, Centers for Disease Control and Prevention; P. Adam Kelly, Southeast Louisiana Veterans Health Care System; Jeffrey L. Smith, VA Mental Health Quality Enhancement Research Initiative; Timothy P. Hogan, Bedford VA Medical Center; Hildi Hagedorn, Minneapolis VA Health Care System; Ina Gyllys-Colwell, VA Puget Sound Health Care System; Rachel M. Orlando, VA Puget Sound Health Care System

**Presenter:** Christian Helfrich, Ph.D., M.P.H., Research Investigator, Health Services Research and Development, VA Puget Sound Health Care System, christian.helfrich@va.gov

**Research Objective:** Change initiatives frequently have poor success rates, and sustained implementation of new programs remains a challenge in health services. Recent reviews find few published measures of organizational readiness to change that have undergone rigorous validation.

Researchers in the VA Ischemic Heart Disease QuERI developed the Organizational Readiness to Change Assessment (ORCA), consisting of 3 scales: strength of the evidence for the change (Evidence); organizational context of the change (Context); and organizational capacity for internal facilitation of the change (Facilitation). Items are agreement statements assessed on a 5-point Likert scale, and the scales are scored at the site level.

Our goal was to evaluate the psychometric properties of the ORCA, focusing on content and criterion validities.

**Study Design:** Secondary data was gathered from 4 independent projects testing interventions to improve implementation of evidence-based practices within VA. Each project fielded a baseline ORCA within 0-4 months of project initiation. Two studies also fielded measures of job satisfaction in order to test convergent and discriminant validities of the ORCA. We assessed inter-rater reliability with intra-class correlation coefficients and a multi-item measure of observed versus random agreement.

We tested criterion validity using simple Spearman correlations and scatter plots. For predictive validity, the outcome was implementation effectiveness and the independent variables were the ORCA scales. Convergent and discriminant validities examined Pearson correlations between measures of different aspects of job satisfaction that should have greater or lesser associations with the ORCA scales, based on degree of conceptual overlap.

**Population Studied:** VHA clinicians and staff implementing evidence-based clinical practices.

**Principal Findings:** We obtained data from a total of 53 sites with 130 respondents to the Evidence scale (2.5 respondents/site) and 140 respondents to the Context scale (2.6 respondents/site).

We found mixed results for inter-rater reliability. The Evidence and Context scales exhibited overall strong levels of within-site vs. between-site agreement with 20% and 29%, respectively, of ORCA variance attributable to site. However, this was largely due to very strong within-site agreement among a minority of sites. We had too few respondents/site to obtain reliable estimates of mean site-level scores.

We found mixed results for criterion validation, with negative findings for predictive validation but positive findings for discriminant and convergent validation. Sites exhibited substantial
Variation in the extent of implementation between baseline and follow-up, from negative changes to large positive changes. This is important because predictive validation is predicated on the existence of differences among sites in the outcomes. Neither site-level Evidence nor Context scales were associated with extent of implementation. As predicted, the Context scale had significant correlations only with satisfaction with direct supervision (r=.48, p<.01) and senior management (r=.69, p<.01).

Conclusions: Study findings suggest potential revisions to the ORCA and raise questions about how to effectively use this instrument to support implementation activities. The lack of predictive validity of the ORCA may be due to the limited unit-level variance in ORCA scores, or need for ORCA items to measure additional domains of readiness such as compatibility and outcome expectancy.

Implications for Policy, Delivery, or Practice:

Funding Source(s): VA
Poster Session and Number: C, #1215

Ready to Change? The Role of Physician and Staff Engagement, Ownership, and Participation in Managing Change

Dorothy Hung, Palo Alto Medical Foundation Research Institute; Eric Wong, PAMFRI; Katie Anderson, PAMF; James Hereford, PAMF

Presenter: Dorothy Hung, Ph.D., M.A., M.P.H., Assistant Investigator, Health Policy Research Department, Palo Alto Medical Foundation Research Institute, hungd@pamfri.org

Research Objective: Healthcare organizations are implementing an array of changes to provide more affordable, high-quality care. However, many organizations achieve only partial success when implementing initiatives, with half of failures due to lack of readiness to change among personnel. Readiness to change is a critical precursor to successful implementation of improvement efforts. This study examines factors that contribute to change readiness among physician and staff in a large, multispecialty organization undergoing system-wide transformation beginning in primary care.

Study Design: Cross-sectional data were collected by surveying physicians and staff in primary care and administrative departments. The response rate was 70% across all departments (average 72% within-department rate). Validated, multi-dimensional assessments including the Organizational Change Recipients' Beliefs Scale (Armenakis, et al.) and Maslach Burnout Inventory (1986) were administered. Factor analysis was conducted to identify constructs regarding perceptions and characteristics of the work environment. Linear regression and hierarchical linear modeling were used to examine relationships at both individual and departmental levels of analysis.

Population Studied: Approximately 706 physicians and staff in 19 primary care departments (Family Medicine, Internal Medicine, Pediatrics) and 3 call centers were included for analysis.

Principal Findings: Non-physicians, including nurses, medical assistants, and administrative staff, reporting a high level of employee engagement (e.g., “My ideas and suggestions are valued by my department”) and professional ownership/commitment (e.g., “I am willing to put in a great deal of effort to help my department succeed”) scored significantly high on four dimensions of readiness to change (p<0.01). These dimensions included perceived appropriateness of the change, anticipated benefit from changes, perceived support for change among peers and leaders, and capability to implement changes. Among physicians, departmental ownership/commitment was positively associated with these four dimensions, and also a fifth dimension of perceived need for change (p<0.05). Both physicians and non-physicians reporting burnout in the form of emotional exhaustion perceived greater need for change (p<0.01), while those with longer tenure in their department perceived less need for change (p<0.01). Burnout as reflected in depersonalizing patients was associated with less perceived capability of implementing changes among non-physicians (p<0.05). Last, participation in decision making was positively associated with non-physician engagement and ownership of department initiatives (p<0.05).

Conclusions: High levels of employee engagement and ownership/commitment were associated with various aspects of readiness to change, ranging from perceived appropriateness of the change to perceived capability of implementing changes. Only a sense of ownership affected a perceived need for change among physicians. Among all respondents, burnout and tenure universally affected perceptions for needed change. Staff participation in decision making was associated with non-physician engagement and ownership.
Implications for Policy, Delivery, or Practice: Experiences of the work environment can affect physician and staff beliefs about changes being undertaken by their organization. These beliefs feed into multiple aspects of readiness to change, which are prerequisite for successful quality improvement efforts. Staff participation in decision making may help instill a sense of engagement and ownership among non-physicians, though alternate mechanisms must be sought when preparing physicians for change.

Funding Source(s): AHRQ
Poster Session and Number: C, #1216

Evidence-Based Design of Audit and Feedback Programs: Lessons Learned from Two Clinical Intervention Studies
Sylvia Hysong, Michael E. DeBakey VA Medical Center and Baylor College of Medicine; Harrison J. Kell, Vanderbilt University; Laura A. Petersen, Michael E. DeBakey VA Medical Center and Baylor College of Medicine; Barbara W. Trautner, Michael E. DeBakey VA Medical Center and Baylor College of Medicine

Presenter: Sylvia Hysong, Ph.D., Assistant Professor, HSR&D, Michael E. DeBakey VA Medical Center and Baylor College of Medicine, hysong@bcm.edu

Research Objective: Audit and feedback (A&F) is a common intervention used to change health care provider behavior and improve health care quality. Yet after 25 years of A&F research in healthcare, we still do not clearly understand what distinguishes successful A&F interventions from unsuccessful ones (Ivers, 2012). A conceptual framework is needed to organize the elements of A&F and offer plausible explanations for observed differences in effectiveness (Foy et al. 2005). Kluger and DeNisi’s (1996) Feedback Intervention Theory (FIT) elegantly addresses this gap. Our paper demonstrates how FIT can be systematically applied in health care settings to design better feedback interventions, through two examples from applied research studies using FIT-based feedback interventions.

Study Design: We present case studies of two markedly different A&F interventions designed using FIT.
CASE 1: We designed an A&F intervention to improve VA medical residents’ capacity to distinguish between asymptomatic bacteriuria (ABU) and catheter-associated urinary tract infection (CAUTI). Residents received face-to-face A&F for their ABU cases managed between July 2011-June 2012. Our intervention was based on a treatment flowchart derived from the Infectious Diseases Society of America (IDSA) guidelines. Correct versus incorrect decisions, as well as the correct course of action, were highlighted by reviewing pathways through the flowchart. Trained research assistants reviewed the feedback verbally with subjects using a standardized script. Experts evaluated residents’ feedback acceptance immediately post-delivery.
CASE 2: We designed an A&F intervention to help physicians meet guideline-recommended goals for controlling patients’ hypertension. Over 20 months, participants in all study arms received five web-based A&F reports at four-month intervals. Reports displayed each physician’s and in some cases their clinic’s] percentage scores for: patients receiving guideline-recommended hypertension therapy; patients meeting goal blood pressure levels; and patients receiving hypertension therapy that also met goal blood pressure levels during last visit. Suggested performance goals for the subsequent period were also included.

Population Studied: CASE 1: 154 Internal Medicine Residents at the Houston VA Medical Centers (VAMC). CASE 2: 77 primary care physicians at 12 geographically dispersed VAMCs

Principal Findings: CASE 1: Feedback givers reported most residents to be thoughtful, open to suggestions, and motivated to improve during their 5-10 minute feedback session. Residents receiving A&F exhibited a 40% reduction in unnecessary screening for asymptomatic bacteriuria, compared to residents at the control site (P=0.04, Wilcoxon). At the intervention site, the residents’ specificity in diagnosing asymptomatic bacteriuria improved from 0.63 to 0.84, versus from 0.64 to 0.70 at the control site (Cadena-Zuluga et al. 2012).
CASE 2: Physicians reported that the feedback delivered by this intervention was more useful and meaningful than what they regularly receive from their facilities. Use of guideline-recommended hypertension treatment improved significantly (p<0.01) for all study arms over the course of the study in unadjusted analyses (Petersen et al. 2012).

Conclusions: FIT can be used successfully in highly diverse situations as a guide to design feedback interventions that will more effectively improve provider performance and quality of health care.
Implications for Policy, Delivery, or Practice: Adopting a more theory-based approach to A&F design can lead to interventions that improve care more effectively, and improve policymakers’ return on investment.

Funding Source(s): VA

Impact of Adding a Panel Management Assistant to Clinical Teams on Provider Self-Efficacy

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Presenter: Ashley Jensen, M.P.A., Assistant Research Scientist, New York University, School of Medicine, ashley.jensen@va.gov

Research Objective: Panel management (PM) is a central tenet of Patient Centered Medical Home (PCMH) models and is important for the improvement of population health outcomes. However, training and support for implementing PM tasks is limited. With the VA national shift toward PCMH, known as Patient Aligned Care Teams (PACT), there is a pressing need to develop and test PM strategies. The Program for Research on the Outcomes of VA Education (PROVE), explored the impact of incorporating Panel Management Assistants (PMA) and PM education on PACT providers’ and nurses’ attitudes towards and experience with PM.

Study Design: Primary care providers (PCPs) and nurses were surveyed at baseline to assess their PM self-efficacy and training. The teams were then randomly assigned to one of 3 groups: control, PMA support, and PMA support plus targeted PM education. After the 9-month intervention, the staff was surveyed again. The survey assessed: PM self-efficacy (mean of 7 items, 11-point: not at all to completely confident scale, Cronbach’s alpha= 0.93, items included: ability to recognize patient subgroups with distinct needs, to use data to identify panel needs, and to plan specific strategies targeting patients with poor outcomes), perceived sufficiency of training in PM (1 item, 5-point Likert scale), and routine use of PM strategies (1 item, 5-point Likert scale).

Covariates included job satisfaction (1 item, 5-point Likert scale), job stress (1 item, 5-point Likert scale), and the work environment atmosphere (1 item, 5-point calm to chaotic scale).

Population Studied: Participants included 44 providers and 17 nurses at the Brooklyn and Manhattan VA Campuses, who serve on 20 different teams, and provide primary care to over 25,000 veterans.

Principal Findings: The survey response rates were 75% pre-intervention and 77% post-intervention. Primary care staff whose team was allocated to one of the PMA study arms reported an 8% increase in their PM self-efficacy from 6.4 to 6.9 out of a maximum score of 10, while staff in the control group reported a 25% decrease from 7.5 to 6.0 (p=0.04). Overall, the proportion of respondents reporting sufficient training to do panel management increased from 20% at baseline to 46% post-intervention (p=0.01). Routine use of PM also increased from 21% to 39% (p=0.01) and was correlated with PM self-efficacy (Pearson’s r=0.342, p=0.02). Staff reporting a chaotic work environment had a 17% lower PM self-efficacy (p=0.02). Job satisfaction and job stress were not associated with PM self-efficacy or use.

Conclusions: PM self-efficacy was modest among VA primary care staff, even one year after implementing PACT, but improved with the addition of a PMA to the team. Participating staff reported more adequate training and increased use of PM strategies following the trial.

Implications for Policy, Delivery, or Practice: Although limited by our small sample, our findings indicate clearly that there is room for improvement in PM training, efficacy, and use. Further analyses will determine the impact of PM self-efficacy on clinical and patient experience outcomes.

Funding Source(s): VA

Implementation of Quality Management Systems: The Role of Hospital (Management) Boards

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Research Objective: Objective

Recent studies in the US, Canada and Europe have shown that the implementation of quality management systems differs considerably between hospitals. Therefore, our objective was to determine whether the level of implementation is influenced by the Hospital Board’s commitment to quality of care and external pressures such as accreditation and legislation. Background

Hospitals are putting large efforts in implementing evidence-based management systems and organizational innovations for patient-centered care. Having a hospital quality management system is a prerequisite to successfully implement these innovations. Previous studies showed that the effectiveness of implementing innovations was not only associated with the Hospital (management) Board’s commitment to quality, but also with external pressures such as accreditation, legislation and market competition.

Study Design: Our study was a cross-sectional international comparative survey in Europe. Data collection took place in 2011. Questionnaires measuring Board behavior and hospital quality management consisted of previously validated scales if possible, and were deployed in seven European countries using a forward-backward translation strategy.

Population Studied: We approached CEOs and quality managers in 210 hospitals in Czech Republic, France, Germany, Poland, Portugal, Spain and Turkey.

Principal Findings: We obtained data from 188 hospitals, showing a large variation in the development of hospital quality management systems, of the Hospital (management) Boards’ commitment to quality of care, and the influence of external pressures. Using a linear multivariable regression model at hospital level with random incept by country (adjusted for confounding effects at hospital level), preliminary results show that quality management systems are more developed when Hospital (management) Boards were more committed to quality of care, which is expected to be even stronger when, as perceived by the CEO, the quality management system was strongly influenced by external pressures.

Conclusions: Our preliminary results show that Hospital (management) Boards can influence the implementation of quality management systems, provided that they are committed to quality of care. Further analyses will provide more insight in the influence of external pressures such as accreditation.

Implications for Policy, Delivery, or Practice: As a hospital quality management system is a prerequisite to deliver high quality patient-centered care, it provides hospital Boards with the opportunity to comply to their legal accountability for quality of care by facilitating its development and implementation.

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Poster Session and Number: C, #1219

Does Better Care Need to Cost More?

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Research Objective: This study examined the relationship between primary care physicians’ use of resources, and clinical quality and patient-assessed quality indicators.

Study Design: We used a dataset linking electronic health records, administrative claims, and patient satisfaction surveys from a large ambulatory group practice with mixed sources of payment. The unit of analysis was the primary care physician (PCP). For the measure of resource use, we examined the ratio of the observed costs of the PCP’s panel relative to the expected costs adjusted for age, sex, and clinical conditions of the PCP’s panel (“costs”). For the measures of clinical quality, we combined various indicators pertinent to primary care practice and created a composite average score (number of patients who met the target/number of eligible patients). For patient-rated care quality, we examined the percent of patients who indicated in the survey that they were “very likely” (5 on 1-5 scale) to recommend their provider to others. We tested whether costs
Antibiotic Prescribing for Acute Respiratory Infections Increases as the Clinic Session Wears On

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Presenter: Jeffrey Linder, MD, MPH, FACP, Associate Professor of Medicine, Division of General Medicine and Primary Care, Brigham and Women's Hospital and Harvard Medical School, jlinder@partners.org

Research Objective: Reducing the rate of inappropriate medical treatments is a top national priority. Fatigue and stress may deplete clinicians’ capacity to resist ordering potentially inappropriate services, such as antibiotics for acute respiratory infections (ARIs). Due to fatigue and erosion of willpower (i.e., “ego depletion”), we hypothesized that primary care clinicians would be less likely to prescribe antibiotics for ARIs at the beginning and more likely to prescribe antibiotics for ARIs at the end of clinic sessions.

Study Design: We compared the antibiotic prescribing rates for all ARIs, antibiotic-appropriate diagnoses (e.g., pneumonia and sinusitis), and non-antibiotic-appropriate diagnoses (e.g., non-specific upper respiratory tract infections and acute bronchitis) for the first visit of a half-day clinic session and the last hour of a half-day clinic session (i.e., the 11 am and 4 pm hours) to the remaining visits. We used the chi-squared test for bivariate comparisons. We used multivariable generalized estimating equations to evaluate independent predictors of antibiotic prescribing adjusting for demographics, appropriateness of diagnosis, and clustering by clinician.

Population Studied: 488,724 total visits and 24,726 ARI visits scheduled from 8 am to 5 pm, Monday to Friday, by patients age 18 to 64 years old without chronic lung disease to 532 clinicians in 23 Boston-area primary care practices, between May 2011 and April 2012.

Principal Findings: ARI patients had a mean age of 41.9 years; 68.8% were women, 71.4% White, 11.0% Latino, and 7.8% Black; 83.8% had private insurance and 90.8% spoke English. The antibiotic prescribing rate was 60.3% for all ARIs (n=24,726), 78.3% for antibiotic-appropriate diagnoses (n=8667), and 50.7% for non-antibiotic-appropriate diagnoses (n=16,059). The antibiotic prescribing rate for the first visit of the session was significantly lower than later visits for all ARIs (57.8% vs. 60.7%; p=0.002),
antibiotic-appropriate diagnoses (75.3% vs. 78.7%; p=0.01), and non-antibiotic-appropriate diagnoses (48.3% vs. 51.0%; p=0.02). The antibiotic prescribing rate was significantly higher during the last hour of each session compared to the remainder of the session for all ARIs (62.1% vs. 59.8%; p = 0.001), antibiotic-appropriate diagnoses (80.3% vs. 77.6%; p=0.01), and non-antibiotic-appropriate diagnoses (52.2% vs. 50.2%; p=0.03). In multivariable modeling, clinicians were less likely to prescribe antibiotics at the first visit of the session (odds ratio [OR], 0.90; 95% confidence interval [CI], 0.82 to 0.99) and more likely to prescribe antibiotics in the last hour of a clinic session (OR, 1.10; 95% CI, 1.02 to 1.18).

**Conclusions:** Antibiotic prescribing rates for ARIs were lower for the first visit of a clinic session and higher during the last hour of a clinic session. These findings support the hypothesis that fatigue or cumulative stress erodes clinicians’ abilities to resist prescribing potentially inappropriate treatments.

**Implications for Policy, Delivery, or Practice:** To reduce inappropriate health care utilization, delivery systems should explore strategies to mitigate the effects of clinician fatigue or stress.

**Funding Source(s):** NIH

**Poster Session and Number:** C, #1221

**Are Small General Practices Here to Stay?**

Sanne Lykke Lundstrom, The Technical University of Denmark; Kasper Edwards, The Technical University of Denmark

**Presenter:** Sanne Lykke Lundstrom, Ph.D. Student, Department of Management Engineering, The Technical University of Denmark, slund@man.dtu.dk

**Research Objective:** Relational coordination (RC) is about relationships between roles instead of individual. Role-based coordination has a practical advantage over coordination that is based on personal ties, as it allows for the interchangeability of employees. Organizational Social capital (OSC) is the actual and a potential resource embedded in relationships among actors in an organization, and an important predictor of group and organizational performance.

Danish general practices can choose how many patients to cover i.e. patient load based on personal preferences such as income, work hours and job satisfaction etc. As a result patient load can be perceived as a performance outcome. The research objective of this paper is to examine if high RC and/or OSC is correlated with a high patient load and characteristics of general practice.

**Study Design:** This is a quantitative study based on a questionnaire survey, which measures OSC and RC among GPs and their staff.

The questionnaire was composed from questions obtained from the Copenhagen Psychosocial questionnaire (COPSOQ) and Gittells seven question on RC; translation and a few modifications were made in order to best fit the question to the field. The survey was conducted as a paper version due to evidence of higher return rate on paper versus electronic in a primary care setting.

For each general practice the patient load were calculated based on age and gender of the patients in the practice.

**Population Studied:** The questionnaire was sent to every Danish GPs and their staff, approximately 2074 practices with about 2 - 15 staff members in each practice. 67 practices were eliminated due to pension, death or other reasons. 702 practices (3029 individuals) responded.

**Principal Findings:** The results showed a correlation between OSC and RC. There was significant variation between respondents scoring of OSC and RC depending on profession. We compared ratings made by the participating practices and found the practice form to be highly significant for the rating of OSC and RC. Compared to other practices solo practices (single owner) had the highest rating of OSC and RC. The ratio between patients listed at a clinic and employees showed to be highly significant for the rating of RC in the general practice. We found that clinics with few patients per employees and clinics with very many patients per employees rated RC higher than clinics with a medium number of patients per employee ratio. The results on patient load are being analysed at moment.

**Conclusions:**

**Implications for Policy, Delivery, or Practice:** Our study shows that solo practices have higher OSC and RC than cooperative and partnership practices. There is a general move towards larger practices with more and more patients from both the political side as well as healthcare professionals, in particular doctors. Our study implies a need for larger practices to work on how they coordinate and use the resources available to them. Furthermore, based on this...
study we need to reconsider if fewer, but larger general practices are the right way to handle the increasing demand general practice due to growing populations.

**Funding Source(s):** Other, The Technical University of Denmark

**Poster Session and Number:** C, #1222

### Infrastructural Mechanisms Leading Toward Pro-accountable Care Organization

**Orientation:** A Survey of Hospital Managers

Maysoun Masri, University of Central Florida; Thomas Wan, University of Central Florida; Judith Ortiz, University of Central Florida

**Presenter:** Maysoun Masri, Sc. D, MBA, M.P.H, Health Management & Informatics, University of Central Florida, Maysoun.Dimachkie@ucf.edu

**Research Objective:** Little is known about how specific infrastructural mechanisms including the current healthcare provider networks, system integration level, clinical and information integration, organizational social capital, and market competition may all influence hospital managers’ Pro-ACO Orientation. The purpose of the study is to 1) explore how Pro-ACO Orientation, as a latent construct, is captured from the perceptions of hospital managers; and 2) identify infrastructural mechanisms leading to the formation of Pro-ACO Orientation.

**Study Design:** An electronic-survey of hospital managers, identified by the Health Information Management System Society (HIMSS), was conducted to elicit hospital managers’ perceptions on the benefits and barriers to participate in ACOs. The survey tool contains numerous questions covering several Likert-scale measures of the theoretical constructs such as: 1) knowledge about ACOs, the commitment to develop a strategic plan for ACOs, willingness to participate in ACOs, perceived benefits and barriers of ACO participation, and organizational social capital; 2) organizational care delivery structure in terms of systems integration and networks formed with other health care organizations; 3) health information technology (HIT) infrastructure in terms of electronic medical record usage; and 4) contextual factors such as size and urban location.

**Population Studied:** The respondents include 89 hospital managers or executives from different acute care hospitals.

**Principal Findings:** After eliminating incomplete responses, only 84 hospitals were included in the analysis. Of the total respondents, 58% (48) reported that they are moving toward the establishment of ACOs and having a strategic plan for joining ACOs; 56% are planning to join ACOs in next two years; 48% are considering joining ACOs; and 25% had already participated in ACOs during 2012. Urban hospitals were more likely than rural hospitals to be engaged in ACO development. However, network size was one of the strongest indicators of infrastructural mechanisms for predicting Pro-ACO Orientation.

**Conclusions:** It is imperative for health planners and policy decision makers to understand how organizational and contextual factors can be assessed and used as predictors of the Pro-ACO Orientation and the future growth of ACOs in the United States.

**Implications for Policy, Delivery, or Practice:**

One might question the sustainability of ACOs in the US. The ultimate test of ACOs is their ability to reduce health disparities, improve population health, and contain costs. A system-level change will require the consideration of contextual factors influencing the transformation in health care (Best et al 2012). Innovative research is urgently needed to demonstrate how the growth of ACOs facilitates the achievement of these goals in the health care delivery system.

**Funding Source(s):** NIH

**Poster Session and Number:** C, #1224

### A Systematic Review of Emotional Intelligence and Physician Leadership

**Presenters:**
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**Research Objective:** This review evaluates current knowledge and practice about emotional intelligence (EI) and physician leadership. Key themes in the literature are identified and areas for future research and training are posited.

**Study Design:** Systematic Review: Searches were performed using PubMed, Google Scholar, and Business Source Complete for the period January 1990-July 2012. The search terms used were physician and leadership, emotional intelligence, organizational behavior, and organizational development.
Improvement Projects: Organizations: Lessons from Hospital
Promoting Voice in Health Care

Population Studied: All abstracts were reviewed. Full articles were evaluated if they addressed the connection between emotional intelligence and physician leadership. Articles were included if they focused on physicians or physicians-in-training.

Principal Findings: 3713 eligible abstracts prompted review of 437 full papers, of which 144 are included in this review. Three themes were identified: 1. There is broad-based endorsement of EI as a leadership development strategy for many types of healthcare providers and medical settings. 2. Models of EI and leadership development practice vary greatly, and 3. EI is desired and relevant throughout medical education.

Conclusions: EI is widely endorsed as a component of curricula for developing physician leaders. Research comparing practice models and measurement tools will critically advance understanding about how to build EI to enhance leadership in physicians throughout their careers.

Implications for Policy, Delivery, or Practice: The paucity of available studies of EI in healthcare clearly invites greater attention. Studies are needed to further address each of the themes that emerged in this review. In particular, greater attention is needed to establishing and standardizing the measurement of EI in healthcare providers. Significant additional questions remain: Which components of EI are most critical at specific times during the career trajectories of physicians? How should EI be integrated into the constantly increasing burden of skills and knowledge that competent physicians should have? Should all physicians receive leadership development training, or only those who are specifically recruited/interested? Answering these questions thoroughly, thoughtfully, and collectively as healthcare providers will ensure a cadre of trained physicians that will effectively navigate the complexities of emerging health systems.

Funding Source(s): AHRQ
Poster Session and Number: C, #1225

Promoting Voice in Health Care Organizations: Lessons from Hospital Improvement Projects
Ingrid Nembhard, Yale School of Public Health and Yale School of Management; Israel Labao, Yale School of Public Health; Shantal Savage, Yale School of Public Health

Presenter: Ingrid Nembhard, Ph.D., M.S., Associate Professor, Yale School of Public Health and Yale School of Management, ingrid.nembhard@yale.edu

Research Objective: Many quality problems in health care have been attributed to communication problems. Health professionals frequently do not voice important information. Voice refers to the discretionary communication of ideas, suggestions, concerns or opinions about work-related issues with the intent to improve organizational or unit functioning. Research suggests that greater staff voice is associated with organizational performance and improvement. The importance of voice suggests value in developing greater understanding of the facilitators of voice. This research aims to provide insight on what drives health professionals to voice and how they use their voice.

Study Design: We conducted a qualitative study using data from site visits and in-depth interviews in randomly sampled hospitals, and purposely augmented the sample to ensure diversity in teaching status, size, geographic location, size, and performance quality as indicated by Hospital Quality Alliance data. We continued additional site visits until we reached theoretical saturation. Analyses employed the constant comparative method and were conducted by a team using Atlas.ti software.

Population Studied: We studied 12 hospitals participating in the Door-to-Balloon (D2B) Alliance, a national campaign to promote the implementation of evidence-based practices for improving treatment time for patients with STEMI (a common type of heart attack) to meet the national guideline (i.e., door-to-balloon time of 90 minutes or less). None of the hospitals had achieved the campaign goal of 75% of patients with STEMI treated with PCI within 90 minutes of hospital arrival, and all hospitals had only implemented one or none of the four evidence-based practices recommended for the treatment. The significant room for quality improvement in these hospitals suggested that there were potentially issues and suggestions to voice in these settings. We interviewed 99 hospital staff including administrators (n=19), physicians (n=25), nurses (n=15), and other clinical and administrative personnel (n=40).

Principal Findings: Several factors shape health professionals’ propensity to voice. They include individual factors (e.g., perceived responsibility), organizational factors (e.g.,
Designed forums for voice), and environmental factors (e.g., guidelines that support ideas). The data suggests that facilitators of voice provided health professionals with three critical ingredients for voice: opportunity, confidence, and/or protection from repercussions of voice. Individuals used their voice to support quality improvement in three ways — to support their learning, inform others and protect patients. Results did not vary by hospital performance.

**Conclusions:** Facilitators of voice fall into several categories, several of which leaders of health care organizations can shape. The key to facilitating voice is creating an environment that minimizes the risk of voice.

**Implications for Policy, Delivery, or Practice:** Our results suggest that there are several levers that managers can use to elicit voice in health care organizations and that voice can be used in multiple ways to facilitate improvement.

**Funding Source(s):** AHRQ

**Poster Session and Number:** C, #1226

**Self-Regulation in Relationship between Physicians and Pharmaceutical Companies as Perceived by Policymakers in Israel**

Rachel Nissanholtz-Gannot, Mayer-JDC-Brookdale institute; Ariel University Center; Shifra Shvarts, Ben Gurion University of The Negev, Israel; Segev Shani, Ben Gurion University of The Negev, Israel

**Presenter:** Rachel Nissanholtz-Gannot, Ph.D., L.L.M., Researcher, Smokler Center for Health Policy Research; Department of Health Management, Mayer-JDC-Brookdale institute; Ariel University Center, rachelni@jdc.org.il

**Research Objective:** The relationship between physicians and pharmaceutical companies raises many questions around the world. The need to address ethical problems in this context, particularly with the apprehensions about influencing the physicians’ prescribing behavior, has encouraged the physicians and the industry in Israel to draw up a Joint Ethical Code that will regulate appropriate limits to the relationship. The goal of the study was to examine the perceptions of policymakers in Israel regarding this relationship and attempts at self-regulation in Israel.

**Study Design:** A qualitative study made of:

1. 35 semi-structured in-depth interviews with policymakers: managers in the health system and the Ministry of Finance, directors of the health plans, directors of pharmaceutical companies, heads of scientific associations and heads of patients' organizations.
2. 10 interviews with physicians in various fields and of varying seniority — in the community and in hospitals, residents, senior physicians, and hospital directors.
3. Examination of attitudes towards this relationship taken from official documents of various agencies, e.g., associations of pharmaceutical companies, associations of physicians, legislation in various places, etc.
4. Examination of the Joint-Ethical-Code established in Israel and the way that it is perceived by policymakers.

**Population Studied:** The study included policymakers from various fields, in order to give expression to the perceptions of senior policymakers about the issue. The attitudes of policymakers are important because senior managers influence the practices in their organizations and are able to assimilate what they consider to be appropriate behavioral norms in this area. The physicians in the field were interviewed in order to learn their perspective on the relationship, since they are one of the sides directly involved.

**Principal Findings:** Most of the respondents were found not to believe that the ethical code was achieving its goal and they did not believe that this was the way to address the weighty ethical issues arising from this relationship. While the policymakers among the physicians support the code and consider it to be a tool for determining appropriate limits in the relationship, the vast majority of the policymakers in other groups, do not support it and believe self-regulation is not the right way to solve the problem of that relationship.

**Conclusions:** In order to examine the most appropriate way of addressing the issues arising in the relationship between physicians and the pharmaceutical companies, attention must be paid to the policymakers' perceptions. The fact that most of them do not believe in self-regulation will cause them not to assimilate the Code in the organizations that they direct, so the fate of the ethical code will be doomed from the start.

**Implications for Policy, Delivery, or Practice:** The relationship between the physicians and the pharmaceutical companies is complex and raises many issues that need to be addressed. The lack of budgets and the need to develop new medications demands that the relationship be continued, but limits need to be set. Policymakers in Israel and abroad can reach
conclusions from the study regarding ways of addressing these issues.

**Funding Source(s):** N/A, The Israel National Institute for Health Policy and Health Services Research (NIHP)

**Poster Session and Number:** C, #1227

**Care & Cure: Combine or Collaborate? Evaluating Inter-Organizational Designs in Healthcare**

Angele Pieters, Tilburg University; Kim van Oorschot, BI Norwegian Business School; Henk Akkermans, Tilburg University; Sally Brailsford, University of Southampton

**Presenter:** Angele Pieters, Ph.D. Student, School of Economics and Management, Tilburg University, angele@angelepieters.com

**Research Objective:** The healthcare sector is facing many problems at the same time: rising costs, increase in patients with lifelong diseases, and unsatisfying quality. One root cause is that the design of services provided needs to be improved. In healthcare, there is a prominent role for conditions that require a combination of simple, general, preventive monitoring (care) activities and complex, specialized, medical intervention (cure) activities. Examples are diabetes mellitus, COPD, cardiovascular risk, depression and being pregnant. Several inter-organizational designs are found that aim to deliver these care and cure activities. Unfortunately, many of these designs deliver fragmented and poorly coordinated care. As a result, the sector is seeking alternative inter-organizational designs, in which both opposing kinds of expertise are combined in a more synergetic manner. However, what inter-organizational design would work best for care-cure conditions, taking into account that patient’s needs are met, and that problems due to fragmentation are overcome?

**Study Design:** Experimenting with different designs in the real world remains dangerous, costly and time-consuming. Therefore, we resort to simulation modeling to arrive at a systematic evaluation of different designs. We develop a system dynamics (SD) simulation model that focuses on the dynamics of inter-organizational collaboration and competition in a tiered healthcare system. The SD model resides in insights from observations, questionnaires, interviews, group model building sessions and literature. The model evaluates different designs by the following outcome variables: medical performance, effectiveness, client satisfaction, and employee satisfaction.

**Population Studied:** The case setting is Dutch maternity care. Pregnancy is a care-cure condition: pregnant women need care, and only in case of an increased risk for complications, they need cure. Dutch maternity care is organized as a tiered system: midwifery practices are responsible for low-risk pregnant women and obstetric departments in hospitals are responsible for high-risk pregnant women. Although this system has its advantages and is often taken as an example for other countries, it does not perform well regarding perinatal and maternal morbidity and mortality. Therefore, solutions are sought in different inter-organizational designs.

**Principal Findings:** Our analysis suggests that, for Dutch maternity care, out of six designs, a collaborative design, in which collaboration between care (midwifery practices) and cure (hospital) organizations is improved, is optimal, because of the virtuous cycles of trust and transparency that are nurtured in this setting. A competition-driven design, where some care providers are closely integrated with cure providers is found to lead to inferior results.

**Conclusions:**

**Implications for Policy, Delivery, or Practice:**
For Dutch maternity care, we recommend to implement a collaborative design. For maternity systems which are built on the medical model, as is the case in most developed countries, and which are thinking about moving towards a more midwifery model, this research carries the advice to be careful with introducing independent midwifery practices. It will only work well when there are high levels of collaboration and trust with the cure providers (obstetric departments in hospitals). For care-cure conditions our recommendation is to study the dynamics of collaboration between healthcare providers in relation to the condition specific characteristics in detail before deciding what inter-organizational design might work best.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #1228

**Results from a Multisite Study of Work Relationships in VA Primary Care**

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at San Antonio; Luci Leykum, MD, MBA, MSCI, South Texas Veterans Health Care System; Polly Noël, PhD, South Texas Veterans Health Care System; Drew Russell, MS, South Texas Veterans Health Care System; Michael Parchman, MD, MPH, MacColl Center for Health Care Innovation, Group Health Research Institute, Group Health Cooperative

**Presenter:** Jacqueline Pugh, M.D., Staff Physician/Investigator, South Texas Veterans Health Care System, pugh@uthscsa.edu

**Research Objective:** Improving health care delivery in order to improve patient outcomes has not resulted in consistent improvement in patient outcomes across settings. One reason may be that health care organizations are complex systems, where relationships of the individuals within the organization are critical to their emergent clinical outcomes. We posed the following research questions: Could we distinguish primary care clinics on the basis of their staff work relationships? Would the differences among clinics in work relationships be related to primary care patient outcomes and patient satisfaction?

**Study Design:** Cross-sectional observational mixed methods study of work relationships in 17 Veterans Health Administration primary care clinics.

**Population Studied:** Staff were surveyed and interviewed and their interactions observed. Patients were surveyed by mail. Patient outcome data were obtained from VA databases at the regional and national level. Outcome Measures: Patient satisfaction as rated on two questions: Overall Rating of Personal Doctor/Nurse and Overall Rating of Healthcare, obtained from national VA patient survey of satisfaction with health care. Patient self-rating of health obtained from patient mail survey. Hemoglobin A1c, LDL and blood pressure measurements were the primary clinical outcomes. We also examined preventive measures such as vaccination rates.

**Principal Findings:** After controlling for both clinic and patient characteristics, staff work relationship survey scores were associated with patients’ rating of satisfaction with their doctor/nurse but not with intermediate outcomes of A1c, LDL, or systolic blood pressure or self-reported health. Preventive care measures also were not associated with survey scores.

**Conclusions:** We hypothesized that high quality work relationships are important to primary care clinical outcomes. While work relationships were associated with patient satisfaction with their doctor/nurse, work relationships were not associated with routine measures of chronic disease management or preventive care. These findings may reflect differences in the role of work relationships in the execution of different tasks in primary care.

**Implications for Policy, Delivery, or Practice:** The organizational design and management of primary care may be more nuanced that we originally thought. For processes about which there is little doubt concerning their efficacy and the patient population to whom they apply, organizational interventions such as electronic reminders, role responsibility assignment (nurse vs. physician), population management, provider, team and clinic performance feedback and performance awards may be sufficient to achieve successful implementation. But patients will still need high quality work relationships to be satisfied with their care.

**Funding Source(s):** VA

**Poster Session and Number:** C, #1229

**Influence of Organizational Cultural Competence Climate on Providers’ Cross-Cultural Skills in Clinical Practice**

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**Presenter:** Tanjala Purnell, Ph.D., M.P.H., Postdoctoral Fellow, General Internal Medicine, Johns Hopkins University, tpurnell@jhsphs.edu

**Research Objective:** Providing culturally competent care is an advocated strategy for reducing disparities and improving patient-centered care for culturally diverse patients. Little is known about the influence of organizational cultural competence climate on providers’ skill levels in treating culturally diverse patients and families. The objective of this study was to examine the association of perceived organizational cultural competence climate (i.e., leadership and care delivery structure) with providers’ self-rated cross-cultural skills in clinical practice.

**Study Design:** We administered a web-based, cross-sectional survey with Likert-response
questions about providers’ self-rated skills in identifying 1) cultural customs and religious beliefs that might affect clinical care and 2) whether a patient is mistrustful of the healthcare system. We measured perceptions of organizational leadership and care delivery structure with respect to cultural competence by asking providers how much of a problem they perceived each of the following when delivering care: 1) lack of time to address cultural issues, 2) poor access to interpreters, and 3) dismissive attitudes about cross-cultural care among hospital leaders (“no or small problem” versus “moderate or big problem”). Differences in self-rated skills (dichotomized into “fairly or very” versus “less than fairly” skillful) by perceptions of organizational climate were assessed using multivariable logistic regression.

**Population Studied:** Our study population included medical faculty, fellows, and residents who engage in patient care within 10 clinical departments of an urban academic medical center.

**Principal Findings:** Among 1,220 total participants (47% response rate), 52% were male, and mean age 39.8 years with 62% Caucasian, 21% Asian, 10% African American, and 4% Hispanic. 62% speak a language other than English, and two-thirds received training in cultural competence. 34% rated themselves as fairly or very skillful in identifying cultural customs, 33% in identifying religious beliefs, and 41% in identifying patients who are mistrustful. 42% perceived lack of time, 28% perceived poor access to interpreters, and 8% perceived dismissive attitudes as moderate or big problems. Compared with participants who perceived lack of time as a small or no problem, those who perceived this as a moderate or big problem were less likely to rate themselves as fairly or very skillful in identifying cultural customs (OR: 0.41; 95% CI: 0.31-0.54), identifying religious beliefs (OR: 0.41; 95% CI: 0.31-0.53), and identifying patients who are mistrustful (OR: 0.40; 95% CI: 0.31-0.53). Similarly, those who perceived poor access to interpreters as a moderate or big problem were less likely than counterparts to rate themselves as fairly or very skillful in identifying cultural customs (OR: 0.71; 95% CI: 0.54-0.94), identifying religious beliefs (OR: 0.68; 95% CI: 0.52-0.89), and identifying patients who are mistrustful (OR: 0.73; 95% CI: 0.55-0.95). We found no statistically significant associations between perceptions of dismissive attitudes and providers’ self-rated cross-cultural skills.

**Conclusions:** Perceived lack of time to address cultural issues and poor access to interpreters were strongly associated with providers’ self-rated cross-cultural skills.

**Implications for Policy, Delivery, or Practice:** Improved reimbursement rates (for increased time) and organizational structural support for cross-cultural encounters are fundamental strategies to enhance delivery of patient-centered and culturally-appropriate care for diverse patients.

**Funding Source(s):** NIH, Johns Hopkins University School of Medicine

**Poster Session and Number:** C, #1230

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**Is Privatization the Solution to the Financial Distress of Public Hospitals?**

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**Presenter:** Zo Ramamonjiarivelo, Ph.D., M.B.A., Assistant Professor, Department of Health Administration, Governors State University, zramamonjiarivelo@gmail.com

**Research Objective:** Research suggests that privatization is one of the strategies that public hospitals adopt when they are in financial distress. A hospital is in financial distress when its liquid assets are not sufficient to meet its short-term obligations. Private status may have less stringent rules with respect to funding and it may offer more operational freedom vis-à-vis public status. While for-profit hospitals pay income taxes, they may still achieve higher profitability than not-for-profit hospitals given their profit maximization goal. The purpose of this study was to test two hypotheses: hypothesis 1 tested whether privatization resulted in better financial performance and hypothesis 2 tested whether public hospitals that converted into private for-profit facilities exhibited better financial performance compared to public hospitals that converted to private not-for-profit status.

**Study Design:** This study used a non-experimental longitudinal design. We merged panel data sets from the American Hospital Association Annual Survey, Medicare Cost Reports, Area Resource File, and Local Area Reports, Area Resource File, and Local Area.
Unemployment Statistics. The independent variable “privatization” was defined as conversion from public status to either private not-for-profit or private for-profit status. Financial performance was measured by two dependent variables: operating margin and total margin. Control variables included per capita income, unemployment rate, percent of population aged 65 years or older, number of physicians per 1,000 population, market concentration, excess capacity, Medicare HMO penetration, metropolitan location, yearly change in unemployment rate, bedsize, teaching status, occupancy rate, outpatient mix, payer mix, multihospital system membership, health network affiliation, and contract management. Fixed-effects regression models were constructed followed by two joint tests to confirm whether the difference between the margins of the hospitals that became for-profit or not-for-profit were statistically significant.

**Population Studied:** A national sample of non-federal acute care public hospitals in 1997. These hospitals were tracked through 2009, resulting in 6,454 hospital-year observations for the operating margin data set and 6,579 hospital-year observations for the total margin data set.

**Principal Findings:** Both hypotheses were supported. Compared to hospitals that remained public, privatized hospitals exhibited 5% higher operating margin (p < 0.001) and 2% higher total margin (p < 0.001). Compared to hospitals that remained public, hospitals that privatized into for-profit status had 8% higher operating margin (p < 0.001) and 3% higher total margin (p < 0.001), while those who privatized into not-for-profit status had 4% higher operating margin (p < 0.001) and a marginally significant 1% higher total margin (p < 0.1). The joint tests confirmed that the operating and total margins of the public hospitals that became private for-profit are significantly greater than those who became not-for-profit.

**Conclusions:** Privatization improves hospital financial performance, and privatization to for-profit status results in better financial performance compared to privatization to not-for-profit status. Improved financial performance of privatized hospitals is primarily driven by improved operating margins, which may be a result of higher patient revenues, lower operating costs, or both.

**Implications for Policy, Delivery, or Practice:** Privatization could be a mean to restore the financial health of distressed public hospitals.

Future research should focus on the impact of privatization on healthcare access and quality.

**Funding Source(s):** N/A

**Poster Session and Number:** C, #1231

**A Framework for Mainstreaming Patient-Centered Communication in Community-Based Healthcare Organizations**

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**Presenter:** Dina Refki, D.Sc., Executive Director, Rockefeller College of Public Affairs & Policy, University at Albany, Center for Women in Governance, drefki@albany.edu

**Research Objective:** Effective communication between providers and patients is dependent on the ability to bridge the divides of language, culture and literacy, and transmit vital information in a patient centered manner. Patient-centered communication is the cornerstone of quality, patient safety, satisfaction, and health outcomes. The objective of this paper is to advance a framework for mainstreaming patient centered communication within community-based healthcare organizations.

**Study Design:** The Mainstreaming framework evolved from a 3-year research study with family planning centers in New York State that took place from 2009 – 2012. The study sought to test the correlation between enhanced organizational management systems for the provision of patient centered communication, and improved patient health outcomes. Enhanced management system was measured by ability to integrate the needs of Communication Vulnerable Patients (CVP) into an organization’s operating structure including its design, culture, data and information, and monitoring/evaluation systems. Improved patient outcomes were measured through increased testing for STD with Latina patients. The study was conducted in two phases. In phase 1, a Baseline Survey was administered to deepen understanding of the organizational structures of community-based organizations providing family planning services in New York State. In Phase 2, six clinics were purposely
selected from the pool of survey respondents and invited to participate in the study. The study focused on working with clinics to strengthen their organizational management systems and test the study hypothesis. The 6 clinics were divided into two groups; A and B. A delayed intervention methodology was used. Group A received the intervention 4 months before Group B receives its intervention. Delayed intervention allowed an opportunity to use Group B as a control Group for the initial 4 months. Data collection in phase 2 included, observational site visits; key informant interviews, action plan development sessions, technical assistance sessions, patient chart reviews and review of organizational records.

Social Learning Theory51 and Behavioral Ecological Model guided the research. The Mainstreaming Framework was informed by O’Connor &Kotze’s (2008) Learning Organization’s theory, System theory and system thinking principles (Senge, 1990), and tools and concepts of gender mainstreaming, gender budgeting and gender auditing.

**Population Studied:** Community-based healthcare organizations providing family planning services to Communication Vulnerable Patients (CVP).

**Principal Findings:** With few exceptions, clinics’ response to communication barriers due to language, culture or literacy has been reactive, ad hoc and non-consistent. If a patient does not speak English well, clinics resorted to providing a linguistic mediator. An occasional training on cultural competency or overcoming literacy barriers were seen as sufficient responses to this complex challenge. Clinics’ responses were found to ignore the complexity of the organizational system and the interconnectedness of its many parts and elements. They overlooked the unique needs of CVP and failed to consider that meeting a short term need through isolated actions without considering the long term implications can cause upheaval in the equilibrium of the whole system. When organizations addressed the provision of patient centered communication through a comprehensive approach which integrated CVP’s needs into all parts of the organization’s structure, only then was it possible to see movement toward the objective of strengthened management systems.

**Conclusions:** The study concludes that mainstreaming patient-centered communication entails a holistic approach which integrates the needs of CVP into each element of an organizational structure (Glickman et. al., 2007). This study suggests that system thinking is critical to catalyze organizational learning and development (Senge, 1990). System thinking takes into account the interconnections between organizational structure, processes and outcomes (Donabedian, 2003), and the need to conceive any organizational change as one that affect the whole system and all its subparts.

**Implications for Policy, Delivery, or Practice:** The mainstreaming framework developed in this paper provides guidance to community based healthcare organizations to integrate the needs and concerns of CVP within the organizational structure including its design, culture, data and information, and monitoring/evaluation systems. Mainstreaming facilitates overcoming the simplification that often occurs when dealing with CVP and the reductionist strategies that perceive the provision of language assistance or ad hoc training of staff as the ultimate solution to the problem. The grave limitations of these strategies stem from the failure to recognize the interrelated consequences of communication breakdowns, and the overall impact on organizational structure, process and health outcomes resulting from the absence of a holistic approach (Ullmer, 1986). Additionally, applying system thinking principles to this complex problem enables practitioners to overcome mental models that perceive serving CVP as a burden and facilitate harnessing the business potential of capturing a larger pool of the patient market.

**Funding Source(s):** NIH

**Poster Session and Number:** C, #1232

**Getting from Here to There: Medical Homes, Policy Change and Implementation Science**

**Presenter:** Jill Rissi, Portland State University; Robin Baker, MPH, Portland State University

**Research Objective:** To evaluate the intent, development, implementation and efficacy of the Patient Centered Primary Care Home Model in order to identify factors which facilitate, or impede its success, provide insight into potential modifications to improve program implementation, and identify areas in which modifications to statutes or administrative rules may further health system transformation goals.
Study Design: Semi-structured interviews and document analysis based on an implementation science framework consisting of five domains. Key informants that were involved in the development of enabling legislation and implementation of the PCPCH program included elected and appointed government officials, healthcare providers and administrators, and consumer advocates. Documents included statutes, administrative rules, and other state reports.

Population Studied: Persons involved in the development and implementation of the PCPCH Program.

Principal Findings: Development of the PCPCH Program involved numerous stakeholders, whose engagement and perceptions also played a role in shaping the implementation process. In particular, early analysis suggests that the presence of internal opinion leaders and external change agents to champion and support change can mitigate resistance and facilitate support within clinics. In addition, analysis suggests that financial incentives were a challenge to implementation, a critical incentive for participation, and a key element in determining the pace of progress. Although consumer engagement is a key element of the program, evidence for, and the efficacy of such involvement is mixed. The enabling legislation itself appears to be an important element that defines the intent, incentives, processes and expectations for the program, and is complemented by structured administrative rules and agency policies. These documents, along with technical assistance provided by the state and by independent organizations, provided valuable direction and support to PCPCH clinics. Eligibility criteria, certification metrics, and payment processes and systems are critical elements affecting implementation at the clinic level.

Conclusions: Policy documents, accountability metrics, and payment systems are unique elements that both define and influence the implementation of PCPCH programs. Clearly articulating statutory intent, program structure, and accountability processes can facilitate implementation, particularly under conditions in which timelines are short and service providers must coordinate multiple system transformation initiatives. Many states are actively engaged in efforts to incentivize coordination of care among providers of physical, behavioral, and oral health care, and to achieve the “Triple Aim” of better health, better care and lower cost. While financial support is critical to these efforts, clarity of intent, strong policy authority, and technical assistance are necessary to ensure successful implementation.

Implications for Policy, Delivery, or Practice: States at the forefront of health system transformation are experimenting with many approaches designed to improve the coordination, experience, and outcomes of care while also managing its overall cost. Comprehensive assessments of such efforts, including the influence of enabling legislation, administrative rules, and agency policies that shape program structures and processes, are critical, but often overlooked elements of the evaluation process. Systematic inclusion of these elements and the application of implementation science frameworks may highlight areas where the use of model statutory language and administrative rules would facilitate successful program implementation and achievement of system transformation goals.

Funding Source(s): Other, Oregon Health Authority under a grant from HRSA's State Health Access Program

Poster Session and Number: C, #1233

In VA, is Patient Centered Medical Home Readiness Associated with Cancer Screenings?

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Presenter: Danielle Rose, Ph.D., M.P.H., Research Health Scientist, Center for the Study of Healthcare Provider Behavior, VA Greater Los Angeles Healthcare System, danielle.rose@va.gov

Research Objective: Little is known about the relationship between organizational characteristics and receipt of preventative care. VA has implemented a national initiative to develop patient-centered medical homes (PCMH) in primary care settings. We report on the prevalence of PCMH features and their links with receipt of cancer screenings.
Study Design: Cross-sectional survey of census of VA primary care leaders (n=841).
Population Studied: In 2009, the American College of Physicians Medical Home Builder, a survey assessing PCMH-readiness, was fielded with primary care leaders at all VA Medical Centers and community-based outpatient clinics (response rate: 100%) just prior to implementation of PCMHs in VA primary care programs.
We calculated PCMH scores for seven modules: patient-centered care and communication; access & scheduling (access); organization of practice; care coordination; use of technology (technology); population management; and quality improvement. Higher scores indicate greater prevalence of PCMH features. We used VA’s HEDIS-like dichotomous outcome measures to assess achievement of guideline-concordant cancer screenings for breast and cervical cancer screenings for women and colorectal cancer screenings for all veterans. We tested the association between each PCMH score and cancer screenings in separate logistic regressions. Modules that were borderline significant (p<0.2) in associations with receipt of screenings were included in the multivariate analyses. Controls included primary care clinic type (hospital vs. community-based primary care clinic), complexity and distance from VA hospitals (for community-based clinics).
Principal Findings: Overall, a majority of sites had 70% of PCMH features. For screenings, 88% obtained mammograms, 93% obtained cervical cancer screenings and 82% colorectal cancer screenings. All module scores were associated with at least one screening, except for care coordination. Higher technology and quality improvement scores were associated with greater odds of receiving a mammogram (technology OR: 1.02, 95%CI: 1.003, 1.04; quality improvement OR: 1.03, 95%CI: 1.002, 1.05). Higher access scores were associated with greater odds of receiving a cervical cancer screening (OR: 1.09, 95%CI: 1.03, 1.15). Higher organization of practice scores were associated with lower odds of receiving a mammogram (OR: 0.96, 95%CI: 0.93, 0.99) or cervical cancer screening (OR: 0.96, 95%CI: 0.93, 0.99).
Conclusions: We found evidence of linkages between PCMH readiness and cancer screening. Sites with greater support for access, use and technology and quality improvement were more likely to report achieving cancer screenings. The negative relationship between organization of practice
scores and receipt of cancer screenings could reflect challenges in implementing new practices (e.g., problem lists, medication lists, flow sheets, regularly scheduled team meeting, daily team huddles, and standing orders for vaccinations). That is, these PCMH features may improve care in the long run, however implementation challenges in the short run may disrupt care and result in worse performance.
Implications for Policy, Delivery, or Practice: Organizations adopting PCMH may realize gains in cancer screening, but may struggle during implementation. Cancer screenings are not considered one of pillars of PCMH reorganization, so these findings signal that cancer screenings remain an important target for quality improvement.
Funding Source(s): VA
Poster Session and Number: C, #1234

Organizational Factors Associated with the Effective Implementation and Translation of a Primary Care Based Behavioral Program to Improve Blood Pressure Control: The HTN-IMPROVE Study
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Presenter: Ryan Shaw, PhD, RN, Post-doctoral Research Fellow, Center for Health Services Research, Durham VA Medical Center, ryan.shaw@dm.duke.edu
Research Objective: We sought to implement an evidence-based nurse-delivered self-management phone intervention to facilitate hypertension management within a large complex health system. The Hypertension Telemedicine Nurse Implementation Project for Veterans (HTN-IMPROVE) was deployed in primary care practices in 3 Veterans Affairs Medical Centers (VAMCs). Guided by the Weiner Organizational Theory of Implementation Effectiveness, a model of the determinants of
effective innovation implementation in organizations, we sought to answer the following research questions: 1) What is the level of organizational readiness to implement the intervention? 2) What are the specific facilitators, barriers, and contextual factors that may affect organizational readiness to change?

**Study Design:** Facilities agreed to enroll 500 participants over a 1-year period with at least 0.5 full-time equivalent employees of nursing time to execute the program. A priori semi-structure interviews were conducted with 27 stakeholders including nurses, physicians, administrators, and information technology professionals between 2010 and 2011. Through transcript review, researchers iteratively identified facilitators and barriers of organizational readiness to change (ORC) and intervention implementation.

**Population Studied:** 27 primary care stakeholders from 3 geographically diverse VAMCs.

**Principal Findings:** Key ORC facilitators included: Stakeholder buy-in; improving hypertension is a key performance metric and benefits of HTN-IMPROVE are recognized. Positive organizational characteristics likely to impact ORC include: 1) Situational factors: other similar programs (e.g., telehealth) that support buy-in, adequate staff, and alignment with existing clinic workflow and climate; 2) change valence (perceived value to organization's members): improvement in patient outcomes, is positive for the professional nurse role, and is evidence-based; 3) task demands: general understanding of the program to be implemented; 4) resource availability: office space, IT infrastructure and support, and existing equipment will be used. The primary ORC barrier was unclear long-term commitment of nursing. Negative organizational characteristics likely to impact ORC include: 1) situational factors: added workload, competition with existing clinical programs, length of implementation, and limited time available by nursing staff; 2) change valence: buy-in is only temporary until evidence shows improved patient outcomes; 3) task demands: contacting patients may be difficult, and the logistics of integration into existing workflow could be a challenge; 4) resource availability: inadequate staffing.

**Conclusions:** The model of organizational change identified key facilitators and barriers of organizational readiness to change and successful implementation of HTN-IMPROVE. Results show that ORC and readiness to implement the program is primarily positive as indicated by the perceived value of the program. However, the primary negative factors include unclear nursing buy-in, and as perceived by key stakeholders, resource availability.

**Implications for Policy, Delivery, or Practice:** There is a significant gap between discovery and delivery of evidence-based hypertension interventions. This study allows us to understand the needs and challenges of intervention implementation. Furthermore, examination of organizational facilitators and barriers to implementation of evidence-based interventions may inform dissemination in other chronic diseases. This project may have a substantial impact on hypertension management by helping VA and other health systems accelerate the translation of evidence-based medicine and reductions in health disparities.

**Funding Source(s):** VA

**Poster Session and Number:** C, #1235

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**The Effects of Non-Work/Work Interface on Hospital-Physicians’ Work Performance**

Prof. Ran Lachman, The College of Management Academic Studies; Shirley Shlefer

**Presenter:** Shirley Shlefer, Scholar, shlefer@012.net.il

**Research Objective:** The purpose of this study was to examine the effects of non-work/work conflict and the rarely studied effect of non-work/work enrichment on physicians’ performance at the hospital.

**Study Design:** An anonymous internet questionnaire was distributed to physicians using hospitals' mailing lists. In addition to physician's performance, the questionnaire consisted of measures of non-work/work enrichment, conflict and background variables. The effects of non-work/work interfaces on performance were examined also by braking down physician's hospital–performance into two comprising dimensions: Direct medical care and Caring for patients and human relations. Various control variables were examined as well, and explanations offered.

**Population Studied:** Respondents consisted of physicians working at 27 Israeli hospitals. 428 valid questionnaires were returned. These physicians were of 32 medical specializations at different stages of their medical career. The average age was 49, average work tenure was 16, 41 percent were women, and 88 percent married.
**Principal Findings:** The major results of the study were: a) A significant negative effect of non-work/work conflict on the different aspects of physician’s performance. Namely, the more non-work/work conflict experienced by physicians would damage their performance at the hospital; b) A significant positive effect (though weaker) of non-work/work enrichment on the different aspects of physicians’ performance. Namely, the more non-work/work enrichment experienced by the physicians would improve their performance at the hospital; c) A significant positive association (though weak) between conflict and enrichment; d) Enrichment is a partial mediator in the conflict’s effect on the different aspects of physician’s performance; e) Conflict is a partial mediator in the enrichment’s effect on the different aspects of physician’s performance; f) Gender and hierarchy status do not mediate the main effects of non-work/work conflict and of non-work/work enrichment on the aspects of physician’s performance at the hospital.

**Conclusions:** Both the positive and negative dimensions of non-work/work interface (i.e. enrichment and conflict) were found to explain together a significant percent of the variance of physician’s performance at the hospital. Gender and hierarchy status weren’t found to have any bearing on those effects. Between the two dimensions of the interface, Non-work/work conflict was found to be the main factor, having a major effect on physician’s performance and partially mediating enrichment’s effect.

**Implications for Policy, Delivery, or Practice:**

In the eternal strive to explain and improve the crucial physicians’ performance at the hospitals, physicians’ lives beyond work and its interface with work should be taken into strategic consideration.

In the shorter term, it is recommended to support and help physicians find coping strategies to reduce the non-work/work conflict and to enhance the non-work/work enrichment.

**Funding Source(s):** Other

**Poster Session and Number:** C, #1236

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**A Regional Collaboration for Quality Improvement for Patients with Chronic Conditions**

Barbara Sorondo, Eastern Maine Medical Center

**Presenter:** Barbara Sorondo, Director, Clinical Research Center, Eastern Maine Medical Center, bsorondo@emh.org

**Research Objective:** To describe an HIT-enabled primary care collaborative in which non-affiliated healthcare organizations created a culture of trust among clinicians that positively affects regional quality of care through transparent discussion of performance improvement (PI) data and best practices, and led to the creation of a regional ACO.

**Study Design:** Information on leadership, organizational structure, technology use, and processes implemented were gathered through structured interviews. A quasi-experimental, one group pre-post test design was used to analyze the performance improvement indicators. PI measures were obtained from a centralized data registry and reported monthly in an open forum using a Plan, Do, Study, Act approach.

**Population Studied:** PI indicators for diabetes mellitus (DM), cardiovascular disease (CVD), chronic obstructive pulmonary disease (COPD) and asthma patients were tracked and analyzed from September 2010 to September 2012 from 124 primary care providers with >50,000 active patients, from two healthcare systems and one FQHC. Interviews were conducted with CEOs, CMOs, Medical Directors, or Quality Directors of each organization to collect their views on the characteristics of a successful collaboration, leadership, and creating a sustainable multi-institutional collaboration. Interviews were 60-90 minutes long and were based on 17 open-ended questions.

**Principal Findings:** A total of 44 PI metrics (DM=19; CVD=12; Asthma=6; COPD=7) were tracked. A total of 36 (82%) have reached either interim or national goals. Blood pressure control and compliance with influenza immunization were among the most challenging metrics to improve. The PI collaborative has become sustainable and led to the creation of a regional ACO.

**Conclusions:** This paper presents an innovative, replicable, collaborative, and sustainable model for bringing together competing organizations to improve the healthcare in a community. Its success has been the basis for the region’s new ACO, which continues the PI Committee’s work beyond the regional program.

**Implications for Policy, Delivery, or Practice:** This paper presents an innovative, replicable, collaborative, and sustainable model for bringing
together competing organizations to improve the healthcare in a community. Its success has been the basis for the region’s new ACO, which continues the PI Committee’s work beyond the regional program.

**Funding Source(s):** Other, Office of the National Coordinator for Health Information Technology

**Poster Session and Number:** C, #1237

**The Impact of Variations in State Public Health Budgets, Workforce, and Social Capital on Population Behavioral Outcomes**

Huabin Luo, CDC; Sergey Sotnikov, Centers for Disease Control and Prevention; Timothy Van Wave, CDC

**Presenter:** Sergey Sotnikov, Ph.D., Economist, Office for State, Tribal, Local and Territorial Support, Centers for Disease Control and Prevention, ann0@cdc.gov

**Research Objective:** The objective of this research is quantitative evaluation of the effectiveness of use of financial, labor, and social capital resources in promoting healthy behaviors at the state level. A Grossman health production function approach is used to model the behavior of state public health authorities whose objective is assumed to be maximizing the number of people in their state that are practicing healthy behaviors, given financial, public health workforce, social capital assets, and other resources available.

**Study Design:** Data on state-level public health spending and the number of employed FTE in public health at the state level was obtained from the US Census of Governments. Social capital is approximated by the total number of civic, social advocacy, religious and grant giving non-governmental organizations from the US Census County Business Patterns database. Prevalence of state population health behaviors was derived from the BRFSS and combined with state population data from the US Census Bureau to calculate the total number of people at the state level that do not smoke, binge drink, eat recommended servings of fruits and vegetables, or exercise regularly. Multiple log linear regression analysis of relationships between healthy behaviors and state-level public health spending, workforce and social capital was conducted using a panel data set covering 1995-2008.

**Population Studied:** The units of analysis are state public health authorities and their decisions to allocate limited financial, public health workforce and social capital resources to maximize number of people in their state that practice healthy behaviors. The pooled panel sample contained a total of 714 observations of 50 states and District of Columbia over 14 years (1995-2008)

**Principal Findings:** The long-run elasticity estimates for public health spending ($\beta=0.256173, t=10.42$), public health FTEs ($\beta=0.267266, t=8.8$), social capital ($\beta=0.470633, t=17.62$) with respect to aggregate measure of healthy behaviors were statistically significant and of expected sign. These estimates imply that 10% increase in spending, FTEs or social capital will result in 2.5%, 2.7% and 4.7% increase in number of people practicing healthy behavior, respectfully. Overall, production function exhibited constant return to scale type, meaning that across the board 10% increase in all three input will lead to proportional (10%) increase in output. During 1995-2008 the marginal returns to public health spending declined from 0.40 to 0.25, while for public health labor force increased for 0.22 in 1998 to 0.40 in 2008. Returns to social capital did not change much during that period. The overall effectiveness (total factor productivity) as measured by constant term in annual regressions has been steadily improving over time.

**Conclusions:** This study suggests that social capital assets/networks, may be a more important determinant (at the margin) of success for promoting healthy behaviors in populations than financial and/or labor resources.

**Implications for Policy, Delivery, or Practice:** Investments in social capital and performance improvement may have positive impact on health outcomes. Strategies of preserving FTEs rather than simply maintaining current levels of funding can be an effective way to prevent deterioration of positive health behaviors in populations by using the higher marginal impact of public health workforce over time.

**Funding Source(s):** CDC

**Poster Session and Number:** C, #1238

**Interdisciplinary Practice Leadership for Quality Improvement in Ambulatory Care: Results from the First Year of the Veterans Assessment and Improvement Laboratory**

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System; Jacqueline J. Fickel, Greater Los Angeles VA Healthcare System; Lisa Altman, Greater Los Angeles VA Healthcare System; Negar Sapir, Greater Los Angeles VA Healthcare System; Lisa V. Rubenstein, Greater Los Angeles VA Healthcare System

Presenter: Susan Stockdale, Ph.D., Research Health Scientist, Greater Los Angeles VA Healthcare System, Veteran’s Health Administration, susan.stockdale@va.gov

Research Objective: New team-based primary care models such as the patient centered medical home (PCMH) or VA’s Patient Aligned Care Teams (PACT) program are complex to implement, requiring simultaneous achievement of new staffing models, performance goals, and practice organizational arrangements. The research reported here assesses whether a structured quality improvement process can facilitate implementation of PACT. In this paper, we: 1) Describe a multi-level intervention approach to creating a practice leadership infrastructure for implementing PCMH using quality improvement (QI) methods; 2) Identify barriers and facilitators to development of QI leadership infrastructure; 3) Discuss implications for implementation and sustainability of QI leadership infrastructure.

Study Design: VAIL Phase I included 3 demonstration site practices located in 3 VHA Healthcare Systems (HCS) in Veterans Integrated Service Network 22 (VISN 22). The study intervention supported the development of clinical organizational structures needed for conducting quality improvement, including a regional Steering Committee, local demonstration site interdisciplinary Quality Councils (QCs), and expert-led across-site workgroups (WGs). One of the main tasks of QC’s and WG’s was to develop QI “innovations,” designed to support PCMH implementation. The Steering Committee, comprised of VISN and HCS leadership, was tasked with reviewing these proposals and selecting the most meritorious for funding/support. We conducted 60-minute, semi-structured interviews with 58 key stakeholders at the end of VAIL Phase I (October 2011 – April 2012). Interviews were coded and analyzed using ATLAS.ti software. Deductively derived codes facilitated the identification of key themes, which were then further demarcated with inductively derived codes. For this paper, codes related to how local QCs formed and evolved were analyzed.

Population Studied: Key stakeholders in VISN 22, including VISN, HCS, and practice site leadership.

Principal Findings: The Steering Committee, QCs, and WGs were implemented over a 3 month period at all sites. Regular participation in QCs, WGs, and VISN Steering Committee was high, including preparation and review of 30 PACT-related innovations proposals. Steering Committee members were able to come to agreement in selecting 8 innovations and 7 were initiated; a similar level of activity carried through the following year with 30 new proposal reviews. Based on interviews, QCs and WGs at all three sites showed substantial interdisciplinary participation and interaction. Interviewees commented that the QCs supported practice transformation. The structure and functioning of these groups, however, differed at each site, shaped by pre-existing infrastructure and relationships among clinical leaders and research partners. Interviewees reported that pre-existing interdisciplinary relationships and the availability of a dedicated program support assistant with data/IT skills facilitated QC and WG functioning. Lack of engagement of key leaders, however, was a barrier to successful implementation and spread of innovation projects.

Conclusions: The research-clinical partnership studied here was able to implement a multi-level quality improvement process including interdisciplinary regional administration, medical center leadership, and local primary care, with across-discipline interaction in all sites. The rapid and voluntary uptake of the new clinical organizational structures suggests a need for forums for interdisciplinary quality improvement management for PCMH implementation.

Implications for Policy, Delivery, or Practice: Empowering multilevel interdisciplinary leadership through a structured research-clinical partnership is feasible, and can promote innovation targeting practice transformation.

Funding Source(s): VA
Poster Session and Number: C, #1239

Examining the Features Necessary for Achieving High Reliability in Patient Safety: What do VA Medical Centers have in common?
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Research (COLMR); Jeffrey Solomon, Center for Health Quality, Outcomes, and Economic Research (CHQOER); Jennifer Hayes, VA Office of Academic Affiliations; Amy Rosen, Center for Organization, Leadership, and Management Research (COLMR)

Presenter: Jennifer Sullivan, Ph.D., M.S., Health Science Specialist, Center for Organization, Leadership, and Management Research (COLMR, VA Boston Healthcare System, jennifer.sullivan@va.gov

Research Objective: Although high reliability science has been applied to healthcare organizations, there is little empirical evidence on whether organizations such as the Veterans Health Administration (VA), which has long been a national leader in improving patient safety, have achieved levels of high reliability with respect to performance on patient safety. Our objective in this study is to describe three features necessary to achieve high reliability—leadership, safety culture, and robust process improvement (PI). Leadership support is important to obtaining high reliability because organizational improvements cannot succeed without it. A safety culture is necessary because it conveys the importance of safety principles and informs staff how to function. Robust PI is also an essential to attaining high reliability because these approaches allow staff to systematically diagnose and solve safety problems. We hypothesize a consistent presence of these high reliability features across VAMCs because of their long-term emphasis on development of analytic tools, training programs, and focus on patient safety.

Study Design: In-person site visits were conducted in 2009-10 with a total of 141 clinicians and leaders. Subjects were interviewed about structures and process of care related to patient safety at their hospitals. Analysts coded qualitative data for the three key features necessary to achieve high reliability—leadership, safety culture, and robust PI; data were aggregated into six individual site summaries. A cross-site matrix was created to compare safety practices across sites.

Population Studied: Six VAMCs selected based on adequate surgical volume, geographic distribution, and variation in the Agency for Healthcare Research and Quality’s Patient Safety Indicator Composite measure.

Principal Findings: We found evidence of variation in leadership support and patient safety culture, and some consistency in robust PI at the six sites. Leaders expected safety events to be measured, their performance benchmarked, and results reviewed by formal committees. The following leadership support practices varied: high expectations of low AE rates, monitoring AE rates, and personal involvement in PI teams. Sites also varied in evidence of strong safety cultures, from those where staff felt comfortable speaking up about AEs to where they felt ‘shamed and blamed’. Most staff reported feeling personal responsibility for reporting and reducing AEs. Although robust PI techniques were generally evident in all six sites, these varied with respect to techniques used at each site.

Conclusions: Our results suggest that the six VAMCs in our sample have most of the features in place to achieve high reliability, yet there was variation in practices within each element. More primary data collection is needed to further categorize these sites in terms of reliability and to better understand the extent to which variation in elements affects level of reliability.

Implications for Policy, Delivery, or Practice: High reliability science provides systematic principles for hospitals to use in order to improve patient safety events. This study has shown that even for VA hospitals with evidence of reliable practices, variation in practices within each domain indicates that more can be done before we can identify high reliability in the VA.

Funding Source(s): VA

Poster Session and Number: C, #1240

Evaluation of Scientific Management Theory Applied to Operating Room Efficiency
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Presenter: Akkeneel Talsma, Ph.D., R.N., Assistant Professor, Surgery - Transplant, University of Michigan, antalsma@umich.edu

Research Objective: The purpose of this study is to evaluate whether OR duration is a function of two types of standardization unique to surgical processes. Discontinuity in the pairing of nursing staff or case scheduling may hamper efficiency as handoffs occur and task flow is disrupted. Frederick Taylor’s Scientific Management Theory (SMT) emphasizes
standardizing work processes to achieve time efficiency, and may serve as a framework for evaluating the effect of standardizing staffing and case scheduling on OR duration. This study presents the concept of circulator-scrub dyad consistency, where the nursing staff circulator and scrub from one surgical case remain paired into the subsequent case. 

**Study Design:** This cross-sectional, cohort study used OR electronic health records including data on preoperative patient health status and case complexity. Nursing staff presence, and type of procedure in sequential surgical cases, documented by OR nurses, identified circulator-scrub dyads and procedure consistency. The dataset was compiled through the American College of Surgeon’s National Surgical Quality Improvement Plan program. Descriptive statistics and hierarchical regression were employed to analyze dyad consistency, procedure consistency, and surgical times.

**Population Studied:** The study population was 310 adult general surgery cases conducted in a large U.S. teaching hospital during 2008.

**Principal Findings:** More than 80% (n=249) of the cases demonstrated circulator-scrub dyad consistency. After controlling for environmental, patient health status, and case complexity variables, hierarchical regression revealed that dyad consistency did not explain a significant portion of the variation in total OR duration (R2 change =.001, Finc(1,292) = .32, p = .576), and did not make a unique statistically significant contribution to explaining total OR duration (B = -373.78, t = -5.56, p=.576). However, scheduling the same type of procedure in sequential cases was statistically significant for an association with lower total OR duration (B = -1563.93, t = -3.32, p < 0.05) and turnover time between cases (B = -282.96, t = -4.23, p < 0.001), thereby reducing total OR time and turnover time by 26 minutes and 4.7 minutes, respectively.

**Conclusions:** The concept of circulator-scrub dyad consistency, although not statistically significant for an effect on OR duration in this study due to lack of variation in the sample, will be useful in developing nursing staff structure to achieve efficiency and cost savings. Scientific management theory has potential applications for improving teamwork, coordination, and surgical flow. Future studies should consider circulator-scrub dyad consistency and other staffing characteristics unique to the OR for streamlining day-to-day and longer-term use of resources that contribute to an efficient and harmonious surgical environment. The use of time in the OR has implications for health care costs, access, and policy. Efficiency, measured in minutes pared from surgical processes, heightens prospects for improving surgical care without increasing expenditures on staffing, supplies, or infrastructure.

**Implications for Policy, Delivery, or Practice:** Standardization of nursing staff arrangements may affect the timely provision of health care without increasing expenditures. Principles of scientific management theory may be applied to uncover nursing staff arrangements and case scheduling patterns that minimize the opportunity cost of time to patients and providers, and that maximize the talents of existing health delivery inputs.

**Funding Source(s):** RWJF

**Poster Session and Number:** C, #1241

**Redesigning a Primary Care System – Bringing Together Employees**

**Understanding of the Moving Parts**

Andrada Tomoia-Cotisel, University of Utah; Debra Scammon, PhD, University of Utah, David Eccles School of Business; Karl Blanchet, PhD, London School of Hygiene & Tropical Medicine; Zaid Chalabi, PhD, London School of Hygiene & Tropical Medicine; Bernd Rechel, PhD, London School of Hygiene & Tropical Medicine; Norman Waitzman, PhD, University of Utah, Department of Economics; Julie Day, MD, Community Clinics, University of Utah Hospitals and Clinics; Michael K. Magill, MD, University of Utah, Department of Family and Preventive Medicine

**Presenter:** Andrada Tomoia-Cotisel, MHA, MPH, Research Associate, Department of Family & Preventive Medicine, University of Utah, andradat@hsc.utah.edu

**Research Objective:** To increase knowledge and understanding of the complex system redesign of a patient centered medical home (PCMH). PCMH analysis to date has been focused on the impact of the overall transformation on outcomes. Newer studies correlate particular PCMH elements to outcomes. This work provides a holistic qualitative understanding of our system’s PCMH as experienced by those working within it – the PCMH components, their interactions and emergent behavior – an understanding, which can ultimately yield insights to guide efficient and successful transformation of delivery.
Study Design: Descriptive qualitative design for employee semi-structured interviews. Using a systems thinking approach, the perspectives of University of Utah Community Clinics (UUC) providers, medical assistants (MAs), and management are explored and integrated into a portrait of Care By Design (CBD), the UUC’s version of the PCMH. Causal loop diagrams (CLDs) illustrating each participant’s view of CBD – its elements, relationships, and feedback loops – were created based upon qualitative analysis of interview data from 2011. CLDs were analyzed to identify the most prevalent components and feedback loops. CLD variation was explored by clinic, role, and primary care team (typically consisting of 2 providers and 5 MAs).

Population Studied: The study population is employees implementing and managing the PCMH redesign within the UUC Clinics. One provider and one MA from each team were interviewed (n=46). All Leadership (n=9), Center Managers (n=9), Center Medical Directors (n=10) and Nurse Supervisors (n=8) were interviewed.

Principal Findings: CLDs illustrate employees’ understanding of the PCMH within which they operate. CLD variation is observed by clinic, role, and team. Principal findings include important tensions, feedback loops and unintended consequences experienced by informants in implementing the UUC’s version of the PCMH. Preliminary results suggest themes that merit further exploration:

1. Each personnel category identifies with particular CBD elements (e.g., MAs with the Care Teams subset)
2. There is extensive variation among CLDs within each clinic, even within personnel categories
3. Feedback loops suggest tensions within the CBD system of care (e.g., between elements supporting appropriate access and elements supporting continuity)

Conclusions: Examination of the inner workings of this PCMH model provides insights into interactions and feedback loops that are critical to the success of delivery transformation. The systems thinking perspective may be useful as managers implement practice transformation. Recognition of the various levels of complexity within a system and the range of understanding that employees may have can provide insights for helping employees appreciate how the pieces of the system fit together. Of particular value is an understanding of system components, sub-systems, linkages, feedback loops, and complexity of the feedback loops.

Implications for Policy, Delivery, or Practice: Tensions, feedback loops and unintended consequences identified provide a view into the emergent behavior of the system of care delivery that is our PCMH. For those fostering the implementation of PCMHs, this view provides a way to think about the dynamics of transformation and thus enhance future implementation efforts.

Funding Source(s): AHRQ
Poster Session and Number: C, #1242

Systems Thinking - A Facilitator of PCMH Implementation?
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Presenter: Andrada Tomoaia-Cotisel, MHA, MPH, Research Associate, Department of Family & Preventive Medicine, University of Utah, andradat@hsc.utah.edu

Research Objective: To explore how a primary care team’s understanding of the University of Utah Community Clinics (UUC) healthcare delivery system is associated with that team’s patient centered medical home (PCMH) implementation. This system-level understanding is illustrated by the structures, processes and feedback loops identified. The UUC’s version of the PCMH is called Care By Design (CBD).

Study Design: Cross-sectional design using semi-structured interviews with management and care team members, including physicians and medical assistants (MAs), as well as team level data measuring the extent of implementation (0 = not implemented to 4 = fully implemented) of 28 individual components of CBD. Data collection strategies included observation, chart audit, and operational reports. Data were collected in 2011. Qualitative analysis of interview data was used to create a causal loop diagram (CLD)
illustrating each participant’s view of the UUCC system. CLDs from the provider and MA on each team are combined to form one team level CLD (tCLD). These tCLDs are then categorized by level of complexity, composition and level of agreement (i.e., teams and management; provider and MA). Correlation analysis was used to assess relationships between teams’ implementation of CBD (at three levels: aggregate, 3 CBD principles, and 28 individual components) and the complexity and composition of their tCLDs, controlling for level of agreement.

**Population Studied:** The study population includes all clinical teams from the 10 UUCCs. Interviews (n = 46) were conducted with one provider and one MA from each team. Each clinic’s management (Center Manager, Medical Director, and Nurse Supervisor) was also interviewed (n=27).

**Principal Findings:** Preliminary correlation analyses suggest:
1. Perception of one’s own level of implementation does not necessarily correlate with actual implementation (e.g., provider describes the difficulties in implementation, observes the system in its complexity, and thinks he is failing at implementing the changes; when, in fact, he is implementing a large portion of them)
2. Mediating effects may include: Clinic management personnel’s understanding of the system. The level of agreement between CLDs of MAs and providers on the same team
3. The potential existence of a tipping point in understanding; where, respondents reaching that level of understanding (identified components and complexity), successfully implement all three CBD principles.

**Conclusions:** A fuller understanding is important to achieving a higher level of PCMH implementation, even when that higher level of understanding may translate into resistance to implementation. Having employees at all levels who identify more of the system components and recognize the system’s complexity allows them to better implement complex system redesign such as PCMH.

**Implications for Policy, Delivery, or Practice:**
- Soliciting input from employees implementing the redesign, both supporters and detractors.
- Exploring system problems identified, facilitating experimentation and communicating solutions.
- Augmenting employees’ understanding in areas of the system with which they are less familiar.

2. The Personnel Strategy
   - In hiring, training and retention, fostering an organization of employees who are able to better understand systems.

**Funding Source(s):** AHRQ

**Poster Session and Number:** C, #1243

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**Innovative Strategies for Improving Diabetes Care Management for Vulnerable Populations: Facilitators and Barriers to Integration in Routine Primary Care**

**Philip Van Der Wees, Harvard Medical School; Mark W. Friedberg, RAND; John Z. Ayanian, Harvard Medical School; Hector P. Rodriguez, UCLA Fielding School of Public Health**

**Presenter:** Philip Van Der Wees, Ph.D., Research Fellow, Health Care Policy, Harvard Medical School, vanderwees@hcp.med.harvard.edu

**Research Objective:** Patient panel management and community-based care management may be a viable option for community health centers that serve vulnerable patient populations with diabetes. The purpose of our study was to assess approaches for integrating office based panel management and community based management in routine primary care, and to identify barriers and facilitators for implementation.

**Study Design:** The iCare Diabetes trial provided the basis for our study, in which 14 clinic sites participated from five health care organizations in Northern California. The clinic sites were at random allocated to the intervention group (n=5) or control group (n=9). The five intervention clinics were at random allocated to an intervention using a medical assistant panel manager (n=2) or community health worker (n=3). We conducted key informant interviews from the participating clinics when the clinics were in the first half of the 12 months intervention phase. The aim of the interviews was to learn about changes for improving diabetes care, and perceived barriers and facilitators encountered during the early implementation period.

**Population Studied:** We invited key informants from each clinic site to participate. The following
roles were assigned for key informants: practice coordinator, clinician, medical assistant (MA), community health worker (CHW), and other roles (nurse/allied health professional). We conducted thematic analysis for each of the four roles to identify diabetes care improvement strategies as well as perceived barriers and facilitators to implement these strategies.

**Principal Findings:** The team models varied considerably among the CHW and MA intervention clinics, resulting in differences in the organization and implementation of health coaching activities. Some clinics used components of the Teamlet Model of primary care, being a small team of a clinician and health coach, as an extension of the traditional physician visit, by introducing pre-visit, post-visit, and in-between visits of the MA to provide chronic disease self-management support. Implementation of regular home visits of the CHW was not always feasible. Responses from both CHW and MA emphasized the importance of the support from the collaborating clinician and practice leader. A team climate that enables the MA and CHW to take responsibility in their health coaching activities was consistently mentioned as an essential component to grow in their new role and to gain trust from their patients. Participants were optimistic that evidence for the effectiveness and efficiency of the health coaching positions would convince management to allocate sufficient resources for the future.

**Conclusions:** Real world implementation of interventions to improve diabetes care management for vulnerable populations resulted in considerable differences among the two intervention arms in our randomized controlled trial. The anticipated roles of the MA and CHW in their health coaching activities were executed in different ways.

**Implications for Policy, Delivery, or Practice:** The implementation of MA and CHW health coaches underscores that tailored approaches are required. Allowing for latitude in approaches may deviate from the originally intended models, but allow for acceptance and adaptation.

**Funding Source(s):** AHRQ

**Poster Session and Number:** C, #1244

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**Quick Turns in Tight Spaces: Implementing Change in Small Practices using Streamlined Lean – A Multiple Case Study on Changing Opiate Prescription Management**

Constance Van Eeghen, University of Vermont; Charles MacLean, MD, University of Vermont; Mark Pasanen, MD, University of Vermont; Amanda Kennedy, PharmD, University of Vermont

**Presenter:** Constance Van Eeghen, Assistant Professor, General Internal Medicine-Research, University of Vermont, cvaneegh@uvm.edu

**Research Objective:** Increasing abuse, misuse and diversion of prescription opioids in Vermont has highlighted the need for providers to change their processes for prescribing. However, small independent practices face challenges in adopting new strategies because of time constraints and lack of quality improvement (QI) support. Our state health department supported the development of a streamlined version of “Lean” QI focused on prescription processes for 10 ambulatory practices with limited QI resources. The objective of this study is to describe the use of Lean by these practices and the types of changes that were accomplished over short timeframes.

**Study Design:** This multiple case study followed ten unrelated ambulatory practices as each used a standard Lean template to analyze workflow and implement changes. The practices were asked to choose at least one from a menu of 14 suggested strategies for managing opioid prescriptions. The Lean approach was characterized by limited meeting time (8 hours total), multi-disciplinary teams that ranged from 3-8 members, direct involvement of front line providers and staff, and a tightly structured problem solving approach. Teams staged the Lean process at their convenience and bypassed some of the Lean process steps. We collected qualitative data from each team’s Lean documentation and field journals of our direct observations to understand how practices used and adapted the Lean process and which strategies they implemented.

**Population Studied:** The study subjects were providers and staff from ten practices (one Internal Medicine, six Family Medicine, two combined Family Medicine/Internal Medicine, and one Orthopedics). Practice ranged from two to 12 prescribing providers.

**Principal Findings:** All 10 practices completed the Lean process, using between six and eight of the 10 standard process steps. All 10 practices used four steps: shared identification of the underlying issue, data collection on multiple perspectives on the background of the issue, system diagram of the current patient care process for opioid refills, and an
implementation plan. The absence of the other steps was generally not related to successful process improvement. The one exception was that the absence of the time-study step was associated with higher implementation rates (P=0.07 by Fisher’s exact test). Based on our observations, teams were able to compensate for missing steps due to their previous work on process analysis, readiness for suggested strategies of prescription management, and their motivation for change. The two most common strategies implemented, used by at least four teams, were developing agreement among all prescribers to use a standard process for prescription management and establishing a roster of opioid prescription patients.

**Conclusions:** A streamlined approach to Lean management can be used in a variety of small ambulatory practices to implement change regarding challenging patient care issues. Adapting the process to accommodate local constraints did not decrease successful implementation and may have advantages in efficiency.

**Implications for Policy, Delivery, or Practice:**
Policy makers and health care leaders may find it effective to support practical implementation strategies for smaller, front-line health care organizations where a large proportion of health care is delivered.

**Funding Source(s):** Other, Vermont Department of Health

**Poster Session and Number:** C, #1245

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**Diversity in Upper Level Healthcare Management: A Gender Analysis**

Mary K. Zimmerman, University of Kansas School of Medicine; Tracey LaPierre, PhD, University of Kansas

**Presenter:** Mary K. Zimmerman, PhD, Professor of Health Policy & Management, Department of Health Policy and Management, University of Kansas School of Medicine, mzimmerman@ku.edu

**Research Objective:** This research focuses on gender disparity in upper-level healthcare management positions in the US, seeking first to identify and then to understand the conditions under which inequities in advancement occur for women compared to men. Analyses were conducted for three specific objectives: 1) assess the degree of gender equity among those promoted into top management and to analyze the impact of individual, organizational and family variables; 2) examine gender differences in perceived discrimination and harassment and attitudes toward gender equity; 3) examine gender differences in managerial aspirations.

**Study Design:** The study analyzes responses from a cross-sectional, nationally representative survey of men and women health care executives. Gender comparisons were conducted on the impact of individual, family, and organizational characteristics in relation to gender equity variables. Main dependent variables were: level of first healthcare management position; current position level; and promotion to senior management or not. Bivariate gender analyses employed chi square and one-way ANOVA. Multivariate logistic regression was used to analyze gender differences in advancement controlling for individual, family, and organizational variables.

**Population Studied:** Data were drawn from the American College of Healthcare Executives’ 2006 Gender and Careers in Healthcare Management Survey, a national, stratified, probability sample of male and female managers. All 1,597 survey respondents completed a standard set of questions plus one of two specialized sets of questions, with random assignment to populate each version. The current analysis uses a subset of 685 individuals (312 men and 373 women) who met study requirements and had completed the questionnaire version with items most compatible with study objectives.

**Principal Findings:** Regarding degree of gender equity, after controlling for numerous individual, family and organizational factors, women still had 32 percent lower odds of promotion into upper management. Mentoring was a significant predictor of promotion to senior management but only when the mentor was male. One-third of women perceived gender discrimination in the past five years and were more likely to report gender discrimination. Men began their careers in higher positions than women, and less than half compared to 80% of women supported efforts to proportionally increase women managers. Women were also significantly less likely than men to aspire to top positions, again controlling for multiple factors.

**Conclusions:** Expected health system growth under the ACA and the need to strengthen upper-level healthcare management require retaining and promoting the “best and the brightest.” Persisting gender disadvantage as identified by this research is troubling and
demands remediation. Gender differences in aspirations raise concerns about the gender friendliness of workplace cultures and policies. Findings also raise questions about the extent to which the locus of change resides in the individual as opposed to organizational culture and policies.

**Implications for Policy, Delivery, or Practice:**
Findings reveal multiple avenues for policies and practices that will help reduce gender disparities: men mentors (upper management), policies to address work-family conflict, and programs to improve the gap in cultural understandings between men and women managers.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #1246

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**PAYMENT AND DELIVERY SYSTEM INNOVATIONS**

**Early Experiences from the Massachusetts Multi-Payer Patient-Centered Medical Home Initiative**

Teresa Anderson, University of Massachusetts Medical School; Linda Cabral, University of Massachusetts Medical School; Laura Sefton, University of Massachusetts Medical School; Ann Lawthers, University of Massachusetts Medical School; Humberto Reynoso, University of Massachusetts Medical School

**Presenter:** Teresa Anderson, Ph.D., Director For Evaluation, Center for Health Policy and Research, University of Massachusetts Medical School, terri.anderson@umassmed.edu

**Research Objective:** The Massachusetts Patient-Centered Medical Home Initiative (MA-PCMH) is the Executive Office of Health and Human Services’ (EOHHS) public (Medicaid)/private cooperative effort to promote adoption of the patient centered medical home (PCMH) model. Since the MA-PCMH’s inception in 2010, the Center for Health Policy and Research at UMass Medical School has evaluated the MA-PCMH’s intervention with a diverse group of 45 primary care practices. The full evaluation seeks to measure select outcomes, including: mastery of Patient Centered Medical Home (PCMH) core competencies; improvements in patient experiences; and clinical impact - relative to non-participating practices. The evaluation’s qualitative study aims to describe the MA-PCMH primary care practices’ early experiences with adopting the PCMH model and the challenges faced.

**Study Design:** This qualitative study uses a descriptive design with multiple data sources. Three rounds of in-depth, semi-structured individual interviews and focus groups with the practices’ Medical Home Facilitators (MHF) were conducted over 14 months. The 45 practices’ MA-PCMH applications were collected and field notes taken at 5 MA-PCMH collaborative learning sessions. Using an analysis plan framed by the study aims, PCMH competencies, organizational change theory and evidence from other PCMH initiatives data were deductively coded. The MA-PCMH evaluation workgroup assessed the credibility of the qualitative team’s work. The University of Massachusetts Human
Subjects Institutional Review Board approved this qualitative study (Docket #14225).

**Population Studied:** The 45 MA-PCMHI primary care practices selected via an EOHHS competitive bid process.

**Principal Findings:** Over half of practices selected for the MA-PCMHI are Community Health Center affiliates (54%) and have multiple practice specialties (56%). Most are located in urban areas (89%). The 45 practices include independent physician practices as well as safety net hospital affiliates. Practices’ experience with health information technology varied widely at project inception. The analyses produced four themes: (1) each practice has a unique medical home adoption experience which requires a time span sufficient for organizational and personal transformation; (2) practice leaders’ consistent support is necessary for PCMH adoption; (3) information technology shortcomings impede PCMH adoption as does (4) generating revenue via fee-for-service reimbursement.

**Conclusions:** A practice adopts PCMH principles and practices at its own pace which may exceed the time span of a demonstration project, for example the MA-PCMHI’s three year period. Therefore, it is important to allow sufficient time, facilitate the adoption process and monitor the practices’ progress as well as the expected clinical and cost outcomes. While monitoring practices’ progress, the MA-PCMHI has worked to sustain high levels of support from the practice organizations’ executive leaders (CEOs) and enhance information technology systems’ functioning to support PCMH model care. In a fee-for-service environment, PCMH model care is not always reimbursed.

**Implications for Policy, Delivery, or Practice:** Practices require sufficient time, consistent executive leadership support, proficiency in electronic medical record and patient registry use, and adequate financial reserves for PCMH model adoption. Therefore, PCMH initiatives should consider practices’ readiness and reserves for the change expected during a specified time period.

**Funding Source(s):** Other, MassHealth, the Massachusetts Medicaid Program

**Poster Session and Number:** A, #431

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**Primary Care Physicians’ Readiness to Provide Accountable Care and Achieve the Triple Aim**

Anne-Marie Audet, The Commonwealth Fund; Michelle Doty, The Commonwealth Fund

**Presenter:** Anne-marie Audet, M.D., Vice President, Quality Improvement and Efficiency, The Commonwealth Fund, ama@cmwf.org

**Research Objective:** Little is known about the extent to which primary care practices are implementing accountable care strategies to provide enhanced access, care management and outreach to individual patients and panel populations; coordinated care among various providers within and outside the practice; engage patients in their care; and track and monitor quality and utilization. This study provides a snapshot of current readiness of primary care physicians to provide accountable care and discusses whether payment incentives and additional practice redesign resources can foster transformation.

**Study Design:** Data come from the 2012 Commonwealth Fund International Health Policy Survey of Primary Care Physicians. We use 30 items to create composite scores to assess whether physicians have capacity in five domains that are essential for accountable care: 1) providing enhanced access; 2) collecting actionable data to manage individual and patient populations; 3) managing and coordinating patient care within and outside their practice; 4) patient outreach; and 5) collecting and comparing data on clinical performance, process, outcomes and patient experience. We describe the degree to which physicians achieve each domain, and examine characteristics associated with greater “accountable care” capacity.

**Population Studied:** A nationally representative sample of 1,012 primary care physicians in the United States.

**Principal Findings:** Only 19% of primary care physicians can provide “enhanced accessible care”, including same or next-day appointments and after-hours care. Nearly half of physicians have HIT capacity which enables them to manage individual patients and panel populations. Physicians have greater capacity to coordinate patient care within their practice than with outside providers. Most physicians contact their patients in between visits (72%) and help coordinate care for their patients after discharge (76%); only one-third of physicians can
Research Objective: Oral anticoagulation therapy (OAT) is a proven therapy for stroke risk reduction, but has been underutilized in medical practice. Failure to use low cost OAT among patients with atrial fibrillation (AF) is an increasing driver of rising health care costs; oral anticoagulation use has been found to reduce costs by 30 percent among individuals with AF. In 2008, updates to the Joint Commission National Patient Safety Goals addressed anticoagulation medications. Their effect on OAT use has not been evaluated. The objective of this study was to estimate the effect of regulatory policy changes concerning anticoagulation on OAT underuse in real-world clinical settings. Specifically, we examined the effect of The Joint Commission’s National Patient Safety Goals (NPSG) on initiation of oral anticoagulation therapy for individuals with incident atrial fibrillation.

Study Design: We created a retrospective cohort with two comparison groups in a new user design. Complete North Carolina State Employee Health Plan claims data from 944,500 individuals enrolled between January 1, 2006 and December 31, 2010, were supplemented with data from the Area Resource File and Online Survey, Certification and Reporting data network. We then tested for changes in oral anticoagulation therapy initiation following the update of NPSG to address anticoagulation. We developed multivariate models using difference in difference estimates with critical control variables defined a priori. Effects were estimated with generalized estimating equations using a log link, poisson distribution and exchangeable correlation structure with clustering at the facility level.

Population Studied: Incident cases of AF were identified from the North Carolina State Employee Health Plan, a privately insured population of active and retired state workers and their dependents. Incident cases of mechanical heart valve placement or severe systemic thromboembolism were similarly identified as a positive comparison group. Incident cases of paroxysmal atrial fibrillation with major contraindications to receiving OAT were identified as a negative comparison group. The analytic sample included 12,290 individuals with 38 percent in the treatment group of interest, 5 percent in the negative comparison group and 57 percent in positive comparison group.

Principal Findings: The unadjusted pre/post treatment group difference was an increase from
28 percent to 32 percent, while the positive comparison group declined from 65 percent to 60 percent OAT initiation following index clinical event. The multivariate difference in difference estimate, representing eligible individuals with incident atrial fibrillation, exhibited an 11 percentage point increase in OAT initiation (SE=3.6).

**Conclusions:** The updating of NPSG to include anticoagulation is associated with greater initiation of guideline concordant oral anticoagulation therapy for eligible individuals with incident atrial fibrillation.

**Implications for Policy, Delivery, or Practice:** This research examines an understudied area of health policy governing health care delivery safety and quality in a population with documented underuse of appropriate cost-saving therapy.

**Funding Source(s):** AHRQ

**Poster Session and Number:** A, #433

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**Improving Care Coordination in Patient-Centered Medical Homes: An Assessment of Referrals and Coordination between Primary and Specialty Care**

Amanda Borsky, CNA; Shing Lai (Angie) Cheng, MPH, CNA; Thomas Bickett, MA, CNA; Linda Pikulin, MA, CNA

**Presenters:** Amanda Borsky, MPP, Research Analyst, Health Research and Policy, CNA, borskya@cna.org

**Research Objective:** To analyze referral patterns between patient-centered medical homes (PCMHs) and specialty care practices and assess how PCMHs interact and coordinate with specialists in the Military Health System (MHS), U.S. Navy.

**Study Design:** This is a mixed methods study with quantitative and qualitative components. First, qualitative data is collected from semi-structured interviews with providers at PCMH sites to identify reasons why PCMH providers refer to specialty care and reasons specialty providers perceive that PCMH providers refer patients to their care. Second, a retrospective analysis of the MHS administrative claims database is used to determine the change in specialty referral patterns before and after PCMH implementation at each site. We will apply various statistical tests to determine whether there are significant differences in key outcome measures that include: the number and types of referrals, the characteristics of providers initiating and receiving the referrals, and the characteristics of patients being referred to specialty care before and after PCMH implementation.

**Population Studied:** The population studied includes TRICARE patient enrollees at four family medicine and pediatric PCMHs that are part of the MHS, U.S. Navy. Patients include active duty and their dependents and retirees and their dependents. The population also includes primary and specialty care providers.

**Principal Findings:** A 2010 position paper by the American College of Physicians provided a framework for how to improve interactions and coordination between the primary care clinicians and specialists within a medical neighborhood. Based on preliminary feedback from some of the more mature PCMHs, Navy Medicine leadership has heard that specialists may be receiving referrals for issues that perhaps could have been addressed within the PCMH. While some referrals to specialists are clinically appropriate, other referrals may not be necessary. Informal discussions with clinicians suggest that appropriateness can be inferred based on the outcome of the referral (e.g., referrals that result in surgery). In addition, when PCMH providers refer patients to specialty care providers, it is unclear what types of information the specialty provider communicates back to the referring PCMH provider about the patient’s care and follow-up.

**Conclusions:** The PCMH model emphasizes the provision of better access, continuity, wellness, and disease management for its patients. To achieve these goals, an emphasis on care coordination is needed.

**Implications for Policy, Delivery, or Practice:** Findings from this study will provide an understanding of the communication and coordination functions between PCMH and specialists and help to better define the respective roles and responsibilities of providers within the medical neighborhood in order to improve care coordination and the quality of care for patients.

**Funding Source(s):** Other, U.S. Navy, Bureau of Medicine and Surgery

**Poster Session and Number:** A, #434

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**EAC, AAC, and the Battle for Supremacy among Medicaid Prescription Drug Reimbursement Benchmarks**

Brian Bruen, George Washington University; Katherine Young, Kaiser Family Foundation
**Presenter:** Brian Bruen, MS, Lead Research Scientist & Lecturer, Department of Health Policy, George Washington University, bkbruen@gwu.edu

**Research Objective:** In February 2012, CMS released draft rules that would change payment for Medicaid-covered drugs from existing “estimated acquisition cost” (EAC) standards to “actual acquisition cost” (AAC) standards. This paper describes several new pharmacy payment metrics under development or in use at the federal and state levels, compares these various metrics for several high-use medications, and discusses implications for state Medicaid officials, researchers, and others with an interest in understanding the changing landscape of prescription drug reimbursement in Medicaid.

**Study Design:** This paper first reviews existing regulations and guidance pertaining to reimbursement for outpatient prescription drugs by Medicaid programs, including the February 2012 proposed rule, with quantitative comparisons of various benchmarks available to states to help determine reimbursement amounts. The document review draws primarily on regulations and formal letters sent by CMS to states, but also includes a review of existing research comparing these benchmarks. Quantitative comparisons draw on multiple data sources including Medicaid drug utilization data and reimbursement amounts reported to CMS by states; drug price data from a commercial drug database similar to those used by states to determine EAC; and newly available data from states and the federal government concerning acquisition costs and retail pricing for medications.

**Population Studied:** This analysis focuses on pricing and reimbursement benchmarks currently used by states to determine payments to pharmacies for prescription drugs under Medicaid (e.g., average wholesale price (AWP), wholesale acquisition cost (WAC), actual acquisition cost (AAC) and average manufacturer price (AMP), as well as new measures under development at the federal and state levels including National Average Retail Price (NARP) and National Average Drug Acquisition Cost (NADAC).

**Principal Findings:** Although they operate under by a common set of federal regulations and guidelines, states use a variety of approaches to determine reimbursement levels to pharmacies for outpatient prescription drugs dispensed to Medicaid beneficiaries. Concern about the availability and reliability of AWP, a common measure used to set reimbursement amounts, have many Medicaid policymakers searching for new benchmarks. In a 2012 Kaiser Family Foundation survey, officials from more than 30 states reported plans to move to a new benchmark but there was no consensus about which benchmark they might choose: many said WAC (16 states), some said AAC (5 states), some planned to use a new AWP publisher (5 states), several had not made a decision at time of survey (7 states) and others were waiting for more information about NADAC. We find differences between the various benchmarks ranging from single-digit percentages for most brand-name medications to very large percentage differences for multiple source generic drugs.

**Conclusions:** Payment for prescription drugs in Medicaid is a major focus of policymakers at the federal and state levels, and an area of constant change in the recent years. Ongoing efforts to increase transparency in prescription drug pricing have led to a proliferation of metrics that states could use to determine drug reimbursement in Medicaid, but each metric involves a different set of assumptions and tradeoffs that continue to make the decision about which is best a very challenging one for Medicaid policymakers.

**Implications for Policy, Delivery, or Practice:** See conclusions.

**Funding Source(s):** Other, Kaiser Family Foundation

**Poster Session and Number:** A, #435

**National Health Reform and Medical Necessity**

Michael R Cousineau, DrPH, Keck School of Medicine at the University of Southern California; Scott Cheng, Keck School of Medicine at the University of Southern California; Chris Feifer, DrPH, Keck School of Medicine at the University of Southern California; Robert Bitonte, MD, JD, Los Angeles County Medical Association

**Presenter:** Scott Cheng, M.P.H., Research Associate, Family Medicine Department, Keck School of Medicine at the University of Southern California, scottrocucucla@gmail.com

**Research Objective:** The lack of clarity in defining medical necessity for all interventions and all patients has been controversial for many years. The paper provides a framework for
studying and understanding how the medical necessity will be applied to health care reimbursement decisions, patient care practices, covered benefits and denials under federal health care reform. We examine the impact medical necessity has on health care costs, quality, and effectiveness and provide policy options, in addition to areas for future research.

**Study Design:** We reviewed the literature and produced an overview of the historical debate on the use of medical necessity language for deciding claims and pre authorization decisions. The study observed key issues in the definition of medical necessity and consistency in the application of policy among payers, their impact on costs, patient care and patient health outcomes.

**Population Studied:** The study examines health care payers, providers, and the general patient population.

**Principal Findings:** The perceptions of medical necessity do not only vary among physicians. Even between physicians and patients, and between physicians and payers, there is a lack of clarity in defining necessity for interventions and patients.

Providers and patients believe the insurance companies use medical necessity indiscriminately to deny paying for expensive procedures. Payers believe that medical necessity criteria are needed to protect patients from unproven and possibly harmful medical interventions. While the federal government has no common definition and less than a third of the states have any type of regulatory language, many private payers have created standards for defining the term.

Judicial review and decisions have had a significant impact on medical necessity definitions including the 2001 Racketeering Influenced and Corrupt Organization Act (RICO) ruling against health plans, Aetna, CIGNA, Health Net, Prudential, WellPoint/Anthem, and Humana which has helped to shape subsequent decisions on claims denial using medical necessity language. Since the RICO decisions, there has been little done to assess how medical necessity language has changed in both definition and practice.

While most of the literature focuses on denials based on medical necessity, there may be equal concerns about patients not getting the care they need that has been shown to be effective and necessary based on evidence.

The ACA provides and regulates funding for the establishment of health insurance exchanges, essentially a new market place for people to enroll in a private health insurance plan. Health reform could also emphasize the importance of cost effectiveness research will have on determining medical necessity.

**Conclusions:** Since the RICO decision, medical necessity remains ambiguous in definition and inconsistent in its use for claims processing and pre approvals.

**Implications for Policy, Delivery, or Practice:** With the PPACA the issue of medical necessity is likely to re-emerge particularly in the development of an essential benefit package, accountable care organizations, and comparative effectiveness research. Clarifying this definition and approval process will important for protecting the health of patients and reducing unnecessary expenditures.

**Funding Source(s):** Other, Los Angeles County Medical Association

**Poster Session and Number:** A, #436

“We’re isolated in a way that most people simply don’t understand” – Care Coordination among Rural Safety Net Clinics
Sarah Derrett, University of Otago; Kathryn E. Gunter, Department of Medicine, The University of Chicago; Robert S. Nocon, Department of Medicine, The University of Chicago; Michael T. Quinn, Department of Medicine, The University of Chicago; Katie Coleman, MacColl Center for Health Care Innovation, Group Health Research Institute; Donna Daniel, Qualis Health; Marshall H. Chin, Department of Medicine, The University of Chicago

**Presenter:** Sarah Derrett, Ph.D., M.P.H., B.A., Senior Research Fellow, Preventive and Social Medicine, University of Otago, sarah.derrett@otago.ac.nz

**Research Objective:** Rural safety net clinics face difficulties coordinating care for patients. This case study examines 1) unique challenges to care coordination in rural clinics, and 2) strategies to address challenges.

**Study Design:** Qualitative case study involving individual in-person interviews with 35 providers and staff (e.g. administrators, physicians, nurses, care coordinators, medical assistants) from three rural clinics. Interviews were audio-recorded, transcribed, thematically coded and analyzed using the framework method.

Principal Findings: Participants described challenges that are common to safety net providers generally, such as limited specialty care options for Medicaid and uninsured patients, difficulty exchanging information with external providers, and payment models that do not support care coordination activities occurring outside provider appointments, such as telephone follow-up and linking patients with community resources. Rurality compounded these challenges. Specialists are scarce in rural areas, and when distant urban specialists willing to accept referrals from Medicaid or uninsured patients were found by clinic staff, rural patients often faced burdensome travel for care (e.g. 5 to 6 hours). A lack of public transportation, costs and planning (e.g. negotiating rides with friends or family) presented further challenges for rural patients.

To address challenges, respondents reported drawing upon many tools that may be used in safety net settings generally: a team-based approach to provide and coordinate care, empanelment of patients to a specific provider and care team, and connections with community resources. The commitment to team-based care in these clinics was notable. To address rural patient needs, respondents reported implementing different models of team-based care to provide configurations to support full-time staff roles for care coordination (e.g. team coordinator, LPN). Teams in the rural setting reported empanelment was beneficial because it provided accountability for patients and equipped teams with continuous knowledge of a specific group of patients and their social and medical needs. Since rural clinics are situated in small communities, participants described benefits of having a limited number of local organizations (e.g., one mental health agency, one community college) with which to coordinate care. Clinics developed patient-centered partnerships with these facilities to leverage local resources for patients, such as community-based primary care and mental health team meetings, physical activity programs at the community college, and transportation assistance. To counter rural specialty provider scarcity, some clinics provided exam rooms for visiting specialists or increased specialty care days at their clinics.

Conclusions: Particular challenges are faced by rural populations when they have to negotiate travel to distant specialists. Rural clinics utilized many of the same tools for care coordination that are common in other settings, but leveraged these tools locally by drawing upon the strengths of their small and connected communities.

Implications for Policy, Delivery, or Practice: Health centers that are implementing the PCMH should be particularly attentive to the importance of empanelment, team-based care, and linkages to community resources, as these features can enhance care coordination in the rural setting. However, current primary care reimbursement models threaten sustainability of some successful care coordination strategies, particularly in the rural setting.

Funding Source(s): CWF
Poster Session and Number: A, #439

Complex Approach for Identification of Patients at High Risk for Readmission
Natalia Egorova, Mount Sinai School of Medicine; Maria Basso Lipani, Mount Sinai Hospital; Claudia Colgan, Mount Sinai Hospital; Doran Ricks, Mount Sinai School of Medicine; Annetine Gelijns, Mount Sinai School of Medicine; Alan Moskowitz, Mount Sinai School of Medicine; Jill Kalman, Mount Sinai Hospital

Presenter: Natalia Egorova, Ph.D., Assistant Professor, Health Evidence and Policy, Mount Sinai School of Medicine, natalia.egorova@mountsinai.org

Research Objective: To identify patients at high risk of readmission for enrollment into health care transitional services.

Study Design: There is a federal mandate to reduce preventable readmissions. Predicting hospital readmission risk is of great interest to identify which patients would benefit most from care transition interventions. High readmission rates reflect gaps in providing timely, seamless, coordinated care to a subset of beneficiaries who have multiple chronic conditions and compounding psychosocial stressors. Using logistic regression, we developed a risk prediction model for readmission within 30-days. Based on the model, risk score for 30-day readmissions was calculated. We further stratified population into two groups: (a) those with a score of 2 or 3, who have an average rate of readmission of 19%, and (b) those with a score of 4 or more, who have an average readmission rate of 29%. Patients with one
readmission in 30 days or 2 in 6 months prior to the index hospitalization or with risk score of 2 or higher were approached by social workers. Social workers conducted an extensive, beneficiary-centered interview assessing several dimensions of psychosocial strain, including income, mental health, social support, language, literacy, specialty care, nutrition, etc. to determine whether these elements will be operative in increasing the patient’s likelihood of readmission. Based on the readmission score and interview, the patients were enrollment into transition program and level of intervention was determined. Patients in both the high and lower intensity intervention groups received post-discharge phone follow-up and care coordination to a) assure a connection with a PCP; b) address psychosocial stressors; and c) enhance skills for self-management of illness and behavioral change.

**Population Studied:** Patients hospitalized at the Mount Sinai Hospital during 2010-2011

**Principal Findings:** During our study, 407 patients were enrolled in the care transition program and completed a 5 week intervention. This social worker-led transitional program, decreased 30-day readmission rate from 30% to 12%, emergency department (ED) visits by 63% (over 3+ months), and achieved a 90% primary care show rate at 7-10-day post-discharge. There was substantial concordance of predictions based on hospitalization history with a more formal risk model based on factors that characterize patients through demographics and comorbidities. Ninety-two percent of Preventable Admissions Care Team Program enrollees had a risk score greater than 2 and 78.0% had a risk score of 4 or greater.

**Conclusions:** Hospitalizations history alone, which is readily available in real time in most institutions, is a reasonable proxy to more formal multivariable regression models in predicting 30-day readmission risk. Identification of patient for enrollment to the care transition program require complex approach including screening based on their severity of illness through scoring of the risk of readmissions and previous history of hospitalizations as well as psychosocial interview.

**Implications for Policy, Delivery, or Practice:** If substantiated through further study, this complex approach may have national implications for real time high risk patient identification for transitional services.

**Funding Source(s):** Other

**Poster Session and Number:** A, #440

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**Specialist-Hospitalist in Pediatric Endocrinology: Qualitative Assessment and Resource Utilization**

Evan Fieldston, University of Pennsylvania School of Medicine & CHOP; Adam Stoller, Columbia University School of Public Health; Andrew Palladino, University of Pennsylvania School of Medicine; Sarah Brewer, The Children's Hospital of Philadelphia; Oludolapo Fakeye, The Children's Hospital of Philadelphia

**Presenter:** Evan Fieldston, M.D., M.B.A., Assistant Professor, Pediatrics, University of Pennsylvania School of Medicine & CHOP, fieldston@email.chop.edu

**Research Objective:** Hospitalists commonly cover general medical and pediatric services; specialist-hospitalists are a newer entity, mostly found in adult settings. Our objective was to assess the impact of a full-time pediatric endocrinology hospitalist service, in place since September 2009, on professional dynamics, resource utilization and resource utilization at a freestanding academic children’s hospital.

**Study Design:** Qualitative assessment of subspecialty hospitalist model was conducted through semi-structured interviews. Separately, resource utilization was analyzed using a longitudinal retrospective pre/post study design (2007-2012). Length of stay (LOS), standardized length of stay ratio (SLOS) (i.e. observed to expected LOS), and for admissions prior to and after implementation of the model were compared for Type 1 diabetes, diabetes with ketoacidosis, and unspecified hypoglycemia using random-effects maximum likelihood regression models adjusted for demographics, illness severity, seasonality, mortality risk and complications.

**Population Studied:** Pediatric endocrinology hospitalist staff and hospitalized children on endocrinology service at a freestanding children’s hospital.

**Principal Findings:** According to unit staff, the full-time specialist improved professional dynamics and facilitated better quality of care. Average LOS for visits under the hospitalist model was not significantly shorter than previously. Average SLOS was, however, 0.21 (p=0.002) less for patients under the hospitalist model.

**Conclusions:** Overall, this study suggests that a pediatric endocrinology hospitalist offers consistent and accessible attending-level care
that facilitates enhanced quality, encourages stronger inter-professional dynamics, and for specific complex diagnoses accomplishes both these purposes at comparable costs to families and with shorter stays for patients.

**Implications for Policy, Delivery, or Practice:**
The specialty-hospitalist model may be beneficial in other pediatric service lines as well as in adult medicine.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #441

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If You’ve Seen One Medical Home, You’ve Seen One Medical Home: Lessons Learned from Medical Home Transformation

Signe Flieger, Brandeis University

**Presenter:** Signe Flieger, M.A., M.S.W., PhD Candidate, The Heller School for Social Policy and Management, Brandeis University, signepf@brandeis.edu

**Research Objective:** To understand the process of becoming a patient-centered medical home (PCMH). To explore the variation in PCMH features and transformation strategies implemented by pilot practices.

**Study Design:** In-depth qualitative interviews were conducted with 79 participants at nine pilot sites in late 2011. Interviews were transcribed and analyzed using QSR NVivo qualitative analysis software.

**Population Studied:** Nine family practices participating in the New Hampshire Citizens Health Initiative Multi-Stakeholder Medical Home Pilot with varied size, ownership, and history, including FQHCs, private family practices, and hospital-owned practices. All achieved NCQA PPC-PCMH Level 3 recognition.

**Principal Findings:** The practices in this study represent a wide range of PCMH models. Many practices believed they were a PCMH prior to the pilot. Thus, it became clear that the PCMH is a "spectrum" not an endpoint. Some of the common components identified across the PCMH practices included: Team-based care, role maximization, care coordination, standardization of care, disease registries, continuous quality improvement, performance data and transparency, open access, behavioral health, and patient-centeredness. However, these features varied significantly across sites, including the existence and structure of teams; the presence of explicit care coordination; the number of conditions tracked with registries and the extent to which these registries were used consistently; the nature of behavioral health services available to the patient (e.g., fully integrated, part-time contract with external agency, outside referral); and the approach to enacting patient-centeredness.

Some of the strategies employed by the practices throughout transformation included using the NCQA recognition process as a gap analysis for targeted improvements: enabling people to work at the highest level of their license (i.e., role maximization) as a member of the team; setting aside time to work on transformation, including time for providers to establish standards of care, time for staff members to review and act on disease registries, and/or time for teams to meet and plan for the day; and empowering all members of the office to problem-solve and offer ideas for continuous quality improvement. Challenges ranged from internal (e.g., changing office culture, developing and defining new roles, and sustaining changes over time) to external (e.g., reimbursement still primarily volume driven and lack of collaboration with community providers).

**Conclusions:** As the PCMH model continues to propagate across the country, it is becoming increasingly important to explore what practices are actually doing to become PCMHs and how they are moving through that process. While all of these practices were recognized by the 2008 NCQA PPC-PCMH guidelines, it is clear that there is significant variation in the operation, structures, and nature of these practices with respect to components of the PCMH. There is no one-size-fits-all PCMH model, however, there are likely key elements that foster better outcomes in certain conditions.

**Implications for Policy, Delivery, or Practice:**
Given that the primary goal behind the proliferation of the PCMH is to provide better care at a lower cost, further research is needed to identify the features of the PCMH that yield the most advantageous cost and quality outcomes in a given practice setting. Such research can support further transformation efforts and yield better value over the long term.

**Funding Source(s):** AHRQ, Endowment for Health

**Poster Session and Number:** A, #442

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Team Composition, Medical Homeness, and Relational Coordination in the Patient-Centered Medical Home

Signe Flieger, Brandeis University; Jody Hoffer Gittell, Brandeis University
**Presenter:** Signe Flieger, M.A., M.S.W., PhD Candidate, The Heller School for Social Policy and Management, Brandeis University, signepf@brandeis.edu

**Research Objective:** To understand team-based care in the patient-centered medical home (PCMH) and explore the relationship between team-based care, medical homeness, and relational coordination. We hypothesize that variations in team composition will be associated with the level of medical homeness and the strength and breadth of relational coordination networks.

**Study Design:** This study examines PCMH family practices as part of the New Hampshire Citizens Health Initiative Multi-Stakeholder Medical Home Pilot. 79 in-depth qualitative interviews were conducted in late 2011. Interviews were transcribed and analyzed using QSR NVivo. Sites completed Medical Home Indexes in late 2011, and relational coordination surveys were distributed electronically in Spring 2012. Relational coordination is a mutually reinforcing process of communicating and relating for the purpose of task integration, measured along seven dimensions—frequent, timely, accurate, and problem-solving communication, and shared goals, shared knowledge, and mutual respect.

**Population Studied:** Nine practices across New Hampshire with varied size, ownership, and history, including FQHCs, private family practices, and hospital-owned practices. All achieved NCQA PPC-PCMH Level 3 recognition.

**Principal Findings:** Prior to the medical home, care was described as disjointed and uncoordinated in practices without formalized teams. Establishing formal teams was difficult but rewarding and required a change in the “culture” and “mentality” of the office, made easier by “getting the right people in the right jobs.” Team-based care supported registries and evidence-based care. Many participants noted improved communication, clearer role definitions, and more efficient care delivery as a result of team-based care. Across the practices, team composition differed. Broadly, the nature of these teams fell into one of the following categories: “team” in name only (called teams, functioned in more traditional roles); small clinical (teams included small group of providers, nurses, and medical assistants); interdisciplinary (larger teams, included behavioral health professionals and/or care coordinators); and whole staff (small practice, entire office seen as a team).

In general, as the level of medical homeness increased so too did the size and/or breadth of the teams. We would expect the level of relational coordination to decrease as teams increased in diversity and scope, unless other strategies are employed to strengthen it, such as the development of boundary spanner roles, team meetings, and shared protocols. These patterns can be shown through specific relational ties and composite measures of relational coordination.

**Conclusions:** It makes intuitive sense that practices with more integrated teams also exhibited more medical homeness. Furthermore, the relationship of relational coordination to team composition illustrates the complex relational components that play a role in teambuilding. Thus, as practices develop broader teams, the challenge of fostering strong communication and relationships becomes more pronounced as there are more people involved in the task.

Further analyses will explore how these dynamics impact the quality and cost outcomes associated with the PCMH.

**Implications for Policy, Delivery, or Practice:**
As PCMHs proliferate across the country, team-based care is becoming more common. More research is needed to understand the processes of transformation to team-based care, and identify best practices that recognize the variation that exists among family practices and how these dynamics impact the quality and cost of care delivered.

**Funding Source(s):** AHRQ, Endowment for Health

**Poster Session and Number:** A, #443

**Building the Foundation for a Patient-Centered Medical Home in a Large VA Academic Medical Center**
Presenter: Jane Forman, ScD MHS, Research Scientist, Center for Clinical Management Research, VA Ann Arbor Healthcare System, jane.forman@va.gov

Research Objective: The Department of Veterans Affairs (VA) has launched an initiative to transform primary care using the patient-centered medical home (PCMH) model. PCMH requires redesign of the care delivery system around small interdisciplinary teams, or teamlets, that work closely together to deliver patient-driven, comprehensive, and coordinated care to a prescribed patient panel, as well as practice redesign that involves changes in roles and work processes. The current literature on PCMH implementation has focused largely on relatively small practices, rather than on larger, more complex settings. A high proportion of VA primary care is delivered in medical centers, most of which are academically affiliated. These clinics have part-time physicians and residents providing the majority of patient care, and large staffs and patient populations. We conducted an in-depth qualitative study of early PCMH implementation in a large VA academic medical center to identify the barriers and facilitators to transforming primary care in this complex setting.

Study Design: We conducted 33 semi-structured interviews with ambulatory care leadership, providers, and staff, and observations of nurse staff meetings, during the first year of PACT implementation (February to December 2011), in one VA academic medical center. Interviews were audio-recorded and transcribed; staff meeting field notes were handwritten. We coded data using constructs from the Consolidated Framework for Implementation Research, which consists of common constructs from the implementation science literature, and developed findings through constant comparison to inductively identify themes within, and interactions between, constructs.

Population Studied: Ambulatory care leaders, providers, and staff at one VA academic medical center.

Principal Findings: We identified several factors that presented barriers to implementing the PCMH model in a large VA academic medical center. These included: 1) Part-time providers and residents had multiple roles outside the clinic, which delayed communication with nurses and clerks about clinical issues and changes in work processes. 2) The complexity of garnering and reconfiguring space in a large institution delayed co-location of teamlets, further impeding communication essential to meeting PCMH goals such as interdisciplinary discussion of patient needs and improving access to care. 3) Doubling the number of clinic staff to fully staff teamlets, combined with having multiple part-time providers on each teamlet, made teamlet formation logistically complex. Further, the need to train and integrate new staff into the clinic at a time of rapid change made it more challenging for staff to establish relationships with multiple providers.

Conclusions: Large academic medical centers may face special challenges in implementing the medical home model. The presence of part-time providers and residents and large size make their existing care model less compatible with the PCMH model than settings in which PCMH was initially conceived and implemented. Delays in building a foundation for teamwork make it difficult to redesign practices to attain key PCMH goals.

Implications for Policy, Delivery, or Practice: Although PCMH has become a dominant model of primary care delivery in the US, little is known about the challenges academic medical centers and other large, complex settings face in implementing the model. Additional research is needed to test and expand on our findings to foster successful implementation in these settings.

Funding Source(s): VA

Poster Session and Number: A, #444

The Effect of Medicaid Reimbursement on Practice Patterns – Cesarean Deliveries in Washington State
Sara Freeman, RTI International; Amy Kandilov, RTI International

Presenter: Sara Freeman, Research Economist, Health Care Payments and Financing, RTI International, sfreeman@rti.org

Research Objective: In 2009, the state of Washington adjusted its Medicaid reimbursement for childbirth by reducing the amount paid for an uncomplicated cesarean delivery to equal the payment for a complicated vaginal delivery, where previously the payment difference was approximately 5,000 dollars per birth. Our objective is to take advantage of this policy variation to assess the effect of
reimbursement for cesarean deliveries on their incidence among Medicaid patients in WA.

**Study Design:** We use a difference-in-differences statistical approach in our analysis, comparing the cesarean delivery rate and other outcomes before and after the 2009 policy for Medicaid patients and for control groups of patients who would not be expected to be affected by the Medicaid reimbursement change. Hospital fixed effects are employed to control for unobserved hospital characteristics that may affect the rate of cesarean deliveries, so that the outcome of interest is the within hospital change in the Medicaid cesarean rate produced by the policy.

**Population Studied:** The population studied includes all Medicaid patients who have a hospital stay for a birth in the state of Washington; this is the population affected by the reimbursement changes. For comparison, we use all women covered by private health insurance who have a hospital stay for a birth in WA, and also all women covered by Medicaid or MediCal who have a hospital stay for a birth in Oregon or California; these populations should not have been affected by changes in Medicaid in WA. Data for the empirical analysis comes from Healthcare Cost and Utilization Project State Inpatient Databases from the states of Washington, Oregon, and California, from 2008 through 2010.

**Principal Findings:** The primary outcome of interest will be the change in the rate of cesarean deliveries for Medicaid patients in WA, compared to private health insurance patients in WA and compared to Medicaid patients in CA and OR. We will also assess any positive or negative spillovers for the reimbursement policy on Washington’s non-Medicaid patient population. For example, the reimbursement change in Washington affects the payment for uncomplicated cesarean deliveries, while the payment for complicated cesarean deliveries remains unchanged. One unintended consequence could be that the rate of complicated cesarean deliveries increases as hospitals more thoroughly code complicating conditions that could increase reimbursement, leaving little change in the overall cesarean rate.

**Conclusions:** Our analysis will allow us to evaluate the reimbursement change in WA and to explore any direct and indirect consequences of the Medicaid payment policy. We discuss whether or not the reimbursement change is successful in reducing cesarean deliveries and in reducing Medicaid payments for births.

**Implications for Policy, Delivery, or Practice:** The effect of the reimbursement change for cesarean deliveries in WA has broad implications for Medicaid programs in other states as well as private health insurance. If the WA policy is successful in lowering the rate of cesarean deliveries and payments with no adverse health effects for women and their babies, other insurance programs will likely follow suit and implement similar changes. If the policy is unsuccessful, there may be other unintended consequences for hospitals, payers, and patients.

**Funding Source(s):** Other, RTI International

**Poster Session and Number:** A, #445

**Factors Associated with High Medical Home Capability in Federally-funded Community Health Centers**

Yue Gao, Univ of Chicago; Robert S. Nocon, University of Chicago, Department of Medicine; Kathryn E. Gunter, University of Chicago, Department of Medicine; Ravi Sharma, US Department of Health and Human Services, Health Resources and Services Administration; Quyen Ngo-Metzger, Department of Health and Human Services, Agency for Healthcare Research and Quality, Center for Primary Care, Prevention, and Clinical Partnerships; Lawrence P. Casalino, Weill Cornell Medical College, Department of Public Health; Marshall H. Chin, University of Chicago, Department of Medicine

**Presenter:** Yue Gao, M.P.H., Statistician, Department of Medicine, Univ of Chicago, ygao3@medicine.bsd.uchicago.edu

**Research Objective:** Implementation of the patient-centered medical home (PCMH) is a key component of the Health Resources and Services Administration’s (HRSA) efforts to improve care in HRSA-supported community health centers (HCs) serving vulnerable populations. We identified factors associated with high PCMH capability among HCs.

**Study Design:** Cross-sectional correlation of practice and neighborhood factors with PCMH capability was assessed via the 2009 Commonwealth Fund National Survey of Federally Qualified Health Centers and the Safety Net Medical Home Scale. The scale generates 0-100 scores for total PCMH score and six subscales: access/communication, patient tracking/registry, care management, test/referral tracking, quality improvement, and external coordination. Practice factors (e.g.
Idaho's rural health centers, presence of an electronic medical record (EMR), hospital affiliation, and financial characteristics, and average patient characteristics (age, gender, race, poverty level, insurance, chronic disease burden) were drawn from the survey and the Uniform Data System, a national database of HCs. Neighborhood factors (demographics, socioeconomic status, and provider supply) were drawn from the Dartmouth Primary Care Service Area (PCSA) Project and Census Bureau and measured at the PCSA level. We developed multivariate GEE models for total PCMH score and each of the six subscales, with practice and neighborhood covariates. Since EMR adoption has increased substantially in FQHCs since 2009, we also performed subgroup analyses that included only those HCs with an EMR.

Population Studied: Subjects drawn from 1,014 HRSA grantees receiving Section 330 community health center program funding in 2009. After excluding HCs with missing data, we included 706 centers (70 percent).

Principal Findings: Mean total PCMH score was 61.8 (SD=12.0). Subscale scores were highest for test referral/tracking (70.5, SD=23.5) and lowest for care management (49.6, SD=18.6). EMR (43.9 percent) was a strong correlate for total PCMH score and all PCMH subscales. EMR was associated with a 12.1-point higher total PCMH score (CI 10.5-13.7). Among PCMH subscales, the strongest association with EMR was patient tracking/registry (27.6 points higher with presence of EMR, CI 24.5-30.6). Other factors were positively correlated with PCMH score, though none as strongly as EMR. Higher total PCMH score was significantly associated with closer affiliation with local hospitals (1.7 points per additional affiliation type, with a total of six potential affiliation types), and more financial incentives for quality improvement and care management (1.3 points per additional incentive type, with a total of four potential incentive types). In a subset analysis of the 310 HCs with EMR, the effects of closer hospital affiliation and more financial incentives remained (both 1.5 points per additional type of affiliation or incentive).

Conclusions: Presence of an EMR, closer affiliation with local hospitals, and more financial incentives for quality improvement and care management were associated with higher medical home capability in HCs. Presence of an EMR was the strongest correlate.

Implications for Policy, Delivery, or Practice: EMRs are important for achieving high PCMH capability and HRSA's support of EMR adoption in health centers may yield important healthcare improvements. Other factors, such as hospital affiliations and financial incentives, may increase in relative importance as more health centers establish EMR capabilities and may be used to help guide policy to expand PCMH adoption.

Funding Source(s): CWF

Poster Session and Number: A, #446

Patient-Centered Medical Home Implementation: Early Experience in Oregon

Sherril Gelmon, Portland State University; Rachel Trotta, Portland State University; Paige Hatcher, Oregon Health Authority; Nicole Merrithew, Oregon Health Authority

Presenter: Sherril Gelmon, Dr.P.H., Professor Of Public Health, College of Urban and Public Affairs, Portland State University, gelmons@pdx.edu

Research Objective: To evaluate the implementation of the Patient-Centered Primary Care Home (PCPCH) Program, an initiative established in 2009 by the Oregon Legislature, in order to understand and compare actual practice with the PCPCH model, consisting of program attributes of access to care, accountability, comprehensive whole person care, continuity, coordination and integration, person and family centered care.

Study Design: This aspect of the PCPCH evaluation was designed to elicit responses from each of the sites recognized as a PCPCH as of August 2012. The study involved administration of a web-based, confidential survey, sent to the clinic administrator or key contact identified to the OHA. The survey of clinics recognized as a PCPCH was developed drawing heavily upon the background research of OHA, the existing literature, and a complementary survey administered for the Oregon Primary Care Association annually in 2009-2012. The survey questions address the six core attributes that are the basis for the recognition application; survey data are augmented by additional descriptive information regarding staffing, visits, population density, geography, and related factors. The initial survey was administered in Fall 2012; it will be readministered in Summer 2013.

Population Studied: The findings are based upon a survey of the 205 recognized Tier 2 and Tier 3 PCPCHs.
**Principal Findings:** Of the first 205 recognized clinics, 181 responded to the survey for a response rate of 88%. The population of 205 practices consisted of two percent of the respondents were in Tier 2 (N=58), and 68% were in Tier 3 (N=123); these responses mirror the overall PCPCH population (64 Tier 2, 31% and 141 Tier 3, 69%). The overall distribution of the clinics by geographic region suggests differences in scope and extent of services available in large/medium/small urban and rural settings. The size of the practices varied, with an average of 6.6 FTE providers, and 11.94 average other FTE clinical staff. The average number of annual visits was approximately 19,000. The majority (75.7%, N=181) of respondents serve both adult and pediatric populations. Almost half (45.9%) provide obstetrics care. Within each of the six core attributes, the discussion focuses on additional data collected on the measures of that attribute: access to care, accountability, comprehensive whole person care, continuity, coordination and integration, person and family centered care. Our findings are identifying common practices that will in turn be integrated into the current revision of the PCPCH Recognition Standards, being developed by the OHA.

**Conclusions:** Early implementation of the PCPCH model of care shows progress towards Oregon’s goal of achieving the “Triple Aim” of better population health, better individual system care and lower costs.

**Implications for Policy, Delivery, or Practice:** The evidence from this evaluation is informing the work of the OHA’s Office for Oregon Health Policy and Research (OHPR) as it revises the standards for PCPCH recognition, and will contribute to the policy process and clinic practice by highlighting evidence of the six core attributes of the PCPCH model.

**Funding Source(s):** HRSA, Oregon Health Authority

**Poster Session and Number:** A, #447
Population Studied: We enrolled 700 English, Spanish, and Chinese (Mandarin and Cantonese)-speaking adults reflecting an ethnically diverse, low income population with limited educational attainment (mean age= 66). Twenty-five percent were African American, 20% Latino/Hispanic, 19% White, 25% Chinese, 6% Filipino, and 5% reported other race/ethnicities. Less than 11% had a household income of greater than $20,000 per year, and 66% had limited health literacy. At baseline, 85% of the enrolled population reported a usual source of health care, and 80% had used the ED and/or had been hospitalized in the past 6 months.

Principal Findings: Randomization was successful for characteristics including demographics, socioeconomic variables, activities of daily living, and pre-hospitalization health care usage between intervention and control group (p>0.1 for all). Of the 700 enrolled, outcomes at 30 days were available in administrative data for 670 (96%), including 14 (2%) who died. Thirty days after hospital discharge 45 patients (13.6%) in the usual care group and 39 (11.9%) in the intervention group were readmitted to the index hospital (p = 0.51), and 28 (8.5%) of the usual care group compared to 28 (8.6%) of the intervention group visited the ED (p= 1.0).

Conclusions: Among a diverse population of adults age 55 and older admitted to an urban public hospital, there was no difference in the 30-day rate of post-hospitalization ED visits and readmissions to the index hospital between an intervention group who received a hospital-based nurse-led transitional care intervention with telephone follow-up and tailored patient education materials and the usual care group.

Implications for Policy, Delivery, or Practice: Nurse-led hospital-based discharge interventions for transitional care may not be effective among diverse populations age 55 and older with high pre-admission health care usage and usual source of care. Populations with complex medical and social needs may require transitional-care interventions that partner with outpatient providers and/or include home-based visits.

Funding Source(s): Other, Gordon and Betty Moore Foundation

Anthropological Approaches: Uncovering Unexpected Insights about the Implementation and Outcomes of Patient-Centered Medical Home Models

Robert Goldman, Alpert Medical School of Brown University; Jeffrey Borkan, Alpert Medical School of Brown University

Presenter: Roberta Goldman, PHD, Clinical Professor, Family Medicine and the Brown Center for Primary Care and Prevention, Alpert Medical School of Brown University, roberta_goldman@brown.edu

Research Objective: The hallmark of anthropology is the exploration of the complexity of human interactivity and culture. Anthropology has much to contribute to PCMH evaluations, in which researchers aim to not only describe implementation and outcomes, but also uncover contextual meaning and reasons behind those descriptions within a rapidly evolving health care system. An anthropological approach can help researchers identify the underlying factors in the practice, among patients, and in the community that drive how PCMH transformation decisions are made, how changes occur, and how changes affect those involved. The approach goes beyond examining quantitative outcomes to explore the qualitative aspects of how the practice is transforming, why particular changes are (or are not) occurring, and how all affected parties conceptualize and experience the changes.

The ethnographical approach sets anthropology apart from other disciplines – using the qualitative process of exploring in depth the why’s and how’s of human culture, behavior, and expression. The ethnographic method can uncover unexpected insights that are best gained by studying a topic in person, in situ, over time, and from diverse perspectives. The ethnographic method uses multiple data collection techniques producing data that are useful on their own as well as complementary to quantitative data in mixed-methods studies. This presentation describes four anthropological data collection methods common in the ethnographic method: participant observation, in-depth interviews, focus groups, and textual analysis.

Study Design:

Population Studied:

Principal Findings: Anthropological PCMH evaluations identify the shared cultural meanings between and among different groups.
of stakeholders to determine how culture is constructed at the practice. This can include interviewing and observing doctors, nurse practitioners, office staff, and patients to explore the ways they experience and understand concepts such as care coordination and quality improvement. A longitudinal evaluation from an anthropological perspective documents the dynamic change in practice culture and patients’ interactions with this change as PCMH transformation initiatives unfold.

**Conclusions:** An anthropological approach uses an iterative format, ensuring that insights and questions arising during earlier analyses are woven into subsequent data collection, and that relevant emerging subjects areas are explored. This provides stakeholders with multiple perspectives on the functioning of the medical practice, and provides patients, providers, and staff the opportunity to explain their thoughts and experiences in their own words. However, anthropological methods require time, labor and skills that must be adequately planned for in the PCMH evaluation design.

**Implications for Policy, Delivery, or Practice:** Using a holistic, anthropological approach within a mixed-methods evaluation design provides the opportunity for researchers to uncover the social context surrounding phenomena that are documented through quantitative methods, and provides insights into the personal meanings that stakeholders bring to their work and practice environment. These insights can lead to the development of better data collection tools and hypotheses, and in the end, to richer data sets and more rigorous and insightful interpretations of PCMH transformation.

**Funding Source(s):** HRSA

**Poster Session and Number:** A, #449

**The Early Impacts of a Primary Care Provider Compensation Model Designed to Improve the Triple Aims**

Jessica Greene, George Washington University; Judith Hibbard, University of Oregon; Valerie Overton, Fairview Health Services

**Presenter:** Jessica Greene, Ph.D., Professor, School of Nursing, George Washington University, jessgreene@gwu.edu

**Research Objective:** This study examines primary care providers’ (PCPs) early experiences working under Fairview Health Services’ new compensation model, designed to reward the Triple Aims rather than volume. The model, implemented in April 2011, pays PCPs based upon: clinic-level quality metrics (40%); productivity, measured by patient encounters including nontraditional visits (20%) and risk-adjusted panel size (20%); clinic-level patient experience (10%), and, in the future, cost of care (10%).

**Study Design:** This is a mixed method study with three components. First, we conducted in-depth interviews with PCPs and administrators (n=21) to identify the ways in which the new model had impacted primary care practice. The interviews were conducted eight months after the model’s implementation. The second component was an online survey of 156 Fairview PCPs (response rate 55%) to assess PCPs’ perception of change resulting from the new compensation model 16 months after implementation. The third component, still in progress, is the analysis of administrative PCP panel data on quality, which will be used to identify the characteristics of PCPs that are associated with quality improvement.

**Population Studied:** PCPs at Fairview Health Services.

**Principal Findings:** PCPs reported that the new compensation model had a quick and pronounced impact on their orientation towards quality. Half of PCPs (51%) reported that the new compensation model had improved the quality of their own patient care, and slightly more (59%) reported the quality of their colleagues’ care improved. The majority reported the new compensation model increased the frequency of the following: ensuring patients were up to date on quality metrics even though it was unrelated to the purpose of the visit, reaching out to patients who are failing on a quality metric, and helping improve colleagues’ quality metrics. One PCP explained, “We’ve gotten 100% of our appropriate diabetics in this office on aspirin, not 90% or 85% or 72%, but 100%.... It [the compensation model] generates a sense within the organization of reaching out to these people, and standardizing care and optimizing care to get the best results.” PCPs also credited the new model for increasing the use of non-traditional modes of patient interactions, such as telephone, e-visits, and nurse-only visits.

The compensation model did, however, result in some challenges including lower FFS billing and reductions in PCP job satisfaction. PCPs were least satisfied with the focus on quality metrics above patients’ immediate needs, the model’s complexity, the frequency of changes to the
model, and the importance of clinic-level rather than individual performance.

**Conclusions**: PCPs reported that the new compensation incentives have made a pronounced impact on their practice, particularly in terms of shifting focus towards quality and embracing the use of alternative types of patient visits.

**Implications for Policy, Delivery, or Practice**: Accountable Care Organizations, seeking to provide higher quality and lower cost care, may benefit from Fairview’s experience, which suggests that changing compensation incentives may be an important lever for delivery higher value care. That being said, Fairview’s experience also demonstrates that comprehensive change in compensation can be challenging.

**Funding Source(s)**: CWF

**Poster Session and Number**: A, #450

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**Do Nursing Home Residents Stand to Benefit from Being in a Patient-Centered Medical Home Initiative?**

Susan Haber, RTI International; Suzanne Goodwin, Ph.D., Centers for Medicare and Medicaid Services; Nancy McCall, Sc.D., RTI International

**Presenter**: Susan Haber, Sc.D., Director, Health Coverage for Low-Income and Uninsured Populations, Division for Health Services and Social Policy Res, RTI International, shaber@rti.org

**Research Objective**: Residents of nursing homes, who are typically excluded from patient-centered medical home (PCMH) initiatives, may be likely to benefit from PCMH principles of comprehensive, coordinated care to address their high rates of co-morbid conditions and decreased functional status. These analyses investigate whether having a stronger primary care provider (PCP) relationship – a hallmark of the PCMH – is associated with lower utilization of potentially avoidable services among nursing home residents.

**Study Design**: Descriptive and multivariate analyses compared utilization of and expenditures for potentially avoidable services among Medicare beneficiaries residing in nursing homes based on regularity of PCP visits during the nursing home stay, continuity of care (measured using Bice and Boxerman’s continuity of care index), and whether the usual source of care changed after nursing home admission. Variables for beneficiary characteristics and utilization were created from the Medicare Enrollment Data Base and claims; nursing facility characteristics were identified from Online Survey, Certification, and Reporting (OSCAR) data; and the Minimum Data Set (MDS) was used to create beneficiary function status measures.

**Population Studied**: All fee-for-service Medicare beneficiaries with at least 90 days of consecutive residence in a nursing home between July 2007 and June 2009 (n=1,290,594). Nursing home residents were identified using the Chronic Condition Warehouse Timeline file, which has daily indicators of nursing home residence derived from the MDS.

**Principal Findings**: After controlling for beneficiary and nursing home characteristics, higher percentages of months with a PCP visit, greater numbers of PCP visits per month, and maintaining the same usual source of care after a nursing home admission were all associated with reductions in potentially avoidable inpatient and emergency room service utilization and costs. For example, payments for ACSC inpatient admissions were $938 lower for beneficiaries with a PCP visit in a high percentage of months than for those with visits in a low percentage of months. Although individuals with medium care continuity had lower potentially avoidable service use and costs than those with low care continuity, individuals with high care continuity had the highest use and costs of potentially avoidable services. However, the highest levels of care continuity may reflect underreferral for specialist services rather than well-coordinated care.

**Conclusions**: These analyses indicate that nursing home residents could benefit from receiving care that is consistent with PCMH-model principles and should be considered for inclusion in PCMH initiatives. Our findings are consistent with previous research, which has shown that programs with PCMH features, such as Evercare, have been successful in reducing hospitalization rates among nursing home residents.

**Implications for Policy, Delivery, or Practice**: Some adaptations of the PCMH model may be necessary if it were to be applied to nursing home residents. Although the PCMH concept encourages maintaining provider relationships as an individual moves across care settings, it may be beneficial to establish a PCMH within a nursing home for those who are long-stay
residents. It will be important to address the lack of integration between Medicare- and Medicaid-financed services for dually eligible nursing home residents and the resulting incentives for cost shifting between the programs by moving patients between nursing homes and hospitals. 

**Funding Source(s):** CMS

**Poster Session and Number:** A, #451

**Organizational Transformation in a Safety Net Provider: Lessons Learned from a Case Study**


**Presenter:** Karen Hacker, M.D., M.P.H., Executive Director, Institute for Community Health, Cambridge Health Alliance, khacker@challiance.org

**Research Objective:** Early accountable care organization (ACO) pilots have focused on commercial populations and Medicare, but few have addressed the feasibility of ACOs for Medicaid and safety net populations. Although the Affordable Care Act will soon cover 30 million previously uninsured Americans, safety net providers will nonetheless face significant pressure to improve their quality and efficiency. To assess how safety net providers might redesign delivery systems to achieve these objectives we conducted a case study of the Cambridge Health Alliance (CHA), a public safety net integrated delivery system in Massachusetts where health care reform began over five years ago. In 2009, CHA began to establish an ACO model that would incorporate a patient centered medical home (PCMH) structure at its outpatient clinics.

**Study Design:** We conducted over 30 semi-structured interviews with leaders and staff throughout the organization and an in-depth internal document review to ascertain the key strategies, evidence of progress, barriers and future challenges. Analysis included thematic coding of interviews and internal documents to identify substantial enablers and limiters to organizational transformation. We also analyzed changes in quality metrics, and conducted an interrupted time series analysis of per capita spending for enrollees in risk contracts before and after global payment arrangements.

**Population Studied:** CHA serves a large diverse Medicaid population through a network of primary care clinics, a large psychiatry department, two inpatient hospitals, three emergency departments, and an array of specialists.

**Principal Findings:** CHA faced momentous financial pressures to transform care delivery following Massachusetts’ coverage reforms, which enacted significant reductions in Medicaid payments and in state subsidies for safety net patients. With a limited base of commercially insured patients, CHA could not fill the ensuing fiscal gap with new patient revenues. One of the few paths to financial sustainability was to begin shifting payment towards global budget models while redesigning care to improve efficiency and value. The major strategies undertaken by CHA include transforming primary care sites to NCQA recognized PCMHs, closely managing referrals to ensure appropriate cost-effective care, developing new tertiary referral partnerships, establishing new complex care management processes, reconfiguring its workforce to support patient-centered care and continuous improvement, and investing in actionable information technology to monitor performance.

**Conclusions:** Safety net providers will continue to face major fiscal challenges regardless of national health care reform. Early assessment of CHA demonstrates that these providers can begin a delivery system transformation through alignment of financial incentives, concerted efforts to change workforce culture, expanded care management and investment in performance measurement. CHA and other safety net providers will be challenged to transform care with limited resources. Nonetheless, there are early signs of progress in some of CHA’s most advanced ambulatory sites.

**Implications for Policy, Delivery, or Practice:** Safety net organizations can transform care delivery but this process takes time. Strong commitment from senior management and performance tracking are required to ensure accountability. Constant funding strains make change particularly difficult. Public payers willingness to collaboratively develop financing models with safety net organizations that reward shared objectives will be critical for success.

**Funding Source(s):** CWF

**Poster Session and Number:** A, #452
The Relationship between Attributes of Primary Care Medical Homes, Patient Engagement, and the Processes and Outcomes of Care among Individuals Living with Diabetes

Allyson Hall, University of Florida; Fern Webb, PhD, University of Florida; David Wood, MD, University of Florida; Jeffrey Harman, PhD, University of Florida; Jinayi Zhang, PhD, University of Florida

**Presenter:** Allyson Hall, Ph.D., Associate Professor, Health Services Research, Management & Policy, University of Florida, hallag@phhp.ufl.edu

**Research Objective:** How primary care sites implement key attributes of the medical home may be directly associated with how patients experience care, engage in their care, and ultimately their health outcomes. This study examines how experiences with care and patient engagement (as measured by the Patient Activation Measure (PAM)) varies across four (4) patient centered medical homes (PCMHs) that each have different approaches to implementing the patient-centered care model.

**Study Design:** We conducted structured in-depth interviews with the medical directors and administrative of 4 academic family medicine clinics, all of which were NCQA level 3 accredited for the PCMH. The interview asked them to describe their structure and use of key PCMH characteristics such as use of the EMR to track and remind providers and patients and implementation of disease management programs. In addition to the PAM, a telephone survey asked patients to report on their experiences and satisfaction with care. Ordered logistic regression analysis was used to determine the relationship between a medical home practice and the extent to which patients were more engaged or activated in their care. Regression analyses controlled for the race/ethnicity, marital status, educational attainment, health status, and age of the patient.

**Population Studied:** 1,300 randomly selected adult patients with diabetes seen at 4 National Committee for Quality Assurance (NCQA) Level 3 accredited academic primary care practices located in a southeastern state.

**Principal Findings:** The qualitative interviews showed that despite all 4 clinics achieving NCQA accreditation, there are stark differences in the manner and degree to which key components of the PCMH model are implemented. For example, some providers use the electronic medical record (EMR) to create self tasks or reminders for what to check during a patient visit. Other providers do not use reminder systems at all. One clinic (location A) had implemented a diabetes disease registry and a disease management program while the other clinics had a more traditional approach to diabetes care by primary care with referral to specialty care. A higher proportion of patients at location A reported positive experiences with care. 88 percent of patients at Location A thought that their doctor “always listened carefully to them” compared to 79, 69 and 70 percent at the other locations, respectively (p=.03) Similarly, 84 percent of patients at Location A reported that their doctor “always explained things to them in a way they could understand” compared to 74, 64, and 76 percent of patients in the other three clinics (p=.04). Patients at location A had higher overall PAM scores compared to patients seen at the other three clinics (mean scores of 68 compared to 63, 60, and 63 p=.03). Adjusted ordered logistic regression analysis confirmed that patients at other locations were statistically significantly less likely to have higher PAM score compared to patients at location A (OR .68; .59. 64) Health status was also significant: patients in poorer health were less likely to have higher PAM scores.

**Conclusions:** Despite receiving similar NCQA ratings, how medical homes offer and provide services can vary. Location A’s focus on disease management could be associated with more positive experiences with care and greater activation.

**Implications for Policy, Delivery, or Practice:** Simply achieving NCQA accreditation is not sufficient to assuming that components of the medical home are being adhered to uniformly across practices. Understanding what elements are related to specific improvements in care will help practices better tailor their delivery systems to meet the needs of patients.

**Funding Source(s):** Other, The Aetna Foundation

**Poster Session and Number:** A, #453

Integrated Health Care for Vulnerable Populations: Supporting Transformation in Safety Net Hospitals and Health Systems

Ricky Harrison, NAPH; Linda Cummings, PhD, Vice President for Research, NAPH; Director, NPHHI; Judith Simmons, MD, Principal, Lion Head Advisors; Betsy Carrier, MBA, Consultant
**Presenter:** Ricky Harrison, M.P.A., M.S., Senior Research Associate, Research, NAPH, rharrison@naph.org

**Research Objective:** The Patient Protection and Affordable Care Act (ACA or health reform) is redefining health care, ensuring better coordination between primary, secondary, and tertiary care. One of its major goals is to improve quality and efficiency within the health care system. Transformation into an integrated delivery system is one method of accomplishing such a health care system.

The goal of this research was to test the hypothesis that many safety net hospital systems face significant challenges as they transform into fully integrated, high quality health systems and will require specific, targeted assistance to accomplish this transformation.

Our three main objectives were to:
1. drive the work of safety net hospitals in transforming into integrated, high quality delivery systems for vulnerable patients by providing a fundamental roadmap;
2. inform other key players in the health care system of best practices in the delivery of high quality care to the millions of newly covered and vulnerable patients; and
3. provide policy recommendations aimed at strengthening the safety net and protecting vulnerable patients as the Patient Protection and Affordable Care Act provisions around delivery system reform take effect.

**Study Design:** To achieve these objectives, our researchers surveyed 190 NAPH-member hospitals and completed case studies of four, including Boston Medical Center (BMC), Cambridge Health Alliance (CHA), Harborview Medical Center (Harborview-Seattle, WA), and Harris Health System (HHS-Houston, TX).

**Population Studied:** This study focused on safety nets. These hospitals and health systems provide high volumes of uncompensated primary, secondary, and, tertiary care to the country’s most vulnerable. As such, they play an important role in reducing health disparities among these groups—racial and ethnic minorities.

**Principal Findings:** Many NAPH members are well-prepared to lead the nation in implementing health reform; they have long excelled in addressing the needs of low-income, racially and ethnically diverse patient populations. However, many are faced with providing increasing numbers of uncompensated care while operating with shrinking budgets, presenting barriers for even our highest performers that need to transform their systems to ensure seamless, efficient, population-focused care, especially as millions of newly insured enter the health system.

**Conclusions:** To achieve integration, systems need:
- support from their leadership;
- an integrated workforce;
- coordination with and between community clinics and other non-hospital service providers;
- coordination between primary and specialty services; and
- a fully integrated health information technology infrastructure.

**Implications for Policy, Delivery, or Practice:**

- Policy. The cornerstone of the ACA is quality and efficiency. Given that safety net hospitals already provide a large amount of uncompensated care, these systems need funding to support necessary transformation.
- Delivery. Hospitals and health systems will need to change their methods of care delivery to ensure patient access, improved quality, and increased efficiency. This will involve training the work force, building and maintaining partnerships with community partners, and achieving a leadership and governance structure that supports a path to true system integration.

**Funding Source(s):** Other, The Aetna Foundation

**Poster Session and Number:** A, #454

**Patient-Centered Medical Home Capacity and Readmission Rates**

Larry Hearld, University of Alabama at Birmingham; Kristine R. Hearld, Ph.D., University of Alabama at Birmingham; Robert Weech-Maldonado, Ph.D., University of Alabama at Birmingham; Tory Harper Hogan, BA, University of Alabama at Birmingham

**Presenter:** Larry Hearld, Ph.D., M.B.A., M.S.A., Assistant Professor, Health Services Administration, University of Alabama at Birmingham, lheardl@uab.edu

**Research Objective:** Hospital readmissions are receiving increased attention as indicators of potentially poor quality care and unnecessary expenditures. Concomitant with this attention on hospital readmissions is increased interest in the patient-centered medical home (PCMH) as a
means of improving quality. Research on the PCMH is in its infancy, however, with relatively little empirical research reflecting the fact that the PCMH consists of a range or degree of capabilities across multiple dimensions (e.g., extended access, care coordination, preventive services) rather than the simple presence of a discrete set of practice characteristics. The purpose of this study was to longitudinally examine the relationship between physician practices’ PCMH capacity (range of services across 12 dimensions identified as component parts of the PCMH) and readmission rates (7-day, 30-day, and 90-day). The study also distinguished between two aspects of PCMH capacity – interpersonal capacity (relationship-oriented activities such as self-management support, individual care management) and technological capacity (technology-oriented activities such as patient registries and tools to enhance access).

**Study Design:** Fixed effects panel regression models were used to account for unobserved, time-invariant heterogeneity across practices. Hausman tests confirmed the appropriateness of using fixed effects models. Data consisted of physician practices’ periodic (six-month) self-assessments of PCMH capabilities and administrative claims data regarding services provided to patients attributed to these practices. Models also controlled for changes in illness severity and time.

**Population Studied:** We examine these relationships over a 3-year period (2008-2010), focusing on 831 Michigan physician practices participating in a pay-for-performance program that included the implementation of the PCMH as one of its central features.

**Principal Findings:** A one-unit increase in global PCMH capacity was associated with lower 7-day (b = -0.018, p<0.01), 30-day (b = -0.032, p<0.001), and 90-day (b = -0.038, p<0.001) readmission rates. A one-unit increase in interpersonal capacity was also significantly associated with lower 7-day (b = -2.543, p<0.01), 30-day (b = -4.748, p<0.001), and 90-day (b = -5.960, p<0.001) readmission rates. Technical capacity was not significantly associated with any of the readmission rates.

**Conclusions:** Greater implementation of PCMH capabilities is associated with lower readmission rates. Certain aspects of the PCMH, however, may be more likely to influence readmissions.

**Implications for Policy, Delivery, or Practice:** In addition to pursuing broader adoption of the PCMH across physician practices, policy makers and practitioners should promote more extensive PCMH implementation within practices as a means of improving quality. An awareness of differential influence across different types of PCMH activities may also help policy makers and practitioners understand when the PCMH may be most likely to have its intended effects.

**Funding Source(s):** AHRQ, UAB Center for Outcomes and Effectiveness Research and Education

**Poster Session and Number:** A, #455

**The Participation Patterns and Administrative Challenges of Pay-for-Performance and Public Reporting Programs in Small- and Medium-Sized Physician Practices**

Larry Hearld, University of Alabama at Birmingham; Jeffrey A. Alexander, Ph.D., George Washington University; Yunfeng Shi, Ph.D., Pennsylvania State University

**Presenter:** Larry Hearld, Ph.D., M.B.A., M.S.A., Assistant Professor, Health Services Administration, University of Alabama at Birmingham, lhearld@uab.edu

**Research Objective:** A key component of efforts to improve the quality of care in the U.S. is the use of public reporting and pay-for-performance programs. Little is known, however, about the degree to which small- and medium-sized physician practices are participating in these programs. Research also suggests that a barrier to broad acceptance and diffusion of these programs is the proliferation of different program measures, which can create administrative and financial burdens due to the allocation of scarce staff resources to unique data collection processes. This study examined the participation of small- and medium-sized physician practices in pay-for-performance and public reporting programs and the degree of administrative problems due to participation in multiple programs.

**Study Design:** Based on data from a nationally representative telephone survey of small-medium sized physician practices, logistic regression models were used to identify physician practice characteristics associated with: 1. Participation in at least one pay-for-performance or public reporting program; 2. Participation in multiple pay-for-performance or public reporting programs; and 3. High levels of administrative problems due to a lack of
standardization in pay-for-performance or public reporting program measures.

**Population Studied:** 1,141 small- and medium-sized primary care and specialty physician practices (fewer than 20 practicing physicians) located throughout the United States that were providing care to chronically ill patients.

**Principal Findings:** Most practices (71.0%) were participating in at least one pay-for-performance or public reporting program, but relatively few (12.7%) were participating in multiple programs. Among the practices participating in multiple programs, relatively few (11.7%) reported high levels of administrative problems due to a lack of standardization on performance measures. Practices affiliated with an IPA, PHO, or integrated delivery system were more likely to participate in multiple programs and less likely to report administrative problems. In contrast, practices owned by non-physicians (e.g., hospitals), compared to physician ownership, were less likely to participate in any program or multiple programs and were more likely to report administrative problems if they did participate.

**Conclusions:** Most small- and medium-sized physician practices participate in at least one pay-for-performance or public reporting program, however, they appear to limit how many programs they participate in. Despite concerns about administrative challenges due to multiple reporting programs, most practices participating in multiple programs do not report high levels of administrative problems. A practice’s willingness to participate and ability to cope with the administrative complexity of multiple programs is, in part, a function of relational characteristics.

**Implications for Policy, Delivery, or Practice:** Identifying why more physician practices are not participating in multiple pay-for-performance and public reporting programs is important for understanding the potential for these programs to improve quality for a broader set of patients. Our findings suggest that policy makers and practitioners may be able to utilize larger organizational entities (e.g., IPA, PHO) to help these practices enter into and manage the complexity of pay-for-performance and public reporting programs. However, these findings also raise questions about what these entities are doing that helps practices enter into and manage these programs, as well as how much policy makers and payers focus their efforts on these larger entities and work with them to promote these programs.

**Funding Source(s):** RWJF

**Poster Session and Number:** A, #456

**Understanding Patient-Centered Medical Home Implementation: A Qualitative Analysis of Implementation Gaps in Six Practices**

Timothy Hoff, Northeastern University; Matthew DePuccio, Virginia Commonwealth University

**Presenter:** Timothy Hoff, Ph.D., Associate Professor of Management, Healthcare Systems, and Health Policy, D’Amore-McKim School of Business, Northeastern University, t.hoff@neu.edu

**Research Objective:** The Patient-Centered Medical Home (PCMH) model of care is an important innovation in health care delivery. However, less is known about the model’s everyday implementation. This study examines implementation gaps among six NCQA accredited medical home practices.

**Study Design:** A qualitative, comparative case study design was used to pursue the research objective. The organization sample consisted of six NCQA-accredited PCMH practices delivering primary care services. Data collection involved staff interviews and archival analysis of practice protocols related to PCMH care. A sensemaking conceptual lens was used to help guide data collection and interpretation. This lens focused on gaining rich description from practice staff on their everyday work experiences doing medical home care, then exploring how these experiences shaped the practice’s collective knowledge, learning, and action related to doing PCMH care. Both taxonomic analysis and a grounded theoretical analytic approach were used to identify the implementation gaps.

**Population Studied:** The population studied consisted of 51 clinical and non-clinical staff working in the six practices. The care delivery focus was older adult patients since this cohort is complex and consumes the majority of primary care services. The sample included 21 primary care physicians, 5 nurse practitioners or physician assistants, 7 non-clinical practice managers, 6 registered nurses, 7 licensed practice nurses, 3 medical assistants, and 2 network-level clinical quality supervisors.

Interviews were conducted between October 2011 and November 2012.

**Principal Findings:** Implementation gaps were identified in delivering PCMH care to older adult
patients. These included: (a) inability of practices to attend to the full range of older adult health-related needs between traditional in-office visits; (b) insufficient assessment of elderly patient conditions by practices on a regular basis; (c) breakdowns in care coordination, in particular practice oversight of care transitions (e.g. hospital to nursing home) and specialist visits; and (d) lack of integration of elderly patients’ family members into the care process. Practice staff were less aware of the gaps given their intense focus on complying with basic elements of PCMH care designed to make office-based care routines more efficient and standardized. Factors that in staff minds facilitated these gaps included the structure of available time and contact between practice and older patient; reimbursement schemes that still favored episodic care; practice cultures trapped in traditional ways of thinking about patients; and less practice awareness of the larger “medical neighborhood” available for meeting elderly care needs.

**Conclusions:** The PCMH model promotes numerous improvements in patient care. However, for specific populations like the elderly, the model as currently structured may fall short in addressing important patient care and service-related needs. Primary care practice staff are highly focused on promoting the standard elements of medical home care and may be less cognizant of or able to address these gaps without additional assistance and guidance.

**Implications for Policy, Delivery, or Practice:** The findings of this study suggest where PCMH care can be improved for an important patient cohort, i.e. older adults. The results move away from a “one size fits all” approach to medical home implementation and offers clues for policy development on how to build and incentivize additional medical home components that might improve the patient-centeredness of the model at an individual patient level.

**Funding Source(s):** AHRQ

**Poster Session and Number:** A, #457

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**Prevalence and Distribution of Outpatient Surgical Care**

John Hollingsworth, University of Michigan; John D. Birkmeyer, MD, University of Michigan; Zaojun Ye, MS, University of Michigan; David C. Miller, MD, MPH, University of Michigan

**Presenter:** John Hollingsworth, M.D., M.S., Assistant Professor, Urology, University of Michigan, kinks@med.umich.edu

**Research Objective:** With over 53 million ambulatory procedures performed annually, efforts to achieve greater value in surgical care should include a focus on outpatient surgery. To facilitate this process, we examined current trends in outpatient surgery across different setting and surgical specialties.

**Study Design:** We performed a retrospective cohort study using the Florida files from the Healthcare Cost and Utilization Project’s State Ambulatory Surgery and Inpatient Databases. After identifying all physicians who performed one or more surgical procedures, we empirically determined each physician’s specialty based on the mix of procedures that he/she performed. As our initial analytic step, we measured the proportions of procedures that were performed on an inpatient or outpatient basis. Next, we examined for changes over time in the frequency of outpatient surgery for individual specialties. Finally, for each clinical specialty, we determined the proportion of all ambulatory procedures carried out in a surgery center, and we assessed for temporal trends in this proportion.


**Principal Findings:** Two-thirds of surgical procedures are carried out on an outpatient basis. This proportion has risen for many surgical specialties over the last decade, including several that now perform nearly all of their cases in outpatient settings. Within individual surgical disciplines, overall trends in the use of outpatient surgery are strongly associated with the specialty’s affinity for non-hospital based facilities. As surgeons perform more and more procedures on an outpatient basis, the location for them is predominantly the freestanding ambulatory surgery center.

**Conclusions:** There is growing consolidation of surgical care in outpatient settings, especially freestanding ambulatory surgery centers.

**Implications for Policy, Delivery, or Practice:** Our findings indicate that a majority of surgeons in many specialties provide predominantly outpatient care and will, therefore, have limited exposure to the efficiency gains that may evolve from payment bundling. Further, the increasing concentration of outpatient surgery in surgery centers may pose a challenge for Accountable...
Care Organizations and their cost containment efforts, given the historically production-based incentives associated with surgery centers. **Funding Source(s):** AHRQ

**Poster Session and Number:** A, #458

**Exploring the Relationship between Physician Alignment and Policy Adherence**

*Rebecca Russ-Sellers, Ph.D., Greenville Hospital System; Matthew Hudson, Greenville Hospital System*

**Presenter:** Matthew Hudson, Ph.D., M.P.H., Comparative Effectiveness Research Director, Academic Services, Greenville Hospital System

**Research Objective:** This research will assess relationships between physicians’ practice philosophy and resource perceptions, relative to a novel regional healthcare policy consistent with Affordable Care Act (ACA) tenets. This policy is designed to optimally manage 14,000 Greenville County, SC Medicaid enrollees via enhanced care coordination. We hypothesize philosophically and resource-aligned physicians practice in a manner consistent with the new regional policy.

**Study Design:** We will implement a cross-sectional study design, using a web-based survey to solicit physician perceptions of health management readiness (self-reported practice philosophy and resource assessment).

**Population Studied:** Our study will solicit 800 medical doctors affiliated with an integrated health care system (five campuses, 1,268 beds) serving the northwest region of South Carolina. In addition to soliciting health management readiness perceptions, we will solicit information on employment status (system-employed, nonemployed, affiliated), practice classification (adult primary care, pediatric primary care, adult specialist, pediatric specialists), and sociodemographics (age, year degree earned, race, gender).

**Principal Findings:** We will consider differences between optimally aligned physicians and minimally aligned physicians on likelihood of practice consistent with coordinated care policy (e.g., screening, well visits, adherence to asthma and mental illness screening guidelines). We will stratify analyses by employment status and practice classification; we will further control for sociodemographic effects (age, year degree earned, race, and gender).

**Conclusions:** At present, the research literature offers limited insight clarifying the extent to which health policy facilitates inherent physician practice tendencies, or modifies practice tendencies. Consequently, this study will enhance knowledge relative to ACA-informed policy making and analysis.

**Implications for Policy, Delivery, or Practice:** We anticipate this work may clarify whether health care policies differentially enhance and facilitate practitioners predisposed to policy intent. This work may also clarify the extent to which policy successfully shifts practice norms among physicians having philosophies/practice styles less consistent with the regional policy. Comparing the magnitude of change difference may elucidate policy strengths, improvement opportunities, and inform necessary policy adjuncts to better ensure policy success and utility. These results will inform subsequent surveys measuring alignment change as the policy initiative matures. In a subsequent initiative, we will compare survey responses with Healthcare Effectiveness Data and Information Set (HEDIS) measures to examine associations between physician responses and care quality. These subsequent efforts, collectively, may inform system policies favorably impacting care delivery and regional policy adherence.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #459

**Qualitative and Quantitative Comprehension of Diabetes Care Delivery Interventions in Minnesota**

*Ryan Johnson, Mayo Clinic; Nilay D. Shah, Mayo Clinic; Steven A. Smith, Mayo Clinic; Jay Desai, HealthPartners Institute for Education and Research; Jennifer L. Ridgeway, Mayo Clinic; Victor M. Montori, Mayo Clinic*

**Presenter:** Ryan Johnson, M.B.A.,M.S., Masters Health Services Analyst, Health Sciences Research, Mayo Clinic, johnson.ryan1@mayo.edu

**Research Objective:** The Triple Aim has three dimensions for optimizing health system performance: improving patient experience, improving population health, and reducing the cost of care. In Minnesota, public performance reporting of diabetes quality metrics has occurred since 2003 through Minnesota Community Measurement (MNCM). MNCM reports an Optimal Diabetes Care score, comprised of all-or-none thresholds of blood
pressure control, lipid control levels, hemoglobin A1C measurements, tobacco-free status, and aspirin use where not contraindicated. It is unknown what activities have been implemented by healthcare systems and payers to impact performance measures and the attainment of the Triple Aim for individuals with diabetes. This project has the objective to enumerate and better understand the types of existing interventions and programs impacting the quality of diabetes care delivery in the state of Minnesota.

**Study Design:** Two instruments were utilized for data collection. A baseline quantitative survey was followed up with a semi-structured qualitative interview of key stakeholders.

**Population Studied:** Cross-sector stakeholder engagement occurred with information gathered from entities representing medical providers, integrated health systems, federally qualified health centers, health plans and purchasers, and Indian Health Services. Forty quantitative surveys were completed, representing 25 different organizations in various capacities. Ten health plans/payers were represented, each with a single survey. Twenty-nine interviews representing 22 different organizations were completed.

**Principal Findings:** Eighty-nine percent of all those surveyed indicated that diabetes care was a high priority within their organization. Diabetes registries were indicated as a top method of participant identification in 88 percent of the healthcare provider surveys. Payers indicated medical claims as a top method of identification, with only 10 percent utilizing a diabetes registry. Only 12 percent of healthcare providers utilized claims data. Excluding the Tribal/Indian Health Services entities surveyed, which do not report to MNCM, 93 percent of interventions indicated by medical provider surveys monitored all five criteria of the MNCM Optimal Diabetes Care metric. Fifty percent of the health plans monitored the five criteria, while two others monitored four of the five components, with aspirin use being the exception. Only 26 percent of all medical providers indicated monitoring service utilization and 17 percent monitor morbidity and mortality of their diabetic population impacted by the described interventions, whereas health plans indicated monitoring these metrics at a much higher frequency, 80 percent and 60 percent, respectively. Patient perception of health was monitored by 24 percent of healthcare providers and sixty percent of health plans surveyed.

Monitoring patient satisfaction was indicated by 41 percent of healthcare providers and ninety percent of health plans.

**Conclusions:** Identifying and understanding the current state of diabetes care delivery represents a critical first step towards identifying strategies to improve the utilization and value of existing care practices that promote advancement toward the Triple Aim. Information gathered during this study suggests that, in general, current data collections are inadequate to make complete and informative evaluations on these interventions achieving the Triple Aim.

**Implications for Policy, Delivery, or Practice:** Cross sector opportunities exist for information sharing, data integration, shared learning, and future collaborations to collectively minimize duplicative efforts of scarce healthcare resources and advance care delivery.

**Funding Source(s):** Other, Grant Funded

**Poster Session and Number:** A, #460

**Impact of a Single-Provider Lock-In Program for Opiates in a Managed Medicaid Population**

Sarah Kachur, Johns Hopkins HealthCare; Alyson Schuster, MPH, MBA, PhD, Johns Hopkins HealthCare; Peter J. Fagan, PhD, Johns Hopkins HealthCare; Yanyan Lu, Johns Hopkins HealthCare; Elizabeth LeNoach, Johns Hopkins HealthCare; Hugh Fatodu, RPh, MBA, Johns Hopkins HealthCare; Chester W. Schmidt, MD, Johns Hopkins HealthCare

**Presenter:** Sarah Kachur, PharmD, MBA, BCACP, Clinical Pharmacy Manager, Pharmacy Review, Johns Hopkins HealthCare, skachur@jhhc.com

**Research Objective:** Single-provider lock-in programs have been proposed as a tool to combat prescription drug abuse in insured populations, particularly Medicaid populations. These programs limit an enrollee’s prescriptions to a single designated prescriber and pharmacy, theoretically improving coordination of care and reducing medication overuse and “doctor-shopping”. Despite growing interest in lock-in programs to reduce overutilization of controlled substances, reports on the outcomes of such programs are limited. This evaluation determines the impact of a single-provider lock-in program for prescription opiates on health care utilization and costs within a Medicaid Managed Care Organization (MCO) in Maryland.
Study Design: The study is a pre-post design comparing the change in prescription fills and medical utilization in the six months before and after initial enrollment in the opiate lock-in program. We use medical and pharmacy claims data from one Medicaid MCO in Maryland to create a longitudinal dataset consisting of one observation for each member month during the study period. We use a GEE regression analysis and the ACG software (version 9) to calculate resource utilization and chronic condition count.

Population Studied: We identified 111 health plan members ages 18 years or older with initial enrollment in the lock-in program between March 2008 – February 2011. The health plan identified plan members for the lock-in program who exhibited signs of opiate overuse (multiple prescriptions, multiple prescribers, and/or opiate-seeking emergency department visits), and enrolled members in the program after review by a multidisciplinary committee and a thirty day “warning” period.

Principal Findings: The mean age of those enrolled in the lock-in program was 37.4 years, 69% were female, and 21% resided in an urban area. Fifty-six percent were in the “very high” resource utilization band and 27% had six or more chronic conditions. The number of opiate prescriptions decreased following enrollment in the lock-in program, from 3.42 to 1.37 prescriptions PMPM. Likewise, emergency department visits decreased from 1.92 to 1.23 PMPM. Primary care office visits, specialist office visits, and enrollment in substance abuse treatment programs remained unchanged. The number of inpatient admissions decreased slightly (0.21 to 0.17 per member-month), while inpatient costs decreased by 11% ($1,522 vs. $1,353 during the six-month period). Total cost was 16% lower in the six months following program enrollment ($3,424 vs $2,868), driven by decreases in inpatient costs, expenditures for opiate medications ($173 vs. $88) and emergency room visits ($1,180 vs. $900).

Conclusions: Enrollment in a single-provider lock-in program decreases opiate prescriptions and emergency department visits with limited impact on office visits. However, enrollment in substance abuse treatment programs was also not changed.

Implications for Policy, Delivery, or Practice: Expanding the use of single-provider lock-in programs may help reduce opiate overuse from multiple prescribers within insured populations. Since single-provider lock-in programs limit only those prescriptions paid by the health plan, such programs should be implemented in combination with statewide prescription drug monitoring programs.

Funding Source(s): No Funding

Poster Session and Number: A, #461

The Effects of Transformed Primary Care on Health Care Utilization and Cost among a Non-Elderly Cohort: A Multivariate, Longitudinal Analysis

Jaewhan Kim, University of Utah; Michael Magill, University of Utah; Norman Waitzman, University of Utah; Debra Scammom, University of Utah; Timothy Farrell, University of Utah; Julie Day, University of Utah; Andrada Tomoaia-Cotisel, University of Utah

Presenter: Jaewhan Kim, Assistant Professor, Public Health, University of Utah, jaewhan.kim@utah.edu

Research Objective: The patient-centered medical home (PCMH) has been touted for its potential to reduce health care utilization and cost, particularly among patients with chronic conditions. Yet, there has been a paucity of longitudinal analyses, at the patient level, of the effects of individual components of the PCMH on health care utilization and cost. The objective of this study was to perform a multivariate analysis of the effects on health care utilization and cost in 2008-2010 among a cohort of non-elderly adult patients (20-64 years old) with specific chronic conditions exposed (in 2008) to Care By Design (CBD), the University of Utah Community Clinics’ (UUCC) version of the PCMH.

Study Design: We used a retrospective cohort study design involving the Utah All Payers-Claims Database. Generalized estimation equation (GEE) models, controlling for patient-level demographic characteristics such as age, gender, continuity of care, and health status, including number of co-morbid conditions, were run to estimate total cost (=inpatient + outpatient + pharmaceutical costs) as well as outpatient, inpatient, and pharmaceutical utilization and cost in two-year follow-up after 2008. All costs were adjusted to 2010 dollars using Medicare price indices.

Population Studied: The population studied included all non-elderly patients having at least one visit to a UUCC in 2008. The sample consisted of all medical claims for the 97,992 patients with private health insurance in 2008 receiving primary care in any of the ten UUCCs.
Among them, we focused on a subset of 2762 patients with coronary artery disease (7.17%), diabetes mellitus (87.6%), or heart failure (3.73%) diagnoses (identified by ICD-9 codes), given the expected increased in health care utilization and costs in these populations. In 2008, mean (SD) age and proportion female were 39.6 (10.6) years and 51.4%, respectively.

**Principal Findings:** Median total cost of care in 2008 was $2614 (25th and 75th quartiles: $1063 and $5550). Median inpatient care utilization and costs were 0.6 days and $3387 (25th and 75th quartiles: $1398 and $13644), respectively, in 2008. In fully adjusted models, the total cost of care in 2009 and in 2010 as compared to total cost of care in 2008 was increased by $18 (p-value=0.721) and was reduced by $125 (p-value=0.470), respectively. In adjusted models, inpatient care utilization in 2009 and in 2010 were not significantly different from that in 2008 (p-value=0.256 and p-value=0.455). The total cost of care in 2009 and in 2010 as compared to total cost of care in 2008 was reduced by $39 and by $59, respectively. However, these total costs of care were not significantly different from baseline (p-value=0.797 between 2008 and 2009; p-value=0.718 between 2008 and 2010).

**Conclusions:** There was a reduction in inpatient medical care costs among those patients with one or more of the index chronic conditions exposed to primary care where CBD was implemented. However, the reductions observed were not statistically significant.

**Implications for Policy, Delivery, or Practice:** A transformation in primary care holds promise for significant reduction of long-term reduction of health care utilization and cost, particularly inpatient cost.

**Funding Source(s):** AHRQ, NIH

**Poster Session and Number:** A, #462

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**The Many Journeys to Accountable Care**

Eugene Kroch, Premier Incorporated and University of Pennsylvania; Joseph F. Damore, Premier Research Institute; Danielle A. Lloyd, Premier Research Institute; Diaine Shannon, Premier Research Institute

**Presenter:** Eugene Kroch, Ph.D., Vice President & Chief Scientist, Health Care Systems, Premier Incorporated and University of Pennsylvania, ekroch@wharton.upenn.edu

**Research Objective:** Accountable care has been proposed as a means to reform the U.S. healthcare system, even though the best strategies for implementing accountable care are not yet fully understood. Case studies of diverse organizations that have begun to implement accountable care can illustrate the diversity of alternative paths that are succeeding.

**Study Design:** On-site visits were performed to validate organizational self-assessments, using the Premier "capabilities framework," which is a way to inventory the building blocks needed to transform delivery from volume-based to value-based health care. We conducted structured interviews with executive leaders to explore how internal and external environments influenced whether, when, and how to pursue accountable care. We focused on how organizations implemented best practices to achieve administrative, clinical, and IT transformation, targeting perceived benefits from facilitating factors in their local markets when faced a number of challenges, including the lack of readiness of some payers to engage in value-based contracts and the plentitude of unknowns in the journey to accountable care.

**Population Studied:** Four hospital-led organizations were selected from 23 health systems participating in the Premier PACT Implementation Collaborative as of September 2011. These organizations were chosen to provide variation in geographic location, demographic characteristics, and other factors with the goal of generating widely applicable lessons for other healthcare organizations throughout the country.

**Principal Findings:** Depending on market conditions and other factors, these organizations selected different entry points and populations for their initial forays into accountable care. As a group, however, they covered subpopulations from all possible payers: commercial health plans, self-insured employee plans, Medicare, and Medicaid, as well as uninsured individuals. Of special interest to the national agenda, two of the four case study organizations serve as safety net hospitals, providing critical services to underserved populations. Despite the differences in the paths selected to embark on accountable care, these organizations shared similar experiences with implementation. All four faced the challenge of determining the ideal speed at which to implement accountable care for their organization and environment. Leaders of these organizations did not have at the outset all the capabilities required for effective population health management and value-based
Determinants of Participation in an Incentivized Employee Wellness Program for a Healthcare Workforce

Bernie Lau, University of Washington; David Grossman, Group Health Research Institute; Kay Theis, Group Health Research Institute

Presenter: Bernie Lau, M.P.H., Phd Student, Health Services, University of Washington, bernlau@uw.edu

Research Objective: Wellness programs provide support and incentives to employees to adopt healthier lifestyles or take other actions to improve health. Approximately two-thirds of US employers offered wellness programs to their employees in 2012. The proportion of large employers offering financial incentives for participation increased from 20% to 41% between 2008 and 2012. As these programs become more common and the size of incentives grow, potential concerns have emerged about inequitable distribution of incentives.

In 2010, a large integrated health delivery system implemented an incentivized employee wellness program. Employees received a $450 discount on their annual health benefits premium for the following year by completing a health risk assessment and successfully participating in a number of wellness activities. Our objective is to examine factors associated with achieving the premium discount in an incentivized employee wellness program for a healthcare workforce.

Study Design: This study used survey data collected as part of a larger quasi-experimental design, as well as records of participation in wellness activities for a corresponding 12-month period. Records of premium discounts, indicating successful program participation, were collected from employer administrative data. Logistic regression was conducted to determine whether health status, health risks, employment and socioeconomic characteristics were associated with achieving the premium discount.


Principal Findings: 3,463 people completed the survey (71.7% response rate). The majority of respondents were female (80.1%), white (79.6%), and between ages 35-64 (79.0%). Nearly half were college graduates and about two-thirds were married. Nearly all respondents (94.4%) enrolled in the wellness program and most (86.1%) received the premium discount for successful participation.

Multivariate regression analyses indicate that employees receiving the premium discount were more likely to be women (OR 2.10; 95% CI 1.63, 2.94); white (OR 1.75, 95% CI 1.27, 2.41); and college graduates (OR 1.52, 95% CI 1.12, 2.05). Employees with coverage for a partner or spouse (OR 0.63, 95% CI 0.48, 0.82) and older employees (OR 0.89, 95% CI 0.79, 1.01) were less likely to receive the premium discounts.

Achieving the premium discount was also associated with above-average physical health status (OR 1.55, 95% CI 1.03, 2.33) and above-average mental health status (OR 1.70, 95% CI 1.16, 2.50).

Conclusions: Although overall participation in an incentivized employee wellness program was relatively high, these results indicate certain groups were more likely to receive the premium discount through fulfillment of program requirements. Achieving premium discount was associated with health status, age, and certain socioeconomic characteristics. However, income, job class, and BMI were not significantly associated with receiving the discount.

Implications for Policy, Delivery, or Practice: Policies supporting care coordination and innovative payment reform will be needed to ensure timely and successful movement of organizations to accountable care.

Funding Source(s): CWF

Post Session and Number: A, #463
Differential participation suggests program design may reach certain groups more effectively. In particular, those in worse health, who may be in greater need for behavior change, are less likely to achieve program goals.

**Implications for Policy, Delivery, or Practice:**
Provisions in PPACA encourage the use of financial incentives to promote employee participation in wellness programs, allowing rewards up to thirty percent of the cost of healthcare coverage. As the implementation of incentivized wellness programs increase, these findings bring attention to the importance of program design to ensure equity in opportunity as well as monitoring to improve efficiency in the allocation of resources to employees. Future analyses should further investigate and decompose patterns of participation to inform program design and appropriate offerings of reasonable alternatives.

**Funding Source(s):** AHRQ
**Poster Session and Number:** A, #464

**Delivery System Integration and Health Care Spending and Quality for Medicare Beneficiaries**

J. Michael McWilliams, Harvard Medical School; Michael E. Chernew, Harvard Medical School; Alan M. Zaslavsky, Harvard Medical School; Pasha Hamed, Harvard Medical School; Bruce E. Landon, Harvard Medical School

**Presenter:** J. Michael McWilliams, M.D.,Ph.D., Assistant Professor, Department of Health Care Policy, Harvard Medical School, mcwilliams@hcp.med.harvard.edu

**Research Objective:** The Medicare accountable care organization (ACO) programs rely on delivery system integration and provider risk sharing to lower spending while improving quality of care. We compared spending and quality of care between large and smaller provider groups and examined how size-related differences varied by 2 factors considered central to ACO performance: group primary care orientation and financial risk sharing by providers.

**Study Design:** Using 2009 Medicare claims and linked American Medical Association Group Practice data, we assigned Medicare beneficiaries to provider groups based on their use of primary care services. We categorized group size according to eligibility thresholds for the Shared Savings (=5,000 assigned beneficiaries) and Pioneer (=15,000) ACO programs and distinguished hospital-based from independent groups. We measured the primary care share of large groups’ specialty mix (primary care orientation) and used health maintenance organization market penetration and data from the Community Tracking Study to estimate the extent of financial risk accepted by different types of provider groups in different areas for managed care patients. Spending and quality of care measures included total medical spending, spending by type of service, 5 process measures of quality, and 30-day readmissions, all adjusted for sociodemographic and clinical characteristics.

**Population Studied:** A random 20% sample of 4.29 million traditional fee-for-service Medicare beneficiaries who were continuously enrolled in Parts A and B and received at least 1 primary care service in 2009.

**Principal Findings:** For larger hospital-based groups, mean total per-beneficiary spending was $849 higher (P<0.001) than for smaller groups, 30-day readmission rates averaged 1.3% percentage points higher (P<0.001), and performance on process measures of quality was not consistently better. In contrast, larger independent physician groups performed better than smaller groups on all process measures and exhibited significantly lower per-beneficiary spending in counties where risk sharing by these groups was more common (-$426 lower; P<0.001). Among all groups sufficiently large to participate in ACO programs, a strong primary care orientation was associated with lower spending, fewer readmissions, and better quality of diabetes care.

**Conclusions:** Spending was lower and quality of care better for Medicare beneficiaries served by larger physician groups with strong primary care orientations in environments where providers accepted greater risk.

**Implications for Policy, Delivery, or Practice:**
The full impact of the Medicare ACO programs, as determined from quasi-experimental evaluations, will not be known for several years. Our observational findings from existing variation in organizational features and incentives are nevertheless consistent with the conceptual basis for these programs – namely, that policies coupling delivery system integration with provider risk sharing, while strengthening primary care, may lower spending and improve quality of care for Medicare beneficiaries.

**Funding Source(s):** NIH, Doris Duke Charitable Foundation
Poster Session and Number: A, #465

Spillover Effects of the Alternative Quality Contract on Spending and Quality for Medicare Beneficiaries
J. Michael McWilliams, Harvard Medical School; Bruce E. Landon, Harvard Medical School; Michael E. Chernew, Harvard Medical School

Presenter: J. Michael McWilliams, M.D., Ph.D., Assistant Professor, Department of Health Care Policy, Harvard Medical School, mcwilliams@hcp.med.harvard.edu

Research Objective: To examine the spillover effects of the Blue Cross Blue Shield (BCBS) Alternative Quality Contract (AQC) – a global payment system with pay-for-performance incentives – on spending and quality of care for Medicare beneficiaries in Massachusetts.

Study Design: Using a difference-in-differences approach and Medicare claims data from 2007-2010, we compared spending and quality of care for beneficiaries served by organizations participating in the AQC (intervention group) with spending and quality for beneficiaries served by other providers (control group), before and after organizations joined the AQC in 2009 or 2010. We estimated differential changes for the intervention group separately for their first and second years of exposure to the AQC, focusing on the 7 organizations that joined the AQC in 2009 for estimates in year 2. We analyzed total spending on hospital and outpatient care and spending by type of service. Annual quality measures included 5 process measures, hospitalizations for ambulatory care-sensitive conditions, and 30-day readmissions, all assessed from claims. We used propensity-score methods and linear regression to adjust for sociodemographic characteristics, baseline clinical conditions, and county fixed effects. Robust variance estimators were used to adjust for clustering within organizations and within individuals over time.

Population Studied: In each study year, we attributed traditional fee-for-service Medicare beneficiaries to provider groups in the AQC or to other providers based on their use of primary care services. The intervention group included 417,182 person-years and the control group 1,344,143 person-years.

Principal Findings: Pre-intervention spending trends did not differ between the intervention and control groups, and there were no significant changes over the study period in group differences in sociodemographic or baseline clinical conditions. Relative to the control group, total quarterly spending for the intervention group differentially decreased in year 2 of the intervention (-$99; P=0.02) but not in year 1 (-$34; P=0.18). The spending reduction in year 2 was explained largely by lower spending on outpatient care (-$77; P<0.001), particularly for beneficiaries with 5 or more chronic conditions (-$139; P<0.001). By type of service, there were significant differential reductions in spending on office visits (-$9; P<0.001), emergency room visits (-$3; P=0.02); minor procedures (-$12; P<0.001), imaging (-$13; P=0.001), laboratory tests (-$4; P=0.002), and cancer therapies and other drugs covered by Part B (-$25; P<0.001). Annual rates of LDL testing differentially increased for beneficiaries in the intervention group with diabetes (+3.1 percentage points; P<0.001) and cardiovascular disease (+2.5; P<0.001), but performance on other quality measures did not differentially change.

Conclusions: The AQC was associated with modest reductions in spending for Medicare beneficiaries but not with consistently better quality of care. Similar to savings among BCBS commercial AQC enrollees, savings in Medicare were greater in year 2 of AQC incentives, concentrated among medically complex patients, and explained by lower spending on similar types of services.

Implications for Policy, Delivery, or Practice: Efforts by provider groups to control spending in response to global payment incentives from one payer may have similar effects on spending for other patients they serve.

Funding Source(s): NIH, Doris Duke Charitable Foundation

Poster Session and Number: A, #466

The Use of Individualized Dashboards and Pay-for-Performance to Improve Venous Thromboembolism Prophylaxis Compliance by Hospitalists
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Presenter: Henry Michtalik, M.D., M.H.S., M.P.H., Assistant Professor, General Internal Medicine, Johns Hopkins University, hmichtalik@jhu.edu

Research Objective: Venous thromboembolism (VTE) accounts for over 100,000 deaths per year and costs the healthcare system approximately $15,000 per event. Methods to increase appropriate prophylaxis have included computerized physician order entry (CPOE) with decision support, dashboards, and pay-for-performance (P4P) programs. In this study, we sequentially examined CPOE-based decision support alone, group and provider-specific feedback using a dashboard plus decision support, and a P4P program in conjunction with dashboards and decision support to improve VTE prophylaxis.

Study Design: CPOE with decision support for appropriate VTE prophylaxis based on American College of Chest Physicians (ACCP) guidelines was incorporated into the admission order-sets for all adults admitted to our academic, tertiary care medical center in 2008. Appropriate prophylaxis was audited through the CPOE system 24 hours from admission. To further improve VTE prophylaxis, a web-based dashboard specific to the hospitalist group was launched in January 2011, providing both hospitalist group and individualized hospitalist compliance rates. Benchmarks were determined using this dashboard. After 6 months of feedback only, a P4P program was initiated with hospital funding. No payment was made to individual hospitalists with ACCP-compliant VTE prophylaxis rates of <80%. Graduated payouts were made for compliance rates of 80-100% to a maximum of $0.50 per work RVU. Using time series analysis, the percent compliance for the hospitalist group was compared during all three periods: CPOE alone, CPOE with dashboard, and CPOE with dashboard tied to P4P. The analysis was restricted to the non-teaching unit of the hospital where individual housestaff practice would be unlikely to confound the results. A sensitivity analysis explored the potential impact from physician turnover.


Principal Findings: We examined 4119 inpatient admissions by 38 hospitalists from 2008-2012. The 5 most frequent primary diagnoses were heart failure, acute kidney failure, syncope, pneumonia, and chest pain. Patients had a median age of 57 years [IQR: 44, 69], APR-DRG severity of illness score of 2 [2, 3] and length of stay of 3 days [2, 6]. VTE prophylaxis group compliance rates were 84% (95% CI: 83, 85), 90% (95% CI: 88, 93), and 94% (95% CI: 93, 96) for CPOE alone, CPOE with dashboard, and CPOE with dashboard tied to P4P respectively. Compliance significantly improved with both the use of the dashboard (p<0.001) and the addition of the P4P program (p=0.01). Annual individual physician VTE P4P payments ranged from $80 to $1429 (mean $654; SD ±364). Physician payments for the P4P program totaled $12,422 and were distributed to 19 providers achieving benchmarks. Sensitivity analysis accounting for physician turnover did not significantly impact the comparisons.

Conclusions: Although CPOE with decision support assists with appropriate VTE prophylaxis, direct feedback using dashboards significantly improved compliance. This effect was further augmented by incorporating an individual physician pay-for-performance program.

Implications for Policy, Delivery, or Practice: In this program, the total P4P payments for an entire year were less than the cost of a single VTE event, suggesting an actual cost-savings. Real-time dashboards and physician-level incentives may assist hospitals in reducing preventable harm and achieving quality and safety benchmarks.

Funding Source(s): Other, Johns Hopkins Hospital; Johns Hopkins Hospitalist Scholars Fund

Poster Session and Number: A, #467

Total Payment Revenue: Innovative Payment Mechanisms in Maryland Hospitals
Karoline Mortensen, University of Maryland; Chad Perman, University of Maryland

Presenter: Karoline Mortensen, Ph.D., M.A.E., B.S., Assistant Professor, Health Services Administration, University of Maryland, karoline@umd.edu

Research Objective: Innovative payment designs that realign incentives to discourage hospital readmissions, align outpatient and inpatient care, and reward collaborative, efficient care while lowering expenditures have great appeal in this era of healthcare reform. The state of Maryland was on the cutting edge of innovation when it implemented global hospital
budgeting, or Total Payment Revenue (TPR), for 10 rural hospitals in July, 2010. This quasi-experimental program incorporates financial incentives to reduce the volume of admissions/readmissions through investment in an integrated, care coordination infrastructure that promotes quality and efficiency of care over quantity. TPR guarantees hospitals annual revenue upfront; a global budget based on the previous year’s charges. Hospitals achieve savings by delivering care more efficiently, or diverting care to less expensive settings. Hospitals meeting the program’s quality of care standards earn bonuses by coming in below the total budget, otherwise bearing the financial risk. Maryland operates an all-payer system for hospitals, setting rates for Medicare, Medicaid, and private insurers, offering an ideal setting for TPR. The objective of this analysis is to determine whether implementation of the TPR program reduced hospital readmission rates. Future analysis will analyze ambulatory care sensitive visits and charges.

Study Design: Probit difference-in-difference models are estimated to evaluate the effect of implementation of TPR on 31 day individual readmission rates. The key independent variable is a binary interaction variable that equals one for “treatment” hospitals participating in TPR in the “post” period after program implementation. The analysis controls for a treatment indicator, a pre/post indicator, payer type, hospital size, sex, race, income, age, and a health condition severity index.

Population Studied: Data are from the 2009-2011 Healthcare Cost and Utilization Project (HCUP) Maryland State Inpatient Database (SID). The SID contains the universe of individual inpatient discharges, including the 10 hospitals that participated in the TPR program and 6 rural control hospitals. The analysis sample includes 466,100 individual hospital discharges.

Principal Findings: In the 18 months before TPR implementation, control hospitals had lower readmission rates (mean=0.160) than treatment hospitals (0.180). After TPR implementation, average readmissions dropped for non-participating control hospitals (0.148), but not for treatment hospitals (0.181). Difference-in-difference probit results confirm that although overall readmissions dropped during the post period, the coefficients were positive for the treatment indicator and for the interaction between post and treatment. Sensitivity analysis using interactions for the treatment hospitals and 6, 12, and 18 months post implementation are also all positive, but the coefficients decrease over time.

Conclusions: One of the goals of TPR was to lower readmission rates, however these rates did not show consistent downward trends for treatment hospitals after implementation of the program.

Implications for Policy, Delivery, or Practice: As the health care system innovates, it is important to evaluate the success of these innovations. Our results show that it is still early to determine the impact of TPR. Our results suggest that even initiatives that alter payment in significant ways may not have instantaneous effects, particularly for rural hospitals that lack coordinated care delivery infrastructure.

Funding Source(s): No Funding

Poster Session and Number: A, #468

Transformation and Implementation Evaluation of the Maryland Multi-Payer Patient Centered Medical Home Program

Donald Nichols, IMPAQ International; Sarah Pederson, IMPAQ International; Elizabeth Gall, IMPAQ International; Camellia Bollino, ; Jill Marsteller, Johns Hopkins University

Presenter: Donald Nichols, Ph.D., Principal Research Associate, IMPAQ International, dnichols@impaqint.com

Research Objective: This study assesses the practice transformation process among MMPP practices. In particular, we address: 1) which types of practices are most likely to successfully implement; 2) which aspects of the model were particularly difficult to implement; 3) what results could be replicated in other practices; 4) whether patient-centered medical homes (PCMH) result in cost savings; and 5) which aspects of the PCMH principles most impact quality and costs.

Study Design: This study combines quantitative and qualitative methods. Site visits at selected practices included key informant interviews about infrastructure changes and experiences and satisfaction with the transformation process and its outcomes. We conducted the first round of site visits between September 2012 and January 2013. Another set of site visits will occur near the end of the demonstration. We also use quantitative data to longitudinally track progress of practice transformation including achievement of Maryland PCMH recognition levels and identification of unmet criteria among MMPP practices.
**Population Studied:** The site visit team sampled nine practices across settings and practice types. The team targeted three practices each in urban, rural, and suburban locations. In each location type we selected an FQHC, a privately owned practice, and a hospital-owned practice. The team also selected a mix of practices to include family and internal medicine, pediatricians, and geriatricians. The quantitative analysis includes two waves of data on the PCMH recognition levels for all 52 participating practices.

**Principal Findings:** All practices met the requirement of achieving NCQA recognition in the first year of the program (75% at higher levels than required and over 40% at the more stringent Maryland PCMH recognition level). The quantitative analysis showed that during the first year, practices fell short of the Maryland recognition level most frequently due to lack of 1) 24-7 phone response; 2) summaries of care records for transitions; 3) care management and coordination by specially trained team members; and 4) problem lists for all patients. The following themes emerged from the qualitative data: 1) hospital-owned practices experienced the greatest ease in adopting requirements, as a result of access to hospital resources; 2) adoption and meaningful use of EHRs has been the most demanding requirement; 3) practices that engaged staff early experienced the least staff resistance; 4) EHRs and care coordinators have resulted in increased communication within practices; and 5) practices have not yet seen cost savings due to investment of all returns back into the transformation process.

**Conclusions:** Practices experienced variation in transformation as a result of practice characteristics, such as setting. Those with embedded support and resource networks tend to describe smoother transitions to the PCMH model than practices without mature EHR systems, referral networks, and external partnerships. Involvement of staff in planning and implementation led to heightened staff willingness to change. Mechanisms to increase communication across staff improved quality and coordination of care and resulted in positive staff perceptions.

**Implications for Policy, Delivery, or Practice:** The year one findings of this study have specific implications for Maryland in deciding whether to expand the PCMH program, and broader considerations for organizations interested in creating programs to develop PCMHs.

**Funding Source(s):** Other, Maryland Health Care Commission

**Poster Session and Number:** A, #469

**The Effects of Financial Incentives on Physicians’ Choice of a High-Cost, Ambiguous-Value Intervention: Evidence from the Treatment of Atrial Fibrillation**

Elena Prager, University of Pennsylvania

**Presenter:** Elena Prager, Ph.D. Student, University of Pennsylvania, elprager@wharton.upenn.edu

**Research Objective:** To determine whether physician behavior can be shifted toward higher value care and quantify the extent of that shift using the treatment of atrial fibrillation (AF) as a case study. AF is a cardiac condition that can be treated aggressively via a surgical procedure known as cardiac ablation or less intensively via medical management. Physician reimbursement rates for the former are substantially higher, but evidence on its relative effectiveness is mixed at best.

**Study Design:** Observational data are used to estimate physicians’ propensity to choose one treatment over the other depending on differences in reimbursement, controlling for patient characteristics, using a discrete choice model. That is, treatment decisions are a function of a patient’s clinical characteristics and the appropriateness of an intervention for that patient, and these decisions are a discrete variable. Identifying variation in reimbursements is obtained from geographic variation and from a discrete change in provider reimbursements in 1997, when CMS abruptly changed the grouping of providers for the purposes of geographic reimbursement adjustments.

**Population Studied:** Given that an estimated 82% of cases of AF occur in patients aged 65 to 85, observational data from the National 20% Sample of Medicare Fee-for-Service Beneficiaries are used. This sample includes rich patient-level data, which allows for the necessary adjustment of important patient characteristics.

**Principal Findings:** Analysis of the data will yield a quantitative estimate of physicians’ responsiveness in treatment decisions to financial incentives (reimbursements). The degree of physician responsiveness will determine the effects of a change in reimbursement that “encourages” the use of the
low-cost intervention. Final results are expected by summer 2013.

**Conclusions:** This study proposes a rigorous method for analyzing the effectiveness of financial incentives for encouraging high-value care, using AF as a case study. The framework is generalizable to other conditions where intensive and less-intensive treatment alternatives are available.

**Implications for Policy, Delivery, or Practice:** As ACOs and other quality-improvement measures of the Affordable Care Act are implemented, these kinds of estimates of the magnitude of the effect of financial incentives will become a useful input for payment policy decisions.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #470

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**Building ACOs: What Kind of Infrastructure is Necessary?**

M. Susan Ridgely, RAND; Cheryl Damberg, RAND Corporation; Glenn Melnick, RAND Corporation; Peter Huckfeldt, RAND Corporation; Daniella Meeker, RAND Corporation

**Presenter:** M. Susan Ridgely, J.D., Senior Policy Analyst, RAND, ridgely@rand.org

**Research Objective:** In 2011, Blue Shield of California provided funding to 18 provider organizations across California to develop the health IT and clinical infrastructure needed to develop ACOs. Using qualitative and quantitative methods, RAND is evaluating the development of ACOs under this grant program - with a focus on three questions: (1) can these health care organizations develop a functioning ACO? (2) what clinical and health IT infrastructure is necessary to carry out ACO core competencies; and (3) what kinds of metrics can these "nascent" ACOs report that can be used for performance measurement?

**Study Design:** A case study approach is being used to evaluate this natural experiment because of the complexity and stage of the intervention and the primary interest in questions of implementation. We conducted interviews by telephone and during site visits with representatives of the health plan, hospitals, and physician organizations. We employed a number of strategies to decrease the possibility of bias, including the use of: a detailed methodology to serve as a guide; interview protocols across the sites and types of respondents; a multidisciplinary (public health, law, economics, information science) team of senior investigators (rather than single observer) for interview data collection; and external review by the organizations being studied.

**Funding Source(s):** Other, Blue Shield of California

**Principal Findings:** While the projects have faced sizable implementation challenges, by the end of the grant year (2012), 8 grantees had ACOs in place and the remaining projects were still in the planning stages (e.g., developing infrastructure and/or identifying potential partners). Seven of the sites used their BSC funds to develop health IT infrastructure exclusively, two targeted care coordination intervention development, and the remainder focused on both types of infrastructure development. Physician organizations were able to provide performance data on a standard set of metrics.

**Conclusions:** Participants across California see value in the ACO model and are moving rapidly to develop the health IT infrastructure to underpin ACO core competencies.

**Implications for Policy, Delivery, or Practice:** The experience of these nascent ACO organizations in California may be instructive to other organizations in deciding whether to pursue ACO relationships and in determining what kind of infrastructure they will need for population management.

**Poster Session and Number:** A, #471

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**Evaluating Bundled Payment in California**

M. Susan Ridgely, RAND; Peter Hussey, RAND Corporation

**Presenter:** M. Susan Ridgely, J.D., Senior Policy Analyst, RAND, ridgely@rand.org

**Research Objective:** One of the leading payment reform models is bundled payment, which provides payment for all of the care a patient needs over the course of a defined clinical episode - in this case - a hip or knee replacement. We evaluated the IHA Bundled Payment and Gainsharing Demonstration, funded by AHRQ. The objectives of the evaluation are to determine whether the model...
can be implemented with health plans, hospitals and physician organizations across the state of California.

**Study Design:** A case study approach was used because of the small number of sites, the complexity and stage of the intervention and the primary interest in questions of implementation. We conducted interviews by telephone and during site visits with health plan administrators, hospital administrators, medical staff management, and front-line physicians. We employed a number of strategies to decrease the possibility of bias, including the use of: a detailed methodology to serve as a guide; interview protocols across the sites and types of respondents; a multidisciplinary (public health, law, economics) team of senior investigators (rather than single observer) for interview data collection; and external review by the organizations being studied.

**Population Studied:** Six California health plans and their network providers.

**Principal Findings:** In spite of a high level of enthusiasm and effort among a broad cross-section of stakeholders, the demonstration project has experienced a series of significant delays. As was the case for the pilot sites implementing PROMETHEUS Payment (Hussey, Ridgely & Rosenthal, 2011), initial ambitious goals were unable to be realized because of unanticipated (or more precisely under-anticipated) challenges. By the beginning of 2013, only two contracts were in place (Aetna and Blue Shield) and the volume has been extremely low (<20 cases).

**Conclusions:** Simulations of the impact of bundled payment using secondary data are easy to do, but implementation of payment reform “in the real world” is slow and non-linear process. Participants, policymakers and researchers should plan accordingly.

**Implications for Policy, Delivery, or Practice:** If the bundled payment initiative spreads across California healthcare markets, diverse delivery systems, patient populations, and clinical areas, valuable experience will be gained about which designs and approaches may be effective; what administrative, regulatory and delivery system structures pose the most difficult barriers to implementation; and the requirements for scaling bundled payment approaches nationally. At this point in the development of bundled payment, however, there is much more conceptual discussion than actual experience. Enthusiasm (at least in California) in the face of other reform alternatives (such as ACOs) is waning.

**Funding Source(s):** AHRQ

**Poster Session and Number:** A, #472

**Part-Time Primary Care Physician Access and Continuity in the Patient Centered Medical Home**

Ann-Marie Rosland, VA Ann Arbor Healthcare Center and University of Michigan Medical School; Sarah Krein, VA Ann Arbor CCMR and University of Michigan; H. Myra Kim, VA Ann Arbor CCMR and University of Michigan; David Ratz, VA Ann Arbor CCMR; Darcy Safar, VA Ann Arbor CCMR; Eve Kerr, VA Ann Arbor CCMR and University of Michigan

**Presenter:** Ann-Marie Rosland, M.D.,M.S., Research Scientist, VA Center for Clinical Management Research and Division of General Internal Medicine, VA Ann Arbor Healthcare Center and University of Michigan Medical School, arosland@umich.edu

**Research Objective:** Patient Centered Medical Home (PCMH) models prioritize same-day access to and continuity with one assigned primary care provider (PCP). At the same time, PCPs are increasingly seeing patients on a part-time schedule. Likewise, the VHA is emphasizing same-day access and continuity in its nation-wide PCMH program. Yet many VHA PCPs, particularly those in academically affiliated medical centers, are not in clinic every day because they work part-time or have other duties. We sought to determine how limited availability (“part-time”) and full availability (“full-time”) VHA PCPs differed in same-day access and continuity.

**Study Design:** VHA PCP availability was measured through assigned patient panel size, which is directly proportional to the number of half-day sessions the PCP is in clinic. Part-time was defined as having less than 5 half-day sessions per week. Continuity was measured by whether a primary care appointment or non-acute ED visit was completed with the patient’s assigned PCP. The main measure of access was whether a request for a same-day appointment was accommodated on the same-day with the assigned PCP. We also examined whether same-day requests resulted in an appointment with the assigned PCP within 1 week or an appointment on the same-day with any PCP. Multilevel models (MLM) evaluated the impact of PCP availability on continuity and access.
controlling for demographic and clinical characteristics of the requesting patients, number of same-day requests the patient made in the month, and site of care.

**Population Studied:** We examined primary care clinic appointment data from July 2010 to October 2012 in one VHA healthcare system. 1312 total PCP-months of care were examined; 49.7% were from part-time PCPs.

**Principal Findings:** Across 128,376 visits, patients had an AOR for 'continuity' – seeing their assigned PCP – of 1.25 (95% CI 1.21, 1.30) per each additional session increase in PCP weekly availability. The expected probabilities of continuity were 67% for patients of PCPs with 2 sessions/week, 79% for patients of PCPs with 5 sessions/week, and 92% for patients of PCPs with 10 sessions/week. Across 21,862 same-day appointment requests, the AOR of being seen on the same day with the assigned PCP was 1.07 (1.03, 1.10) per additional weekly session of availability; expected probabilities were 18% for 2 sessions/week, 21% for 5 sessions/week, and 27% for 10 sessions/week. The AOR of being seen within 1 week by the assigned PCP was similar (1.07 (1.03, 1.10) per additional weekly session), but with higher overall expected probability: 27% for 2 sessions/week, 31% for 5 sessions/week, and 38% for 10 sessions/week. Differences in the odds of being seen same-day by any PCP were slightly attenuated (AOR 1.05 (1.02, 1.09)) with high expected probabilities of 54% for 2 sessions/week, 56% for 5 sessions/week, 61% for 10 sessions/week.

**Conclusions:** Patients of part-time PCPs experienced significantly less continuity and, to a smaller extent, less same-day access, than patients of full-time PCPs.

**Implications for Policy, Delivery, or Practice:**
Given the growing prevalence of part-time PCPs and the projected shortage of providers in the future, PCMH programs will need to structure care teams that include part-time providers while enhancing levels of access and continuity.

**Funding Source(s):** VA

**Poster Session and Number:** A, #473

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**The Relationship Between External Physician Payment, Internal Compensation, and Medicare Costs among Small and Medium-Sized Physician Practices**

Andrew Ryan, Weill Medical College of Cornell University; Stephen Shortell, University of California, Berkeley School of Public Health; Sean McClellan, University of California, Berkeley School of Public Health; Frances Wu, University of California, Berkeley School of Public Health; Lawrence Casalino, Weill Cornell Medical College

**Presenter:** Andrew Ryan, Ph.D., M.A., Assistant Professor, Public Health, Weill Medical College of Cornell University, amr2015@med.cornell.edu

**Research Objective:** Despite the intense policy interest around physician payment reform, the relationship between external payment (e.g. fee-for-service), internal compensation (e.g. salary), and patterns of care remain poorly understood, largely as a result of data limitations. This study uses national data from small and medium-sized physician practices to evaluate the relationship between external payment mechanisms, internal compensation, and health care costs.

**Study Design:** Retrospective cross-sectional analysis of the National Survey of Small and Medium-Sized Physician Practices, a nationally representative survey of physician practices in the United States with fewer than 20 physicians, linked with Medicare claims data. The survey was administered to practice leaders between 2007 and 2009 (N=1,745; response rate 63.2%). Physicians associated with each practice were identified via internet search. Using Medicare Part B Carrier File claims in 2008 and 2009, fee-for-service Medicare beneficiaries were assigned to a given practice if the practice provided a plurality of the patient’s outpatient office visits.

We estimated beneficiary-level models in which our outcomes were costs for evaluation and management (E&M), physician office services (non-E&M), tests, imaging, and total Part B costs (mean=$3,319) for assigned beneficiaries.

Our first model estimated the relationship between external payment, measured as percentage of practice’s HMO and POS patients for whom some financial risk was taken (mean=17.2%) and costs, controlling for practice characteristics (practice size, specialty, ownership, payer mix, region, and percentage of patients with limited English proficiency) and patient characteristics (age, gender, and race). To assess whether the alignment of external payment and internal compensation was associated with health care costs, our second model included a variable for internal physician compensation, measured as the percentage of total physician compensation that was based on productivity (mean=41.5%), and an interaction between this term and external payment. We
estimated the effects of external payment and internal compensation overall and for different practice specialties (primary care, cardiology, endocrinology, pulmonology, and multispecialty). All equations were estimated using Generalized Linear Models with a log link to account for the skewed distribution of health care costs.

**Population Studied:** Our final sample included 1,419,243 beneficiary observations in 2008 and 2009 from 750,940 Medicare beneficiaries matched to 1,492 practices consisting of 5,240 physicians.

**Principal Findings:** External physician payment and internal compensation were weakly related: a 10 percentage point increase in the patients for whom some financial risk was taken was associated with a 1.4 percentage point reduction in compensation for productivity (p < .05). However, in both adjusted and unadjusted analysis, financial risk was weakly and non-significantly associated with each measure of health care costs, overall and for each practice specialty. Furthermore, the alignment of incentives hypothesized to reduce costs, greater financial risk and less payment for productivity, was not associated with a reduction in any measure of Medicare costs, overall and for each practice specialty.

**Conclusions:** In a national sample of physician practices, external payment and internal compensation were related to each other, but not associated with Medicare costs.

**Implications for Policy, Delivery, or Practice:**
Our study calls into question the assumption that payment reforms that increase financial risk for practices will reduce health care costs. Furthermore, the alignment of incentives hypothesized to reduce costs, greater financial risk and less payment for productivity, was not associated with a reduction in any measure of Medicare costs, overall and for each practice specialty.

**Funding Source(s):** CWF

**Poster Session and Number:** A, #474

**Analyzing Value Based Purchasing Performance Through an Organization’s Structure Lens**
Pooja Sangwan, Virginia Commonwealth University; Jonathan DeShazo, VCU

**Presenter:** Pooja Sangwan, Ph.D., M.B.A., B.E., Ph.D. Student, Department of Health Administration, Virginia Commonwealth University, sangwanp2@vcu.edu

**Research Objective:** The CMS Hospital Value Based Purchasing (HVBP) program aims to bridge the widening gap between healthcare cost and quality by rewarding healthcare organizations (HCO) for providing better quality care for lower cost. The key performance metric in HVBP is a composite of both clinical process of care and patient experience scores. Little is known regarding the relationship between HCO organizational structure and both of these measures together. Because success in the HVBP era is dependent on performing well on both these measures it is important to fill this knowledge gap. This research aims to evaluate the relationship between clinical process of care measures and patient satisfaction measures through an organizational structure lens. Specifically, we evaluate organizational structures that produce higher clinical process of care or patient satisfaction scores. We then examine which factors should be considered in a strategy that maximizes both clinical process performance and patient satisfaction as measured by HBVP.

**Study Design:** The study employs a cross sectional approach to analyze hospitals that reported clinical process of care and patient satisfaction scores to CMS through June 2012. Analysis was done only on the 12 clinical process of care and 8 patient satisfaction measures that comprise the value based purchasing (HVBP) program for FY2013.

**Population Studied:** 4491 US hospitals.

**Principal Findings:** The analysis suggested correlation between the performance measures. 15 of the organizational structures of a HCO were shown to be associated with specific performance measures. Teaching hospital status, CBSA status and contract managed hospitals status were factors that contributed the most to the overall weighted HVBP performance score.

**Conclusions:** The study results show that organizational structure components are significant factors contributing to a HCO’s performance in the HVBP program.

**Implications for Policy, Delivery, or Practice:**
VBP introduces a radical shift in practice of medicine the healthcare industry. The zero-sum nature of the program would introduce significant pressure within the industry to create high quality healthcare outcomes. The market competitive aspect of the program not only means that the HCOs need to better organize their internal processes but also closely monitor how their organization fairs against others in the market. The VBP program advertently puts a value to the historically unquantifiable concept of “quality”. Walking this tight rope between achieving the best clinical outcomes while creating a satisfying experience for the patient can be a daunting task for any healthcare
organization in the industry. Analyzing the relationship between organizational structure of an HCO and performance on clinical or patient experience scores can provide meaningful insight to HCO’s to recognize what structures in an organization complement higher scores in the program. This recognition can be an important first step for any HCO looking to reorient itself to perform better on this program. Apart from building delivery knowledge this study also has certain policy implication. The results of the study can be utilized by policy makers and researchers alike to identify if certain organizational structures such as church operated or rural hospitals lend themselves poorly to this program. Recognizing such inherent disadvantages to some organizational structures can then be probably used to introduce variations to the scoring mechanism of the program.

**Funding Source(s):** No Funding  
**Poster Session and Number:** A, #475

### Market Failures In Healthcare and How the ACA Does (or does not) Address Them

Jb Silvers, Case Western Reserve University

**Presenter:** Jb Silvers, Ph.D., Professor, Weatherhead School of Management, Case Western Reserve University, jb.silvers@case.edu

**Research Objective:** To identify where standard market assumptions fail to hold in the patient, purchaser, insurer and provider sectors and analyze all sections of the Affordable Care Act that either attempt to address (or ignore) these impediments to lower cost and higher quality.

**Study Design:** In the initial phase, the study will consider each decision in the value chain where asymmetric information, excessive transactions cost, agency failure, inadequate measures of quality, conflicting financial incentives, and other symptoms of market failure have been documented. After suggesting the underlying causes of each, the second phase will analyze the elements of the ACA that directly or indirectly impact each. This will draw on prior studies of other policy initiatives, market reactions to changes in other industries and other insights from behavioral economics.

**Population Studied:** US health system and its participants

**Principal Findings:** Some aspects of the ACA clearly address information asymmetries (e.g., transaction costs (e.g., broker contingent commissions from insurance companies, medical loss ratio minimums, etc.), agency failure (e.g., employer incentive to reduce coverage, shared savings under ACOs, etc.), quality measures (e.g., reporting initiatives, value based purchasing, etc.), financial incentives (e.g., medical homes, ACOs, etc.) and others. However, important market failures continue and must be recognized in making reform work and in assessing it’s success. The fact that much of the assumed ACAs impact rests on market principles makes this analysis and knowledge essential.

**Conclusions:** The Affordable Care Act is a major step in assuring a robust and efficient marketplace in health care in all stages of the value chain—but is not perfect.

**Implications for Policy, Delivery, or Practice:** Future policymakers must address the places where this law leaves pockets of market failure. If not, we may ultimately and prematurely declare the ACA a failure. Participants in the system must analyze both the positive changes from the ACA and places where continued imperfection will lead to further policy revisions with their resultant implications for strategy and action.

**Funding Source(s):** No Funding  
**Poster Session and Number:** A, #476

### Massachusetts Patient-Centered Medical Home Initiative: Impact on Clinical Quality at Midpoint

Judith Steinberg, University of Massachusetts Medical School; Sai Cherala, Center for Health Policy and Research, University of Massachusetts Medical School; Christine Johnson, Center for Health Policy and Research, University of Massachusetts Medical School; Ann Lawthers, Center for Health Policy and Research, University of Massachusetts Medical School

**Presenter:** Judith Steinberg, M.D., M.P.H, Deputy Chief Medical Officer, Center for Health Policy and Research, Commonwealth Medicine, University of Massachusetts Medical School, judith.steinberg@umassmed.edu

**Research Objective:** To assess the impact on clinical quality of practices' participation in a Patient-Centered Medical Home (PCMH) demonstration. The MA PCMH is a statewide, three-year, multi-payer demonstration of PCMH
implementation in 45 primary care practices. Practices receive technical assistance, including a learning collaborative, coaching provided by external facilitators, and feedback of aggregated data, to support their implementation of PCMH processes. This study aims to assess the overall impact of this approach to transformation on a practice’s delivery of selected clinical services, including preventive care, care coordination and care management, and its processes and outcomes of care related to the initiative’s targeted conditions of diabetes and asthma, at the midpoint of the initiative.

**Study Design:** Quality improvement study utilizing self-reported monthly clinical quality measures data from 45 MA PCMHI practices. Data on thirteen clinical quality measures reported by practices from April 2011 through September 2012 were studied. Clinical quality measures covered the domains of adult diabetes, pediatric asthma, care transitions and care management, continuity of care and adult prevention. The measure set was designed to advance practices’ quality improvement activities and skill set and thus required practice-based, as opposed to claims-based, reporting. The statistical significance of changes in clinical quality data from baseline to the 18-month time point was assessed. At the baseline and 18-month time points, data for each measure from all reporting practices were aggregated and an average of reporting practice rates was calculated. Change from baseline to 18 months was assessed using the paired t-test.

**Population Studied:** The 45 MA PCMHI primary care practices include community health centers, large and small private practices and academic medical practices. Thirty-five practices fielded adult teams (77.7%); seven fielded pediatric teams (15.5%); and three had both adult and pediatric teams (6.6%). There were five rural (11.1%) and 40 urban practices (88.8%).

**Principal Findings:** Eleven of thirteen clinical quality measures showed improvements and two showed statistically significant improvement from baseline to midpoint. There was a significant improvement in the one diabetes process measure, screening for depression (23.2 to 38.8%, p<0.0001) but no significant change in diabetes intermediate outcome measures (hemoglobin A1C, blood pressure and LDL control) over this time-period. The care transitions measure, follow-up after discharge from the hospital, also showed statistically significant improvement (36.6 to 59.2%, p=0.028).

**Conclusions:** In the first 18 months of the MA PCMHI, participating practices have significantly improved their diabetes care delivery by more consistently screening patients for depression and their care transitions process by more consistently contacting patients within 48 hours after hospital discharge. There was no significant impact on the intermediate outcomes of diabetes care.

**Implications for Policy, Delivery, or Practice:** Primary care practice transformation takes time; processes of care are more likely to improve before outcomes are impacted. Use of a clinical quality measures set is important for practices’ skillset development in quality improvement, a PCMH component, and for evaluating the impact of implementing PCMH processes on patient care and outcomes.

**Funding Source(s):** Other, State

**Poster Session and Number:** A, #477

**Medical Service Trips: The Status of the Literature**

Kevin Sykes, University of Kansas School of Medicine

**Presenter:** Kevin Sykes, M.P.H., B.S., Doctoral Student, Otolaryngology-Head and Neck Surgery, University of Kansas School of Medicine, ksykes@kumc.edu

**Research Objective:** This research aims to present the issues, concepts, and gaps identified in the published literature describing the work completed in association with medical service trips (MSTs). This literature is difficult to synthesize given the diverse agendas and backgrounds of the authors, but the limited work in this area and the growing interest in the topic justifies further exploration.

**Study Design:** This study reports on a systematic literature review.

**Population Studied:** Using PubMed.gov we identified publications from 1992 to 2012. We included English publications describing work completed in association with short-term MSTs from high-income countries (HICs) to low and middle income countries (LMICs).

**Principal Findings:** For more than 50 years, HICs have been sending healthcare providers into areas of LMICs to address the needs of patients, both medical and surgical. The short-term model, often referred to as “medical missions” or MSTs, creates special challenges
and concerns that have been well documented in the literature. The majority of the MST literature qualifies as commentary and only a few publications report measurable outcomes of this work. Using more than 30 terms to refer to similar activities this literature is difficult to gather under one umbrella. Less than three percent of all of the identified publications on the topic can be classified as rigorous studies. Reporting outputs rather than outcomes is the standard approach for quantifying the value added to the communities and individuals served by these trips. This level of analysis for quality falls short of the measures used to identify high quality evidence based medicine. Arguably, implementing this evidence, if it did exist, would assume that providers would deliver medical care in a standardized manner with the inclusion of continuous care and outcome analysis. By definition, MSTs do not deliver care under this model. The consensus for the ethical challenges of MSTs is that there should be no assumed ethical immunity solely based on the altruistic nature of these efforts. Delivering care without understanding the impact or the outcome of that care is at the heart of these challenges.

Conclusions: The disproportionate burden of disease and the shortage of healthcare resources create marginalized populations in LMICs with inadequate healthcare access. MSTs exist as a mechanism for addressing this need and continue to grow in popularity in spite of the lack of evidence to support these activities. Where we stand currently is in an area of unknown short-term or long-term impact of MSTs. The gap between the care provided by visiting providers and its impact on the community is immeasurable. By considering this gap when developing or planning MSTs and including data collection in the mission, we can begin to address some of the concerns and validate the practice or provide information about areas that need improvement.

Implications for Policy, Delivery, or Practice: MSTs travelling to LMICs, are largely unregulated and often lack evaluative procedures. As a means of addressing global healthcare shortages, the goals for the activities of MSTs fall under the larger umbrella of public health. Establishing basic standards for data collection and quality may be an area for public health policy development.

Funding Source(s): No Funding

Poster Session and Number: A, #478

Exploring the Role of an Existing Primary Health Care Network in the Implementation of Family Physician Services in Rural Iran
Amirhossein Takian, Brunel University London; Leila Doshmangir, Tehran University of Medical Sciences, Iran; Arash Rashidian, National Institute for Health Research & Tehran University of Medical Sciences, Iran

Presenter: Amirhossein Takian, M.D., Ph.D., FHEA, Assistant Professor, Health Studies, Brunel University London, amir.takian@brunel.ac.uk

Research Objective: The primary health care (PHC) in Iran has contributed considerably to improve health outcomes in rural areas. However, the health system suffers from inadequate responses to ever-increasing public health demands and lack of affordability. Since 2005, a mixed reform comprising of family physician (FP) services and rural health insurance has been implementing across the country. We explored the role of the pre-existing PHC network on the implementation of FP in rural Iran.

Study Design: A qualitative, longitudinal, and prospective evaluation of the national implementation of FP in Iran. We used a mixed inductive/deductive thematic framework approach for data analysis.

Population Studied: We gathered data at three different levels: national, provincial, and six local rural health centers. In total, we conducted 71 interviews: national (19 interviews), provincial (9 interviews) and local (43 interviews) with policy makers, managers, doctors, allied health professionals, and patients. We also conducted three focus groups with representatives of the public at three (out of six) local health centers in Golestan province, northeast Iran, plus purposeful content analysis of documents of various types.

Principal Findings: We identified seven main aspects of the existing PHC network, which contributed to the implementation of FP: 'a respected and functioning PHC network'; 'accessibility and geographical coverage'; 'efficient hierarchy'; 'the only possible host'; 'a remedy for chronic challenges in the rural PHC'; 'FP as the gate-keeper?'; and 'the role of the private sector'. The existence of a functioning PHC was pivotal to drive policy makers’ decision to begin the national implementation of FP in rural areas. Although the existing PHC structure...
resulted in certain limitations, it was, in its totality, as a facilitator of implementing FP.

**Conclusions:** This study underpins, we argue, the importance of a pre-existing and functioning PHC network in facilitating the implementation of FP and accompanying universal health insurance in rural Iran.

**Implications for Policy, Delivery, or Practice:** Our study sheds light on how an existing PHC system can influence the implementation of a boarder global agenda for the expansion of primary healthcare systems and family medicine. It also complements the limited literature from other countries that an existing primary healthcare infrastructure could be used as an effective platform for facilitating other health sector reforms, i.e. FP, and strengthening the health system eventually.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #479

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**The Experience of Purchaser-Provider Split in the National Implementation of Family Physician and Universal Health Insurance in Iran: An Institutional Approach**

Amirhossein Takian, Brunel University London; Leila Doshmangir, Tehran University of Medical Sciences, Iran; Arash Rashidian, National Institute for Health Research & Tehran University of Medical Sciences, Iran

**Presenter:** Amirhossein Takian, M.D., Ph.D., FHEA, Assistant Professor, Health Studies, Brunel University London, amir.takian@brunel.ac.uk

**Research Objective:** Since 2005, under the banner of family physician (FP) program, the Iranian health system has undergone substantial reforms to change utilization of health services, improve quality of care, and enhance affordability; the latter was implemented through simultaneous implementation of universal health insurance in rural areas and cities of less than 20,000 populations across the country. The implementation of FP was the first national attempt to separate the purchaser and provider of primary health care services in Iran. This paper explores the process of purchaser-provider split (PPS) during the implementation of FP and health insurance, and its consequences for the health system in Iran, using an adapted institutional theoretical approach.

**Study Design:** A qualitative, longitudinal, and prospective evaluation of the national implementation of FP and universal health insurance in Iran. We used a mixed inductive/deductive thematic framework approach for data analysis, applying a mixed framework comprising institutional rational choice theory and principal agent theory.

**Population Studied:** We gathered data at three different levels: national, provincial, and six local rural health centers. In total, we conducted 71 interviews: national (19 interviews), provincial (9 interviews) and local (43 interviews) with policy makers, managers, doctors, allied health professionals, and patients. We also conducted three focus groups with representatives of the public at three (out of six) local health centers in Golestan province, northeast Iran, supplemented by purposeful content analysis of documents of various types.

**Principal Findings:** Views towards PPS and its consequences on the implementation of FP were diverse. Some participants identified the split as an essential step for undertaking the parallel implementation of FP and universal health insurance. Others questioned whether the split was beneficial for the implementation of FP and its outcome for the public, as envisioned by policy makers. Many interviewees thought that PPS harmed the implementation of FP in Iran. We identified a number of factors that contributed to this, including: following contradictory goals by the purchaser and the provider; diverse interpretations of FP by the two; the fragile environment for teamwork in the country; the mutual hostile perceptions of the purchaser and provider from each other because of their organizational past, all of which made the purchaser reluctant to pay for primary care services provided through FP.

**Conclusions:** We explored the perceptions and attitudes of key stakeholders with regards to purchaser-provider split during the concurrent implementation of FP and universal health insurance in Iran, and found mixed evidence about PPS. Our adapted institutional theoretical approach was helpful to illustrate the inter-organizational factors that affected PPS.

**Implications for Policy, Delivery, or Practice:** We advocate careful contextual preparation prior to large-scale application of PPS in health care. Cultural characteristics of the health system, the existing degree of inter-organizational cooperation, and the history of relationship between the purchaser and provider organizations needs to be analyzed and understood, prior to planning and executing the PPS at large-scale.

**Funding Source(s):** No Funding
Keeping the Primary Care Practice at the Center of Post-Hospitalization Care Transition
Ning Tang, University of California, San Francisco; Jeffrey T. Fujimoto, UCSF; Leah S. Karliner, MD, MAS, UCSF

Research Objective: Calling patients after hospital discharge is one intervention aimed at reducing hospital readmissions. These phone calls have traditionally been made by hospital-based nurses. It is unclear if calls shifted to primary care practice-based nurses can further improve care coordination and prevent medical mishaps. We sought to test the hypothesis that primary care clinic nurses can improve care coordination and patient education as well as identify early symptoms of worsening disease immediately after hospital discharge.

Study Design: From July to December 2012, two nurses integrated in the General Internal Medicine (GIM) practice called all patients discharged home from the Medicine Service at UCSF Medical Center within 72 hours of discharge. Nurses used a standardized call script to review all key post-discharge issues, including follow-up appointments, medication reconciliation, home care needs, durable medical equipment needs, new symptoms, and how to access urgent clinical assistance. Nurses documented their calls using a template in our electronic medical record (EMR). Gaps in care were immediately handled at the time of the call by forwarding the EMR note to the PCP, schedulers, social workers, and other clinic staff. We employed PDSA cycles to improve upon the intervention.

Population Studied: GIM patients ages 18 and over discharged home from the Medicine Service at UCSF Medical Center

Principal Findings: To date, 268 of 482 (56%) discharged patients had follow-up phone calls completed, on average 2.6 days after discharge. Our nurses found that 29% of patients did not have a follow-up appointment scheduled, 19% had unmet home care needs, 17% described new symptoms, 16% needed medication refills, 13% needed referrals, 10% had equipment problems, 6% were unaware of their follow-up appointment times, and 2% had medication errors. Nurses provided education about how to get care urgently to 87% of contacted patients. Additional education about follow-up appointments, medications, symptom management, and diet was provided for 81%, 53%, 51%, and 8% of contacted patients, respectively.

Of the remaining 214 patients without completed calls: 44 had already been seen in follow-up or called by their PCP, 25 were readmitted, 3 were in the ED at the time of the call, 6 calls were deferred for PCP feedback, 1 refused, 1 ended the call prematurely, 7 were not called due to staffing issues, and 127 were unreachable despite multiple attempts.

Conclusions: Nurses uncovered a wide range of clinical and educational needs of patients shortly after hospital discharge. There were immediate benefits to relocating post-discharge nurse phone calls to the primary care practice: Clinic nurses had easy access to clinic schedulers to arrange follow-up appointments; they knew how to quickly access PCPs to troubleshoot clinical problems or obtain orders for needed medications, home care, or equipment.

Implications for Policy, Delivery, or Practice: Primary care practices are important partners in improving care transitions and reducing hospital readmissions. A nurse phone call program based in the primary care clinic has potential to fill gaps in patient education and clinical care, but additional efforts are needed to increase the efficiency of the nurses’ time spent on each patient call and better identifying patients who benefit the most from this program.

Funding Source(s): Other, Mount Zion Health Fund

Reducing Hospital Readmissions:
Developing a Transitions-of-Care Program at UCSF’s General Internal Medicine Clinic
Ning Tang, University of California, San Francisco

Research Objective: Reducing hospital readmissions is a national health care priority, and while most interventions to reduce readmissions have been hospital-based or
hospital-driven, a true transitions-of-care (TOC) program should include a strong primary care component. We set out to test interventions in the General Internal Medicine (GIM) clinic at UCSF to reduce hospital readmission rates for our cohort of patients, and to determine the components of a comprehensive primary care-based TOC program.

**Study Design:** Starting in June 2010, we began tracking all-cause 30-day hospital readmission rates for the 22,600 patients belonging to the GIM clinic. The initial focus of our program was to ensure patients were offered outpatient follow-up appointments within 14 days of discharge. GIM clinic nurses called patients who refused, cancelled, or did not arrive for the appointment. In February 2012, we launched the second phase of our program which added nurse phone calls within 72 hours of hospital discharge and a standardized process for the post-hospitalization appointment. This standardized process includes reserving appointment slots to ensure patient access and longer appointment times with a nurse visit prior to the physician visit, where the nurse assists with medication reconciliation, patient education, and care coordination. We did not include a control group, as we felt these interventions were critical components to delivering high quality outpatient care. We employed PDSA cycles to improve upon each intervention over time and monitored the program’s impact on readmissions rates and patient access.

**Population Studied:** Adults with a PCP in the GIM clinic at UCSF who were discharged home from the Medicine Service at UCSF Medical Center

**Principal Findings:** All-cause 30-day readmission rates for GIM patients discharged from the Medicine Service dropped from a baseline of 15.3% in CY2009 to 10.52% in CY2011 and 11.0% in January-November 2012. At baseline, 44% of patients discharged from the Medicine Service had a timely follow-up appointment scheduled on the day of discharge. During our intervention months, over 90% of patients were offered follow-up appointments within 14 days of discharge. Reserving appointment slots for post-hospitalization follow-up solved underlying problems with primary care access. A hybrid nurse-physician follow-up appointment enables providers to fully assess the medical, social, and educational needs of patients after hospitalization.

**Conclusions:** Our understanding of effective interventions to reduce hospital readmissions is still limited. We offer one version of a comprehensive transitions-of-care program in a large General Internal Medicine clinic that is associated with decreased readmission rates and improved access to primary care. Patients and providers have found these set of services as highly desirable and represent high quality patient care.

**Implications for Policy, Delivery, or Practice:** Primary care practices are important partners in improving care transitions and reducing hospital readmissions. Further research is needed to understand the full spectrum of services that should be offered to patients discharged from the hospital and specialized services that should be reserved for patients at high risk for readmissions.

**Funding Source(s):** Other, Mount Zion Health Fund

**Poster Session and Number:** A, #482

**Prevalence of Patient-Centered Medical Homes Features in VA Facilities – Results of a National Survey**

Stephanie Taylor, Veterans Administration, RAND; Danielle E. Rose PhD, Veterans Administration; Melissa M. Farmer PhD, Veterans Administration; Ismelda A. Canelo MPA, Veterans Administration; Lisa V. Rubenstein MD, Veterans Administration; Elizabeth M. Yano PhD, Veterans Administration

**Presenter:** Stephanie Taylor, Ph.D., Associate Director, HSR&D Center Of Excellence, Veterans Administration, RAND, stephanie.taylor8@va.gov

**Research Objective:** In 2010, the Veterans Health Administration (VA) began the largest transformation in the nation to patient-centered medical home (PCMH) models to improve primary care. Given the VA’s history in being at the forefront of developing primary care delivery in the context of PCMH-models, it is likely that many VA primary care practices were early adopters of PCMH and already had individual PCMH features in place in 2007, before the VA’s launch of PCMH implementation. We report the baseline prevalence of individual PCMH features in VA primary care practices nationally and the prevalence of practices that we classified as fully PCMH in 2007, before the VA initiated PCMH implementation.

**Study Design:** We conducted a cross-sectional analysis of the full census of VA hospitals and large community-based outpatient clinics
(CBOCs) serving 4,000 or more unique outpatients and delivering 20,000 or more outpatient visits. We assessed essential PCMH features consistent with the National Committee for Quality Assurance’s standards, grouped the features into PCMH domains, and defined facilities as having “full PMCH” models if they had the majority of features in a domain, for all domains.

**Population Studied:** Our national survey collected data from primary care practice directors (90% response rate, n=225) and Chiefs of Staff (86% response rate, n=111) at VA hospitals and large community-based outpatient clinics.

**Principal Findings:** Many VA primary care practices had several PCMH features in place prior to the VA’s initiation of PCMH implementation. Practices appeared to have made the greatest advances in facilitating patient self-management (84% of practices) and enhanced patient access and continuity (82%). However, few practices reported having a majority of registry features (18%) or features involved in measuring and improving performance (35%). Also, only 6% of practices met our definition of having full PCMHs in 2007.

**Conclusions:** The nation’s largest health care system, the VA, began officially implementing their version of PCMH in 2010. Despite this, many PC practices appeared to have several PCMH features in place prior to the official initiation of the PCMH implementation and, as such, will likely be found to be early adopters of the full PCMH model when evaluations of the implementation are complete. The prevalence of PCMH features in VA primary care practices appears to have been slightly higher than levels seen in some health care systems yet lower than others’.

**Implications for Policy, Delivery, or Practice:** The results of this baseline study could be used to inform future studies examining the trajectory with which VA primary care practices achieve PCMH care over time. The potential that PCMH models have to improve primary care is too great to not continue to track the implementation of various demonstration projects and experiments as they become more stabilized, accepted and routine, which could lead to more robustly positive patient and clinic outcomes.

**Funding Source(s):** VA

**Practice Characteristics Associated with Higher Levels of PCMH Implementation**

Manasi Tirodkar, National Committee for Quality Assurance; Suzanne Morton, MPH, MBA, National Committee for Quality Assurance; Thomas Whiting, MPH, National Committee for Quality Assurance; Robert Saunders, PhD, National Committee for Quality Assurance; Sarah Hudson Scholle, DrPH MPH, National Committee for Quality Assurance

**Presenter:** Manasi Tirodkar, Ph.D., M.S., Research Scientist, Research & Performance Measurement, National Committee for Quality Assurance, tirodkar@ncqa.org

**Research Objective:** The patient-centered medical home (PCMH) is a critical aspect of delivery system reform; however, becoming a PCMH requires major changes for practices. Recently, NCQA released the second version of the requirements for recognition that are more stringent than the original standards. The purpose of this paper is to examine 1) which requirements are most challenging and 2) variations by practice characteristics.

**Study Design:** We used data from NCQA’s 2011 PCMH recognition program. The program has six standards: enhance access and continuity, identify and manage patient populations, plan and manage care, provide self-care support and community resources, track and coordinate care, measure and improve performance. One element within each standard is required for passing. Practices submit a self-assessment and supporting documentation for review by NCQA staff. Five percent are audited for compliance; 6 percent of practices did not pass. NCQA recognizes each practice site, defined as a single location where clinicians use the same records and systems. We tested for bi-variate differences using chi-square tests with a Bonferroni adjustment for multiple comparisons (p<.0019).

**Population Studied:** 521 practices were recognized as of November 2012. We examined these practice types: 26 percent federally qualified or community health center; 18 percent small physician-owned (<5 clinicians); 11 percent large physician-owned (5 + clinicians); 5 percent military; and 40 percent hospital, health system, or health plan owned.

**Principal Findings:** Nearly three-quarters of PCMH 2011-recognized practices achieved the highest level of recognition, ranging from 79 percent of health centers to 60 percent of small
physician-owned practices. The most challenging elements for practices to meet as evidenced by scoring 100 percent of the element’s points were collecting patient experiences data (n=75, 14 percent), providing referrals to community resources (n=192, 37 percent), providing web-based access to records and advice (n=220, 42 percent), providing after-hours access to patients (n=244, 47 percent), measuring quality performance (n=249, 48 percent), and reporting on measure performance (n=250, 48 percent). There was variation across practices types in achievement of different PCMH components. Significantly more health centers scored full credit on elements related to the practice team, assessment of the patient population, and quality measurement and reporting. Small physician-owned practices were less likely to gain full credit for practice teams and coordination of care transitions, but did better on referral tracking and follow-up. Large physician-owned practices were more likely to score full points on areas such as providing web-based access to records and advice, recording clinical data in structured fields, using data for population management, and informing patients about the medical home. Hospital/health system/health plan practices were less likely to score full points on using data for population management and performing comprehensive health assessments of patients. Conclusions: Among this group of early adopters of the more stringent 2011 PCMH standards, there is strong variation in how practices achieved recognition.

Implications for Policy, Delivery, or Practice: How practices implement the PCMH is likely to vary based on patient population, practice organization and affiliation, clinic priorities and experiences. Efforts to support implementation of the PCMH should take into account the existing resources and goals of the practice.

Funding Source(s): N/A

Poster Session and Number: A, #484

The Role of Delegation in Promoting Enhanced Clinic Access in Medical Homes: Perspectives from Primary Care Providers and Nurses in the Veterans Health Administration
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Research Objective: An emerging literature has documented barriers to enhancing clinic access in the context of Medical Home implementation. To date, organizational factors have been emphasized, while internal team-focused barriers to practice redesign have been less well-described. Our research objective was to understand and describe barriers to implementing enhanced clinic access from the perspective of Primary Care Providers (PCPs) and Registered Nurse Care Managers (RNCMs) working in the Veterans Health Administration (VHA).

Study Design: The study was part of a multi-year, mixed-methods formative evaluation of VHA’s transformation to a Patient Aligned Care Team (PACT) model across two Veterans Integrated Service Networks (VISNs). Semi-structured interviews conducted during the first 18 months of PACT implementation elicited information regarding strategies for practice redesign, roles and expectations for different team members, and challenges arising during implementation. Interview transcripts were coded separately for the two VISNs, with a focus on identifying themes around barriers to enhanced clinic access from the perspectives of team PCPs and RNCMs. Themes identified for each VISN were then compared for similarities and differences to develop a comprehensive understanding of the challenges facing PACTs across two large and diverse geographic regions.

Population Studied: Purposefully sampled PCPs (n=32) and RNCMs (n=42) implementing PACT in the upper Midwest and mid-Atlantic regions.

Principal Findings: Reported strategies for achieving enhanced clinic access were relatively standard across regions and teams. To be successful, these strategies required negotiation...
of team roles, interprofessional understanding, and reallocation of work. PCPs reported constraints on their ability to delegate, expressed uncertainty about nurses’ scope of practice, and stressed the importance of within-team decision making with regard to daily team activities. RNCMs described feeling unsure about role expectations, voiced frustration with PCPs’ perceived unwillingness to delegate, and highlighted the challenges of acquiring new responsibilities with limited delegation power. State-by-state variations in laws governing scope of practice for RNs contributed to further concern and confusion about what work could be done by team nurses.

**Conclusions:** At the team-level, PCPs and RNCMs are the primary drivers of practice change necessary to achieve enhanced clinic access. In order to make and sustain such changes, they require support in a number of key areas including: clear guidance on scopes of practice for different team members that reflect local conditions; tools to improve role clarity (e.g., customizable position description templates); and methods for enhancing intra-team functioning and communication (e.g., close support from local practice coaches). Ideally, these resources would be made available at the earliest stages of Medical Home implementation. However, teams already engaged in implementation activities who are struggling with enhanced clinic access would still benefit from guidance and resources.

**Implications for Policy, Delivery, or Practice:** Prior evaluations of Medical Home implementation have described macro-level factors affecting practice improvement efforts, such as payment reform and organizational culture. In contrast, this study emphasizes team-level impediments including challenges to interprofessional role negotiations and delegation of work. Unaddressed, these issues may lead to increased stress and burnout for primary care staff, and ultimately scuttle organizational initiatives to make meaningful changes to delivery of care.

**Funding Source(s):** VA
**Poster Session and Number:** A, #485

**Gaps in Accountable Care Organizations’ Readiness to Optimize Medication Use**
Bobby Dubois, National Pharmaceutical Council; Kimberly Westrich, National Pharmaceutical Council; Greg Kotzbauer, Dartmouth Institute; Jerry Penso, American Medical Group Association; Marv Feldman, Premier Inc.; Scott Pope, Premier Inc.

**Presenter:** Kimberly Westrich, M.A., Director, Health Services Research, National Pharmaceutical Council, kwestrich@npcnow.org

**Research Objective:** This research focused on understanding the role of pharmaceuticals in helping Accountable Care Organizations (ACOs) succeed in meeting financial and quality targets.

**Study Design:** Phase I of this research involved a working group consisting of seven provider organizations (Baystate Health, Billings Clinic, Fairview Health Services, Geisinger Health System, Marshfield Clinic, Sharp HealthCare, University of Utah Health Care), Premier (an alliance of hospitals and health systems), the American Medical Group Association (an association of multi-specialty medical groups), and the National Pharmaceutical Council (a non-advocacy policy research group supported by the pharmaceutical industry) that developed a conceptual framework for considering the role of pharmaceuticals in ACOS. Phase II consisted of an internet survey, which was distributed to ACOs around the country who were members of either AMGA, Premier, or the Dartmouth-Brookings ACO Learning Network.

**Population Studied:** 46 ACOs of varying sizes, contract and integration types from around the country completed the survey.

**Principal Findings:** Overall, ACOs are not ready to optimize use of pharmaceuticals. Identified gaps included (parentheticals indicate percent of respondents reporting “high readiness” to address an area): Ability to quantify the cost offsets of appropriate medication use (7%), Ability to notify providers when a prescription has been filled (9 %), Preparedness to educate patients about diagnostic and therapeutic alternatives and implications when determining a care plan (11 %), Having protocols in place to share potential drug-drug/disease/polypharmacy concerns with a patient’s care team (13 %), readiness to use evidence-based quality metrics to ensure appropriate medication use when there are condition-specific incentives to achieve economic savings (22%). Practices currently in use with the highest uptake included: Ability to transmit prescriptions electronically (70 %), Ability to view prescription and medical data in a single system (54 %), Having a formulary in place that encourages generic use when appropriate (50%).
**Conclusions:** Currently, many gaps exist for optimal medication management among ACOs. There is a need for tools to help ACOs improve their understanding and application of the important role pharmaceuticals contribute towards meeting financial and quality benchmarks.

**Implications for Policy, Delivery, or Practice:**
The authors hope that this framework and results of the assessment survey will help ACOs identify key areas for improvement, and achieve the triple aim of better care for individuals, improved health for populations, and slower cost growth. Following-up on this work, the authors are currently developing an interactive assessment tool for ACOs to further identify, prioritize, and address gaps in care that can improve upon the status-quo of pharmaceutical consideration in an ACO’s delivery of care.

**Funding Source(s):** Other, National Pharmaceutical Council

**Poster Session and Number:** A, #486

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**Managed Care’s Impact on Healthcare Utilization and Spending**

Christopher Whaley, UC Berkeley; Richard Scheffler, UC Berkeley School of Public Health

**Presenter:** Christopher Whaley, A.B., Student, Health Services and Policy Analysis, UC Berkeley, cwhaley@berkeley.edu

**Research Objective:** While managed care has long been recognized as having lower per-patient expenditures, it is not clear if this effect is due to healthier patients, better bargaining power, or better patient management, which results in lower utilization. We examine the effect of HMO enrollment on healthcare spending and utilization.

**Study Design:** We used data from the 2002-2009 Medicare Expenditure Survey (MEPS) to examine healthcare spending and utilization for health maintenance organization HMO enrollees. To account for the endogenous selection of individuals into HMOs, we used occupational characteristics as an instrumental variable. Results were estimated using 2-stage least squares.

**Population Studied:** We examined subjects enrolled in private insurance and excluded Medicare and Medicaid beneficiaries. We measured utilization and the patient-specific aggregate amount spent by households and payers for multiple types of services.

**Principal Findings:** Compared to non-managed care enrollees, HMO enrollees had lower total spending, spending on prescription drugs, inpatient services, and office-based doctor’s visits. Total out-of-pocket spending was also lower. HMO enrollees had 13% (95% CI: 1.77 - 26.24%) more ER visits than non-HMO enrollees, but fewer office based visits (-51%, 95% CI: -68.5 - -24.04%), inpatient hospital days (-22%, 95% CI: -32.36% - -10.86%), and prescription fills (-37%, 95% CI: --60.74 - -1.18%).

**Conclusions:** After controlling for the endogenous selection into HMO plans, HMO enrollees tend to have fewer medical expenditures, which is possibly driven by lower levels of utilization. Patient health outcomes and time trends were not examined, so the effect on quality and the long-run spending impact is unclear.

**Implications for Policy, Delivery, or Practice:** Managed care plans appear to reduce both healthcare spending and utilization. The strategies used by managed care to reduce healthcare utilization may be useful for other healthcare organizations.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #487

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**Does HHS’ Presumption of Competitive Grant Application Reviews Lead to “Cream Skimming” in Federal Delivery System Innovation Projects?**

J. T. Williams, Penn State - Harrisburg

**Presenter:** J. T. Williams, J.D., Adjunct Professor, Penn State - Harrisburg, jwilli28@hotmail.com

**Research Objective:** The default process for grantmaking within HHS is competitive, with “merit-based” review, even when programs are meant to remedy poor health or poor health care delivery. As used in the field of political science, “cream skimming” refers to choices by public program administrators and potential participants, e.g., in job training or school choice programs, that result in overrepresentation of the most able eligible participants. This is a somewhat different connotation of the term than its typical usage in health services research, but the framework may be useful in exploring disparities in participation in federal initiatives intended to promote improved health and health care.
**Study Design:** Policy analysts test programs for “creaming” by comparing enrolled participants to the pool of eligible participants. This study looks at 15 current HHS programs in which states were the primary applicants or were the primary units from which applications were solicited in the grantmaking process, and that were selective in that there are fewer than 50 participants.

**Population Studied:** 50 US States

**Principal Findings:** The 15 programs have yielded 200 award sites to date. Sixteen states—those having between 5 and 8 awards—accounted for 107 of the sites. Twelve of those states ranked in the top half of “America’s Health Rankings” as calculated by United Health Foundation. Eleven of those states were in the top half of states ranked by per capita income. Only 3 of the 16 states, Ohio, North Carolina and Kentucky, were not in the top half of either list.

**Conclusions:** The default process for grantmaking within HHS is competitive. It appears that higher-achieving, higher-resource states are advantaged in this process, with the lion’s share of awards going to states with less room for improvement in health. Allison’s Organizational Process Paradigm holds that bureaucracies stick to existing routines and repertoires. The creaming hypothesis predicts that bureaucrats who prefer positive program evaluations would have little reason to challenge the status quo of “merit-based” review. An alternative explanation is that the negative association between grants and poor health is driven by choices of states with individualistic cultures skeptical of both government intervention and exhortations to adopt healthy behaviors.

**Implications for Policy, Delivery, or Practice:** While merit-based review is quite sensible in the context of research grants, it could have perverse consequences for initiatives intended to promote payment and delivery system innovation. These programs face the same dilemma as job training and similar programs with dual goals of serving needy populations and yielding positive results. Additional dollars spent will surely have lower return on investment in healthy states with efficient, high-quality care, and programs are less likely to reach regions with poorer population health. Sites that are skewed toward good outcomes reduce opportunities for policy learning and reduce generalizability of findings. It may be time to develop a new paradigm for site selection in initiatives intended to promote improved health and health care, including pre-award technical assistance to states, and in which program administrators are afforded a “freedom to fail” that permits risk-taking.

**Funding Source(s):** N/A

**Poster Session and Number:** A, #488

**Parents’ Preferences for Types of Enhanced Access Services in the Pediatric Medical Home**

Joseph Zickafoose, Mathematica Policy Research; Lisa R. DeCamp, MD, MSPH, Division of General Pediatrics, Johns Hopkins University, Baltimore, MD, United States; Lisa A. Prosser, PhD, MS, Child Health Evaluation and Research (CHEAR) Unit, Division of General Pediatrics, University of Michigan, Ann Arbor, MI, United States

**Presenter:** Joseph Zickafoose, M.D., M.S., Researcher, Pediatrics, Mathematica Policy Research, jzickafoose@mathematica-mpr.com

**Research Objective:** To inform medical home implementation by assessing parents’ relative values for different categories of enhanced access services and their willingness to make trade-offs with other aspects of primary care.

**Study Design:** Internet-based survey. The survey included a discrete choice experiment asking parents to choose between descriptions of hypothetical primary care offices that differed in enhanced access services (communication during and after office hours, same-day sick visits, evening and weekend office hours, electronic communication) and other aspects of care that might need to be traded off to implement new services (time to next available preventive care visit, weekday daytime office hours, provider continuity). Travel time was included as a measure of value (i.e., parents might be willing to trade longer travel time for services they value more).

To assess preferences, we used a multivariate mixed logit model to estimate the independent effects of each enhanced access service on parents’ choices and then standardized preferences on a 0-10 scale for comparisons across services. We estimated parents’ marginal willingness to travel (mWTT, minutes) for hypothetical offices with different combinations of services.

**Population Studied:** National sample of parents with children ages birth-17 years.
**Principal Findings:** 820 parents participated in the survey (response rate 41%). Parents’ strongest preference was for primary care offices that guaranteed same-day sick visits (coefficient: 0.57 [SE 0.05], standardized preference: 10 [10-point scale]), followed by those with higher provider continuity (coefficient: 0.36 [SE 0.03], standardized preference: 8.4). Parents were also significantly more likely to choose practices with 24-hour phone advice plus non-urgent email advice, evening hours 4 or more times a week, and at least some hours on weekends. Parents were significantly less likely to choose practices that were closed during some weekday daytime hours (coefficient: -0.11 [SE 0.04], standardized preference: 4.7) or had wait times longer than 4 weeks for preventive care visits (coefficient: -0.40 [SE 0.04], standardized preference: 2.4). There was heterogeneity in parents’ preferences for guaranteed same-day sick visits, weekday hours, and provider continuity, and analyses are underway to understand whether these differences in preferences are associated with the sociodemographic characteristics of parents or their children.

Parents’ median reported travel time to their child’s current primary care office was 15 min. (interquartile range: 10-20 min.). Based on the results from analysis of the discrete choice experiment, parents’ mWTT was 44 min. (95% CI 37-51) for an office with idealized levels of all services and 19 min. (95% CI 14-24) for an office with a moderate level of enhanced access services (phone advice 24-hours, no email, sick visits usually available on same day, evening hours 2 nights a week, open half a day on Saturdays).

**Conclusions:** Parents have strong priorities for certain enhanced access services, particularly same-day sick care. Parents may be willing to make trade-offs in order for their child’s primary care practice to implement enhanced access services but are likely to be dissatisfied if changes result in less provider continuity.

**Implications for Policy, Delivery, or Practice:** Primary care practices and medical home programs should involve parents in assessing trade-offs when necessary and setting priorities for changes to primary care services.

**Funding Source(s):** Other, Blue Cross Blue Shield of Michigan Foundation

**Poster Session and Number:** A, #489

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**PATIENT-CENTERED OUTCOMES RESEARCH**

**Patient-Centered Care: Differences in Patient Care Satisfaction by Race/Ethnicity in California Hospitals?**

Edmund Becker, Emory University; Jason Hockenberry, Ph.D., Emory University; Jae Yong Bae, Emory University; Peter Joski, Emory University

**Presenter:** Edmund Becker, Ph.D., Professor, Department of Health Policy and Management, Emory University, ebeck01@sph.emory.edu

**Research Objective:** To describe and analyze the relationships among measures in the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey on inpatient satisfaction and hospital market characteristics by race/ethnicity for AMI, CHF, and pneumonia treatment for all California hospital discharges during 2009-2011.

**Study Design:** Cross-sectional analysis of a three-year database linking California HCAHPS patient care satisfaction (PCS) data with corresponding data from the Healthcare Cost and Utilization Project – State Inpatient Database (HCUP-SID), 2010 American Hospital Association Annual Survey of hospital characteristics, and evidence-based medicine (EBM) process of care measures. Our key dependent variables are: HCAHPS PCS measures for each domain (overall rating of the hospital, recommend the hospital to family and friends, communication with physicians, communication with nurses, responsiveness of hospital staff, control of pain, communications about medications, and discharge instructions), measures of EBM processes of care for each of the three treatments, hospital charges, and length-of-stay. Descriptive and multivariate models include controls for relevant hospital market, structural (Herfindahl–Hirschman index, median population, % minority) characteristics, as well as individual patient characteristics (age, gender, insurance coverage, race/ethnicity, and severity adjustments).

**Population Studied:** All AMI, CHF, and pneumonia patients by race/ethnicity (Asian, black, Hispanic, other, white) discharged from 323 California acute-care hospitals during the period 2009 thru 2011.

**Principal Findings:** There are extensive differences among the five racial/ethnic groups of inpatients. Hispanics were 20 years younger
than white non-Hispanic inpatients, (34 yo vs 54 yo) and over three times more likely to have Medicaid coverage than white non-Hispanics (48% vs. 13%). Among the five racial/ethnic groups, Hispanics averaged 1.5 times fewer diagnoses, had the lowest number of chronic conditions (2.5 versus 4.4 for black inpatients), but had the highest number of inpatient procedures (1.9 versus 1.5 for black inpatients). Black inpatients averaged lengths of stay that were more than 1 day longer than any other racial/ethnic group. Finally, Black inpatients were in hospitals where inpatients had the greatest degree of dissatisfaction with their hospital stays on all 8 HCAHPS PCS measures. For black inpatients, 26.1% and 22.1%, respectively, were dissatisfied with the communications about their medications and communication about their discharge information from California hospitals.

**Conclusions:** It is essential that policymakers, hospital leaders, and hospital patients and providers understand the implications of patient centered care in the hospital setting, especially now that this is linked to Medicare reimbursement. Our research indicates that there are significant racial/ethnic differences in the HCAHPS PCS scores. Moreover, these differences appear to vary substantially based on hospital markets, structural characteristics, and EBM process of care measures.

**Implications for Policy, Delivery, or Practice:** Further work is needed to understand the links between these differences and objective patient care outcomes. In addition, national efforts to address these variations will need a fuller understanding of the treatment processes for AMI, CHF, and pneumonia for these inpatients. These differences could reflect sorting to lower quality hospitals by race, but they may also reflect differences in expectations of care that have little bearing on clinical outcomes.

**Funding Source(s):** Other, PCORI

**Poster Session and Number:** B, #850

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**Principal Findings:** 2742 cancer patients had 3334 hospitalizations with a diagnosis of metastatic cancer in NYC hospitals; 52% were <65 yrs, 47% were white and 19% were insured by Medicaid. The 30 day readmission rate was 44% of which 27% were potentially preventable. Patients with Medicaid had higher readmission rates than those with other insurance (49% vs 43%; p<0.0001). Black patients had higher readmissions than white patients (47% vs 41%; p=0.0004). Multivariate analysis of readmission for dehydration, pain or failure to thrive found that Black patients (OR=1.46; 95%CI: 1.2-1.8), those with greater comorbidities (OR=1.22; 95%CI: 1.2-1.3) were at greater risk of 30d readmission (model p<0.0001). Male patients had lower risk of readmission (OR=0.81; 95%CI: 0.7-0.97). Patient age and insurance were not significant in the final model.

**Conclusions:** Higher rates of potentially avoidable 30d readmission rates among adults with metastatic cancer occurred in blacks, and those with greater comorbidities.

**Implications for Policy, Delivery, or Practice:** High rates of 30 day readmission among patients hospitalized with metastatic cancer
Evaluating Measurement Equivalence across Race and Ethnicity on the CAHPS® Cultural Competence Survey

Adam Carle, Cincinnati Children’s Hospital Medical Center; Robert Weech-Maldonado, Ph.D., University of Alabama at Birmingham

**Research Objective:** The Consumer Assessments of Healthcare Providers and Systems (CAHPS®) Cultural Competence Survey assesses patients’ experiences with culturally competent care. This study evaluates the equivalence of responses to this survey across different racial and ethnic subgroups. In this study, we examined whether measurement bias on the CAHPS Cultural Competence Survey impedes valid measurement across White, Black, and Hispanic patients.

**Study Design:** We used multiple group (MG) confirmatory factor analyses (CFA) to examine possible measurement bias across non-Hispanic White (n = 146), non-Hispanic Black (n = 148), and Hispanic (n = 339) adults.

**Population Studied:** Participants came from two Medicaid managed care plans, one in New York and the other in California in 2008.

**Principal Findings:** MG-CFA provided general support for the equivalence of the CAHPS Cultural Competence Survey in measuring doctor communication, health promotion and perceived trust across groups. However, we observed statistically significant differences in the thresholds associated with the Doctor Communication-Positive Behaviors. Nevertheless, sensitivity analyses indicated that measurement bias did not meaningfully influence conclusions about average experiences with culturally competent care across non-Hispanic White, non-Hispanic Black, and Hispanic patients in our sample.

**Conclusions:** Our results support the use of the CAHPS Cultural Competence Survey across non-Hispanic White, non-Hispanic Black, and Hispanic patients. Though we found some statistically significant measurement bias, sensitivity analyses demonstrated that measurement bias does not substantively influence conclusions based on patients’ responses. Health providers at various levels can place confidence in the CAHPS Cultural Competence Survey and use it in diverse populations to evaluate patients’ experiences with culturally competent care.

**Implications for Policy, Delivery, or Practice:** Our results provide evidence that investigators, payors, clinicians, and other users of the CAHPS-CC can validly and confidently use the CHAPS-CC across non-Hispanic White, non-Hispanic Black, and Hispanic patients. Importantly, this indicates that any potential observed disparities or differences in cultural competence across non-Hispanic White, non-Hispanic Black, and Hispanic patients experiences likely reflect true differences not culturally-based measurement error.

**Funding Source(s):** The Commonwealth Fund

**Poster Source and Number:** B, #852

Does the Consumer Assessment of Healthcare Providers and Systems Cultural Competence Survey provide equivalent measurement across English and Spanish versions?

Adam Carle, Cincinnati Children’s Hospital Medical Center; Robert Weech-Maldonado, Ph.D., University of Alabama at Birmingham

**Research Objective:** The English and Spanish versions of the Consumer Assessments of Healthcare Providers and Systems (CAHPS®) Cultural Competence Survey (CAHP-CC) assess patients’ experiences with culturally competent care. The possibility exists that even when Spanish and an English speakers experience the same levels of culturally competent care, responses describing their care may differ. This is called measurement bias. To deliver reliable and valid information across language, responses must provide equivalent measurement across versions. In this study, we examined whether measurement bias on the CAHPS-CC impedes valid measurement across the English and Spanish versions.

**Funding Source(s):** The Commonwealth Fund

**Poster Session and Number:** B, #852

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**Funding Source(s):** No Funding

**Poster Session and Number:** B, #851

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Adam Carle, Cincinnati Children’s Hospital Medical Center; Robert Weech-Maldonado, Ph.D., University of Alabama at Birmingham

**Research Objective:** The Consumer Assessments of Healthcare Providers and Systems (CAHPS®) Cultural Competence Survey assesses patients’ experiences with culturally competent care. This study evaluates the equivalence of responses to this survey across different racial and ethnic subgroups. In this study, we examined whether measurement bias on the CAHPS Cultural Competence Survey impedes valid measurement across White, Black, and Hispanic patients.

**Study Design:** We used multiple group (MG) confirmatory factor analyses (CFA) to examine possible measurement bias across non-Hispanic White (n = 146), non-Hispanic Black (n = 148), and Hispanic (n = 339) adults.

**Population Studied:** Participants came from two Medicaid managed care plans, one in New York and the other in California in 2008.

**Principal Findings:** MG-CFA provided general support for the equivalence of the CAHPS Cultural Competence Survey in measuring doctor communication, health promotion and perceived trust across groups. However, we observed statistically significant differences in the thresholds associated with the Doctor Communication-Positive Behaviors. Nevertheless, sensitivity analyses indicated that measurement bias did not meaningfully influence conclusions about average experiences with culturally competent care across non-Hispanic White, non-Hispanic Black, and Hispanic patients in our sample.

**Conclusions:** Our results support the use of the CAHPS Cultural Competence Survey across non-Hispanic White, non-Hispanic Black, and Hispanic patients. Though we found some statistically significant measurement bias, sensitivity analyses demonstrated that measurement bias does not substantively influence conclusions based on patients’ responses. Health providers at various levels can place confidence in the CAHPS Cultural Competence Survey and use it in diverse populations to evaluate patients’ experiences with culturally competent care.

**Implications for Policy, Delivery, or Practice:** Our results provide evidence that investigators, payors, clinicians, and other users of the CAHPS-CC can validly and confidently use the CHAPS-CC across non-Hispanic White, non-Hispanic Black, and Hispanic patients. Importantly, this indicates that any potential observed disparities or differences in cultural competence across non-Hispanic White, non-Hispanic Black, and Hispanic patients experiences likely reflect true differences not culturally-based measurement error.

**Funding Source(s):** The Commonwealth Fund

**Poster Session and Number:** B, #852

Does the Consumer Assessment of Healthcare Providers and Systems Cultural Competence Survey provide equivalent measurement across English and Spanish versions?

Adam Carle, Cincinnati Children’s Hospital Medical Center; Robert Weech-Maldonado, Ph.D., University of Alabama at Birmingham

**Research Objective:** The English and Spanish versions of the Consumer Assessments of Healthcare Providers and Systems (CAHPS®) Cultural Competence Survey (CAHP-CC) assess patients’ experiences with culturally competent care. The possibility exists that even when Spanish and an English speakers experience the same levels of culturally competent care, responses describing their care may differ. This is called measurement bias. To deliver reliable and valid information across language, responses must provide equivalent measurement across versions. In this study, we examined whether measurement bias on the CAHPS-CC impedes valid measurement across the English and Spanish versions.

**Funding Source(s):** No Funding

**Poster Session and Number:** B, #851

Evaluating Measurement Equivalence across Race and Ethnicity on the CAHPS® Cultural Competence Survey

Adam Carle, Cincinnati Children’s Hospital Medical Center; Robert Weech-Maldonado, Ph.D., University of Alabama at Birmingham

**Research Objective:** The Consumer Assessments of Healthcare Providers and Systems (CAHPS®) Cultural Competence Survey assesses patients’ experiences with culturally competent care. This study evaluates the equivalence of responses to this survey across different racial and ethnic subgroups. In this study, we examined whether measurement bias on the CAHPS Cultural Competence Survey impedes valid measurement across White, Black, and Hispanic patients.

**Study Design:** We used multiple group (MG) confirmatory factor analyses (CFA) to examine possible measurement bias across non-Hispanic White (n = 146), non-Hispanic Black (n = 148), and Hispanic (n = 339) adults.

**Population Studied:** Participants came from two Medicaid managed care plans, one in New York and the other in California in 2008.

**Principal Findings:** MG-CFA provided general support for the equivalence of the CAHPS Cultural Competence Survey in measuring doctor communication, health promotion and perceived trust across groups. However, we observed statistically significant differences in the thresholds associated with the Doctor Communication-Positive Behaviors. Nevertheless, sensitivity analyses indicated that measurement bias did not meaningfully influence conclusions about average experiences with culturally competent care across non-Hispanic White, non-Hispanic Black, and Hispanic patients in our sample.

**Conclusions:** Our results support the use of the CAHPS Cultural Competence Survey across non-Hispanic White, non-Hispanic Black, and Hispanic patients. Though we found some statistically significant measurement bias, sensitivity analyses demonstrated that measurement bias does not substantively influence conclusions based on patients’ responses. Health providers at various levels can place confidence in the CAHPS Cultural Competence Survey and use it in diverse populations to evaluate patients’ experiences with culturally competent care.

**Implications for Policy, Delivery, or Practice:** Our results provide evidence that investigators, payors, clinicians, and other users of the CAHPS-CC can validly and confidently use the CHAPS-CC across non-Hispanic White, non-Hispanic Black, and Hispanic patients. Importantly, this indicates that any potential observed disparities or differences in cultural competence across non-Hispanic White, non-Hispanic Black, and Hispanic patients experiences likely reflect true differences not culturally-based measurement error.

**Funding Source(s):** The Commonwealth Fund

**Poster Session and Number:** B, #852

Does the Consumer Assessment of Healthcare Providers and Systems Cultural Competence Survey provide equivalent measurement across English and Spanish versions?

Adam Carle, Cincinnati Children’s Hospital Medical Center; Robert Weech-Maldonado, Ph.D., University of Alabama at Birmingham

**Research Objective:** The English and Spanish versions of the Consumer Assessments of Healthcare Providers and Systems (CAHPS®) Cultural Competence Survey (CAHP-CC) assess patients’ experiences with culturally competent care. The possibility exists that even when Spanish and an English speakers experience the same levels of culturally competent care, responses describing their care may differ. This is called measurement bias. To deliver reliable and valid information across language, responses must provide equivalent measurement across versions. In this study, we examined whether measurement bias on the CAHPS-CC impedes valid measurement across the English and Spanish versions.

**Funding Source(s):** No Funding

**Poster Session and Number:** B, #851
Study Design: We used multiple group (MG) confirmatory factor analyses (CFA) to examine measurement bias across English (n = 851) and Spanish (n = 113) speakers.


Principal Findings: MG-CFA provided general support for the equivalence of the CAHPS-CC in measuring Doctor Communication-Positive Behaviors, Doctor Communication-Negative Behaviors, Doctor Communication-Preventative Care, Equitable Treatment, and Trust. We did observe statistically significant differences in the thresholds associated with the item asking whether a doctor gave easier to understand instructions. However, analyses indicated that bias did not meaningfully influence conclusions about average experiences using the English and Spanish versions of the CAHPS-CC.

Conclusions: Our results support the use of the English and Spanish versions of the CAHPS-CC. Though we found some bias, analyses demonstrated that it did not substantively impact conclusions for the studied domains. Health providers can place confidence in the two different CAHPS-CC translations.

Implications for Policy, Delivery, or Practice: Our results provide evidence that investigators, payors, clinicians, and other users of the CAHPS-CC can validly and confidently use the CHAPS-CC across individuals of English and Spanish language. Importantly, this indicates that any potential observed disparities or differences in cultural competence experiences likely reflect true differences not language-based measurement error.

Funding Source(s): The Commonwealth Fund

Poster Session and Number: B, #853

Colorectal Cancer Survivors’ Trust in their Follow-up Care Physician: The Role of Patient-Physician Communication by Stage of Cancer

Neetu Chawla, National Cancer Institute; Neeraj K. Arora, PhD, National Cancer Institute; Ingrid Oakley-Girvan, PhD, Cancer Prevention Institute of California; Steven B. Clauser, PhD, National Cancer Institute

Presenter: Neetu Chawla, Ph.D., M.P.H., Cancer Prevention Fellow, National Cancer Institute, neetu.chawla@nih.gov

Research Objective: Trust in physicians plays an important role in facilitating cancer patients’ adjustment to their illness. However, patient trust has rarely been examined within the context of post-treatment follow-up care. We used data from the Assessment of Patient Experiences of Cancer Care (APECC) study to evaluate predictors of colorectal cancer survivors’ trust in their follow-up cancer care physicians overall and by stage of cancer.

Study Design: The APECC study recruited cancer survivors from the Cancer Prevention Institute of California’s (CPIC) cancer registry, a member of the Surveillance, Epidemiology, and End Results (SEER) program. Eligible participants met the following criteria: could read English; had primary diagnosis of leukemia, bladder, or colorectal cancer between June 1, 1999 and May 31, 2001 (2-5 years before the study); were at least 20 years of age at the time of diagnosis; received cancer treatment; had no other cancer diagnoses between the initial diagnosis and the start of the APECC study; and had no objections from their physician to participate in the study. Trust was assessed using a validated 11-item scale and responses were transformed to a 0-100 metric. Hierarchical linear regressions were conducted to examine predictors of trust with socio-demographic, clinical, and follow-up care variables entered in the first model and patient-physician communication variables (i.e. physician knowledge of the patient, information exchange, and physicians’ affective behavior) in the second. Using AJCC stage classification, stratified regressions were conducted to assess differences in predictors of trust by early (0, i, ii) vs. late stage (iii, iv) patients.

Population Studied: Our analytic sample included colorectal cancer survivors who were 2-5 years post-diagnosis and saw a follow-up care physician in the past year (N=371).

Principal Findings: The mean trust score was 83.58 and did not significantly vary by cancer stage. In the main effects model, older age, increased length of patient-physician relationship, better health status, and male physician gender were associated with greater trust (p less than 0.05 for all). When communication variables were added, physician knowledge (p less than 0.001), information exchange (p less than 0.001), and affective behavior (p less than 0.05) were significantly associated with greater trust. In stratified analyses, physician knowledge (p less than 0.001) and information exchange (p less than 0.05) were associated with greater trust among early stage patients and information exchange
(p less than 0.001) and physician affect (p less than 0.05) were significant predictors of trust among late stage patients.

**Conclusions:** Patient-physician communication plays a central role in facilitating trust between colorectal cancer survivors and their follow-up care physicians. Information exchange was an important dimension of communication for all survivors, but early stage patients valued physician knowledge while late stage patients valued physician affect.

**Implications for Policy, Delivery, or Practice:** Our findings suggest that to build and sustain patient trust, different aspects of communication may need to be emphasized during follow-up care interactions between physicians and survivors diagnosed with early vs. late stage colorectal cancer.

**Funding Source(s):** N/A, NCI

**Poster Session and Number:** B, #854

**Activating Patients with Depression: Evidence from a Nationally Representative Data Set**

Jie Chen, University of Maryland at College Park; Karoline Mortensen, University of Maryland at College Park; Robin Bloodworth, University of Maryland at College Park

**Presenter:** Jie Chen, Ph.D., Assistant Professor, Health Services Administration, University of Maryland at College Park, jichen@umd.edu

**Research Objective:** Approximately 1 in 10 adults have depression in the United States. People with depression are less likely to be engaged in their treatment, or adhere to their treatment plan, compared to patients with other diseases. Activating patients in their own health and health care, at the core of the patient-centered care, has become a priority for policy makers to improve the efficiency and quality of the health care delivery system. Although the literature on patient activation is developing rapidly, little is known about the factors associated with activation among patients with depression.

To our knowledge, this is the first study to examine the factors associated with patient activation among those with depression. In this study, we explore four aspects that may be related to patient activation: the demographic and socio-economic characteristics of the patient; the patient-physician relationship; health care access and the site of the patient’s usual source of care; and community characteristics, including geographic area.

**Study Design:** The data for this analysis are from 2007 Health Tracking Household Survey. It is the first large, nationally representative survey to include patient activation measures in assessing the level of activation in the civilian, noninstitutionalized US population. The survey includes a thirteen-item patient activation measure in the consumer engagement section, composed of self-reported responses to questions regarding patients’ self-management of their own health. To estimate the association between community characteristics and patient activation, we link the Health Tracking Household Survey data with county-level data from the Area Resource File by the county identifier. Multivariable linear regressions are used to estimate the individual factors associated with the patient activation index. Multivariable logistic regressions are used to estimate the factors associated with each of these thirteen activation measures.

**Population Studied:** Our study sample includes adults age eighteen and older with a diagnosis of depression and response to the consumer engagement questions. Our final sample size is 1,670.

**Principal Findings:** We find that depressed patients reporting a usual source of care in a primary care setting have higher patient activation levels than those reporting EDs or hospital outpatient clinic as their usual source of care. We also find that better patient-physician relationships, the availability of community mental health centers, lower proportion of foreign-born individuals, and higher income in the local community are associated with higher activation. Results also show geographic variation in activation levels among patients with depression.

**Conclusions:** Our study provides evidence of aspects conducive to effective strategies to improve patient activation, such as improving the patient-physician relationship, sustaining the continuity of care, and disseminating medical knowledge at various sites of care and in the local community, among depressed patients.

**Implications for Policy, Delivery, or Practice:** The Affordable Care Act heightened awareness of patient activation when it created the Patient Centered Outcomes Research Institute (PCORI) in 2010. The mission of the PCORI is to produce and communicate high quality research that helps people make better-informed health care decisions. Engaging patients in the health care
and decision making is at the core of PCORI. Future studies should further estimate the causal effects of the continuity patient-physician relationship, patient education and community characteristics on patient activation.

**Funding Source(s):** No Funding

**Poster Session and Number:** B, #855

### Elective Induction of Labor at Term Compared with Expectant Management: Associations with Infant and Maternal Health Outcomes in California

Blair Darney, Oregon Health and Science University; Jonathan M. Snowden, Oregon Health & Science University; Yvonne W. Cheng, UCSF; R. Lorie Jacob, Oregon Health & Science University; James M. Nischolosn, Penn State University College of Medicine; Sascha Dublin, Group Health Research Institute; Darios Getahun, Department of Research & Evaluation, Kaiser Permanente Southern California; Aaron B. Caughey, Oregon Health & Science University

**Presenter:** Blair Darney, Ph.D., M.P.H., Post-doctoral Fellow, Department of Medical Informatics & Clinical Epidemiology/Health Services, Oregon Health and Science University, darneyb@ohsu.edu

**Research Objective:** Induction of labor and elective induction of labor have been steadily increasing in the United States; the impact of elective induction of labor on maternal and infant outcomes is not clear. Existing literature uses non-transparent classification schemes, and/or compares elective induction to spontaneous labor, which is not the actual clinical alternative. We used a transparent classification method and clinically relevant comparison group to test the association of elective induction of labor and cesarean delivery, operative vaginal delivery, lacerations, macrosomia, and perinatal death, compared with expectant management.

**Study Design:** Retrospective cohort of all deliveries in California in 2006 using linked hospital discharge and vital statistics data. We excluded fetal anomalies, breech presentations, and multiple gestations. We compared elective induction (induction without recorded medical indication as defined by The Joint Commission) at each term gestational age (37-40 completed weeks) with expectant management (delivery at some later gestational age). We used bivariate and multivariable methods to examine associations for each outcome at each gestational week and stratified by parity. Elective induction, covariates, and outcomes were identified using International Classification of Diseases, Ninth Revision, Clinical Modification codes and/or vital statistics data.

**Population Studied:** All term, vertex, singleton, non-anomalous births in California in 2006

**Principal Findings:** Estimates are based on an analytic sample of 365,037 deliveries (46.1% nulliparas). Overall, the fraction of cesarean delivery was lower across all gestational ages and among both nulliparas and multiparas during women with elective inductions (37 [7.7% vs. 15.9%, p<.001], 38 [8.1% vs. 16.3%, p<.001], and 39 [9.4% vs. 17.6%, p<.001] weeks). Multivariable models controlling for common confounders supported bivariate results. Elective induction is not associated with increased odds of lacerations, or operative vaginal delivery at any term gestational age (37-40) compared with expectant management. Elective induction was significantly associated with reduced odds (OR=.23; 95% CI, .06-.90) of perinatal death at 39 weeks, controlling for parity.

**Conclusions:** Elective induction of labor was associated with reduced odds of cesarean delivery among both nulliparous and multiparous women at each term gestational age (37-40 weeks). In addition, we found that elective induction was not associated with increased perinatal mortality at any term gestational age (37-40) compared with expectant management and was significantly associated with reduced odds of perinatal death at 39 weeks, controlling for parity. Our analysis suggested that elective IOL was not associated with increased odds of lacerations or operative vaginal delivery. Finally, we observed that the odds of macrosomia were lower among electively induced women, nulliparas and multiparas, at 37, 38, and 39 weeks.

**Implications for Policy, Delivery, or Practice:** This study extends previous work to examine all term (37-40 weeks) deliveries, separates nulliparous and multiparous women, uses a transparent and reproducible definition of elective induction, and compares elective induction to expectant management, the clinically relevant comparator. As labor induction and elective induction continue to increase in frequency, research should continue to refine methods for appropriately studying induction of labor to inform practice guidelines.

**Funding Source(s):** AHRQ

**Poster Session and Number:** B, #856
A Model for Patient-Centered Outcomes Research: Caregivers’ Perspectives on Child Psychotropic Treatment

Susan DosReis, University of Maryland School of Pharmacy; Lauren D. Wagner, University of Maryland School of Pharmacy; Sean Lynch, University of Florida, Jacksonville; Emily Frosch, Johns Hopkins University School of Medicine

Presenter: Susan DosReis, Ph.D., Associate Professor, Pharmaceutical Health Services Research, University of Maryland School of Pharmacy, sdosreis@rx.umaryland.edu

Research Objective: Caregivers of youth with mental illness have a vital role in determining when to seek mental health services in general and when to initiate psychotropic treatment for their child’s illness specifically. Patient-centered outcomes research (PCOR), however, often excludes the perspective of the caregiver of a child with a mental illness. To address this gap, the objectives of this study were to a) identify caregiver-desired short and long-term outcomes of treatment for their child’s attention-deficit/hyperactivity disorder (ADHD); b) assess caregivers’ openness to different treatment approaches and the strategies used to achieve desired outcomes; and c) assess caregivers’ perceptions of whether desired outcomes were achieved one year after initiating care for their child.

Study Design: This qualitative, 12-month prospective study design involved in-depth interviews with caregivers (48) at baseline, 6 months, and 12 months following an initial ADHD diagnosis. Interviews were audiorecorded, transcribed verbatim, and analyzed using grounded theory methods. Perceived changes in their child were categorized into short-term goals. Life goals expected from treatment were categorized as long-term outcomes. Changes in openness to use different treatment approaches over the course of one year was categorized as adaptability. Strategies that caregivers used to achieve desired outcomes were categorized as their overall approach to care-seeking. Interrelationships among short- and long-term outcomes, adaptability, and strategies informed a theoretical model of how caregivers’ ensure that their desired outcomes are met.

Population Studied: The target population was primary caregivers of children newly diagnosed with ADHD who were initiating care in primary pediatric or specialty mental health settings.

Principal Findings: The model revealed that caregivers’ ensured desired outcomes were met by balancing their adaptability and treatment strategies. Caregivers reported short-term outcomes as: symptom improvement (19%), lessening of problems (17%), sporadic changes (8%), not yet resolved (46%), or no change (8%). The long-term outcomes were future hopes for a child who was ‘disease-free’ (25%), prepared for adult life (27%), or able to be independent (25%). Adaptability to treatment ranged from being open to a variety of interventions (31%), establishing limits for when and which treatments they would use (37%), needing to be informed before initiating treatment (15%), being influenced by societal views (13%), and taking a path previously followed (4%). Key strategies used included being an advocate (21%), promoting child well-being (10%), fostering independence (10%), and focusing on medication (6%).

Conclusions: Traditional health services research outcomes of symptom reduction, continuity of care, and medication adherence are different than the caregiver desired outcomes in this study. Partial or sporadic improvement of their child’s problems was sufficient for one-quarter of caregivers. Thus, decisions to remain engaged in care may be more aligned with caregivers’ personal values and goals for their child’s treatment rather than attainment of clinical parameters.

Implications for Policy, Delivery, or Practice: This research could inform the development of new patient-centered measures for PCOR. The outcomes of this work could be better integration of caregiver reported outcomes in program planning and policies for child mental health services.

Funding Source(s): NIH, NIMH

Poster Session and Number: B, #857

The Impact on Payer Coverage Policies of a New Public Council’s Deliberation and Voting on the Comparative Clinical Effectiveness and Value of Medical Interventions

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**Research Objective:** Private and public payers are increasingly interested in using patient-centered outcomes research (PCOR) to inform medical policymaking, but significant barriers impede the use of federally produced evidence reviews. To address this problem, the New England Comparative Effectiveness Public Advisory Council (CEPAC) was created to deliberate on Agency for Healthcare Research and Quality (AHRQ) evidence reviews supplemented with cost-effectiveness and budget impact analyses. The Council rated the available evidence for two topics and weighed the comparative value of different treatments via a formal voting process. This study analyzes the impact of CEPAC votes on payer coverage policies.

**Study Design:** We used a mixed methods study design. Following the CEPAC votes, we evaluated the websites of 44 private and public payers for changes to existing medical policy related to management options for 1) atrial fibrillation (AF); and 2) treatment-resistant depression (TRD). We also interviewed payers to understand their reaction to the CEPAC votes.

**Population Studied:** National and regional private payers, Medicare and Medicaid

**Principal Findings:** For patients with AF, CEPAC voted 16-0 that the evidence was not adequate to demonstrate equivalent or superior outcomes for minimally invasive surgical ablation compared to catheter ablation. Subsequently, none of the 44 payers changed their coverage policies regarding surgical ablation.

For patients with TRD, CEPAC voted 10-5 that the evidence was adequate to demonstrate that repetitive transcranial magnetic stimulation (rTMS) was equivalent or superior to usual care. Subsequently, we identified 5 payers that reversed existing non-coverage policies for rTMS. The regional Medicare contractor for New England and Anthem cited the CEPAC meeting in their rationale. Interviews assessed reasons for action or inaction in response to CEPAC votes.

**Conclusions:** For AF, respondents indicated that no coverage policies were changed because: 1) payers view "no" votes as actionable primarily by hospital and clinical communities; 2) payers were unable to use their coding and billing systems to target coverage or payment policies specifically to minimally-invasive surgical ablation; 3) surgical ablation was thought to be rarely used, and therefore not worth the risk of antagonizing clinicians and patients; and 4) there are more palatable tools than non-coverage policies for cost control, including tiered networks favoring high-value clinicians.

With respect to rTMS, respondents indicated that CEPAC voting influenced changes in coverage policy because: 1) the voting coincided with coverage decision-making cycles internal to the payers; 2) Medicare is considered an influential payer and therefore provided a blueprint for coverage language that other payers could adopt; and 3) using PCOR to initiate coverage is easier than using it to terminate coverage.

**Implications for Policy, Delivery, or Practice:** Early experience with CEPAC suggests ways to enhance the dissemination of PCOR to payer coverage policies. Timing of public council votes and a focus on topics which can be identified by current coding and billing data systems are among the key steps to advance public input into coverage decisions.

**Funding Source(s):** AHRQ

**Poster Session and Number:** B, #858

**Incidence and Impact of Perioperative Myocardial Infarction and Pulmonary Embolism in Single vs. Bilateral Elective Arthroplasty Patients**

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**Presenter:** Mary Forte, PhD, DC, Assistant Professor, Epidemiology and Orthopaedics, University of Maryland School of Medicine, mforte@umoa.umm.edu

**Research Objective:** Elective total hip and knee replacements are common and the demand for arthroplasty in older multimorbid individuals is increasing as the population ages. Despite the ongoing orthopaedic and policy focus on pulmonary embolism after arthroplasty, recent
perioperative myocardial infarction (MI) is becoming a dominant complication. However, the incidence of MI and MI-associated mortality relative to pulmonary embolism (PE) among arthroplasty patients remains unknown. Moreover, differences in these patient outcomes after single versus bilateral arthroplasty during the same hospital stay are unknown. We undertook a study to inform these issues.

**Study Design:** Retrospective cohort of discharge abstracts from the 2000-09 HCUP Nationwide Inpatient Sample. The primary outcomes were inpatient acute MI and PE; the secondary outcome was mortality. Logistic regression examined the association between acute MI, PE and mortality after total hip (THA) and bilateral total knee arthroplasty, relative to unilateral total knee arthroplasty (TKA), controlling for age, sex, modified Charlson comorbidity score without acute MI and surgical indication. Incidence and adjusted odds ratios are reported from SAS survey procedures.

**Population Studied:** Patients age 60 or older who underwent total hip, total knee or bilateral TKA were included. Patients with cancer, infection, fractures, revision surgery and uncommon bilateral hip or hip-knee arthroplasty were excluded.

**Principal Findings:** Discharge abstracts represented 4,478,007 patients; 15.8 percent were age 80 or older. Two-thirds of patients underwent TKA (66.8 percent), 29 percent THA and 4.2 percent bilateral TKA. Overall, 0.32 percent of patients suffered an MI and 0.37 percent a PE; however, mortality was higher after MI than PE (8.6 vs. 3.9 percent respectively) versus 0.1 percent among patients without MI or PE. MI incidence differed by procedure and was lowest after TKA (0.3 percent) and highest after bilateral TKA (0.6 percent). MI-associated mortality differed by procedure and was highest after bilateral TKA (10.9 percent). PE incidence differed by procedure and was lowest after total hip arthroplasty (0.2 percent) and highest after bilateral TKA (0.8 percent). PE-associated mortality was highest after THA (6.2 percent). The adjusted odds ratio of MI after bilateral TKA was twice that of unilateral TKA patients. The mortality odds ratio after bilateral versus single TKA was 3.2 after controlling for other factors.

**Conclusions:** Among arthroplasty patients, acute MI is as common as PE but MI-associated mortality is higher. Bilateral TKA increased the risk of MI, PE and mortality compared to unilateral TKA. The magnitude of surgery during a hospital stay is an important risk factor for MI and PE that persisted after controlling for patient-related factors.

**Implications for Policy, Delivery, or Practice:** Despite the ongoing focus on arthroplasty-related PE, myocardial infarction is emerging as a dominant complication. Since routine testing for MI after arthroplasty is generally not conducted and MI outcomes are improved with early intervention, routine testing for MI could improve outcomes. Shifts in the arthroplasty population over time require monitoring by the orthopaedic community to respond to the evolving care needs of sicker and older patients. Before same-stay multiple arthroplasty surgeries are supported, a clinical trial is needed to demonstrate if this approach is safe.

**Funding Source(s):** Other, Dept of Orthopaedics, U Maryland SOM

**Poster Session and Number:** B, #859

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**Geographic Variation of Prostate Cancer Treatments in the Veterans Health Administration**

**Research Objective:** As part of a broader project to examine the comparative effectiveness of treatments for prostate cancer, we explored patterns of geographic variation within the Veterans Health Administration (VHA). Such variation is a source of quasi-randomness we will exploit to infer causal relationships between treatments and outcomes. Our large sample size will permit us to stratify by patient characteristics, consistent with the goals of patient-centered outcomes research.

**Study Design:** Ours is an observational, retrospective comparative effectiveness study of prostate cancer treatment modalities. In the first phase of the project, we estimated the relationship between receipt of various treatment modalities (radical prostatectomy, external beam...
radiation, brachytherapy) and site of diagnosis, controlling for baseline demographics, prognostic factors (stage and grade), and comorbidities.

**Population Studied:** We examined a cohort of veterans with a prostate cancer diagnosis in 2001-2003, who are dually eligible for VHA and Medicare benefits, are over 65 years of age, rely principally on the VHA for their outpatient care in a baseline year, and not enrolled in a Medicare Advantage (MA) plan. A focus on VHA-Medicare dually high VHA reliance and no MA enrollment ensures that we captured all care received. Our sample includes about 100,000 subjects.

**Principal Findings:** Variation in modality of prostate cancer treatment is considerable. For example, radical prostatectomy, the most common form of treatment overall, is the treatment of choice for about 20% of treated patients within two of the 23 VHA service networks that existed during the years of focus. At two others, 85% of treated patients received radical prostatectomy. Large variation in other treatment modalities is also evident. We found that 90% of those treated between 2001 and 2003 were treated within one year of diagnosis.

**Conclusions:** We observed large variations in practice patterns for VHA treatment of prostate cancer.

**Implications for Policy, Delivery, or Practice:**
Prostate cancer is a common disease among elderly men but infrequently fatal. Clinically insignificant cancer is common. Observation of large variations in treatment, controlling for demographics, comorbidities and prognostic factors, is a signature of overtreatment, though it does not convey the degree. Future phases of our study will exploit such variation as a source of quasi-randomness, to relate treatment to outcomes. By doing so, we expect to quantify the degree of overtreatment. Moreover, our large sample size will permit stratification by important patient characteristics, like life expectancy or comorbidities. The reason to focus on such subpopulations is that they are more likely to die with, not from, prostate cancer, and are therefore at higher risk of overtreatment. Importantly, randomized trials with lower samples than we will have are generally underpowered for such sub-analyses.

**Funding Source(s):** VA

**Poster Session and Number:** B, #860

**FORCE-TJR: Novel Design for National TJR Comparative Effectiveness Research Based on Patient-Centered Outcomes**

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**Presenter:** Patricia Franklin, M.D., M.B.A., M.P.H., Professor, Director of Outcomes Research, Department of Orthopedics, University of Massachusetts Medical School; patricia.franklin@umassmed.edu

**Research Objective:** Traditionally, total joint replacement (TJR) registries have focused primarily on storing implant data and analyzing time-to-revision by manufacturer and component types. While implant revision is an important endpoint, sub-optimal outcomes short of revision are important to surgeons and patients, and as the case of the 2010 implant recall illustrates, a national systematic patient-centered outcomes research (PCOR) and monitoring system is greatly needed. In Fall 2009, the US federal Agency for Healthcare Research and Quality funded FORCE-TJR, Function and Outcomes Research for Comparative Effectiveness in TJR, a research consortium and database of over 100 surgeons and 30,000 patients. FORCE-TJR collects comprehensive TJR outcomes including patient-reported pain and function and post-operative sequelae. The FORCE-TJR team developed novel methods to assure comprehensive, longitudinal data collection from diverse patients and surgeons for years into the future.

**Study Design:** To assure broad surgeon and patient participation and comprehensive data collection, the FORCE-TJR team developed methods to (1) assemble a research consortium of a national sample of over 100 diverse surgeons representing all regions of the US with varied hospital and surgeon practices to ensure that analyses and research reflect typical US practice; surgeons agree to invite all patients to participate, (2) implement a virtual model for patient consent and data entry of consistent,
validated patient-reported surveys, (3) conduct efficient screening for post-TJR sequelae and validated chart review and adjudication, and (4) document implant details. FORCE-TJR collects baseline patient attributes; procedure and implant details; surgeon and institutional characteristics; annual patient-reported pain and function as well as healthcare utilization due to knee or hip issues, post-procedure complications and revisions, and, in a subset of patients, serum/DNA samples. Patients sign a consent to participate so that FORCE-TJR can contact patients directly to complete longitudinal assessments.

**Population Studied:** Patients with advanced knee and hip arthritis who undergo TJR are enrolled in FORCE-TJR.

**Principal Findings:** In the first 2 years, FORCE-TJR assembled a consortium of 111 surgeons in practices operating in urban and rural settings in 21 states with academic, private, and HMO ownership and performing varied annual volumes of TJR surgery. Across practices, 80 to 95 percent of patients have enrolled. More than 8,200 patients have enrolled to complete standardized surveys via Internet or scannable paper forms. With the current enrollment rates, we expect to meet our target of 30,000 patients by 2014. We have collected baseline data for all enrolled patients and 6-month data for 2,500. Preliminary data have been presented at several national meetings.

**Conclusions:** The FORCE-TJR research program employs innovative strategies to collect comprehensive post-TJR data from a national cohort of more than 30,000 patients. Comparative effectiveness research (CER) emerging from these data will include patient, implant, and health system predictors of post-TJR adverse events, pain relief, functional gain, and revision.

**Implications for Policy, Delivery, or Practice:** We propose to transform this consortium of orthopedic offices into a research laboratory that will serve as a national model for PCOR and CER in TJR. These analyses will offer novel and important new evidence to guide patient, surgeon, and policy decisions for TJR, the most common and costly Medicare procedure.

**Funding Source(s):** AHRQ

**Perspectives on Complementary Data Sources in Diabetes Health Technology Assessment: An Enrolling Practice-Based Research Network and a Large Commercial Health Plan**

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**Presenter:** Jeffrey Frimpter, Sr Manager, Ebm, Sanofi US, jeffrey.frimpter@sanofi.com

**Research Objective:** Diabetes FORWARD (DF) is a practice-based research network (PBRN) focused on Type 2 Diabetes (T2DM) health technology assessment (HTA) and health services research (HSR) in North America, based in primary care practices with electronic medical records (EMR) and enriched with supplementary patient- and provider-reported information. Recruitment is currently 9% of goal, with interest in early evaluations of how the DF source population might relate to other T2DM populations.

**Study Design:** We examined descriptive information among these EMR, PBRN, and health plan populations.

**Population Studied:** Eligible patients are adults with T2DM receiving pharmacotherapy, and other criteria previously reported. We examined the T2DM cohort of the DF-EMR, the DF population enrolled between March and September 2012 (DF), and members with continuous enrollment through 2011 in a large commercial health plan (LHP). We reviewed preliminary descriptive information to inform future analyses of patient subgroups and outcomes among populations in these data sources.

**Principal Findings:** Overall, the DF-EMR source population (n=187,991) and DF patients (n=935) varied from the LHP (n=719,041) in ways to be expected from data sources created for fundamentally different purposes. DF-EMR and DF had slightly greater percentages of males vs LHP, respectively (48.1 and 43.6 vs 54.2%), and a US geographic distribution skewed toward the South: Northeast, 13.1 and 9.6 vs 32.1%; South, 62.6 and 68.4 vs 42.0%; Midwest, 14.2 and 15.4 vs 16.3%; West, 10.0 and 6.5 vs 9.4%. Insurance types reflected the nature of the sources for DF-EMR and DF vs LHP: Commercial, 51.1 and 47.4 vs 87.2%; Medicare, 41.9 and 39.8 vs 6.1%; and Medicaid,
1.5 and 7.7 vs 0.3%. The DF population had a higher average Charlson Comorbidity Index than LHP (Mean [SD], 1.6 [1.2] vs 0.8 [1.5], respectively) and slightly greater prevalence of insulin use (18.6 vs 17.3%). Distribution of oral antidiabetic drug (OAD) use varied in the DF vs LHP populations, reflecting the DF pharmacotherapy inclusion criterion: No OAD, 7.4 vs 45.7%; 1 OAD, 43.1 vs 27.6%; 2 OAD, 37.4 vs 18.2%; 3 or more OAD, 12.1 vs 8.2%. This preliminary assessment did not segregate DF patients by differential health insurance types, nor the LHP by treatment history, as future analyses will aim to consider.  

**Conclusions:** HTA and HSR require complementary data sources to translate findings into improved outcomes across patients and settings. This descriptive assessment begins to investigate the potential applicability of findings across populations from such important complementary data sources.  

**Implications for Policy, Delivery, or Practice:** This assessment is intended to introduce preliminary perspectives on the first T2DM-focused PBRN and to contribute to the discourse regarding synthesis and application of research into practice and patient care.  

**Funding Source(s):** Other, Sanofi  

**Poster Session and Number:** B, #862  

**Use of CER by States: Current Trends and Emerging Models**  
Jenny Gaffney, Avalere Health LLC; Tanisha Carino, PhD, Avalere Health LLC; Christine Liow, MPH, Avalere Health LLC; Caroline Pearson, Avalere Health LLC  

**Presenter:** Jenny Gaffney, A.B., Senior Manager, Evidence-Based Medicine Center, Avalere Health LLC, jgaffney@avalerehealth.net  

**Research Objective:** A depressed economic climate coupled with the corresponding rise in Medicaid enrollment have challenged the ability of Medicaid programs to strike a delicate balance in providing healthcare access to vulnerable individuals while being prudent with taxpayer dollars. To mediate these competing interests, states are increasingly investing in resources to augment their capacity for using clinical and cost evidence to inform pharmacy benefits. The federal government has also injected significant funding for comparative effectiveness research (CER) to help Medicaid programs and others identify optimal treatments for specific patient populations.  

In partnership with the Kaiser Family Foundation (KFF), Avalere sought to examine if and how Medicaid programs are using public CER to inform their pharmacy coverage policies.  

**Study Design:** Avalere and KFF conducted primary and secondary research on seven state fee-for-service (FFS) Medicaid programs in Florida, Louisiana, Maryland, Massachusetts, Minnesota, Nevada, and Washington, and three Medicaid managed care organizations (MCOs) operating in these markets—Amerigroup, Molina Healthcare, and United. Finally, Avalere conducted case studies of emerging collaborative models between state Medicaid programs and CER generators for informing Medicaid coverage policies and where possible, evaluated the impact of this CER on coverage policies.  

**Population Studied:** Avalere assessed state FFS Medicaid programs and Medicaid MCOs.  

**Principal Findings:** One of the key findings from this report is that current public CER efforts fall short of meeting the needs of state Medicaid pharmacy directors. They do not use public CER due to the lack of cost information, length, and delayed timing of the reviews relative to their formulary reviews. The majority depend on a private pharmacy benefit manager (PBM) to conduct evidence reviews that inform their pharmacy policies. Additionally, states are beginning to partner directly with external health technology assessment entities to fund new models of collaboration for the development and translation of CER. Avalere identified the New England Comparative Effectiveness Public Advisory Council (CEPAC) and Oregon’s Health Evidence Review Council (HERC) as two such models that seek to bridge the apparent disconnect between public CER and local payer needs.  

**Conclusions:** Despite an influx in federal dollars to generate more CER, state Medicaid programs are not using publicly available sources of CER to inform their pharmacy policies and instead, turn to resources that produce timely, concise evidence reviews that include cost information and are customized to their individual needs.  

**Implications for Policy, Delivery, or Practice:** Many of the questions surrounding the usefulness and relevance of public CER will become more salient with the increasing demand for Medicaid programs to demonstrate that they are delivering high value care in their...
local markets. To provide these payers with useful research, there needs to be concerted efforts to address the current disconnect between national generators of CER and local decision makers. The creation of communication systems linking state Medicaid programs, researchers, and those that translate this research to the payer community will be vital to ensure the research is timely and relevant. Other regions of the U.S. may benefit from establishing a CEPAC-like model for translating existing CER into a format that better informs coverage and reimbursement decisions at the regional level.

**Funding Source(s):** Other, Kaiser Family Foundation

**Poster Session and Number:** B, #863

### Nesting Studies within Patient Registries

**Presenter:** Eric Gemmen, Quintiles Outcome

**Research Objective:** Patient registries often represent a significant investment of time and resources, particularly if prospective, longitudinal data is collected from a large number of patients over an extended amount of time. The infrastructure of an operating patient registry can include sites with an established relationship with the sponsor who are trained and experienced in data collection and verification, a patient population that is already recruited and engaged in research, and a database with rich, real-world information on conditions and treatments. Such existing resources present opportunities for nested sub-studies which can leverage this infrastructure to address additional research questions. This session will discuss how nesting sub-studies within existing patient registries can be a useful and efficient way of answering new research questions.

**Study Design:** N/A

**Population Studied:** N/A

**Principal Findings:** N/A

**Conclusions:** Nesting sub-studies can be an innovative and efficient use of existing registry resources. Using an existing registry infrastructure in this way can greatly decrease time and costs usually associated with recruitment and start-up activities. The session will examine design and operational considerations for nested studies; issues to be highlighted include obtaining additional consent from patients, providing additional training and reimbursement to sites, and data security issues. Finally, the session I will present a case example of a nested sub-study in an existing registry, and summarize lessons learned from this example.

**Implications for Policy, Delivery, or Practice:** Increasing the use of nested studies where possible, instead of initiating standalone studies, could realize cost savings for sponsors, minimize the burden of participation for patients and providers, and maximize the knowledge gained from a given registry. The Patient-Centered Outcomes Research Institute, federal government agencies, industry, and other sponsors of patient-centered outcomes research and comparative effectiveness research might provide incentives for utilizing existing registry programs in this way as a strategy for maximizing the use of available research resources.

**Funding Source(s):** AHRQ

**Poster Session and Number:** B, #864

### FURTHeR: A Comparative Effectiveness Research Infrastructure for PHIS+

**Presenter:** Ram Gouripeddi, University of Utah

**Research Objective:** Integrating clinical data with administrative data will improve the quality of comparative effectiveness research (CER) studies by providing more accurate case ascertainment and additional clinical variables for analyses. The PHIS+ project is augmenting the existing Pediatric Health Information System (PHIS) administrative database housed at the Children’s Hospital Association with clinical data using the Federated Utah Research and Translational Health electronic Repository (FURTHeR) infrastructure. FURTHeR was developed by the University of Utah Biomedical Informatics Core to federate and integrate health information from heterogeneous data sources in order to support syntactic and semantic data interoperability for clinical and translational research purposes.

**Study Design:** FURTHeR integrates clinical data consisting of laboratory, microbiology and radiology data from six children’s hospitals...
An Adjusted Depression Screening Scale for Multiple Sclerosis Patients
Douglas Gunzler, Case Western Reserve University

**Presenter:** Douglas Gunzler, Ph.D., Senior Instructor Of Medicine, Medicine, Case Western Reserve University, dgunzler@metrohealth.org

**Research Objective:** Develop an adjusted depression screening scale for Multiple Sclerosis (MS) patients accounting for the overlap of depression and MS symptoms.

**Study Design:** Retrospective Cohort.

**Population Studied:** Knowledge Program (KP) at Cleveland Clinic’s Neurological Institute (NI) links PHQ-9 responses to the EPIC Electronic Health Records (EHR). Inclusion criteria includes KP subjects from the Mellen Center for Multiple Sclerosis in the NI with a PHQ-9 score and timed 25-foot walk. Data are available for 3,507 MS patients from 2008-2011.

**Principal Findings:** Significant overlap was found for all MS symptoms under study, including MS-related fatigue, functional and cognitive disability, and PHQ-9 using a structural equation modeling (SEM)-based approach. SEM is a very general technique combining complex path models with latent (unobserved) variables. No meaningful subgroup measurement differences by age, sex, race, MS type and baseline time since diagnosis were observed. In addition, no model showed a meaningful improvement in fit criteria over an initial model examining just the overlap of MS-related fatigue and PHQ-9. Using our initial model, an adjusted depression screening scale was formed based on factor scores.

**Conclusions:** Our approach enables us to observe significant overlap between MS symptoms and PHQ-9 and construct an adjusted depression screening scale specifically for use on MS patients, correcting for the significant overlap of MS-related fatigue and depression symptoms.

**Implications for Policy, Delivery, or Practice:** The roles of MS-related fatigue and depression in patient-reported fatigue in MS patients is not clear. An algorithm is provided for an adjusted depression screening score specifically for MS patients through a correction of the overlap of MS-related fatigue and depression symptoms. This new adjusted scale can be used to help clinicians prevent over or under prescribing antidepressants and fatigue and MS medication, and providing better tailored care. Extending this...
scale to account for other symptoms of overlap is straightforward. Within the MS population under study, a less conservative depression screening scale could also account for overlap in cognitive and functional disability. In addition, this SEM-based approach generalizes to similar problems in any field involving overlapping diagnostic criteria.

**Funding Source(s):** Other, Novartis

**Poster Session and Number:** B, #866

### The Intersection of Comparative Effectiveness Research and Electronic Clinical Data: A Review of the Peer-Reviewed and Grey Literature

Marianne Hamilton Lopez, AcademyHealth; Rebecca Singer Cohen MPP, AcademyHealth; Indra Neil Sarkar, PhD, MLIS, University of Vermont; Courtney Segal, AcademyHealth; Erin Holve, PhD MPP MPH, AcademyHealth

**Presenter:** Marianne Hamilton Lopez, M.P.A., Senior Manager, AcademyHealth, marianne.hamiltonlopez@academyhealth.org

**Research Objective:** Technological advances in clinical informatics have made large amounts of data accessible and potentially useful for research. As a result, a burgeoning literature, in traditional peer-reviewed journals as well as non-commercial or “grey” literature, bridges the fields of health services research and biomedical informatics. Using an exploratory, systematic effort, the Electronic Data Methods (EDM) Forum conducted complex semantic searches of the peer and grey literature at the intersection of comparative effectiveness research (CER) and electronic clinical data (ECD). This paper presents the structured methodology, and preliminary findings, from these two reviews.

**Study Design:** A structured multi-step approach was used to search and identify relevant papers. Identified articles were coded based on key areas related to developing infrastructure and methods for conducting CER with ECD.

**Population Studied:** The peer-reviewed search included: a structured search of PubMed, manual reviews of articles from selected publication lists; and manual reviews of research activities based on prospective ECD. The grey literature search included: a structured search for key concepts in grey literature-producing organizations; a structured search for key concepts in Google; and manual reviews of websites from research activities related to the EDM Forum.

**Principal Findings:** In the peer-reviewed search, 2,435 citations were identified as potentially relevant and 132 papers met inclusion criteria (88 of which were chosen for final analysis). Two cross-cutting themes emerged: the challenges of conducting research in the absence of standardized ontologies and data collection; and unique data governance concerns related to the transfer, storage, de-identification, and access to ECD. Current gaps on the use of clinical informatics for cohort identification, cloud computing, and single point access to research data were identified. An update to the peer-reviewed search is currently underway.

In the grey search, more than 156 million potential documents and Web pages were identified, 5,400 titles were reviewed, and 48 documents and Web pages were ultimately identified as most relevant. Early lessons suggest that future examinations of the grey literature will need to account for identification and quality of the grey literature. The absence of a structured vocabulary within this emerging area of study combined with the ever-expanding nature of the internet contributed to issues of classification.

**Conclusions:** There was good parity between some of the topics and the reviews shared certain gaps in the literature. However, there appears to be three major topical differences in the focus of the grey and peer-reviewed literature related to technical topics such as security, policy-relevant documents, and natural language processing.

**Implications for Policy, Delivery, or Practice:** An influx of new research for CER and PCOR will likely result in new peer-reviewed and grey literature on research as well as policy issues such as research governance, and implementation strategies. Finding rigorous approaches to search the literature will be important to inform the research and policy communities about multidisciplinary viewpoints, ongoing initiatives, challenges, and proposed solutions to leverage ECD for CER in order to improve patient outcomes.

**Funding Source(s):** AHRQ

**Poster Session and Number:** B, #867

### Are We There Yet? Innovative Solutions and Lessons Learned Using Electronic Clinical Data for CER, PCOR, and QI in Learning Health Systems

Erin Holve, AcademyHealth; Courtney Segal, AcademyHealth; Marianne Hamilton Lopez,
AcademyHealth; Eric Shultz, AcademyHealth; Jonathan Nebeker, Salt Lake City VA Medical Center

**Presenter:** Erin Holve, Ph.D, M.P.H., M.P.P., Director, Research & Education in HSR, AcademyHealth, erin.holve@academyhealth.org

**Research Objective:** The Electronic Data Methods (EDM) Forum brings together perspectives from a community of comparative effectiveness research (CER), patient-centered outcomes research (PCOR), and quality improvement (QI) grants building electronic clinical data (ECD) infrastructure to support learning health systems. Two sets of site visits were conducted with seven infrastructure projects funded by the American Recovery and Reinvestment Act (ARRA) of 2009 to understand the opportunities of the field, as well as challenges of this work. This paper discusses progress to date—both with respect to building infrastructure and conducting research—as well as cross-cutting challenges and opportunities faced by the research teams as they have worked to support the use of ECD for research and QI.

**Study Design:** Seven exploratory site visits were conducted under naturalistic inquiry in two periods: the spring of 2011, and the winter of 2012-2013. Themes, challenges, and innovations are identified in the visit notes through coding, keyword searches, and review for complex concepts. An IRB exemption was received to conduct all site visits.

**Population Studied:** Seven innovative research projects (R01s) focused on building infrastructure and methods for collecting and analyzing ECD and facilitating its use for CER, PCOR, and QI. More than 60 investigators representing a range of roles and responsibilities for the projects participated in each round of the site visits.

**Principal Findings:** Case examples of promising data, methods, resources, and tools that have been developed to address historical challenges of research and QI will be presented. In addition, several over-arching themes will be discussed to inform future thinking about building infrastructure for research and QI. These include: establishing “networks of people” as a prerequisite to sustainable data sharing; determining an appropriate level of data de-identification in order to balance privacy protections and access to data that is useful for CER, PCOR, QI, and care improvement; designing a flexible funding and support model for the networks in order to maximize their potential, given their complexity and lack of clear business models; and, engaging key stakeholders in meaningful ways at the right time.

**Conclusions:** The infrastructure the research projects are building address the goals of a learning health system that can be leveraged to generate evidence and improve patient outcomes. The findings highlight technical and non-technical challenges that the HSR community will need to consider with respect to governance, analytic methods, informatics, and the way these tools come together in practice. The projects demonstrate that it is possible to achieve relevant, rigorous, and rapid research and QI, but a high level of collaboration and support will continue to be important to foster partnership and best practices.

**Implications for Policy, Delivery, or Practice:**

The experiences of the projects participating in the EDM Forum represent a substantial federal investment in building the kind of infrastructure envisioned to support CER, PCOR, and QI using ECD. Examples of successful implementations as well as cautionary lessons from the projects are important to understand the direction in which learning health systems are headed, and how current infrastructure investments can be leveraged to improve outcomes for patients.

**Funding Source(s):** AHRQ

**Poster Session and Number:** B, #868

**Development and Use of a New Measure of Shared Decision-Making**

Kristen Kjerulff, Penn State College of Medicine; Diana Velott, Department of Public Health Sciences, Penn State College of Medicine; Junjia Zhu, Department of Public Health Sciences, Penn State College of Medicine; John Repke, Department of Obstetrics and Gynecology, Penn State College of Medicine

**Presenter:** Kristen Kjerulff, Ph.D., Professor, Public Health Sciences, Penn State College of Medicine, khk2@psu.edu

**Research Objective:** Shared decision-making has been described as the most important attribute of patient-centered care. Patients and their families want to be involved in medical care decisions, to be treated with respect and to have their preferences and values taken into account as part of the treatment decision-making process. Shared decision-making is particularly
crucial when it comes to childbirth – women and their families have strong preferences and critical outcomes are at stake. The objective of this study was to develop and evaluate a survey instrument to measure shared decision-making around the mode of delivery decision-making process.

**Study Design:** A 6 item survey instrument was developed (the Delivery Decision-Making Scale, DDMS), based on review of the literature on shared decision-making, and administered via telephone interview one month after delivery, as part of a large-scale, multi-center prospective study of outcomes of childbirth. Respondents answered “true” or “false” in response to statements such as “My opinions and desires about delivery were taken into account”, “I was treated with respect throughout the delivery process”, and “I had an equal say in how my baby was delivered”.

**Population Studied:** 3,006 women, aged 18 to 36, who delivered at 76 hospitals throughout Pennsylvania participated in this study.

**Principal Findings:** The Cronbach’s Alpha for the scale was 0.66, which was good for a 6 item scale, and each of the items exhibited good corrected-item total correlations. Total scores on the DDMS ranged from 0 to 6, the higher score indicating higher shared decision-making. The mean (M) was 5.4 (standard deviation (SD) was 1.08), indicating high satisfaction with the delivery decision-making process overall. Women who had an unplanned cesarean section had the lowest shared decision-making scores by mode of delivery (M = 4.9, SD = 1.4), while women having spontaneous vaginal delivery had the highest (M = 5.5, SD = 0.88), p < .0001. Women who were younger, less educated and were covered by public insurance reported lower scores on shared-decision making (all p < .0001). White women had significantly higher scores on shared decision-making than Black (p < .0001) and Hispanic (p = .001) women.

**Conclusions:** The “Delivery Decision-Making Scale” exhibited good internal consistency reliability, evidence of validity and provided information about factors related to shared decision-making at a crucial treatment decision-making juncture – the mode of delivery decision. Women who were younger, less educated, Black and Hispanic, and covered by public insurance (as opposed to private) reported lower levels of shared decision-making.

**Implications for Policy, Delivery, or Practice:** It’s important for research on patient-centered care to measure shared decision-making from the patient’s perspective and to address disparities in the way that critical treatment decisions are made. We introduce a new instrument to measure shared-decision making which could easily be modified for use in a variety of settings.

**Funding Source(s):** NIH

**Poster Session and Number:** B, #869

**My On Health Report: A Pragmatic Trial to Evaluate the Implementation of Behavioral and Mental Health Assessments in Primary Care**

Alexander Krist, Virginia Commonwealth University; Beth A. Glenn, UCLA Fielding School of Public Health; Hector P. Rodriguez, UCLA Fielding School of Public Health; Melissa Hayes, Virginia Commonwealth University; Rodger Kessler, University of Vermont; Russell Glasgow, National Cancer Institute

**Presenter:** Alexander Krist, M.D., M.d, Assistant Professor, Family Medicine, Virginia Commonwealth University, ahkrist@vcu.edu

**Research Objective:** While it is recommended that clinicians screen patients for unhealthy behaviors and mental health issues, these topics are often overlooked during busy office visits. Health risk assessments, as mandated by the Centers for Medicare and Medicaid Services as part of an Annual Wellness Visit, can help clinicians to systematically collect this patient information. Integrating these assessments into patient portals and electronic health records (EHRs) can make collecting this information more efficient and routine for practices. As the third phase of a three part project, we are testing the extent to which diverse primary care practices can integrate into their electronic workflow and consistently collect a behavioral and mental health assessment and evaluate its impact on care.

**Study Design:** This is a pragmatic, cluster randomized, implementation trial, currently underway in nine pairs of primary care practices. We integrated a standardized tool, www.MyOwnHealthReport.org (or the MOHR website), into the electronic workflow of the study sites. The MOHR website includes 17 evidence based, patient-report items to assess 10 behavior and mental health domains. It automates patient and clinician feedback reports. Practices within each pair are randomized to early intervention (fielding the
MOHR site to patients prior to an office visit) or delayed intervention (usual care with delayed fielding of the MOHR site) conditions. Primary outcomes are being measured by a postal or email survey two weeks after office visits and include the proportion of patients who complete the MOHR assessment (Reach) and whether patients in intervention versus control practices report receipt of counseling and support for behaviors and mental health (Effectiveness). Research team members worked with each site to locally integrate MOHR into clinical activities to identify the patients to direct to the MOHR website, and develop a practical workflow for staff.

**Population Studied:** All adult patients presenting for wellness and or chronic care at the study sites were included. Each practice pair had similar characteristics. Practices were purposely selected to represent the range of primary care nationally including private practices; health system practices; federally qualified health centers; urban, suburban, and rural settings; and practices serving affluent to low socioeconomic populations.

**Principal Findings:** Practices needed to develop a range of workflows to systematically collect patient reported behavior and mental health measures. Workflows varied depending on practice resources, practice informatics infrastructure and capacity, and patient characteristics. Preliminary patient behavior and mental health measures, the proportion of patients who use the MOHR website, and the Effect of the MOHR website on counseling and support will be presented.

**Conclusions:** Primary care practices need significant support and integrated informatics tools to systematically identify and assist patients’ to prioritize and develop goals for behavior and mental health concerns.

**Implications for Policy, Delivery, or Practice:** The MOHR study should be of interest to researchers, practitioners and policy makers involved in pragmatic tests in real world settings and in promoting consistent collection and use of patient reported health measures.

**Funding Source(s):** NIH, Agency for Healthcare Research and Quality; Office of Behavior and Social Sciences Research; CTSA Grant Number ULTR00058 from the National Center for Advancing Translational Sciences (NCATS)

**Poster Session and Number:** B, #870

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**Methods for the Collection of Patient Reported Outcomes Measures in a Safety Net-Oriented Practice Based Research Network: A SAFTINet Demonstration Project**

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**Presenter:** Bethany Kwan, Ph.D., M.S.P.H., Assistant Professor, Colorado Health Outcomes Program, University of Colorado Denver, bethany.kwan@ucdenver.edu

**Research Objective:** The Scalable Architecture for Federated Translational Inquiries Network (SAFTINet) is a safety net-oriented practice-based research network with an associated federated database of existing electronic health data to support comparative effectiveness research (CER). SAFTINet selected and implemented patient-reported outcomes measures (PROMs) in primary care practices, to enhance the data set available for research and to inform clinical care. We engaged the practices in the design of data collection content and procedures to ensure it would be feasible, sustainable, and useful for clinical care. Our research objective is to describe our stakeholder engagement methods and the challenges, solutions and compromises in the process of selecting and implementing a PROM for our cardiovascular disease (CVD) cohorts: patients with hypertension or hyperlipidemia.

**Study Design:** We used the 7p stakeholder engagement framework to bridge the perspectives of research and clinical stakeholders, and the ISOQOL user guide to guide planning selection and implementation for PROMs appropriate for the CVD cohorts. Critical steps include: 1. Select a content area (e.g., quality of life, symptoms/impairment, behavioral data); 2. Select a measurement tool; 3. Implement the tool in participating practices; and 4. Arrange for documentation of results in structured fields for inclusion in the SAFTINet federated database.

**Population Studied:** Participating practices are primarily federally qualified health centers representing approximately 260,000 patients (30% covered by Medicaid), 500 primary care
providers, and four safety net healthcare organizations in Colorado and Tennessee. **Principal Findings:** SAFTINet stakeholders opted to implement a single-item medication adherence question and a checklist of barriers to medication adherence, together referred to as the Medication Adherence Survey (MAS). Clinical partners each completed a planning worksheet designed to provide structure and guidance to the implementation process, by specifying the patients to whom the MAS would be administered, the mode of administration, workflow related to scoring, interpretation and clinical decision making, and anticipated barriers. Lessons learned include the importance of balancing the need for fidelity to research protocols with the priorities of real-world healthcare settings. Research requires standardized data collection, while clinical care needs actionable information for patients and providers and feasible data collection strategies tailored to unique practice environments.

**Conclusions:** When implementing a PROM in a real-world setting, high fidelity to a specific protocol across a wide variety of practices is difficult to achieve. While there are benefits of conducting research with real clinical practices (e.g., external validity), practices' primary objective is to provide patient care, while research and data collection are secondary. Investigators can work with practices to enhance standardization of data collection, but should remain flexible and considerate of the need to compromise.

**Implications for Policy, Delivery, or Practice:** The interpretation of evidence based on the use of PROMs should be made being mindful of the flexibility required to implement them in real-world clinical settings.

**Funding Source(s):** AHRQ
**Poster Session and Number:** B, #871

**Parent Health Priorities for NICU Babies**

Eileen Lake, University of Pennsylvania; Joanna Celentano, Children’s Hospital at Dartmouth; Jeannette Rogowski, University of Medicine and Dentistry of New Jersey

**Presenter:** Eileen Lake, Ph.D., R.N., Associate Professor, School of Nursing, University of Pennsylvania, elake@nursing.upenn.edu

**Research Objective:** Infants cared for in the neonatal intensive care unit (NICU) are tiny and vulnerable to sickness, disability and death. They are given complex treatments to help them survive, grow, and develop. The NICU is unique in having parents as the sole decision maker and the bedside nurse as the principal caregiver. Hospitalization in a NICU is often an unexpected event for parents. Our goal was to develop patient-centered outcomes for this setting to guide future research efforts. Specific objectives were to identify NICU parents’ health priorities for their infant and to learn from NICU parents how parents, nurses, and NICUs can support the achievement of these health priorities.

**Study Design:** A national convenience sample of NICU parent advisors was recruited from the Vermont Oxford Network (VON) Family Advisors. The VON is an international collaborative to improve the quality of care for newborns and families. Fourteen parent advisors joined telephone sessions to answer these questions:

1. While in the NICU, what were your major health concerns for your infant?
2. What can parents do to improve these health outcomes of their infants?
3. How can nurses and the NICU they work in help parents make the best decisions about their infant’s health and health care?
4. What NICU policies or practices regarding parental presence and involvement help parents to support the health of their infants?

From one to four parent advisors joined each of the six sessions, which were recorded, transcribed, and analyzed for themes. A subset of transcripts was coded by a 3 member research team until no new themes emerged. This list of themes became the finalized codebook and was used to code the remaining transcripts.

**Population Studied:** Parents of NICU infants

**Principal Findings:** There were six overarching themes: 1) Relationship with staff, 2) Control and participation, 3) Staffing and hospital environment, 4) Education, 5) Hand washing and infection, and 6) Human milk.

Overall, parents described a sense of powerlessness that dominated much of their experience during their infant’s stay in the NICU. Though survival and long-term health outcomes were at the forefront of parents’ minds during this time, parents also described aspects of the day-to-day experience in the NICU as significant to patient/family satisfaction. Ultimately, parents described relationships with hospital staff, communication, and teaching from staff as central aspects of their experience while in the
NICU and as important to their transition from the NICU to home. Many participants related relationships with hospital staff, and nurses specifically, to the ability to access health information about their infant, the general quality and comfort of their experience in the NICU, and their ability to participate in decision making and care for their infant.

**Conclusions:** Parents care about a healthy baby. Nurses and NICUs can support the infant's health through greater education and involvement of NICU parents in care and decisions.

**Implications for Policy, Delivery, or Practice:**

Research on NICU care practices and policies should be done to identify specific strategies to achieve patient-centered outcomes for NICU infant health.

**Funding Source(s):** NIH

**Poster Session and Number:** B, #872

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**Comparative Effectiveness of Hospital Nursing Resource Profiles**

Eileen Lake, University of Pennsylvania; Christopher Lee, Oregon Health and Sciences University

**Presenter:** Eileen Lake, Ph.D., R.N., Associate Professor, School of Nursing, University of Pennsylvania, elake@nursing.upenn.edu

**Research Objective:** Hospital nursing services are a principal U.S. healthcare delivery system. Nurses give bedside care around the clock. The nursing staff is the largest hospital workforce. Beyond these hallmark features are varying nursing features across hospitals. How well educated are the nurses? How many patients does each nurse care for? Does the work environment support the registered nurse’s professional practice? Although these features vary across hospitals, we theorized that specific “naturally occurring” combinations, or profiles, exist that may be more or less effective in achieving patient better outcomes. We aimed to shift the paradigm from the traditional approach to a profile approach to generate better evidence for hospital executive decision making and resource allocation. Our objective was to identify and analyze the comparative effectiveness of nursing profiles in a large, representative hospital sample.

**Study Design:** We identified the profiles through latent class mixture modeling of nurse survey data from 35,000 hospital staff nurses collected in 2006 in the Multi-State Nursing Outcomes Study. The sample included all community hospitals in 4 states (CA, FL, NJ, PA); N = 692. Nurse survey measures included patients per nurse, fraction of hospital nurses with Bachelors of Science degrees in nursing, and ratings of the professional practice environment using the NQF standard measure Practice Environment Scale of the Nursing Work Index. Hospital outcomes were eight separate HCAHPS experience items, e.g., “Staff gave patients discharge information.” Patient outcomes were 30-day mortality and failure to rescue following common surgeries.

**Population Studied:** Hospitals, adult surgical patients, hospitalized patients' ratings of their experiences

**Principal Findings:** Three profiles emerged consistent with higher, middle, and lower ratios of nurses-to-patients, proportions of registered nurses with bachelor's degrees, and ratings of a professional nursing environment. The “high” resource profile was found disproportionately in large, not-for-profit, non-teaching hospitals. The “low” resource profile occurred disproportionately in smaller, for-profit facilities with less sophisticated technological capacity. Nurse job outcomes and quality ratings, surgical patient mortality and patients' assessments of care experiences were considerably and statistically significantly better in hospitals with better nursing resource profiles. These differences were roughly double the size of effects detected in models where nursing features were modeled separately.

**Conclusions:** Hospitals provide nursing resources in consistent patterns. Resource profiles are associated with outcomes and quality. Improving nursing resources in smaller, for-profit hospitals may enhance their outcomes. Implications for Policy, Delivery, or Practice: This paradigm shift simultaneously overcomes limitations of the traditional approach in which nursing features are analyzed in isolation, i.e., an “all else equal” multivariable framework while providing real world evidence that is more useful to hospital executives and managers about the comparative effectiveness of nursing resources.

**Funding Source(s):** NIH

**Poster Session and Number:** B, #873
Comparison of Innovations in Screening Colonoscopy Protocols (2-Person Technique and Propofol Sedation) in Improving Adenoma Detection Rates

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**Presenter:** Yi Jhen Li, M.H.A., PhD Student, Health Services Policy and Management, University of South Carolina, li66@email.sc.edu

**Research Objective:** To assess the effectiveness of innovative colonoscopy protocol elements, specifically, comparing hands-on 2-person technique with the usual 1-person technique, and comparing propofol sedation with usual Demerol/Versed sedation. Performance indicators are polyp detection rate (PDR), adenoma detection rate (ADR), mean number of adenomas per screened individual, procedure time, and polyp anatomic location.

**Study Design:** An endoscopy center in South Carolina has implemented a polyp-maximizing colonoscopy clinical protocol with several innovative elements. Two protocol elements will be studied: 1) 2-person technique - endoscopy technician advances the colonoscope and the physician manipulates the scope tip for polyp search and removal (preempting endoscopist’s motor skill deterioration due to forearm fatigue, and conferring the dexterity of two “right” hands for endoscope advancement, colon surface inspection, and polyp removal). We will compare providers using this option with solo performers, and 2) propofol sedation (comparing pre- April 2005 cases with post). Of 59 providers, 57 used the 2-person technique (54 trained primary care physicians (PCPs) performing with onsite specialist available for rescue assistance, and 3 specialists), and 2 specialists performing solo.

**Population Studied:** Data on 18,140 initial screening colonoscopies performed during 2001-2009, 17,613 with 2-person technique (13,662 by PCPs, 3,951 by specialists) and 527 colonoscopies with solo technique (both specialists).

**Principal Findings:** Procedure time was shorter with the 1-person technique, vs. 2-person technique (both specialists, and PCPs). PCPs had longer procedure time than specialist. Within the 2-person technique, the difference between PCP and specialists is small, about 2 minutes (23.23 mins, vs. 25.34 mins), compared to the differences among specialists between 1-person and 2 person techniques (4.5 minutes shorter with the 1-person technique, 18.79 mins, vs. 23.23 mins, and 2-person technique PCP: 25.34 mins). The PDRs for 1-person technique is significantly lower than 2-person technique (47.1% for 1 person technique specialists, 63.7% for 2-person technique specialists, and 61.5%, for PCPs). ADR differences mirror the PDR differences (23.9%, 30.4%, 31.2% respectively). Similar was the trend with mean number of adenomas per subject (0.36, 0.47, and 0.5 respectively). Multiple logistic regression (underway) will control for patient and physician demographics, number of polyps, and PCPs’ previous colonoscopy volume experience in procedure time, ADR, and small adenoma detection rates. Multilevel modeling will be used to account for patients nested within physicians. Multinomial regression will be used to assess number of adenomas per subject. Analyses regarding propofol are underway.

**Conclusions:** The 2-person technique encourages longer procedure time with careful inspection, and produces higher polyp removal rates, conferring better cancer protection in future.

**Implications for Policy, Delivery, or Practice:** We recommend the 2-person technique to become a standard protocol requirement, with payers covering this expense. Additionally our study has workforce implications. Currently, the nationwide need for 23 million colonoscopies vs. specialist capacity available for 12 million, calls for innovative workforce approaches. Better lesion detection by PCPs using a 2-person technique than specialists using the current, universally prevalent 1-person technique, and teh equivalence of PCP rates to 2-person technique specialists validates the case for training PCPs and supporting them to provide high quality procedures at endoscopy centers with specialist standby support.

**Funding Source(s):** NIH

**Poster Session and Number:** B, #874

Assessing Effectiveness of Chemoradiation Therapy for Advanced Laryngeal Cancer

Chun Chieh Lin, American Cancer Society; Amy Y. Chen, MD, MPH, FACS, Emory University School of Medicine; Kara Prickett, MD, Emory University School of Medicine; Ahmedin Jemal, DVM, PhD, American Cancer Society
**Presenters:** Chun Chieh Lin, Ph.D., M.B.A., Program Manager, Surveillance and Health Service Research, American Cancer Society, anna.lin@cancer.org

**Research Objective:** Treatment for patients with advanced stage laryngeal cancer includes surgery or chemoradiation (CRT) although CRT is becoming more common in recent years. However, no previous study compared the effectiveness of CRT in improving survival to surgical treatment using population-based dataset. In this study, we compare overall survival rates between CRT and other primary treatment types for patients with regional stage laryngeal cancer in a linked population-based cancer registry claim dataset.

**Study Design:** A retrospective analysis of SEER-Medicare claim linked dataset. Survival was measured as the time from cancer diagnosis until death or until date of last follow-up. We used cox proportional hazard model to compare overall survival rates of CRT over other primary treatment types after adjusting for age, race, gender, comorbid condition, Medicaid dual eligibility status, cancer sequence and diagnosis year.

**Population Studied:** Patients diagnosed with regional stage laryngeal cancer between 1997 and 2007, with continuous, non-HMO, Medicare part A and B benefits identified from the linked SEER-Medicare database.

**Principal Findings:** There were 2,568 patients with regional stage laryngeal cancer selected during study period. 1,083 of these patients had laryngectomy as their primary treatment, 430 were treated with CRT, 716 had other non-standard treatment and 339 had no treatment at all. Median survival for the entire cohort was 26 months. After adjusting for all confounding variables, CRT showed poor overall survival compared to surgery at 2 years (HR, 0.83; 95% CI, 0.7 to 0.985; p=0.0335) and 5-years (HR, 0.76; 95% CI, 0.65 to 0.89; p=0.0007). Older age (>=70 years), with one or more comorbid conditions, Medicaid dual eligibility, and prior cancer history were all associated with higher risk of mortality (p<0.05).

**Conclusions:** Contrary to our expectation, CRT did not show improved overall survival compared to surgical treatment for regional stage laryngeal cancer based on analyses from population-based registry claim linked dataset, which is consistent with results from previous studies using institutional based registry data.

**Implications for Policy, Delivery, or Practice:** Although CRT provides organ preservation for better communication function, CRT delivered inferior overall survival rate when compared to surgical treatment as demonstrated in this study. The benefit and trade-off between treatments should be fully discussed with patients before deciding treatment plan.

**Funding Source(s):** Other, American Cancer Society Intramural Research

**Poster Session and Number:** B, #875

**Patient Preferences for Initiation and Mode of Administration of Insulin Therapy for Type-2 Diabetes: A Systematic Review**

Susan M Joy, Johns Hopkins Bloomberg School of Public Health; Emily Little, Johns Hopkins University; John FP Bridges, Johns Hopkins Bloomberg School of Public Health; Jodi B Segal, Johns Hopkins Bloomberg School of Public Health

**Presenter:** Emily Little, B.A., Senior Research Assistant, Center for Health Services Outcomes Research, Johns Hopkins University, elittle@jhsph.edu

**Research Objective:** The decision to initiate insulin is a difficult one for patients and their doctors and the availability of different insulin preparations and delivery devices complicates the choice. We sought to synthesize the patient preference literature to document medication and device-related factors influencing patients’ preferences regarding insulin therapy in type-2 diabetes.

**Study Design:** We conducted a systematic review of English language articles according to registered protocol CRD42012002285 on patient preferences about insulin use. We searched PubMed, EMBASE, EconLit, and CINAHL databases. Titles, abstracts and full-text articles were selected consecutively based on inclusion and exclusion criteria by two independent reviewers with disagreements resolved by consensus. Studies included if they reported patients’ preference for diabetes medication or delivery method. For the purpose of this review, we defined preference as a rating or choice of one treatment option over another; willingness to initiate, continue, or stop using a treatment or to recommend a treatment for future use. Studies were excluded if they reported preferences for aspects of diabetes care other than insulin medication or delivery; if preferences were only those of patients with
type-1 diabetes or persons without diabetes; if preference was used synonymously with adherence, satisfaction, other patient reported outcomes or general health status measures. Results were synthesized qualitatively. **Population Studied:** Adult patients with type-2 diabetes

**Principal Findings:** Our literature search captured 1883 articles, of which forty-six (n=46) met selection criteria; twelve addressed patients’ willingness to initiate therapy (n=12) and the remainder focused on innovations in insulin delivery (n=34). Insulin initiation was impacted by blood sugar control, weight control, diet flexibility, dosing flexibility/ convenience/ frequency, route of administration, desire to avoid injections, hypoglycemia, side effects, and cost. Conditional upon initiation, patients preferred modes of administration that were less costly, more convenient, accurate, discreet, and easier to use. There is also evidence that patients prefer an insulin pump over an insulin pen, but both were preferred over a vial and syringe.

**Conclusions:** As the US moves into an era of patient centered outcomes research we demonstrate that evidence synthesis methods can be used to assess patient preference outcomes. Through this review we demonstrate that patients may be willing to trade improved glucose control for a less desired mode of medication administration.

**Implications for Policy, Delivery, or Practice:** While the FDA has issued guidance indicating it will consider data on patient preferences in the review of medical devices, methodological standard for assessing patient preferences are needed. Patient preferences regarding use of insulin are mediated by a wide variety of influences. Clinicians might be more effective with insulin initiation if they can elicit the mediators of their patient’s willingness or lack of willingness to use insulin.

**Funding Source(s):** Other, The analyses upon which this publication is based were performed under contract number HHSF2232010000072C

**Poster Session and Number:** B, #876

**The Importance of Accounting for Rater Severity/Leniency in Measures of Observed Patient Outcomes: An Example of Measuring Recovery of Consciousness in Adults with Severe Traumatic Brain Injury**

Trudy Mallinson, University of Southern California; Theresa Pape, Dr.PH, MA, CCC-SLP/L, Department of Veterans Affairs, Edward Hines, Jr. Hospital; Ann Guernon, MS CCC-SLP, CCRC, Department of Veterans Affairs, Edward Hines, Jr. Hospital

**Presenter:** Trudy Mallinson, Ph.D., Assistant Professor, Occupational Science and Occupational Therapy, University of Southern California, trudy.mallinson@usc.edu

**Research Objective:** To examine impact of rater severity/leniency on measures of neurobehavioral functioning derived from the Disorders of Consciousness Scale (DOCS). Observed performance, where a clinician observes and then rates patient’s performance, is common in healthcare. When some raters are more severe or lenient in how they assign scores, measurement of patient recovery can be skewed or distorted and treatment effectiveness may be under- or over-estimated.

**Study Design:** Prospective, observational, cohort study.

**Population Studied:** 57 acute rehabilitation clinicians administered the DOCS in pairs 7 acute or sub-acute rehabilitation settings to 212 patients with severe traumatic brain injury who were vegetative or minimally conscious at time of study enrollment and within 180 days of injury. To complete the DOCS, clinicians present 31 sensory stimuli to patients and rate the elicited response on a 3-point rating scale.

**Principal Findings:** Data were analyzed using the multi-faceted Rasch model (MFRM). A facet is anything that contributes to making a person appear to have more or less of a trait than they actually do, such as rater severity/leniency. MFRM is an extension of the Rasch model that enables the effect of facets to be removed from the measurement of patient ability. Person separation reliability (equivalent to Cronbach’s alpha) was .90. Infit mean square statistics ranged between .8 – 1.14, indicating items fit the assumptions of the measurement model.

Seven raters were unacceptably severe (measures greater than .5 logits); patients scored by these raters appear to have less functioning than they actually have. Four raters were unacceptably lenient (calibrations less than -.5 logits); patients scored by these raters appear to have more functioning than they do.

Rater severity/leniency measures ranged from -1.20 to 1.02 logits, a range of 2.31 logits, meaning a patient’s measure of neurobehavioral function might differ as much as 2.31 logits.
depending on whether the most severe or the most lenient rater scored that patient. A minimally detectable difference for the DOCS is .9 logits. Clearly the difference between the most severe and the most lenient raters represents the most extreme case. To examine the impact of rater severity on DOCS measures overall, we compared data with and without accounting for rater severity. Before adjustment, 4% of patients (9/212) had measures that were too high; 14% (30/212) had measures that were too low. These data suggest that there is a significant effect of rater severity/leniency on DOCS patient measures.

**Conclusions:** Accounting for rater severity/leniency is important in measurement of patient-centered outcomes. To precisely measure neurobehavioral functioning in patients experiencing seriously impaired consciousness, DOCS measures should be adjusted to account for variations in rater severity/leniency.

**Implications for Policy, Delivery, or Practice:** Raters can introduce unwanted variation into scores that threaten the interpretation of patient-centered outcomes measures, yet it receives scant attention in outcomes research. There is no reason to believe that rater severity/leniency issues are not also present in most observed performance data. This analytic approach represents a marked improvement over current approaches that ignore rater severity and will enable us to evaluate the true change in patient-centered outcomes over time despite data being collected by different raters.

**Funding Source(s):** VA

**Poster Session and Number:** B, #877

**Selection of Comparison Practices for the Evaluation of the Maryland Multi-Payer Patient Centered Medical Home Program Using a Practice-Level Propensity Score Matching Approach**

Jill Marsteller, Johns Hopkins University; Yea-Jen Hsu, Johns Hopkins University; Donald Nichols, University of Wisconsin-Madison

**Presenter:** Jill Marsteller, Ph.D., M.P.P., Associate Professor, Health Policy and Management, Johns Hopkins University, jmarstel@jhsph.edu

**Research Objective:** The Maryland Health Care Commission (MHCC) launched the Maryland Multi-Payer Patient Centered Medical Home Program (MMPP) on April 14, 2011. Fifty-two primary care practices participated in the demonstration. Evaluators are using a difference-in-difference analytic approach to assess the impact of the program on various outcomes over time. This presentation describes the methodology and results for selecting the comparison practices for the evaluation using the Maryland Board of Physicians (MBP) licensure database. The presentation also discusses issues encountered in implementing the selection and limitations of the method.

**Study Design:** We identified the population of potential comparison practices by aggregating physician-level observations in the MBP database into practices based on unique Employer Identification Numbers (EINs) and practice address. This process yielded an initial set of 2,006 non-MMPP primary care practices from which to choose comparison sites. We used propensity scores to match each MMPP practice to one practice from the CareFirst Blue Cross/Blue Shield PCMH program (CF PCMH, another active PCMH program in Maryland), and one unexposed practice using nearest neighbor matching. The matching process used 22 variables describing practice characteristics, their physicians, and characteristics of their location. For some MMPP practices that did not have close matches in the full propensity model, we used a stripped-down model that included only five important organizational variables plus statistically significant variables from the full model to select matches for them. For the three MMPP practices that could not be identified in the MBP database, we manually selected one CF PCMH match and one unexposed match based on five variables: setting, ownership, practice setting, number of physicians, and rural/urban location of practice.

**Population Studied:** Fifty-two MMPP sites and 2,006 non-MMPP primary care practices identified from the MBP database.

**Principal Findings:** The final selected matched practices yielded 57 CF comparisons and 47 unexposed comparisons. The three groups (MMPP, CF comparison, and unexposed comparison) are not statistically different on any variable. In spite of the balance in the matched groups, we encountered several challenges and limitations in implementing the approach. First, the suboptimal quality of variables based on the MBP dataset (such as incorrect EINs; different zip codes for the same address; differences in practice information from physicians in the same practice; and differences in reporting format in some of the variables) made the identification of unique practices difficult and may have
Statistical Process Control: Possible Uses to Monitor and Evaluate the Patient-Centered Medical Home

Jill Marsteller, Johns Hopkins University; Mary Margaret Huizinga, Johns Hopkins University; Lisa Cooper, Johns Hopkins University

Poster Session and Number: B, #878

Statistical Process Control (SPC) is a method for monitoring and controlling processes to improve quality and efficiency. Control charts are a key tool in SPC, allowing for the monitoring of process stability and identifying when changes occur. This presentation focuses on one SPC tool called the control chart. A control chart depicts the process over time to show the impact of the intervention. Control charts can also be used to monitor process measures (e.g., the number of patients with hypertension contacted by the care manager); identify early signs of correlation between processes and outcomes that can be useful in engaging clinicians and staff in the intervention, a key element of successful change management; and examine differences across groups (e.g., comparing hypertension control across different practices) and to aid self-management interventions. A review of the literature between 1990 and 2004 showed SPC had been used to analyze 97 different variables measuring health care improvement. Control charts may have four advantages for PCMH evaluations: (1) provision of early information to evaluators and stakeholders, (2) avoidance of lack of power issues from small sample sizes, (3) identification of rare adverse events, and (4) simplification of data interpretation to avoid mistaken conclusions. Control charts have a few limitations. They require: (1) “smart application” and expert consultation for appropriate use, (2) at least 20 data points each with 25 units for reliable results, and (3) a way to account for autocorrelation.

Conclusions:

Research Objective: One issue in evaluating PCMHs is that reporting of changes in process and outcome measures is typically infrequent and often lags significantly after the start of the intervention. While this is partly due to the burden of frequent data collection, a lack of good short-term process metrics, and the fact that outcome metrics often require an extended time to show the impact of the intervention, it is also due to a lack of knowledge regarding tools to differentiate true change from random noise, particularly during the intervention. Statistical process control (SPC) uses the theory of variation to make sense of any process or outcome measured over time, usually with the intention of detecting improvement or maintaining a high level of performance. SPC combines rigorous time series analysis with graphical presentation of data, and can provide early insights into the data in a manner understandable to a wide range of audiences. In the case of PCMH evaluations, findings from SPC may be included in ongoing status reports to stakeholders including frontline clinicians, staff members, office managers, evaluators, funders, and policymakers.

Conclusions: The results of no statistically significant differences across the three groups suggest that the comparison practice selection process was successful. This approach will permit outcomes comparisons between the MMPP intervention and “no intervention,” as well as an alternative intervention.

Implications for Policy, Delivery, or Practice: This study demonstrates a feasible approach to select comparable control groups for a statewide quality improvement initiative and provides valuable experiences in terms of challenges and limitations to other researchers and evaluation experts.

Funding Source(s): Other

Principal Findings: Using frequently measured data, a control chart can be used to detect, early on, whether any change has taken place since the start of the intervention, long before results from a larger, summative evaluation are available. Such information can be used for purposes ranging from forming hypotheses about changes in outcomes to adapting elements of the intervention to increase the likelihood of success. Control charts can also be used to monitor process measures (e.g., the number of patients with hypertension contacted by the care manager); identify early signs of correlation between processes and outcomes that can be useful in engaging clinicians and staff in the intervention, a key element of successful change management; and examine differences across groups (e.g., comparing hypertension control across different practices) and to aid self-management interventions. A review of the literature between 1990 and 2004 showed SPC had been used to analyze 97 different variables measuring health care improvement. Control charts may have four advantages for PCMH evaluations: (1) provision of early information to evaluators and stakeholders, (2) avoidance of lack of power issues from small sample sizes, (3) identification of rare adverse events, and (4) simplification of data interpretation to avoid mistaken conclusions. Control charts have a few limitations. They require: (1) “smart application” and expert consultation for appropriate use, (2) at least 20 data points each with 25 units for reliable results, and (3) a way to account for autocorrelation.

Conclusions:
Implications for Policy, Delivery, or Practice: Other
Poster Session and Number: B, #879

Coordination of Care and Disparities in Use of Chemotherapy among Stage III Colorectal Cancer Patients
Arden Morris, University of Michigan; Jennifer J Griggs, MD, University of Michigan; Rachel Davis, PhD, University of South Carolina; Mousumi Banerjee, PhD, University of Michigan; Paul Abrahamse, MA, University of Michigan; Kevin Ward, PhD, Emory University; Ikuko Kato, MD, PhD, Wayne State University; Sarah T. Hawley, PhD, University of Michigan

Research Objective: Our prior work demonstrated low uptake of chemotherapy among patients with advanced stage rectal cancer and significantly lower uptake among minorities. In this analysis, we hypothesized that health system factors such as inadequate coordination of care contribute to under-use of chemotherapy among minority and low socioeconomic status (SES) patients.

Study Design: We performed a population-based survey of all stage III colorectal cancer patients diagnosed in the state of Georgia and Metropolitan Detroit SEER catchment areas. Our dependent variables were perceived care coordination and self-reported use of chemotherapy. Independent variables included clinical and demographic factors. We used chi square analyses to assess associations between patient characteristics, coordination of care, and use of chemotherapy. Multiple logistics regression examined relationships between SES, coordination of care, and use of chemotherapy after adjusting for age, sex, and comorbidity.

Population Studied: Principal Findings: To date, 430 patients have completed the survey (initial response rate of 46%). Most participants have reported good-to-excellent coordination of care (mean=4.2 on a scale of 1-5), and care coordination did not differ by clinical or demographic factors except for education (p=.03). Those who perceived better care coordination were more likely to receive chemotherapy (p<0.001). Respondents with less than high school education had significantly lower uptake of chemotherapy relative to their counterparts (76% vs. 89%, p=0.004), and this difference was significant even when adjusting for coordination of care.

Conclusions: SES, in particular education level, was associated with both coordination of care and with receipt of chemotherapy. Given that omission of chemotherapy is associated with decreased survival, these findings may have implications for quality of care and disparities in care, and may contribute to identification of targets for health system intervention.

Implications for Policy, Delivery, or Practice: Other, American Cancer Society
Poster Session and Number: B, #880

Prospective Association of Patient Activation Measure with Medical Costs
David Mosen, Kaiser Permanente Northwest; Judith Hibbard, University of Oregon; Elizabeth Shuster, Kaiser Permanente Northwest, Center for Health Research

Research Objective: The patient activation measure (PAM) refers to an individual’s skills, knowledge, and confidence to manage their health and their ability to engage health providers in shared decision making practices. Such skills are important for the ongoing management of chronic conditions, such as diabetes and hypertension. Although extensive research has examined the association of PAM with utilization and health outcomes; little research has examined the association of PAM with medical costs. The objective of this research was to examine the prospective association of PAM with four cost measures: 1) total costs, 2) emergency department (ED) costs, 3) inpatient costs and 4) pharmacy costs.

Study Design: Using an observational study design, we studied patients with 1 or more chronic conditions (diabetes, congestive heart failure, coronary artery disease, depression and hypertension) with a PAM assessment between 12/4/2007 and 2/28/2011. The PAM is 13 items and categorizes PAM into four levels: PAM 1(lowest level of activation, where patients typically lack confidence and self-management skills and may not understand the need to be actively involved in managing their health) and PAM 4 (highest activation where patients
typically have the necessary self-management skills and are more pro-active about their health). Patients received care in Kaiser Permanente Northwest (KPNW) and were enrolled in 1 or more care management programs. Per patient per month (PPPDM) medical costs were calculated 12 months after the PAM assessment date. Costs were constructed in 4 areas: total, ED, inpatient and pharmacy. Using Ordinary Least Squares Regression, each cost measure was regressed on PAM level (PAM 1 [reference group] vs. PAM 2, PAM 3, and PAM 4); adjusting for the following covariate measures; age, gender, and a count of total generic medications in the six months prior to PAM assessment. We performed statistical analyses on logged PPPDM medical costs, but report comparisons in absolute dollars (2011).

**Population Studied:** A population of 3,447 adults with 1 or more chronic conditions. PAM assessments were completed between 12/4/2007 and 2/28/2011 and the population average age was about 60 with a little more than half female (53.2%).

**Principal Findings:** Compared to those with PAM 1 scores, those with PAM 3 scores had lower total costs (beta coefficient = $-516, standard error = +/- 141; p = .03), ED costs (beta coefficient = $-25, standard error = +/- 10; p = .0007) and inpatient costs (beta coefficient = $-281, standard error = +/- 99; p= .03). No significant associations were found among PAM and pharmacy costs.

**Conclusions:** Among a population with 1 or more chronic conditions; adults with higher PAM scores (PAM 3) had significantly lower total costs, ED costs and inpatient costs, compared to patients with lower PAM scores (PAM 1).

**Implications for Policy, Delivery, or Practice:** Our results found that higher PAM scores are associated with lower medical costs. Further research is needed to better understand which chronic conditions are most sensitive to cost measures; and whether incremental improvements in patient activation results in lower medical costs for adults with chronic conditions.

**Funding Source(s):** Other, Kaiser Permanente

**Patient Barriers to Primary Medication Adherence**

Jennifer Polinski, Brigham and Women's Hospital; Pamela Wescott, Informed Medical Decisions Foundation; Joseph P. Frolkis, Brigham and Women's Hospital; Aaron S. Kesselheim, Brigham and Women's Hospital; Cora Allen-Coleman, Brigham and Women's Hospital; Michael A. Fischer, Brigham and Women's Hospital

**Presenter:** Jennifer Polinski, Sc.D., M.P.H., Epidemiologist, Division of Pharmacoepidemiology, Brigham and Women's Hospital, jpolinski@partners.org

**Research Objective:** Because current systems record information about prescriptions as they are issued, patients who do not fill a first prescription for a new medication can be more readily identified. However, little is known about the clinical and socio-cultural barriers to filling the first prescription, defined as primary medication adherence (PMA). In developing a decision support tool to improve PMA for antihypertensive medications, we sought to understand patients’ perspectives regarding the hypertension diagnosis, taking medications, and other barriers to PMA. We also explored attributes of the patient/provider discussion that might make PMA more likely.

**Study Design:** 4 focus groups. Patients were sent an introductory letter and invited to “opt in” to a focus group study about PMA.

**Population Studied:** We recruited 26 patients in Massachusetts who did not fill a first prescription for an antihypertensive medication within 8 days after an e-prescription was sent to the pharmacy.

**Principal Findings:** Patients’ mean age was 57±11; half were female. The majority (N=24, 92%) had prescription drug insurance. Education levels ranged from 5 (19%) with less than a high school education to 6 (23%) with masters’ degrees. Most patients were angry about and suspicious of their hypertension diagnosis: “There are lots of false positives.” Most were angry at or distrustful of their providers, believing that the provider did not want to help them: “It’s just script, script, script: you’re done.” Patients frequently cited current adherence to one antihypertensive as a reason not to begin a newly prescribed antihypertensive: “I have two already and I felt that this one here, it’s going to be a third and they[re] all supposed to work the same.” Patients noted cost as a key barrier to PMA: “You have to choose between whether [you are] putting food on the table for your children or getting your medication.” Despite this, most patients held negative opinions of more
affordable generic medications, believing they were a sign of the provider’s disrespect: “You can tell the difference in quality.” Fears about medication side effects were common: “You see these commercials that they say take this and you may experience near death and all of these suicidal tendencies—I don’t want to be taking something [like that].” Patients discussed four attributes of the patient/provider conversation that might make PMA more likely, including provider’s demonstration of respect for the patient, full disclosure of the medication’s side effects, provision of any information about alternative medicine options or lifestyle modifications that could be used in place of medications, and provider sensitivity to costs.

Conclusions: Among patients with barriers to PMA, distrust and anger regarding the diagnosis and the need for medications are common. Against this backdrop, cost, fear of side effects and misperceptions about generic medications are also barriers.

Implications for Policy, Delivery, or Practice: Our findings suggest that widely touted approaches like reminders or patient incentives do not address important factors that drive PMA and are unlikely to fully address the problem. In contrast, decision support tools may present a forum to establish provider credibility and patient trust prior to the prescribing of an antihypertensive prescription: “Once they come in...they are going to fill it, they just need you to give them that extra push.” In fact, most pharmacists did not view their role as helping a patient make a treatment decision: “They [the patients] have come with a prescription. We’re not deciding if they need the medication.” Only 1 pharmacist noted that not filling a medication might be a preferred outcome for a patient. Instead, pharmacists saw their role as more circumscribed: their job was to remove barriers to PMA by filling knowledge gaps: “We were always taught to do the ‘what, how, what: what did the doctor tell you...what did he tell you to expect?’ If you hit those just those three questions...it’s an open-ended conversation [that begins].” While 4 (24%) pharmacists stated that they had never seen a reason for using an educational handout or decision support tool, the remaining 76% used handouts frequently and saw them as a way to connect with patients and reinforce key messages about medications: “[Using the handouts] I noticed tended to spark more questions. So we at least put [the handout] on the bag so that they’re coming back asking those questions.”

Conclusions: Pharmacists did not see themselves as facilitators of a patient’s treatment decision but rather as medication experts who could remove barriers to PMA by providing information. Most pharmacists held positive views about handouts and their ability to use them in practice, provided the decision to take a medication had already been made.

Pharmacists’ Role in Primary Medication Adherence: An Opportunity for Shared Decision Making?

Jennifer Polinski, Brigham and Women’s Hospital; Pamela Wescott, Informed Medical Decisions Foundation; Aaron S. Kesselheim, Brigham and Women’s Hospital; Joseph P. Frolikis, Brigham and Women’s Hospital; Cora Allen-Coleman, Brigham and Women’s Hospital; Michael A. Fischer, Brigham and Women’s Hospital

Research Objective: When patients are first prescribed a new medication, they must then present to the pharmacy to fill that prescription, a phenomenon known as primary medication adherence (PMA). Retail pharmacists are often the first to recognize patients’ failure to fill a first prescription. This makes them potentially valuable actors in improving PMA. In order to create a new decision support tool to assist patients with hypertension as they make decisions about PMA, we assessed pharmacists’ potential role in shared decision making for PMA and their willingness to use decision support tools when interacting with patients.

Study Design: 2 focus groups.

Population Studied: Retail chain pharmacists, one each from 17 locations nationwide.

Principal Findings: Pharmacists had been practicing for an average 10±6 years. A majority were female (N=13, 76%) and of white race (N=14, 82%). All pharmacists agreed that a patient who came to the store had almost always made the decision to fill the antihypertensive prescription: “Once they come in...they are going to fill it, they just need you to give them that extra push.” In fact, most pharmacists did not view their role as helping a patient make a treatment decision: “They [the patients] have come with a prescription. We’re not deciding if they need the medication.” Only 1 pharmacist noted that not filling a medication might be a preferred outcome for a patient. Instead, pharmacists saw their role as more circumscribed: their job was to remove barriers to PMA by filling knowledge gaps: “We were always taught to do the ‘what, how, what: what did the doctor tell you...what did he tell you to expect?’ If you hit those just those three questions...it’s an open-ended conversation [that begins].” While 4 (24%) pharmacists stated that they had never seen a reason for using an educational handout or decision support tool, the remaining 76% used handouts frequently and saw them as a way to connect with patients and reinforce key messages about medications: “[Using the handouts] I noticed tended to spark more questions. So we at least put [the handout] on the bag so that they’re coming back asking those questions.”

Conclusions: Pharmacists did not see themselves as facilitators of a patient’s treatment decision but rather as medication experts who could remove barriers to PMA by providing information. Most pharmacists held positive views about handouts and their ability to use them in practice, provided the decision to take a medication had already been made.
Implications for Policy, Delivery, or Practice:
From pharmacists’ perspective, the retail pharmacy is not the forum for discussing patients’ treatment preferences but rather an opportunity to improve PMA through sharing knowledge. Given these beliefs, pharmacy-based decision support interventions are likely to change PMA only modestly. Because the costs of any intervention can be high, the shared decision making process for PMA is likely best initiated with the provider at the point of prescribing.

Funding Source(s): Other, PCORI
Poster Session and Number: B, #884

Improving Primary Medication Adherence with Decision Support Tools: The Providers’ Perspective
Jennifer Polinski, Brigham and Women’s Hospital; Pamela Wescott, Informed Medical Decisions Foundation; Aaron S. Kesselheim, Brigham and Women’s Hospital; Joseph P. Frolkis, Brigham and Women’s Hospital; Cora Allen-Coleman, Brigham and Women’s Hospital; Michael A. Fischer, Brigham and Women’s Hospital

Presenter: Jennifer Polinski, Sc.D.,M.P.H., Epidemiologist, Division of Pharmacoepidemiology, Brigham and Women’s Hospital, jpolinski@partners.org

Research Objective: Up to 28% of patients do not fill a first prescription for a new medication, a phenomenon known as primary medication non-adherence. Decision support tools facilitate collaboration between patient and provider in the treatment decision and may enhance the likelihood of primary medication adherence (PMA). In order to design a decision support tool to improve PMA to antihypertensive medications, we evaluated providers’ awareness of and attitudes towards PMA and their willingness to use decision support tools when treating hypertension.

Study Design: 3 focus groups.
Population Studied: 15 primary care providers: 9 physicians, 1 nurse practitioner, 4 physician assistants and 1 practice-based pharmacist. Physicians had been practicing a median 19±9 years; other providers 10±15 years.

Principal Findings: Three providers believed that their patients always filled their newly prescribed medications while other providers’ estimates varied between 80 – 95%. Four major themes emerged from discussions. All providers agreed that patients typically rejected the diagnosis of hypertension and the need for antihypertensive medications, impacting PMA rates: “I think that the first reaction is usually denial: ‘how can I have high blood pressure? I feel fine.’” Providers believed they had differential success with PMA depending on whether the prescription was for a first antihypertensive or an additional one: “Even if I say we would have better control using 2 different medicines with a different strategy for each, [patients] would rather go to a higher and higher dose than take 2 pills.” Most providers (N=12, 80%) took a team-based approach to PMA, often relying on ancillary providers for assistance: “If the medical assistant is the one who is going to get them to take the pill, I’ll take it.” All providers approved of a PMA decision support tool but held mixed opinions about their ability to incorporate one into regular practice: “the thing about handouts is they’re never handy when I need them” versus “I like [our] patient education site; I use that a lot to print out handouts for the patients.” Physicians were more likely to describe limited consultation time as a barrier to using decision support tools.

Conclusions: Providers are largely aware of PMA and readily identified barriers to PMA for antihypertensive therapy. However, providers likely overestimate their own patients’ PMA. Most providers welcomed a team-based approach to care and see important roles for ancillary providers in PMA efforts. Providers endorsed the use of decision support tools for PMA but were less confident about their ability to integrate these tools into practice given limited consultation time and tool accessibility.

Implications for Policy, Delivery, or Practice: Patients are assuming a more active and more collaborative role in their care, and decision support tools can be an important part of that process. The success of decision support tools for hypertension will depend on the extent to which the tools address condition- and medication-specific concerns, as well as on whether the tools can be incorporated into routine practice. Creating a tool well-suited to the needs of both primary and ancillary providers may be the best approach to increase the likelihood of use, potentially improving PMA among patients with hypertension.

Funding Source(s): Other, PCORI
Poster Session and Number: B, #885
Are There Long-Term Benefits to Prescribing Long-Acting Analogue Insulin Compared to Human Insulin?

Julia Prentice, VA and Boston University; Paul Conlin, VA and Harvard University; David Edelman, VA and Duke University; Walid Gellad, VA and University of Pittsburgh; Todd Lee, VA and University of Illinois; Steven Pizer, VA and Boston University

Presenter: Julia Prentice, PhD, Health Scientist, Health Care Financing and Economics, VA and Boston University, jprentic@bu.edu

Research Objective: Diabetes mellitus is the seventh leading cause of death in the United States and leads to serious complications including retinopathy, nephropathy, and neuropathy as well as coronary artery, cerebrovascular, and peripheral vascular disease. Approximately 25.8 million Americans are affected by diabetes, and total cost related to diabetes in 2007 was $174 billion dollars.

The progressive nature of diabetes requires many individuals to need insulin therapy to maintain glycemic control. Providers and patients can choose between long-acting 'human' isophane insulin (NPH) and long-acting analogue insulins (e.g. glargine or detemir). No generic versions of the analogue insulins are available making them much more expensive compared to NPH. Analogue insulin may be cost-effective if it improves glycemic control or if it prevents diabetes complications compared to NPH. Previous studies have not found significant clinical differences between the two types of insulin in the short-term when focused on glycemic control or hypoglycemia. Ours is the first study to compare the effectiveness of NPH and long-acting insulin on long-term outcomes including mortality and preventable hospitalizations.

Study Design: This is a retrospective observational study. To overcome the main limitation of observational studies that treatments are not randomly assigned, we use local variation in provider prescribing patterns as an instrumental variable and control for several measures of provider quality. Our quasi-experimental treatment was the proportion of days for which each patient had an analogue insulin prescription between the date they entered the study and a series of "snapshot dates" occurring 90 days, 1 year, 2 years, 3 years, 4 years, 5 years and 6 years after the index date. The instrumental variables approach estimates a pair of simultaneous equations: one for the amount of treatment before the snapshot date and the second for outcomes occurring after the snapshot date. Our treatment equations modeled the proportion of days prescribed analogue insulin as a function of the provider-level prescribing rate and control variables. Mortality and preventable hospitalizations were assessed using Cox proportional survival models.

Population Studied: US veterans who received a prescription for diabetes medication from 2000 to 2005, initiated analogue or NPH insulin before 2010, and were dually enrolled in Medicare.

Principal Findings: There are no significant differences in the hazard ratios predicting mortality and preventable hospitalizations when comparing NPH and long-acting analogue insulin.

Conclusions: Previous research has not found a significant clinical advantage of long-acting analogue insulin compared to NPH for short-term outcomes including glycemic control. This study further confirms these findings by examining long-term diabetes complications including mortality and preventable hospitalization and finding no significant differences.

Implications for Policy, Delivery, or Practice: Long-acting analogue insulins do not offer a significant clinical advantage in short-term or long-term health outcomes when compared to NPH. This lack of clinical difference in outcomes along with the high-cost of analogue insulin makes NPH the more cost-effective prescribing choice.

Funding Source(s): VA

Impact of Comparative Effectiveness Research on Biomedical Innovation and Population Health

Daryl Pritchard, National Pharmaceutical Council; Mike Eber, Precision Health Economics; Marco Huesch, Precision Health Economics; Robert Dubois, National Pharmaceutical Council; Darius Lakdawalla, Precision Health Economics

Presenter: Daryl Pritchard, Ph.D., Director, Research Policy, National Pharmaceutical Council, dpritchard@npconow.org

Research Objective: The use of Comparative Effectiveness Research (CER) is intended to help patients and providers make sound
healthcare and treatment decisions. However, little is known about the impact of CER on financial incentives for medical innovation and, ultimately, the health of future generations.

Using a microsimulation approach, we analyze the impacts of potential CER policies on biomedical innovation and population health in the United States and Europe.

**Study Design:** We selected three clinical scenarios that reflect broad trends for assessing the impacts of CER policies on innovation returns: growth in personalized medicine; increasing demand for head-to-head trials; and changes in size and complexity of trials. We estimated the impact on development costs, revenue, and the timing of returns (lags between development, approval, and reimbursement coverage). These scenario-specific impacts were then generalized to the US and European markets, and a range of estimated effects of CER policies were compiled. We simulated the impact of changes in current innovation incentives on producer output and the health of future populations in year 2060 using the Future Elderly Model (FEM).

**Population Studied:** The FEM can simulate the health of the entire future population based on various input factors.

**Principal Findings:** Under most scenarios, CER policies would have negative impacts on innovation, and lead to substantial reductions in population life expectancy. Population life expectancy was estimated to be reduced by 14.1% (~range, 9.0% to 15.6%) by 2060 due to CER policies related to trends in personalized medicine, 4.4% (-8.1% to +5.5%) related to active comparators, and 7.4% (-11.4% to +10.2%) related to increased trial complexity.

**Conclusions:** Only with multiple innovation-friendly assumptions (such as trial cost reductions, relatively high price increases, and large market size growth driven by personalized medicine), do CER policies generate increases in innovation output and corresponding social value.

**Implications for Policy, Delivery, or Practice:** The potential long-run consequences of CER on innovation and future health calls for careful consideration of CER policies that encourage and incentivize innovation.

**Funding Source(s):** Other, National Pharmaceutical Council

**Poster Session and Number:** B, #887

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**Which Patients Improve Medication Adherence Over Time among Rural Patients with Type 2 Diabetes?**

Haiyan Qu, University of Alabama at Birmingham; Richard Shewchuk, University of Alabama at Birmingham; Monika Safford, University of Alabama at Birmingham

**Presenter:** Haiyan Qu, Ph.D., Assistant Professor, Health Services Administration, University of Alabama at Birmingham, hhyqu@uab.edu

**Research Objective:** To define groups of diabetes patients who experience varying trajectories of change in medication adherence and outcomes over time and who therefore may require different types of interventions.

**Study Design:** In the context of a 14-month community-based trial among rural Alabama residents with diabetes who received a 1-hour diabetes education class, we applied a latent class analysis to identify subgroups that had similar patterns of changes in medication adherence and outcomes, controlling for intervention arm. Latent class analysis is a person-based rather than a variable-based analytic method. Medication adherence was assessed using the Morisky scale. Domains that mapped to a conceptual model of medication adherences were assessed using validated scales that included trust in physicians, perceived efficacy in patient-physician interactions, diabetes distress, depressive symptoms and social support.

**Population Studied:** The 344 participants had mean age 59.9 ±12.0 years, 74.7% were females, 88.6% were Black, and 39.9% used insulin. Their mean baseline A1c was 8.0±2.0%, low-density lipoprotein cholesterol was 110.6±38.1 mg/dL, blood pressure (BP) was 135.5/83.2±21.6/13.0 mmHg, and body mass index (BMI) was 36.0±8.1 kg/m².

**Principal Findings:** Overall medication adherence improved 18.0%, BMI decreased 0.3 kg/m², and there was no statistically significant improvement in glycemic control, BP or cholesterol. Four distinct groups emerged from the latent class model. Group 1 (n=109) members were more likely to be Black, use insulin and had relatively high baseline A1c; they reported moderate trust in physicians, perceived efficacy in patient-physician interactions, and diabetes distress. Their adherence rate improved, A1c, cholesterol and BMI did not but BP did. Group 2 (n=104) members had the
shortest duration of diabetes, lowest baseline A1c, highest BMI, and fewest insulin users (22.1%); they reported the greatest self-efficacy in physician interactions and the least diabetes distress as well as depressive symptoms. Their adherence rate improved and they had improvement in all four outcomes. Group 3 (n=83) members were the oldest (68.5 years), had the longest diabetes history, lowest BMI, and relatively lower baseline A1c; they reported the highest trust in physicians, patient activation, and social support. They had the greatest improvement in medication adherence (25.4%) and improvement in all outcomes except systolic BP. Group 4 (n=48) members were more likely to be Black and young (53 years), had the least optimal A1c control at baseline, and 62.5% used insulin. This group reported the lowest trust in physicians, self-efficacy at the doctor’s visit, patient activation, and social support but the greatest diabetes distress and depressive symptoms. Their medication adherence worsened and they did not experience improvement in any of the outcomes.

Conclusions: This study identified four distinct groups of patients with differing patterns of attitudes as well as changes in medication adherence and outcome over time. Individuals in these groups are likely to require distinct approaches to improvement.

Implications for Policy, Delivery, or Practice: Patient-centered interventions may be tailored for groups that can be defined based on validated assessment tools, physiologic measures and a person-based rather than a variable-based analytic approach.

Funding Source(s): Other, AAFP-UNC
Poster Session and Number: B, #888

Practice-Level Correlates of Patient-Centered Medical Home Characteristics: A Report from the SAFTINet CER Team
Marion Sills, University of Colorado School of Medicine; Bethany M. Kwan, PhD, MSPH, University of Colorado School of Medicine; Diane L. Fairclough, DrPH, MSPH, Colorado School of Public Health; Lisa M. Schilling, MD, MSPH, University of Colorado School of Medicine

Presenter: Marion Sills, M.D., M.P.H., Associate Professor, Pediatrics, University of Colorado School of Medicine, marion.sills@childrenscolorado.org

Research Objective: Evidence suggests the patient centered medical home (PCMH) model should improve delivery of preventive care services, lower cost, and enhance quality of care. Widespread but varied PCMH implementation offers the opportunity to conduct observational comparative effectiveness research in real-world settings on the impact of specific PCMH functions on clinical outcomes. We examined a series of practice-level characteristics (hypothesized common causes of both PCMH characteristics and clinical outcomes) as possible correlates of PCMH characteristics and confounders of the PCMH-outcomes relationship.

Study Design: Self-report practice-level surveys were administered in 51 primary care practices in the Scalable Architecture for Federated Translational Inquiries Network (SAFTINet), Practice leadership completed (1) the SAFTINet Delivery of Coordinated Care Survey (DoCCS), a measure of multiple PCMH domains including team-based care, panel management, and enhanced access; and (2) a survey of general practice characteristics, including organizational features, patient population, provider/staff characteristics, and health information technology infrastructure. We examined variability in DoCCS total and domain scores and correlations between DoCCS scores and select practice characteristics in 47 practices with complete data.

Population Studied: Participating practices are primarily federally qualified health centers with electronic health records, representing ~260,000 patients (30% covered by Medicaid), 500 primary care providers, and four safety net healthcare organizations in Colorado and Tennessee.

Principal Findings: Total DoCCS scores were moderate to high (M = 3.70, SD = 0.54) on a scale of 1 to 5, with no significant mean differences among the four organizations. Domain scores were as follows: Personal clinician (M = 4.43, SD = 0.59), Team-based care (M = 3.34, SD = 1.43), Access (M = 3.82, SD = 0.53), Patient centeredness (M = 3.77, SD = 0.72), Coordinated/Integrated care (M = 3.82, SD = 0.51), Quality Improvement (M = 3.56, SD = 0.58), Evidence-Based Medicine (M = 3.42, SD = 0.91), Engaged Leadership (M = 3.40, SD = 0.89), and Registries (M = 3.98, SD = 1.04). Neither membership in an Accountable Care Organization nor size of the practice (numbers of medical office visits, unique patients, or providers/provider FTEs) were associated with
total score. There was a trend showing a positive relationship between level of mental health integration and total score. Characteristics of patient population that were positively related to total score include proportion of Caucasian patients and proportion of patients for whom English is their first language. Domain-specific results will also be presented.

**Conclusions:** Of practices in SAFTINet, there was variability across practices in DoCCS scores, suggesting that the DoCCS can detect variation in PCMH characteristics. Practices caring for more minority and non-English-speaking patient populations showed slightly lower PCMH scores. Aspects of the patient population, but not of provider/staff characteristics or organizational or HIT structure, may be potential confounders of a PCMH-clinical outcomes relationship in our observational research. These results may only apply to practices similar to those included in this research.

**Implications for Policy, Delivery, or Practice:** It is important to consider characteristics of patient populations when conducting research on the PCMH model, and interpreting and translating findings into practice. Support for practices caring for patients with language barriers may be needed in PCMH implementations.

**Funding Source(s):** AHRQ

**Poster Session and Number:** B, #889

**Comparative Effectiveness of Pharmacologic and Mechanical Strategies for Prevention of VTE among Special Populations**

Sonal Singh, Johns Hopkins University; Elliot Haut, Johns Hopkins University; Daniel Brotman, Johns Hopkins University; Ritu Sharma, Johns Hopkins University; Yohalakshmi Chelladurai, Johns Hopkins University; Kenneth Shermock, Johns Hopkins University; Sosena Kebede, Johns Hopkins University; Jodi Segal, Johns Hopkins University

**Presenter:** Sonal Singh, M.D., M.P.H., Asst Professor Of Medicine And Public Health, Department of Medicine and International Health, Johns Hopkins University, sosingh@jhsph.edu

**Research Objective:** Venous thromboembolism is a prevalent and avoidable complication of hospitalization. Patients hospitalized with trauma, traumatic brain injury, burns, or liver disease; patients on antiplatelet therapy, obese or underweight patients, those having obesity surgery, or with acute or chronic renal failure have unequal risks for bleeding and thrombosis and may benefit differently from prophylactic medication. Our objective was to systematically review the comparative effectiveness and safety of pharmacological and mechanical methods of prophylaxis of VTE in these special populations.

**Study Design:** We conducted a systematic review and meta-analysis. We searched MEDLINE®, EMBASE®, SCOPUS, CINAHL®, www.clinicaltrials.gov, International Pharmaceutical Abstracts (IPA), and the Cochrane Library in July 2012. This was complemented by hand searches from the reference lists and unpublished studies provided by sponsors. Two reviewers evaluated studies for eligibility, serially abstracted data using standardized forms, and independently evaluated the risk of bias in the studies and strength of evidence for major outcomes and comparisons. We qualitatively synthesized the evidence and also pooled the relative risks from the controlled studies.

**Population Studied:** We included randomized controlled trials among patients with trauma, traumatic brain injury, burns, liver disease, obese and underweight, those undergoing bariatric surgery and patients with kidney disease. Since these populations may be excluded from trials, we also included controlled observational studies of pharmacologic agents, and uncontrolled observational studies and case series of inferior vena cava filter use.

**Principal Findings:** After a review of 30,902 unique citations, we included 102 studies of which just 8 were trials. Fifty eight studies reported on patients with trauma, thirteen studies reported on patients with traumatic brain injury, one study reported on patients with burns, two studies reported on patients with antplatelet agents, twenty one studies reported on patients having bariatric surgery, two studies reported on obese patients and five studies reported on patients with renal failure. We found no studies that reported on patients with liver disease or those who were underweight. The majority of observational studies had a high risk of bias. The strength of evidence is low that IVC filter placement is associated with a lower incidence of PE and fatal PE in hospitalized patients with trauma compared to no IVC filter placement. The strength of evidence is low that enoxaparin reduces DVT and that UFH reduces mortality in patients with TBI when compared to patients...
without anticoagulation. Low grade evidence supports that IVC filters with usual care are associated with increased mortality and do not decrease the risk of PE in patients undergoing bariatric surgery compared to usual care alone. All other comparisons, for all of the key questions, had insufficient evidence to permit conclusions.

Conclusions: Our comparative effectiveness review demonstrates that there is a paucity of high quality evidence to inform treatment of these special populations.

Implications for Policy, Delivery, or Practice: Future research using robust observational studies that control for confounding by indication and disease severity are needed as randomized controlled trials typically exclude or do not report on these populations.

Funding Source(s): AHRQ
Poster Session and Number: B, #890

Patient Perceptions of Barriers to Optimal Medication Use During the Hospital-to-Home Transition
Heather Sobko, University of Alabama at Birmingham; Monika M. Safford, MD, University of Alabama at Birmingham

Presenter: Heather Sobko, Ph.D., R.N., Postdoctoral Fellow, Preventive Medicine, University of Alabama at Birmingham, hsobko@uabmc.edu

Research Objective: The purpose of this study was to better understand the patient perspective on barriers to optimal medication use during the hospital-to-home transition for medically complex patients at high risk for rehospitalization, using heart failure and chronic obstructive pulmonary disease (COPD) as examples.

Study Design: Observational study using qualitative methodology

Population Studied: We studied adult patients (age >18 years) hospitalized for heart failure or COPD at a single academic medical center between August, 2012 and January 2013. Participants had to have a previous hospitalization for the same condition within the previous six months and had to be discharged to their home (not to a skilled nursing facility), and to speak English. We enrolled patients while still in the hospital and conducted in-person semi-structured interviews with telephone follow-up 1 week later. Interview transcripts were coded and analyzed using ANSwr software.

Principal Findings: Among the 50 study participants, common themes that emerged included knowledge deficits about self-management, beliefs and attitudes toward medication-taking during transitions of care, barriers to optimal medication use (financial barriers, recognizing medication side effects, misunderstanding of medication instructions, inconsistent daily regime for taking medications, knowing who to call and when to call for support with medication questions or problems), and perceptions that hospital staff “busy-ness” precluded inquiring further about medicines at time of discharge. By the 1-week follow-up interview, 41 (82%) participants were not taking at least one medication (mean 3, range 1-6) as prescribed; errors included incorrect doses or timing of doses, and redundant or missing medications.

Conclusions: Current discharge procedures at this hospital led to a very high prevalence of medication errors within one week of discharge among this sample of complex patients at high risk for readmission. Many of the barriers to optimal medication use that emerged from the qualitative research could be addressed through modification of discharge procedures.

Implications for Policy, Delivery, or Practice: More patient-centered, effective procedures around the time of discharge are needed in order to reduce preventable medication errors and associated complications and costs.

Funding Source(s): NIH, Ruth L. Kirschstein National Research Service Award
Poster Session and Number: B, #891

Patient Centered Diagnostic Communication in Borderline Personality Disorder
Sandra Sulzer, UNC-Chapel Hill

Presenter: Sandra Sulzer, Ph.D., Postdoctoral Fellow, Sheps Center for Health Services Research, UNC-Chapel Hill, sulzer@email.unc.edu

Research Objective: Mental health care providers lack systematic information about patient experiences receiving mental health diagnoses. As a result, they are left to guess about the effectiveness of their communication practices. This study examined both how providers communicate the Borderline Personality Disorder (BPD) diagnosis with patients and how patients responded to communication practices. Previous research has
included evidence of why providers might choose not to give the diagnosis.

**Study Design:** Primary data included a convenience and snow-ball sample of in-depth interviews of mental health care providers (n=22) and persons diagnosed with BPD (n=10). Primary patient reports supplemented diagnostic encounters from memoirs and online message boards (n=22) augmented patient interview data. Data collection continued until no new themes emerged and saturation was established. Interviews were analyzed using grounded theory and institutional ethnography.

**Population Studied:** The population included a geographically diverse group of psychiatrists, psychologists and licensed clinical social workers in the United States, practicing in 2012. Additionally, any patients in the United States who had been diagnosed with Borderline Personality Disorder by a mental health care provider were included.

**Principal Findings:** Clinicians used a variety of strategies to communicate the BPD diagnosis. These included using euphemisms, relying on symptom-based language, or naming the diagnosis, often including a criticism of the label itself. The vast majority did not tell patients they had BPD, even if they believed this to be the most accurate diagnosis. They did this on the basis of anticipating a poor patient response to the stigma of the label.

Generally however, patient responses did not line up with clinician expectations. Honesty and directness were preferred over euphemisms and symptom-based language in most cases. Categorically, all patients who found out at a later juncture that their provider had withheld the diagnosis left treatment with that provider.

**Conclusions:** What patients with BPD are told and how they are told affects their desire to stay in treatment, as well as their relationships with their providers.

**Implications for Policy, Delivery, or Practice:** This research may lead to better clinical outcomes in the most prevalent personality disorder in the U.S. by helping clinicians to retain their patients through effective diagnostic communication. Since the majority of clinicians appear to withhold the diagnosis from patients, which patients found to be the least effective communication strategy, there is room for improvement. Patients instead prefer honest and direct communication, including a discussion of the stigma associated with the label, and how they can overcome this mental illness. By offering this as part of the discussion about diagnosis, providers can remove a serious barrier to treatment adherence. By replicating practices that patients find to be most effective in diagnostic communication, providers may achieve better treatment results.

**Funding Source(s):** AHRQ

**Poster Session and Number:** B, #892

**Comparative Risks of Cardiac Events and Mortality Following Placement of Coronary Bare-Metal versus Drug-Eluting Stents**


**Presenter:** Christie Teigland, Senior Statistical Research Manager, cteigland@inovalon.com

**Research Objective:** To evaluate the relative likelihood of cardiac events and death associated with the placement of bare-metal stents (BMS) vs. drug-eluting stents (DES) in Medicare patients aged 65 years or older with coronary artery disease (CAD).

**Study Design:** This retrospective longitudinal study used a propensity-score matching technique to identify two cohorts of patients in a large nationally representative administrative claims database. The patient cohorts were identified by the existence of a hospital or outpatient claim for a BMS (ICD-9-CM 36.06 or CPT 92980, 92981) or DES (ICD-9-CM 36.07 or CPT G0290, G0291). The two cohorts of eligible patients were followed up to six years after stenting to assess the comparative risk of revascularization (PCI), myocardial infarction (MI), coronary artery bypass surgery (CABG) and death using multivariate survival analysis (Cox proportional hazards model).

**Population Studied:** The sample consisted of Medicare patients aged 65 years or older who received a coronary stent between January 1, 2005 and December 31, 2011.

**Principal Findings:** The study population included matched cohorts of 7,954 patients that received a BMS (female = 47.1%, age = 75.3 [± 6.2], history of hypertension = 73.5%, history of congestive heart failure (CHF) = 24.4%, history of valvular heart disease (VHD) = 10.8%) and 7,954 patients that received a DES (female = 47.3%, age = 75.3 [± 6.1], history of hypertension = 70.5%, history of congestive heart failure (CHF) = 25.1%, history of valvular heart disease (VHD) = 11.0%). Patients with a
DES had a significantly higher risk of MI (HR = 1.36, 95% CI: 1.17-1.59, p<0.0001) and PCI (HR = 4.72, 95% CI: 4.43-5.04, p<0.0001) compared to BMS after controlling for potential confounders. Patients with a DES had a significantly lower risk for CABG (HR = 0.414, 95% CI: 0.20-0.85, p<0.0001) compared to BMS after controlling for potential confounders.

Conclusions: This longitudinal analysis using propensity matched (risk adjusted) cohorts of patients with DES and BMS found that the use of DES was significantly correlated with an increase risk in future adverse events, including risk of MI and PCI in comparison to BMS.

Implications for Policy, Delivery, or Practice: Existing evidence on the effectiveness of DES compared to BMS is mixed. While some studies have found lower rates of MI and death subsequent to DES placement, there has been growing concern that patients with DES may be exposed to an increased risk of stent thrombosis compared to patients with BMS. This has raised new questions about relative patient safety of DES because stent thrombosis is associated with a high risk of MI and death. More recently, there has been growing concern that cardiologists are over-using DES rather than using cheaper BMS for patients at low-risk of another blockage, resulting in excessive high costs to the healthcare system with no clear evidence of added benefit. These results add important new information to the debate over whether the high use (and added cost) of DES placement is consistent with the triple aim of providing better care, better health and value to the healthcare system.

Funding Source(s): No Funding
Poster Session and Number: B, #893

Understanding and Addressing Barriers to Care for Iraq and Afghan War Veterans: Findings from a Photovoice Study
Gala True, Philadelphia VA Medical Center; Ellen S. Fritch, M.S. Ed., Center for Health Equity Research and Promotion

Presenter: Gala True, PhD, Health Science Research Specialist, Center for Health Equity Research and Promotion, Philadelphia VA Medical Center, jennifer.true2@va.gov

Research Objective: More than two million Veterans have returned from deployments in support of the wars in Iraq and Afghanistan; meeting the health care needs of these Veterans will be a leading public health challenge over the next 50 years. However, studies have documented low rates of health care utilization among this cohort of Veterans. We conducted a community-engaged research project with Iraq and Afghan war Veterans to identify factors contributing to treatment avoidance, failure to follow-up on recommended care, and discontinuation of care.

Study Design: A Photovoice approach was used to collaborate with Veterans of Operations Enduring Freedom (OEF) and Iraqi Freedom (OIF). Veterans were given a camera and asked to take photos of their daily lives or contribute photos from their personal collections to describe the impact of military service on their health, health care needs, and experiences with health care. Each Veteran was then interviewed individually to elicit the meaning behind their photos. Interview transcripts and photos were coded and analyzed by members of the research team to identify preliminary themes, and to select exemplary photos and quotes. Themes were refined and revised through small group discussions with Veteran participants.

Population Studied: Forty OEF/OIF Veterans who were representative of the current military force in terms of gender, age, race/ethnicity, branch of service, and number of deployments.

Principal Findings: We identified key barriers to treatment-seeking and initiation, engagement with care, and following a recommended course of treatment. These barriers fell into three broad categories: 1. characteristics of military service and culture; 2. organization and culture of healthcare delivery; and 3. patient-level causes. Characteristics of military service that impacted Veterans’ willingness to engage in care included: cultural norms of stoicism, silence, and self-reliance; prioritizing the needs of fellow soldiers over one’s own needs; and mixed messages from military command prior to the end of a deployment. Veterans described features of healthcare organization and delivery that posed barriers to care: an overwhelming or unwelcoming bureaucracy; negative encounters with staff or providers; inability to have primary needs addressed during early visits; and perception of the system as overburdened. A number of factors emerged specific to individual patients or subgroups of Veteran patients; for example, Veterans who were dealing with housing instability, alcohol or drug addiction, or those who had experienced Military Sexual Trauma. Veterans’ photos and quotes will be used to illustrate and illuminate each theme.
Conclusions: Photovoice is a powerful tool for engaging Veterans in research. Our study identified barriers to care from the Veterans' perspective, and generated ideas for improving access to care for returning combat Veterans. In keeping with a community-engaged research approach, many Veteran participants have collaborated on dissemination of findings including making presentations to healthcare providers.

Implications for Policy, Delivery, or Practice: Understanding the perspectives and experiences of OEF/OIF Veterans in their own words, and utilizing their expertise to educate providers, is an important step toward providing patient-centered care and improving healthcare utilization for OEF/OIF Veterans. The success of this project provides a blueprint for conducting community-engaged research with a variety of Veteran populations.

Funding Source(s): VA
Poster Session and Number: B, #894

Preliminary Experience with WebEx Virtual Review
Nghia Vo, Agency for Healthcare Research and Quality; Kishena Wadhwani, PhD, AHRQ; Francis Chesley, MD, AHRQ

Presenter: Nghia Vo, MD, Sro, Agency for Healthcare Research and Quality, nghia.vo@ahrq.hhs.gov

Research Objective: To evaluate the first six unplanned review sessions using the WebEx virtual system at AHRQ.

Study Design: Because of Hurricane Sandy and other technical issues, 4 study sections (SS) and 2 special emphasis panels (SEP) have been switched to WebEx virtual review instead of scheduled face-to-face meetings. A questionnaire has been sent to all 110 reviewers of these meetings. Scientific review officers (SRO) and reviewers are both new to this technology.

Population Studied: Limitations: This study is limited by the low response rate of reviewers, the unplanned use of virtual review, and technical problems inherent to this emerging technology. The bundling of the review sessions during a 5-week period may have adversely affected the result of the study.

Principal Findings: The response rate was 38% (42/110) overall with 63% and 29% respectively for SEP and SS reviewers. One hundred and twenty-eight applications have been discussed, with a range of 6 to 34 applications per session. The average length of discussion for each application was 20 minutes. Accessing the WebEx system was simple (76%) and pre-meeting overview was found to be useful (72%). Audio and Web display are rated as excellent in 80% and 95% of cases respectively. One third of reviewers have experienced difficulty working with the system.

Half of the reviewers would participate in WebEx review again (51%), while 42% would not; SEP reviewers are more receptive than SS members to this new technology (75% vs. 42%, p<.05). Cited advantages of the technology include: no travel (73%), decreased cost (22%), and fast review (5%). Disadvantages claimed include: minimal interaction between reviewers (47%), distraction (16%), less thorough review (16%), and no networking (5%).

Conclusions: We conclude that: 1) WebEx virtual review has been successfully used in six review sessions with up to 34 applications per session; 2) SEP reviewers are more receptive to virtual review than SS reviewers.

Implications for Policy, Delivery, or Practice: 1) WebEx virtual review is a duplicable and affordable method of review even for new reviewers and SROs; 2) Solving the technical problems related to this new technology may improve its attractiveness and decrease the cost of the review process.

Funding Source(s): N/A
Poster Session and Number: B, #895

Patient and Nurse Discharge Readiness Assessments and Return to Hospital
Marianne Weiss, Marquette University; Linda Costa, University of Maryland; Olga Yakusheva, Marquette University; Kathleen Bobay, Marquette University

Presenter: Marianne Weiss, D.N.Sc., R.N., Associate Professor, College of Nursing, Marquette University, marianne.weiss@marquette.edu

Research Objective: Patients and their providers frequently have different perspectives about discharge readiness. Previous research with the 21-item Readiness for Hospital Discharge Scale (RHDS) has linked discharge readiness perceptions to readmission and ED use after hospital discharge. The purpose of this study was to compare patient perception with nurse assessment of readiness for hospital discharge using a clinically practical 8-item
RHDS, and to determine the association of patient and nurse discharge readiness assessments with readmission and emergency department (ED) visits within 30 days after discharge.

**Study Design:** The study used a prospective longitudinal design. Eight-item short forms of the RHDS were completed on the day of discharge by patients (PT-RHDS) and their discharging nurses (RN-RHDS). Patient characteristics, readmissions, and ED visits were extracted from electronic records. Analyses were conducted for PT-RHDS and RN-RHDS as continuous variables (0-10 point scale) and categorical variables using a predetermined cut-off score of <7 for ‘low readiness’. PT-RHDS and RN-RHDS scores were compared using mean and correlation for the continuous variables and agreement for the categorical variables. Logistic regression analyses for post-discharge utilization of readmission and ED visits were conducted using PT-RHDS and RN-RHDS as continuous variables and categorical variables. Logistic regression models included unit-level fixed effects, clustering at the nurse level, adjustment for uneven cluster sizes, and controls for patient characteristics.

**Population Studied:** The sample included 254 adult medical-surgical patients discharged home without hospice care between May and November, 2011 and their discharging nurses from 3 units of an Eastern US academic medical center.

**Principal Findings:** Mean scores for PT-RHDS and RN-RHDS were the same (8.4) and were correlated at r=.32 (p<.01). In 24 percent of cases, PT-RHDS, RN-RHDS or both were rated within the ‘low readiness’ category. Using readmission as the outcome category, the unadjusted and adjusted odds ratios for the continuous RN-RHDS measure were .61 (p=.05) and .53 (p=.02). There was no significant association between PT-RHDS and readmission. When the analyses were conducted with RN-RHDS and PT-RHDS categories, odds ratios for the association of RN-RHDS and readmission were 6.3 (unadjusted) and 9.0 (adjusted) for the ‘low readiness’ category (<7) compared to the ‘very high readiness’ category (scores of 9 to 10). No other categories were significantly different from the highest category. None of the control variables were significantly associated with readmission. Neither PT-RHDS nor RN-RHDS were significantly associated with ED visits. Number of medications (4 or more) on discharge was strongly associated with ED use, with odds ratios of 4.8 to 5.0, (p<.05) across the adjusted models for PT-RHDS and RN-RHDS.

**Conclusions:** Nurse assessment, but not patient perception, of low discharge readiness was associated with increased risk of readmission within 30 days post-discharge. The 8-item RHDS produced similar results to prior studies using the instrument’s 21-item form.

**Implications for Policy, Delivery, or Practice:** Discharge readiness assessment should become a standard practice within the discharge process. Nurse assessment of discharge readiness will augment existing strategies for identification of patients at risk for readmission. Patient perception of discharge readiness is useful as a metric of outcomes of the hospital phase of the care continuum.

**Funding Source(s):** No Funding

**Poster Session and Number:** B, #896

**Short-Term Risks Associated with Sedation During Colonoscopy: Evaluation of 2009 CMS Mandate for Anesthesia Services**

Karen Wernli, Group Health Research Institute; Alison T. Brenner, University of Washington; Carolyn M. Rutter, Group Health Research Institute; John M. Inadomi, University of Washington

**Presenter:** Karen Wernli, Ph.D., M.S., Assistant Investigator, Group Health Research Institute, wernli.k@ghc.org

**Research Objective:** In 2009, the Centers for Medicare and Medicaid (CMS) mandated the use of trained anesthesia-professionals to administer propofol. The decision had a strong impact on gastroenterologists given increasing use of propofol in place of conscious sedation during colonoscopy procedures. Providers generally believe that propofol administered during colonoscopy is as safe as conscious sedation, but no large studies have evaluated rare outcomes or changes in risks after the CMS mandate, intended to improve safety. Our research objectives were to compare the effect of colonoscopy provided with anesthesia services versus conscious sedation on risk of 30-days outcomes and to evaluate temporal trends in risk pre- and post-CMS mandate in November 2009.

**Study Design:** We conducted a retrospective cohort study of 3,564,753 men and women who received one colonoscopy during 2008-2010
using administrative claims data from the Truven Health MarketScan® Research Databases. **Population Studied:** Men and women 40–64 years who were insured, living within the US, and received a colonoscopy either with conscious sedation or with a concurrent claim of anesthesia services. We assumed the use of anesthesia services was administration of propofol, given its widespread use with colonoscopies. We assessed short-term 30-day risk of inpatient and outpatient outcomes associated with the colonoscopy (i.e., colonic perforation, hemorrhage, acute diverticulitis, abdominal pain, anemia, ulcerative colitis, and complications from the procedure), use of anesthesia (i.e., pneumonia, infection, and complications secondary to anesthesia), and cardiopulmonary events (i.e., hypotension, myocardial infarction, and stroke). We calculated descriptive statistics and estimated odds ratios using logistic regression models that adjusted for patient age and sex, polypectomy, and time period (pre- or post-mandate). At the time of presentation, we will also adjust the analyses for comorbidity score. We also conducted stratified analyses to estimate risks associated with use of anesthesia services pre- and post-CMS mandate. **Principal Findings:** Nationally, 31% of colonoscopies were conducted with anesthesia services, which varied significantly by region (Northeast: 51% vs. West 8%; p<0.0001). Prior to the CMS mandate, use of anesthesia services during colonoscopy, compared to conscious sedation, was associated with increased short-term risks of colonoscopy-related outcomes (hemorrhage (OR=1.27, 95% CI 1.26, 1.28), acute diverticulitis (OR=1.74, 95% CI 1.70, 1.78), abdominal pain (OR=1.09, 95% CI 1.07, 1.10), ulcerative colitis (OR=1.31, 95% CI 1.28, 1.33), and anesthesia-related outcomes (complications secondary to anesthesia (OR=1.30, 95% CI 1.19, 1.42)). After the CMS mandate, risks of anesthesia-related outcomes were no longer elevated, but risk of some colonoscopy-related outcomes, while reduced from pre-mandate levels, remained elevated (hemorrhage (OR=1.04 95% CI 1.03, 1.06), acute diverticulitis (OR=1.31, 95% CI 1.27-1.35), ulcerative colitis (OR=1.11, 95% CI 1.08-1.15)). **Conclusions:** The use of anesthesia services with propofol during colonoscopy was associated with increased short-term harms pre-CMS mandate. However, post-CMS mandate, the risks were reduced, especially for anesthesia-related outcomes. Use of propofol remains associated with increased risk of some colonic outcomes, but not anesthesia associated outcomes. **Implications for Policy, Delivery, or Practice:** The CMS policy likely had a positive effect in reducing the risk of rare harms in individuals undergoing routine colonoscopy by requiring anesthesia-professionals to administer propofol. **Funding Source(s):** AHRQ **Poster Session and Number:** B, #897 **Surveys of the Comparative Effectiveness Research Environment and the Impact on Medical Policy-Making** Joel Weissman, Harvard Medical School; Kimberly Westrich, National Pharmaceutical Council; Claudia Schur, Social & Scientific Systems, Inc.; Annelise Adams, Social & Scientific Systems, Inc.; Steve Pearson, ICER; Sarah Emond, ICER; Lee Hargraves, University of Massachusetts, Boston; Bobby Dubois, National Pharmaceutical Council; **Presenter:** Kimberly Westrich, M.A., Research Director, Health and Economic Research, National Pharmaceutical Council, kwestrich@npcnow.org **Research Objective:** Describe the state of CER as perceived by major stakeholders, including its use in medical and formulary policy-making, assessments of different levels of evidence, and the future impact of CER on health technology and the health of the public. **Study Design:** Surveys of major health care stakeholders influential in or affected by CER; telephone follow-up in both surveys to maximize response. **Population Studied:** Two surveys: 1) Healthcare stakeholders involved on a regular basis with issues related to CER and health care decision making including government policymakers, researchers, human resources specialists, employers, and trade organizations. 2) Medical and pharmacy directors of payers (health insurance plans) and state Medicaid programs. **Principal Findings:** The 2012 health care stakeholder survey is the third iteration, and while 75 percent of respondents felt that CER led to little or no improvement for health care decision-making in the past year, more than half believed that CER will substantially improve decision-making over the next five years. In the stakeholder survey, PCORI is the organization
that nearly 75% of respondents now believe will have the lead role in establishing CER research standards and research priorities, surpassing both AHRQ and NIH. Compared to the two previous year’s surveys, the 2012 stakeholders’ survey indicated modest progress in development of research standards, availability of new research methods, processes for interpreting and applying evidence, and the range of effects that are included in judging the value of medical interventions and how the concept of value is translated to medical decisions. The survey of medical and pharmacy directors provides a deeper look at the types of evidence used by these decision makers and their views of the use of CER now and over the next five years in setting medical and pharmacy coverage policies. The survey also obtained views on the utility of CER reviews, and the types of outcomes that respondents believe should be reflected in the research priorities and projects that PCORI funds.

Conclusions: These surveys reflect increasing optimism that CER will improve decision making in the future, a good indication that stakeholders see CER as moving in the right direction. The results demonstrate recognition of the changing environment for CER and in particular the significance of PCORI’s role in that environment. Nevertheless, the application of CER to setting coverage policy faces substantial barriers, such as the mismatch between topics studied and conditions of interest to the payer community.

Implications for Policy, Delivery, or Practice: The success of CER depends on how well research responds to the needs of stakeholders and effective application of the evidence produced by the research. These two surveys help to promote a common understanding of the environment for CER and the expectations of stakeholders for its impact. The survey of medical and pharmacy directors provides unique insights on the attitudes of those who are among the primary users of CER. Together, the two surveys can identify opportunities for improving communication and education about CER.

Funding Source(s): Other, National Pharmaceutical Council

Poster Session and Number: B, #898

Evaluating the Effect of Team Care on the Patient Experience
Douglas Wholey, University of Minnesota; Kathleen M. White, University of Minnesota School of Public Health Division of Health Policy & Management; Jon Christianson, University of Minnesota School of Public Health Division of Health Policy & Management; Suohna Lee, University of Minnesota School of Public Health Division of Health Policy & Management; Dr. Richard Adair, Allina Health, University of Minnesota, whole001@umn.edu

Research Objective: Team-based models of care for people with chronic illnesses are being implemented across different practice settings. These models reflect different team structures and different expectations about how teams can function to improve care. Two common features of team care are the incorporation of patients into the team and the use of non-clinical, as well as clinical, personnel. A key question with respect to health care teams is how team care affects patients’ health behaviors and overall evaluation of care. A better understanding of these mechanisms is important in designing health care teams to facilitate patient health behaviors, acceptance and overall evaluation of care, which in turn can influence patients’ effective participation in team care.

The study has two purposes. First, it designs and examines the properties of an instrument measuring the patient experience and overall evaluation of care combining the theory of teams and with health behaviors theory. Second, it uses the instrument to determine the effect of a specific team care model on the patient experience and overall evaluation of care.

Study Design: Randomized controlled trial with patients randomized to receive care from a care team that included the patient and a lay “care guide” versus usual care. Patients completed a survey before randomization and one year later. The survey assessed patient perception of care team activities (helping, reinforcement) and patient beliefs (social support, individualized care, understanding, clinic staff interaction, whether clinic staff care about patient’s health) along with an overall assessment of care. With respect to instrument properties, Cronbach alphas for each wave of the survey were calculated to assess reliability, and confirmatory factor analysis was used to assess discriminant and convergent validity. Model fit was assessed using standardized root mean square residual (controlling for clustering by clinic); root mean squared error of approximation; and Bentler’s
comparative fit index. A difference-in-differences and lagged dependent variable methodology was used to assess the impact of team care on patient experience of team care as reported in the patient survey.

**Population Studied:** 2135 patients with hypertension, diabetes or heart failure were recruited from 6 diverse primary care clinics.

**Principal Findings:** The measurement analysis demonstrates strong convergent and discriminant validity and strong reliability. Team care was associated with higher patient perceptions of social support, helping, reinforcement, individualized care, and treatment understanding. Team care was associated with higher overall evaluation of care through its effect on reinforcement, individualized care, and helping.

**Conclusions:** Assessment of the effect of team care on the patient experience and overall evaluation of care can be enhanced with a survey based on team theory and health behaviors theory.

**Implications for Policy, Delivery, or Practice:**
The results can be used to design team care models that enhance patient experience and participation in teams. We introduce a new survey tool to measure the effect on the patient experience and patient centered individualized care.

**Funding Source(s):** Other, Robina Foundation

**AHRQ’s Community Forum Public Deliberation Demonstration: Minority Participants’ Experience in Deliberation**

Amy Windham, The American Institutes for Research; Kristin Carman, American Institutes for Research; Steve Garfinkel, American Institutes for Research; Manshu Yang, American Institutes for Research; Grace Wang, American Institutes for Research; HarmoniJoel Noel, American Institutes for Research; Dierdre Gilmore, American Institutes for Research; Diane Martinez, American Institutes for Research

**Presenter:** Amy Windham, Ph.D.,M.P.H., Senior Researcher, Health, The American Institutes for Research, awindham@air.org

**Research Objective:** Public deliberation methods are designed to obtain informed perspectives from the general public on complex topics such as those that arise in health care and research. The Community Forum experiment used a randomized controlled trial to evaluate the effectiveness of four distinct deliberative methods that varied in terms of length, use of technology, and expert testimony in a project to obtain public views on the use of evidence in medical decisions.

A founding principle of deliberation is that all persons affected by a policy decision should have equal opportunity to participate in making that decision (Webler, 1995). To that end, inclusion and diversity are major priorities for deliberation. This study describes participants’ reports on two aspects of quality: discourse quality and implementation quality. Secondly, we report whether members of minority or disadvantaged groups report a more or less favorable experience in deliberation compared to majority groups.

**Study Design:** The Deliberative Experience Survey, developed for the CF experiment, measured two domains: (1) level of discourse quality which included constructs such as equal participation in the discussions, respect for others’ opinions and tolerance of differing perspectives, and reasoned justification of ideas; and (2) implementation quality which included items gauging quality of group facilitation, quality of the educational materials provided, quality of the experts, participants’ perceived value of the method, and participants’ view of the influence the results will have on research. Multiple linear regression was used to test whether demographic characteristics, specifically minority group membership, were related to deliberative experience.

**Population Studied:** The sample included 878 participants who took part in one of the four deliberative methods and completed the Deliberative Experience survey at the end of their session. The sampling strategy was designed to reflect a diverse population similar to the local population distribution in the four locations. The locations were selected to achieve a diverse sample in terms of racial, ethnic, and sociodemographic background (Raleigh, NC; Sacramento, CA; Chicago, IL; and Washington, DC).

**Principal Findings:** The Community Forum project successfully recruited and convened 76 deliberative groups of between 8 and 30 persons per group to facilitate the exchange of information and ideas across people with diverse perspectives and backgrounds. Each of the deliberative groups was ethnically and socioeconomically diverse. Although there was some variation among deliberative methods,
participants gave very favorable reports of their experience in the deliberations in terms of both discourse and implementation quality. Controlling for method and demographic characteristics, African American participants (p=.02) and participants with a high school diploma or less (p<.001) reported significantly higher discourse quality. Asian (p=.01) and African American (p<.001) participants and participants with a high school diploma or less (p=.03) gave significantly higher implementation quality ratings. Age, income, Hispanic ethnicity, and speaking a language other than English at home were not related to deliberation quality.

**Conclusions:** Members of minority groups reported similar or better experience in the Community Forum deliberative groups compared to white, better educated, and higher income participants.

**Implications for Policy, Delivery, or Practice:** Public deliberation promotes inclusion and is a suitable method for obtaining input from diverse members of the public.

**Funding Source(s):** AHRQ

**Poster Session and Number:** B, #900

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**Cost-Effectiveness Analysis of Alternative Treatments of Atrial Fibrillation**

Tony Yang, George Mason University; Linda Henry, the Inova Heart and Vascular Institute

**Research Objective:** Atrial fibrillation (AF) is a cardiac rhythm disorder found in more than 2.3 million Americans. Three key approaches are used to treat AF. We aim to analyze which option provides better clinical investments based on medical benefit per health expenditure. Our overarching objective is to produce findings that will help target and refine ongoing strategies for improving the safety, appropriateness and cost-effectiveness of cardiac care for AF.

**Study Design:** We compare three strategies for the primary treatment of AF: Cox-Maze procedure, percutaneous catheter ablation, and medication, using a decision analytic approach. We construct a Markov model, a type of mathematical computer simulation model, which is populated with primary data and supported by data from the literature and other publicly available sources. The model projects the lifetime costs and quality-adjusted life years gained (QALY) from each of the three options.

**Population Studied:** Estimates of treatment efficacy will be derived from approximately 100 patients undergoing maze procedure (plus a year’s worth of follow up data), and nearly 200 patients undergoing catheter ablation in 2010-2011.

**Principal Findings:** Our preliminary results show that Cox-maze surgery is less costly and results in better outcomes than two other interventions. It remained the preferred strategy after adjusting the outcomes to eliminate the costs and events associated with other complications. The results of our sensitivity analyses which test the robustness of our findings researches the conclusion.

**Conclusions:** Cox-maze surgery results in better outcomes than other options in patients with AF, and at a lower cost.

**Implications for Policy, Delivery, or Practice:** Quantifying the long-term clinical effectiveness of each treatment method and identifying which of these treatment options are more cost-effective will provide valuable information for decision-makers and clinical leaders involved.

**Funding Source(s):** Other, INOVA LIFE SCIENCES RESEARCH COLLABORATION FUND

**Poster Session and Number:** B, #901

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**Patient-Centeredness in Research on Guideline Concordance: An Example of Radiation Therapy after Breast Conservation Surgery**

Nengliang Yao, Pennsylvania State University

**Presenter:** Nengliang Yao, PhD, Research Associate, Center for Health Care and Policy Research, Pennsylvania State University, ayao@psu.edu

**Research Objective:** Guideline concordance alone is widely used for determining quality of health care and utilization patterns. Effects of disease, patient, physician, hospital, and community characteristics on guideline concordance are often analyzed using binary logit models from the perspective of health service researchers. However, treatment characteristics are frequently missing in their conceptual framework, and treatments were dichotomized into concordant therapy and non-concordant therapy without considering the heterogeneity of non-concordant treatments. For example, dozens of studies have analyzed the guideline concordant radiation therapy after breast conservation surgery (BCS) in the last
two decades. They have found that about 15% to 30% of patients who undergo BCS do not receive radiation therapy. These studies have examined the influence of tumor, patient, physician, hospital, and community characteristics on guideline concordance and proposed policy implications. Unfortunately, guideline concordance of radiation therapy has not been improved after decades of research. More recent studies have found that use of BCS without radiation therapy appears to have increased nationally in recent years. This study uses radiation therapy as an example to estimate the effect of treatment characteristics on the probability of choosing a guideline concordant treatment among several alternatives.

**Study Design:** Nested logit and multinomial probit models were used to examine the effects of treatment characteristics on patient’s choice while accounting for other factors. The dependent variable is the primary treatment of breast cancer including surgery and radiation therapy. Patients are classified as treated with mastectomy (concordant treatment #1), BCS with external beam whole breast radiation (WBI, concordant treatment #2), BCS with external beam accelerated partial breast irradiation (APBI, new treatment #1), BCS with brachytherapy APBI (new treatment #2), or BCS without radiation (bad choice) as indicated by claims codes. Treatment features of interest include average treatment and recovery time, guideline recommendation as a proxy of expected effectiveness, local Medicare coverage, and the distance to the nearest radiation facility. Medicare coverage was grouped into four categories (favorable, selective, neutral, and unfavorable) on the basis of information in the local coverage determination database regarding treatment alternatives during the study interval.

**Population Studied:** A sample of 53,766 female breast cancer patients was identified in SEER-Medicare linked data. These patients were 65 years or older and diagnosed with a first breast cancer that was AJCC stage 0, I, or II during 2002 and 2007. I have limited the analysis to those most likely to have complete claims and those most likely to consider a definitive local therapy.

**Principal Findings:** New treatments increased dramatically in the study period from 2% to 13%. Conversely, guideline concordant treatments decreased substantially from 83% to 70%. BCS without radiation increased. The emergence of new treatments did not reduce the rates of BCS without radiation. Treatments with long treatment and recovery times and long travel distances are associated with decreased probabilities of being chosen, and treatments recommended by guideline and covered by Medicare are associated with increased probability of being chosen.

If I assume that new radiotherapies provide equivalent local tumor control compared to guideline concordant treatments, then we would expect to see new radiotherapies become more available than before, maybe as available as traditional WBI, which predicts about a small decrease in BCS without radiation but big decrease in BCS with WBI. Medicare may cover new radiotherapies nationally, in which case a small decrease in BCS without radiation but a big decrease in BCS with WBI is predicted. At the same time, these changes are all expected to increase new radiotherapies dramatically. However, we will see a substantial decrease of non-concordant care if the treatment/recovery time of radiotherapy is dramatically shortened to one dose right after surgery.

**Conclusions:** The treatment received by early stage breast cancer patients is associated with characteristics of all available treatment options. Treatment characteristics and heterogeneity of treatment options should be considered in conceptualizing studies about guideline concordance.

**Implications for Policy, Delivery, or Practice:** Policymakers and researchers may want to focus more attention on finding new radiotherapies that consist of one dose administered right after surgery to improve quality of care. Future research on patterns of care and patient choice may be performed from the patient-centeredness perspective.

**Funding Source(s):** Other, Susan Komen Breast Cancer Foundation

**Poster Session and Number:** B, #902

**Translating Comparative Effectiveness Research into Practice: What Clinicians Think**

Jeanette Ziegenfuss, HealthPartners Institute for Education and Research; Victor Montori, Mayo Clinic; Jon Tilburt, Mayo Clinic; Annie LeBlanc, Mayo Clinic; Jim Deming, Mayo Health System; Steven Reed, Park Nicollet; Sean Gregory, Texas A&M Health Sciences Center; Nilay Shah, Mayo Clinic
Presenter: Jeanette Ziegenfuss, Manager, Data Collection Center, HealthPartners Institute for Education and Research, jeanette.y.ziegenfuss@healthpartners.com

Research Objective: With the passage of the Affordable Care Act resources devoted to Comparative Effectiveness Research (CER) have been codified into law. The Patient-Centered Outcomes Research Institute (PCORI) was established specifically to help build this body of work that ultimately helps patients and their providers select optimal treatment options (Patient-Centered Outcomes Research Institute, 2012). In order to effectively translate CER into practice, clinicians must both be exposed to and able to act on the evidence generated from this body of work.

Study Design: In order to ascertain the extent of exposure to and ability to engage with the evidence generated from CER, we conducted a survey of an identified clinician population. A survey link was sent via email in late 2012. Initial non-responders were sent reminder emails at two week intervals. The survey contained questions about frequency of consulting a number of sources to stay up to date “on the latest evidence that informs clinical decision-making,” as well as familiarity of and opinions about CER.

Population Studied: 271 primary care clinicians practicing at one of seven clinic sites were sent a survey invitation. Sites were participating in an implementation trial of translating evidence into practice for shared decision making, were located in the Midwest and represented a variety of practice settings with respect to size, urbanicity and multi-specialty nature. Surveys were sent regardless of participation in the implementation trial.

Principal Findings: 116 clinicians (42.8%) responded. Approximately half of the respondents were participants in the broader trial. With respect to sources consulted to stay up to date on the evidence, 42% reported medical journals at least weekly and 40% monthly. The sources consulted by most on a weekly basis were distilled resources (i.e., UpToDate), with 96% consulting them weekly, followed by primary care colleagues (83%), and specialty care colleagues (70%). The sources consulted least often were industry representatives (80% never consulting them), Podcasts (70% never consulting ), and specialty “throwaway” magazines (54% never consulting). When asked how familiar they were with the term comparative effectiveness research, only 9% said they were “very familiar.” An additional 33% reported being “moderately familiar,” with the remainder being “not very” or “not at all familiar.” After being provided a definition of CER, most reported being only “moderately” or “not very” confident in their ability to “critically evaluate published evidence from this type of research,” (44% and 42%, respectively). The majority of clinicians (71%) reported, however, that they were “moderately optimistic” that evidence from CER would improve the quality of health care in the United States.

Conclusions: Over 80% of responding clinicians indicated that they consult medical journals at least monthly “to stay up to date on the latest evidence.” However, a large majority were not familiar with the term CER and did not think that they could critically evaluate this type of research. Nonetheless, they thought that this research would improve the quality of health care in the United States.

Implications for Policy, Delivery, or Practice: This disconnect suggests the need for additional work in mechanisms to translate CER into information that is useful for practicing physicians.

Funding Source(s): AHRQ,
Poster Session and Number: B, #903
**PUBLIC AND POPULATION HEALTH**

**Diabetes and Work Force Productivity: An Assessment of Diabetes-Related Productivity Losses among Type II Diabetes Mellitus Patients in Central Texas**

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**Presenter:** Lola Adepoju, M.P.H., Ph.D (c), Doctoral Student, Department of Health Policy and Management, Texas A&M Health Science Center School of Rural Public Health, adepoju@tamhsc.edu

**Research Objective:** To assess the impacts of chronic disease management programs for patients with type 2 diabetes on productivity-related indirect costs of the disease. This study estimates: 1) the productivity–related costs associated with employee absence on the job due to a diabetes-related hospitalization, 2) the productivity losses associated with diabetes-related disability, and 3) the productivity losses associated with employee presence on the job (reduced productivity while on the job and/or reduced time at work due to diabetes-related ambulatory care visits). We model total productivity loss (sum of 1, 2 and 3) as a function of identified demographic and clinical characteristics.

**Study Design:** Data were obtained from electronic medical records (EMR) and survey responses of 376 adults aged 18 years or older who were enrolled in one of seven regional clinics of a university-affiliated group practice and consented to participate in a randomized controlled trial of T2DM self-management programs in Central Texas. All study participants had uncontrolled diabetes (baseline HbA1c 7.5% or greater) and were randomized into one of four study arms: personal digital assistant hand held device (PDA), Chronic Disease Self-Management Program (CDSMP), combined PDA and CDSMP (COM), and usual care (UC). The study lasted two years. EMR were used to estimate 1) employee absence on the job due to a diabetes-related hospitalization using length of stay over a one-year period. A multiplication factor from the literature was used to estimate 2) employee absence on the job due to diabetes-related disability. Survey responses and EMR were used to estimate 3) reduced productivity and time on the job. Reduced productivity is calculated based on survey responses on impairments that limit work; reduced time at work is calculated based on the number of diabetes-related ambulatory care visits, including physician office, emergency department and out-patient visits. The human-capital approach to estimate lost productivity is used to cost components 1, 2 and 3, which are summed to obtain total productivity loss. Using robust regression, we model total productivity loss as a function of different diabetes self-management programs, as well as other identified demographic and clinical characteristics.

**Population Studied:** Persons with Type 2 diabetes

**Principal Findings:** Compared to subjects in the usual care arm, there were no statistically significant differences in productivity losses for persons undergoing any of the three diabetes-management interventions. Males were associated with higher productivity losses (additional $601/year; p=0.001) and persons with greater than high school education were also associated with more losses (additional $659/year; p=0.001). Compared to non-Hispanic whites, point estimates suggest Hispanics and non-Hispanic blacks had lesser losses, although these did not attain statistical significance at 0.05. Persons aged =65 were associated with significantly lesser losses (~$420/year; p=0.03) compared to individuals aged 40-64. Interestingly, neither higher baseline HbA1c values nor greater baseline comorbidity count were significantly associated with productivity losses.
Conclusions: We are unable to find evidence that the chronic disease management programs examined in this trial control indirect productivity losses. Persons with chronic conditions such as diabetes may continue to work despite their illnesses, until they are unable to work.

Implications for Policy, Delivery, or Practice: Persons with chronic conditions such as diabetes may continue to work despite their illnesses, until they are unable to work.

Funding Source(s): NIH
Poster Session and Number: C, #1250

Health Care Costs and Utilization Associated with Lyme Disease in the United States

Emily Adrion, Johns Hopkins Bloomberg School of Public Health; John Aucott, Johns Hopkins School of Medicine; Jonathan Weiner, Johns Hopkins Bloomberg School of Public Health; Klaus Lemke, Johns Hopkins Bloomberg School of Public Health

Presenter: Emily Adrion, M.Sc., Doctoral Candidate, Johns Hopkins Bloomberg School of Public Health, eadrion@jhsph.edu

Research Objective: In the United States, Lyme disease is the most frequently reported vector borne infection and in the highly endemic Northeastern region it is the second most common reportable infectious disease of any type. After antibiotic treatment of Lyme disease, as many as 10 to 20 percent of individuals may experience persistent symptoms of fatigue, musculoskeletal pain, and neurocognitive complaints which have been classified by the Centers for Disease Control as Post-treatment Lyme Disease Syndrome (PTLDS).

Despite its prevalence, little is known about the impact of Lyme disease infection on health care costs and utilization in the United States. The purpose of this study is threefold: 1) to examine the impact of Lyme disease on 12-month health care costs and utilization, 2) to understand the relationship between Lyme disease and the probability of developing symptoms consistent with PTLDS, and 3) to understand how PTLDS may impact health care costs and utilization.

Study Design: This study utilizes retrospective data on medical claims and member enrollment for persons enrolled in commercial health insurance plans between 2006-2010, drawn from the IMS Health Data Warehouse Extract. Generalized linear models were used to examine the relationship between Lyme disease status and 12-month health care costs in 11 different cost categories. Negative binomial regression analysis was used to examine the impact of Lyme disease status on 3 different measures of health care utilization. Multivariable logistic regression analysis was used to examine the impact of Lyme disease status on the odds of PTLDS-related claims. The aforementioned analyses were then repeated in order to compare cost and utilization outcomes for those in the Lyme disease group with one or more PTLDS-related claim to those in the Lyme disease group with no PTLDS-related claims.

Population Studied: 52,795 persons with Lyme disease and 263,975 matched controls, all of whom were under 65 years old and enrolled in a commercial or self-insured health insurance plan between 2006-2010. We performed a 5 to 1 matching of controls to cases using stratified random sampling without replacement, matching on age, sex, enrollment year, region, and payer type (commercial or self-insured).

Principal Findings: A Lyme disease diagnosis is statistically significantly associated with higher 12-month health care costs and utilization. A Lyme disease diagnosis is also statistically significantly associated with a four times greater likelihood of having any PTLDS-related claim. In addition, among those with Lyme disease, having one or more PTLDS-related claim is statistically significantly associated with considerably higher 12-month health care costs and utilization, as compared to those with no PTLDS-related claims.

Conclusions: Lyme disease and PTLDS are a significant source of health care utilization and costs and are likely associated with significant levels of patient suffering and unmeasured cost in lost production and health related function.

Implications for Policy, Delivery, or Practice: Efforts to improve provider recognition of the early signs of Lyme disease at time of ideal treatment, as well as additional research into the pathophysiology and effective treatment of PTLDS are needed. Ongoing efforts in public education around Lyme disease prevention are critical as well.

Funding Source(s): Other
Poster Session and Number: C, #1251

Complementary and Alternative Medicine Use During the Childbearing Year

Katy Backes Kozhimannil, University of Minnesota School of Public Health; Pamela Jo Johnson, Medical Research Institute; Neha Ghildayal, BSB, Medica Research Institute; Todd H. Rockwood, PhD, Division of Health
Policy & Management, U of MN; Lori Knutson, BSN, RN, HN-BC, Integrative Healthcare Solutions

**Presenter:** Katy Backes Kozhimannil, PhD, MPA, Division of Health Policy and Management, University of Minnesota School of Public Health, kkb@umn.edu

**Research Objective:** Use of complementary and alternative medicine (CAM) in the US is highly prevalent, with over 1/3 of adults reporting CAM use, and women of childbearing age are the primary users of CAM. However, little is known about the extent to which CAM is used by women during pregnancy and childbirth. The objective of this study was to document the prevalence of CAM use, types of CAM used, and reasons for CAM use among women of childbearing age.

**Study Design:** We used 2007 National Health Interview Survey (NHIS) data, the most current nationally representative data on CAM practices, to examine CAM use by pregnancy status (currently pregnant, recently pregnant - those not currently pregnant who gave birth in the past year, and neither currently nor recently pregnant). Primary outcomes of interest were any past year CAM use and reasons for CAM use. CAM use was also examined in three ways: 1) 22 specific CAM therapies, 2) grouped into five CAM types, and 3) classified as provider-based or self-treatment. Reasons for using CAM and health conditions treated with CAM were also examined. Descriptive analyses included cross-tabulations with design-based F-tests. Multiple logistic regression was used to estimate the odds of CAM use by pregnancy status adjusted for demographic, social, and economic factors.

**Population Studied:** Our target population was US women of childbearing age. The analytic sample included female respondents to the 2007 NHIS Alternative Health Supplement, ages 18 to 44, (n = 5,764 unweighted).

**Principal Findings:** Overall, 67% of women of childbearing age reported using CAM in the past year. This differed by pregnancy status with currently or recently pregnant women having significantly higher prevalence of CAM use than others (78.2% vs. 65.8%; P < 0.001). Back pain (17.1%), neck pain (7.7%), and anxiety (3.7%) were the most common specific conditions treated with CAM among women of childbearing age. However, nearly 12% of currently pregnant women and 28% of recently pregnant women reported using CAM for pregnancy-related reasons (P < 0.001). In adjusted analyses, currently and recently pregnant women had 2.7 times higher odds of past year CAM use compared with other women of childbearing age (95% CI 2.1-3.4; P < 0.001).

**Conclusions:** CAM use during the childbearing year is prevalent, with over three-quarters of currently/recently pregnant women reporting some CAM use. Of women who reported CAM use during the year in which they were pregnant, 20% reported using CAM specifically for pregnancy-related reasons, making this the most common reason for CAM use among pregnant and postpartum women.

**Implications for Policy, Delivery, or Practice:** Nearly four million women give birth in the US every year. Pregnancy and childbirth are the most common reasons women access health services in the US. With growing demand for non-pharmacologic and non-medical alternatives during the perinatal period and nearly half of all births financed by state Medicaid programs, it is dually imperative for providers to be aware of the changing needs and practices of pregnant women and for policymakers to understand how public resources may be used to support appropriate, effective use of alternative approaches to managing pregnancy and childbirth.

**Funding Source(s):** No Funding

**Predictors of Postpartum Obstetric and Primary Care Utilization for Women with Complicated Pregnancies**

Wendy Bennett, Johns Hopkins University School of Medicine; Hsien-Yen Chang, Johns Hopkins University; David M Levine, Johns Hopkins University; Lin Wang, Johns Hopkins Healthcare, LLC; Donna Neale, Johns Hopkins University; Erika Werner, Johns Hopkins University; Jeanne Clark, Johns Hopkins University

**Presenter:** Wendy Bennett, M.D., M.P.H., Assistant Professor, General Internal Medicine, Johns Hopkins University School of Medicine, wendy.bennett@jhmi.edu

**Research Objective:** Pregnancy complications, such as gestational diabetes mellitus (GDM) and hypertensive disorders of pregnancy (HDP), are risk factors for type 2 diabetes (DM) and cardiovascular disease. Guidelines recommend postpartum DM screening for women with GDM
and reassessing blood pressure for women with HDP. We determined predictors of postpartum utilization of primary and obstetric care in the one year after delivery.

**Study Design:** We conducted a retrospective cohort study using claims data 2003-10 from a private health insurance plan and a Medicaid Managed Care Organization in Maryland. Our sample included women with one pregnancy and insurance claims 6 months prior to conception through 12 months after delivery. We compared utilization between women with complicated pregnancies (GDM, pregestational DM or HDP) and a comparison group of women who had a pregnancy without any of these complications, using ICD9 and CPT codes. The primary outcome was a primary care visit within 12 months and the secondary outcome was an obstetric visit within 3 months after delivery. We used multivariate logistic regression models to assess the association between the pregnancy complications and sociodemographic predictor variables, and utilization of care at 3 and 12 months after delivery, stratified by insurance type.

**Population Studied:** We identified 37,751 pregnancies, which accounted for 8,389 complicated pregnancies (7,741 women) and 28,054 comparison pregnancies (23,559 women); 87.2% in sample had Medicaid insurance.

**Principal Findings:** Rates of HDP, GDM and pregestational DM were 17.0%, 9.1% and 1.4%, respectively. Compared to the group without complications, women with a complicated pregnancy were older at delivery (24.8 vs. 26.5 years, p<0.001), had higher rates of cesarean delivery (38.0% vs. 24.6%, p<0.0001) and preterm delivery (13.7% vs. 8.0%, p<0.0001). Among women with private health insurance 60.0% in the complicated delivery and 49.5% in the comparison group attended a primary care visit within 12 months postpartum. Half of women with Medicaid lost coverage 3-6 months after delivery. Among those with coverage = 6 months postpartum, 56.6% in the complicated group and 51.7% in the comparison group attended a primary care visit within 12 months. Nearly half of all women with private health insurance and 60.0% of women with Medicaid attended a postpartum obstetric visit within 3 months. Among women with Medicaid, statistically significant predictors of receiving a primary care visit within 12 months postpartum included non-Black race, older age, preeclampsia or pregestational DM (but not GDM) and depression. Among women with private health insurance, statistically significant predictors of receiving primary care within 12 months included co-morbid diagnoses of thyroid disease and asthma, being a current smoker and having a mental health disorder, but not pregnancy complications.

**Conclusions:** Compared to women without pregnancy complications, women with GDM, HDP or pregestational DM were more likely to attend primary care visits within one year after delivery. However, except for women with pregestational DM, fewer than 60% of women with complicated deliveries attended a visit.

**Implications for Policy, Delivery, or Practice:** Because many women lose insurance coverage within 3 months of delivery, Medicaid expansion policies have potential to improve women’s post-pregnancy preventive health care, especially for women at risk of developing chronic diseases.

**Funding Source(s):** NIH

**Poster Session and Number:** C, #1253

**Annual Direct and Indirect Costs of US Employees with Bipolar Disorders, Schizophrenia and Controls from 2001 to 2011**

Richard Brook, The JeSTARx Group; Krithika Rajagopalan, Sunovion Pharmaceuticals; Nathan Kleinman, HCMS Group; Mariam Hassan, Sunovion Pharmaceuticals; Jacob Young, HCMS Group; Jim Smeeding, The JeSTARx Group; Andrei Pikalov, Sunovion Pharmaceuticals

**Presenter:** Richard Brook, M.B.A., M.S., VP, Retrospective Research, The JeSTARx Group, rbrook@jestarx.com

**Research Objective:** To compare the annual direct and indirect costs between US employees with Bipolar Disorder (BPD), Schizophrenia, and Controls without BPD/Schizophrenia.

**Study Design:** Retrospective analysis of administrative claims and employer payroll data. For BPD and Schizophrenia subjects, the index date was the date of the initial BPD or Schizophrenia claim, and for Controls, the average of BPD and Schizophrenia index dates by year. All subjects were required to have 12 or more months of follow-up after their index date. Outcomes measured annually were: medical, drug, sick leave (SL), short- and long-term disability (STD, LTD), and workers’ compensation (WC) costs. The cohorts were examined using two-part regression (logistic
followed by generalized linear models), while controlling for potentially confounding factors (demographics, job related variables, region, and index year). All costs were inflation adjusted to 2012. Reported significant results had p-values less than 0.05.


**Principal Findings:** The analysis identified 5299 employees with BPD; 391 with Schizophrenia; and 653,707 Controls. Compared with Controls, the BPD and Schizophrenia cohorts were less likely to be married and exempt (salaried) and had lower salaries. In 2001, BPD employees annually cost $8573 more than Controls, with higher costs in all benefit categories, and significantly higher costs for Medical ($4701), Rx ($2252), SL ($391), STD ($762), and WC ($461). Those with Schizophrenia were $8,812 more costly than Controls and significantly higher for Medical ($6549) and Rx ($2119) and $205 lower WC. Overall, BPD employees were $239 less expensive than those with Schizophrenia despite $649 higher STD and $666 higher WC (both significant). In 2011, BPD employees cost $9547 more than Controls, with higher costs in all categories, and significantly higher costs for Medical ($6147), Rx ($2552), SL ($208) and STD ($413). Those with Schizophrenia were $7772 more costly than Controls and significantly higher for Medical ($5191) and Rx ($2630). BPD employees were $1775 more expensive than those with Schizophrenia (all categories non-significant). The significant BPD cohort changes (2001 to 2011) were +$1950 for Medical and -$473 for STD. Since 2006, there have been consistent decreasing trends in STD costs for the BPD and Schizophrenia cohorts (since 2007 for LTD and WC). From 2001-2011, direct costs as a percent of total increased for those with BPD from 78.9% to 86.7% and from 75.2% to 78.8% for Controls; for Schizophrenia these percentages decreased through 2005 and then increased through 2011.

**Conclusions:** The impact of BPD and Schizophrenia is costly in the workplace, leading to increased health benefit costs. While disability costs have become marginally lower since 2006, medical costs (e.g., doctor or inpatient visits) among these two patient populations remain significantly high, suggesting the need for better therapeutic options.

**Implications for Policy, Delivery, or Practice:** Using appropriate treatments can manage overall patient costs, not just the direct components.

**Funding Source(s):** Other, Sunovion Pharmaceuticals, Inc

**Poster Session and Number:** C, #1254

**Understanding Perspectives of Public Health Employees Post a Multi-Department Consolidation**

Aimee Budnik, Kent State University; Dr. John Hoornbeek, Kent State University; Dr. R. Scott Olds, Kent State University

**Presenter:** Aimee Budnik, M.S., B.S., Doctoral Student And Graduate Assistant, College of Public Health, Kent State University, abudnik@kent.edu

**Research Objective:** This component of the study sought to gain insight into the employees' experiences transitioning to and working within a newly consolidated district. Specifically, 1) to identify challenges that have been experienced by the public health department staff during and after a consolidation; 2) to gain insight about the meaning of culture and its role after a merger or consolidation of a public health entity; and 3) to hypothesize a theory or framework for public health departments for culture and its role in consolidation.

**Study Design:** This study was a mixed methods evaluation of a newly consolidated health district in Ohio using focus groups, interviews of key stakeholders and quantitative survey of the workforce. The qualitative data was analyzed using a Grounded Theory Approach.

**Population Studied:** The population studied were the employees of the newly formed health district. This health district consolidated three independent health departments into a single public health district in one county in Ohio. There were 24 participants in four focus group sessions. Twelve interviews with senior staff members were conducted.

**Principal Findings:** Preliminary results suggest that there were challenges associated with the merging of three departments into one newly formed organization. Other findings include the perceptions related to cultural work differences amongst the employees and differences in perspectives about change. Perspectives varied
by department of origin and current employee job position.

Conclusions: This study suggests that not only is there a need to manage the employees closely during a consolidation effort, it is also important to assess and measure the employees’ perception about culture and its impact on the newly formed organization. These results suggest that the challenges associated with managing and directing a newly formed organization may be also connected to an employee’s perspective and familiarity with the “New Public Health paradigm” as defined in IOM report in 1988 in addition to the change itself.

Implications for Policy, Delivery, or Practice: These results have implications for potential consolidators in public health districts. In a time of significant economic constraints to manage and operate a public health department, public health districts have sought ways to become more efficient while providing mandated and recommended public health services for their communities. More research is needed to develop ways to assess employee perceptions about the consolidation as well as their perceptions and familiarity with “New Public Health paradigm” as both of these will impact the operation of a newly formed organization.

Funding Source(s): Other, County Health District

Poster Session and Number: C, #1255

Provider’s Encouragement and Breastfeeding Practices in Los Angeles County: Findings from the 2010 Los Angeles Mommy and Baby Survey
Stacy Sun, Tulane Medical School; Shin Chao, MCAH

Presenter: Shin Chao, Ph.D., Chief, Research Evaluation Planning Unit, LADPH, MCAH, schao@ph.lacounty.gov

Research Objective: Despite the large body of breastfeeding research, studies addressing the timing of providers’ help/encouragement and breastfeeding practices are limited. This study examined the association between breastfeeding practices and provider’s help/encouragement provided in two time periods: during delivery hospital stay and during well-baby checkup.

Study Design: We analyzed data from the 2010 LAMB Survey, a population-based mail survey that is distributed to randomly selected women in LAC who recently had a live birth. Mothers were asked if their providers helped or encouraged them to breastfeed at the delivery hospital and during the well-baby checkup. LAMB also asked mothers if they had ever breastfed or pumped breast milk to feed their baby after delivery and if they were still breastfeeding at the time of the survey. Multiple logistic regressions were used to assess the effect of encouragement on breastfeeding practices after adjusting for potential confounders (such as: race, education, marital status, foreign born, health insurance, prenatal care, and having LBW baby). Appropriate sampling weights were used to adjust for design effect and non-response bias.

Population Studied: The final study population consisted of 6,044 singleton mothers who delivered live births in LAC in 2010 (adjusted response rate = 57%).

Principal Findings: Ninety percent of LA mothers who gave birth in 2010 were encouraged by a healthcare professional to breastfeed at the delivery hospital and 66% of them received such encouragement during well-baby checkup. Provider encouragement at the delivery was positively related to breastfeeding initiation (aOR = 2.6, 95% CI = 1.8-3.8) but not with continuous breastfeeding at 3 months duration (aOR = 0.8-0.1.95% CI = 1.8-3.8); however, encouragement received at the well-baby checkup was positively associated with continuous breastfeeding at 3 months duration (aOR = 1.5, 95% CI = 1.2-1.9). African American women or women who received less than high school education were less likely to initiate (aOR = 2.4,1.7; respectively) or continue breastfeeding (aOR = 2.1,1.8; respectively).

Conclusions: Health care providers have a significant impact on the initiation and continuation of breastfeeding. Encouragement during delivery can increase a mother’s rate of initiating breastfeeding, but ongoing provider encouragement beyond the hospital is necessary for her to continue for three months. This study points to the importance of training physicians and nurses to support breastfeeding, since some providers lack the knowledge and experience to support it. Providers should continue to provide encouragement to mothers after the mothers leave the hospital. Furthermore, providers must ensure that all pregnant women have the opportunity to make informed decisions about breastfeeding during the hospital stay and well-baby checkup. Hospitals and physician’s office can become more “baby-friendly” by taking steps such as
Annual Fecal Immunochemical Test Mailing Program for Colorectal Cancer Screening: Rate of Return in Year 2
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Research Objective: Distance from healthcare facilities can be a barrier to colorectal cancer (CRC) screening, especially for colonoscopy. A newer alternative is an improved at-home stool-based test requiring only one sample, the fecal immunochemical test (FIT). A cohort of veterans overdue for CRC screening was identified in 2011-12 in a predominantly rural Veterans Affairs (VA) Health Care System catchment area, and an intervention involving mailing FITs to patients’ homes was tested. Those who had negative FIT results continued to Phase 2. The objective in this phase was to determine the proportion of veterans who would complete a second FIT mailed to them one year after completing an initial FIT.

Study Design: One year post-intervention, subjects received a recruitment mailing and a telephone call to assess eligibility and interest in participating in Phase 2, which included a second FIT and a brief survey.

Population Studied: Phase 1 included veterans ages 51-64 who were regular users of VA healthcare and were asymptomatic, at average risk, and overdue for CRC screening. Those over 65 were excluded due to their likelihood of using non-VA services covered by Medicare. Phase 2 included those who completed an initial FIT and received a negative result.

Principal Findings: Of 192 veterans who took the FIT one year prior, 32 were ineligible for follow up testing (23 due to recent symptoms or medical history, 7 received a recent colonoscopy, 1 deceased, 1 moved away). Of the remaining 160 veterans, 126 (79%) agreed to take the survey and complete the FIT, 20 (13%) refused to continue participation, 3 (2%) had a scheduled colonoscopy and 11 (7%) could not be contacted. There were no significant demographic differences between participants and those who refused. Both groups were 90% male with an average age of 62. A higher proportion of participants were rural (58%) compared to those who refused (40%), but difference was non-significant. Among 126 survey respondents, 90% reported the FIT was easy, convenient, and it was important to have the FIT mailed to them rather than have to pick it up at a clinic/facility. Ninety-eight percent indicated they would be extremely/very likely to complete the FIT each year if mailed to them annually. Thus far, 78% of participants have completed and returned FITs; 93% were negative and 7% were positive and are scheduled for clinical follow-up.

Conclusions: Among veterans who were overdue for CRC screening and agreed to take a FIT mailed to their home, an overwhelming
majority was amenable to taking it again one year later and reported a high level of satisfaction with this method of screening.

Implications for Policy, Delivery, or Practice: The FIT presents a reasonable alternative in a population who were initially non-adherent to colorectal cancer screening guidelines. Annual FIT mailing programs may have the potential to increase CRC screening rates, particularly among those who face distance barriers to health care services. Further, these programs can stratify average risk patients to FIT testing, thus allowing those at high risk to have greater access to colonoscopy services.

**Funding Source(s):** VA
**Poster Session and Number:** C, #1257

The Assessment of Medical Utilization and Health Behavior among Elderly with Hypertension, Hyperglycemia, and Hyperlipidemia
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**Presenter:** Shang-jyh Chiou, Dr.P.H., Assistant Professor, Healthcare Administration, Asia University, chiou@asia.edu.tw

**Research Objective:** This study is to explore the relationship between health behavior (promotion and risk) and medical utilization among the elderly with hypertension, hyperglycemia, and hyperlipidemia diseases

**Study Design:** The study used the National Health Interview Survey (NHIS) in 2005 in Taiwan. On the questionnaire, the interviewer would ask more details regarding the frequencies and duration when participants had either one or more of the health promotion or risk behaviors. Based on the four categories (exercise, diet, weight control, and lifestyle), in the health promotion behavior, we derived five subgroups as well as (drinking, smoking, betel nuts), in the health risk behavior. Finally, we used the regression models to explore the relationship between medical utilization and health behavior (positive and negative) adjusted with the other characteristics.

**Population Studied:** We only used the respondents in NHIS, who were over 65 years old and consented to link to the National Health Insurance (NHI) database in 2006 for the claim information. There were 2,727 cases in the initial database; however, only 964 cases with either one of hypertension, hyperglycemia, and hyperlipidemia were included in our study.

**Principal Findings:** The more health promotion items the more OPT visiting occurrences (0.66 vs -0.13 vs 2.36 vs 1.21), resulted in less likelihood of hospitalization (-8.69 vs -6.73 vs -1.94 vs -15), while a health risk behavior decreased their OPT frequencies. Only the health risk behaviors were significantly (p<0.05) associated with outpatient services with the negative parameter (-4.42 vs -6.04 vs -11.39). Individuals with more comorbidities or having iADLs used more OPT services (2.25, 3.72 respectively) and those having ADLs used more admissions (1 vs 24.87).

**Conclusions:** Most elderly did not have the risk behaviors while they also need to pay more attention in diet and weight control. Surprisingly, the subjects having health risk behaviors do not use more OPT visits, which needs the further studies to provide more evidence. The more health promotion behavior results in the less the hospitalization and expenditure use.

**Implications for Policy, Delivery, or Practice:** The health authorities can design feasible strategies to encourage the elderly to practice more health promotion behaviors in order to reduce hospital admission expenditures. Patients with chronic diseases need to adhere to the clinical protocol which requires them to utilize outpatient services regularly. Thus, it is essential to help patients to continuously have health promotion behaviors in order to control their chronic diseases.

**Funding Source(s):** No Funding
**Poster Session and Number:** C, #1258

Patient Protection and Affordable Care Act: Public Perceptions toward Quality and Access to Care
Neale Chumbler, University of Georgia College of Public Health; Samir P Desai, University of Georgia College of Public Health; Kevin Dobbin, University of Georgia College of Public Health

**Presenter:** Neale Chumbler, Ph.D., Professor And Department Head, Department of Health Policy and Management, University of Georgia College of Public Health, chumbler@uga.edu

**Research Objective:** As the new Patient Protection and Affordable Care Act (PPACA) nears full implementation in 2014, there remains unanswered details regarding the extent to which both the access and quality of care will improve for US residents. The purpose of this
study was to assess the beliefs and attitudes regarding the public’s perspectives regarding the extent to which the quality of care and access to care will increase after the implementation of the PPACA.

**Study Design:** Random digit dialing was used to generate the survey sample after identifying all landline telephone exchanges in Georgia and determining relevant proportional household estimates. A total of 13988 random numbers were dialed by interviewers using a computer-assisted telephone interviewing system to acquire 503 completed interviews between November 20, 2012 and November 28, 2012 (2-3 weeks after the election). The cooperation rate, as defined by the American Association for Public Opinion Research was 29 percent, a rate comparable to national telephone surveys. The survey yielded a margin of error of ±4 percent. Multiple imputation technique was used to account for missing data. Ordinal logistic regression models were used to assess the extent to which Georgian’s believe the quality of care and access to care would increase, decrease or the stay the same after implementation of the PPACA, adjusting for the following respondent variables: 1) sociodemographics (age, gender, marital status, race/ethnicity); 2) self-rated health status; 3) sense of coherence (SOC; a construct used to explain why some people are more disposed than others to illness after stressful situations); 4) travel time to doctor’s office; and 5) importance of short wait times as doctor’s office.

**Population Studied:** Household residents of Georgia aged 18 years or older.

**Principal Findings:** A majority of respondents were white (n=360) and female (n=313). The majority (n=445) of the respondents had at least a high school degree. Approximately 46 percent of the respondents believed that quality of care would either increase or stay the same after implementation of PPACA. Similarly, 52 percent of the respondents believed that access to care would either increase or stay the same after implementation of PPACA. The ordinal regression model found that individuals who were White were more likely to believe the quality of healthcare would decrease (p=0.06) after implementation of PPACA.

**Conclusions:** Public perceptions towards the PPACA and its impact on quality and access to healthcare seem to differ based on an individuals’ race and SOC. An individuals’ race and SOC could be further explored to tailor communication strategies in an ethnically diverse context.

**Implications for Policy, Delivery, or Practice:** A concerted effort to develop communication strategies and outreach efforts to better educate the general population on the PPACA may alleviate some of the reservations that are inherent to any major policy implementation, especially in terms of healthcare quality and access.

**Funding Source(s):** No Funding

**Increasing Influenza Vaccination Rates among Restaurant Employees: A Pilot Study**

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**Presenter:** Meredith Cook, M.S., Doctoral Candidate, Health Services, University of Washington Health Promotion Research Center, cookm3@uw.edu

**Research Objective:** Influenza vaccination rates in the U.S. are only about 40 percent, despite the recommendation from the Centers for Disease Control and Prevention (CDC) that all adults receive the vaccination. Influenza has consequences for healthcare costs and population health. The total annual cost burden of influenza is $87.1 billion and it is responsible for an estimated 3,000 to 49,000 deaths annually.

Workplaces can help raise influenza vaccination rates and have an incentive to prevent influenza among employees. Evidence-based approaches employers can use to increase vaccination include increasing physical access, making vaccination free, and engaging in promotion.
Disseminating these approaches to restaurants could increase vaccination rates and help address rate disparities. While implementation in restaurants could help reach a demographic with particularly low vaccination rates that is frequently uninsured, it presents unique challenges.

Our objectives were to implement a low-intensity, evidence-based approach to increasing vaccination rates and to describe the distinct challenges of implementing the restaurant industry.

**Study Design:** We conducted a pilot study of an influenza vaccination program with a group of Seattle-area restaurants. All participating restaurants received free materials to promote influenza vaccination, assistance arranging an onsite vaccination event, and free influenza shots for their employees. We surveyed employees, regardless of vaccination status, before and after the intervention to measure change in overall vaccination rates and employee attitudes. We also surveyed employees vaccinated at the restaurant to capture their demographics. We collected data on implementation using direct observation and by interviewing managers after the intervention.

**Population Studied:** Our study population was a convenience sample of 11 restaurants in the Seattle metropolitan area. Participating restaurants had at least 25 employees who spoke English or Spanish and were over 18 years of age. We included only full-service restaurants and those without a history of worksite vaccination.

**Principal Findings:** 428 restaurant employees completed pre-intervention surveys. A mean of 26.2 percent of employees received the flu vaccination in 2011-2012. We observed differences in baseline vaccination rates associated with race/ethnicity, age, and education level. Attitude towards influenza vaccination was positively associated with vaccination status. Vaccination rates among Hispanic/Latino respondents were higher (31.4 percent) than among non-Hispanic/Latino respondents (24.9 percent).

A mean of 71.0 percent of employees at work on the day of the vaccination event received the flu vaccination and 37.0 percent of all employees were vaccinated. A mean of 45.8 percent of those vaccinated had not received an influenza vaccination before. Managers were key to the intervention’s success. Workplace vaccination rates were higher when managers took a more active role in promotion and exhibited more positive interactions with employees.

**Conclusions:** Baseline vaccination rates in restaurant employees were low. A substantial proportion of employees chose to get vaccinated when financial and physical access barriers were removed. With minimal investment, restaurants can use access and promotion-based strategies to increase vaccination rates.

**Implications for Policy, Delivery, or Practice:** Low-intensity, evidence-based vaccination strategies to increase vaccination rates can be successfully adapted to the restaurant setting. Because of the importance of managers in promoting vaccination, efforts to disseminate workplace-based vaccination promotion strategies to restaurants should focus on management buy-in.

**Funding Source(s):** CDC

**Poster Session and Number:** C, #1260

**Tracking Effects of Laws Governing State Public Health Organization Over Four Decades**

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**Presenter:** Julia Costich, J.D., Ph.D., Professor, Department of Health Services Management, University of Kentucky, julia.costich@uky.edu

**Research Objective:** State public health agencies and organizations have long been subject to reconfigurations. The legal infrastructure that gives rise to such changes in agency organization is created and modified by state law as it evolves over the state’s history. From 1974-1991, the Public Health Foundation (PHF) was responsible for the annual collection and analysis of voluminous state public health data, including elements of the state agency’s authority, governance, and scope of action. Unfortunately, data collection was discontinued when funding ceased in 1991, but annual data are available for the 17 intervening years, covering important periods in the evolution of state health departments. In more recent years, the Association of State and Territorial Health
Officials (ASTHO) has collected similar data in their state Profile Surveys.

**Study Design:** We have encoded the PHF dataset to support machine-readable analysis and longitudinal comparison with the ASTHO data. The legal elements serve as independent variables in the form of a dataset and coding manual that allow for uniform data entry. Combining these two datasets allows us to examine the long-term impact of legal changes on the activities of the state health department, including activity scope, funding, and ability to carry out their roles.

**Population Studied:** State public health departments

**Principal Findings:** Alterations to state public health agency organizational structure are found in statutes, regulations, executive orders, and subregulatory documentation. Linking legal cause to public health effect requires consideration of a host of factors, including the intervals between legal enactment and implementation, between implementation and impact, and between any combination of these elements and other relevant events. Generally, movement from freestanding status to integration with an umbrella super-agency is associated with a reduction in public health-specific funding and activity scope. More commonly, specific functions (e.g., services for vulnerable populations such as older adults and persons with disabilities) are carved in or out of state public health agencies, leading to related increments in funding and activity scope.

**Conclusions:** The legal infrastructure of state public health can have major effects on the type and scope of activities as well as funding for state public health agencies. The impact of changes in governing law may have effects that are more subtle than those detected in quantitative reports and assessment would be enhanced with qualitative research.

**Implications for Policy, Delivery, or Practice:** Frequent legal initiatives to alter agency structure can jeopardize the success of long-term investments and collaborations across units that are essential to addressing major population health issues. Policy makers should assess potential consequences carefully before undertaking changes to public health agency structure.

**Funding Source(s):** RWJF

**Poster Session and Number:** C, #1261

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**Case Studies in Public Health Law Enforcement**

Julia Costich, University of Kentucky; Dana J. Patton, Ph.D., Univ. of Alabama Dept. of Political Science

**Presenter:** Julia Costich, J.D., Ph.D., Professor, Department of Health Services Management, University of Kentucky, julia.costich@uky.edu

**Research Objective:** Law is an essential tool in public health but resource constraints and hostility towards government intervention heighten the need for well-informed and equitable enforcement. We developed an approach to assessing enforceability and potential enforcement cost of public health laws, and now test the method with a series of case studies.

**Study Design:** The analytical model includes the proposed level of enforcement (local, state, federal, etc.), the locus of regulated activity, the relationship between the regulated activity and other regulatory functions, and the extent to which violations are detectible. We tested the ability of the analytical matrix to identify ineffective enforcement strategies, using findings from The Community Guide regarding public health legal interventions, primarily in the area of injury prevention. Data sources include law enforcement and transportation records as well as the more traditional data supporting health services research.

**Population Studied:** Not applicable.

**Principal Findings:** Mismatches between enforcement and legal objectives undermine the effectiveness of some public health laws, while in other instances, the text of a law can obstruct enforceability. Public health education and the development of social norms associated with the signaling effect of law may help fill some of these gaps, but when public safety is at issue, reliance on “softer” approaches can impede the effect envisioned by the law’s sponsors. All-terrain vehicle laws are a prime example of enforcement provisions that are based on a false analogy, in this case between highway traffic and off-road vehicle use.

**Conclusions:** Enacting new public health law requires considerable investment of political capital, and public health policy makers need to assure elected officials that their efforts have strong odds of achieving the desired goal. Attention to appropriate enforcement strategies can improve the effectiveness of public health law.
Implications for Policy, Delivery, or Practice: Enforcement strategies consistent with public health objectives are essential for effective public health law, particularly in this era of resource constraints.

Funding Source(s): No Funding

Poster Session and Number: C, #1262

Ambulatory Diagnosis and Treatment of Non-Malignant Pain in the United States, 2000-2010
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Research Objective: To characterize the diagnosis and management of non-malignant pain in ambulatory, office-based settings between 2000 and 2010.

Study Design: We conducted a serial cross-sectional analysis of the National Ambulatory Medical Care Survey (NAMCS), a nationally representative audit of office-based physician visits. Our main outcomes included the annual volume of visits with a primary symptom or diagnosis of pain and reported prescription opioid or non-opioid pharmacologic therapy in visits limited to new musculoskeletal pain.

Population Studied: Analyses were limited to adults without a diagnosis of malignancy.

Principal Findings: The prevalence of reported pain as a primary symptom or diagnosis consistently represented one-fifth of visits, varying less than 2% from 2000 through 2010. Patient-reported pain as a primary symptom comprised 17% to 19% of visits, whereas provider diagnoses of pain increased nearly 50% from 2000 (5.7% of visits with pain as a primary diagnosis) to 2010 (8.5%). Among all pain visits, opioid prescriptions nearly doubled from 11.3% to 19.6%, whereas use of non-opioid analgesics remained unchanged (26%-29% of visits). Pain medications were associated with one-half of new musculoskeletal pain visits, with the use of non-opioid pharmacotherapies decreasing from 38% of visits (2000) to 29% of visits (2010). After adjusting for potentially confounding covariates, few patient, physician or practice characteristics were associated with the use of non-opioid rather than opioid analgesia. Multiple sensitivity analyses supported the robustness of our results and their substantive interpretation.

Conclusions: Increased opioid use during the past decade has not been accompanied by similar increases in non-opioid analgesics. Clinical alternatives to prescription opioids may be underutilized as a means of treating ambulatory non-malignant pain.

Implications for Policy, Delivery, or Practice: Concern among clinicians and policy-makers regarding prescription drug abuse has often been countered by calls to improve the identification and treatment of chronic non-malignant pain. We examine whether the dramatic escalation of prescription opioid sales has been accompanied by similar increases in non-opioid analgesics and changes in pain prevalence. Our findings indicate that the prevalence of reported pain in ambulatory practice has not changed during the past decade. However, patients’ symptoms are increasingly diagnosed by clinicians and treated with prescription opioids. Trends in opioid prescriptions have not been paralleled by similar increases in the use of non-opioid therapies, representing an important opportunity to reduce a growing epidemic of prescription opioid abuse.

Funding Source(s): AHRQ

Poster Session and Number: C, #1263

The Effect of a Smoking Reduction Policy on Health Care Expenditures
Noelia Duchovny, Congressional Budget Office; James Baumgardner, Congressional Budget Office

Presenter: Noelia Duchovny, Ph.D., Analyst, Health, Retirement, and Long-Term Analysis Division, Congressional Budget Office, noelia.duchovny@cbo.gov
Research Objective: To quantify the impact of an illustrative 50-cent (or 10 percent) increase in the cigarette tax on health care expenditures over a 75-year period and to describe how changes in smoking, survival, and health care spending evolve over time.

Study Design: Econometric analysis was conducted to estimate the impact of smoking on mortality and the impact of smoking on health care expenditures, using National Health Interview Surveys linked to mortality data and to the Medical Expenditure Panel Survey, respectively. Based on that analysis, a simulation of overlapping cohorts of people whose smoking behavior is changed—using elasticities from the literature—was conducted to forecast the effects of a permanent increase in the cigarette tax on smoking rates, longevity, and total health care spending over a 75-year period.

Population Studied: Non-institutionalized adults, age 18 and older, who smoke at the time of the tax increase and others who would become smokers over the study period.

Principal Findings: After controlling for differences in observable characteristics between smokers (current and former) and nonsmokers, we find that smoking increases health care spending by 11 to 16 percent, depending on the age group. The probability of dying in the next year is also higher among smokers: between the ages of 25 and 74, smokers are roughly twice as likely to die as people who have never smoked but who have the other characteristics of smokers. Thus, an increase in the cigarette tax would result in reduced spending per capita and an increased number of people because of lower mortality rates. Total health spending is the result of those two countervailing forces, with the latter force being relatively strong among the older population over the longer term.

Based on elasticities from the literature, we estimate that, by 2021, the higher tax would result in about 1.4 million fewer smokers and about 10,000 adults who would not otherwise have survived to that year. Over time, the policy’s impact on health and longevity would grow because of the continuing improvement in health for people who stopped smoking, the decline in the share of adults who took up smoking, and the cumulative effect of lower mortality rates. We estimate that, by 2085, an additional 200,000 people would be alive because of the higher tax. Detailed simulation results will estimate the path of the change in total health spending over time as a result of the policy.

Conclusions: Raising the tax on cigarettes would likely result in lower total health care spending initially; over time, the effects of increasing longevity would become more important.

Implications for Policy, Delivery, or Practice: Even so, changes in health care spending are one of many considerations of a policy aimed at reducing cigarette consumption.

Funding Source(s): No Funding

Poster Session and Number: C, #1264

Longitudinal Relationship between Obesity and Musculoskeletal Disorders among Registered Nurses

Kihye Han, University of Maryland School of Nursing

Presenter: Kihye Han, Ph.D., R.N., Post-doctoral Fellow, Department of Family and Community Health, University of Maryland School of Nursing, khan001@umaryland.edu

Research Objective: Nurses, the largest group of health care workers, are at greater risk of work related musculoskeletal disorders (MSD) than other workers. There is a lack of knowledge about the relationship between obesity and MSD in nurses. In addition to the physically demanding nature of nursing work and work-related sleep problems attributed to scheduling, some hypothesize that obese employees are more likely to have poor ergonomic fit and lack of alertness at work due to sleep difficulties thus resulting in injury or disorder of the joints or other tissues in the back or the upper/lower limbs. This study examined the impact of obesity on reported MSD of back, neck and shoulder among registered nurses.

Study Design: This study utilized data from the longitudinal Nurses Worklife and Health Study that had collected information on self-reported weight and height at baseline and MSD symptoms six and 15 months in subsequent waves. Overweight/obesity was defined as 25 or more body mass index. MSD cases were defined as those with relevant symptoms in the back, neck, and/or shoulder lasting one or more weeks, or at least monthly, with moderate or more pain, on average. Using binomial regression models, we related baseline obesity to the new occurrence of three types of MSD (back, neck, shoulder). Other potential risk factors were also included in models: physical...
and psychological demands, restless and/or inadequate sleep, age, race/ethnicity, caring for dependents, and lack of exercise.

**Population Studied:** Out of the 4,229 eligible actively licensed nurses sampled randomly from two US states, a cohort of 2,273 nurses working in nursing within the past year of the baseline survey participated in all three waves. Study nurses had similar characteristics to US nurses in terms of age (47 years old on average), race (87% White), gender (95% female), education (48% diploma/associate’s degree) and work setting (54% working in hospitals).

**Principal Findings:** The estimated proportion of overweight/obese nurses was 55%. Cumulative incidence of MSD was 21% for back, 14% for neck, and 17% for shoulder problems. When compared to underweight/normal weight nurses, overweight/obese nurses were significantly more likely to have an incident MSD: back (OR=2.17, 95% CI=1.70-2.78), neck (OR=1.72, 95% CI=1.31-2.25) and shoulder (OR=1.97, 95% CI=1.51-2.58). These associations were attenuated slightly after including other potential risk factors: back (OR=1.97, 95% CI=1.48-2.63), neck (OR=1.61, 95% CI=1.17-2.22) and shoulder (OR=1.71, 95% CI=1.24-2.37). Nurses with incident MSD were also significantly more likely to report high physical and psychological demands, restless and inadequate sleep than asymptomatic nurses.

**Conclusions:** Obesity was significantly associated with nurse MSD. Findings suggest that efforts to reduce obesity, as well as job demands and impaired sleep, among nurses could be beneficial to minimize risks of MSD.

**Implications for Policy, Delivery, or Practice:** To prevent MSD in nurses, collective actions for reducing obesity would be helpful. A favorable organizational climate that offers healthier food choices and meal breaks for sufficient time to have a proper meal can decrease obesity risk and future health problems such as MSD. Additionally, ergonomic re-design of workplace to decrease demands and efforts to improve quality and quantity of sleep by providing healthful work schedules may also be beneficial to protect nurse MSD.

**Funding Source(s):** No Funding. The original data collection for the Nurses Worklife and Health Study was supported by National Institute for Occupational Safety and Health R01 OH07554 (Dr Trinkoff, PI).

**Poster Session and Number:** C, #1265

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**Community Factors and Hospital Readmission Rates**

Jeph Herrin, Health Research & Educational Trust; Justin St. Andre, Health Research & Educational Trust; Kevin Kenward, Health Research & Educational Trust; Maulik Joshi, Health Research & Educational Trust; Anne-Marie J. Audet, The Commonwealth Fund; Stephen J. Hines, Health Research & Educational Trust

**Presenter:** Jeph Herrin, Ph.D., Senior Statistician, Health Research & Educational Trust, jeph.herrin@yale.edu

**Research Objective:** To examine the relationship between community factors and hospital readmission rates.

**Study Design:** We used hierarchical linear models to assess the effects of a range of county factors, including socio-economic, health system, and urban characteristics, on the pooled AMI, HF, and PNE 30-day risk standardized readmission rate (RSRR).

**Population Studied:** We examined all hospitals with publicly reported 30-day readmission rates for patients discharged during July 1 2007 to June 30 2010 with acute myocardial infarction (AMI), heart failure (HF), or pneumonia (PNE). We linked these to publicly available county data from the Area Resource File, the Census, Nursing Home Compare, and the Nielsen PopFacts data sets.

**Principal Findings:** The main findings are based on readmission rates at 4,073 hospitals located in 2,254 counties or county equivalent.

Before accounting for any hospital or county characteristics, 58 percent of national variation in the pooled 30-day RSRR was explained by the county in which the hospital was located. In multivariable analysis a number of county factors were found to be independently associated with increased hospital readmission rates, including: higher proportions of the population never married (adjusted difference in RSRR between highest and lowest quartile [95% Confidence Interval]: 0.42% [0.18%,0.66%]; P < 0.001); lower numbers of general practitioners per capita (-0.80% [-1.09%,-0.51%]; P < 0.001); higher numbers specialists per capita (0.70% [0.22%,1.17%]; P < 0.001). Other independent factors were lower ratio of general practitioners to specialists, lower nursing home quality, more hospital beds per capita, and central urban rather than rural location. County factors explained 27.5% of the variation in rates across
Hospital and Emergency Department Fall-related Injury Rates among Seniors: Does Place Matter?
Geoffrey Hoffman, University of California, Los Angeles Fielding School of Public Health; Hector Rodriguez, PhD, UCLA Fielding School of Public Health

Research Objective: Research suggests that fall-related risk factors or health outcomes may be related to area-level characteristics such as its demographic makeup and types of health resources. Yet, little if any research has examined the association of fall-related injuries (FRI) and area-level factors and there is uncertainty regarding how to define the geographic boundaries used in area-level analyses. We examine FRI and area-level associations using two types of area measurements—county and Primary Care Service Area (PCSA)—to identify predictors and to observe whether there are differences in predictors across types of areas.

Study Design: We estimate ED and hospital FRI rates per 100,000 seniors by county and by PCSA using OLS regression with robust standard errors. Results were consistent when using random intercepts and GEE models. FRIs were measured using ICD-9 external cause of injury codes. Predictors included county- and PCSA-level health resources (number of MDs, RNs, SNFs, and HHAs per 1,000 older adults (65 and older) and FQHCs), indicators of need (percentage living in HPSAs, median household income), and demographic characteristics (proportions of females and racial/ethnic minorities).

Population Studied: We use 2000-8 hospital and 2005-8 emergency department (ED) discharge data from the California Office of Statewide Health Planning and Development (OSHPD), the 2000-2008 California Department of Finance, the 2004 and 2005 Area Resource Files (ARF), the 2005-2008 Dartmouth Atlas. We examined 636,687 hospital FRIs and 521,403 ED FRIs for adults ages 65 and older who had California addresses in the OSHPD administrative discharge data.

Principal Findings: The average FRI rate per 100,000 seniors was 3,578 in EDs and 1,775.9 in hospitals. Regression coefficients represent FRI rate changes associated with a 1-SD change in the area-level predictors. Area-level variables in the Dartmouth and ARF data were not equivalent and not entirely comparable. FRI rate predictors were remarkably consistent using county and PCSA definitions of the area but somewhat divergent across hospital and ED settings. The levels of health resources in a given area were largely positively predictive of county FRI rates (e.g., HHAs associated with increases of 402.9 in ED and 91.8 in hospital county-level FRI rate). Measures of need had mixed associations in hospitals and EDs. Higher proportions of minority populations were generally associated with lower FRI rates (e.g., -180.3 in ED and -50.8 in hospital PCSA-level FRI rates) while higher female proportions (288.5 in hospital and 338.1 in ED county-level FRI rates) were associated with substantial increases in FRI rates.

Conclusions: Health resources and socioeconomic factors are associated with elderly FRI rates using two different geographic boundaries. Thus, the type of areas in which seniors live and the levels of resources available to them are associated with utilization of care for FRIs in hospitals and EDs.

Implications for Policy, Delivery, or Practice: The results have methodological and policy implications for falls research and prevention. Both county and PCSA geographic definitions are appropriate for use in these types of analyses. Policy makers can address disparities in FRI rates according to the level of health resources and the racial/ethnic composition in an area, which may target improvement efforts addressing under- or over-utilization of resources.

Funding Source(s): RWJF

Poster Session and Number: C, #1267
Green Affordable Housing as an Opportunity to Improve the Health of Low Income New Yorkers: An Analysis of the Population Seeking to Move into Health-Promoting Buildings

Ahuva Jacobowitz, New York City Department of Housing Preservation and Development; Jack Jerome, New York City Department of Housing Preservation and Development; Elyzabeth Gaumer, New York City Department of Housing Preservation and Development

Presenter: Ahuva Jacobowitz, B.A., Research Coordinator, Housing Policy Research and Program Evaluation, New York City Department of Housing Preservation and Development, jacobowa@hpd.nyc.gov

Research Objective: This project examines the demographics and baseline health characteristics of households that apply to move to green affordable housing developments that incorporate health-promoting features, including smoke-free policies, one-site fitness centers, common green space with supports for passive and active recreation, and design features that seek to promote stair utilization over elevators. Knowing more about the population that seeks to move to these types of projects will help to develop a better understanding of the potential impact of constructing these types of buildings for low-income households.

Study Design: A self-administered questionnaire was administered to one individual from each household that appeared for a screening interview (n=4,000 applicants) at each of four new construction green affordable sites that are all LEED certified and incorporate healthy-promoting design elements(n=372 units). Survey data provide information on a range of characteristics, including household composition, housing and neighborhood quality, and baseline health status (physical and mental health, as well as health behaviors) at the time of application for housing. Descriptive data for the applicant population at these four sites is compared to applicants to other non-green affordable housing sites also constructed over the same period in New York City. These data are also compared to citywide population data to examine whether there is any evidence of self-selection among the applicant population and/or whether applicants to green housing appear to be healthier at baseline than similar populations that do not apply to move to health-promoting buildings.

Population Studied: Low-income households that applied to affordable housing sites in New York City.

Principal Findings: The findings show that low-income households that apply to move to health promoting green buildings are similar in baseline health status and demographic characteristics to the broader, citywide population.

Conclusions: This supports the idea that green housing may provide a novel intervention that can help to alter health behaviors among low-income households by aligning health interventions with affordable housing development.

Implications for Policy, Delivery, or Practice: If scaled, green health-promoting affordable housing may help to encourage active lifestyles that could reduce healthy disparities over time for this vulnerable population.

Funding Source(s): NIH, The John D. and Catherine T. MacArthur Foundation

The Effect of Clean Indoor Air Laws on Asthma Discharges: A 17 State Analysis

Glenn Landers, Georgia State University

Presenter: Glenn Landers, Sc.D., M.B.A., M.H.A., Associate Project Director, Georgia Health Policy Center, Georgia State University, glanders@gsu.edu

Research Objective: To test whether or not clean indoor air laws are associated with reductions in working age adult and child asthma discharges.

Study Design: The study employs a pre/post non-equivalent control group design. Quarterly county rates of asthma discharges before a state’s implementation of a clean indoor air law are compared with rates after implementation, controlling for the presence of county laws. The study uses Hill’s guidelines for causality as a framework to improve causal inference.

Population Studied: The selection of study states is dependent on the date each state implemented its smoke-free law and the availability of each state’s HCUP State Inpatient Data (SID). As of April 2011, 35 states had some form of statewide clean indoor air law (workplace, restaurants, bars, or combinations thereof). Twelve of these states serve as study states, and five serve as controls. Together, they had a combined population in 2005 of more than...
103,000,000 individuals, or about 35 percent of the U.S. population.

**Principal Findings:** The effect of state clean indoor air laws on working age adult and child asthma discharges over and above the effect of preexisting county laws is not significantly different from zero; however, county laws are associated with statistically significant reductions in both working age adult and child asthma discharges. The effect of county workplace laws on working age adult asthma discharges over and above the effect of other types of county smoke-free laws is also not significantly different from zero; however, other types of county smoke-free laws alone are associated with reductions in working age adult asthma discharges.

**Conclusions:** The results do not support a link between state laws and reductions in asthma discharges over and above the effect of county laws, but they do support a link between county laws and asthma discharge reductions. They also support a link between other county smoke-free laws (i.e. not workplace laws) and asthma discharge reductions. The results are strengthened by the use of Hill’s guidelines for causality, which suggest the links between county laws and asthma discharge reductions demonstrated in this study may be causal.

**Implications for Policy, Delivery, or Practice:** This is the first multi-state analysis of clean indoor air laws using the HCUP SID. The results from this study lend support to community-based smoke-free policy approaches, but should not be taken as state tobacco policies not being effective. In fact, the Institute of Medicine recommends multifaceted state approaches to reducing the effects of tobacco use (IOM, 2000). The study’s findings are also important for the implications of state law preemption. It may be unwise for smoke-free advocates to pursue state level smoke-free laws in states that have yet to pass a comprehensive law. Rather, their efforts might be better focused at the local level, where the evidence finds there is a significant effect. The study highlights the advantages and disadvantages of using the HCUP SID. The HCUP SID would be even more useful to researchers if AHRQ actively worked to encourage nationwide participation in the standardized database and encouraged states to not censor individual data fields within the SID.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #1269

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**Rural-Urban Differences in Health Care Expenditures and The Influenced Factors**

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**Presenter:** Wei Chen Lee, M.S.P.H., Doctoral Student, Health Policy and Management, Texas A&M University Health Science Center, wlee@srph.tamhsc.edu

**Research Objective:** This study sought to address whether and to what extent there are rural-urban differences in the healthcare expenditures. Additionally, this study explored what characteristics of urban and rural populations related to their expenditures on hospital outpatient, hospital inpatient, and home health care.

**Study Design:** A two-part model was used to compare expenditures and percentage of zero users in rural areas with those in urban areas. Two multinomial regression models were conducted to examine the influenced factors of healthcare expenditures for urban and rural populations, respectively. To account for the complex multi-stage sample design, all analyses were weighted to produce national statistics based on a person-level weight variable generated by the Agency for Healthcare Research and Quality (AHRQ).

**Population Studied:** This secondary-data analysis used the 2009 Medical Expenditure Panel Survey (MEPS) data set, a nationally representative survey of the U.S. civilian noninstitutionalized population. Excluding people under 18 years old and who did not complete the survey, the final sample is composed of 26,008 adults representing 229,283,460 national populations.

**Principal Findings:** Overall, there are 15.96 percent of samples from rural areas. Urban-rural differences in expenditures were small across all and within each type of service. There are higher percentages of zero users among urban populations. Urban populations averaged higher in total healthcare expenditures than rural populations after controlling for demographics, care needs, and enabling factors. Age, gender, race, education, insurance, and health conditions influenced the expenditures of urban populations while age, gender, race, marital status, insurance, and several health-related...
factors influence the expenditures of rural populations.

**Conclusions:** The hypothesis that expenditures for rural populations would be substantially more than their metropolitan counterparts due to their worse health conditions was not proved. Even though there are fewer nonzero users in urban areas, higher cost of keeping healthy could be the driver of their high expenditures.

**Implications for Policy, Delivery, or Practice:** The healthcare expenditures in the United States have been rising in the past three decades and expected to grow even faster nowadays. For people already receiving care, the quality of care received should be further analyzed. As to better serve uninsured and ill populations, it is imperative to recognize whether the price of care is affordable and whether the services they need are accessible. Greater coordination among rural community hospitals is also important to tackle challenges due to geographic location, small size, limited workforce, and constrained financial resources.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #1270

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The Impact of California Emergency Department Closures on Inpatient Mortality

Charles Liu, Harvard Medical School; Judith H. Maselli, Department of Medicine, University of California, San Francisco; Renee Y. Hsia, Department of Emergency Medicine, University of California, San Francisco

**Presenter:** Charles Liu, A.B., M.D. Candidate, Harvard Medical School, charles_liu@hms.harvard.edu

**Research Objective:** Between 1996 and 2009, the annual number of ED visits in the US increased by 51% while the number of EDs nationwide decreased by 6%, leading to increased ED crowding and overextension of ED staff. Studies have shown that communities with more minority, Medicaid, and low-income patients are at higher risk of having their EDs close, a trend that may widen disparities in access to health care. While recent studies have shown that ED closures are associated with worse outcomes for patients with acute myocardial infarction and other time-sensitive conditions, none has investigated the impact of closures on all-cause inpatient mortality for a general population. Furthermore, these past studies have generally used ED crowding or change in travel distance to the nearest ED as surrogates for ED closures, rather than investigating the effects of closures directly. To improve our understanding of these effects, we examined the association between ED closures in California in 1999-2010 and the inpatient mortality rate of patients hospitalized near those closures.

**Study Design:** We identified all instances of ED closure during the study period using the California Office of Statewide Health Planning and Development (OSHPD) Hospital Annual Utilization Data files, supplemented and verified with phone calls to hospital administrators and public health authorities. We defined relevant ED closures as those occurring within the patient’s Hospital Service Area (HSA), as defined by the Dartmouth Atlas Project, and we obtained patient-level mortality data from the California OSHPD Patient Discharge Data files. To determine the effect on inpatient mortality of admission to a hospital experiencing an ED closure in its HSA, we ran a multivariate generalized linear regression model.

**Population Studied:** Our study population included all patients admitted via the ED to general acute care hospitals in California in 1999-2010.

**Principal Findings:** In our analysis, 25.1% of admissions studied experienced an ED closure in their HSA. Patients exposed to ED closure experienced higher odds of inpatient mortality than those not exposed to closure (odds ratio [OR]: 1.05, 95% confidence interval [CI]: 1.02-1.09). In our sensitivity analysis classifying admissions as “exposed” only when they occurred within 2 years of an ED closure in their HSA, the increased mortality for patients exposed to closure persisted (OR: 1.04, 95% CI: 1.02-1.07).

**Conclusions:** ED closures are associated with an approximately 5% increase in odds of inpatient mortality at nearby hospitals. Without interventions, vulnerable populations will likely continue to experience increased mortality associated with their disproportionate exposure to ED closures.

**Implications for Policy, Delivery, or Practice:** Whether to intervene to limit or stop ED closures is a complex, multifactorial decision that must be weighed by communities and policymakers, but our findings suggest it may be time to reconsider the current practice of letting market forces alone largely determine ED closures and access. Proposals to regulate the closure of EDs are not a new idea – calls for this approach can be found as early as three decades ago. While
interventions of this type can be difficult to enact and implement, however, our findings indicate that such regulation could lead to lives saved in the entire surrounding community.

**Funding Source(s):** NIH

**Poster Session and Number:** C, #1271

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**A System Dynamics Evaluation of HIV/AIDS Care for Women of Color**

David Lounsbury, Albert Einstein College of Medicine; Anton Palma, MPH, Albert Einstein College of Medicine; Arthur Bank, PhD, Albert Einstein College of Medicine

**Presenter:** David Lounsbury, PhD, Assistant Professor, Epidemiology and Population Health, Albert Einstein College of Medicine, david.lounsbury@einstein.yu.edu

**Research Objective:** As part of an on-going, multi-site program evaluation to develop and implement evidence-based strategies to enhance HIV/AIDS care for women of color (WOC) we used system dynamics (SD) modeling (Richardson and Pugh, 1981) to assess the effectiveness of various HIV demonstration programs. Specifically, our SD model seeks to demonstrate sites’ effectiveness in patient engagement over a five year (60 month) time horizon, given site-specific program innovations, local service capacity, and local epidemiologic burden. We also sought to assess the utility of the group modeling building method (Vennix, 1996) for program evaluation and decision making.

**Study Design:** We conducted a multiple case study comparison of seven selected program sites using Vensim modeling software. Collaborating with stakeholders from each site, we used group model building to: (1) formulate a general SD model of patient engagement; (2) estimate site-specific initial key parameters in the model; (3) generate and assess simulated model output. The final model was designed to examine three types of interventions: (1) outreach to newly diagnosed persons, (2) enhanced retention activities, and (3) outreach to persons lost to care. A series of ‘webinars’ with site stakeholders were scheduled using a conference call line and an interactive computer screen-sharing service. Field notes from sessions were qualitatively analyzed to inform a process analysis, including project feasibility and acceptability among stakeholders.

**Population Studied:** Persons living with HIV in selected catchment areas throughout the United States.

**Principal Findings:** With our guidance, sites identified useful sources of data to inform modeling, namely regional HIV surveillance data, clinic service use data, and other information about contextual factors or events affecting service delivery to WOC in their catchment area. Comparison of simulation output indicated diverse patterns of effectiveness in patient engagement across sites, with small to modest effects of interventions targeting WOC. Sites varied both in absolute numbers of patients served and in the proportion of persons who were newly diagnosed or lost to care over time. Sites faced challenges in keeping up with an increasing need for HIV primary care services. Sites reported that SD modeling taught new ways to conceptualize and synthesize data, assess changes in demand for care, and to evaluate service interventions. All sites reported that SD was novel and complemented their current evaluation activities. Incorporation of discrete external events, program implementation milestones, and effects of local epidemiologic burden served to calibrate the SD model for replication of historical patterns, which fostered confidence in the model’s validity and utility.

**Conclusions:** The model building process helped sites understand their role and potential in addressing service needs in relation to the larger epidemic. Their understanding about how patients flow through their local care system in relation to the structural dynamics associated with effective patient engagement was enhanced via presentations of site-specific simulated trends over time and by selected metrics of performance.

**Implications for Policy, Delivery, or Practice:** A system dynamics simulation via group model building is a viable and useful method for public health program evaluation projects.

**Funding Source(s):** HRSA

**Poster Session and Number:** C, #1272

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**Identifying Diabetic Adults at High Risk for Future Hospitalization Using Integrated Data**

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Nae-Yuh Wang, General Internal Medicine at Johns Hopkins School of Medicine

**Presenter:** Yanyan Lu, M.S., Biostatistician, Care Management, Johns Hopkins Healthcare LLC, ylu@jhhc.com

**Research Objective:** The increase in the prevalence of diabetes in the United States, along with the associated medical cost, has led to a demand for a risk prediction tool to identify diabetic members at high risk of hospitalization. The risk prediction model we developed improves the existing models in two ways: (1) The model was based on clinical data, in addition to administrative medical claims data. (2) The model predicted all-cause hospitalization, rather than only hospitalization for specific complications of diabetes. It is expected that the appropriate intervention will improve the clinical outcomes and increase financial savings for high risk diabetic members.

**Study Design:** We used health care plan data from Johns Hopkins HealthCare (JHHC), a managed care organization in Maryland. Our primary dependent variable is hospitalizations in 2010. The candidate predictors included demographic variables, health risk indicators from the Adjusted Clinical Groups (ACG) system, cost and utilization measures, pharmacy-related risk indicators, laboratory results and disease conditions. We conducted exploratory data analysis to determine the final model predictors observed in 2009. Clinical insight was also taken into account. Discrimination and calibration were used to evaluate the model performance. The model was validated using split sample and bootstrapping methods.

**Population Studied:** The study focused on health plan members with diabetes identified by medical diagnosis and pharmacy code. We identified 6022 diabetic members from two JHHC health plans: 44% from a commercial plan and 56% from a Medicaid plan. Health plan members 18 years or older with at least one month of enrollment in both 2009 and 2010 were included in the study. Mean age of members was 47.8 years in 2009, and 66.6% were female. Twenty-two percent had at least one inpatient admission and 38% had at least one Emergency Department (ED) visit. The average total cost of care was $14,123 per diabetic member in 2009.

**Principal Findings:** The model accuracy, measured by c-statistic (or area under ROC curve), was 0.77, indicating an acceptable model performance. A stable c-statistic was observed from both validation methods. The identified high-risk group (with risk prediction scores in the upper quartile) had an average total cost of $31,306 in 2010 and 45% had at least one admission in that year. In contrast, the low-risk group (with risk scores in the lower quartile) had an average total cost of $4,262, and 6% had at least one admission.

**Conclusions:** We developed a risk prediction model based on clinical data and administrative medical claims data. Our model predicted all-causes hospitalizations for people with diabetes. It created risk prediction scores and stratified these patients based on their risk scores.

**Implications for Policy, Delivery, or Practice:** The identification and stratification of diabetic members may contribute to the development of population health programs to improve diabetes care for those patients who are most likely to experience clinical benefit. While our prediction model uses diabetes as a representative chronic illness, the methods we developed can be generalized into an overall data driven patient-centered approach to identifying and risk stratifying people with chronic illness.

**Funding Source(s):** Other, Johns Hopkins HealthCare

**Poster Source(s):** Other, Johns Hopkins HealthCare

**Poster Session and Number:** C, #1273

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**Special Delivery: A Lifecourse Approach to Understanding the Determinants of Birth Delivery Methods in the United States**

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**Presenter:** Kara Mandell, Graduate Student, Population Health Sciences, University of Wisconsin--Madison, kmandell@wisc.edu

**Research Objective:** An increasing number of US women deliver via cesarean section (C-section); however, such surgery poses serious
risks to the mother and baby and is often not medically necessary. It is therefore critical to identify factors leading to vaginal versus C-section delivery, as they are not well understood. This study takes a lifecourse approach to understanding the factors contributing to delivery methods in the US. Specifically, this study evaluates preconception and pregnancy-related determinants of vaginal, elective and non-elective C-section delivery methods, using a nationally representative sample of women.

**Study Design:** Data are from the Early Childhood Longitudinal Study-Birth Cohort (ECLS-B), a nationally representative, population-based survey of women delivering a live baby in 2001.

**Population Studied:** We examined data on 9,350 women from the ECLS-B. Distinction between vaginal and C-section delivery was derived from birth certificate data. Three delivery methods were examined: 1) vaginal delivery (reference); 2) non-elective C-section; and 3) elective C-section. Women who delivered via C-section and also had any labor complication or delivered a preterm (<37 weeks) baby were classified as having a “non-elective C-section.” Women who delivered a term (>= 37 weeks) baby via C-section without any labor complication were classified as having an “elective C-section.” Using multinomial logistic regression, we examined the role of sociodemographics, health, healthcare, stressful life events (before and during pregnancy), pregnancy complications, and history of C-section on the odds of elective and non-elective C-sections, compared to vaginal delivery.

**Principal Findings:** 74.2% of women had a vaginal delivery, 11.3% had a non-elective C-section, and 14.5% had an elective C-section. Multivariable analyses revealed that women were more likely to have a non-elective C-section if they had experienced any preconception stressful life event, a prior C-section, any pregnancy complication, were older, obese, delivered multiples, or were living in the South, compared to women who delivered vaginally. Women were more likely to have an elective C-section if they had a prior C-section, were older, obese, or delivered multiples. Neither initiation of prenatal care nor health insurance was significantly associated with delivery method.

**Conclusions:** Over 25% of US women delivered their babies by C-section, with 44% of these women having an elective C-section. Prior C-section delivery was the strongest predictor of both elective and non-elective C-section. Preconception stressful life events significantly contribute to the risk for non-elective C-section and may present an important opportunity for intervention.

**Implications for Policy, Delivery, or Practice:** Surgical deliveries continue to occur at a high rate in the US despite evidence that they increase the risk for morbidity and mortality among women and their children. Reducing the number of elective C-sections is warranted in order to lower the short and long-term risks for deleterious health outcomes for women and their babies across the lifecourse. Moreover, a number of important factors, including preconception stressful life events, predict non-elective C-sections. Accordingly, healthcare providers should strive to identify and address such risk factors in an effort to optimize low-risk delivery methods and to improve the survival, long-term health, quality of life, and well-being of children and their mothers.

**Funding Source(s):** HRSA

**Poster Session and Number:** C, #1274

**A System Dynamics-Based Evaluation of the New York State HIV Testing Law**

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**Presenter:** Erika Martin, PhD, MPH, Assistant Professor, Rockefeller College of Public Affairs & Policy, University at Albany-SUNY, emartin@albany.edu

**Research Objective:** To increase HIV testing among New York State (NYS) residents, a 2010 law requires that all persons aged 13 to 64 be offered HIV testing as part of routine medical care, and simplifies informed consent and pretest counseling. The NYS Department of Health must also evaluate the statute’s impact on the number of HIV tests and individuals linked to care. To supplement the evaluation, we developed a system dynamics computer
simulation model of the NYS system of HIV testing and care to project long-term effects and test different implementation scenarios. 

**Study Design:** We developed a conceptual model based on discussions with system experts, and used Vensim software to create a mathematical model. Data sources include CDC, NYS surveillance and Medicaid data; published literature; and expert opinion. After calibrating the model to NYS data, we simulated: (a) baseline projections of what would happen in the absence of the law, and how results would change under (b) three different levels of implementation (low, high, perfect), and (c) alternate scenarios on the frequency of repeat testing (annual repeat testing, five-year testing, one-time testing). Outcomes include new diagnoses, proportion of late diagnoses, linkage to care among newly diagnosed individuals, number of individuals currently engaged in care, number of living cases, and new infections.

**Population Studied:** The model includes all New Yorkers aged 13 to 64.

**Principal Findings:** Without the law, we project a continuing decline in annual new infections, new diagnoses, and the fraction of undiagnosed cases, and a slight increase in people living with diagnosed HIV infection and individuals engaged in care. If implemented as designed, the law will avert HIV infections and reduce the fraction of undiagnosed cases and newly diagnosed AIDS cases. Even though new infections will decline, the number of individuals in care will remain constant due to the survival benefits of antiretroviral therapy. There were small differences across scenarios that varied the frequency of repeat testing (from one-to-time to annual), but notable differences when comparing the level of implementation (from low to perfect).

**Conclusions:** Although the law can improve critical outcomes, it will not eliminate the epidemic and there will continue to be many New Yorkers requiring HIV treatment. It is important to continue to invest in programs providing HIV care, and to use a broad policy approach with a wide range of HIV prevention interventions in addition to the law. NYS could maximize resources by emphasizing one-time testing in routine care, in addition to continued targeting testing.

**Implications for Policy, Delivery, or Practice:** System dynamics modeling is useful for health policy evaluation, particularly for complex systems, where empirical data are limited to short time horizons, for outcomes that cannot be measured directly (such as new infections), and when policies are implemented in the context of concurrent policies that may affect outcomes. In this study, we illustrated the law’s potential short- and long-term effects, identified strategies to improve implementation, and helped the NYS Department of Health select appropriate outcomes to monitor the law’s future success.

**Funding Source(s):** CDC

**Poster Session and Number:** C, #1275

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**Leading through Health Systems Change. A Public Health Opportunity**

Karen Minyard, Georgia Health Policy Center; Glenn Landers, Georgia Health Policy Center; Mary Ann Phillips, Georgia Health Policy Center; Chris Parker, Georgia Health Policy Center; Brittney Romanson, Georgia Health Policy Center; Liz Imperiale, Georgia Health Policy Center

**Presenter:** Karen Minyard, Ph.D., R.N., Executive Director, Georgia Health Policy Center, kminyard@gsu.edu

**Research Objective:** To assist public health leaders to address and apply adaptive thinking to the legal, administrative, and financial challenges that health reform poses to their organizations and to help them plan for the presented challenges.

**Study Design:** This process was informed by environmental scanning and formative research characterizing the expected impacts of the ACA on population health and public health practice. The tool heightens one’s learning capacity and leadership through two key components: technical versus adaptive thinking skills and a five-step learning process. This tool employs the theory of adaptive leadership to provide a framework of the role public health officials can take in this challenging environment, while the five-step process focuses on actions leading to innovation and strategic thinking.

To begin, learners use an online tutorial with guided practice questions related to the role of public health in the provision of clinical preventive services, surveillance and monitoring of health status, and community planning. Next, participants are introduced to a detailed tutorial of actions to consider related to technical and adaptive challenges. By the end of this process, learners have created a simplified implementation plan for navigating the integral aspects of the health reform law and health system change to improve population health.
**Population Studied:** Twenty federal, state, and local public health leaders participated in semi-structured interviews. Thirty eight state health officials attended an introduction webinar and eight senior deputies participated in a focus group. States from around the nation piloted the tool with membership organizations beginning the process.

**Principal Findings:** Qualitative data regarding the feasibility of the tool was collected through twenty semi-structured interviews, an introduction webinar, a focus group at the ASTHO Senior Deputies meeting, and a pilot program with diverse states from around the nation. The tool was developed and revised with the assistance of adult program and course development consultants.

A thematic analysis showed that overall, leaders benefited from using the tool. The flexibility of the process, working in teams or as an individual, and the mode in which the work may be completed, electronic or PDF format, were identified as key components of the ease of the tool’s usage. The process allowed for the opportunity to stay abreast of the evolving issues related to the ACA. Adaptive thinking provided leaders with a diagnostic capacity with elements in planning, building partnerships, and gathering information. As a result, participants were able to create a simplified strategic plan for their organization.

**Conclusions:** Practitioners have vital questions related to how health system change and the ACA will affect their organizations and want information and tools for navigating through the law. This tool provides a new conceptual framework that lays the groundwork for strategic action and innovation.

**Implications for Policy, Delivery, or Practice:** During this critical period of transformation, public health has the opportunity to think systematically and begin to lay the groundwork for strategic action and innovation with a conceptual framework for leading, navigating and leveraging multiple aspects of the ACA and health systems change, to improve population health.

**Funding Source(s):** Other, National Network of Public Health Institutes

**Poster Session and Number:** C, #1276

**Find a Hidden Smoker in Korea: Urine Cotinine versus Self-Reported**

Myung-Bae Park, Department of Preventive Medicine, Yonsei University Wonju College of Medicine; Chun-Bae. Kim, Department of Preventive Medicine, Yonsei University Wonju College of Medicine

**Presenter:** Myung-Bae Park, M.A., Researcher, Student, Preventive medicine, Department of Preventive Medicine, Yonsei University Wonju College of Medicine, parklove5004@naver.com

**Research Objective:** Most countries in the world including South Korea estimate national health indexes on smoking rates based on self-reported questionnaire. In South Korea, national statistics on health are measured by using KNHANES (Korea National Health and Nutrition Examination Survey). Compared to other OECD (The Organization for Economic co-operation and Development) countries, males have a high smoking rate, but female have a very low smoking rate. Nevertheless, there was almost no research on accuracy of the self-reported questionnaire survey regarding smoking rate in Korea. To compare the usefulness, urine-cotinine and the self-reported questionnaire for examining the accuracy and tendency of smoking rate.

**Study Design:** We used the database of KNHANES. This is a stratified multistage sampling design based on all household members. The urine-cotinine concentration was measured by using Gas Chromatography Mass Spectrometry by Clarus 600T of Finland PerkinElmer, with reagents Cotinine (Sigma, USA) and Diphenylamine (Aldrich/USA). The difference between the self-reported smoking rate and urine-cotinine based smoking rate will be explored by SAS 9.2 for Window. And we analyzed simple logistic regression will be used for finding out what characteristics lead to incorrect self-reported.

**Population Studied:** Among 26,665 participants of KNHANES between 2008 and 2011 whose self-reported smoking rate can be used, 14,086 people whose urine-cotinine data are available were analyzed. The subjects were 54.8% male and 45.2% female. 14.9% were the age between 19 and 29, 19.8% between 30 and 39, 19.6% between 40 and 49, 18.6% between 50 and 59, 16.7% between 60 and 69, and 10.3% 70 and older.

**Principal Findings:** The self-reported smoking rates were 48.8% for male and 7.0% for female, and, the smoking rate based on high sensitivity with no more than 20ng/ml of urine-cotinine concentration was 58.8% for males and 24.1% females. The simple kappa was 0.6854 with K=0.7517 for males and K=0.3621 for females. If
smoker defined golden standard (50ng/ml or more), the smoking rate is 51.5% for males, and 13.9% for females. The simple kappa was 0.8446 with K=0.8776 for males and K=0.5988 for females. If smokers are defined by 100ng/ml or more urine-cotinine, based on the previous research that the concentration of urine-cotinine from secondhand smoking cannot exceed 100ng/ml, smoking rates are 49.6% for males and 10.9% for females. The simple kappa was 0.8778 with K=0.8920 for males and K=0.6959 for females. The sensitivity of urine-cotinine concentration >=20ng/ml was 67.0%, specificity 98.8, positive predictive value(PPV) 97.8% and negative predictive value(NPV) 79.8%. If urine-cotinine concentration >=50ng/ml was 83.0%, specificity 98.5, PPV 96.8% and NPV 91.7%. Finally, urine-cotinine concentration >=100ng/ml was 87.9%, specificity 98.0, PPV 95.5% and NPV 94.5%. When simple logistic regression was performed based on urine-cotinine of 50ng/ml or more. Greater false response was noted among female (OR=1.267), among basal disease such as 'hypertension', 'diabetes', 'dyslipidemia' (OR=0.747), history of cancer (OR=0.693). And, the significance of difference was highest among the people in their 20s 50=<age<=60 (0.641), 60=<age<=70 (0.548), and age >=70 (0.595) in comparison to people in their 19=<age<30.

Conclusions: There was a high possibility that women would give a false answer, which means the smoking rate of Korean females is underestimated. This was due to the social desirability in Korea where women's smoking is considered a taboo. Also, an in-depth study must be conducted regarding the reason that there was an accuracy or false response according to the age, basal diseases and cancer experience.

Implications for Policy, Delivery, or Practice: The government does not have a strong smoke-free policy for women due to the low smoking rate. However, the urine-cotinine analysis shows that women’s smoking rate is actually higher than the current statistics, which necessitates support and expansion of program for smoke-free policy for women.

Funding Source(s): Other, Korea Ministry of Health and Welfare. Korea Center for Disease Control and Prevention.

Poster Session and Number: C, #1277

Review of Published Estimates of the Global Cost Effectiveness of Influenza Vaccination
Samuel Peasah, Centers for Disease Control and Prevention; Eduardo Azizz-Baumgartner, Centers for Disease Control and Prevention; Martin Meltzer, Centers for Disease Control and Prevention; Marc-Alain Widdowson, Centers for Disease Control and Prevention

Presenter: Samuel Peasah, Ph.D., M.B.A., Post-doctoral Fellow, Centers for Disease Control and Prevention, skpeasah@gmail.com

Research Objective: Seasonal influenza affects 10–20% of the world’s population annually, resulting in a significant number of outpatient and hospital visits and substantial economic burden both on health care systems and society. With recently updated WHO recommendations on influenza vaccination and broadening vaccine production, policy makers in middle- and low-income countries will need data on the cost of influenza disease and the cost effectiveness of vaccination.

Study Design: We reviewed published literature to summarize global estimates of the cost-effectiveness of influenza vaccination and the burden of influenza. We searched PUBMED (MEDLINE), EMBASE, WEB of KNOWLEDGE, and IGOOGLE using the key words 'influenza', 'economic cost', cost effectiveness', and 'economic burden'. We identified 142 studies which estimated either cost associated with seasonal influenza or cost-effectiveness/cost-benefit of influenza vaccination. 120 of these studies were conducted in high income, 22 in upper-middle income, and no studies in low and lower-middle income countries.

Population Studied: Principal Findings: In high and upper-middle income countries, per capita total cost of influenza illness ranged between $30 and $64. 44 of these studies reported vaccination cost-effectiveness in high risk groups (older adults, children, and pregnant women). From both societal and health care payer perspectives, 15 (34%) studies reported that influenza vaccination was cost-saving (10 in children, 3 in older adults, and 2 in pregnant women), 25 (57%) studies reported cost-effectiveness ratios between $980 and $48,617/QALY gained, between $1,820 and $34,610 per life year saved (4 in children, 18 in older adults, and 3 in pregnant women), 3 studies reported cost effectiveness ratios from $70,089 to a maximum of $450,000 per case prevented (one from each
Assessing Barriers and Facilitators to Implementation of Lynch Syndrome Screening

Jane Peredo, Veterans Health Administration GLA; Alison B. Hamilton, VA Greater Los Angeles Healthcare System; Angela B. Cohen, VA Greater Los Angeles Healthcare System; Cynthia E. Gammage, VA Greater Los Angeles Healthcare System; Taylor J. Sale, VA Greater Los Angeles Healthcare System; Maren T. Scheuner, VA Greater Los Angeles Healthcare System; , ; ,

Presenter: Jane Peredo, Sc.M., Genetic Counselor, Medicine, Veterans Health Administration GLA, jane.peredo@va.gov

Research Objective: Recognizing individuals with Lynch syndrome, the most common cause of hereditary colon cancer, can guide risk-appropriate recommendations for cancer surveillance and prevention. Our goal was to identify barriers and facilitators to implementation of Lynch syndrome screening.

Study Design: Semi-structured interviews were conducted, transcribed, and deductively analyzed. To develop structured, systematic descriptions and comparisons of the facilities, we used a rapid matrix analysis to summarize five topics: barriers to implementation, facilitators of implementation, tumor tissue screening processes, informed consent, and policy issues.

Population Studied: Network leadership, and clinical and administrative leaders from the five VA medical centers in Veterans Integrated Service Network (VISN 22).

Principal Findings: Participants included the Network chief medical officer and chiefs of staff (n=6), and clinical chiefs and staff from Pathology and Laboratory Medicine (n=10), Medical Oncology (n=8), Gastroenterology (n=9), Surgery (n=7) and Primary Care (n=6). Awareness of Lynch syndrome varied considerably within and across facilities and specialties. Lynch syndrome screening was available at four of five facilities. No systematic approach to screening existed at any facility. Opinions varied with regard to whether targeted versus universal screening should be implemented. Those who favored targeted screening had concerns about the lack of relevance of screen positive results and related costs, particularly for older patients who are less likely to have Lynch syndrome, while those who favored universal screening were concerned about missing cases. There was no consensus about the need for informed consent prior to Lynch syndrome screening; among those who felt it was necessary, there were differing opinions on how it should happen. Reasons for wanting consent prior to the screening stage included concerns about potential harms relating to psychological distress and implications for family members. Existing barriers to implementation of Lynch syndrome screening included: cost (including downstream costs for diagnostic testing and surveillance); lack of awareness, knowledge and expertise about Lynch syndrome; lack of infrastructure and resources; lack of laboratory processes and procedures; low prevalence of Lynch syndrome; and tight laboratory budgets. Existing or potential facilitators included: availability of guidelines, policy and protocols; provider education; gastroenterologists available to manage cases; clinical genetics expertise; a registry for tracking and monitoring screen positive cases; funding, resources and manpower to implement a screening program; and tumor boards at each facility to discuss cases. Recommendations for implementation included: developing screening guidelines; identifying a champion at each facility; having a case manager track screen-positive cases; educating providers; utilizing tumor boards; referring screen-positive patients for genetic consultation (with telehealth being key to providing these services across the Network); developing electronic health record tools for test orders; developing a registry to track screened cases; and instituting quality indicators and performance measures to promote implementation.

Conclusions: Implications for Policy, Delivery, or Practice: Decision makers in low and lower-middle income countries lack economic data to support policy decisions of influenza vaccine use. Cost-effectiveness studies of influenza vaccination of WHO-recommended risk groups such as pregnant women and young children, using standard methods are urgently needed.

Funding Source(s): N/A

Poster Session and Number: C, #1278

Risk group), and one study on older adults reported $6,000-112,000/DALY saved. There were significant differences in methodology, direct and indirect costs, preventing easy extrapolation of results to other countries.

Implications for Policy, Delivery, or Practice: Decision makers in low and lower-middle income countries lack economic data to support policy decisions of influenza vaccine use. Cost-effectiveness studies of influenza vaccination of WHO-recommended risk groups such as pregnant women and young children, using standard methods are urgently needed.

Funding Source(s): N/A

Poster Session and Number: C, #1278

Conclusions: Implications for Policy, Delivery, or Practice: Decision makers in low and lower-middle income countries lack economic data to support policy decisions of influenza vaccine use. Cost-effectiveness studies of influenza vaccination of WHO-recommended risk groups such as pregnant women and young children, using standard methods are urgently needed.
Conclusions: Although increased Lynch syndrome screening is a Healthy People 2020 objective, considerable barriers to implementation exist within VISN 22 at the provider, organizational, and systems levels. We suspect similar barriers exist for other healthcare systems.

Implications for Policy, Delivery, or Practice: A multi-level implementation strategy is necessary for successful Lynch syndrome screening implementation.

Funding Source(s): VA

Poster Session and Number: C, #1279

Developing an Online Exchange for Public Health Quality Improvement Initiatives
Jamie Pina, RTI International; Pamela Russo, Robert Wood Johnson Foundation; Jennifer McKeever, National Network of Public Health Institutes

Presenter: Jamie Pina, Ph.D., M.S.P.H., Research Scientist, CAHIT, RTI International;jpina@rti.org

Research Objective: This work demonstrates the advantages of a user-centered design process to create an online resource that can successfully accelerate learning and application of quality improvement (QI) by governmental public health agencies and their partners. Public health practitioners, at the federal, state, local and tribal levels, are actively seeking to promote the use of quality improvement to improve efficiency and effectiveness. Many of the processes, systems, and outcomes needing improvement are quite different from those of health care quality improvement, and examples of public health QI initiatives need to be made easily available for knowledge transfer between peers. The Public Health Quality Improvement Exchange (PHQIX) was developed to assist public health agencies and their partners in sharing their experiences with QI and to facilitate increased use of QI in public health practice. Successful online exchanges must provide compelling incentives for participation, site design that aligns with user expectations, information that is relevant to the online community and presentation that encourages use.

Study Design: User-centered design was applied to develop PHQIX. Quality improvement consultants, end users from public health practice, and researchers from academia were invited to take part in exploratory exercises that provided input to the site design and information modeling. Word frequency analysis of public health QI project reports was used to develop a taxonomy for public health quality improvement information.

Population Studied: Public Health practitioners, QI experts and researchers, academic researchers, models from health care and other industries, QI initiative evaluators.

Principal Findings: Within the first 3 months of online availability, the exchange has received 74 QI initiative submissions and has 510 registered users. Site analytics show that users spend the majority of their time on the intended purpose; reviewing the QI efforts of peers in the public health community. The popularity of the site and the general community response suggests that user-centered design provided an optimal platform for the development of the online exchange, and may assist the public health community in overcoming previously-identified barriers to the acceptance of online collaborations tools. In addition to increased online information seeking, an evaluation of impact on knowledge of QI methods and tools and performance of QI initiatives among users is will be conducted as the site matures.

Conclusions: Online exchanges for public health practice information are successful when site design aligns with user expectations and information is carefully modeled for the intended community. Public health practitioners are open to the exchange of information about their practice through online communities, particularly when this type of exchange facilities improvements in their own work.

Implications for Policy, Delivery, or Practice: The application of quality improvement by public health agencies is critical to improve both efficiency and effectiveness. The goal of the exchange is to accelerate development of a culture of quality improvement in public health and to identify best practices that can be adopted and adapted across the nation.

Funding Source(s): RWJF

Poster Session and Number: C, #1280

The Effectiveness of a Mandate for Influenza Vaccination in Health Care Providers: A Systematic Review
Samantha Pitts, Johns Hopkins University School of Medicine; Kathryn Millar, Johns Hopkins University School of Public Health; Jodi Segal, Johns Hopkins University School of Medicine
**Presenter:** Samantha Pitts, M.D., M.P.H., Research And Clinical Fellow, Medicine, Johns Hopkins University School of Medicine, spitts4@jhmi.edu

**Research Objective:** To systematically examine the published evidence of the effectiveness of an institutional mandate for influenza vaccination in health care providers (HCPs).

**Study Design:** We searched MEDLINE, Embase, the Cochrane Library, CINAHL, and Web of Science until 12/14/2012 using controlled vocabulary and key word searches to identify studies that evaluated a mandate. We defined “mandate” as required influenza vaccination for continued employment or clinical practice, with limited exemptions for medical or religious reasons. Two reviewers independently screened all articles by title/abstract and then by full text based on specified eligibility criteria. Two reviewers sequentially abstracted study design and outcome data from each article, including HCP attitudes, vaccination rates, absenteeism, and clinical outcomes. We assessed the risk of bias due to the known limitations of observational studies.

**Population Studied:** We examined the effect of a mandate among health care providers, including employees, medical staff, contract personnel, and volunteers within a health care organization.

**Principal Findings:** Our search strategy yielded 693 unique records. We included 11 published studies; 8 examined mandates at single institutions or health systems, and 3 assessed mandates across multiple institutions. Six studies are pending full text screening. Ten included studies involved hospitals or health systems including hospitals, and one involved pharmacists. All were within the United States. All 11 studies examined vaccination rates. Five single institution studies reported pre- and post-mandate rates in comparable populations, with increases in vaccination rates of 27% (in 3 studies), 44% (in 1) and 44-68% (in 1, depending on the comparison season). All 5 studies implemented at least one additional strategy with the mandate (e.g., an educational campaign). An additional pre/post study which expanded the population requiring vaccination with the mandate reported a 7% increase; this institution had a comprehensive influenza vaccination strategy and high vaccination rate prior to the mandate (92%). A multi-institution study reported an average increase across sites of 24%, and one performance improvement initiative reported that hospitals with a mandate had a 9% higher vaccination rate in the final year of the program (P<0.001). The remaining 3 studies had incomplete reporting and vaccination rate changes were indeterminable. No study reported on clinical outcomes in patients. Two single institution studies reported on absenteeism among health care providers; one reported a reduction, while the second found no significant difference. Six of the 11 studies reported on terminations and “voluntary resignations,” which combined ranged from 0.02-0.15%.

**Conclusions:** A mandate for influenza vaccination among HCPs is associated with substantial increases in vaccination rates in observational studies. The 2 studies with the least improvement involved institutions with a high pre-mandate vaccination rate or participating in a multifaceted performance improvement project. The mandate was frequently implemented with other strategies to increase vaccination. There were insufficient studies to draw conclusions about clinical outcomes among HCPs or patients.

**Implications for Policy, Delivery, or Practice:** Knowledge of clinical outcomes would require systematic surveillance for health care associated influenza.

**Funding Source(s):** AHRQ, Dr. Pitts is supported by a Comparative Effectiveness Development Training Award, Grant 1T32HS019488-02

**Poster Session and Number:** C, #1281

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**Research Objective:** This study examines how older cancer survivors’ self-reported health status and depression are associated with different types of activities, including: (1) social...
activities; (2) physical activities; and (3) activities involved in online technology use.

**Study Design:** We utilized hierarchical multiple regression and logistic regression models in this cross-sectional study. The outcome variables are older cancer survivors’ self-reported health status and depression. Social activities, physical activities, and activities involved in online technology use are independent variables of interest. Social activities include older cancer survivors’ visiting friends or family, attending clubs or organized activities, and going out for enjoyment in the last month. Physical activities are measured as participating in light exercise or vigorous activities (e.g., walking out, swimming, running or biking) in the last month. Online technology uses are measured as email or text use, or seeking health information using the Internet. Other covariates, such as sociodemographic factors, were controlled for in the study.

**Population Studied:** 1,430 older cancer survivors were drawn from the first round of 2011 U.S. National Health and Aging Trend Study, a nationally representative study of community-dwelling Medicare beneficiaries aged 65 and over.

**Principal Findings:** About 40% of older cancer survivors reported that their health as ‘very good’ or ‘excellent,’ and 44% of them felt depressed during the last month. Older cancer survivors actively participated in different activities. For social activities, 89% visited friends or family members, 41% attended clubs, classes or other organized activities, and 83% went out for enjoyment in the last month. For physical activities, while 39% participated in vigorous activities and 30% participated in light exercise, 31% were inactive in the last month. For activities related to the use of online technology, 44% of respondents used email or text using the Internet or mobile phone. 22% also used the Internet for seeking health related information, such as contacting Medical providers, handling Medicare or other health insurance, and learning more about their health conditions, for example. Older cancer survivors’ health status was positively associated with social, physical, and online activities. For example, participating in clubs or other organized activities (beta=.10), going out for enjoyment (beta=.09), walking (beta=.07), and email or text use (beta=.07) were positively associated with older cancer survivors’ health status. For depression, all types of social activities were negatively associated, and physical and online activities were not associated with respondents’ feeling depressed.

**Conclusions:** This study revealed that different types of activities matter in improving health or mental health status. Online technology use can be a pronounced medium to promote health among cancer survivors while encouraging social activities can specifically endorsing mental health elevation.

**Implications for Policy, Delivery, or Practice:** Healthcare professionals and policymakers should provide individualized and effective psycho-social interventions that allow older cancer survivors to participate more in different types of activities. This will increase the desired outcomes of health and mental health conditions in older cancer survivors.

**Funding Source(s):** No Funding

**Poster Session and Number:** C, #1282

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**Estimating the Societal Economic Impact of Abuse-Deterrent Formulations of Long-Acting Opioids in the United States**


**Presenter:** Louis Rossiter, Ph.D., Research Professor, Thomas Jefferson Program in Public Policy, The College of William & Mary, ashei@analysisgroup.com

**Research Objective:** Prescription opioid (RxO) abuse represents a substantial public health problem, accounting for over 16,500 deaths and approximately 56 billion USD in societal costs annually. The recent development of abuse-deterrent formulations (ADFs) of long-acting opioids (LAOs) represents one approach to reducing the societal burden of RxO abuse while maintaining appropriate access to RxOs for chronic pain patients. We examine the societal economic impact of ADFs by analyzing changes in LAO utilization, costs, and abuse following introduction of an ADF among commercially-insured, Medicaid, and Medicare-eligible patients.

**Study Design:** Using de-identified Truven MarketScan medical and pharmacy claims data for commercially-insured, Medicaid, and Medicare-eligible patients, we examined changes in medical costs associated with the...
introduction of an ADF among chronic LAO users using a difference-in-differences design. Medical costs reflect payments by insurers and out-of-pocket patient costs, measured in 2011USD. In addition, changes in rates of diagnosed opioid abuse following the introduction of an ADF and excess costs associated with diagnosed opioid abuse were analyzed. These estimates were supplemented with publicly-available government data and literature to account for undiagnosed opioid abuse and non-chronic LAO users (including RxO diversion), assuming the current market share of ADFs. The total cost savings of ADFs were estimated based on reductions in medical costs due to switching to ADFs and reductions in abuse and abuse-related medical costs. In addition, a literature-based estimate of the ratio of medical to indirect (i.e., work place and criminal justice) costs of opioid abuse was used to estimate the potential indirect cost savings of ADFs.

**Population Studied:** The study sample included commercially-insured, Medicaid, and Medicare-eligible patients with at least one pharmacy claim for an RxO, 2009-2011 (approximately 13.5M patients). Medical costs and abuse rates of the uninsured were assumed to follow those of Medicaid patients. Additional data were used to extrapolate estimates to a U.S. societal perspective.

**Principal Findings:** Rates of diagnosed opioid abuse among chronic LAO users declined approximately 16 percent (averaged across payers) following the introduction of an ADF. The observed reductions in rates of diagnosed opioid abuse, in combination with the excess medical costs of opioid abuse, imply sizeable medical cost savings consistent with the reduction in medical cost savings observed among chronic LAO users switching to an ADF. Accounting for non-chronic LAO users, RxO diversion, and undiagnosed opioid abuse further increased medical cost savings. Incorporating literature estimates on indirect costs roughly doubled the annual societal cost savings of ADFs. These findings represent preliminary estimates, based on currently available data and assumptions.

**Conclusions:** The introduction of ADFs has been associated with substantial reductions in abuse-related economic burden.

**Implications for Policy, Delivery, or Practice:** By reducing abuse and abuse-related costs, ADFs represent one important way to mitigate the rising economic and mortality burden of RxO abuse in the U.S. while maintaining appropriate access to care for chronic pain patients.

**Funding Source(s):** Other, Purdue Pharma L.P.

**Poster Session and Number:** C, #1283

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**Intimate Partner Violence During Military Service and OEF/OIF Active Component and Reserve and National Guard Service Women**

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**Presenter:** Anne Sadler, Ph.D., Researcher, Deputy Director- Iowa City Vamc Mental Health Service Line, Research, Mental Health Service Line, Iowa City VAMC, anne.sadler@va.gov

**Research Objective:** To identify intimate partner violence (IPV) experiences during military service of OEF/OIF Active Component (AC) and Reserves/National Guard (RNG) servicewomen, including deployment associated IPV.

**Study Design:** 1339 women participated in a cross Sectional Study. Consenting women completed a computer-assisted telephone interview assessing socio-demographic and military characteristics, trauma exposures, health outcomes and care.

**Population Studied:** Women with current or prior OEF/OIF AC or RNG military service. Defense Manpower Data Center provided the sample from 5 Midwestern states.

**Principal Findings:** Participant median age was 37 years (range 18-59). Most were white (77%), Married (54%) and currently actively serving (80%). IPV, violence perpetrated by a spouse, partner, or ex-partner was experienced by one-third (33%) of women during their military service. Of the women experiencing IPV, most reported that being emotional abused by their partner (n=372, 84.7%). The next most common type of abuse was physical with 40.6% (n=178) reporting being hit, slapped, kicked or otherwise physically hurt. Another 19 (4.3%) reported being threatened with physical harm but did not report being physically hurt. Sexual assault by an intimate partner, which includes attempted and completed rape, was also common during military service (21.2%, n=93). Stalking was
reported by 14.6% of women who experienced IPV. Twenty-four (5.5%) women reported being threatened with a gun, knife, or other weapon. Almost half of the women (46.0%, n=202) reported multiple types of IPV. Women who were victims of IPV during their military service were more likely to be in the army (p=.015), currently be students (p=.002), be separated, divorced, or widowed (p<.001), have cared for a child or children (p<.001), joined the military to avoid domestic violence (p<.005), have a service connected disability (p=.042), screen positive for probable PTSD (p<.001), and screen positive for probable depression (p<.001). There were no significant differences found in IPV occurrence during military between officers and enlisted women, RNG or AC service, or women who were deployed during OEF/OIF and those not deployed.

Conclusions: Our findings indicate that IPV during military experience is a common experience in OEF/OIF AC and RNG servicewomen and a significant public health concern.

Implications for Policy, Delivery, or Practice: The VA routinely screens for MST but not IPV. Hence, the health consequences of IPV, with and without additive military sexual violence or deployment traumas, and current safety of these servicewomen may be overlooked. Further research is indicated to understand unique risk factors and health outcomes of military IPV.

Funding Source(s): VA, CDMRP/DoD

Poster Session and Number: C, #1284

Technology Diffusion and Diagnostic Testing for Prostate Cancer

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Presenter: Florian Schroeck, M.D., M.S., Fellow, Health Services Research, Urology, University of Michigan, florian.schroeck@gmx.net

Research Objective: Driven by the promise of increased effectiveness and decreased morbidity, innovative prostate cancer treatments such as minimally invasive radical prostatectomy (MIRP) and intensity modulated radiotherapy (IMRT) have largely supplanted more traditional local therapies. While these innovative technologies may fuel increased use of prostatectomy and radiotherapy, they may also have population-level spillover effects on screening and diagnostic testing for prostate cancer. For these reasons, we examined the association of technology penetration with receipt of prostate specific antigen (PSA) testing and prostate biopsy.

Study Design: In this retrospective cohort study, our primary outcomes were population-based rates of PSA testing and prostate biopsy. Men were followed for PSA testing and prostate biopsy from 2003 – 2007 or until prostate cancer diagnosis or death. The exposure of interest was technology penetration. Using provider identifiers from the claims data, we measured technology penetration as the number of providers performing MIRP or IMRT per population in a market (hospital referral region, n=69). Markets were then classified into low-, intermediate-, or high-tech markets based on tertiles. We used multivariable generalized estimating equations to assess the association of technology penetration with rates of PSA testing and prostate biopsy, while adjusting for patient and market characteristics, as well as for clustering of patients within markets.

Population Studied: 116,879 Medicare beneficiaries age 66 or older living in the Surveillance, Epidemiology and End Results (SEER) areas. Data was obtained from the SEER–Medicare linked database and the 5% sample of Medicare beneficiaries.

Principal Findings: Rates of diagnostic testing differed widely across markets, with a median of 386 (range 313 – 509) PSA tests and 9 (range 3 – 17) prostate biopsies per 1,000 person years. Men from high-tech markets had only minimally increased PSA testing rates (438 vs. 418 per 1,000 person-years, p < 0.001) compared to those from low-tech markets, while rates of prostate biopsy did not differ significantly (9 vs. 8 per 1,000 person-years, p=0.809). The impact of technology penetration on PSA testing and prostate biopsy was much smaller than the effect of age, race, and comorbidities (e.g., the PSA testing rate per 1,000 person years was 481 for men with only one vs. 369 for men with 3+ co-morbid conditions, p < 0.001).

Conclusions: Increased technology penetration was associated with a statistically, but not
Implications for Policy, Delivery, or Practice: For patients, our findings provide insight regarding the degree to which the availability of new technology might influence the use of related healthcare services. Our data suggest that dissemination of new prostate cancer-related technology did not affect the use of PSA testing and prostate biopsy, thus allaying concerns that dissemination of robotic prostatectomy and IMRT may fuel additional “case-finding” efforts. For payers and policymakers, our findings are of immediate interest as they consider coverage decisions for other new technologies.

Funding Source(s): Other, NIDDK T32 DK07782 and American Cancer Society PF-12-118-01-CPPB

Estimating the Cost of HIV Surveillance in the United States
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Research Objective: HIV case surveillance is a primary source of information for monitoring HIV and guiding the allocation of prevention and treatment funds. Surveillance is becoming increasingly critical to the implementation of test-and-treat prevention strategies that require data on timing of diagnosis, entry and retention in care, and viral load suppression. While the number of persons living with HIV and the need for surveillance data have increased, little is known about the cost of performing high-quality surveillance, where high-quality is defined as meeting or exceeding Centers for Disease Control and Prevention (CDC) data quality standards regarding completeness and timeliness of reporting diagnosed HIV cases and ascertaining duplicate cases and deaths. We estimate the economic costs of high-quality HIV case surveillance programs operated by state and local health departments in the US.

Study Design: We collected primary data on the unit cost and quantity of resources used to operate the HIV case surveillance program in the state of Michigan, where HIV prevalence is moderate to high. We evaluated the cost of collecting data on new versus established cases, and we estimated both fixed and variable costs of surveillance. Based on the Michigan data, we projected the expected annual surveillance cost of all 59 US state, local, and territorial health departments funded to conduct HIV surveillance, and we estimated the total cost of HIV surveillance in the US. To project costs from Michigan to other health departments, we used area-specific median hourly wage and benefits for each health department to estimate local labor costs. We also adjusted fixed costs to reflect the potential economies or diseconomies of scale in health departments with higher or lower HIV prevalence than Michigan.

Population Studied: 59 state, local, and territorial health departments in the US.

Principal Findings: In Michigan, the number of newly reported HIV cases during 2009 was 818 and the number of established HIV cases, 14,046. We estimated the annual total program cost to be $1,286,524 ($87/case), the annual cost of new cases to be $108,657 ($133/case), and the annual cost of established cases, $1,177,867 ($84/case). We estimated the national HIV surveillance cost in the US at $68 million, 28% higher than expected 2013 federal funding. The median cost in the health department with low (625 cases) and high (37,166 cases) HIV prevalence was $211,000 and $1,835,000.

Conclusions: Our analysis has shown that a systematic approach to costing public health surveillance activities is feasible. For HIV surveillance, a substantial portion of total surveillance costs are attributable to the maintenance of established cases.

Implications for Policy, Delivery, or Practice: HIV surveillance costs are likely to increase with the increasing number of persons living with HIV and more intense focus on expanded HIV screening, early diagnosis, and monitoring of care, treatment, and HIV viral load suppression. As the demand for HIV surveillance data grows, more funding is likely to be required.

Funding Source(s): CDC

Poster Session and Number: C, #1286
Hearing Loss Substantially Affects Quality of Life in Older Adults
Annie Simpson, Medical University of South Carolina

Presenter: Annie Simpson, Ph.D., Assistant Professor, Healthcare Leadership and Management, Medical University of South Carolina, simpsona@musc.edu

Research Objective: Hearing loss (HL) is common in older adults and is often considered part of "normal aging" by both patients and physicians. Use of hearing aid is often delayed until the HL is advanced. This diminishes the chance of effective adaptation to the use of a hearing aid, and may substantially affect patients' health-related quality of life (HRQoL). The magnitude of impact of HL on HRQoL is not well described in the literature. Yet without a clear understanding of the contribution of HL to HRQoL, underuse of hearing aids is likely to continue, with an increased attendant risk of negative life events. This study compares the marginal effect of HL on HRQoL to the impacts of other common chronic conditions.

Study Design: Retrospective cohort data from two sources.

Population Studied: 273 participants in a longitudinal study of age-related HL (1987-2012 ECSP data Supported by NIH/NIDCD grant P50 DC000422) provided measures of hearing, comorbidity, and responses to the Patient Reported Outcomes Measurement Information System (PROMIS) instrument. HL was defined as "mild" if pure-tone average (PTA) was 26-40 dB HL, and "moderate/severe" for > 40 dB HL. PROMIS responses were summed based on their weighted factor score and used as the indicator of HRQoL. Data from 12,542 subjects in the 2000 Medical Expenditure Panel Survey (MEPS) provided self-reported HL, HRQoL and chronic condition indicators. The EQ5D visual analog scale (VAS) response was used as the indicator of HRQoL. HRQoL scores for "mild" and "moderate/severe" HL were compared to no HL in multivariable regression models controlling for hypertension, diabetes, coronary artery disease, joint pain, stroke, arthritis, asthma, depression, emphysema or COPD, or blindness.

Principal Findings: 32% of the subjects in the ECSP data set had mild HL and 19% had moderate/severe HL. The mean PROMIS summary scores observed was 2.6 (range 1.8-3.4, SD 0.31). Of the respondents in the MEPS data set 6% had mild HL and 0.3% had moderate/severe hearing loss. The mean EQ5D score observed was 77.2 (range 1-100, SD 17.2). Moderate/severe HL conferred a clear decrement of HRQoL, similar to heart disease, arthritis and stroke in the ECSP data (p=0.01). HL in the MEPS data was associated with decrements similar to emphysema and blindness (p-value<0.0001).

Conclusions: These exploratory findings warrant careful consideration of age-related HL in clinical practice and suggest that further research is needed to examine the effect of hearing loss on older patients' HRQoL.

Implications for Policy, Delivery, or Practice: The impact of age-related HL on HRQoL is not well understood, yet the decrement in HRQoL associated with HL may be comparable to decrements from other chronic illnesses. It is important for primary care practitioners to understand the impact of HL on patients and provide counseling on amelioration. The current lack of insurance coverage for most hearing testing and hearing aids in older adults should be reassessed.

Funding Source(s): NIH

Variation in Local Health Departments' Cost of Providing Clinical Health Services: Evidence from Florida
Simone Singh, University of Michigan

Presenter: Simone Singh, Ph.D., Assistant Professor, Health Management and Policy, University of Michigan, singhsim@umich.edu

Research Objective: While overall spending patterns of local health departments (LHDs) have been studied extensively, little is known about how efficiently LHDs use their financial resources. This study documents the substantial variations in LHDs' cost of service provision and analyzes how LHD organizational and community characteristics contribute to these variations.

Study Design: Financial data for the period from 2001 to 2011 for LHDs in Florida was obtained from the Florida Department of Health. Financial data was supplemented with data on LHD organizational and community characteristics from NACCHO's Profile Studies and the Area Resource File. Descriptive analysis was used to examine the costs of clinical health...
services provided by LHDs and to evaluate trends. Bivariate analysis of variations in costs was conducted along select LHD organizational and community characteristics, including size of the population served, location, volume and mix of services, and staffing patterns. Services analyzed as part of this study included select clinical health services provided by LHDs, such as comprehensive child health services, comprehensive adult health services, and dental health services.

Population Studied: All 67 LHDs in the the state of Florida.

Principal Findings: Descriptive analysis found that the costs of clinical health services provided by LHDs varied substantially both across service lines and over time. Bivariate analysis showed that low-cost LHDs differed substantially from high-cost LHDs. Most notably, low-cost LHDs provided higher volumes of a given service and used their staff more productively.

Conclusions: The costs of providing clinical health services vary widely both within and across LHDs. Few LHDs have consistently low costs for all the clinical health services they provide. Economies of scale and staff productivity appear to be key to LHDs' ability to provide clinical health services in an efficient manner.

Implications for Policy, Delivery, or Practice: In times of budget shortfalls and reduced funding for public health activities, an in-depth understanding of LHDs' costs of service provision can help local health officers provide needed services at a lower cost and allocate resources to those areas where they have the biggest impact on population health.

Funding Source(s): No Funding

Poster Session and Number: C, #1288

Excess Costs Associated with Preterm Birth

Mark Smith, Truven Health Analytics; Kay Miller, Truven Health Analytics; Susan Raetzman, Truven Health Analytics

Presenter: Mark Smith, Ph.D., Director, Truven Health Analytics, mark.w.smith@truvenhealth.com

Research Objective: The costs of having a baby extend beyond labor and delivery to prenatal care during pregnancy and postnatal care during the months following birth. Preterm delivery, defined as delivery before 37 weeks of gestation age, may drive costs even higher through extended lengths of stay and additional procedures. Our objective was to estimate the extra costs associated with preterm delivery and with birth-related complications in a privately insured population in the United States.

Study Design: We performed a cross-sectional analysis of administrative claims records using data from the Truven Health MarketScan Commercial Claims and Encounters Database (CCAE). The CCAE contains the inpatient, outpatient, and outpatient prescription drug experience of several million employees and their dependents annually. We used data from 2008-2010 to examine two overlapping time periods: for the mother, nine months before and three months after a 2009 delivery; for the baby, the first 12 months of life. Outcomes were total payments for all payers for health care encounters and prescription medications. Payments are reported in 2011 dollars and are weighted to be nationally representative of individuals with employer-sponsored insurance.

Population Studied: We identified live births in 2009 birth encounters using ICD-9-CM diagnosis codes and ICD-9-CM or CPT/HCPCS procedure codes. We excluded individuals who were not continuously enrolled for the 12-month window or who belonged to capitated health plans, in both cases because the full cost of their care cannot be known with certainty. Babies were excluded whose birth date was uncertain, who were greater than one year in age, whose claims were bundled with their mother’s, or who were part of a multiple-gestation birth (e.g., twins). Mothers were excluded if their gender was recorded as male, were under age 15 or older than 55, or had more than one delivery in the year following the first birth.

Principal Findings: After applying exclusion criteria there were 123,669 babies born in 2009 and 198,710 mothers who gave birth once in 2009. (The figures differ because babies and mothers can be covered by different health plans.) Total insurance payments averaged $54,591 for preterm births, more than $50,000 above the $4,315 average for uncomplicated births at term. Adding out-of-pocket payments by patients raised the totals to $55,805 versus $5,045, respectively. Total insurance payments averaged $15,623 for complicated deliveries (at any gestational age) versus $10,044 for uncomplicated deliveries. Including out-of-pocket payments raised the totals to $17,401 and $11,576, respectively.

Conclusions: Health care associated with preterm birth is 11 times more expensive on average than care relating to uncomplicated at-
term births, and it is 3.2 times more expensive than care associated with complicated births. The excess costs of preterm birth extend well beyond the initial hospital stay.

**Implications for Policy, Delivery, or Practice:** Public health programs to reduce premature births, already known to improve the health of children and mothers, have the potential to significantly reduce costs as well.

**Funding Source(s):** Other, March of Dimes Foundation

**Poster Session and Number:** C, #1289

**Impact of Beacon Communities’ Public Health Initiatives—A Social Informatics Perspective**

Adam Vincent, RTI International; Paula Soper, RTI International; Kelley Chester, RTI International; Corey Frost, RTI International; Diana Smith, RTI International; Laura Marcial, RTI International; Barbara Massoudi, RTI International; Saira Haque, RTI International; Taha Kass-Hout, Centers for Disease Control and Prevention

**Presenter:** Paula Soper, M.P.H., M.S., Senior Health Research Informaticist, Health Policy and Management, RTI International, soperpa2@gmail.com

**Research Objective:** To review social and organizational consequences of selected Beacon Communities’ public health interventions using Social Informatics (SI) as a lens. Social Informatics refers to the body of research and study that examines social aspects of computerization— including the roles of information technology in social and organizational change, the uses of information technologies in social contexts, and the ways that the social organization of information technologies is influenced by social forces and social practices

**Study Design:** The Beacon Community Program in the office of that National Coordinator for Health IT funds 17 communities around the nation to develop innovative health IT solutions to promote better health, better care at lower costs. Many of these communities have developed innovative collaborative programs to improve population and public health outcomes and infrastructure. Prior to engaging with the Beacon Communities, an environmental scan was conducted to gather publicly available information on each of the 17 Communities. Subsequent to the environmental scan, interviews were conducted with a subset of 9 Communities identified as having public health-related interventions. Following the interviews, the study population was narrowed to 6 communities with promising public health-related interventions. A series of interviews and site visits were conducted with representatives from the 6 selected Communities to learn about their approaches and achievements related to public health. Evaluation of the selected communities for this project resulted in a unique approach due in part to the various ways each site developed collaborations to bridge gaps between public health and the healthcare environment. Focusing on investigating these projects using theoretical foundations from social informatics afforded an examination of the uses of technology in complex social contexts. This forms the basis for interpreting our findings and providing details on organizational consequences.

**Population Studied:** The following Beacon Communities, conducting activities most germane to public health informatics, were included:

- Southeast Michigan Beacon Community – txt4health
- Crescent City Beacon Community – txt4health
- Greater Cincinnati Beacon Community – txt4health
- Southern Piedmont Beacon Community – WIC Intake Avatar
- Southeast Minnesota Beacon Community – Asthma Action Plan Portal
- San Diego Beacon Community – HIE Cloud Technology for immunization data exchange

**Principal Findings:** The Beacon Communities are engaged in a variety of efforts aimed at improving the health of their patients and their communities. However, only a subset are actively partnered with public health agencies in their communities. Prior involvement of public health organizations in health systems and health IT activities in their communities seems to be an important factor in the development of a Beacon organization which prioritizes public health interventions. Public health leadership on Beacon planning and project committees has resulted in improved public health information technology infrastructure in those communities, and improved data exchange and collaboration between clinical and public health sectors in most communities studied. Most Beacon communities studied were able to leverage their partnerships and infrastructure for activities well beyond the scope of Stage 1 Meaningful Use.
Most public health interventions have been institutionalized within Beacon partner agencies and are expected to be maintained or expanded following completion of the Beacon project. **Conclusions:** Applying social informatics theory to Beacon Community public health projects provides important insights into the interaction of organizational culture, individuals, technology and tasks, and the impact of these interactions on overall success of public health initiatives. While interaction dynamics differed across communities, some common factors of success were identified. **Implications for Policy, Delivery, or Practice:** The Beacon Communities showcase emerging techniques for improving public health services and infrastructure using health IT and information exchange. Understanding social and organizational structures of successful Beacon Communities can help other communities when planning their own efforts. This can include best practices for developing joint projects with clinical and public health organizations within a community to foster better integration of care and services. **Funding Source(s):** CDC
**Poster Session and Number:** C, #1290

### Improving Access to Care through Social Network Analysis: Insights from the Community Connector Program

M. Kate Stewart, University of Arkansas for Medical Sciences; Xi Zhu, University of Iowa; Naomi Cottoms, Tri County Rural Health Network; Holly C. Felix, University of Arkansas for Medical Sciences; Sharla Smith, University of Arkansas for Medical Sciences; Jinger Morgan, University of Arkansas for Medical Sciences; Glen P. Mays, University of Kentucky

**Presenter:** M. Kate Stewart, M.D., M.P.H., Professor, Health Policy and Management, University of Arkansas for Medical Sciences, stewartmaryk@uams.edu

**Research Objective:** Community health workers (CHWs) help underserved populations navigate systems of care, build trust in system providers, and facilitate behavior change. Many CHW programs use social networks to achieve their goals. This study used social network analysis to examine how CHWs called community connectors use their social networks to find persons (cases) with unmet need for long-term care (LTC) at highest risk of institutionalization and facilitate their access to home and community based LTC services. **Study Design:** Five CHWs listed the members of their social networks who are most helpful to them in identifying cases and indicated whether these members knew each other. CHWs then prospectively collected data about contacts made in their daily work. Retrospective performance data from the previous six months were obtained from program records on the number of contacts CHWs made to find cases and number of connections of cases to services. The CHWs’ baseline networks were examined for network structures, and network density and constraint were calculated. The relationship between network structures and performance was explored with bivariate plots. The relationship between daily networking patterns and effectiveness in identifying cases was explored via a logistic regression model to predict the likelihood of obtaining referrals from daily contacts. **Population Studied:** The population studied was CHWs in the Community Connector Program who serve low income, rural adults in need of LTC. **Principal Findings:** Network graphical analysis indicates wide variation among CHWs in their patterns of connection to contacts and cases. Most CHWs had highly dense networks with high network constraints. One CHW had a less dense network with low network constraint, which may imply opportunities to bridge across different social groups for diverse information. The bivariate plots indicated a clear negative association between network constraint and performance such that CHWs who had lower constraint networks had identified more cases in the previous six months. Results from the logistic regression model showed that both frequency of interaction with contacts and number of connections to the baseline network were significant in predicting the likelihood of obtaining referrals from the contacts. **Conclusions:** Findings suggest that CHWs should be encouraged to develop new and diverse relationships that fall outside their existing social networks to help them obtain novel information about potential cases that might not otherwise be discovered. Findings also suggest the importance of strengthening ties to existing contacts through frequent interaction and identification of common acquaintances, both of which improve the
Regional Variation in Costs of Hematopoietic Cell Transplantation: An Analysis of the 2008-2010 Nationwide Inpatient Sample
Viengneesee Thao, University of Minnesota; Ezra Golberstein, University of Minnesota, Twin Cities; William Thomas, University of Minnesota, Twin Cities; Katy B. Kozhimannil, University of Minnesota, Twin Cities; Jaime Preussler, National Marrow Donor Program; Ellen M. Denzen, National Marrow Donor Program; Navneet S. Majhail, National Marrow Donor Program

Presenter: Viengneesee Thao, MS Candidate, Student, University of Minnesota, viengneesee@gmail.com

Research Objective: To explain the variation in cost of Hematopoietic Cell Transplantation (HCT) by state.

Study Design: The primary outcome variable is total cost (TC) which was calculated by multiplying total charges by a hospital wide, all payer inpatient cost-to-charge ratio. The primary independent variable is the state in which the HCT was performed. We used linear regression to examine state level regional variation in HCT costs and controlled for covariates and hospital clustering. Covariates included patient demographics (gender, race, income, insurance status), case mix (age, length of stay, diagnosis, number of procedures, type of transplant, co-morbidities, discharge status) and hospital characteristics (bed size, location-urban/rural, ownership/control). The local area wage index was included as an explanatory variable to account for geographic variation. Analysis was conducted using SAS 9.3.

Population Studied: Secondary data were drawn from the 2008-2010 Nationwide Inpatient Sample (NIS). The NIS is a cross-sectional database which captures a patient’s primary hospitalization. Representing approximately 96% of the U.S. population, the NIS is the only national hospital database with charge information on all patients regardless of payor.

Principal Findings: Of the study sample 60% were white, 64% had private insurance, 36% lived in a large metropolitan area and 32% resided in a zip code where the median annual income was >$48,000. The mean age of HCT recipients was 50 years (SD 19). Patients spent an average of 26 (SD 17) days in the hospital. California contributed the greatest number of patients (16%) to the analysis. Among cases, 42% were allogeneic (donor) HCT, 58% were autologous (self) HCT and the type of HCT was not specified in <1%. More than 95% of HCT were performed at urban teaching hospitals. The mean unadjusted TC was $69,202 (inter-quartile range $44,593 to $108,765). The state with the highest mean TC of HCT was Washington at $252,711 ($194,074 - $335,434) and the lowest was South Carolina at $35,279 ($26,704 - $45,579).

Conclusions: Ongoing analyses will describe cost drivers and adjust for covariates and within hospital correlation. Additional studies are needed to determine whether variation in TC translates into disparities in quality or outcome.

Implications for Policy, Delivery, or Practice: Policies that encourage high-cost regions to behave more like low-cost regions while encouraging low-cost regions to continue their current practices can help in controlling healthcare costs. Findings from this study will help policy makers identify where policies like these are needed.

Funding Source(s): No Funding
Poster Session and Number: C, #1292

Cost-Effectiveness of a Ready for Recess Program in Two Elementary Schools
Hongmei Wang, University of Nebraska Medical Center, College of Public Health; Jennifer Huberty, University of Omaha; Kelly Shaw-Sutherland, University of Nebraska Medical Center

Presenter: Hongmei Wang, PhD, Assistant Professor, Health Services Research, University of Nebraska Medical Center, College of Public Health, hongmeiwang@unmc.edu

Research Objective: Health promotion interventions to increase children’s physical activity in school settings have become increasingly popular over the past decade. Research suggests that when given an opportunity to be active during recess, children...
will typically engage in meaningful amounts of physical activity. However, relative efficiency of these programs and the cost implications are not readily available. This study aims to examine the cost effectiveness of a school-based program called ‘Ready for Recess’ targeting in improving the students physical activity levels.

**Study Design:** The Ready for Recess program was designed to increase physical activity among students through an overall change in the recess environment (educate staff and provide equipment) in two elementary schools from September 2008 through April 2009. The effectiveness of the Ready for Recess program was measured by the change in the length of time students participated in moderate or vigorous physical activity (MVPA) during a single school day. A paired t-test was used to examine the statistical significance of the change over time. The total program costs for the Ready for Recess program in 2008-2009 were categorized into equipment costs, initial training costs, and personnel costs. The total program cost was compared to the program effectiveness to calculate the cost effectiveness ratio, which indicates the cost effectiveness of the program by comparing to status quo.

**Population Studied:** A total of 445 students were in the two participating elementary schools. One classroom per grade was chosen from grade 3 to 5 for participation in each school. A total of 93 students in grades 3 and 5 were included in this study as they wore accelerometers and have MVPA measures.

**Principal Findings:** The paired t-test suggests that there was a 24-minute increase (P < 0.001) in the average time spent in MVPA among the students. The number of minutes spent in MVPA increased from an average of 26.2 minutes to an average of 50.2 minutes over a 7-hour school day. The total cost of the Ready for Recess program was $27,941.27 and the Incremental cost effectiveness ratio was $1,164.22.

**Conclusions:** The results suggest that on average $1164.22 was spent on the Ready for Recess program to produce an additional minute spent in MVPA daily during school day in the 2008-2009 school year. Sensitivity analysis were conducted and CER increased when we changed the assumptions for student management time, daily average recess-related time, and number of days of outdoor recess implementation to reflect more staff time spent on implementation. The highest CER was $1,473.91 for each additional minute that students spent in MVPA per school day when an estimated 10 hours were spent on student management each week.

**Implications for Policy, Delivery, or Practice:** The effectiveness and the cost-effectiveness of the Ready for Recess program suggest it is promising in promoting physical activities in schools. As the majority of the program costs are personnel cost and the initial equipment investment, it would be more cost-effective for the program to sustain for a longer time and be implemented in a larger scale.

**Funding Source(s):** N/A, Live Well Omaha Kids

**Poster Session and Number:** C, #1293

**Factors that Impede or Promote the Quality of Community Health Assessment and Improvement Planning Processes and Outputs in Kansas**

Ruth Wetta, University of Kansas School of Medicine-Wichita; Gianfranco Pezzino, MD, MPH, Kansas Health Institute; Barbara LaClair, MHA, Kansas Health Institute

**Presenter:** Ruth Wetta, RN, PhD, MPH, MSN, Associate Professor, Preventive Medicine and Public Health, University of Kansas School of Medicine-Wichita, rwettaha@kumc.edu

**Research Objective:** Community health assessment (CHA) and improvement planning (CHIP) is gaining attention as a process for collecting and analyzing health-related data to identify, prioritize and set goals for public health improvement. This qualitative/quantitative study assessed the perceptions of CHA-CHIP stakeholders in Kansas communities about factors that impede or promote the quality of CHA-CHIP processes and outputs.

**Study Design:** Fifteen focus groups, representing 11 of 15 regions, were conducted via telephone using a structured interview script between April and July 2012. The telephone methodology permitted the inclusion of participants from geographically distant frontier and rural settings. In addition to age, gender, and regional affiliation, participants completed attitudinal items exploring their confidence to perform CHA-CHIP activities.

**Population Studied:** Geographically, Kansas is the 15th largest state and has 100 local health departments (LHDs) serving a population of 2.8 million people in frontier, rural and urban settings. Participants were LHD administrators, hospital representatives and key community stakeholders involved in CHA-CHIP activities.
Participants (N= 76) were predominantly female (86.0%) and 51 years or older (66.7%).

**Principal Findings:** Uniform perceptions about the CHA-CHIP process included: importance of community and stakeholder involvement, use of multiple data sources in the assessment and conducting the CHA-CHIP in a structured manner. Urban counties reported more advanced completion of CHA-CHIP activities as compared to rural counties. Moreover, rural counties appeared to have less confidence in their ability to conduct or contribute to the CHA-CHIP process in the county. Previous collaborative activity appeared to enhance the progress of CHA-CHIP activities. Two motivating factors for pursuing a CHA-CHIP included public health accreditation and the federal mandate for critical access hospitals to perform a CHA. Essential resources to conduct CHA-CHIP activities included: additional funding, staff and time, and external technical assistance to support (1) data compilation and interpretation, (2) community meeting facilitation, (3) national model adaptation to rural settings and (4) distance technology use for CHA-CHIP training and guidance. Barriers included competing priorities within local health department settings and differences in public health and federal cycles for performing CHA-CHIP.

Three early adopters of a regional approach to CHA-CHIP reported using existing frameworks to facilitate their CHA-CHIP activities (QI methods, prioritization-matrices, consensus-building methods and SWOT analysis). However, most participants reported barriers to performing regional CHA-CHIP activities, including: (1) geographic distance between counties, (2) different points of readiness to initiate CHA-CHIP among counties, (3) elected officials being county-focused, (4) county residents fear losing local resources to another county, and (5) greater potential for success with a county level focus.

**Conclusions:** Study results suggest a uniform interpretation of CHA-CHIP requirements in rural and urban regions; however, rural counties lack the capacity to perform many CHA-CHIP activities.

**Implications for Policy, Delivery, or Practice:** Supportive frameworks individualized to rural/urban needs (application of national models, just-in-time training, the application of distance learning modalities) may enable local communities to perform CHA-CHIP processes more independently. Further research in needed to quantify the contribution of collaboration to the progress of CHA-CHIP completion and identify methods to support the development of partnerships.

**Funding Source(s):** RWJF

**Poster Session and Number:** C, #1294

**Patient-Prescriber Agreements: Current Issues and Approaches**

Corinne Woods, University of Maryland, Baltimore School of Pharmacy; Mario Luong, University of Maryland, Baltimore School of Pharmacy; Francis Palumbo, University of Maryland, Baltimore School of Pharmacy; Dale Slavin, United States Food and Drug Administration; Carol Pamer, United States Food and Drug Administration; Ilene Zuckerman, University of Maryland, Baltimore School of Pharmacy; Jacqueline Palmer, University of Maryland, Baltimore School of Pharmacy

**Presenter:** Corinne Woods, BSPharm, MPH, Research Pharmacist, Pharmaceutical Health Services Research, University of Maryland, Baltimore School of Pharmacy, cwoods@rx.umaryland.edu

**Research Objective:** This project reviewed literature regarding Patient-Prescriber Agreements (PPA). Focusing on the purpose, use, evaluation and consequences of PPAs, the project also identified perspectives of key stakeholders regarding PPAs.

**Study Design:** The project was a systematic review of literature in peer-reviewed journals and online sources, which were searched using key words and phrases pertaining to PPAs. Websites of relevant organizations were also searched for policy statements or official positions regarding PPAs.

**Population Studied:** The project primarily studied the use of, evaluation of and approaches towards PPAs administered to patients receiving opioid prescriptions for chronic non-cancer pain.

**Principal Findings:** PPA Use

In general, opioid PPAs are used (1) to inform a patient of the risks of long-term opioid use, (2) to delineate the responsibilities of the patient and (3) to explain the consequences of aberrant behavior. Surveys show varying use of PPAs in pain management, from 27 to over 80 percent of practitioners using a PPA. Numerous health care centers have instituted a blanket policy requiring PPAs for all patients receiving opioids on a long-term basis. Three states have passed regulations requiring PPAs in certain populations.
or circumstances, and many other states have adopted language encouraging the use of PPAs. Per recent Food and Drug Administration (FDA) regulations, certain opioid medications require a PPA.

Evaluating PPAs
Few well-designed, controlled studies have been performed evaluating the use of PPAs. One systematic review, six intervention studies, nine observational studies and eight surveys were included in this review. The systematic review found a lack of consistency of the PPAs and relatively weak evidence supporting PPA effectiveness. Some intervention and observational studies found that aberrant behavior resolved from using PPAs; others found that certain outcomes indicating aberrant behavior were significantly improved; aberrant behavior improvement ranged from 2 to 55 percent. Surveys showed that PPAs currently in use have a handful of similar components but vary greatly in regards to content, form and administration. Practitioners polled generally found PPAs helpful for certain issues, such as communicating risks of opioid therapy.

Stakeholders’ Perspectives
Several federal and state organizations have expressed support for opioid PPA use. Health care practitioners, professional organizations and patient advocacy groups have expressed mixed views; some support PPAs while others caution against mandatory use. Some claim that PPAs potentially harm the patient-physician relationship while others recommend widespread opioid PPA use.

Conclusions: There is a great deal of concern and controversy regarding the use of opioid PPAs and a lack of robust, controlled studies evaluating their effectiveness. The varying designs and outcomes of the studies included in this review precluded a definitive determination of the effectiveness of PPAs. State and federal policies vary and no clear consensus was identified among key stakeholders.

Implications for Policy, Delivery, or Practice:
Understanding the tools that may impact opioid safety, misuse and abuse are crucial for understanding the barriers to and solutions for solving opioid abuse and helping shape health care policy. The results of this literature review helps shed light on how useful PPAs may (or may not) be in combatting the national epidemic of opioid abuse.

Funding Source(s): Other, FDA, via Centers for Excellence in Regulatory Science (CERSI) award

Cost Effectiveness of Cervical Cancer Screening Strategies after Availability of HPV Vaccine
Bin Xie, University of Western Ontario

Presenter: Bin Xie, Ph.D., Assistant Professor, Obstetrics & Gynecology, University of Western Ontario, bxie5@uwo.ca

Research Objective: Cost effectiveness of various cervical cancer screening strategies as well as HPV vaccination have been evaluated separately in various contexts. However, no published study had evaluated the cost effectiveness of various strategies that integrate both population level screening and HPV vaccination. This paper aims to provide such an analysis using data from Ontario, Canada.

Study Design: Markov models were developed to evaluate various strategies that integrate cervical cancer screening and HPV vaccination. Data from the cervical cancer screening and HPV vaccination programs in Ontario, supplemented by data from the literature, were used to populate the models. Cost data were obtained from a large hospital in Ontario.


Principal Findings: Compared to the alternative strategy of pap-test every five years for women between 25 and 70 years combined with HPV vaccine for girls at grade 8, current practices in Ontario (Pap-test every three years for women between 21 and 70 years and HPV vaccination for girls in grade 8) was significantly more costly with slightly better effectiveness (ICER: $1,256,000 per QALY gained). All other strategies were either dominated by, or had unacceptably high ICERs, compared to the alternative strategy.

Conclusions: With a universal HPV vaccination program, cervical cancer screening can start at a later age with less frequency with significant cost savings and little negative impact on outcomes.

Implications for Policy, Delivery, or Practice: Policy makers should take into account the effect of HPV vaccination when designing cervical cancer screening strategies.

Funding Source(s): No Funding

Poster Session and Number: C, #1296
Simulation Model for Hip and Knee Replacement Wait Times in an Ontario Health Planning Region
Bin Xie, University of Western Ontario; Bert Chesworth, University of Western Ontario; Azaz Bin Sherif, University of Western Ontario; Clayon Hamilton, University of Western Ontario

Presenter: Bin Xie, Ph.D., Assistant Professor, Obstetrics & Gynecology, University of Western Ontario, bxie5@uwo.ca

Research Objective: To develop a simulation model for total hip and knee replacement surgery as a decision-making tool to help decision makers understand the impact of various queuing strategies on wait times.

Study Design: To represent the current decentralized queuing method for surgery, one year of historical wait time data for hip and knee replacement surgery in an Ontario regional planning area were obtained from Cancer Care Ontario. Using simulation software Arena, the following alternative queuing scenarios were created: a centralized waiting list for all surgical candidates, a centralized waiting list for urban hospitals and a decentralized waiting list for rural hospitals, and three other scenarios with a combination of centralized and decentralized waiting lists. Each scenario was compared on the basis of its resultant mean wait time and its 90th percentile benchmark wait time.

Population Studied: Patients who received total hip and knee replacement surgery in the region.

Principal Findings: The mean and 90th percentile wait times for the current method of decentralized queuing in the region was 123 and 177 days, respectively. These values decreased to 93 and 125 days respectively, in the scenario where a centralized wait list was used for all candidates in the region. All other scenarios decreased the mean and 90th percentile wait times due to the presence of some centralized queuing.

Conclusions: Centralized waiting lists mainly reduce the variation of the wait times, with minor impact on mean or medium wait times. Centralized waiting lists help prevent extremely long wait times. The impact of physiotherapist’s involvement in the decision-making process for surgery needs to be evaluated.

Implications for Policy, Delivery, or Practice: Whenever possible, centralized waiting list should be used.

Funding Source(s): Other, Southwest LHIN in Ontario, Canada
Poster Session and Number: C, #1297
STUDENT POSTERS

Parsing the Coverage Gap Effect: Are Sicker Beneficiaries More or Less Vulnerable to Cost-Sharing Increases?
Arielle Bensimon, Harvard University; John Hsu, MD, MBA, MSCE, Harvard University

Presenter: Arielle Bensimon, Harvard University, PhD Student, Health Policy, Harvard University, bensimon.a@gmail.com

Research Objective: Medicare Part D beneficiaries often face mid-year cost-sharing increases once their drug spending exceeds the annual coverage gap threshold. This non-linear cost-sharing structure makes observed spending endogenous, as greater use induces higher cost-sharing. Ignoring the endogeneity leads high-spending beneficiaries to appear more adherent. We sought to develop and test models for predicting Part D beneficiaries’ drug spending in the absence of cost-sharing changes. We then evaluated the differential impact of cost-sharing changes on drug consumption behavior among beneficiaries with varying levels of predicted spending.

Study Design: We used a natural experiment in which Part D Prescription Drug Plans (PDPs) featured moderate, constant cost-sharing in 2006, and then introduced the standard Part D coverage gap (with generic-only coverage) in 2007. Using split-sample validations, we compared the performance of approaches for predicting annual drug spending in 2006 based on individual characteristics and first-quarter spending; predicted spending was used as a measure of drug burden. We then examined the impact of cost-sharing increases on beneficiary behavior by decile of predicted 2007 spending using fixed-effects (within-person) regressions. Regressions compared each individual’s monthly drug spending and number of brand-name/generic drug fills in months before versus after gap entry, among subjects who reached the 2007 gap threshold ($2,400).

Population Studied: 60,096 non-institutionalized Medicare Part D beneficiaries who were continuously enrolled in the same PDP in 2006-2007 and did not receive any subsidies.

Preliminary Findings: A prediction model with covariates for age, sex, Part D risk-adjustment score, and first-quarter spending by AHFS drug class yielded the best overall performance in comparisons of predicted versus observed 2006 spending (mean difference: $30; mean absolute difference: $1,098). Among the 77.5% of beneficiaries who reached the coverage gap in 2007, subgroups with higher predicted spending exhibited greater reductions in monthly Part D spending following gap entry, largely attributable to decreases in brand-name drug fills. Subjects in the tenth decile of predicted 2007 spending (>=$8,295) decreased total monthly drug spending by $180 (standard error [SE]: 2.59) and had 0.95 (SE: 0.02) fewer brand-name fills per month, compared to decreases of $52 (SE: 3.22) and 0.52 (SE: 0.02) brand-name fills per month in the third decile ($2,759-$3,268). Within most decile groups, decreases in brand-name drug fills were accompanied by lesser increases in the frequency of generic drug fills.

Conclusions: Beneficiaries with higher predicted drug spending showed larger decreases in monthly drug consumption (primarily for brand-name drugs) in response to cost-sharing increases, as compared to beneficiaries with lower predicted spending. Generic drug use did not decrease after gap entry (as expected given the study plans’ continuous coverage of generics), but also did not increase sufficiently to offset brand-name drug reductions.

Implications for Policy, Delivery, or Practice: These findings suggest an income or cumulative spending effect in which beneficiaries with higher drug burden demonstrate larger cost-related reductions in drug use than those with lower drug burdens. The modeling approach for predicting drug spending under constant cost-sharing also represents a promising method for examining behavior in the context of non-linear cost-sharing.

Funding Source: NIH
Poster Session: A

Do Alcohol Screening Scores Identify Patients at Risk of 30-day Hospital Readmission?
Laura Chavez, M.P.H., Veterans Affairs Health Services Research & Development; Anna Rubinsky, Veterans Affairs Puget Sound HSR&D; Dan Kivlahan, Veterans Affairs; Katharine Bradley, Group Health Research Institute

Presenter: Laura Chavez, M.P.H., Research Health Science Specialist, Veterans Affairs Health Services Research & Development, laura.chavez2@va.gov
Research Objective: Hospitals nationwide are under increasing pressure from the Centers for Medicare and Medicaid Services (CMS) to reduce 30-day hospital readmissions among Medicare patients. Hospitals are therefore interested in identifying patients with modifiable risk factors for readmission. Alcohol misuse, detectable with brief screens, is a modifiable health behavior associated with poor medication adherence and self care, medical and surgical complications, and hospital admission. However, the association between alcohol screening results and hospital readmission is unknown. The objective of this study was to evaluate whether a 3-item screen for alcohol misuse, the AUDIT-C, could identify patients at increased risk of 30-day readmission.

Study Design: This cohort study used data from VA administrative databases linked to Medicare inpatient files, and assessed the association between alcohol screening results and hospital readmission in patients who received care at one of 24 Veterans Affairs (VA) medical centers in the western US and were admitted to the hospital (VA or Medicare) in the year after VA alcohol screening. All-cause readmission (VA or Medicare) within 30 days of discharge was the main outcome measure, using adapted CMS criteria. Patients were categorized into 4 drinking groups based on AUDIT-C scores (0-12 points) and previous research: nondrinkers and low-risk, moderate-risk, and high-risk drinkers. Logistic regression was used to evaluate the association between drinking groups and 30-day all-cause readmission, adjusting for covariates (age, gender, race, marital status, Deyo-Charlson index, service-connected disability, smoking) and accounting for the potential correlation of patient outcomes within VA facilities.

Population Studied: VA outpatients were eligible if they had an AUDIT-C screen documented in their medical record (2004-2008), were age 65 or older, were enrolled in Medicare, and had a VA or Medicare hospitalization for a medical/surgical condition in the year after screening. Veterans were excluded if they were admitted from a long-term care facility or transferred to another acute care facility during their index hospitalization, were hospitalized in the 30 days prior to their alcohol screen, or died during index hospitalization or in the 30 days after discharge.

Preliminary Findings: Among 40,736 eligible VA patients with an index hospitalization, 5,943 (15%) were readmitted. The adjusted probability of readmission was 18.9% (95% CI 15.3-22.6%) among high-risk drinkers compared to 13.6% (95% CI 12.6-14.6%) among low-risk drinkers. Readmission rates were also significantly higher for nondrinkers (15.2%; 95% CI 14.5-15.9%) relative to low-risk drinkers. Moderate-risk drinkers did not have readmission rates that differed significantly from low-risk drinkers.

Conclusions: High-risk drinkers based on the AUDIT-C alcohol screening questionnaire had significantly higher risk for readmissions than low-risk drinkers. Nondrinkers were also at slightly higher risk for readmissions compared to low-risk drinkers.

Implications for Policy, Delivery, or Practice: Medicare now reimburses for annual alcohol screening and The Joint Commission has launched hospital quality indicators focused on identifying and addressing alcohol misuse. This study found that alcohol screening up to a year before hospitalization identified patients at greater risk for 30-day readmissions. Future research should evaluate whether alcohol assessment and management, offered as part of discharge planning or post-discharge follow-up, can reduce hospital readmissions.

Funding: VA

Poster Session: A

Parent Insurance Coverage and Preventive Service Use by Publicly Insured Children
Ziqian Chen, B.S., University of Iowa; Amber M. Goedken, University of Iowa

Presenter: Ziqian Chen, B.S., Graduate Student, College of Pharmacy, University of Iowa, ziqian-chen@uiowa.edu

Research Objective: Public health insurance provides coverage for many children from low-income families but not necessarily their parents. Parents ineligible for public coverage must obtain private coverage or remain uninsured. While there is a positive association between parent enrollment in Medicaid and well-child visits among children under age six in Medicaid, a comparison of well-child visits between publicly insured children with privately insured and uninsured parents has not been undertaken. Understanding how preventive service utilization differs between publicly insured children depending on their parents’ source of coverage is important given the Affordable Care Act will expand health coverage for low-income parents through both public and private sources. We sought to examine the
relationship between source of parent insurance coverage and well-child visits among children in Medicaid or the Children’s Health Insurance Program (CHIP).

**Study Design:** Cross-sectional analysis of the 2009 Medical Expenditure Panel Survey-Household Component (MEPS-HC). We assessed whether the child had at least one well-child visit during the year. Parent insurance coverage was categorized as: (1) full-year uninsured, (2) full-year Medicaid, (3) part-year Medicaid, (4) full-year private and (5) part-year private. A logit model was used to assess the association between parent insurance coverage and well-child visits, controlling for parent (age, education, language, employment, health, health service use, and attitude toward overcoming illness without medical help), child (age, race, health, and oldest child), and household (Metropolitan Statistical Area, region, income, family structure, and number of children) variables.

**Population Studied:** We included children aged 17 years or less. Eligible children were required to have Medicaid or CHIP coverage exclusively the entire year and be linked to a parent who was uninsured the entire year or had a single source of insurance (Medicaid or private) during the year.

**Preliminary Findings:** Of the 3073 children, 36.4% had full-year uninsured parents. Fifty percent of the children had at least one well-child visit. In the multivariate analysis, the odds of children with full-year Medicaid parents having well-child visits were significantly lower than the odds for children with uninsured parents (odds ratio = 0.61; 95% confidence interval, 0.44-0.84). No significant difference was observed between children with full-year privately insured parents and children with uninsured parents.

**Conclusions:** Publicly insured children with parents under full-year Medicaid coverage are less likely to have well-child visits than those with uninsured parents. The observed phenomenon may be attributable to underlying differences between the families. Families where both parents and children are enrolled in Medicaid generally earn less than families where parents are uninsured and may face greater access issues. Alternatively, the parents may differ in their knowledge of and preferences for preventive care.

**Implications for Policy, Delivery, or Practice:** There is room for improvement in the rates at which publicly insured children are receiving well-child visits, particularly among children whose parents also have public coverage. Despite insurance coverage for both parent and child, there are factors hindering these children from receiving visits, so other strategies are needed to improve their use of preventive services.

**Funding:** No Funding

**Poster Session:** A

**Preconception Stressful Life Events Moderate the Effect of 9/11 on Obstetric Outcomes**

Kara Mandell, MA, University of Wisconsin-Madison; Whitney P. Witt, PhD, MPH, University of Wisconsin-Madison

**Presenter:** Kara Mandell, MA, Doctoral Student, Population Health Sciences, University of Wisconsin-Madison

**Research Objective:** Mounting evidence suggests that maternal stress over the lifecourse can be biologically transmitted to offspring through obstetric outcomes including pregnancy complications and low birth weight. This study takes advantage of a natural experiment by using data from a nationally representative cohort of children born in the United States before and after the terrorist attacks of September 11, 2001 (9/11), to understand the intergenerational effects of stress.

**Study Design:** Data are from a nationally-representative cohort of women who gave birth to a live baby in 2001. We use multiple regression to determine the effects of intrauterine exposure to 9/11 on the obstetric outcomes of babies born in the U.S. controlling for maternal socio-demographic characteristics, family socio-economic status, timing of initiation of prenatal care, plurality, health insurance coverage during pregnancy, parity, and U.S. region of residence. To determine if maternal stress prior to pregnancy moderates this relationship, we use a difference-in-difference approach, comparing babies born before and after 9/11 whose mothers did and did not experience preconception stressful life events. We also stratify by region to determine whether the effects of 9/11 are different in the Northeast.

**Population Studied:** The Early Childhood Longitudinal Study – Birth Cohort (ECLS-B) is a nationally representative cohort of women who gave birth to a live baby in 2001 (n=9350).

**Preliminary Findings:** We do not find an overall effect of in utero exposure to 9/11 on obstetric
outcomes across the country or in the Northeast specifically. We also found no difference in obstetric outcomes among women who had stressful life events prior to pregnancy when comparing those who gave birth before and after 9/11. However, in the Northeast, among infants whose mothers had experienced preconception stressful life events, being exposed to 9/11 during pregnancy increased the probability of being born low birth weight, OR=3.23, 95% CI 1.42-7.36 and very low birth weight (OR=3.60, 95% CI: 1.49-8.74) compared to women who had experienced preconception stressful life events and who had given birth before 9/11). In addition, mothers living in the Northeast who experienced preconception stressful life events were more likely to give birth to a baby with congenital abnormalities after being exposed to 9/11 (OR=8.81, 95% CI 3.35-23.15).

Conclusions: We find no effect of 9/11 on birth outcomes across the United States or in the Northeast. However, children born to mothers who had experienced stressful life events prior to pregnancy were more vulnerable to being exposed to 9/11 during pregnancy, resulting in decreased birth weight and increased probability of congenital abnormalities.

Implications for Policy, Delivery, or Practice: Given the high personal and societal costs of poor obstetric outcomes, policy makers should consider giving pregnant women who have experienced previous stressful events priority for services after negative large scale events like 9/11. As the occurrence of events like 9/11 are unpredictable, and it is often difficult to provide services to everyone who is in need afterwards, it may be more effective to offer preventive interventions that focus on reducing the deleterious effects of the accumulation of stress, such as those that promote coping skills and build resiliency, to women prior to such events.

Funding: AHRQ
Poster Session: A

Evaluation of Behavioral and Technological Interventions to Diabetes Self-care in a Racially/Ethnically Diverse Population: A Randomized Controlled Trial
Lola Adepoju, Texas A&M Health Science Center School of Rural Public Health; Jane N. Bolin, JD, Ph.D, Department of Health Policy and Management, Texas A&M Health Science Center School of Rural Public Health; Darcy M. Moudouni, Ph.D, Department of Health Policy and Management, Texas A&M Health Science Center School of Rural Public Health; Janet W. Helduser, M.A, Department of Health Policy and Management, Texas A&M Health Science Center School of Rural Public Health; Marcia Ory, Ph.D, MPH, Department of Health Promotion & Community Health Sciences, Texas A&M Health Science Center School of Rural Public Health; Samuel Forjuoh, MD, DrPH, Department of Family & Community Medicine, Scott & White Healthcare, College of Medicine, Texas A&M Health Science Center

Presenter: Lola Adepoju, M.P.H., Doctoral Student, Department of Health Policy and Management, Texas A&M Health Science Center School of Rural Public Health, adepoju@tamhs.edu

Research Objective: To evaluate the cost-effectiveness of four diabetes self-management interventions for type 2 diabetes in a community primary care setting in disadvantaged geographic areas with documented health disparities.

Study Design: A total of 376 adults with type 2 diabetes from a large health care plan in Central Texas were randomized into one of four strategy arms: the Diabetes Pilot software on a personal digital assistant hand held device (PDA) (n=81), Chronic Disease Self-Management Program (CDSMP) (n=101), combined PDA and CDSMP (COM) (n=99), and usual care (UC) (n=95).

Strategy effectiveness was measured by HbA1c levels. Assessments of HbA1c levels occurred at baseline, six months, and twelve months. We compare costs associated with each study arm to the measured HbA1c reduction to determine which intervention was most cost-effective. Economic analyses incorporated the direct medical costs associated with the uncontrolled vs controlled HbA1c states and quality adjusted life years (QALYs) measures.

Population Studied: Persons with Type 2 diabetes

Principal Findings: Compared to the Usual Care group, the CDSMP only arm was the most cost-effective of all three interventions and was associated with an incremental cost effectiveness ratio of $13,106 representing the incremental cost per additional QALY gained. The combined intervention was dominated, costing more and having lesser HbA1c reductions; the PDA intervention was dominated by external dominance. Sensitivity analyses tested the robustness of the model’s estimates under various alternative assumptions, including changing costs and QALYs. The model...
generally predicts acceptable cost-effectiveness ratios in the range $10,577 to $15,975

**Conclusions:** Compared the usual care and based on the common benchmark of $50,000/QALY, the CDSMP only intervention is cost-effective in reducing HbA1c levels among persons with Type 2 diabetes.

**Implications for Policy, Delivery, or Practice:** From a health care management organization perspective, chronic disease self-management programs are cost-effective in affecting HbA1c levels in the short-term.

**Funding Source(s):** NIH

**Poster Session and Number:** A, #1

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**Effects of Diabetes Self-Management Programs on Time-to-Hospitalization among Patients with Type II Diabetes: A Survival Analysis Model**

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**Presenter:** Lola Adepoju, M.P.H., Doctoral Student, Department of Health Policy and Management, Texas A&M health Science Center School of Rural Public Health, adepoju@tamhsc.edu

**Research Objective:** This study compares time-to-hospitalization among patients that participated in a NIH funded study employing a randomized controlled trial (RCT) of Type II diabetes patients. We seek to determine whether the Diabetes Self-Management intervention programs prolonged the time to first hospitalization within any of the RCT groups, after controlling for relevant demographic and clinical variables.

**Study Design:** Data were obtained from electronic medical records (EMR) of 376 adults aged =18 years who were enrolled in one of seven regional clinics of a university-affiliated group practice and consented to participate in a randomized controlled trial of T2DM self-management programs in Central Texas. All study participants had uncontrolled diabetes (baseline HbA1c =7.5%) and were randomized into one of four study arms: personal digital assistant hand held device (PDA), Stanford University’s Chronic Disease Self-Management Program (CDSMP), combined PDA and CDSMP (COM), and usual care (UC). Consistent with survival analysis techniques, we measure time-to-hospitalization (survival time) as the interval between study enrollment and the occurrence of a hospitalization event relating to diabetes. For the purposes of our analyses, we define hospitalization as any acute hospital event relating to diabetes. If a subject did not experience any diabetes-related hospitalization, the subject was considered censored at the end of the 2-year study. We plot Kaplan-Meier survival curves stratified by the RCT study arms, gender, race, and identified comorbidities. Multivariate analyses employing a Cox Proportional Hazards model are used to model the data while controlling for baseline independent variables.

**Population Studied:** Persons with Type 2 diabetes in Central Texas

**Principal Findings:** Subjects enrolled in the CDSMP only arm had a statistically significant lower odds (Hazard ratio: 0.10; p=0.002) of being hospitalized when compared to subjects in the control arm. Subjects in the PDA and CDSMP combined arm showed no improvements in comparison to the control arm. Increasing age and higher HbA1c values were significantly associated with shorter time-to-hospitalization at the 0.05 significance level (hazard ratios: 1.03 and 1.21 respectively; p-values: 0.01 and 0.006 respectively). Greater educational attainment (persons with greater than high school education) was associated with longer times to hospitalization (Hazard ratio: 0.6; p= 0.008) when compared with persons with high school education or less. In comparison to non-Hispanic whites, Hispanics were associated with significantly longer time-to-hospitalization (Hazard ratio: 0.5; p=0.02) while non-Hispanic blacks were associated with shorter time-to-hospitalization, though insignificant (Hazard ratio: 1.1; p=0.64). As the number of comorbidities increased, the time to hospitalization reduced significantly (hazard ratio: 1.8; p=0.003). Higher quality of life (Healthy Days Index) was not significantly associated with time-to-hospitalization. There
were no statistically significant differences in outcomes by gender.

**Conclusions:** The CDSMP diabetes self-management program was effective in prolonging time-to-hospitalization among patients with T2DM among participants in this trial. Persons who are young, have lower HbA1c values, have more than a high school education and have fewer comorbidities, are more likely to experience longer time-to-hospitalization following enrolment in a diabetes self-management programs.

**Implications for Policy, Delivery, or Practice:** Diabetes patients who have more than high school education, fewer comorbidities, lower HbA1c values, and less than 65 years are more likely to experience longer time-to-hospitalization following enrollment in a diabetes self-management programs

**Funding Source(s):** NIH

**Poster Session and Number:** A, #2

**Depression Treatment Patterns among Individuals with Arthritis: A Comparative Analysis with Other Chronic Conditions**

Parul Agarwal, West Virginia University; Xiayoun Lucy Pan, West Virginia University; Usha Sambamoorthi, West Virginia University

**Presenter:** Parul Agarwal, M.P.H., Student/teaching Assistant, West Virginia University, agarwalp82@gmail.com

**Research Objective:** Arthritis and depression often co-occur; studies that describe patterns of depression treatment among individuals with arthritis are scant. The purpose of the study was to compare depression treatment patterns between individuals with arthritis and other types of chronic conditions by predisposing, enabling, need factors, personal health practices and external health environment.

**Study Design:** We used a retrospective cross-sectional design.

**Population Studied:** Data were from 2006 and 2008 Medical Expenditure Panel Survey. The sample consisted of 2,743 adults aged over 21 years with depression and Rheumatoid Arthritis (RA) or Osteoarthritis (OA), other joint disorders and other chronic conditions. Depression treatment consisted of: 1) No treatment; 2) antidepressant use only and 3) both antidepressants and psychotherapy. Multinomial logistic regressions were used to describe patterns of depression treatment within a multivariate framework.

**Principal Findings:** Overall, 22.2% of the study sample reported no depression treatment, 59% used antidepressants only and 19% used combination therapy. After controlling for all other independent variables adults with RA or OA were as likely to report depression treatment as compared to adults with other chronic conditions [antidepressant use: AOR =1.35, CI=0.99,1.84; combination therapy: AOR=1.25, CI=0.86,1.82]. Among individuals with RA or OA significant subgroup differences in depression treatment were observed. African Americans were less likely to report depression treatment [antidepressants: AOR=0.34, 95%CI=0.24, 0.47; combination therapy: AOR=0.29, 95%CI=0.18, 0.47]

**Conclusions:** Our study highlighted that individuals with RA or OA are as likely to report depression treatment as those with other types of chronic conditions after controlling for a comprehensive list of independent variables. Our study also highlighted subgroup differences in depression treatment among individuals with RA or OA.

**Implications for Policy, Delivery, or Practice:** Future research needs to examine whether disparities in depression treatment among individuals with RA or OA are associated with poor health outcomes.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #3

**Impact of Nursing Skill Mix on the Patient Experience of Hospital Care**

Danielle Altares, University of Pennsylvania

**Presenter:** Danielle Altares, M.S.N.,N.P.,B.S.N., Pre-doctoral Fellow, Center for Health Outcomes and Policy Research, University of Pennsylvania, altares@nursing.upenn.edu

**Research Objective:** The skill mix of hospital nursing staff, defined as the proportion of registered nurses to total nursing staff (licensed practical nurses and unlicensed assistive personnel), is a topic of considerable interest to hospital administrators and outcomes researchers. Skill mix reduction is re-emerging as a hospital cost-control measure and there is considerable debate as to the relationship between skill mix and high quality patient care and patient satisfaction. The purpose of this study was to determine the relationship between hospital nursing skill mix and patient reports of their experience with hospital care.
Study Design: The study is a cross-sectional analysis of linked survey data collected in 2006-2007 from registered nurses working in four states (California, New Jersey, Pennsylvania and Florida), the American Hospital Association (AHA) Annual Survey, and the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey data collected between 2006 and 2007. The nurses were surveyed on all manner of work environment, workforce, and quality issues related to their employing institution. Skill mix was measured by aggregating nurse reports of number of RNs, LPNs, and unlicensed assistive personnel on their floor during their last shift to the hospital level. These were then used to calculate the total proportion of hours worked by RN nursing staff. Ordinary least squares (OLS) regression models were used to estimate the effect of the skill mix on global and nursing-related HCAHPS scores, before and after adjusting for nurse work environment, education, staffing and hospital structural characteristics including size, teaching status, level of technology, ownership, and location.

Population Studied: This study included 29,981 nurses from 490 hospitals in California, New Jersey, Pennsylvania, and Florida.

Principal Findings: RN skill mix was significantly associated with both HCAHPS global measures. A 10% increase in the proportion of RNs yielded a 1.98% increase in a hospital's adjusted percentage of patients who would "definitely recommend the hospital to friends and family" (p<.001, 95% CI 1.00-2.96) and a 1.76% increase in the percentage of patients who would rate that hospital as 9 or 10 out of 10 points (p<.001, 95% CI 0.86-2.65). A 10% increase in the proportion of RNs was associated with higher percentages of patients who were always satisfied with nurse communication (1.03%, p<.01, 95% CI 0.36-1.71), patients always receiving help quickly from staff (1.05%, p<.01, 95% CI 0.26-1.85), patients reporting satisfaction with pain control (1.12%, p=.001, 95% CI 0.49-1.75), and patient satisfaction with staff explanation of new medications (1.01%, p=.01, 95% CI 0.38-1.63).

Conclusions: For each additional 10% in the percentage of RN staff at the hospital, patient self-report on global satisfaction as well as nursing specific measures showed a statistically significant increase across both global and nurse-specific satisfaction measures.

Implications for Policy, Delivery, or Practice: In a difficult financial climate hospital administrators need strong evidence on which to base staffing decisions. Due to recent focus on patient satisfaction measures in the Affordable Care Act and associated pay-for-performance requirements, the impact of skill mix on patient satisfaction is an area that deserves closer study.

Funding Source(s): Other, Fontaine Fellowship, University of Pennsylvania

Poster Session and Number: A, #4

Financial Impact of Stroke and Transient Ischemic Attacks during Labor Participation and Retirement

Vishal Arora, Harvard University; Alexander T. Hawkins, Brigham and Women's Hospital Center for Surgery and Public Health; Nathanael Hevelone, Brigham and Women's Hospital Center for Surgery and Public Health; Louis L. Nguyen, Brigham & Women's Hospital Division of Vascular and Endovascular Surgery

Presenter: Vishal Arora, Student, Harvard University, vsarora@college.harvard.edu

Research Objective: Acute illness can lead to negative health consequences, as well as financial strain from decreased work and increased health care bills. We sought to quantify the financial impact of acute stroke and transient ischemic attack (TIA) during a period of labor participation (age 50-64) versus expected retirement (age 65 and older). We hypothesized there would be a greater depreciation in baseline non-housing assets for individuals who had acute stroke or TIA in a period of labor participation, due to possible unexpected retirement or bankruptcy, compared to those presumed to be out of the labor force.

Study Design: Self-reported data of 28,486 individuals in the Health and Retirement Study (HRS) from 1992 to 2010 were analyzed. Any individuals whose reported value of non-housing assets was greater than USD 10 million were Winsorized to an upper bound value of USD 10 million. Random effects multivariable linear models were created to assess the relationship between non-housing assets and stroke, controlling for age, sex, race, number of co-morbidities, years of education, number of children, and marital status. The models were differentiated by the age at which an individual encountered a stroke. Age-matched control groups used were those individuals who had not experienced a stroke during the study period.
Population Studied: 2,471 individuals aged 50-90 suffered a stroke from 1992 to 2010, resulting in an incidence rate of 8.7 pct in the dataset. 505 (20.4 pct) patients experienced an acute stroke in the age range of 50-64 years, compared to 1,966 (79.6 pct) at age 65 and older. 1,973 (79.8 pct) individuals were Caucasian and 428 (17.3 pct) were Black. 1,078 (43.6 pct) individuals were male and 1,393 (56.3 pct) were female.

Principal Findings: Individuals with stroke in the 50-64 age range had a relative decrease in assets of USD 23,704 (9.7 pct) (P<0.001, SE=USD 994) two years post-stroke compared to the control group. For individuals experiencing a stroke at 65 years or older, they experienced a relative decrease of USD 14,766 (6.1 pct) (P<0.001, SE=USD 478) two years post-stroke compared to the control group. The differential decrease in non-housing assets regardless of labor force status, the financial strain from an acute stroke while in the labor force may be more damaging compared to when one is retired. In light of recent fiscal debates, these findings support consideration for greater financial support and unemployment insurance benefits for individuals who are younger, and more likely to be in the labor force.

Implications for Policy, Delivery, or Practice: Although undergoing a stroke will result in a net decrease in non-housing assets after suffering an acute stroke was slightly greater for individuals who are younger, and more likely to be in the labor force. Despite these findings, the effects of the economic burden of stroke on health status and income have been understudied. Our findings suggest that the net decrease in non-housing assets after suffering an acute stroke was slightly greater for individuals who are younger, and more likely to be in the labor force.

Conclusions: Our findings suggest that the net decrease in non-housing assets after suffering an acute stroke was slightly greater for individuals who are younger, and more likely to be in the labor force. Although undergoing a stroke will result in a net decrease in non-housing assets regardless of labor force status, the financial strain from an acute stroke while in the labor force may be more damaging compared to when one is retired. In light of recent fiscal debates, these findings support consideration for greater financial support and unemployment insurance benefits for individuals who undergo a significant health shock while in the labor force.

Funding Source(s): No Funding

Poste Session and Number: A, #5

Which Functions of Electronic Health Record System Increase Health Counseling Services?

Jaeyong Bae, Emory University; Edmund R. Becker, Emory University; Jason M. Hockenberry, Emory University and NBER

Presenter: Jaeyong Bae, M.A., Doctoral Student, Health Policy and Management, Emory University, jbae9@emory.edu

Research Objective: Reducing unhealthy behaviors can prevent the onset of chronic diseases, delay their progress, and manage their conditions effectively. Health counseling in primary care can enhance early detection, prevention, and management of chronic conditions by identifying risk factors of chronic conditions and influencing healthy behavior in patients. Electronic Health Records (EHRs) have potential to promote the delivery of health counseling during primary care visits by providing appropriate patient information with clinical guideline as well as allowing physicians to allocate more time on health counseling due to the improvement of efficiency of care by EHR systems. We examine what impact EHR functions pertaining to providing behavioral health counseling services have on the frequency of health counseling services during primary care visits.

Study Design: The primary outcome of this study is an indicator for health counseling in primary care visits including asthma education, diet/nutrition, exercise, growth/development, injury prevention, stress management, tobacco use/exposure, and weight reduction. We used linear probability model to examine whether 5 EHR functions including computerized system for “clinical reminder”, “clinical notes”, “patient problem lists”, “prescription orders”, “lab test orders” and combinations of functions that would prompt the physician to deliver behavioral health counseling had an effect on delivery of these services. To account for endogenous adoption of EHR, we employed propensity score matching.

Population Studied: This study uses 34,383 primary care office visits to primary care physicians (general practitioners, family practitioners, or general internist) by adults during 2007-2010 in the National Ambulatory Medical Care Survey (NAMCS), a nationally representative survey of patient visits to non-federally employed office-based physicians.

Principal Findings: Overall rate of health counseling services during primary care visits is 40%. 39.3% of the primary care visits had “clinical reminder” function, 46.6% had “clinical notes” function, 41.8% had “patient problem lists” function, 47.4% had “prescription orders” function, and 44.2% had “lab test orders” function. Frequency of health counseling services was not affected by “clinical reminder” or “patient problem lists” in case either one of these two functionalities was used. However, use of both “clinical reminder” and “patient problem lists” functions promote health counseling services by 11.4 percent. “Clinical notes” and “prescription orders” increase health counseling services by 7.0 percent.
counseling services by 11.2 percent and 9.1 percent, respectively. “Lab test orders” had no statistically significant impact on health counseling services.

**Conclusions:** Having both “clinical reminder” and “patient problem lists” functions promote behavioral health counseling services while having either of these functions does not increase counseling services. “Clinical notes” and “computerized prescription orders” individually increase health counseling services. These results indicate that EHR functions pertaining not only to appropriate patient information but also to efficiency and workflow have impact on the frequency of health counseling services.

**Implications for Policy, Delivery, or Practice:** An EHR system with the right mix of functionality can enhance disease prevention/management, improve quality, and reduce costs by providing more health counseling services in primary care. It is also important for policymakers and researchers to note that appropriate measures of EHR elements relating to outcomes are required to evaluate the impact rigorously.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #6

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**The Impact of Two Incentive-Based Health Interventions on Stages of Change and Patient Activation Scores**

Nora Becker, Wharton School of Business, University of Pennsylvania; Jingsan Zhu, University of Pennsylvania; Aditi Sen, University of Pennsylvania; Dr. David Asch, University of Pennsylvania; Dr. Kevin Volpp, University of Pennsylvania

**Presenter:** Nora Becker, Doctoral Student, Health Care Management, Wharton School of Business, University of Pennsylvania, norab@wharton.upenn.edu

**Research Objective:** Stages of change and patient activation (PAM) are two widely used measures which researchers have used to predict the success of behavioral interventions. The stages of change measure classifies participants into one of five stages (Precontemplation, Contemplation, Preparation, Action or Maintenance) based on self-reported readiness to change behavior. The PAM assigns a continuous score from one through 100 based on responses to thirteen questions concerning chronic disease self-management. This study examined the impact of two lottery-based behavioral health interventions on stage of change and PAM scores among individuals. One study used lottery-based financial incentives to incentivize weight loss among obese individuals (n = 132), while the other used similar incentives to improve diabetes self-management (n = 75). Studies have not previously examined the concordance of the scores in these two widely used measures.

**Study Design:** We examine four aspects of PAM and stage of change scores: (1) Their correlation at baseline, (2) Whether they predicted outcomes among participants, (3) If the intervention itself changed participant’s scores, and (4) Whether the change in participant’s scores over time correlated with success in the intervention.

**Population Studied:** Individuals with chronic diseases enrolled in incentive-based health interventions.

**Principal Findings:** At baseline, participants in both interventions had significantly right-shifted PAM and stage of change score distributions compared with the general population, suggesting that both studies tended to attract highly motivated enrollees. The mean PAM scores for the two studies were 73.1 (SD = 20.2), and 75.5 (SD = 16.4), with the range of scores going from zero to 100. For the weight loss study, less than 1% were in the Precontemplation stage of change, 6.8% were in Contemplation, 12.1% were in Preparation, 28.8% were in Action, and 51.5% were in Maintenance. For the diabetes self-monitoring study, no participants were in Precontemplation, 8% were in Contemplation, 9.3% were in Preparation, 29.3% were in Action, and 53.3% were in Maintenance. We found no correlation between baseline PAM and baseline stage of change score for either study ($R^2 = 0.000$ and 0.0014). There was also no association between baseline PAM and stage of chance score and subsequent patient outcomes for either study. Finally, change in PAM and stage of change scores among participants in the intervention groups did not differ by study arm or by success in the intervention.

**Conclusions:** PAM and Stage of Change measures may not be effective mechanisms for either examining ongoing progress or predicting success among highly motivated individuals with chronic diseases enrolled in incentive-based interventions.

**Implications for Policy, Delivery, or Practice:** Better tailoring of health care interventions could greatly increase the efficiency of spending on
interventions. Instruments that are predictive of intervention effectiveness that can be observed ex ante are needed for incentive-based interventions.

**Funding Source(s):** NIH

**Poster Session and Number:** A, #7

**Factors Associated with Mammography Screening in Four Contiguous U.S. States**

Loretta Berger, Boston University School of Public Health; Ann Han, Boston University School of Public Health; Shwetha Sequeira, Boston University School of Public Health

**Research Objective:** Our objective was to evaluate access to care, socio-economic status (SES), and other demographic factors at regional and individual levels that predict the probability of women 40 and older getting mammography screening for breast cancer within the previous two years in cities of Idaho (ID), which had the lowest rates nationally at 63.8%, and contiguous states of Washington (WA), Montana (MT), and North Dakota (ND).

**Study Design:** We conducted a cross-sectional analysis of 2010 Center for Disease Control (CDC) Behavioral Risk Factor Surveillance System (BRFSS) individual survey data for women 40 and over residing in cities of Idaho, Washington, Montana, and North Dakota.

**Population Studied:** Our sample included 10,881 women aged 40 and older in the four states. Women with a history of breast cancer or a missing primary outcome variable (mammogram within the last two years) were excluded. Regional characteristics for cities within each state included a created variable of the sum of general and OB/GYN physicians divided by the civil population to represent provider density and 2010 American Community Survey demographic data from the US Census spatially linked to the study area using ArcGIS.

**Principal Findings:** Having a personal doctor was significantly associated with having a mammogram within the previous two years for women 40 and older in all but one city. Controlling for socio-demographic variables, women 40 and older who had a routine check-up within two years had greater odds of having timely mammography for all cities. Provider density was significantly associated with mammography in the previous two years only in cities in Idaho, which had the lowest mammography rates nationally. Women 40 and older in cities with higher SES (income greater than 50K, high school education or greater) had greater odds of having a mammogram within the previous two years in cities of Idaho, North Dakota and Washington but not Montana. In general, within states, cities with higher SES had greater odds of current mammography compared to those with lower SES except in Montana, and cities with greater access to care had greater odds of current mammography compared to those with less access to care.

**Conclusions:** Our findings are consistent with prior research suggesting a range of possible benefits associated with having and utilizing a usual source of care. State-wide policies directed at improving timely mammography screening may do well to include an effort to promote the importance (and facilitate the establishment) of a relationship with a medical care provider. We are unable to conclude what critical aspects of better access or heightened awareness our results may reflect given the limitations of our study. There are undoubtedly other factors that we were unable to account for in our analysis that contribute to the widely varying uptake of recommended mammography screening.

**Implications for Policy, Delivery, or Practice:** Further study is needed to evaluate other factors, such as structural aspects of the health care system (including issues around underinsurance), in order to identify barriers to care and determine where and how to target efforts to reduce intrastate disparities in the uptake of recommended mammography screening and other important preventive health initiatives.

**Funding Source(s):** Other, Department of Veterans Affairs and PTACP-97-185-16

**Poster Session and Number:** A, #8

**Healthcare Expenditures and Co-occurring Chronic Conditions Associated with Parkinson’s Disease: A Propensity Score Matched Analysis**

Sandipan Bhattacharjee, West Virginia University; Usha Sambamoorthi, West Virginia University

**Presenter:** Sandipan Bhattacharjee, M.S., Student, Pharmaceutical Systems and Policy,
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Research Objective: Existing literature suggests that individuals with Parkinson’s disease (PD) have higher co-occurring conditions and also experience increased expenditure compared to individuals without PD. Studies that examined the relationship between PD and direct healthcare expenditures have highlighted excess expenditures associated with PD. However, these studies have not examined the extent to which co-occurring conditions contribute to these excess expenditures. Therefore, the primary objective of this study is to examine incremental expenditures associated with PD and the role of co-occurring conditions in contributing to these excess expenditures by utilizing a nationally representative sample, recent data, use of a matched case-control design derived through rigorous statistical matching technique (i.e. propensity score matching).

Study Design: A retrospective, cross-sectional matched case-control design was adopted for this study, matching individuals with PD to those without PD using propensity score technique. This study used data from annual releases of the Medical Expenditure Panel Survey (MEPS 2000-2009), a nationally representative survey of households and families. Propensity score matching was performed using gender, race, perceived physical and mental health status and body mass index (BMI). T-tests were used to examine the differences in average total, inpatient, outpatient, emergency room, pharmacy, home healthcare, and other expenditures between PD and no PD groups. Ordinary Least Square (OLS) regressions were conducted on logged expenditures (2009 dollars) controlling for different co-occurring conditions. All analyses accounted for the complex survey design of the MEPS and were conducted in SAS 9.3. As the current study pooled multiple years (2000-2009), the HC-036 file was used which contains the proper variance structure to obtain appropriate estimates from MEPS data that have been pooled over multiple years and where one or more years are from 1996-2001. The percentage change in expenditure was calculated using the formula expβ-1.

Population Studied: The analytic sample consisted of elderly individuals aged 65 years or older and alive during the calendar years. Elderly individuals with PD were identified using ICD-9-CM code of 332.xx. In addition, it was required that those without PD have positive direct healthcare expenditures as all individuals with PD had positive direct healthcare expenditures. Matched controls were selected using the GREEDY 8 to 1 matching technique of propensity score.

Principal Findings: Among elderly, the average total expenditures were $15,404 for those with PD and $13,333 for those without PD. Results from regressions revealed that elderly with PD had 109% greater total expenditure compared to those without PD, when only demographic and socioeconomic variables were entered in the model. When co-occurring chronic conditions were additionally included in the model, those with PD had 84% greater expenditures compared to those without PD.

Conclusions: Excess expenditures associated with PD are partially driven by co-occurring conditions among individuals with PD.

Implications for Policy, Delivery, or Practice: Findings from this study have implications for collaborative care in the management of co-occurring chronic conditions as well as management of PD in order to reduce the complications and thereby reducing the economic burden of PD.

Funding Source(s): Other, WVU Cohorts

Poster Session and Number: A, #9

Factors Associated with Physician Assistant Practice in Primary Care: Evidence from Nebraska
Soumitra Bhuyan, University of Nebraska Medical Center; Aastha Chandak, University of Nebraska Medical Center; Marlene Deras, University of Nebraska Medical Center; Jim Stimpson, University of Nebraska Medical Center

Presenter: Soumitra Bhuyan, M.P.H., Graduate Research Assistant, Health Services Administration, Research and Policy, University of Nebraska Medical Center, soumitrasudip.bhuyan@unmc.edu

Research Objective: The Physician Assistant (PA) profession was developed to expand the reach of primary care physicians and to improve health care access for patients in rural and urban underserved areas across the United States. Previous research shows evidence that PAs can improve the quality of care, increase patient education and patient satisfaction, and reduce health care costs. Increasing the number
of PAs in the health care workforce may be one option to address the expected increase in demand for health services and current shortage of physicians. The objective of the study was to assess the factors associated with PA practice in primary care in Nebraska.

**Study Design:** We used workforce survey data from the Health Professions Tracking Services (HPTS) at the University of Nebraska Medical Center for 2012. In the two stage survey, HPTS first surveys PAs currently practicing in Nebraska. The second survey is sent to physician offices, clinics, and hospitals to assess their use of PAs. Annual verification rate lies between 65-95%. Community variables were retrieved from area resource file. Primary care PAs included those who reported practicing in a location specializing in family medicine, internal medicine, obstetrics and gynecology, and pediatrics. We performed logistic regression to assess the factors associated with PA practice in primary care. Federally employed PAs and those teaching, and in research were excluded. **Population Studied:** The study population was PAs actively practicing in the state of Nebraska.

**Principal Findings:** There were 717 PAs practicing actively in Nebraska in 2012. Of those, 47.6% practice in a location specializing in primary care and 60.4% in urban location, 54.4% are younger than 40 years, 31.4% are male, 35.3% have been in practice since 0-5 years, and 57.9% have a rural background. In the logistic regression model, female PAs had higher odds of practicing (OR: 2.7 CI: 1.7-4.19) primary care than male PAs. PAs older than 61 years and practicing for more than 21 years have higher odds for practicing primary care; however, it was not statistically significant. At county level, nurse practitioners to population ratio and percentage of people below poverty line were negatively associated with PAs practicing primary care. Graduation from a Nebraska or an out of state PA program was not significantly associated with primary care practice. Rural location of upbringing was not significantly associated with practice of primary care.

**Conclusions:** This study analyses the distribution of PAs in Nebraska. Females PAs are more likely to practice primary care. More primary care PAs practice in rural areas. Although, rural upbringing was not significantly associated with practice of primary care, it was significantly associated with PAs practicing in rural areas.

**Implications for Policy, Delivery, or Practice:** Policy interventions are needed to provide incentive to the PA graduates who practice primary care. Ensuring a supply of primary care physicians in rural areas is essential for maintaining or growing the role of PAs in rural areas, as PAs are primarily hired by physicians. Recruiting PA students from rural underserved areas may increase the likelihood that they will return to their rural communities after graduation. Further research is needed to understand attrition rates and retirement patterns among PAs.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #10

**Antipsychotic Duration of Use Among Medicaid-insured Preschoolers, Young Children and Adolescents**

Mehtem Burcu, University of Maryland; Julie M. Zito, Ph.D., Pharmaceutical Health Services Reserach Department, University of Maryland; Daniel J. Safer, M.D., Departments of Psychiatry and Pediatrics, Johns Hopkins University

**Presenter:** Mehtem Burcu, M.S., Graduate Student, Pharmaceutical Health Services Research Department, University of Maryland, mburcu001@umaryland.edu

**Research Objective:** Over the last two decades, the increased use of psychotropic medications singly or in combination, often for unlabeled indications, has been profound. In particular, antipsychotic medications to treat behavioral disorders in youth are a growing concern due to limited data on antipsychotic effectiveness for attention deficit hyperactivity disorder (ADHD), as well as an increasing awareness of serious treatment-emergent adverse events. However, patterns of antipsychotic use in relation to their duration by age group and by psychiatric diagnosis among youth populations are lacking. The main objectives of this study of Medicaid-insured youth were to characterize those on antipsychotic medications, and to assess total days of exposure to these agents, specifically by age group and psychiatric diagnoses.

**Study Design:** In a one-year cross-sectional design, bivariate analyses and multivariable quantile regression modeling were employed to assess characteristics of antipsychotic medicated youth and to assess differences in median duration of exposure to these agents across age groups (preschoolers (2-5 years);
young children (6-12 years); adolescents (13-17 years)] mainly by clinician-reported psychiatric diagnoses and additional study covariates. Other covariates included Medicaid-eligibility groups (SSI [Social Security Income], foster care, TANF [Temporary Assistance for Needy Families], CHIP [the State Children’s Health Insurance Program]), gender, race/ethnicity, U.S. region, and other psychotropic medication classes. A hierarchical approach to diagnoses was adopted from Olfson et al. (2006) for youth with diagnoses in more than one psychiatric category to create mutually exclusive groups, beginning with schizophrenia/other psychoses and followed by pervasive developmental disorders and mental retardation, bipolar disorder, disruptive disorders, ADHD, depressive disorders, anxiety disorders, adjustment disorder, and any other psychiatric diagnosis.

Population Studied: In a mid-Atlantic state Medicaid program, computerized administrative claims were assessed for youth aged 2-17 years with 12 months of enrollment in 2006.

Principal Findings: Among 266,590 continuously enrolled Medicaid-insured youth, the majority (56.0%) were Medicaid-eligible through TANF program followed by CHIP (36.2%). The study population was predominantly African American (56%) and aged 6-12 years (42.8%). The prevalence of antipsychotic use was 3.4%. Youth with ADHD or disruptive behavior disorders, and youth who were Medicaid-eligible through TANF or CHIP constituted the largest group of antipsychotic users, in particular for youth aged 12 years or younger. Compared to SSI-eligible youth (with disability), youth in foster care had longer median durations of antipsychotic use across the age groups (preschoolers: 180 vs. 150 days; young children: 261 vs. 225 days; adolescents 245 vs. 221 days). Among antipsychotic users, clinician-reported bipolar disorder increased with increasing age. However, the longest duration of antipsychotic use occurred among preschoolers diagnosed with pediatric bipolar disorder (203 median days).

Conclusions: Overall, in an annual cohort of continuously enrolled Medicaid-insured youth, the median exposure duration to antipsychotic agents was 6 or more months. Long durations of use were particularly notable in youth with clinician-reported diagnosis of pediatric bipolar disorder, ADHD, and disruptive behavior disorder.

Implications for Policy, Delivery, or Practice: Long term effectiveness, safety, and monitoring of antipsychotic medications in youth, particularly those diagnosed with externalizing behavior disorders are needed. In addition, state Medicaid program oversight appears to be warranted.

Funding Source(s): Other, UM-PHSR

Poster Session and Number: A, #11

Payer Source and Delivery Type: Variations in Diabetes Management and Guideline Adherence

Julia Caldwell, UCLA Center for Health Policy Research

Presenter: Julia Caldwell, Graduate Student Researcher, UCLA Center for Health Policy Research, juliatcaldwell@ucla.edu

Research Objective: Diabetes is a growing public health problem. Implementation of clinical guidelines adherence through disease management plans is necessary to lower costs and diabetes complications. Inconsistencies in diabetes management plan and guideline compliance may depend on insurance payer and delivery type. This study tests for variations in diabetes clinical guideline adherence for a foot exam by a health professional, a dilated eye exam, and HbA1c Test, by health payer/plan within the past year.

Study Design: Analysis was conducted utilizing the population based 2009 California Health Interview Survey of California residents. Respondents were categorized into six health payers/plans. Average marginal effects determined the probability of having an eye exam, foot exam, and HbA1c test in the past year.

Population Studied: A representative sample of all diabetic adults in California ages 18-64.

Principal Findings: Among California adults, 71% of diabetics report receiving a dilated eye exam, 72% of diabetics report receiving a foot exam by a health professional, and 87% of diabetics report receiving an HbA1c blood test within the past year. The probability of having a foot exam decreases by −0.15 [95%CI −0.16, −0.15] for diabetics enrolled in a Medi-Cal HMO compared to diabetics in Kaiser HMO. Diabetics who have disease management plans are significantly more likely to report a foot and HbA1c blood exam in the past year. Compared to diabetics who are white, diabetic African
Americans are significantly more likely to have a foot exam, and Asian/Pacific Islanders are significantly more likely to receive an HbA1c.

**Conclusions:** Variations exist in diabetes management and guideline adherence by health payer source and delivery type. Compared to diabetics enrolled in Kaiser HMO, diabetics enrolled in a Medi-Cal HMO or who are uninsured have a lower probability of clinical guideline adherence. Additionally, having a usual source is a significant predictor in whether diabetics received a dilated eye and foot exam.

**Implications for Policy, Delivery, or Practice:** With the immediate expansion of coverage through the ACA, increased efforts are needed to implement disease management plans and improve compliance among all diabetics.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #12

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**Intimate Partner Violence around Pregnancy: The Role of Health Care Providers and Missed Opportunities to Intervene**

Susan Cha, Virginia Commonwealth University; Saba W. Masho, MD, MPH, DrPH, Virginia Commonwealth University

**Presenter:** Susan Cha, M.P.H., B.A., Pre-doctoral Candidate, Epidemiology & Community Health, Virginia Commonwealth University, susanchabowers@gmail.com

**Research Objective:** To assess the extent to which women who experience intimate partner violence (IPV) actually receive education on partner violence from health care providers during any prenatal care (PNC) visits.

**Study Design:** This cross-sectional study analyzed the 2004-2008 National Pregnancy Risk Assessment Monitoring System, a collaborative population-based program by U.S. state health departments and the Centers for Disease Control and Prevention. IPV victimization was measured using four survey items that addressed physical abuse by a current or former husband/partner in the 12 months before (preconception) and during (prenatal) pregnancy. Responses were categorized as: preconception IPV, prenatal IPV, and preconception and/or prenatal IPV. The outcome of interest was receipt of IPV education by a health care provider during PNC. Separate multiple logistic regression models provided crude and adjusted odds ratios and 95% confidence intervals (CI).

**Population Studied:** Study population consisted of a nationally representative group of women who delivered a live birth in the U.S. between 2004 and 2008 (n=202,367).

**Principal Findings:** Women who reported prenatal IPV were significantly less likely to receive IPV education during PNC (OR = 0.81, 95% CI = 0.70-0.94). Additionally, among ethnic and racial minorities (Black, Hispanic, and Asian/other), women who reported preconception IPV were less likely to receive IPV education during their prenatal visits. Further, Medicaid recipients who had been IPV victims during preconception and/or pregnancy were less likely to receive IPV education (OR=0.76, 95% CI = 0.70-0.83).

**Conclusions:** This study reported that women who experienced IPV during pregnancy were less likely to receive education on partner violence from their health care providers. Racial/ethnic minority groups and Medicaid recipients who reported IPV around pregnancy were also less likely to receive IPV education.

**Implications for Policy, Delivery, or Practice:** These results underscore a critical public health problem and serious missed opportunities to connect battered women to necessary services and care during the preconception and prenatal period. Universal screening for IPV in medical settings remains controversial despite the significant health consequences and costs associated with abuse. Results from the study can elucidate the state of current clinical practice and better inform policies on incorporating universal IPV screening and education into routine care. Special focus should be on vulnerable populations such as women of low-income and racial/ethnic minority group.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #13

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**Perceived Racial/Ethnic Discrimination in the Workplace and the Association with Tobacco and Alcohol Use**

Laura Chavez, Veterans Affairs; India Ornelas, University of Washington; Courtney Lyles, University of California, San Francisco; Emily Williams, VA Puget Sound HSR&D

**Presenter:** Laura Chavez, M.P.H., Research Health Science Specialist, Health Services Research & Development, Veterans Affairs, laura.chavez2@va.gov

**Research Objective:** Empirical evidence and theory support the link between stressors such
as racial/ethnic discrimination and risky health behaviors. Racial discrimination in the workplace could have particularly deleterious effects on stress and coping strategies, given the potential for feelings of powerlessness or instability in this environment. Few studies have examined workplace discrimination specifically, and its association with risk behaviors, such as tobacco and alcohol use across different racial/ethnic groups. The objective of this study was to evaluate the association between perceived racial discrimination in the workplace and tobacco and alcohol use in a large, multi-state sample.

**Study Design:** This cross-sectional study pooled survey data from 2004 to 2010 of the national Behavioral Risk Factor Surveillance Surveys (BRFSS), for 17 states that collected the Reactions to Race module. Primary outcomes included measures of alcohol use (heavy alcohol use, binge drinking) and tobacco use (current smoking, daily smoking). Perceived racial or ethnic discrimination was defined as any report of being treated worse than people of other races in the workplace in the past 12 months. Logistic regression models were used to evaluate the association between perceived discrimination and each alcohol or tobacco use behavior in the overall sample, as well as stratified by race/ethnicity. Main models were adjusted for race, age, gender, income, education, and marital status, while subgroup models were adjusted for all covariates but race. Post-estimation methods were used to calculate adjusted risk ratios (ARR) for each outcome, with those reporting no perceived discrimination as the referent group. Data were weighted to account for complex survey design.

**Population Studied:** Respondents to the BRFSS who completed the Reactions to Race module, and smoking and alcohol measures.

**Principal Findings:** Among 70,780 respondents who completed the measures of interest, perceived discrimination was reported by 4.2% of Whites, 21.2% of Blacks, and 12.3% of Hispanics. Overall, 32% of respondents reported heavy alcohol use, 19% reported binge drinking, 22% reported smoking, and 17% smoked daily. ARRs for heavy and binge drinking in the overall sample were: 1.11 (95% CI 1.01-1.22) and 1.08 (95% CI 0.94-1.26). In race-stratified models, Hispanic respondents reporting discrimination were 45% (ARR=1.45, 95% CI 1.07-1.95) more likely to report heavy drinking, and nearly twice as likely to report binge drinking (ARR=1.90, 95% CI 1.29-2.80).

Overall, ARRs for current smoking and smoking daily were 1.32 (95% CI 1.19-1.47) and 1.41 (95% CI 1.24-1.61). Results of race-stratified models for smoking measures were similar to the overall association for Black and White respondents, but there was no association among Hispanics.

**Conclusions:** Workplace discrimination was relatively common among participants, with the greatest prevalence reported among Black participants. Perceived discrimination was associated with increased risk for alcohol and tobacco use across all racial/ethnic groups. Subgroup analyses suggested there may be some differences by race.

**Implications for Policy, Delivery, or Practice:** Alcohol and tobacco use prevention efforts may need to take into account the stressors of racial/ethnic discrimination in the workplace and their potential to influence these behaviors. Future studies could evaluate whether addressing these stressors and identifying alternative coping strategies can decrease these behaviors.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #14

**Cross Subsidization and Multiproduct Strategies in Medicare Advantage**

Shulamite Chiu, UPenn - the Wharton School

**Presenter:** Shulamite Chiu, B.A., Research Fellow, Health Care Management, UPenn - the Wharton School, chiush@wharton.upenn.edu

**Research Objective:** In 2011, PFFS plans in counties with two or more coordinated care plans with established networks were required to establish their own networks in a government response to rising Medicare Advantage costs. In response, insurers decreased PFFS offerings, but also decreased HMO plans and increased PPO plans. Hence, the shock to PFFS plans affected the entire Medicare Advantage market. My goals then are to:

1. theoretically motivate why plan offerings changed by proposing an extension to Bresnahan and Reiss (1991)’s entry model;
2. introduce the possibility of firms engaging in risk selection by taking advantage of product differentiation and differentiated consumer preferences across their own plan types, which I term cross-subsidization strategies and are an advantageous selection mechanism that has not been previously studied;
3. detect the prevalence of cross-subsidization strategies;
4. calculate the effect of cross-subsidization strategies on consumer welfare.

**Study Design:** I use publicly available data from CMS on Medicare Advantage from 2007-2011 and county-level data. I take advantage of a policy change in 2011 to provide exogenous variation in fixed costs. Because the change in fixed costs changes entry across all plan types, my theoretical model predicts that the success of cross-subsidization strategies should change, thus affecting the structure of the market. I first carry out a series of reduced form regressions to detect cross-subsidization in markets. Because cross-subsidization primarily affects the marginal costs of plans, I then use a model of consumer discrete choice and impose supply-side restrictions to extract plan marginal costs and to detect whether a firm is using a cross-subsidization strategy. Using the demand-side estimates, I run simulations to calculate the change in consumer surplus when cross-subsidization market conditions change.

**Population Studied:** Medicare Advantage insurers and eligible enrollees

**Principal Findings:** My study finds that increasing both fixed costs from operating portfolios with PFFS plans and cross-subsidization barriers decreases the likelihood that new entrants will enter the market with mixed portfolios. However, if increased fixed costs coincide with decreased cross-subsidization barriers, then the effect on new entry with mixed portfolios becomes nebulous. Results expected in April 2013 will determine the effect of decreased likelihood of cross-subsidization strategies on consumer welfare. Theoretically, decreased cross-subsidization implies less plan choice, which may decrease welfare, but may also decrease insurer mark-ups, which are welfare-enhancing.

**Conclusions:** I find that insurers may take advantage of differences in fixed cost and consumer preferences across plan types to leverage their market power, by engaging in advantageous selection through cross-subsidization. Furthermore, an external government intervention to increase the fixed cost of entry for one plan type may limit the ability to cross-subsidize across plans, thus decreasing plan offerings in markets.

**Implications for Policy, Delivery, or Practice:** This study will evaluate whether the policy in 2011 directed to combat the high costs of Medicare Advantage was effective, whether access and consumer choice was impacted negatively by unanticipated effects from cross-subsidization strategies, and whether the government should limit cross-subsidization strategies among firms by limiting product differentiation.

**Funding Source(s):** NIH

**Poster Session and Number:** A, #15

**Development of a Data Collection Tool Characterizing State Focus on the Prevention of Healthcare-Associated Infection in Nursing Homes**

Catherine Cohen, Columbia University; Carolyn Herzig, Columbia University; Eileen Carter, Columbia University; Monika Pogorzelska-Maziarz, Columbia University; Patricia Stone, Columbia University

**Presenter:** Catherine Cohen, B.S.N., R.N., Student, School of Nursing, Columbia University, chc2144@columbia.edu

**Research Objective:** The annual incidence of healthcare associated infections (HAI) in U.S. nursing homes (NH) is estimated to be between 1.6 and 3.8 million. Some states have implemented public policies to limit the burden of HAI in NH, but content and timing of these policies are highly inconsistent between states. The objective of this study was to design a reliable and valid tool that captures state Department of Health (DOH) activities and policies focused on reducing HAI in NH.

**Study Design:** Content validity was established through input from leading experts in the field who identified general elements that characterize state focus on HAI in NH. Elements were refined through iterative examination of the types and breadth of infection prevention activities implemented by state DOH, as described on their respective websites. Websites including those of the Centers for Disease Control and Prevention, the Association for Professionals in Infection Control and Epidemiology, and Centers for Medicare & Medicaid Services that were linked to the DOH sites were also examined to ensure capture of all relevant data. A protocol clarifying the procedure of data collection and operational definitions of relevant terms was developed. Two independent researchers piloted the tool to establish reliability, as measured by Cohen’s Kappa statistic. In the absence of agreement, definitions and interpretations of tool items were discussed with a third, independent reviewer.
and some items were revised for clarity. Two rounds of pilot testing with a total of 5 states were performed.

**Population Studied:** Fifty state DOH.

**Principal Findings:** The tool contains 17 items covering three broad categories: 1) publicizing information directed at consumers intended to increase accountability of and competition between NH, including mandatory HAI reporting and NH inspection reports, 2) offering surveyor training for federally-mandated NH inspections and 3) providing information for NH providers to prevent HAI and monitor HAI incidence. The presence of specific activities within these categories is recorded as “yes”, “no information available on website” or “other” to allow for quantitative analysis. Qualitative descriptions of activities and webpages are also recorded. Initial pilot testing yielded Kappa: .21-.59. Following discussion of item interpretations and refinement of the tool, IRR was improved (Kappa coefficients of .45 and .73).

**Conclusions:** This data collection tool allows comparison of state health policy activities through consistent data collection and ensures meaningful characterization of state focus on HAI reduction in NH.

**Implications for Policy, Delivery, or Practice:** Systematically characterizing ways that DOH attempt to reduce HAI in NH is important to interpret the effects of these activities.

**Funding Source(s):** NIH

**Poster Session and Number:** A, #16

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**Social Determinants of Self-Efficacy in Adults with Asthma**

Ifna Ejebe, University of Wisconsin School of Medicine and Public Health; Lauren E. Wisk, BS, University of Wisconsin School of Medicine and Public Health; Elizabeth A. Jacobs, MD MAPP FACP, University of Wisconsin School of Medicine and Public Health

**Presenter:** Ifna Ejebe, AB, Doctoral Student, Population Health Science, University of Wisconsin School of Medicine and Public Health; ejebe@wisc.edu

**Research Objective:** Asthma self-efficacy, the confidence an individual has to control and manage their asthma, has been shown to be a predictor of asthma management behavior, medication adherence, and asthma quality of life. The objective of this study is to investigate the social determinants of asthma self-efficacy, particularly race and ethnicity and income, and to determine if this relationship is influenced by receipt of asthma management plans, health care access, and utilization, in a population-based sample of adults.

**Study Design:** We examined the relationship between social determinants of health (race and ethnicity, income, gender, age, educational attainment, marital status, geography) and asthma self-efficacy. Asthma self-efficacy was measured using a one-item question ‘How confident are you in your ability to control and manage your asthma?’ and high self-efficacy was defined as reporting ‘very confident’ versus ‘somewhat confident’, ‘not too confident’, and ‘not at all confident.’ Staged multivariable logistic regression models were used to examine if the relationship between social determinants and asthma self-efficacy was retained controlling for asthma severity, health care access (health insurance type, usual source of care), health care utilization (delayed or foregone asthma medical or prescription care), and health care delivery (receipt of written asthma management plan). Reported ORs were adjusted for asthma severity and all confidence intervals were 95 percent.

**Population Studied:** 4,601 adults (weighted n = 2,120,487) with self-reported current asthma from the 2009 California Health Interview Survey, a population-based sample of civilian non-institutionalized adults in California.

**Principal Findings:** 69.8 percent of asthmatic adults reported having high asthma self-efficacy. Latinos (OR 0.64, CI 0.44–0.92), African-Americans (OR 0.33, CI 0.14–0.80), Native Americans (OR 0.27, CI 0.13–0.60), and Asian and Pacific Islanders (OR 0.25, CI 0.13–0.48) were less likely to report high self-efficacy compared to Whites. Individuals with income between 0-99 percent of the federal poverty level (OR 0.50, CI 0.28-0.87) were less likely to report high self-efficacy compared to individuals with income over 400 percent of the federal poverty level. 69.8 percent of adults reported discussing an asthma management plan with their provider, however only 18.1 percent of asthmatic adults reported having a written or electronic asthma management plan. The relationship between income and self-efficacy was no longer significant after further adjustment for health care access, utilization, and delivery; however, the differences in race and ethnicity persisted. Delayed or foregone asthma medical care (OR 0.38, CI 0.15–0.93), asthma prescription care (OR 0.33, CI 0.20–0.53), and lack of a written management plan from a health
care provider (OR 0.42, CI 0.2–0.69), were significantly associated with self-efficacy.

**Conclusions:** We found differences in asthma self-efficacy by race and ethnicity and income. Delayed and foregone asthma medical and prescription care and lack of a written management plan appear to explain the relationship between income and self-efficacy but not racial and ethnic differences in asthma self-efficacy.

**Implications for Policy, Delivery, or Practice:** Despite asthma guidelines, a significant proportion of adults with asthma are not receiving written asthma management plans. Existing disparities in asthma morbidity and mortality may be mitigated by the use of written management plans to increase asthma self-efficacy.

**Funding Source(s):** NIH

**Poster Session and Number:** A, #17

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**Trends in Receipt of Asthma Management Plans by Adults in California from 2003-2007**

Lauren E. Wisk, BS, University of Wisconsin School of Medicine and Public Health; Ifna Ejebe, University of Wisconsin School of Medicine and Public Health; Elizabeth A. Jacobs, MD MAPP, University of Wisconsin School of Medicine and Public Health

**Presenter:** Ifna Ejebe, AB, Doctoral Student, Population Health Science, University of Wisconsin School of Medicine and Public Health, ejube@wisc.edu

**Research Objective:** Asthma management guidelines include delivery of asthma management plans to adults with asthma to help them achieve asthma control. Our objective was to investigate the trend in receipt of asthma management plans over time, identify what need and access factors are associated with plan receipt, and whether these factors modify the trend in plan receipt in a population-based sample of adults with asthma.

**Study Design:** We pooled cross-sectional data from 2003, 2005, and 2007 from the California Health Interview Survey (CHIS), a biennial population-based survey providing statewide estimates of California’s overall population. We defined having received an asthma management plan as answering ‘yes’ to the question ‘Has a doctor or other health professional ever given you an asthma management plan’. Explanatory variables included need-based factors (frequency of asthma symptoms, use of daily asthma medication, emergency department use due to asthma, smoking status, and comorbid conditions), access-based factors (health insurance type, usual source of care), and sociodemographics. We used multivariable logistic regression to model trends in the receipt of asthma management by including a linear term for time into our model and testing interactions between time and need-based and access-based factors respectively to determine whether these relationships stayed constant over time. Adjusted odds ratios (OR) and 95% CI (CI) are reported.

**Population Studied:** 11,953 civilian non-institutionalized adults (weighted n = 5,957,727) with self-reported current asthma living in California.

**Principal Findings:** The percentage of adults who reported receiving asthma management plans changed significantly between 2003 (37.4 percent), 2005 (37.2 percent), and 2007 (41.7 percent) (p = 0.0081). Need-based factors associated with receipt of asthma management plans included reporting daily asthma symptoms (OR 1.63, CI 1.17-2.27) compared to no symptoms, use of daily asthma medications (OR 2.02, CI 1.73-2.36), and having an asthma-related emergency department visit (OR 1.52, CI 1.23-1.87). Access-based factors associated with receipt of asthma management plans included lack of usual source of care (OR 0.64, CI 0.48-0.86), being uninsured (OR 0.74, CI 0.56-0.97), and having public insurance (OR 0.79, CI 0.66-0.94) compared to private insurance. Lower income individuals and those with high school or lower levels of educational attainment were also less likely to report receiving a written asthma management plan. There were no significant racial and ethnic differences in receipt of asthma management plans. The differences in receipt of plans by need and access-based factors were consistent over time.

**Conclusions:** Despite an increase in the receipt of asthma management plans over time, a gap remains between best practice and usual care in adults with asthma. This gap is larger for adults with mild to moderate asthma, adults with less access to the health care system, and lower income adults.

**Implications for Policy, Delivery, or Practice:** There remains room for improvement in the delivery of asthma management plans in adults with asthma. Promotion of asthma management
plans to both patients and providers may result in further increases in the use of these plans.

**Funding Source(s):** NIH

**Poster Session and Number:** A, #18

### Association of a Patient-Centered Medical Home with Health Care Expenditures among Women Diagnosed with Breast or Cervical Cancer

Albert Farias, University of Washington; Susan Hernandez, University of Washington, Department of Health Services

**Research Objective:** The first objective is to describe patient reported access to a patient centered medical home (PCMH) among women diagnosed with breast cancer by race/ethnic groups. Second is to determine total healthcare expenditures among women diagnosed with breast cancer by PCMH and those in a regular source of care. Finally, is to determine if there are differences in the cost of healthcare by race/ethnicity among those in a PCMH.

**Study Design:** This is a cross-section study design using pooled data and population weights from the Medical Expenditure Panel Survey (MEPS) for years 2007-2009. We use a generalized linear model with log-gamma to study the association between total health care expenditures and a composite score that assess domains of a PCMH. We adjust for individual-level potential confounds and stratify the analysis by race/ethnicity to observe differences in costs between subgroups. PCMH was defined as respondent’s access to healthcare meeting at least five out of seven criteria and categorized as having a usual source of care and a medical home or having a usual source of care but no medical home. Total, outpatient, inpatient, emergency dept, prescription, and office-based costs were estimated separately using a two-part GLM model with gamma distribution and log link and recycled coefficients. All costs were inflated to 2011 using the consumer price index.

**Population Studied:** We identified women in the MEPS database who were diagnosed with breast or cervical cancer as identified by ICD-9 codes and within 1 year of diagnosis. MEPS is a cross-sectional study of non-institutionalized adults, we merged and pooled the household component and medical condition data files for 2007-09.

**Principal Findings:** Approximately 77 percent of women diagnosed with breast cancer between 2007 and 2009 reported access to a PCMH. Having a PCMH was significantly associated with having high blood pressure, diabetes, age, marital status, and insurance. Race/ethnicity was significantly associated with whether or not breast cancer patients go to the provider for new health problems or ongoing health problems and whether they receive care from providers that had office hours at night or on weekends. The average breast cancer survivors’ total health care expenditure is approximately 14,845 dollars per year for survivors with access to a PCMH compared to 19,172 dollars for those with a regular provider but no medical home. Outpatient and Office-based costs were significantly different between survivors who had reported access to a PCMH compared to a regular source of care. Among survivors with access to a PCMH we did find significant decreases in costs among Black, non-Hispanics compared to White, non-Hispanics for prescription expenditures and among Hispanics compared to White, non-Hispanic for inpatient hospital expenditures.

**Conclusions:** A large majority of women diagnosed with breast cancer receive care in a PCMH, however, significant differences exist by race/ethnicity. There are also differences in health care expenditures by race/ethnicity.

**Implications for Policy, Delivery, or Practice:** Upstream interventions for prevention, early detection, and treatment are needed to improve disparities in cancer outcomes. A PCMH is one way to improve access to medical care for cancer patients. Equal access to a PCMH by race/ethnicity can decrease the disparity that exists. Longitudinal research needs to be conducted around whether the PCMH is associated with improved long-term clinical outcomes.

**Funding Source(s):** NIH

**Poster Session and Number:** A, #19

### Factors Associated with Unplanned Hospitalization and Adverse Events in Patients with Lung and Colorectal Cancer

Kristen Fessele, Rutgers, The State University of NJ; Robert Atkins, PhD, RN, Rutgers, The State University of NJ School of Nursing, Camden, NJ; Matthew J. Hayat, PhD, Rutgers, The State University of NJ College of Nursing, Newark, NJ

**Researcher:** Kristen Fessele

**Presenter:** Kristen Fessele

**Department of Health Services:** University of Washington

**Funding Source(s):** NIH

**Poster Session and Number:** A, #18

### Factors Associated with Unplanned Hospitalization and Adverse Events in Patients with Lung and Colorectal Cancer

Kristen Fessele, Rutgers, The State University of NJ; Robert Atkins, PhD, RN, Rutgers, The State University of NJ School of Nursing, Camden, NJ; Matthew J. Hayat, PhD, Rutgers, The State University of NJ College of Nursing, Newark, NJ

**Researcher:** Kristen Fessele

**Presenter:** Kristen Fessele

**Department of Health Services:** University of Washington

**Funding Source(s):** NIH

**Poster Session and Number:** A, #18

### Association of a Patient-Centered Medical Home with Health Care Expenditures among Women Diagnosed with Breast or Cervical Cancer

Albert Farias, University of Washington; Susan Hernandez, University of Washington, Department of Health Services

**Research Objective:** The first objective is to describe patient reported access to a patient centered medical home (PCMH) among women diagnosed with breast cancer by race/ethnic groups. Second is to determine total healthcare expenditures among women diagnosed with breast cancer by PCMH and those in a regular source of care. Finally, is to determine if there are differences in the cost of healthcare by race/ethnicity among those in a PCMH.

**Study Design:** This is a cross-section study design using pooled data and population weights from the Medical Expenditure Panel Survey (MEPS) for years 2007-2009. We use a generalized linear model with log-gamma to study the association between total health care expenditures and a composite score that assess domains of a PCMH. We adjust for individual-level potential confounds and stratify the analysis by race/ethnicity to observe differences in costs between subgroups. PCMH was defined as respondent’s access to healthcare meeting at least five out of seven criteria and categorized as having a usual source of care and a medical home or having a usual source of care but no medical home. Total, outpatient, inpatient, emergency dept, prescription, and office-based costs were estimated separately using a two-part GLM model with gamma distribution and log link and recycled coefficients. All costs were inflated to 2011 using the consumer price index.

**Population Studied:** We identified women in the MEPS database who were diagnosed with breast or cervical cancer as identified by ICD-9 codes and within 1 year of diagnosis. MEPS is a cross-sectional study of non-institutionalized adults, we merged and pooled the household component and medical condition data files for 2007-09.

**Principal Findings:** Approximately 77 percent of women diagnosed with breast cancer between 2007 and 2009 reported access to a PCMH. Having a PCMH was significantly associated with having high blood pressure, diabetes, age, marital status, and insurance. Race/ethnicity was significantly associated with whether or not breast cancer patients go to the provider for new health problems or ongoing health problems and whether they receive care from providers that had office hours at night or on weekends. The average breast cancer survivors’ total health care expenditure is approximately 14,845 dollars per year for survivors with access to a PCMH compared to 19,172 dollars for those with a regular provider but no medical home. Outpatient and Office-based costs were significantly different between survivors who had reported access to a PCMH compared to a regular source of care. Among survivors with access to a PCMH we did find significant decreases in costs among Black, non-Hispanics compared to White, non-Hispanics for prescription expenditures and among Hispanics compared to White, non-Hispanic for inpatient hospital expenditures.

**Conclusions:** A large majority of women diagnosed with breast cancer receive care in a PCMH, however, significant differences exist by race/ethnicity. There are also differences in health care expenditures by race/ethnicity.

**Implications for Policy, Delivery, or Practice:** Upstream interventions for prevention, early detection, and treatment are needed to improve disparities in cancer outcomes. A PCMH is one way to improve access to medical care for cancer patients. Equal access to a PCMH by race/ethnicity can decrease the disparity that exists. Longitudinal research needs to be conducted around whether the PCMH is associated with improved long-term clinical outcomes.

**Funding Source(s):** NIH

**Poster Session and Number:** A, #19

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**Researcher:** Kristen Fessele

**Presenter:** Kristen Fessele

**Department of Health Services:** University of Washington

**Funding Source(s):** NIH

**Poster Session and Number:** A, #18
**Presenter**: Kristen Fessele, PhD(c), RN, AOCN, PhD Candidate, College of Nursing, Newark, Rutgers, The State University of NJ, kfessele@gmail.com

**Research Objective**: Identify predictors of initial and multiple unplanned hospitalizations among patients with lung or colorectal cancer receiving outpatient chemotherapy. Chemotherapy administration and symptom management for solid tumors such as lung and colorectal cancer generally occurs in the outpatient setting, though unexpected crises requiring inpatient care arise. Though hospital readmission has emerged as a focal point for health care reform, the concept of an initial unplanned hospitalization in a population of patients intended to receive care entirely in the ambulatory setting is distinct from readmission, which implies a prior inpatient stay. There is scant literature describing the features of oncology patients admitted for the first time, as well as poor consensus related to unique factors associated with predictors for those with multiple repeated admissions over what may be a course of disease spanning several years. Published studies quantifying factors associated with oncology-related unplanned hospitalization are often limited to small datasets derived from cross-sectional single institution retrospective chart reviews. Utilizing the nationally representative Surveillance, Epidemiology and End Results (SEER) – Medicare database to study patients with lung and colorectal cancers receiving outpatient chemotherapy overcomes this limitation.

**Study Design**: SEER-Medicare data are utilized to study patients with billed claims across settings and providers for chemotherapy and cancer-related hospitalizations. Etiology and temporal relationships of hospitalizations to chemotherapy will be analyzed. Regression models will be used to predict factors associated with both the initial unplanned hospitalization as well as those with multiple readmissions, evaluating demographic variables, clinical measures, and setting-of-care characteristics.

**Population Studied**: Analysis is performed on parallel cohorts of patients diagnosed with all stage lung cancer (n=31,789), and all stage colorectal cancer (n=32,717) between 2003 and 2007. Medicare claims data will be examined through 2009.

**Principal Findings**: This dissertation project is in progress, though early descriptive work indicates that approximately 89 percent of patients in both cohorts had at least one hospitalization. Preliminary analyses limited to patients with generally unresectable disease, therefore unlikely to have a planned hospitalization, such as those with Stage IIIIB/IV lung cancers (n=12,461) show 18.9 percent of patients with one hospital admission, 52.9 percent with 2-4 admissions, 23.7 percent with 5-9 admissions, and 4.4 percent with 10 or more admissions. In Stage IV colorectal cancer (n=7,164), 14 percent experienced one admission, 48.3 percent were admitted 2-4 times, 29.4 percent were admitted 5-9 times, and 8.2 percent were admitted 10 or more times. Final results including full descriptive analysis and predictor modeling will be available by summer 2013.

**Conclusions**: Unplanned hospitalizations during chemotherapy are a prevalent and significant problem in patients with lung and colorectal cancers, and result in disruptions to treatment intensity and quality of life. Preliminary data analysis suggests many patients experience unplanned hospitalizations, and a subset of patients are admitted multiple times over the disease trajectory.

**Implications for Policy, Delivery, or Practice**: Considering this advanced disease subset has no planned inpatient treatment component, this work underscores the importance of identification of predictors for all patients with initial and multiple unplanned hospitalizations, allowing clinicians to target education, monitoring and proactive symptom management efforts to those patients at highest risk.

**Funding Source(s)**: N/A

**Poster Session and Number**: A, #20

**Biopsychosocial Characteristics Associated with Readiness for Hospital Discharge in Chronic Heart Failure Patients.**

Eunice Fuchs, University of Maryland School of Nursing; Newhouse, Robin, University of Maryland School of Nursing; Johantgen, Mary, University of Maryland School of Nursing

**Presenter**: Eunice Fuchs, M.S., Certified Registered Nurse Practitioner, PhD. Program, University of Maryland School of Nursing, fuchs@son.umaryland.edu

**Research Objective**: To identify the biopsychosocial risk factors that predict readiness for hospital discharge in chronic heart failure.

**Study Design**: Cross sectional secondary data analysis. Data from the Improving Heart Failure
Outcomes (IHO) study was analyzed. IHO was a prospective cohort study examining nursing care of HF patients admitted to Magnet hospitals. A sample of 31 Magnet hospitals (n=374) was analyzed using multi-level modeling. Multiple imputation approach was used (n=452).

Predictors of readiness for discharge tested were: age, New York Heart Association (NYHA) Class, education level, Beck Depression Inventory (BDI), Self Care of Heart Failure (SCHF) maintenance, management, and confidence; and Dutch HF knowledge. Patient readiness for hospital discharge was measured using the Readiness for Hospital Discharge Scale short form (PT-RHDS/SF).

Population Studied: Magnet certified hospitals from multiple regions across the United States. Most participating hospitals had a 200-400 bed size. The majority were located in urban settings (67.5%) and 7.5% represented rural hospitals. Most of the participating sites had a teaching hospital designation (87.5%). Enrolled chronic HF patients were cognitively intact, = 18 years old, English speakers, who did not undergo procedures during hospitalization, were not transferred to another unit or hospital, and were not discharged to an assisted living or to a skilled nursing facility.

Principal Findings: The majority of participants were male (53.2%), over half were 66 years or older (59.2%), who had at least a high school education (46.6%), and were Caucasian (59.2%), not of Hispanic origin (93.9%). The majority of IHO participants experienced NYHA class II (47.6%) and class III (37.8%) symptoms. The participants had a mean PT-RHDS/SF score 28.50 (SD 5.95) and BDI score 10.93 (SD 8.43). Average SCHF maintenance (66.85, SD 19.03), management (54.80, SD 22.86), and confidence (66.85, SD 22.26) scores were consistently =70, an indicator of inadequate HF self-care practices. Average Dutch HF knowledge score pre-discharge was 12.54 (SD 1.93). Significant bivariate correlations were found between PT-RHDS/SF scores and BDI (r= -0.14, p= 0.003), SCHF management (r= 0.17, p=0.005), SCHF confidence (r= 0.24, p=0.005), Dutch HF Knowledge (r= 0.12, p= 0.01) scores, and NYHA class (r= -0.14, p= 0.005). The sample contained an unconditional intra-class correlation of 11% (?=0.11). There was significant PT-RHDS/SF variability between hospitals (Wald Z= 2.31, p= 0.02). Significant main effect associations between PT-RHDS/SF and BDI scores (t=-2.06, p=0.04), SCHF management (2.26, p=0.02), confidence (t=3.39, p=0.001) scores were found. The conditional ICC was reduced to 7% and no further variability in PT-RHDS/SF scores between hospitals was found in the original raw data (Wald Z= 1.53, p=0.13). The pooled imputed data showed a trend towards significant between hospital variability in the conditional model (Wald Z= 11.47, p=0.05).

Conclusions: In this sample of chronic HF patients, lower depression scores, higher HF self-care management scores and higher self-care confidence were associated with increased readiness for discharge.

Implications for Policy, Delivery, or Practice: Findings indicate that focus on these aspects of nursing care may impact discharge readiness and potentially be associated with 30-day hospital readmission, as previous research has indicated.

Funding Source(s): No Funding

Poster Session and Number: A, #21

Increasing Access to Health Insurance for Young Adults: An Example of Difference-in-Difference-in-Difference Methods

Emily Gillen, University of North Carolina, Chapel Hill

Presenter: Emily Gillen, M.A., Phd Candidate, Health Policy and Management, University of North Carolina, Chapel Hill, egillen@unc.edu

Research Objective: The objective of this study was to determine the true impact of the Patient Protection and Affordable Care Act (ACA) provision designed to expand access to quality, affordable health insurance. One of the first active provisions of the ACA, which took effect in 2010, was to allow unmarried, adults age 19-25, without access to insurance through their jobs, to be covered under their parent’s health insurance plan.

Study Design: I first used a difference-in-difference (DD) approach, which controls for both baseline inter-group differences as well as the counterfactual, to determine the effect of a natural experiment. Between 2009 and 2011, I found a 5 percentage point reduction in the number of adults age 19-25 without any kind of insurance (as compared to adults age 26-32); that reduction is even more pronounced when comparing unmarried, unemployed adults age 19-25 to an unemployed subset of the older cohort. I found a 10 percentage point decrease in the number of adults age 19-25 without insurance in the unemployed cohort. The results
are supported by historical data showing stable trends in insurance coverage; the average percentage of adults age 19-25 without insurance over the years 2004 – 2009 was 32%, compared to 28% for adults age 26-31.

**Population Studied:** I used data from the Center for Disease Control's Behavioral Risk Factor Surveillance System survey for the years 2004 to 2011.

**Principal Findings:** In subsequent analyses, I use a difference-in-difference (DDD) approach and found a 6 percentage point reduction (P<0.0065) in the number of adults age 19-25 without insurance. The results of this second model are consistent with recent findings using other national survey data (Sommers, et.al. 2013). The DDD approach is a more robust method because it allows for a direct comparison of the control and treatment groups of interest without requiring stratification by population characteristics.

I also used a DDD model with dependent variables that represent health service utilization. Though I did not find increases in utilization of preventive services of the same magnitude as insurance uptake, the ACA does impact the number of adults 19-25 year olds with a usual source of care and the number who obtained an annual check-up.

**Conclusions:** The ACA provision extending private health insurance to unemployed and underemployed younger Americans appears to have the intended effect of decreasing the number of adults age 19-25 without health insurance.

**Implications for Policy, Delivery, or Practice:** Young adults are the most likely group to not have a usual source of care and, consequently, are less likely to receive preventive services (Drilea & Weinick, 1998). As the ACA continues to decrease barriers to affordable, quality insurance, researchers must diligently study if and how people are using insurance to access routine, preventive services.


**Funding Source(s):** No Funding

**Poster Session and Number:** A, #22

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**Clinical Decision Support Systems Employed in Eye and Vision Care**

Lori Grover, Johns Hopkins University School of Medicine

**Presenter:** Lori Grover, O.D.,Ph.D., Assistant Professor Of Ophthalmology, Ophthalmology, Johns Hopkins University School of Medicine, lgrover@jhsp.edu

**Research Objective:** 1) to conduct a systematic literature review to understand the state of Clinical Decision Support (CDS) Systems specifically employed in optometric and ophthalmologic practice; and 2) to understand the scope of advanced CDS functionalities and potential for realizing associated outcomes in eye and vision care.

**Study Design:** Systematic literature review

**Population Studied:** Clinical decision support (CDS) systems are information technology systems designed to improve clinical decision making, and form the cornerstone of health informatics research and practice as an embedded concept in clinical information systems. From the health care perspective, clinical decision support (CDS) refers to a variety of approaches providing clinicians, staff, patients, and others with knowledge and individualized person-specific information. A primary purpose of CDSS is to assist clinicians at the point of individual patient care, and CDS has important applications for impacting population health.

**Principal Findings:** Evidence was categorized into four functional areas: administrative, clinical complexity management, cost control, and decision support. The information was found in several formats: peer-reviewed journal publication; published abstract, conference presentations, and proceedings from professional meetings. A total of 39 articles met inclusion criteria. Articles were summarized into four categories based on a CDSS functional classification. The majority of the evidence was related to diabetes population and telemedicine-related applications. New theoretical methods for estimating treatment thresholds and emerging population risk factors have been reported that will ultimately affect physician risk thresholds in managing chronic conditions. Other existing strategies and tools for future inclusion into eye care CDS systems include applications for encoding and exchange of metadata, grading algorithms and other disease/condition-specific differential diagnostic

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tools, access to eye care-specific evidence (i.e., evolving CPG) in EHR systems, incorporation of eye disease and vision condition-specific decision trees and cost-effectiveness models into EHR, use of graphical information systems (GIS) for population compliance management, and stakeholder tele-support groups and educational forums. These represent a small fraction of CDS applications that can assist in meeting the unique needs of eye care providers and patient populations for whom care is a necessity.

**Conclusions:** Despite the widespread use of CDS systems throughout health care and the increased applications in eye and vision care over the past decade, there remains a limited scope of applications in eye care. Telemedicine and DM-related population management in optometry and ophthalmology are common, as are tools for clinical diagnosis and management. Adoption of EHR language, HIT schema, and other administrative CDS are emerging within eye care, as is the use of cost-control CDS albeit as a component of broader EHR systems. A lack of evidence was found for the employ of clinical complexity and management CDS specific to eye and vision care.

**Implications for Policy, Delivery, or Practice:** Findings support future research addressing identified scientific gaps, and ongoing review of the literature should be performed to monitor progress, identify measurable CDSS outcomes and new functionalities for eye and vision care stakeholders. Findings suggest that the potential for expansion of CDSS functionalities in eye care exists as referenced by what is emerging and/or “in the wings” awaiting incorporation into eye care-related CDS systems.

**Funding Source(s):** NIH

**Poster Session and Number:** A, #23

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**Are Medicare/Medicaid Patients in the State of Florida More Prone to Using Emergency Departments as the Source for Non-Urgent Care than Patients with Commercial Coverage?**

Jennifer Hamilton, Nemours Foundation; Chau Duong, University of Central Florida; Douglas Loran, University of Central Florida; Lori Galanida, University of Central Florida; Giselle Tejada, University of Central Florida; Tammy Kimbrell, University of Central Florida; Xinliang Liu, PhD, University of Central Florida

**Presenter:** Jennifer Hamilton, M.S., B.A., Director Clinical Support, Clinical Operations, Nemours Foundation, jenniferhamilton@knights.ucf.edu

**Research Objective:** This study evaluated the likelihood of Medicare and Medicaid patients compared to commercially insured and self-pay patients to utilize the emergency department as their source of primary care. Objectives: 1) to determine inappropriate use of emergency departments by the Medicare/Medicaid population 2) to determine the patient volumes by payer group, 3) to define costs of inappropriate use of the emergency department.

**Study Design:** A descriptive analysis was performed to assess the following outcome variables: 1) likelihood to misuse ED, 2) total cost per payer, and 3) average overall cost for each payer population. A weighted least squares regression was estimated with misuse of ED as the dependent variable. Misuse of ED was a binary variable which equaled 1 if a patient visited ED for non-urgent conditions. Patient payer type and age group were included as independent variables.

**Population Studied:** The study population was patients who visited emergency department (ED) in Florida during 2010-2011. There were 13,443,311 ED visits during this period and a 5% random sample was used in this study. We identified several CPT codes (99999, G0380, G0381, G0382, G0383) that were not clearly emergent or non-emergent classifications. Patient records with those classifications were eliminated from the sample. As a result, 34,280 patient records were removed and the final sample contained 637,886 ED discharge records.

**Principal Findings:** Results of this study indicate that there was a significant percentage of misuse of emergency services for low acuity conditions. Misuse of ED occurred most frequently in the Medicaid population and least frequently with the Medicare population. Specifically, patients with Medicaid coverage had the highest probability (26%) of utilizing an emergency department for a non-urgent health need. Conversely, Medicare patients had the lowest probability (13%) of all payer types. In addition, the female gender was associated with increased probability of misuse of ED. Patients in age groups younger than 18, 19-39, and 40-64 were more likely to misuse ED than those age 65 or above.
Conclusions: Misuse of ED was prevalent among patients examined in this study. Compared with commercially insured patients, Medicaid recipients were more likely to visit ED for non-urgent conditions. Female gender and young age were other factors that were found to be associated with higher probability of misuse of ED.

Implications for Policy, Delivery, or Practice: This study together with some prior studies demonstrated that Medicaid patients are more likely to visit ED for non-urgent conditions. The findings of this study can be used by policy makers and hospital administrators to identify patients who are prone to misuse ED and design corresponding interventions. This study also implies that further studies are necessary to identify factors that contribute to the high probability of misuse of ED among Medicaid patients.

Funding Source(s): No Funding
Poster Session and Number: A, #24

To Evaluate the Effectiveness of the Veggie Van Intervention Pilot in Increasing Access to Local Fruits and Vegetables in Low-Income Communities

Lindsey Haynes-Maslow, University of North Carolina Gillings School of Global Public Health; Lucia A. Leone, University of North Carolina at Chapel Hill; Sarah Kowitt, The University of North Carolina at Chapel Hill

Presenter: Lindsey Haynes-Maslow, M.H.A., B.S.P.H., Health Care Quality and Patient Outcomes Predoctoral Fellow, Health Police and Management, University of North Carolina Gillings School of Global Public Health, lhaynes6@email.unc.edu

Research Objective: Consuming healthy foods, including fresh fruits and vegetables (F&V) can help manage and prevent weight gain and reduce the risk of chronic diseases and some cancers. Unfortunately, most individuals, especially those with lower incomes, do not consume the daily recommended amounts of F&V. The purpose of this study was to evaluate the effectiveness of the Veggie Van pilot in increasing access to local F&V in low-income communities.

Study Design: Affordable produce boxes (half the retail cost of similar boxes sold to middle- to higher-income customers) of North Carolina fruit and vegetables (F&V) were sold weekly from the Veggie Van for a maximum of three months at two low-income housing sites. Self-report average daily F&V consumption and self-report perceived F&V access was assessed at baseline (prior to the start of the Veggie Van pilot) and at follow-up. For Site 1, each week, a nutritionist and chef were on-site conducting cooking demonstrations, providing health information and recipes, and offering samples for 3 months. For Site 2, only a chef was on-site conducting cooking demonstrations, recipes, and offering samples. Self-report average daily F&V consumption and self-report perceived F&V access was assessed at baseline and at 2-month follow-up. We separately evaluated each site.

Population Studied: The Veggie Van pilot was conducted in two public housing communities located in Chapel Hill, North Carolina. In order to reside in the community, total annual household income could not exceed 80% of the median household income in Chapel Hill. Adults ages 18 or older were eligible to participate in the study if they lived in the community and could speak/understand English. A total of 17 participants from both sites completed baseline and follow-up surveys.

Principal Findings: For Site 1, participants’ perceived access to F&V in the neighborhood increased. Individuals purchasing produce from the Veggie Van weekly or every other week (“high users”) increased their F&V consumption by 1.92 servings/day compared to no effect (-0.1 servings/day) for those who purchased 1 time per month or less (“low users”). For Site 2, participants’ perceived access to F&V in the neighborhood also increased. However, high users in Site 2 reported decreasing their F&V consumption by -0.88 servings/day compared to low users increasing F&V consumption by 0.37/ servings.

Conclusions: One reason Site 2’s F&V intake results did not mirror Site 1 might be due to (1) Veggie Van not delivering nutrition education, (2) shorter program length (two versus three months), and (3) some participants filling out surveys after the Veggie Van program ended. Our study shows that access alone may not increase F&V consumption — education is an important component.

Implications for Policy, Delivery, or Practice: A diet high in F&V is associated with lower-risk for obesity and many cancers. In North Carolina, many low income individuals lack access to high quality, affordable local F&V. The Veggie Van program shows promise for improving F&V intake in lower-income and
underserved areas. The Veggie Van program is currently being expanded to sites in four counties and will be evaluated in a randomized controlled trial funded by the National Cancer Institute.

**Funding Source(s):** NIH

**Poster Session and Number:** A, #25

The Effects of Definitional Variation in Electronic Health Records Use in Residential Care Facilities

Amanda Holup, University of South Florida

**Presenter:** Amanda Holup, Student, School of Aging Studies, University of South Florida, aholup@mail.usf.edu

**Research Objective:** With the passage of the 2009 Health Information Technology for Economic and Clinical Health Act, there have been unprecedented efforts by private and public sector leaders to promote widespread adoption of electronic health records (EHRs) in an effort to improve patient safety and the delivery of healthcare. However, despite the growing number of elders who require coordination of care across multiple settings, the adoption of EHRs is not as ubiquitous across the long-term care (LTC) continuum as compared to other acute care settings. Given the vulnerability of LTC residents to adverse health outcomes during periods of care transition and the 2012 Medicare hospital penalties for high rehospitalization rates within 30-days of discharge, the opportunities for promoting EHR adoption across the LTC spectrum should be greater than ever. Therefore, the objective of this study was to provide a more precise estimate of EHR use in RCFs using a system-based definition.

**Study Design:** The study used cross-sectional design. We used facility level data on 2,302 RCFs from the 2010 National Survey of Residential Care Facilities (NSRCF), a nationally-representative, probability sample survey of U.S residential care providers. All participating RCFs were licensed, registered, certified, or otherwise regulated by the state and had four or more licensed beds. Although the Institute of Medicine has identified core functions of an EHR (IOM, 2005), there is no consensus on what functionalities constitute the essential elements of an EHR in LTC. Recognizing that LTC facilities lag in EHR adoption compared to other sectors of healthcare and that relatively few RCFs might have a fully functional EHR, we adopted the basic system definition (DesRoches, et al., 2008; Jha et al., 2009) that defines an EHR as having the capabilities to record resident demographics, resident problem lists, and medications taken by the residents; to order prescriptions and laboratory tests; and to view laboratory and imaging results. Descriptive results were compared to the NSRCF survey question, “Does the facility use electronic health records?”

**Population Studied:** We studied 2,302 residential care facilities in the U.S.

**Principal Findings:** Results indicated that between 3 and 17% of RCFs nationwide are using an EHR. Applying a strict, system-based definition of an EHR indicated that 3% of RCFs nationwide had a basic EHR. However, 55% of RCFs reported using a computerized system for one or more (but not all) of the functionalities defined by a basic EHR system. These functionalities included resident demographics (70% of RCFs) and medication lists (64% of RCFs). This compares to approximately 17% of RCFs who acknowledged having an EHR based on the NSRCF survey question.

**Conclusions:** The findings presented here provide benchmark evidence that the majority of RCFs are not using EHRs. However significant variation exists in the proportion of RCFs using an EHR based on the definition applied.

**Implications for Policy, Delivery, or Practice:** Findings suggest that policymakers should identify the core functions that define an EHR specific to LTC as EHR integration may improve residents’ health outcomes and reduce unnecessary healthcare expenditures.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #26

Consumer Perception and Health Plan Choice Making

Wei Huang, Boston University; Jim Burgess, SPH, Boston University

**Presenter:** Wei Huang, MA, MPH, Student, Boston University, weih@bu.edu

**Research Objective:** The importance of individual cognitive processes in making the decision of health plan choices had been addressed in health services research. This study combined behavioral economics and health economics approaches to investigate the role of consumer perceptions in making the choices of health plan.
**Study Design:** This study collected the MEPS data from 2002 to 2010 (N=27,939). Two employer-based insurance plans, IPA and HMO, were compared. A longitudinal view was taken to analyze the trends of plan choices and consumer perceptions and the relationships between them.

**Population Studied:** Employer-based health plan enrollees from 2002-2010 (N=27,939).

**Principal Findings:** This study found that consumer perceptions play an important role in health plan decision-making. Consumer ratings of their experience with IPA increase over time while ratings for HMO decrease over time, which is consistent with their plan choices. More consumers perceived high quality of care provided by IPA than by HMO, although not significant. Consumer perceived needs of insurance and values of insurance are also important indicators predicting consumer behaviors in making choices of plans. Consumer perceived health status as well as perceived mental health status seem also related to their choice decisions. Over time, an increasing trend of good feelings of health among IPA enrollees and a decreasing trend of good feelings of health among HMO enrollees were observed. More IPA enrollees feel good about their health status compared with HMO enrollees. In general, more IPA enrollees feel “excellent” about their mental health than HMO enrollees. For most of these findings, 2007 seems a turning point directing the changes in consumer perceptions. For example, the ratings of consumer experiences with HMO fell below the ratings with IPA since 2007; since 2007, enrollees in both plans perceived stronger needs of insurance; more IPA enrollees reported “excellent” mental health status than HMO enrollees before 2007, then started decreasing since 2007.

**Conclusions:** The study findings strongly suggest that health plan prices have limited effects in health plan choice making and the plan choice decisions were more responsive to individual perceptions. It seems that, with limited information, consumers may be able to intuitively follow the perceived quality of care and the perceived health status rather than the market price in decision-making. It may also indicate that individual evaluation of the cost rather than the actual price makes more sense to consumers in making the decisions of plan choice. However, whether consumer perceptions correspond with the plan performance or consumer perceptions direct the ratings and choices of plan need further to be studied.

**Implications for Policy, Delivery, or Practice:** Patient-centered care requires researchers to more precisely understand consumer behaviors. A better understanding of consumer health plan choice decision-making can help healthcare providers and insurers to optimally make health plan design and deliver healthcare, in turn to increase consumer satisfaction.

**Funding Source(s):** N/A

**Poster Session and Number:** A, #27

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**The Effect of Medicare Advantage Enrollment on Mammographic Screening in the Medicare Population**

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**Presenter:** Anna Hung, Student, Pharmaceutical Health Services Research, University of Maryland at Baltimore, School of Pharmacy, anna.hung@umaryland.edu

**Research Objective:** To determine the effect of Medicare Advantage health maintenance organization (HMO) enrollment on mammographic screening rates. Prior research has shown that Medicare HMO enrollees have higher rates of mammographic screening compared to beneficiaries in fee-for-service (FFS) Medicare. However, much has changed since these studies were published, including the advent of the Medicare Advantage star rating system to incentivize health plans, substantial increases in Medicare HMO enrollment, and the publication of controversial breast cancer screening guidelines. New research is needed to investigate the current impact of Medicare Advantage HMO enrollment on mammographic screening.

**Study Design:** Analysis of 2009 Medicare Current Beneficiary Survey data comparing unadjusted and adjusted rates of mammographic screening and reasons for no mammographic screening between Medicare FFS and Medicare Advantage HMO enrollees. Adjusted rates were calculated using a multivariate regression model to account for potential confounding due to differences in population characteristics.

**Population Studied:** 5,568 Medicare FFS enrollees and 1,892 Medicare Advantage HMO enrollees.
enrollees. Women with a history of breast cancer and men were excluded.

**Principal Findings:** We found significantly higher unadjusted rates of mammographic screening in the Medicare Advantage HMO population (50.3%) compared to the FFS population (44.0%). Significant differences in characteristics between the two populations were examined; bivariate analyses found significantly higher rates of mammographic screening in certain subgroups, including those <65 years of age (50.0% HMO v 39.4% FFS), those who were not married (45.9% HMO v 38.0% FFS), and those who reported good (50.7% HMO v 43.0% FFS) or fair (48.0% HMO v 36.6% FFS) health status. The top three reasons for not receiving mammographic screening were "wasn't needed" (22.7% HMO v 24.1% FFS), "doctor didn't recommend it" (19.7% HMO v 21.9% FFS), and "forgot" (16.6% HMO v 15.4% FFS). Bivariate analyses showed that within those <65 years of age, significantly more FFS (30.1%) than HMO (12.7%) enrollees reported "doctor didn’t recommend it" as the reason. Adjusted rates from the multivariate analysis will be ready for presentation at the AcademyHealth meetings.

**Conclusions:** Mammographic screening in the Medicare population was low in 2009 among beneficiaries in both FFS and Medicare HMO, but women enrolled in HMO had rates more than 6 percentage points higher. Overall, there were no significant differences in reason given for failure to be screened between the two populations. However, within certain subgroups, like those <65 years of age, women enrolled in FFS reported doctors not recommending screening as the reason at rates more than 7 percentage points higher than women enrolled in HMO. Final conclusions based on the multivariate analysis will be ready for presentation at the AcademyHealth meetings.

**Implications for Policy, Delivery, or Practice:** Mammographic screening utilization rates remain low. Understanding the barriers in FFS vs HMO settings will allow us to target ways to increase the appropriate use of mammographic screening. For example, more women reporting doctors not recommending screening in FFS versus HMO settings is expected because HMOs have more influence over their doctors. Further implications will be ready for presentation at the AcademyHealth meetings.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #28

**Socioeconomic Disparities in Eye Screening Services among Diabetic Patients in Alberta, Canada, 1995-2009**

Jongnam Hwang, University of Alberta; Sarah Bowen, University of Alberta; Chris Rudnisky, University of Alberta; Jeffrey A. Johnson, University of Alberta

**Presenter:** Jongnam Hwang, Ph.D. Student, School of Public Health, University of Alberta, jongnam1@ualberta.ca

**Research Objective:** Diabetic retinopathy (DR) is a serious life-threatening complication in diabetic patients. An annual dilated eye screening by an ophthalmologist is recommended by Canadian Diabetes Association Clinical guidelines for timely detection and effective prevention. Despite strong recommendations for annual eye screening, the rate of screening for diabetic retinopathy among patients living in Alberta has decreased over the past years. Previous studies have suggested that socioeconomic status (SES) is associated with the use of the recommended eye screening services. However, the Canadian evidence on the factor associated with SES-related disparities in the use of eye screening services among diabetic patients is limited. The aim of this study was to assess socioeconomic disparities in the use of eye screening services among diabetic patients in Alberta, Canada.

**Study Design:** SES-related disparities in the use of eye screening services were assessed using the econometric techniques of Concentration Index (CI), and then regression based decomposition analysis was performed in order to identify major contributor to SES-related disparities. SES was represented by 3 measures: census-based median household income, material and social deprivation. Eye screening service was defined in this study as any visit to an ophthalmologist, based on the medical services claims database.

**Population Studied:** This study used data from the Alberta Diabetes Surveillance System (ADSS) 1995-2009 and a total of 1,949,498 diabetic patients in a 15-year period were included in the analyses.

**Principal Findings:** The study found that disparities in the use of eye screening services by an ophthalmologist exist among diabetic patients in Alberta. The income- and material deprivation-related CIs have been in favour of richer groups (i.e., pro-rich), such that higher
income and less materially deprived diabetic patients were more likely to receive eye screening services. Meanwhile, the social deprivation-related CIs have been in favour of poorer groups, such that more socially deprived patients were inclined to use eye screening services in the province. In addition, the study found that the area of residence in the province was an important contributor to disparities in eye screening, but varied by the SES indicator. For example, residing in rural areas increasingly contributed to income-related disparities in eye screening by 14 to 18% from 1995 to 2009, but 44 to 70% of social deprivation related disparities during that same time frame. Diabetic patients aged over 65 also increasingly contributed to social deprivation-related disparities, from 13% in 1995 to 43% in 2009.

**Conclusions:** SES-related disparities in the use of eye screening services exist in diabetic population in Alberta and major contributors to SES-related disparities in diabetic eye screening services vary across three SES indicators over a 15-year period.

**Implications for Policy, Delivery, or Practice:** The findings imply that economic- and social-related resources respectively generate different directions of disparities in the use of eye screening services and also suggest the need for developing health policy to alleviate different determinants of SES-related disparities in the use of eye screening services in diabetic patients.

**Funding Source(s):** Other, Alberta Diabetes Institute; Alliance for Canadian Health Outcomes Research in Diabetes

**Poster Session and Number:** A, #29

**Antidepressant Use and Falls among Community-Dwelling Elderly Medicare Beneficiaries**

Jinani Jayasekera, University of Maryland, Baltimore; Bruce Stuart, PhD, University of Maryland, Baltimore; Ilene Zuckerman, PharmD, PhD, University of Maryland, Baltimore

**Presenter:** Jinani Jayasekera, B.S Pharm., MA., Graduate Student, Pharmaceutical Health Services Research, University of Maryland, Baltimore, jinani@umaryland.edu

**Research Objective:** Falls are a leading cause of morbidity and mortality in older adults. Depression and antidepressant use cause sleep disturbances and subsequently daytime drowsiness which is a significant risk factor for falls. The objective of the study was to examine the association between the use of antidepressants and falls by the level of depression in a nationally representative sample of community dwelling elderly Medicare beneficiaries.

**Study Design:** This cross sectional study used 2005 data from the Medicare Current Beneficiary Survey. Antidepressant use was obtained via prescription fill and refill records maintained by the beneficiaries for the survey. Information on the number of falls and depression was obtained via self report. The levels of self reported depression was operationalized as depressed all or most of the time during the year; some or little of the time during the year and none of the time during the year. Other characteristics studied included: demographics; comorbidities; other medication use; functional status and living situation attributes. Bivariate analyses and chi square test assessed the unadjusted association between antidepressant use and falls. A generalized linear negative binomial model was used to quantify the adjusted relationships.

**Population Studied:** The study sample included beneficiaries living in the community aged 65 years and older.

**Principal Findings:** The final study sample comprised of 8541 beneficiaries. The mean age of the sample was 76.8 years (standard deviation 7.5 years) and 56.9 percent were female. Over 16 percent of beneficiaries used antidepressants and 33.3 percent reported falling within one year of which 42 percent experienced recurrent falls; 5 percent were depressed all or most of the time; 54 percent some or little and 41 percent none of the time during the year. Approximately 18 percent of the antidepressant users were beneficiaries who reported that they were not depressed during the year. The proportion of those who reported falling was higher among antidepressant users at all three levels of self reported depression. Multivariate analysis demonstrated a 29 percent (Rate Ratio CI: 1.13 to 1.47) increased rate of falling annually with antidepressant use compared to no use. This association did not vary by the level of self reported depression (i.e. no effect modification by the level of self reported depression). Female gender was associated with a lower rate of falling. The following characteristics were associated with an increased rate of falls: age; certain comorbid conditions; functional status measures; sedatives and narcotic use.
Conclusions: Antidepressant use is associated with an increased rate of falls among older Medicare beneficiaries regardless of the level of self reported depression experienced within a year.

Implications for Policy, Delivery, or Practice: It is necessary to carefully consider the risks and benefits associated with prescribing antidepressants to elderly in order to avoid a source of injury and disability in this population.

Funding Source(s): No Funding

Conclusions: Although the overwhelming majority of HCFs pursue an explicit health-related purpose and award funds within narrow geographical confines, most mission statements allow for a broad interpretation of health.

Implications for Policy, Delivery, or Practice: This study suggests that when nonprofit hospital sale proceeds endow an HCF, the pursuit of a charitable healthcare mission will not be abandoned after ownership conversion, regardless of any changes made by the converting hospital's new owners. In adopting flexible parameters for their mission statements, grantmakers are free to choose the combination of services (grant awards) and beneficiaries (target populations) that maximizes utility for their communities. Because HCFs have such freedom in their grantmaking practices, public policy should promote local accountability and oversight to ensure the most appropriate use of funds.

Funding Source(s): No Funding

Interdisciplinary Teamwork and Nurse Autonomy: Are They Compatible and How Is Teamwork Associated with Nurse Outcomes

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**Presenter:** Xiao Kang, B.A., B.S.N., Predoc, Center For Health Outcomes And Policy Research, University of Pennsylvania, kangxi@nursing.upenn.edu

**Research Objective:** The aim of the study was to examine whether interdisciplinary teamwork and autonomy were positively associated and determine the relationship between teamwork and nurse outcomes.

**Study Design:** A secondary analysis of the Multi-State Nursing Care and Patient Safety Study which collected data on characteristics of the hospital work environment and satisfaction with various aspects of the work environment from hospital nurses working in California, Pennsylvania, and New Jersey between September 2005 and August 2006 and in Florida between 2005 to 2006. Questions related to interdisciplinary teamwork and autonomy were aggregated to the hospital level to assess the relationships between these factors as well as the relationship between teamwork and nurse outcomes.

**Population Studied:** This study used a sample of 39,350 registered nurses from the Multi-State Nursing Care and Patient Safety Study. The nurses in this sample worked in 682 hospitals in California (n=13,176), Pennsylvania (n=9,973), New Jersey (n=8,381) and Florida (n=7,820). The sample includes at least 10 nurses per hospital.

**Principal Findings:** A strong association was found between teamwork and autonomy (r = 0.87). When separated into categories of high (>75%), medium (25-75%) and low (<25%) levels of teamwork based on quartiles, nurses in hospitals with high levels of teamwork were significantly more likely than nurses in hospitals with low levels of teamwork to be satisfied with their jobs (mean = 0.85 vs. 0.70, p<0.001), satisfied with nursing as a career (mean = 0.91 vs. 0.83, p<0.001), less likely to leave their jobs (mean = 0.10 vs. 0.17, p<0.001) and had lower burnout scores (mean = 0.26 vs. 0.39, p<0.04).

**Conclusions:** Autonomy and teamwork are compatible characteristics of hospital work environments. Interdisciplinary teamwork was associated with better nurse outcomes.

**Implications for Policy, Delivery, or Practice:** Our findings support the Institute of Medicine’s recommendation promoting a team based approach to health care and interprofessional education as part of the preparation of the health care workforce. Hospitals should consider interventions that can promote both autonomy and interprofessional teamwork that can lead to better nurse outcomes.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #32

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**Racial and Diagnostic Disparities in Hospice Use and Effects of Hospice on Use of Acute Care Services at the End-of-Life**

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**Presenter:** Pauline Karikari-Martin, Ph.D(c), M.P.H., M.S.N., Nurse Officer, College of Nursing (CON), Rush University, pauline_karikari-martin@rush.edu

**Research Objective:** This study examined racial and diagnostic differences associated with hospice use and duration of hospice use among individuals aged 65 years or older at the end-of-life (EOL). Secondly we examined the effect of race, diagnosis, and hospice use on acute care services: hospitalizations, intensive care unit/coronary care unit (ICU/CCU) admissions, and emergency room (ER) visits.

**Study Design:** The Hospice Use Model guided this secondary analysis. Existing interview data from the Chicago Health and Aging Project (CHAP), a NIH-funded longitudinal community study of more than 10,000 people age 65 or older, were merged with Medicare claims information. Data were analyzed using logistic and Poisson regression using forward stepwise selection.

**Population Studied:** CHAP participants who died as of December 31, 2009 and were enrolled in Medicare for at least one year before death (n=2,954) were included in the analytic sample.

**Principal Findings:** Compared to Whites (45%), Blacks (55%) were less likely to use hospice (OR = .54; CI .38, .77). Compared to individuals with a non cancer diagnosis (61%), individuals with a cancer diagnosis (39%) were more likely to use hospice (OR = 2.22; CI 1.79, 2.70). There were no racial or diagnostic differences in duration of hospice use. In
models that considered race and diagnosis, hospice users (34%) were less likely than non-users (66%) to be hospitalized (RR=.53; CI .40, .69), have an ICU/CCU admission (RR=.38; CI .20, .71), or an ER visit (RR=.15; CI .11, .22) at the EOL.

**Conclusions:** Disparity in hospice use exists by race (Blacks vs. Whites) and by diagnosis (cancer vs. non cancer) at the EOL. The effect of hospice use on hospitalizations, ICU/CCU admissions, and ER visits is statistically and clinically significant. In multivariate models, hospice use had a more powerful effect on use of acute care services than any other variables and it eliminated racial and diagnostic disparities in ER visits at the EOL. Overall, hospice use is more influential on use of acute care services at the EOL than race, diagnosis, age, education, physical function activities of daily living, and change in cognitive function.

**Implications for Policy, Delivery, or Practice:** Appropriate use of hospice services at the EOL can reduce the use of aggressive interventions and conserve health care resources. Efforts to disseminate and increase awareness of benefits of hospice should employ innovative educational strategies targeting minorities (Blacks) and individuals with a non cancer diagnosis using a three-pronged approach: 1) Community – faith-based organizations, community leaders, family/caregivers, patient advocates, Medicare beneficiaries, and lay patient navigators; 2) Providers – nurse practitioner/physician residency programs, annual continuing education training, certification/seminar in palliative care, and medical encounter checklist that includes hospice benefit information; and 3) Payors – include hospice benefit information for enrollees during enrollment and re-enrollment periods.

**Funding Source(s):** NIH

**Poster Session and Number:** A, #33

**Preventable Hospitalization Rates among Spanish-speaking and English-speaking Hispanics in Medicare: Analysis using the Medicare Current Beneficiary Survey**

Bilal Khokhar, University of Maryland Baltimore; Ilene Zuckerman, University of Maryland Baltimore; Bruce Stuart, University of Maryland Baltimore

**Presenter:** Bilal Khokhar, M.A.,B.S., Research Assistant, Pharmaceutical Health Services Research, University of Maryland Baltimore, bkhokh1@umaryland.edu

**Research Objective:** To examine the impact of language (Spanish and English) on preventable hospitalizations for ambulatory care sensitive conditions in a nationally representative sample of Hispanic Medicare beneficiaries. Previous literature indicates that Hispanics have higher rates of preventable hospitalizations when compared to whites, and this phenomenon may be due to language, and differences in education and income. Unlike previous studies, this study examines preventable hospitalization rates among Hispanics, which makes it possible to isolate the underlying factors associated with higher hospitalization. Distinguishing by language allows us to examine if language barriers lead to lower income and education which in turn lead to higher preventable hospitalizations.

**Study Design:** This retrospective study used Medicare data from the 2007 Medicare Current Beneficiary Survey (MCBS) linked to claims data. Information on Hispanic ethnicity and language was obtained from the MCBS while preventable hospitalization rates were obtained from inpatient claims data. Preventable hospitalizations were defined through ICD-9 codes based on AHRQ’s Prevention Quality Indicator (PQI) specifications and include diabetes, hypertension, congestive heart failure, angina, asthma, dehydration, bacterial pneumonia and urinary infections. Potentially important confounders and mediating variables examined include education, income, marital status, region and self-reported general health. Bivariate analyses using chi-square and t-tests to assess the relationship between language and preventable hospitalizations. Multivariable analysis will determine the extent to which education and income are mediating variables.

**Population Studied:** Hispanics participating in the 2007 MCBS were stratified by the language in which the survey was taken (residents of Puerto Rico excluded).

**Principal Findings:** Of 11,357 beneficiaries in the 2007 MCBS, 653 were identified as Hispanics of whom 215 were Spanish-speaking (33%). The mean age for English and Spanish-speaking Hispanics was 67.2 and 73.5 years, respectively (p <0.001). The majority of English-speaking Hispanics had an education level of high school graduate or higher (57%) while the majority of Spanish-speaking respondents had an education of eighth grade or below (59%). The majority (84%) of Spanish-speaking Hispanics had an income of $20,000 or less,
while 63% of English-speaking Hispanics had an income of $20,000 or less. Differences in education and income between the two groups were statistically significant (p < 0.001). The study identified 230 preventable hospitalizations; 30.14% (132) English-speaking Hispanics and 45.58% (98) Spanish-speaking Hispanics had preventable hospitalizations (p = 0.0001). Further multivariable analysis pooling data from 2007 through 2009 to examine the differences for preventable hospitalizations among Hispanics controlling for education and income will be presented. 

**Conclusions:** Unadjusted results indicated higher rates of preventable hospitalizations for Spanish-speaking Hispanics, while also indicating lower education and income for Spanish-speaking Hispanics. These results suggest that language barriers may lead to lower income and education and higher hospitalizations.

**Implications for Policy, Delivery, or Practice:** Preventable hospitalizations can be reduced through adequate ambulatory care. This study found that disparities exist among Spanish and English-speaking Hispanics; however the results can be translated to other ethnic minorities that have language barriers. Policy can be implemented to ensure that ethnic minorities have adequate access to care regardless of their language, educational and income barriers.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #34

**Utilization in Rural-Urban Areas for Patients with Major Depression in the Patient-Centered Medical Home**
Mona Kilany, University of North Carolina, Chapel Hill

**Presenter:** Mona Kilany, M.S.P.H., Student, Department of Health Policy and Management, University of North Carolina, Chapel Hill, mona.kilany@unc.edu

**Research Objective:** The patient-centered medical home (PCMH) is a model for prevention, care coordination, and management of chronic disease. This model can assist primary care providers in addressing the diverse needs of patients with severe mental illness (SMI) who have a high rate of physical comorbidities. Managing both the physical and mental health needs of patients with SMI can be complex for primary care providers; however, the performance of the PCMH model in rural versus urban areas remains unknown. The purpose of this study was to determine if differences in health services utilization (visits to primary care, outpatient mental health care, inpatient hospitalizations and emergency departments) and quality of care (prescription adherence) exist between rural and urban PCMH for Medicaid patients with SMI.

**Study Design:** Claims data from North Carolina Medicaid’s Community Care of North Carolina (CCNC) program were used. CCNC is a recognized model of the PCMH. Propensity score weighting methods were used to adjust for self-selection into the PCMH. A three-level categorical variable of rurality (metropolitan, non-metropolitan urban and non-metropolitan rural) based on the Rural-Urban Continuum Codes was used. A difference-in-differences approach, with a rurality X medical home interaction term, was estimated using generalized estimating equations to show the extent to which the performance of rural PCMH differs from urban PCMH.

**Population Studied:** The sample for this study was adults (18+) with major depression who were enrolled in North Carolina Medicaid during 2004-2007.

**Principal Findings:** Preliminary results showed that patients with major depression in the PCMH primarily live in metropolitan areas (61%), are not dual eligible, have an average age of 39, had hypertension, COPD or classified as obese. The average patient with major depression in non-metropolitan urban areas had statistically significant 1 more inpatient visit per month, more visits to outpatient mental health providers, to primary care and lower prescription adherence compared to the average patient with major depression in metropolitan areas. Similar, but not statistically significant, results were found for the average patient with major depression in non-metropolitan rural areas.

**Conclusions:** These findings highlight that while the PCMH does not reduce differences in primary care and mental health utilization between urban and rural areas, it does improve the number of visits patients with major depression make to outpatient mental health and primary care providers in non-metropolitan urban and non-metropolitan rural areas.

**Implications for Policy, Delivery, or Practice:** In recent years, there has been a renewed emphasis on models aimed at improving care for individuals with chronic conditions. It is particularly important for policymakers and health care providers to understand the rural-
Longitudinal Association of Restless and Inadequate Sleep to Work Related Musculoskeletal Disorders among Registered Nurses

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Presenter: Kyungsook Kim, M.S., B.A., R.N., Ph.D. Candidate, University of Maryland School of Nursing, kkim005@umaryland.edu

Research Objective: Previous studies have shown that reduced sleep increases risk of work-related injury. It is unclear whether restless sleep (RS) and/or inadequate sleep (IS) together impact musculoskeletal disorders (MSD) injury. The objective was to explore the relation of self-reported RS and IS on work-related MSD among registered nurses.

Study Design: This study used secondary survey data from the longitudinal Nurses Worklife and Health Study on self-reported RS and IS and work-related MSD. Nurses were coded as positive for RS and/or IS if these occurred more than 2 nights per week. MSD cases were reports of relevant symptoms in the back, neck, and shoulder lasting 1 week or more, or at least monthly, with moderate or more pain on average. Using binomial regression models, the relationship between Wave 1 (baseline) RS and/or IS and risk of incident MSD in waves 2 or 3 (6 and 15 months after baseline respectively) was examined. Other potential risk factors included in the models were: age, caring for any children, caring for any dependents, exercise, smoking, obesity, and work schedules.

Population Studied: Out of the 4,229 eligible actively licensed nurses sampled randomly from two US states, completion rate was 62% (n=2,624). Follow-up response rates were 85% in wave 2 and 86% in wave 3. For this analysis, respondents were worked as a nurse prior to wave 1 (n=2,273) were included.

Cumulative incidence of MSD was 26 % for back, 17% for neck, and 19% for shoulder. Nurses who reported RS was 30% and IS was 44%. Nurses who had both was 22%, who had only RS but not IS was 7%, who had only IS but not RS was 22%, and who neither RS nor IS was 49%.

Principal Findings: RS (compared to no RS) increased the risk of having a MSD of all three body regions by 2.6 times. IS (compared to no IS) was associated with a doubling of MSD risk in all body regions.

Compared to nurses without any RS and IS disturbance, nurses with RS had more than 3.6 times the risk of MSD (back OR=3.57, 95% Cl=2.14-6.15; neck OR=3.67, 95% Cl=2.06-6.66; shoulder OR=3.62, 95% Cl=2.06-6.47). For nurses with only IS the risk was 2.3 (back OR=2.25, 95% Cl=1.62-3.15; neck OR=2.67, 95% Cl=1.86-3.81; shoulder OR=2.42, 95% Cl=1.68-3.49). Nurses with both RS and IS showed an additive interaction on MSD (back OR=4.84, 95% Cl=3.49-6.82; neck OR=6.47, 95% Cl=4.59-9.37; shoulder OR=5.84, 95% Cl=4.10-8.40). However, the additive interaction exists only for neck area after adjustment for confounders (OR=5.53, 95% Cl=3.69-8.39).

Conclusions: RS and IS by themselves are associated with a doubled risk of developing an MSD. When combined, the risk ranges from 4.8-6.5 times the risk for those without these sleep difficulties, suggesting the importance of getting adequate sleep to avoid work related injuries.

Implications for Policy, Delivery, or Practice: Educational intervention for sleep improvement strategies may prevent nurse MSD. Screening for undiagnosed sleep disorders may be beneficial as well.

Funding Source(s): N/A

Financial Drivers of Access: Barriers to Unscheduled Outpatient Care

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Research Objective: Emergency department (ED) visits for common chronic diseases are considered to be avoidable. However, given that acute flares are common, it is not yet clear how to deliver needed unscheduled care. We explored barriers to accessing unscheduled outpatient care for the exacerbation of a chronic illness.

Study Design: The Penchansky model of access provided the theoretical framework for our investigation. We used a piloted interview guide to conduct semi-structured qualitative interviews with a purposive sample of stakeholders in the unscheduled care delivery system from June 2012 to January 2013; until theme saturation was reached. Patients were recruited from the ED; other stakeholders were identified using a snowball technique. Interview transcripts and notes were entered into NVivo 10 and double-coded, using an iterative process to identify patterns of responses, ensure reliability, examine discrepancies, and achieve consensus through content analysis.

Population Studied: We conducted 45 interviews with a convenience sample of 26 adult ED asthma patients and a purposive sample of 19 other stakeholders (ED and outpatient providers, health system administrators and payers).

Principal Findings: Themes that emerged indicate that non-patient stakeholders agree: exacerbations of chronic illnesses are best treated by the outpatient provider. Yet all stakeholders identified considerable barriers to unscheduled outpatient care. Qualitative analysis revealed underlying financial drivers in each of Penchansky’s dimensions of access.

(1) Acceptability: decreased provider willingness to see lower-paying, publicly-insured patients;
(2) Accessibility: low income patients reported difficulties accessing transportation;
(3) Affordability: inability of patients to afford copays and medications;
(4) Availability: workforce capacity limitations attributed to lower reimbursement for primary care providers and increasing desire among young physicians to work part-time; inability to provide same-day appointments due to emphasis on volume over flexibility: ‘We need to churn a lot of patients through the system… it becomes a financial thing’; emphasis on ‘upcoding’ over increasing panel size: ‘We are the beneficiaries of a system that rewards a knowledge of coding. Not that we actually see more patients… it’s whether or not you billed the 5’;
(5) Accommodation: difficulty contacting providers due to their conflicts with other job responsibilities, lack of reimbursement for phone/email contact, and cost-containing measures such as automated phone trees and un-invested call centers; perception of extended hours as underutilized and/or unprofitable: ‘They couldn’t afford to continue to have those extended hours because of their payer mix.’ Additional financial drivers spanned multiple access dimensions. Specifically: lack of provider reimbursement for addressing social needs, behavioral health, and ineffective incentives to reduce ED utilization: ‘We get dinged… [but] our docs just shrug their shoulders. What can I do?’

Conclusions: Stakeholders in the unscheduled care delivery system share a common goal: continuity of care; yet multi-dimensional, systemic barriers to unscheduled outpatient care remain.

Implications for Policy, Delivery, or Practice: The Medicare Accountable Care Organization Quality Measures seek to improve access to while reducing need for unscheduled care by incentivizing preventive health, patient-reported access, and reduced hospitalizations for ambulatory-sensitive conditions. However, it is unclear whether these incentives will sufficiently address the existing financially-driven barriers identified by our study. Iterative assessment of the impact of these measures on access will be needed as health systems restructure care delivery.

Funding Source(s): Other, The Doris Duke Charitable Foundation

Poster Session and Number: A, #37

Proxy Response Bias in Assessing Health and Functional Status among Medicare Beneficiaries

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Research Objective: The objectives of the current study were (1) to examine the presence, direction, and magnitude of proxy response bias in health and functional status measures among Medicare beneficiaries participating in the Medicare Current Beneficiary Survey (MCBS), and (2) to assess whether the extent of proxy response bias varies by the relationship between the subject and the proxy (spouse, relative, and non-relative).

Study Design: This study used a pooled cross-section of data from the MCBS surveys in 2007, 2008, and 2009. Health and functional status was assessed across five domains: physical, affective, cognitive, social, and sensory status. A propensity score was used to create matched cohorts with and without proxy using a greedy matching technique. Variables included in the propensity score were age, gender, race, education, marital status, household size, income, Medicare status, and cognitive impairments. Subject self-reports and proxy-reports were compared on the five domains of health and functional status.

Population Studied: Community-dwelling Medicare beneficiaries.

Principal Findings: After applying the propensity score method, proxy response bias was not found in the sensory status domain (seeing [95% CI=0.92-1.12] and hearing [95% CI=1.00-1.20]). Proxy response bias was present in the other four domains. Two domains had moderate proxy response biases: affective status (OR: 1.19-1.25) and social status (OR: 1.52). The cognitive status domains (OR: 2.35-3.71) had large proxy response bias. Within the physical status domain, moderate proxy response bias was found in mobility (OR: 0.91-1.52) and large proxy response biases were found in activities of daily living (ADL) (OR: 1.31-4.05) and instrumental activities of daily living (IADL) (OR: 1.69-6.95). A question regarding subjects’ difficulties in managing money was associated with the largest proxy response bias (OR=6.95). In subgroup analyses, the magnitude of proxy response bias was almost twice as high for relative or non-relative proxies versus spouse proxies in the physical and cognitive status domains.

Conclusions: Proxy response bias was present in the physical, affective, cognitive, and social status domains but not in the sensory status domain. Specifically, proxies tend to over-report health and functional limitations in comparison to subjects themselves. For questions involving private information, unobservable factors, or complex answers, the magnitude of proxy response bias was large. When assessing the impact of different relationships on proxy response bias, the presence and direction remained the same, but the magnitude varied.

Implications for Policy, Delivery, or Practice: The current study provides useful findings for survey organizations that wish to minimize proxy response bias. At the questionnaire development stage, objective, observable, or easy questions that do not call for judgments by proxies are preferred. At the survey execution stage, when the subject is unable to respond, interviewers should identify a proxy who has a close relationship with the subject and is familiar with the questions being asked. The results of this study will also help researchers better use survey data. When using survey data obtained from proxies, researchers should describe possible effects of proxy response bias on study results.

Funding Source(s): No Funding
Poster Session and Number: A, #38

National Trends in Racial/Ethnic Disparities in the Use of Antidepressant Medications by Insurance Type, 2001-2010
Dooyoung Lim, The Pennsylvania State University; Kyoung Rae Jung, The Pennsylvania State University; Yunfeng Shi, The Pennsylvania State University

Presenter: Dooyoung Lim, MHA, Doctoral Student, Health Policy and Administration, The Pennsylvania State University, dyl5159@psu.edu

Research Objective: Many studies have found racial/ethnic variations in the use of antidepressant treatment during the 1990s and early 2000s: Blacks and Hispanics were less likely to use antidepressant medications than whites. Recent data indicate that there has been a significant increasing trend of the antidepressant use among depression patients in the mid and late 2000s; yet, little is known how racial/ethnic variations in antidepressant use changed during this period. Thus, the purpose of this study was to examine whether racial/ethnic differences in the use of antidepressant medications continued between 2001 and 2010, and how they changed. We also
analyzed racial disparities in antidepressant treatment by insurance type.

**Study Design:** We used multiyear data (2001-2010) from the Medical Expenditure Panel Survey (MEPS), which is a nationally representative sample of US general population. Using logistic regressions, we examined the pattern of antidepressant use over years for three mutually exclusive insurance groups: 1) Medicare, 2) Medicaid (including dual eligibles for Medicare and Medicaid), and 3) private coverage.

**Population Studied:** Our sample consists of people with depression identified by ICD-9-CM codes reported in the MEPS household component medical conditions file (N=19,296). They represent national population (6 or older) with self-reported depression in the U.S. The use of antidepressant medications was identified by the drug names reported in the prescribed medicines files (N=5,498).

**Principal Findings:** Blacks in Medicare and Hispanics in Medicaid were less likely to use antidepressant than whites in the earlier years (2001-2003): the adjusted odds ratio was 0.43 and 0.69 for blacks and Hispanics, respectively. However, those disparities seem to decrease in the mid and late 2000s (2004-2006 and 2007-2010). On the other hand, both blacks and Hispanics covered by private insurance reported less antidepressant use compared with whites in the early 2000s (2001-2003): the adjusted odds ratio was 0.59 and 0.67 for blacks and Hispanics, respectively, and those disparities seem to persist until the later years of the study period.

**Conclusions:** During the early 2000s, racial/ethnic disparities in the use of antidepressant medications existed in all insurance groups, which is consistent with the findings of the prior studies. However, the disparities did not endure in the late 2000s among the Medicare and Medicaid populations. Unlike publicly covered minorities, blacks and Hispanics with private coverage have continuously shown racial/ethnic disparities throughout the late 2000s.

**Implications for Policy, Delivery, or Practice:** We may need continuing policy efforts to improve antidepressant treatment among racial/ethnic minorities, particularly those covered by private insurance. Based on the insurance coverage, attention may be given to specific racial/ethnic groups.

**Funding Source(s):** No Funding

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**Why Are They Leaving? Factors Affecting Intention to Leave Among Long-Term Care Facilities Nursing Assistants in Taiwan**

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**Presenter:** Yu-Hsiu Lin, MBA, PhD student, Department of Health Services Policy and Management, University of South Carolina, lynnctc@gmail.com

**Research Objective:** Nursing assistants (NAs) in Taiwan play an essential role in providing long-term care service. Recently, the number of NAs increased significantly due to the dramatic change in demographic and the social environment. However, the rate of quitting NA jobs is also increasing. Little is known about the factors related to NAs’ intention to leave and job stress. The aim of this study was to tease out demographic and organizational factors that are contributable to the intention to leave among long-term care facilities NAs in Taiwan.

**Study Design:** This is a cross-sectional study using a structured questionnaire to collect data from NAs working in long-term facilities. The questionnaire includes the Chinese Version of the Job Content Questionnaire (C-JCQ), facility information, and NAs’ demographics. The C-JCQ is based on the demand-control model developed by Karasek and Theorell and divided into three dimensions: decision latitude control, psychological demand, and social support. A simple logistic regression was used to screen and select the significant variables into the full model. A multiple logistic regression model was used to estimate the relationship between the potential factors and intention to leave, and p values were compared with 0.05 significance level.

**Population Studied:** Through a proportional stratified random sampling, a total of 64 institutionalized long-term care facilities were selected from across Taiwan. Five hundred and seven (507) eligible NA’s, working in the current facility over 3 months, participated in this study.

**Principal Findings:** The results of multiple logistic regression analysis showed that marital
status, decision latitude control, and psychological demand significantly affect the probability of intention to leave. Married NAs had lower intention to leave (OR=0.519, p<0.019, 95% CI=[0.299, 0.899]). Decision latitude control (OR=0.341, p<0.015, 95% CI=[0.177-0.654]) reduced the probability of intention to leave. Having higher psychological demand (OR=1.078, p<0.019, 95% CI=[1.012, 1.148]) significantly increased the probability of intention to leave.

**Conclusions:** Among factors that can be addressed by management, decision latitude control and psychological demand were key contributors to NAs’ intention to leave. The findings in this study may benefit long-term care facilities and encourage them to provide assistance to NAs to decrease the occurrence of intention to leave.

**Implications for Policy, Delivery, or Practice:** Nursing home administrators have the opportunity to counteract job dissatisfaction and, in the long run, resident safety and turnover rate, by adopting sound staff policies. Decision latitude can be improved by increasing the use of care teams, in which NA’s work with other practitioners to design and implement care plans for each patient. The psychological pressures associated with caring for multiple complex patients during each shift are also potentially reduced by teams. Time pressures could more directly be addressed through improvements in workplace design, such as location of necessary supplies, that introduce efficiencies and allow more time for patient care.

**Funding Source(s):** Other, National Science Council, Taiwan

**Poster Session and Number:** A, #40

**Predicting Falls in People with Multiple Sclerosis Living in the Community: Keep it Simple**
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**Presenter:** Rajarshi Mazumder, B.S., Medical Student/ Mph Candidate, School of Medicine, Oregon Health and Science University, mazumder@ohsu.edu

**Research Objective:** Over 400,000 people in the US have multiple sclerosis (MS). Fifty to 65% of these individuals fall at least once each year. Those at increased risk for falls can be identified by tests of varying cost, complexity and length. However, the ideal test for identifying those at increased risk for falls is not known. The objective of this study was to compare how accurately a history of falls, questionnaires related to balance and walking, and physical balance tests, predict future falls in people with multiple sclerosis (MS) living in the community.

**Study Design:** In this prospective cohort study, 58 people with MS completed the Activities-specific Balance Confidence (ABC), Falls Efficacy Scale-International (FES-I), and Multiple Sclerosis Walking Scale-12 questionnaires. The participants’ balance was also evaluated with computerized dynamic posturography. They were also asked, “Have you fallen in the past 2 months?” and, “Have you fallen in the past year?” For the 6 months after these baseline evaluations, all subjects were asked to complete daily fall diaries, noting their number of falls each day. The ability of the baseline tests to predict falls in the following 6 months were evaluated and compared using ROC curves and logistic regression.

**Population Studied:** Subjects were 58 people with multiple sclerosis living in the community, aged 18-50 years, with Expanded Disability Status Scale scores less than or equal to 6.0, participating in a prospective study of mechanisms of imbalance in MS.

**Principal Findings:** All baseline measures individually provided similar prediction of falls in the ensuing 2 or 6 months (AUC 0.62 – 0.75). No measure individually was more accurate than simply querying the patient about falls experienced in the past. The best prediction of falls over the following 2 months was provided by combining a history of one or more falls in the past 2 months with the ABC score (AUC 0.82). The best prediction of falls over the following 6 months was provided by a history of one or more falls over the past year (AUC 0.73).

**Conclusions:** Simply asking people with MS if they have fallen in the past 2 months and past year predicts future falls as well as more expensive, complex, or time-consuming approaches. Clinicians should consider simply asking all their patients with MS whether they have fallen in the past 2 months and the past year to quickly and easily identify those patients at increased risk for falling in the future.

**Implications for Policy, Delivery, or Practice:** Results of this study could inform evidence-based practice guidelines for healthcare professionals involved in caring for people with
The Relationship between Health Literacy and Asthma Outcomes among African-American Adults with Asthma

Courtnee Melton, University of Tennessee Health Science Center; James E. Bailey, University of Tennessee Health Science Center

Presenter: Courtnee Melton, M.S., Graduate Reserach Assistant, General Internal Medicine, University of Tennessee Health Science Center, courtnee.melton@gmail.com

Research Objective: Asthma affects 24.6 million people in the United States, and African-Americans share a disproportionate burden of the disease. African-Americans have a higher prevalence of asthma, worse asthma control, higher hospitalization rates, and higher asthma mortality rates. Adequate health literacy is required to navigate the health care system, follow directions, and make informed decisions regarding health. The prevalence of limited health literacy is greater among minorities, the poor, and people with less than high school education. Low health literacy has been linked to increase use of emergency care, increased hospitalization, and poorer health outcomes. Consequently, health literacy contributes to asthma health disparities. There is limited research on the prevalence of low health literacy among minorities with asthma. The purpose of this study was to determine if self-efficacy and asthma knowledge mediate the relationship between health literacy and asthma outcomes.

Study Design: This cross-sectional study was a sub study of the BELT: Blacks and Exacerbations on LABA vs. Tiotropium study. Health literacy (print literacy) was evaluated using questions developed by Chew et. al (2004). Participants were dichotomized into having adequate or low health literacy. Primary outcomes were asthma control (ACQ) and asthma related quality of life (AQLQ). Mediating factors examined were asthma self-efficacy and asthma self-management knowledge. Chi-square, t-tests, and Wilcoxon Mann-Whitney test were used to compare participants across health literacy levels. The Preacher and Hayes method of bootstrapping multiple mediator analysis was used in this study. Both total and specific indirect effects were examined using 5,000 bootstrap samples to calculate 95% bias corrected confidence intervals.

Population Studied: Sixty six African-Americans recruited from an urban outpatient clinic in Memphis, TN were included in the analysis. Thirty two percent of the population had low health literacy.

Principal Findings: Health literacy was related to asthma control after controlling for potential confounding variables. Neither self-efficacy nor asthma self-management knowledge were found to mediate the relationship between health literacy and asthma outcomes. Health literacy was also associated with the symptom domain of the AQLQ in bivariate analysis, but this relationship was no longer present after controlling for covariates using mediation analysis.

Conclusions: Findings suggest that other mechanisms link health literacy and asthma outcomes. The relationship between health literacy and asthma outcomes is complex, and other factors not included in this study impact the relationship. Perhaps self-efficacy and knowledge influence health behaviors and in turn, these health behaviors influence disease outcomes. Paasche-Orlow et al. (2005) found that inadequate health literacy was associated with poorer metered dose inhaler technique, and individuals with poorer inhaler technique are more likely to have poorer asthma outcomes.

Implications for Policy, Delivery, or Practice: Future research should examine relationships between mediators and self-care behaviors as well as self-care behaviors as actual mediators of the relationship between health literacy and asthma outcomes. Low health literacy is a significant problem for many patients. While the mechanisms linking health literacy to health outcomes are unclear, health care providers should be aware of the communication needs of patients and use recommended communication strategies.

Funding Source(s): No Funding

Poster Session and Number: A, #41

Intervention Effects of Bar Coded Medication Administration: A Systematic Review

Robin Mickelson, Vanderbilt University

Presenter: Robin Mickelson, M.S., Ph.D. Student, Nursing, Vanderbilt University, robin.s.mickelson@vanderbilt.edu
Research Objective: Medication administration errors (MAE) are a major source of morbidity and mortality in hospitalized patients. Bar Coded Medication Administration (BCMA) technology is an increasingly adopted intervention to reduce MAEs that has gained wide support from patient safety organizations, accreditation bodies, and government agencies. Considering the priority of evidenced based interventions, the evidence on the effectiveness of BCMA to reduce MAEs requires attention. Using the framework of interventional components (delivery, receipt, enactment) we systematically reviewed the health information technology (HIT) literature on the effectiveness of BCMA to reduce MAEs.

Study Design: Reports of controlled trials of BCMA implementations, published in English between the years 1990 and 2012, with outcomes potentially influenced by BCMA function, in an inpatient setting were included. Keywords used included: medication administration errors and barcode point of care/ BPOC, BCMA, bar code/encoded/ coding medication/drug administration. These keywords were searched in six databases: PubMed, Web of Science, Cochran Database of Systematic Reviews, Library and Information Science and Technology Abstracts, and ProQuest Dissertation Abstracts.

Population Studied: 327 articles were identified and 275 abstracts screened after removing duplicates. Of these, 120 abstract were removed and 35 full text articles were screened for inclusion criteria resulting in 7 articles included in this review.

Principal Findings: The majority of articles implemented other medication use technologies such as electronic medication administration records (eMAR) and automated dispensing machines (ADM), in tandem with BCMA (n = 6). BCMA definitions varied, with articles defining BCMA as technology that verifies the five rights of medication administration (right patient, drug, dose, time, route), and others including processes such as the organization of workflow and the scheduling of medications. These are not processes BCMA can influence. Some studies included outcomes such as faulty administration technique, and drug not available, outcomes not impacted by BCMA in the analysis of MAEs. Other study issues limiting the ability to detect BCMA effects were not including: 1) medications excluded (n = 2); 2) training and post implementation support (n=3), 3) scan rates (n = 3), and 5) treatment fidelity (n = 0).

Conclusions: No conclusions about the BCMA effectiveness to reduce MAEs can be drawn from these studies because of 1) the introduction of other medication use technology in tandem, 2) the inclusion of outcomes not reflective of BCMA functionality, and 3) inadequate intervention measurement, and 4) unknown intervention adherence. Without addressing these issues, it is not possible to evaluate BCMA effectiveness and understand what specific reasons caused the intervention to succeed or fail.

Implications for Policy, Delivery, or Practice: Standards for the design, measurement and reporting of HIT interventions are needed. These are needed to: 1) control for how and to what extent an intervention is implemented; 2) allow for comparisons across studies; and 3) assure effectiveness results reported are valid and reliable. Findings suggest a framework including the three components of an intervention (delivery, receipt, enactment) for the measurement, monitoring and reporting of HIT effectiveness research.

Funding Source(s): No Funding

Poster Session and Number: A, #43

Coordinated Care for Children in Medicaid and CHIP
Kipyn Miller, University of Texas

Presenter: Kipyn Miller, M.P.Aff., M.Ed., Public Policy PhD Student, Lyndon B. Johnson School of Public Affairs, University of Texas, kipyn.miller@utexas.edu

Research Objective: Children with special health care needs (CSHCN) often require services from multiple health care providers. Coordinating a child’s care between these varied providers can be a challenging task for parents, especially low-socioeconomic parents who may experience difficulties with affording health care or accessing needed services. This study’s objective is to evaluate whether CSHCN, enrolled in Medicaid or the Children’s Health Insurance Program (CHIP) and receiving care coordination services, experience improved access to the health care services they need.

Study Design: Using data from the 2009-2010 National Survey of Children with Special Health Care Needs, two separate outcomes are used to assess children’s access to care: receipt of needed health care and timely access to
services. Using propensity score matching, CSHCN propensity for receiving care coordination services is derived. Two separate measures of care coordination are examined: having a care coordinator and having care coordination services perceived as being adequate by children’s families. Upon matching, an assessment is made of both care coordination measures’ impact on the receipt of health care and whether care is timely.

**Population Studied:** The population studied through this research is children under age 18 who are enrolled in Medicaid or CHIP, have complex health care conditions, and who need mental health or specialty care.

**Principal Findings:** Results demonstrate that care coordination is positively related to whether a child receives the mental and specialty care that they need, regardless of whether or not that coordination is perceived to be adequate by parents. Although care coordination increases the likelihood that children will receive care, results do not support a similar positive impact on timely access to services. CSHCN who have a care coordinator experience delays in obtaining care at a 5.7% higher rate than CSHCN who do not have a care coordinator. Conversely, obtaining care coordination services that are perceived as being adequate by families does not have an effect on whether or not care is delayed.

**Conclusions:** Results indicate that care coordination is associated with an increased ability for children to receive needed mental and specialty care, although it does not positively influence the timeliness in which such care is obtained. Having a care coordinator, regardless of whether care coordination services are perceived as being effective by parents, is positively associated with a child’s ability to receive needed services. However, since having a care coordinator may be negatively associated with the ability to access care in a timely manner, more comprehensive care coordination services beyond basic care coordinator assistance may be needed.

**Implications for Policy, Delivery, or Practice:** Care coordination services are a potential health care intervention that state policymakers may want to consider offering to the CSHCN enrolled in state health care programs. Incorporating care coordination benefits into state Medicaid and CHIP programs may help children get the care they need, potentially leading to better health outcomes and reduced health care costs. To maximize their effectiveness, Medicaid and CHIP care coordination benefits should be developed in a manner that supports communication between providers and provides families with the level of coordination that meets their full care needs.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #44

**Impact of Medicaid Eligibility Expansions on Adult Health**

Kipyn Miller, University of Texas

**Presenter:** Kipyn Miller, M.P.Aff., M.Ed., Public Policy PhD Student, Lyndon B. Johnson School of Public Affairs, University of Texas, kipyn.miller@utexas.edu

**Research Objective:** As a result of the Affordable Care Act (ACA), states have the option to expand Medicaid eligibility in 2014 to adults with higher incomes than is currently required, while receiving higher federal funding rates to pay for the expanded population’s care. Prior to ACA passage, some states had already expanded adult Medicaid eligibility income allowances, enabling an evaluation of Medicaid impacts on higher-income adults. The objective of this research is to examine the potential impact of an ACA eligibility expansion by assessing Medicaid’s impact on the health outcomes of higher-income adults who are currently enrolled in Medicaid.

**Study Design:** Using 2007-2011 National Health Interview Survey panel data, this study compares the health of higher-income Medicaid-enrolled adults to adults with the same income levels but who are uninsured. The sample consists of adults between the ages of 20 and 64 years who have incomes between 50 and 150 percent of the federal poverty level. This study evaluates adult health through separate regional models that examine Medicaid impacts on current health status and on morbidity measures that represent precursors to more severe health needs. As such, separate random effects logistic regression models are run for the southern, mid-western, northeastern, and western regions of the US, examining Medicaid impacts on self-rated health status and on hypertension and diabetes prevalence within the states that comprise each geographic region.

**Population Studied:** The study focuses on adults with incomes within ACA-expansion levels who are not disabled, pregnant, or elderly, and are either uninsured or enrolled in Medicaid. This population represents the adults who are
most likely to be directly impacted by an ACA eligibility expansion.

**Principal Findings:** Research results indicate that Medicaid enrollment is associated with poorer health in the southern and mid-western regions of the country, but not in the northeastern or western regions. In addition to Medicaid coverage, there are certain common elements that impact health across multiple geographic regions for both Medicaid-enrolled and uninsured adults. The inability to afford health care services is associated with lowered self-rated health and higher hypertension prevalence. Attending doctor visits and having a usual source of care are both associated with higher rates of diabetes and hypertension.

**Conclusions:** While Medicaid was not directly found to have a positive association with adult health, findings indicate that individuals with greater health care needs may be more likely to obtain Medicaid coverage, use health care services, establish a usual source of care, and experience difficulty affording care than individuals without significant health care needs.

**Implications for Policy, Delivery, or Practice:** This research provides information for state policymakers considering implementation of an ACA Medicaid eligibility expansion. Adults with health care needs are more likely to obtain Medicaid coverage when available, indicating that Medicaid provides a core coverage option for adults who may not be able to afford private health insurance. Since the ability to afford health care services is an issue for both Medicaid-enrolled and uninsured adults, state policymakers may also want to evaluate the Medicaid benefits currently available to adult enrollees for utilization patterns and potential opportunities for change.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #45

**Trends in Prescription Opioid Use among Medicare Part D Enrollees, 2007 to 2009**

Patience Moyo, University of Maryland Baltimore; Bruce Stuart PhD, University of Maryland Baltimore; Ilene H. Zuckerman PhD, University of Maryland Baltimore

**Presenter:** Patience Moyo, B.A., Graduate Student, Pharmaceutical Health Services Research, University of Maryland Baltimore, pmoyo@umaryland.edu

**Research Objective:** The use of opioid analgesics is a subject of attention for policymakers and clinicians due to safety concerns, including their potential for abuse. While the use of opioids by adolescents and young adults in relationship to drug abuse is well studied, it remains under-studied among older adults. The objectives of this study are to: (1) provide estimates of prescription opioid analgesic use among Medicare Part D beneficiaries; and (2) enrich the understanding of factors associated with opioid use among older adults. The trends are assessed separately for community and facility settings. Because increases in opioid use among facility residents are unlikely to be due to diversion due to the strict regulatory processes for dispensing medications, residents in facilities serve as a ‘control’ against which to compare changes in opioid use that occur in the community.

**Study Design:** Analyses are based on a cross-sectional sample of survey respondents using 2007-2009 data from the Medicare Current Beneficiary Survey (MCBS) that is linked to Part D claims. Opioid use is defined as: (1) the receipt of at least one prescription of any opioid analgesic during a year; and (2) the average annual number of fills by users. Factors associated with the use of opioids are identified from baseline characteristics, comorbidities and other variables that are collected in the MCBS.

**Population Studied:** Medicare beneficiaries, residing either in the community or nursing facilities, enrolled in Part D prescription drug plans. For each year the analyzed community and facility sample had roughly 6,000 and 600 beneficiaries respectively.

**Principal Findings:** The percentage of enrollees with any opioid exposure decreased by 3.8% (39.5% in 2007 to 35.7% in 2009) in the facility setting, and by 0.2% (22.2% in 2007 to 22.0% in 2009) among community residents. Among users, the mean number of fills was 8.0 in 2007 and 7.7 in 2009 among facility residents; while it was 3.4 in 2007 and 3.5 in 2009 among community residents. Bivariate analyses suggest that gender, age, education level, income, disability, history of mental illness and type of pain-related condition were significantly associated with opioid use. Overall, both settings experienced a slight increase in opioid use among enrollees with hip fractures and cancer from 2007 to 2009. Multivariate analyses are in progress and will be available to report at the annual meeting.

**Conclusions:** From 2007 to 2009 the prevalence of opioid use in facilities declined but remained stable among community residents.
While the mean number of fills per person in the facility decreased, it appears that this number grew in the community population, over the same period. The rise in mean opioid fills per community dwelling beneficiary requires further scrutiny and monitoring, as it may suggest a rise in problematic use.

**Implications for Policy, Delivery, or Practice:**
Prescription drug monitoring programs, clinical approaches and other strategies are needed to help manage the legitimate use of opioids while minimizing their diversion and abuse in the community. Future research to assess the factors associated with and the consequences of long-term opioid use among the elderly is warranted.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #46

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**State Tort Reform Caps on Noneconomic Damages: Variable Effect on Paid Claims**
David Muhlestein, Ohio State University College of Public Health

**Presenter:** David Muhlestein, J.D., M.H.A., M.S., Doctoral Candidate, Division of Health Services Management and Policy, Ohio State University College of Public Health, muhlestein.1@osu.edu

**Research Objective:** Tort reform with caps on noneconomic damages, such as pain and suffering, has been proposed as a way of decreasing the national cost of healthcare. A criticism of this approach is that caps will lead to the unintended consequence of reducing access to the system for those with legitimate claims. Critics argue such caps make lawyers less willing to take meritorious cases which will leave deserving patients – those that suffered a legitimate tort – without access to the legal process. This study focuses on measuring the impact of tort reform at the state level, rather than estimating the overall impact of a specific variety of tort reform.

**Study Design:** To estimate changes in tort reform I use an interrupted time series design which is used to estimate changes in trends following the implementation of an intervention. The general approach is to regress trends before and after the implementation of tort reform and evaluate whether the slope or intercept of the regressed lines change. A second tool to evaluate these claims relies on a difference in difference (DiD) design where states that instituted caps on noneconomic damages are compared to states that did not. I first match states to a suitable control state using regression imputation based on paid claims per 1000 physicians up to the point that the state implemented its cap on noneconomic damages. I then evaluate whether there is a difference between the subsequent rates of paid claims per 1000 physicians between the test state that implemented caps on noneconomic damages and the control state that did not.

**Population Studied:** This study evaluates Alaska, Florida, Georgia, Idaho, Illinois, Mississippi, Missouri, Ohio, Oklahoma, South Carolina, Texas and West Virginia, which implemented new caps on noneconomic damages from 2000-10. Data on tort payments come from the National Practitioner Data which contains information on malpractice payments made by, and adverse actions taken against, healthcare providers including physicians, dentists and other healthcare practitioners.

**Principal Findings:** Among states that implemented caps on noneconomic damages, there is significant variability of the effect on paid malpractice claims. Some states, such as Missouri, Ohio and West Virginia, saw no significant change in paid claims after instituting noneconomic caps. Other states, such as Florida, Georgia and Texas, saw significant decreases in the number of paid claims. Results for the DiD test with matched control states are forthcoming, but I expect to find similar levels of variability.

A secondary finding is that there has been a significant decrease in the number of paid claims over time nationally and in most states, independent of efforts at tort reform.

**Conclusions:** Tort reforms that address caps on noneconomic damages, though facially similar, have significantly different results when implemented in individual states.

**Implications for Policy, Delivery, or Practice:** States implemented conceptually similar forms of tort reform, but had significantly different effects on paid claims; this implies that all caps on noneconomic damages are not equivalent. Qualitative studies of the individual state policies need to evaluate how the state policies differ and why they led to different results to direct other states and the federal government as they consider similar policies. The decrease in paid claims, independent of tort reform, may indicate that tort reform is not necessary to curb the number of paid claims, potentially because less medical malpractice is being committed.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #47
Medicare Changes in Reimbursement for Bariatric Surgery and their Effect on the Non-Medicare Population

David Muhlestein, Ohio State University College of Public Health

Presenter: David Muhlestein, J.D., M.H.A., M.S., Doctoral Candidate, Division of Health Services Management and Policy, Ohio State University College of Public Health, muhlestein.1@osu.edu

Research Objective: This study evaluates how changes in Medicare reimbursements (changing when and for what conditions Medicare will reimburse) for bariatric surgery affected non-Medicare patient care. In 2006, Medicare provided a national coverage determination (NCD) as to how bariatric surgery must be performed to be eligible for Medicare reimbursements and a swift decline in bariatric surgeries followed among the Medicare population. This study evaluates how non-Medicare beneficiaries were affected by this Medicare-centric policy.

Study Design: Interrupted time series of the rate of bariatric surgery among the Medicare and non-Medicare population. I also estimate if there is any lag between Medicare and non-Medicare responses using a difference minimization model.

Population Studied: Inpatient hospitalizations where a bariatric surgery was performed. Data comes from the Healthcare Cost and Utilization Project (HCUP) Nationwide Inpatient Sample (NIS) from 1998-2010 representing a 20% sample of United States hospitalizations.

Principal Findings: Simultaneous to the decrease in Medicare reimbursed bariatric surgeries, there was a similar decrease in non-Medicare bariatric surgeries. The magnitude of the change was similar and the timing of the change was similar.

Conclusions: There was significant spillover from Medicare reimbursement policies onto non-Medicare payers that resulted in similar decreases in the number of bariatric surgeries performed in American hospitals. Non-Medicare payers were aware of, and mimicked Medicare policies.

Implications for Policy, Delivery, or Practice: Where Medicare limited the number of providers who could provide a reimbursable service, non-Medicare payers were swift to mimic the policy. Medicare, then, has significant power to influence how private payers reimburse care when the amount of care is expected to be decreased by the decision. It is unknown how non-Medicare payers will respond when Medicare expands coverage which would likely increase the volume of care a payer must reimburse for, but private payers are aware of Medicare policy changes.

Funding Source(s): No Funding

Do Hospitals Meet the “Get With The Guidelines®- Heart Failure” Education Recommendations?

Eyad Musallam, University of Maryland Baltimore/ School of Nursing; Johantgen, Mary E , University of Maryland Baltimore / School of Nursing; Newhouse, Robin, University of Maryland Baltimore / School of Nursing

Presenter: Eyad Musallam, Ph.D. student, Research Assistant, University of Maryland Baltimore/ School of nursing, eyad.musallam@umaryland.edu

Research Objective: The American Heart Association’s “Get with the Guidelines®- Heart Failure” are designed to ensure that the care hospitals provide to heart failure patients is aligned with the latest scientific guidelines. The guidelines recommend that at least 60 minutes of patient education is needed to ensure that the patient or care provider understands what actions must be taken after discharge. The objectives of the study reported here are: 1) to quantify the minutes of education registered nurses and other providers spend teaching recommended content for hospitalized patients with heart failure (HF); and 2) to describe how teaching minutes vary by patient characteristics

Study Design: This descriptive study was a part of a quasi-experimental study of 40 U.S. Magnet Hospitals designed to evaluate the effect of standardized education on heart failure patient outcomes (knowledge, self-care, and readmission). As part of the fidelity assessment for the Improving Heart Failure Outcomes (IHO) study, nurses with expertise in heart failure management estimated the minutes spent teaching patient within eight domains recommended by the American Heart Association and the Joint Commission. Nurses also estimated the minutes by other providers (e.g., physicians, dieticians, pharmacists). A subset of 25 hospitals was used for the analyses since these represented the preponderance of patient records.
Population Studied: The sample of 439 patients from the 25 hospitals included only patients voluntarily consenting to participate, with a primary diagnosis of HF, speaking English, without an intervention procedure or transfer to another hospital unit, and being discharged to home.

Principal Findings: The study sample was half female, with more than half being 60 or older. The majority of the patients (78 percent) have NYHA class II or III. The average length of stay (LOS) for heart failure patients was 3 days. On average, nurses provided 83 minutes of education with a range of 5 to 685 minutes. A significantly higher number of minutes was required for patients less than 66 years (average 99 minutes) in comparison with patients older than 65 years (average 70 minutes); p LT .001. In addition, higher number of minutes was required for patients with NYHA class III and IV heart failure (Average 86 minutes) in comparison with patient with NYHA class III and IV heart failure (Average 78 minutes); p LT .26. Other providers covered an additional 40 minutes. Nurses spent the most minutes to cover discharge medications (average 13 minutes), diet (average 13), and what to do if symptoms worsen (average 10 minutes).

Conclusions: This is the first study that quantifies the number of minutes needed to cover the recommended HF patient education domains across multiple hospitals with a large sample size. Nurses and other care providers exceed the recommended minutes of education; medication education requires the most time.

Implications for Policy, Delivery, or Practice: A combination of essential education intervention during hospitalization, reinforcement with a 48 hour follow-up call, and nurses’ home visits may be needed to fully address teaching domains, improve patients’ self-care confidence, and overall outcomes.

Funding Source(s): Other, American Nurses Credentialing Center

Poster Session and Number: A, #49

Factors Associated with Influenza Vaccination in the Elderly, Diabetic Medicare Population
Xinyi Ng, University of Maryland School of Pharmacy; Bruce Stuart, University of Maryland School of Pharmacy; Ilene Zuckerman, University of Maryland School of Pharmacy

Research Objective: Complications are especially pronounced in the elderly population with diabetes who contract influenza. Despite evidence of influenza vaccination being effective in reducing hospitalizations and death in this susceptible population, vaccination rates remain suboptimal. To improve vaccination rates successfully, in-depth understanding of the determinants and barriers to vaccination will be critical. Although there is a large literature on the socioeconomic determinants of vaccination, little work has been done on elderly individuals’ understanding of the importance of being vaccinated. Therefore, this study seeks to identify the extent to which such factors are associated with receipt of vaccination in the diabetic, elderly population, as compared to the non-diabetic, elderly population. Further, we assessed whether unvaccinated elderly beneficiaries with diabetes differed from those without diabetes in terms of reasons given for failure to receive vaccinations.

Study Design: The study analyzed data from the 2009 Medicare Current Beneficiary Survey (MCBS) supplemented by Medicare claims records. We ascertained vaccination status and presence of diabetes from both self-reports and claims. Key predictive factors for vaccination status were grounded into a conceptual framework based on the Andersen Behavioral Model, which describes vaccination as a function of predisposing, enabling and need factors. Bivariable and multivariable analyses were performed to explore the association between vaccination status and presence of model factors including diabetes.

Population Studied: Our cohort included 11,319 beneficiaries aged 65 or older residing in the community. Of these, 3078 (27%) had diabetes. We excluded institutionalized beneficiaries as their use of vaccination would be inevitably augmented by their constant contact with health care professionals.

Principal Findings: 77.9% of the elderly, diabetic beneficiaries were reported to have received their annual influenza vaccine as compared to 73.6% in the non-diabetics beneficiaries. Unadjusted comparisons showed that vaccinated diabetics beneficiaries, compared to vaccinated non-diabetic beneficiaries, had a statistically significantly
higher proportion in their seventies (44.6% vs. 40.1%), males (48.3% vs. 41.4%), non-whites (16.9% vs. 8.8%), no high school education (27.1% vs. 21.1%), smokes (60.8% vs. 56.3%), with income less than $25 000 (50.6% vs. 44.6%), without supplemental insurance (18.6% vs. 14.7%), and with limitations in mobility (33.4% vs. 23.3%). Moreover, a larger percentage of diabetics beneficiaries reported fair/poor general health (30.6% vs. 17.0%), having concomitant respiratory conditions (20.7% vs. 17.5%), cardiac conditions (48.0% vs. 37.4%) and cancer (23.1% vs. 20.9%). A significantly smaller proportion of the elderly diabetic beneficiaries reported foregoing vaccination because of the misconception that it was not needed (12.3% vs. 16.5%), or that vaccine does not prevent flu (14.4% vs. 17.5%).

**Conclusions:** Predisposing, enabling and need factors appeared to differ between elderly diabetics and non-diabetic. Fewer misconceptions about vaccinations were observed among those with diabetes.

**Implications for Policy, Delivery, or Practice:** Influenza vaccination rates can be potentially improved by strategies that increase demand, vaccine access and overcoming barriers related to physician or patients’ attitudes. This study allows us to elicit the underlying reasons driving vaccination uptake and non-uptake, thereby contributing towards development of targeted interventions tailored towards this high-risk population. Ultimately, this will lead towards improving long-term outcomes in diabetic patients by reducing unnecessary influenza infections and related complications.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #50

### The Role of Pulmonologist Management of Prevalent Chronic Obstructive Pulmonary Disease in Treatment and Outcomes for Newly Diagnosed Lung Cancer

Janaki Deepak, University of Maryland School of Medicine; Xinyi Ng, University of Maryland School of Pharmacy; Amy Davidoff, University of Maryland School of Pharmacy

**Presenter:** Xinyi Ng, Graduate Student, Pharmaceutical Health Services Research, University of Maryland School of Pharmacy, xinyi@umaryland.edu

**Research Objective:** Up to 80% of lung cancer patients have comorbid chronic obstructive pulmonary disease (COPD.) Many are poor candidates for recommended cancer treatment due to diminished lung function and poor functional status related to COPD, and may forgo treatment. The negative effect of COPD may be moderated by pulmonologist-guided medical management – both drug therapy and pulmonary rehabilitation. This study examined the relationships between pulmonologist management of COPD and lung cancer treatment and survival.

**Study Design:** Using the Surveillance Epidemiology and End Results database, supplemented with Medicare enrollment and claims files, we identified non-small cell lung cancer (NSCLC) cases diagnosed from 2002 to 2005 with a prior COPD diagnosis (2-24 months before NSCLC diagnosis). Pulmonologist management was ascertained based on the presence of at least 1 physician claim for an outpatient Evaluation and Management visit with pulmonologist listed as the physician specialty, from the date of COPD diagnosis through 6 months post NSCLC diagnosis. We categorized timing of pulmonologist visits relative to NSCLC diagnosis – pre-diagnosis only, post-diagnosis only, both (pre-post), or neither. Outcomes included a) receipt of recommended treatment (surgical resection for early stage, chemotherapy for advanced NSCLC) and b) all-cause mortality. Stage-specific multivariate logistic regression tested effects of pulmonologist management on treatment received. Cox proportional hazard models examined the effect on risk of death, stratified by treatment receipt.

**Population Studied:** Patients with <30 days survival post NSCLC diagnosis, or incomplete Medicare claims (associated with incomplete Medicare enrollment, or Medicare Advantage enrollment) were excluded.

**Principal Findings:** The study cohort included 5,488 patients with early stage NSCLC and 6,426 with AdvNSCLC, with pre-existing COPD. Two-thirds of early stage and 50% of AdvNSCLC had at least one pulmonologist visit; 54.8% of early stage received surgical resection, and 33% of AdvNSCLC patients received chemotherapy. In early stage NSCLC, pulmonologist visits pre-post NSCLC diagnosis were associated with an increase in surgical resection [OR: 1.39; CI: 1.18-1.64 (p< 0.001.)] Pulmonologist involvement post or pre-post AdvNSCLC diagnosis, was associated with increased chemotherapy rates [OR:1.97(CI:1.66-2.27), OR:1.85(CI:1.71-2.31) p<0.001 respectively]. For both NSCLC stages,
pulmonologist involvement pre-post NSCLC diagnosis was associated with reduced mortality, regardless of treatment receipt. Pulmonologist management reduced mortality risk by 22% [HR:0.78(0.69-0.89) p<0.001] in surgical early stage patients with pre-post visits; the magnitude for non-surgical patients was similar with pre-post and post-only pulmonologist care. Findings were similar for AdvNSCLC.

**Conclusions:** Pulmonologist involvement in management of early stage and AdvNSCLC patients with comorbid COPD had a positive effect on receipt of stage-appropriate treatment and conditional survival, presumably through better therapeutic approaches that improved lung function. Management only during the pre-NSCLC period did not appear to increase treatment rates, and may reflect poor prognosis or poor access to care once NSCLC is diagnosed. Further research is needed to examine the specific aspects of medical management that may have impacted study outcomes.

**Implications for Policy, Delivery, or Practice:** There is increasing interest in multidisciplinary cancer care to optimize therapeutic choices, and improve patient-centered outcomes, particularly for solid tumor patients. This study suggests an important role for management of comorbid conditions by medical specialists.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #51

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Exploring Preferences for Evidence-Based Treatments for Attention Deficit Hyperactivity Disorder from a Patient-Centered Perspective

Xinyi Ng, University of Maryland School of Pharmacy; John F P Bridges, Johns Hopkins University School of Public Health; Emily Frosch, Johns Hopkins University School of Medicine; Gloria Reeves, University of Maryland School of Medicine; Susan dosReis, University of Maryland School of Pharmacy

**Presenter:** Xinyi Ng, Graduate Student, Pharmaceutical Health Services Research, University of Maryland School of Pharmacy, xinyi@umaryland.edu

**Research Objective:** Attention-deficit/hyperactivity disorder (ADHD) is a chronic condition that affects over 5 million U.S. children aged 4-17 years old. It is a child mental health disorder for which there are a number of well-established evidence-based medication and behavioral treatment, yet adherence has been problematic with as many as 50% of children who discontinue treatment within 60 days. Untreated ADHD can have life-long consequences resulting from academic and social difficulties. A body of evidence has shown that caregivers have great concerns with using medication for their child’s ADHD, however, they often reluctantly use it when all other options have been exhausted. To date, there has been little patient-centered research to explore the types and combinations of treatments that are most important to caregivers of children with ADHD. The objective of this research was to identify which types and combinations of evidence-based treatments for ADHD that caregivers most prefer.

**Study Design:** The study was designed to test a discrete choice experiment survey of caregiver preferences for various treatment options for their child’s ADHD. Types of treatment included frequency of medication use, location of child therapy, coordination with the school, parent behavior management training, communication with the provider, care management professional, and monthly cost of care. There were three variations of options in how each treatment type could be delivered. One delivery option per treatment type was presented in a profile and caregivers selected the best and worst option from the profile. The survey included 18 questions, each with a slightly different profile.

**Population Studied:** Twenty caregivers who had a child currently receiving mental health services were recruited across four family support groups between December 2012 and January 2013.

**Principal Findings:** Caregivers preferences for their child’s ADHD favored school and therapy interventions over medication or parent behavioral management. The options most preferred were coordination with the school and location of child therapy. The caregivers most preferred child therapy that was delivered in school and an individual education plan (IEP) for their child. Medication use was chosen more often as the least preferred treatment. Of caregivers who preferred medication treatment, the optimal frequency of use was seven days a week all year round. Of those who preferred parent behavior management, the optimal mode...
of delivery was through one-on-one interaction with a therapist. Types of treatment that ranked lower in caregiver preferences were the mode of communication with the provider and the professional managing the care of their child.

**Conclusions:** This preliminary research suggests that the school is an important component of the care management of children with ADHD. Those caregivers who viewed medication favorably preferred treatment all year round. Parent behavior management was not as important as those treatments provided directly to the child.

**Implications for Policy, Delivery, or Practice:** A patient-centered approach to care must incorporate individual preferences of which type of treatment and in which way it is delivered to patients. This work holds great promise for developing patient-centered care management approaches in delivering evidence-based treatments that caregivers will adhere to. The implication for clinical practice is the advancement of personalized treatment.

**Funding Source(s):** NIH

**Poster Session and Number:** A, #52

**Complementary and Alternative Medicine Use and Health Insurance Coverage among Patients with Abnormal BMI: 2007 National Health Interview Survey**

Mary Ojukwu, National Cancer Institute; Justice Mbizo, Dr. PH, University of West Florida; Oluwadamilola Olaku, MD, MPH, Office of Cancer Complementary and Alternative Medicine/ National Cancer Institute; Farah Zia, MD, Office of Cancer Complementary and Alternative Medicine/ National Cancer Institute

**Presenter:** Mary Ojukwu, B.S., Cancer Research Trainee, Department of Cancer Treatment and Diagnosis, National Cancer Institute, mary.ojukwu@nih.gov

**Research Objective:** Describe complementary and alternative medicine (CAM) use by health insurance status among cancer patients with abnormal BMI.

**Study Design:** Data were obtained from the 2007 National Health Interview Survey (NHIS), a population based cross-sectional survey of the non-institutionalized household US population, and complementary and alternative medicine (CAM) supplement. The outcome of interest was the frequency of CAM use overweight, obese, and normal weight respondents. Data were weighted analyzed using Stata software version 12 for Windows. We generated descriptive, bivariate statistics. Multivariate logistic regression were performed to estimate the odds of CAM use by selected covariates.

**Population Studied:** The sample was taken from a nationally representative sample of the civilian non-institutionalized household population of the United States who completed the 2007 National Health Interview Survey.

**Principal Findings:** One thousand seven hundred and eighty three (1,783) patients had a diagnosis of cancer. Of these, 56.4% were female and 46.6% were male. The mean age of the sample population was 63 years. About 60% of the population had abnormal BMI classifying as overweight or obese. 75% of cancer patients reported CAM. Out of those who used CAM, 73% reported using of biologically based approaches and 51% reported using manipulative and body based therapies. More females used CAM than males (p value=.02). CAM use by Blacks was higher compared to other races (p value 0.03). Also, patients who earned more than $75,000 per annum used CAM more than other income groups (p value= .028). Patients who were female were more likely to use CAM compared to males (p value=.021). The use of CAM by cancer patients is not influenced by health insurance coverage.

**Conclusions:** CAM use is high among cancer patients. Black patients diagnosed with cancer use more CAM compared to other races. Those with an income greater than $75,000 per year used CAM more compared to those with lower income.

**Implications for Policy, Delivery, or Practice:** CAM use is high among cancer patients. All cancer patients should be screened for the use of complementary and alternative interventions. Based on the results of this study, Black patients use more CAM compared to other races.

**Funding Source(s):** NIH

**Poster Session and Number:** A, #53

**Seeking Greener Pastures: An Exploration of the Brain Drain Phenomenon A Survey of Active Physicians in Ghana, West Africa**

Samuel Opoku, University of Nebraska Medical Center, College of Public Health; Bettye Apenteng, University of Nebraska Medical Center, College of Public Health; Preethy Nayar, PhD., University of Nebraska Medical Center, College of Public Health
**Research Objective:** Between 1985 and 1994, it was estimated that approximately 61% of all graduating Ghanaian medical students immigrated to developed nations. In addition to crippling the health systems of developing nations, the emigration of physicians from sub-Saharan countries results in a loss of return on investment to these nations. Given the significant impact the emigration of physicians has on low-resource nations, a study on the determinants of physician emigration is warranted. Therefore, the purpose of this study was to identify the factors associated with the intention of active Ghanaian physicians to leave the country within the next 5 years.

**Study Design:** The study design was a cross-sectional correlational study design using data from an ongoing online survey of practicing physicians in Ghana. Preliminary findings are reported for a sample of 182 physicians who responded to the survey between December 2012 and January 2012. The primary independent variables examined were burnout, satisfaction with resources, satisfaction with professional relationships, satisfaction with work-life balance and overall career satisfaction. Dimensions of burnout and career satisfaction were assessed using modified forms of the Maslach Burnout Inventory and the Physician Work Life Survey. Exploratory factor analyses and measures of internal consistency were used to evaluate the instrument’s validity and reliability. Other demographic and practice characteristics assessed included gender, age, number of working hours per week, professional status (house officer/medical officer/resident/specialist/consultant, geographical location of practice (rural/urban), employer (private/government) and contentment with compensation. Multivariate linear regression models with stepwise selection were used to assess the independent relationships between these factors and the intent to emigrate. All analyses were conducted using the SAS 9.3 statistical software.

**Population Studied:** Active physicians in Ghana, West Africa (N = 182).

**Principal Findings:** Burnout and all four dimensions of career satisfaction were not associated with intent to emigrate. Contentment with compensation was the only variable statistically associated with intent to emigrate. Specifically, physicians who felt they were not well compensated given their training and experience were more likely to report thinking about leaving Ghana within the next 5 years.

**Conclusions:** Neither burnout or career dissatisfaction were motivators for emigration in this study’s sample. Findings from this study indicate that the Ghanaian physicians intending to emigrate may be driven by financial considerations.

**Implications for Policy, Delivery, or Practice:** Health policies aimed at increasing monetary compensation for physicians may improve the retention of physicians in Ghana.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #54

**Burnout and Career Satisfaction among Active Physicians in Ghana, West Africa**

Samuel Opoku, University of Nebraska Medical Center, College of Public Health; Bettyye A. Apenteng, University of Nebraska Medical Center, College of Public Health; Preethy Nayar, PhD., University of Nebraska Medical Center, College of Public Health

**Presenter:** Samuel Opoku, MBChB, Student, Health Services Research, Administration & Policy, University of Nebraska Medical Center, College of Public Health, samuel.opoku@unmc.edu

**Research Objective:** The relationship between job/career satisfaction and burnout has been widely examined in the existing literature within the context of developed nations. However, these relationships have received less attention in developing nations, particularly in the healthcare setting. This study therefore aims to fill this gap in the existing health services literature by assessing the degree of career satisfaction and burnout among physicians practicing in a low resource setting and examining the relationships between burnout and career satisfaction.

**Study Design:** The study design was a cross-sectional correlational study design. Data was obtained from an ongoing online survey of practicing physicians in Ghana. Preliminary findings are reported for a sample of 182 physicians responding to the survey between December 2012 and January 2012. Modified forms of the physician work life study survey and the Maslach Burnout Inventory were used to assess burnout and career satisfaction. Exploratory factor analyses and measures of
internal consistency were used to evaluate the instrument's validity and reliability. Other demographic and practice characteristics examined included gender, age, number of working hours per week, professional status (house officer/medical officer/resident/specialist/consultant, geographical location of practice (rural/urban) and employer (private/government) and contentment with compensation. Multivariate linear regression models with stepwise selection were used to assess the independent relationships between burnout and the various dimensions of career satisfaction.

**Population Studied:** The study population included 182 active physicians in Ghana, West Africa.

**Principal Findings:** Factor analyses yielded one dimension of burnout (number of survey items \( k = 7 \); Cronbach's alpha \( a = 0.71 \)) and four dimensions of physician career satisfaction: satisfaction with professional relationships \( (k=6; \ a = 0.76) \), satisfaction with resources \( (k=4; \ a = 0.72) \), satisfaction with work-family life balance \( (k=3; \ a = 0.72) \) and finally global career satisfaction \( (k=5; \ a = 0.82) \). On a 5-point scale, physicians reported satisfaction with their overall career \( (mean = 3.6) \) and professional relationships \( (mean = 4.0) \) and dissatisfaction with resource availability \( (mean = 2.1) \) and work-life balance \( (mean = 2.5) \). The reported level of burnout was also low \( (mean = 2.3 \) on a 5-point scale). Burnout was negatively associated with all four dimensions of physician career satisfaction after adjusting for various demographic and practice characteristics.

**Conclusions:** Physicians in Ghana are dissatisfied with the work-life balance as well as the lack of resources and supplies needed to effectively care for their patients. High levels of burnout was associated with lower career satisfaction among physicians in Ghana.

**Implications for Policy, Delivery, or Practice:**
Health policies should focus on improving working conditions and enhancing physician work-life balance. Efforts aimed at improving working conditions may help in reducing or preventing burnout and consequently improving career satisfaction among active physicians in Ghana.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #55

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**Determinants of Adoption of Corporate Social Responsibility in the Hospital**

**Industry: Integrating Institutional and Resource Dependence Perspectives**
Sinyoung Park, University of Florida; Mona Al-Amin, Suffolk University; Jeffrey S. Harman, University of Florida

**Presenter:** Sinyoung Park, M.P.H., Student Chapter Treasurer, Health Services Research, Management, and Policy, University of Florida, parksy@ufl.edu

**Research Objective:** Regardless of hospital ownership, hospitals have an obligation to support the community and provide services for the improvement of health. While not subject to the same regulatory pressures as Not-for-Profit (NFP) Hospitals, the changing and competitive health care environment is pushing For-Profit (FP) hospitals to provide community-oriented services voluntarily through Corporate Social Responsibility (CSR) programs in order to improve their profitability. The aim of this paper is to investigate organizational characteristics and market level conditions that determine adoption of CSR programs for NFP and FP hospital, using institutional and resource dependence theory.

**Study Design:** We focused our analysis on general NFP and FP hospitals and searched organizational and market level determinants associated with the adoption of CSR. Institutional and resource dependence theory was used to identify organizational characteristics and market conditions associated with CSR adoption. For this research, we use the the 2009 American Hospital Association Annual Survey (AHA) questionnaires related to community-oriented services to estimate the extent to which hospitals are acting in socially responsible ways. We conducted descriptive statistics using chi-square test and used a correlation matrix to check possible correlated variables. Then, the model was estimated using logistic regression, since the dependent variable (CSR adoption versus non-adoption) is dichotomous.

**Population Studied:** There were a total of 2,766 general NFP hospitals and 814 general FP hospitals in the U.S. included in the AHA. Among the 814 FP hospitals in the U.S., 343 (42%) hospitals adopted a CSR program and 2,026 hospitals, 73% of total NFP hospitals, adopted a CSR program.

**Principal Findings:** Organizational level determinants, hospital size, teaching hospitals, hospital with Joint Commission accreditation and
AHA membership and system membership, were the significant and positive independent variables for NFP hospitals. Larger hospitals and teaching hospitals are more likely to adopt a CSR program (AOR=2.0 and 2.1; p<.05). Hospitals being accredited by the Joint Commission and having AHA membership were more likely to act in socially responsible ways. The odds of adopting a CSR program were over two times greater odds respectively, relative to hospitals without Joint Commission accreditation and AHA membership (AOR=2.0 and 2.30; p<0.001). On the other hands, for FP hospitals, market level determinant, the intensity of market competition, was a statistically significant predictor of CSR adoption at the 0.05 level. Hospitals located in more competitive market were more likely to adopt a CSR program (AOR=1.55; p<.05).

Conclusions: The findings of the study showed that CSR adoption in NFP hospitals was associated with organizational characteristics and CSR adoption in FP hospitals was related to market conditions and some organizational characteristics. One would have to interpret these results as confirming that some resource dependence and institutional elements were associated with the adoption of CSR.

Implications for Policy, Delivery, or Practice: NFP hospitals should adopt innovative new service in order to gain their organizational legitimacy, whereas FP hospitals should view CSR as a means to achieve competitive advantage and at the same time adhere to the movement towards population based outcomes, given the change in health care policy and the increasing competition among the healthcare delivery organizations.

Funding Source(s): N/A
Poster Session and Number: A, #56

Factors Influencing Satisfaction with Case Management Services
Claire Su-Yeon Park Park, University of Florida; Donna Felber Neff, University of Florida College of Nursing

Presenter: Claire Su-Yeon Park Park, M.S.N.,R.N., Ph.D. student, Adult & Elderly Nursing, University of Florida, lachael@ufl.edu

Research Objective: In this study, we aimed to identify the key factors that influence - and thus provide the most information about improving - patient satisfaction with case management - CM - services.

Study Design: Correlational and predictive study for identifying factors that influence satisfaction with CM services

Population Studied: We surveyed 289 patients served between August 5 and 12, 2009 with CM services by 93 case managers in Korea’s National Health Insurance Corporation. Subjects whose main disease was hypertension, diabetes mellitus, arthritis, or stroke were selected using convenience sampling. Between August 5 and September 4, 2009, data was collected using postal - patients - and email - case managers - surveys. Patients’ satisfaction with CM services was measured using a 10 level Likert-scale. Independent variables were derived from previous studies, and were assessed using a 5 level Likert-scale. Data analyses included Pearson’s and Spearman’s correlation coefficients, Mann-Whitney U and Kruskal-Wallis tests, and stepwise multiple regression.

Principal Findings: The statistically significant predictors of satisfaction with CM services were ‘capacity to change’, ‘time with patients’, ‘support/ advocacy’, ‘working period’ and ‘emotional connectedness’. Among the factors that influenced satisfaction with CM services, the ‘capacity to change’, showed the highest standardized coefficient. When they were aggregated, the above factors explained 26.4 percent of the total variance. There was a significant difference between satisfaction level and case managers’ gender, but there was no significant difference related to patients’ gender or disease type. A significant difference between satisfaction level and case manager certification level existed. The emotional correctness factor showed the strongest correlation with the support/advocacy factor - correlation coefficient .483 -. .

Conclusions: Five factors influencing the satisfaction with CM services -‘capacity to change’, ‘time with patients’, ‘support/advocacy’, ‘working period’, and ‘emotional connectedness’- were identified. However, more research is needed that can help identify those factors which explain the remaining 73.6 percent of the predictive variance in satisfaction with CM services.

Implications for Policy, Delivery, or Practice: When attempting to increase the level of satisfaction with CM services, stakeholders should consider these five factors -‘capacity to change’, ‘time with patients’, ‘support/advocacy’, ‘working period’ and ‘emotional connectedness’. Above all, observation of the patients’ ‘capacity to change’ had the greatest effect. This suggests...
the need to develop the management strategies that will facilitate patients’ ability to change behaviors. In addition, further studies are needed to uncover why patients are more satisfied with female case managers than male case managers. Such information would permit CM agencies to identify characteristics that may be used to reduce the satisfaction gap between male and female case managers. In addition, higher qualified case managers satisfied their patients more than the lower qualified case managers. Therefore, there is a need for a continuous certified education to improve CM competencies. In closing, the strongest correlation between ‘support/advocacy’ and ‘emotional connectedness’ suggests that case manager’s assistance is fundamental to improving satisfaction with CM services. 

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #57

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**Development and Preliminary Validation of a Tool to Measure Patients’ Satisfaction with Case Management**

Claire Su-Yeon Park, University of Florida; Soon-Nyung Yun, Seoul National University College of Nursing; Donna Felber Neff, University of Florida College of Nursing

**Presenter:** Claire Su-Yeon Park, M.S.N., R.N., PhD Student, Adult & Elderly Nursing, University of Florida, lachael@ufl.edu

**Research Objective:** Evaluating satisfaction with case management-CM services is the key to improving patients’ compliance and the effectiveness of clinical indicators. However, few studies have examined satisfaction with CM services as existing satisfaction instruments have rarely been developed with a focus on CM. Thus, in this study we aimed to develop a valid and reliable instrument that could accurately determine patient satisfaction with CM services.

**Study Design:** Methodological research for development and preliminary validation of a tool to measure patients’ satisfaction with CM

**Population Studied:** After conducting a literature review, we developed the preliminary items which were tested using the Content Validity Index - CVI - by a panel of 47 experts. Next, item analysis was completed, and data were collected from 379 patients that received CM services from first- and second-level case managers at Korea’s National Health Insurance Corporation - NHIC - from August 5 to September 4 of 2009. When the data was aggregated, factor analysis, cronbach’s alpha coefficient test, and stepwise multiple regression analysis were performed.

**Principal Findings:** Of the 54 preliminary items, 45 items based on the CVI results were selected, and six items were deleted after the item analysis was completed. As a result of the factor analysis, six factors were identified - Advocacy of a case manager, Outcome of care, Communication skill, Formation practices of a healthy life, Referral, and Recognition of risk factors. Cronbach’s alpha coefficient was .976. The greatest influential factor on CM satisfaction was identified as ‘Advocacy of a case manager’ by the stepwise multiple regression analysis.

**Conclusions:** The new instrument developed with a focus on CM was found to be a reliable and valid tool. However, we need to conduct more research to determine its universal applicability.

**Implications for Policy, Delivery, or Practice:** ‘Advocacy of case manager’ is the novel discovery for the first factor, which is responsible for the largest range of satisfaction with CM services. This finding is compelling since managerial strategies are critical to improving case managers’ advocacy ability. In addition, this new instrument can be used to improve educational methods used in case manager training. Above all, further research may be required to solve CM-related problems in order to improve the quality of CM services and use this new instrument in future applications.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #58

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**Factors Influencing Problem Drinking Behaviors in Korean Adults**

Kyong-Hwa Kang, Doctoral student at Seoul National University College of Nursing and Senior Researcher at the Korean Alcohol Research Foundation (KARF) in Korea; Claire Su-Yeon Park, University of Florida; Donna Felber Neff, University of Florida College of Nursing; Sung-Jae Kim, Seoul National University College of Nursing in Korea

**Presenter:** Claire Su-Yeon Park, M.S.N., R.N., PhD Student, Adult & Elderly Nursing, University of Florida, lachael@ufl.edu

**Research Objective:** ‘Problem drinking’ behaviors - PDB - in Korean adults age 19 and older increased from 80.1 percent in 2001 to
88.3 percent in 2010. However, few studies have been conducted to identify the factors that influence PDB in women and men. This study aimed to identify the factors that influence PDB in both genders and to provide suggestions regarding its reduction and directions for further research.

Study Design: Correlational and predictive study design was used for identifying the factors that influence PDB in Korean adults.

Population Studied: This study accessed data from the 2010 The Korean Alcohol Research Foundation - KARF - Drinking Patterns and Alcohol Problems Survey. Data were collected using a self-administered questionnaires based on the multi-stage stratified random sampling from July 28 to August 25 of 2010. The subjects were 2,013 adults - male 1,016, and female 1,015 -. PDB was measured by the Alcohol Use Disorder Identification Test. Analytical statistic tests - Cronbach’s alpha test, t-test, and logistic regression analysis - and descriptive analyses were performed.

Principal Findings: The most significant factors that influence PDB in both genders were the age of onset of habitual drinking, drinking refusal self-efficacy - DRSE -, negative expectancies, family history of alcoholism, and perceived health status. Men were 2.5 times more likely than women to be included in the problem drinking group. In addition, working men were 2.1 times more likely than non-working men to be included in the problem drinking group. As the age of onset of habitual drinking increased, men’s PDB significantly decreased. While men’s PDB was significantly increased both by negative expectancies, indicating 8 types of disadvantages when drinking alcohol, and positive expectancies, indicating 8 types of advantages when drinking alcohol, women’s PDB was increased only by negative expectancies. DRSE significantly reduced the PDB in both genders. However, women’s PDB significantly increased when there was a family history of alcoholism or who express negative perceptions about their general health could be included in the problem drinking group. Likewise, interventions that strive to improve the psychological health of women with a family history of alcoholism or who express negative perceptions about their general health could be developed to reduce PDB in vulnerable women.

Conclusions: The age of onset of habitual drinking, DRSE, negative expectancies, family history of alcoholism, and perceived health status were identified as factors that influence PDB in Korean adults.

Implications for Policy, Delivery, or Practice: This study is compelling because it compared the factors that influence PDB in men and women and examines how they differ between genders. Based on this study, further research is needed to develop appropriate nursing interventions that consider gender differences in populations vulnerable to PDB. For example, interventions that aim to improve drinking refusal skills in working men could be developed to reduce PDB in this population. Likewise, interventions that strive to improve the psychological health of women with a family history of alcoholism or who express negative perceptions about their general health could be developed to reduce PDB in vulnerable women.

Food Security and Body Mass Index among Adults in California
Denise Payan, University of Southern California

Research Objective: Although most obesity research has focused on identifying individual level factors, understanding the role of structural factors is equally important. The relationship between food security and weight status has recently amassed importance; however, the relationship between obesity and food insecurity is not well understood. This study examines the role of food security and its contribution to adult Body Mass Index (BMI). The primary objectives of the study are to provide a robust theoretical framework and to explore the relationship between food security and adult BMI, particularly among minority and low-income populations.

Study Design: The study utilizes a quantitative research design. This cross-sectional analysis uses an ordinary-least-squares (OLS) linear regression model. The dependent variable is a continuous variable (adult BMI). The primary independent variable is food security. Variable selection was based on a literature review and Campbell’s 1991 Conceptual Framework for Food Insecurity. Control variables include socio-demographic, socio-economic, perceived health, physical activity, and disability status. Statistical analyses were performed using SPSS software.

Population Studied: The population studied consists of adults in California who participated in the 2009 CHIS (n=47,614). In the sample, 60% of respondents were female, the average age was 56 years, and the average BMI was 26.7% (overweight). Among those who reported...
food security and were low-income (below 200% FPL), 6.1% reported having experienced food insecurity and 3.6% reported having experienced food insecurity with hunger.

**Principal Findings:** Controlling for the other variables, food insecurity and hunger was found to be, on average, associated with a 0.68 increase in BMI score compared to food secure persons and is highly statistically significant. On average, low-income persons were predicted to have higher BMIs by 0.28 compared to the food secure. Based on the standardized beta coefficients, the greatest effect size was between food insecure and hungry and food security status (0.145 standard deviations). The analysis found statistically significant relationships between BMI and gender as well as BMI and all of the race/ethnic groups compared to Whites (p<0.05).

**Conclusions:** The study contributes to the literature by increasing our understanding of the factors associated with higher BMI. The difference between an individual with food insecurity and an individual with food insecurity and hunger are theoretically important when thinking about consumption patterns. The vulnerability of particularly minority groups to higher BMI should be more closely investigated in future studies.

**Implications for Policy, Delivery, or Practice:** The findings are relevant to policymakers and public health professionals. Future programs should target populations with greater rates of food insecurity and hunger, in addition to low-income minority populations. Culturally sensitive and appropriate interventions should be explored for certain groups (e.g., food insecure African-Americans). Health professionals should consider gathering data about patients’ food security status to develop more effective tailored interventions. The findings support the notion that individuals respond to hunger by consuming accessible, inexpensive, higher energy dense food. Policy responses to address obesity among low-income populations may include nutrient supplementation and increasing access to relatively inexpensive healthy food. In terms of community- and policy-levels, local programs encouraging farmer’s markets in low-income neighborhoods or subsidies for healthy items may be appropriate interventions.

**Funding Source(s):** Other, USC Provost’s PhD Fellowship Program

**Poster Session and Number:** A, #60

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**Are There Racial Disparities in Psychotropic Drug Use and Expenditures in a Nationally Representative Sample of Men in the United States? Evidence from the Medical Expenditure Panel Survey (MEPS)**

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**Presenter:** Geraldine Pierre, MSPH, PhD Candidate, Department of Health Policy and Management, Hopkins Center for Health Disparities Solutions, Johns Hopkins Bloomberg School of Public Health, gpierre@jhsph.edu

**Research Objective:** To determine whether racial disparities exist in psychotropic drug use and expenditures in a nationally representative sample of men 18-64 who access the healthcare system in the United States.

**Study Design:** We employed a pooled cross-sectional design for this study and used a two-part probit-GLM model for analyses. First, a probit model was run to determine the likelihood of drug use by race. Second, generalized linear modeling (GLM) assessed differences in expenditures, by race, among individuals who reported use of one or more psychotropic drugs.

**Population Studied:** Data was extracted from the 2000-2009 Medical Expenditure Panel Survey (MEPS), a longitudinal survey that covers the U.S. civilian non-institutionalized population. Full Year Consolidated, Medical Conditions, and Prescribed Medicines data files were merged across 10 years of pooled data. Only individuals who were interviewed across all three components were included in the final analyses. The sample of interest was limited to adult males 18-64, who reported their race as White, Black, Hispanic, or Asian. Appropriate survey weighting techniques were applied according to MEPS documentation.

**Principal Findings:** We found minority men had a lower probability of psychotropic drug use (Black = -4.3%, 95% Confidence Interval [CI] = -5.5, -3.0; Hispanic = -3.8%, 95% CI = -5.1, -2.6; Asian = -4.5%, 95% CI = -6.2, -2.7) compared to White men. While average spending varied by
race (White: $664.59, Black: $990.87, Hispanic: $725.80, Asian: $932.96), after controlling for demographic and health status variables, there were no statistically significant race differences in expenditures.

Conclusions: This paper reveals that racial and ethnic disparities exist in the use of psychotropic drugs for men, presenting problems of access to mental health care and services.

Implications for Policy, Delivery, or Practice: Implications of our findings suggest public health interventions must ensure equitable access to psychotropic drugs for men. Practical solutions to addressing this access problem include greater community outreach and cultural sensitivity training for practitioners. Policymakers also play a role in passing and enforcing legislation that promotes safe and necessary psychotropic drug access.

Funding Source(s): NIH, NCIMHD

Poster Session and Number: A, #61

The Influence of Throughput on Nurse and Patient Outcomes
Lisa Quinn, University of Pennsylvania; Dr. Linda Aiken, Center for Health Outcomes and Policy Research, University of Pennsylvania; Dr. Ann Kutney-Lee, Center for Health Outcomes and Policy Research, University of Pennsylvania

Presenter: Lisa Quinn, M.S.,R.N., Pre Doctoral Fellow, Center for Health Outcomes and Policy Research, University of Pennsylvania, quinnl@nursing.upenn.edu

Research Objective: A growing body of health services research shows that nurses’ workloads are associated with patient outcomes. However, most of these studies have relied on mere nurse to patient ratios and rough estimates of patient acuity, such as case mix, to measure nurses’ workloads. These nurse to patient ratios have been used in several landmark studies that have established the influence of nurse staffing on patient outcomes, including complications and mortality as well as nurse outcomes, such as burnout and job dissatisfaction. There is another component of nurses’ workloads that is often overlooked. Throughput, or patient turnover, can be a significant portion of a nurse's daily duties, above and beyond important patient care and surveillance. This study will address this gap in the literature by recognizing throughput as a major contributor to nurses’ workloads in relation to patient outcomes. Also, it will be the first study to explore the relationships between throughput and nurse outcomes (burnout, job dissatisfaction, and intent to leave). This work will build upon previous research that has established the link between staffing and nurse and patient outcomes. Incorporating throughput into measures of nurses’ workloads is important to quantifying and describing what it is that nurses do for patients. The results of this work may be of interest to hospital administrators, nurse managers, and healthcare policy-makers who aim to better manage and allocate nursing resources. Drawing attention to the importance of throughput on nurses’ workloads also emphasizes ways in which healthcare organizations can adapt to promote better patient outcomes and nurse retention.

Study Design: This study is a secondary analysis of existing cross-sectional data from 3 sources: 1) American Hospital Association (AHA) data, 2) Patient discharge abstract data, and 3) the Multi-State Nursing and Patient Safety Survey conducted by the Center for Health Outcomes and Policy Research at the University of Pennsylvania. Random samples of registered nurses were mailed these surveys. In 2006-2007, 50% of all New Jersey nurses (n=52,545) were sampled; 40% of all Pennsylvania nurses (n=64,321) were sampled; 40% of all California nurses were sampled (n=106,532). Finally, 25% of Florida nurses (n=49,385) were sampled in the following year, 2007-2008. The surveys asked nurses about their places of employment, the quality of care at these hospitals, and demographic information. The AHA data provides information on hospital structural characteristics such as size and technology level. The state discharge abstracts from these 4 states provide information on all adult discharges from acute care non-federal hospitals for their respective years. The nurse surveys provide information on throughput- or the number of patients admitted, discharged, or transferred for each nurse.

Population Studied: As previously mentioned, registered nurses (RNs) were sampled in the 4 states. All general, orthopedic, or vascular surgical patients (over 18 years of age) discharged from acute care non-federal hospitals in these 4 states in their respective years will be included in the sample.

Principal Findings: Throughput is a significant predictor of job dissatisfaction and burnout in nurses. That is, as throughput increases, or the number of patients admitted, discharged, or transferred, job dissatisfaction and burnout increase.
Throughput is also a predictor of patient mortality and failure to rescue. Medical/surgical units had the most throughput.

**Conclusions:** The work involved with admitting, discharging, or transferring patients is often overlooked and rarely considered when developing staffing ratios. Throughput is a significant predictor of both nurse and patient outcomes and more staff should be allocated to higher throughput areas to promote nurse retention and patient outcomes.

**Implications for Policy, Delivery, or Practice:** Nurse managers and hospital administrators should consider throughput when developing nurse staffing ratios or policies and procedures for dealing with surges in patient admissions.

**Funding Source(s):** Other, National Institute of Nursing Research T32 Grant

**Poster Session and Number:** A, #62

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**Negative Spillover Effects of Mammography False-Positive on Medication Adherence**

Joel Segel, University of Michigan- Ann Arbor

**Presenter:** Joel Segel, B.A., Phd Student, Health Management and Policy, University of Michigan- Ann Arbor, jesegel@umich.edu

**Research Objective:** To estimate the spillover effect of a false-positive mammogram on anti-hypertensive and dyslipidemia medication adherence.

**Study Design:** The study creates a theoretical model of the decision to utilize preventive health care that explicitly models the possibility of a false-positive. The model hypothesizes that a false-positive will have negative spillover effects onto medication adherence by reducing an individual’s trust or belief in the true value of care. Empirically, the study uses a difference-in-difference estimation framework to estimate the changes in medication adherence between the false-positive group and the control group (true-negative). Building on the previous literature, this study uses a claims-based algorithm to identify the two groups. The false-positive group is defined as a woman with a claim for a screening mammogram then a claim for a follow-up test such as a biopsy, a second mammogram, or another type of radiological test within the next 3 months and then no claims for breast cancer treatment. Similarly the control group is defined as a woman with a claim for a screening mammogram, no follow-up tests, and no treatment for breast cancer. Screening mammograms are defined as a non-diagnostic mammogram with no claims for mammogram within the past year. Medication adherence is defined as days with no drugs for a specific therapeutic class of anti-hypertensive or dyslipidemia drug within the 6 months leading up to and following the screening mammogram, with a two month washout period following the screening mammogram. Sensitivity analyses then adjust the values used in the definitions to determine the robustness of the results.

**Population Studied:** The Medicaid-enrolled population with continuous enrollment for two years from the claims data from 8 geographically diverse states collected by Truven Health Analytics. The analysis population includes all women who have had at least one screening mammogram but never any treatment for breast cancer and at least one prescription filled for an anti-hypertensive and dyslipidemia medication in the six month period before and after the screening mammogram. The total sample ranged from just over 15,000 to over 81,000 depending on therapeutic class with about 12% in the false-positive group compared to the control group.

**Principal Findings:** Across the different drug therapeutic classes, a false-positive mammogram tends to lead to a greater number of days without access to medication, significant at the 95% level. Over a 6 month period, results ranged from no significant effect to 15 days without access to medications.

**Conclusions:** For the Medicaid population, experiencing a false-positive mammogram may have a negative spillover effect onto anti-hypertensive and dyslipidemia medication adherence.

**Implications for Policy, Delivery, or Practice:** This is the first study to explicitly model false screening test results in the preventive health care utilization decision process and to analyze the potential spillover effects of a false-positive onto other types of preventive health care utilization. This study highlights the need to potentially better target mammography screening to women with specific risk factors, to better communicate with women who experience a false-positive to ensure that they continue to receive appropriate care, and to better take into account false test results in cost-effectiveness analyses of chronic disease screening.

**Funding Source(s):** Other, University of Michigan Rackham research grant

**Poster Session and Number:** A, #63
Use of Case Reports and the Adverse Events Reporting System in Systematic Reviews: Causality Assessment of Crohn’s Disease Medications and Hepatosplenic T-Cell Lymphoma

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**Presenter:** Saranya Selvaraj, B.Sc., Medical Student, School of Medicine, Johns Hopkins University, sselvar1@jhmi.edu

**Research Objective:** 1) To identify demographic and clinical characteristics associated with cases of hepatosplenic T cell lymphoma (HSTCL) in patients with Crohn’s disease and to assess the causal relationship between medications and HSTCL in Crohn’s disease. 2) To understand the role case reports play in the conduct of systematic reviews.

**Study Design:** Case series. We searched for cases of HSTCL treated for Crohn’s disease using a comparative effectiveness review of Crohn’s disease medications, published case reports, and the Food and Drug Administration’s Adverse Event Reporting System. We used 3 causality assessment tools to evaluate the relationship between medication exposure and HSTCL.

**Population Studied:** Patients with HSTCL and Crohn’s disease

**Principal Findings:** We found 37 unique cases of HSTCL in patients with Crohn’s disease: six patients in the published literature only; nine patients in the AERS database only, and 22 patients matched in the AERS database and the published literature. In the comparative studies identified from the systematic review, one study reported on the absence of HSTCL. Cases were typically young (< 40 years) and male (84%). The most commonly reported medications were anti-metabolites (97%) and anti-tumor necrosis factor alpha (anti-TNFα) medications (76%). Using three causality assessment tools, antimetabolite and anti-TNFα therapies were determined possible causes of HSTCL in Crohn’s disease.

**Conclusions:** There is incomplete overlap in HSTCL cases reported in the published literature and AERS, and HSTCL events were rarely mentioned in trials and observational studies. Establishing a causative effect between anti-metabolite or anti-TNFα therapies and HSTCL is not possible because of incomplete case reporting and limited applicability of causality assessment tools.

**Implications for Policy, Delivery, or Practice:** When performing systematic reviews, case reports can provide information on rare, serious adverse events that may not be included in trials and cohort studies, but consideration should be given to the limitations in the data reported. Minimum reporting requirements and routine reporting of rare life-threatening events would improve our ability to determine whether rare adverse events are causally related to a medication. Irreversible events may require a different approach for causality assessment.

**Funding Source(s):** AHRQ

**Poster Session and Number:** A, #64

Trends in Moderate to Severe Pain and Under-treatment for Pain among Medicare Beneficiaries in Nursing Homes, 2006-2009

Xian Shen, University of Maryland Baltimore; Ilene Zuckerman, University of Maryland Baltimore; Bruce Stuart, University of Maryland Baltimore

**Presenter:** Xian Shen, M.S., Research Assistant, University of Maryland Baltimore, xshen@umaryland.edu

**Research Objective:** Pain management for older adults residing in nursing homes (NHs) continues to present challenges to health care practitioners and researchers. An overview of trends in pain and under-treatment for pain in NHs is needed. This study aimed to evaluate the trends in annual prevalence of moderate to severe pain and annual prevalence of under-treatment for pain among Medicare beneficiaries in NHs from 2006 to 2009.

**Study Design:** An observational study using linked data from 2006-2009 Medicare Current Beneficiary Survey (MCBS) and Minimum Data Set (MDS). MDS assessments are required by federal law to be completed for NH residents in Medicare certified NHs at admission, at significant change in status, quarterly and annually. Pain level was determined by a validated scale based on two items from MDS regarding frequency and intensity of pain.
Moderate pain was defined as having daily mild to moderate pain, while severe pain was characterized as having daily pain at times horrible or excruciating. The unit of analysis for under-treatment was a pair of two consecutive MDS assessments with the first assessment indicating moderate or severe pain. An episode of under-treatment was identified if the moderate to severe pain reported at the first assessment was not alleviated at the subsequent assessment. The Cochran-Armitage trend test was performed to detect trends in moderate to severe pain and under-treatment over the 4-year study period.

**Population Studied:** Medicare beneficiaries residing in NHs who participated in MCBS between 2006 and 2009.

**Principal Findings:** The annual prevalence of moderate to severe pain among Medicare beneficiaries in NHs was 29.3% in 2006, 28.5% in 2007, 25.9% in 2008 and 22.2% in 2009. The decline was statistically significant (trend test, p=0.0001). For the analysis on under-treatment, 1307 pairs of assessments from 685 unique beneficiaries were included. The mean time interval between assessments was 32.9 days. The annual prevalence of under-treatment for pain was 67.3% in 2006, 61.3% in 2007, 60.1% in 2008 and 65.1% in 2009 (trend test, p=0.5047) among the beneficiaries with moderate to severe pain at their first assessment. The probability of an episode of moderate to severe pain being undertreated significantly declined with increasing time interval between MDS assessments from 69.3% for 7 days, 64.8% for 14 days, 61.8% for 30 days, 59.4% for 90 days to 53.4% for more than 90 days (trend test, p=0.0005).

**Conclusions:** The annual prevalence of moderate to severe pain among Medicare beneficiaries in NHs consistently declined from 2006 to 2009. However, the annual prevalence of under-treatment for pain remained high over the study period with more than 60% of the 685 residents with moderate to severe pain being under-treated. The probability of an episode of moderate to severe pain being undertreated was inversely associated with time between MDS assessments.

**Implications for Policy, Delivery, or Practice:** The study findings suggest that pain management in NHs gradually improved between 2006 and 2009 with fewer NH residents reporting moderate to severe pain. However, timely resolution of identified pain among Medicare beneficiaries in nursing homes remains problematic.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #65

**Prospective Measure of Expectant Mothers’ Information Sources and Decision Making about Infant and Childhood Vaccinations**

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**Presenter:** Jo Ann Shoup, MA, MS, MSW, Project Manager, Doctoral student, University of Colorado Denver, School of Public Affairs and Kaiser Permanente Colorado, Institute for Health Research, Jo.Ann.Shoup@kp.org

**Research Objective:** Parents use the internet to seek out health information for themselves and their children. When looking for information on the internet about vaccines, parents encounter vast amounts of information, most of which is in a negative tone about vaccines. Our objective was to survey pregnant women to learn more about their future intentions about vaccination of their unborn baby, vaccine decision making processes and how they use the internet and social media to seek information about vaccines.

**Study Design:** We surveyed 96 women who were health plan members of Kaiser Permanente Colorado, over age 18, and in the first 2 weeks of their third trimester of pregnancy. The paper-based survey comprised of items measured on a Likert-style scale which was sent through postal mail. Descriptive statistics were used to characterize the sample.

**Population Studied:** Pregnant women in their third trimester of pregnancy who were members of a health maintenance organization in Denver, Colorado.

**Principal Findings:** Seventy-three percent of the pregnant women intended to fully vaccinate their baby; 11.5 percent intended to get some vaccines; 11.5 percent are undecided and 4 percent intended to delay vaccines for their baby. Forty-nine percent reported their spouse or partner had the most influence on their
decision about vaccination for their unborn baby, followed by 24 percent reporting they made the decision on their own, 18 percent reported their medical provider influenced their decision, 9 percent reported family member, medical situation, or alternative medical provider influenced their decision. When it comes to future decisions about vaccination for their unborn baby, 66 percent prefer to make the final decision after considering their child’s pediatrician’s opinion, 17 percent prefer shared decision, 13 percent prefer to make their own final decision, 4 percent prefer their child’s pediatrician make the final decision after serious consideration of their opinions. All pregnant women reported general use of the internet at least weekly and 81 percent reported use of social media at least weekly; 76 percent look for health information on the internet at least weekly and 18 percent use social media to seek out health information at least weekly. However, only 7 percent use the internet at least weekly and 1 percent use social media weekly as a resource for seeking out information about vaccines.

Conclusions: Parents are active users of the internet to seek health information. The literature indicates that the internet is an important source of information about vaccines. In our study, pregnant women were concerned about vaccine decisions and used the internet to seek health information; however, they were not using the internet to seek information specifically about vaccines.

Implications for Policy, Delivery, or Practice: Vaccines are one of the most effective public health tools for controlling vaccine preventable disease. However, recent trends show confidence in vaccines is waning. We need to study the decision to vaccinate longitudinally to determine when parents start using the internet to gather vaccine information. This information will contribute to the design and communication messages of web-based tools to address parents’ concerns about vaccines at critical time points in the decision-making pathway.

Funding Source(s): Other, George Bennett Dissertation Grant through the Foundation for Informed Medical Decision Making

Poster Session and Number: A, #66

Organizational Empathy in Hospitals
Geoffrey Silvera, The Pennsylvania State University; Jonathan Clark, PhD, The Pennsylvania State University

Presenter: Geoffrey Silvera, M.H.A., Doctoral Candidate, Health Policy and Administration, The Pennsylvania State University, geoffreysilvera@gmail.com

Research Objective: Since the release of the pivotal Institute of Medicine (IOM) reports "Too Err is Human" and "Crossing the Quality Chasm", the U.S. healthcare system has undergone systematic changes. The result of these changes, in large part, has lead to the development of the patient-centered care (PCC) model. PCC seeks to highlight individual patient needs and preferences as part of the delivery of healthcare services. The development of the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) Survey has standardized the measurement of PCC amongst healthcare organizations (HCOs). The implementation of the HCAHPS, which highlights patient-provider interactions, has emphasized empathy on behalf of the providers to understand the preferences of the patients. Empathy is often thought of as one's ability to place themselves in another's shoes.

Some organizations have been able to achieve empathy at an organizational level. Some examples of these organizations in other industries are The Container Store, Mary Kay Cosmetics, and Apple Computers. Each of these companies have a strategic orientation to delivery extreme levels of customer satisfaction. They achieve this through working with customers to "co-create" service experiences that are emotional as well as economic exchanges. By highlighting the needs of the individual customer through the use of patterns of communication and responsiveness to the customer's needs and preferences, empathetic organizations create customers that are not only satisfied, but fanatical.

This research project seeks to explore the use of Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) Survey as a measurement of organizational empathy.

Study Design: This study will implement a factor-analysis of HCAHPS surveys from 2002-2012.

Population Studied: The study sample will include all U.S. Hospitals that participate in Medicare.

Principal Findings: Preliminary findings suggest that items relating to physician-communication, nursing-communication, pain management, and responsiveness load onto a
implications. These findings are important because they highlight the importance of considering individual factors.

**Research Objective:** Previous randomized clinical trials and their meta-analyses have raised the possibility that thiazolidinediones (rosiglitazone and pioglitazone) may increase the risk of pneumonia. We aimed to test the hypothesis that thiazolidinediones may increase the risk of pneumonia.

**Study Design:** We conducted a population based case-control study in a large administrative database in the United States from 2002 to 2008.

**Population Studied:** We included Adults with type 2 diabetes aged 18-64; we restricted our analysis to 8010 hospitalized pneumonia cases and 8010 controls without congestive heart failure matched on age, sex, enrollment pattern and diabetes complication severity index matched controls. Conditional logistic regression was used to analyse the data.

**Principal Findings:** Compared with controls, cases were more likely to have chronic obstructive pulmonary disease, tobacco use, cancer and receive influenza and pneumococcal vaccination. During the pre-defined recent exposure window (> 60 days prior and < 2 years) 4.8% of case patients were exposed to thiazolidinediones (3.9% on pioglitazone and 1.0% on rosiglitazone) compared to 4% of controls (3.1% on pioglitazone and 0.9% on rosiglitazone). After adjusting for COPD, cancer, tobacco use, and receipt of influenza and pneumococcal vaccination, and exposure in other period, recent exposure to pioglitazone was associated with a small statistically significant increased odd of pneumonia (adjusted Odds Ratio [aOR], 1.27, 95% Confidence intervals 1.04 – 1.55). However neither recent exposure to rosiglitazone (aOR 1.20, 95% CI, 0.82 – 1.75) nor current exposure to either thiazolidinedione within 60 days (aOR, 1.11, 95% CI, 0.98 – 1.25 for pioglitazone; aOR, 0.98, 95% CI 0.72 – 1.32 for rosiglitazone) was associated with statistically significant odds of pneumonia.

**Conclusions:** In this study of US adults with type 2 diabetes although pioglitazone use for more than 60 days was associated with a small increased risk of hospitalization for pneumonia, but shorter duration of pioglitazone use and use of rosiglitazone was not associated with such a risk.

**Implications for Policy, Delivery, or Practice:** Clinicians should balance the known risks of the thiazolidinediones against their benefit.
Venous thromboembolism is a prevalent and avoidable complication of hospitalization. Patients hospitalized with trauma, traumatic brain injury, burns, or liver disease; patients on antiplatelet therapy, obese or underweight patients, those having obesity surgery, or with acute or chronic renal failure have unequal risks for bleeding and thrombosis and may benefit differently from prophylactic medication. Our objective was to systematically review the comparative effectiveness and safety of pharmacological and mechanical methods of prophylaxis of VTE in these special populations.

**Study Design:** We conducted a systematic review and meta-analysis. We searched MEDLINE®, EMBASE®, SCOPUS, CINAHL®, www.clinicaltrials.gov, International Pharmaceutical Abstracts (IPA), and the Cochrane Library in July 2012. This was complemented by hand searches from the reference lists and unpublished studies provided by sponsors. Two reviewers evaluated studies for eligibility, serially abstracted data using standardized forms, and independently evaluated the risk of bias in the studies and strength of evidence for major outcomes and comparisons. We qualitatively synthesized the evidence and also pooled the relative risks from the controlled studies.

**Population Studied:** We included randomized controlled trials among patients with trauma, traumatic brain injury, burns, liver disease, obese and underweight, those undergoing bariatric surgery and patients with kidney disease. Since these populations may be excluded from trials, we also included controlled observational studies of pharmacologic agents, and uncontrolled observational studies and case series of inferior vena cava filter use.

**Principal Findings:** After a review of 30,902 unique citations, we included 102 studies of which just 8 were trials. Fifty eight studies reported on patients with trauma, thirteen studies reported on patients with traumatic brain injury, one study reported on patients with burns, two studies reported on patients with antiplatelet agents, twenty one studies reported on patients having bariatric surgery, two studies reported on obese patients and five studies reported on patients with renal failure. We found no studies that reported on patients with liver disease or those who were underweight. The majority of observational studies had a high risk of bias. The strength of evidence is low that IVC filter placement is associated with a lower incidence of PE and fatal PE in hospitalized patients with trauma compared to no IVC filter placement. The strength of evidence is low that enoxaparin reduces DVT and that UFH reduces mortality in patients with TBI when compared to patients without anticoagulation. Low grade evidence supports that IVC filters with usual care are associated with increased mortality and do not decrease the risk of PE in patients undergoing bariatric surgery compared to usual care alone. All other comparisons, for all of the key questions, had insufficient evidence to permit conclusions.

**Conclusions:** Our comparative effectiveness review demonstrates that there is a paucity of high quality evidence to inform treatment of these special populations.

**Implications for Policy, Delivery, or Practice:** Future research using robust observational studies that control for confounding by indication and disease severity is needed as randomized controlled trials typically exclude or do not report on these populations.

**Funding Source(s):** AHRQ

**Poster Session and Number:** A, #69

**Glucagon-Like Peptide-1-Based Therapies and Risk of Hospitalization for Acute Pancreatitis in Type 2 Diabetes: Population Based Matched Case-Control Study**

Sonal Singh, Johns Hopkins University; Hsien Yen Chang, Johns Hopkins University; Thomas M Richards, Johns Hopkins University; Jonathan M Weiner, Johns Hopkins University; Jeanne M Clark, Johns Hopkins University; Jodi Segal, Johns Hopkins University

**Presenter:** Sonal Singh, M.D., M.P.H., Asst Professor Of Medicine And Public Health, Department of Medicine and International Health, Johns Hopkins University, sosingh@jhsph.edu

**Research Objective:** Acute pancreatitis has significant morbidity and mortality. Previous
studies have raised the possibility that glucagon-like peptide-1-based therapies (GLP-1) including the GLP-1 mimetic (exenatide) and the dipeptidyl peptidase 4 inhibitor (sitagliptin) may increase the risk of acute pancreatitis. We aimed to test whether GLP-1 based therapies, such as exenatide and sitagliptin, are associated with an increased risk of acute pancreatitis.

Study Design: We conducted a population based case-control study in a large administrative database in the United States from 2005-2008.

Population Studied: We included adults with type 2 diabetes aged 18-64; 1269 hospitalized cases with acute pancreatitis were identified using a validated algorithm and 1269 controls matched on age category, sex, enrollment pattern, and diabetes complications. Conditional logistic regression was used to analyze the data.

Principal Findings: The mean age of included individuals was 52 years and 57% were male. Cases with pancreatitis were significantly more likely than controls to have hypertriglyceridemia (12.9% vs 8.3%), alcohol use (3.2% vs 0.2%), gallstones (9.1% vs 1.3) tobacco abuse (16.2% vs 5.5%), obesity (19.6% vs 9.8%) biliary and pancreatic cancer (2.8% vs 0%), cystic fibrosis (0.8% vs 0%) and any neoplasm (29.9 vs 18.0%). After adjusting for available confounders and metformin use, both current use of GLP-1-based therapies within 30 days (adjusted Odds Ratio [aOR], 2.24, 95% Confidence intervals 1.36–3.68) and recent use greater than 30 days and less than 2 years (aOR, 2.01, 95% CI 1.27–3.18) were associated with significantly increased odds of acute pancreatitis relative to the odds in non-users.

Conclusions: Acute pancreatitis has significant morbidity and mortality. In this administrative database study of US adults with type 2 diabetes, treatment with GLP-1-based therapies, sitagliptin and exenatide, was associated with an increased risk of acute pancreatitis.

Implications for Policy, Delivery, or Practice: Clinicians should carefully balance the known benefits of these agents on glucose-lowering along with the risk of acute pancreatitis to determine the optimal therapy for their patients in a shared decision-making context.

Funding Source(s): NIH

Poster Session and Number: A, #70

Dose and Duration Relationship between Pioglitazone and Associated Risk of Bladder Cancer: A Systematic Review and Meta-Analysis

Sonal Singh, Johns Hopkins University; Chun Shing Kwok, Norwich Medical School; Chen Chen Turner, Norwich Medical School; Richard Turner, Norwich Medical School; Chinedu A Madukor, Norwich Medical School; Jodi Segal, Johns Hopkins University

Presenter: Sonal Singh, M.D., M.P.H., Asst Professor Of Medicine And Public Health, Department of Medicine and International Health, Johns Hopkins University, sosingh@jhsph.edu

Research Objective: Pioglitazone is a widely used thiazolidinedione. There have been some concerns about its potential association with bladder cancer. To determine whether pioglitazone is associated with an increased risk of bladder cancer, we performed a systematic review and meta-analysis with a focus on investigating dose and duration effects, and whether risk with pioglitazone differs from rosiglitazone.

Study Design: We conducted a systematic review and meta-analysis. We searched MEDLINE, EMBASE and regulatory documents in June 2012 and conducted meta-analysis on the overall risks of bladder cancer with pioglitazone or rosiglitazone and the risk with different categories of cumulative dose or duration of pioglitazone use.

Population Studied: We included studies among patients with type 2 diabetes.

Principal Findings: 5 RCTs (total >16,000 participants) and 9 observational studies (pooled cohort >1.5 million). There was a significantly higher overall risk of bladder cancer with pioglitazone (RCTs: OR 2.51, 95% CI 1.09–5.80, p=0.03, I2=27%; cohort studies: OR 1.20, 95% CI 1.07–1.34, p=0.001, I2=0%) but not rosiglitazone (RCTs: OR 0.84, 95% CI 0.35–2.04, p=0.71, I2=0%; cohort studies: OR 1.08, 95% CI 0.95–1.23, p=0.24, I2=0%). Subgroup analysis by cumulative dose showed the greatest risk with >28.0 Grams of pioglitazone (OR 1.64, 95% CI 1.28–2.12, p=0.0001, I2=0%) which differed significantly from <10.5 Grams (p=0.02). Similarly, there was a significant difference with the risk of longer (>24 months) compared to shorter (<12 months) cumulative durations (p=0.004) of pioglitazone use. Direct comparison of pioglitazone and rosiglitazone yielded an OR of 1.25 (95% CI 0.91–1.72, p=0.16).
**Conclusions:** A modest but clinically significant increased risk of bladder cancer with pioglitazone was found that appears related to cumulative dose and duration of exposure.

**Implications for Policy, Delivery, or Practice:** We recommend prescribers consider alternative oral hypoglycaemics and limit pioglitazone use to shorter durations.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #71

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**Deleterious Effects of Medicaid Prescription Drug Limits on Cost Related Medication Non-Adherence**

Ming-Hui Tai, University of Maryland; Bruce Stuart, University of Maryland; Ilene Zuckerman, University of Maryland

**Presenter:** Ming-Hui Tai, MS, MHPA, Graduate Student, Pharmaceutical Health Services Research, University of Maryland, mindytai@umaryland.edu

**Research Objective:** Limiting the number of prescription fills that beneficiaries can receive per month is a popular cost-containment strategy in many state Medicaid drug benefit programs. Such limits are a policy concern because they may lead to cost-related medication nonadherence (CRNA). For Medicare dual eligibles, the implementation of Part D in 2006 eliminated all such restrictions and thus may have also reduced CRNA. The objective of this study was to estimate how the shift in drug benefits from pre-Part D Medicaid to post-Part D Medicare affects CRNA among dual eligibles in states with and without prescription limits in 2005.

**Study Design:** The study used a longitudinal difference-in-difference (DID) design in which changes in CRNA between 2005 and 2006 among dual eligibles in states with prescription limits were compared to changes in CRNA among duals in states without restrictions in 2005. Data on state-level prescription limits in 2005 were obtained from the Medicaid/SCHIP Environmental Scanning and Program Characteristics (ESPC) Database. Limits were categorized as no limit, limits of six or more prescriptions per month, and limits set at fewer than six prescriptions per month. Information on CRNA was obtained from 2005 and 2006 Medicare Current Beneficiary Surveys (MCBS). The MCBS is a longitudinal, multipurpose panel survey of a nationally representative sample of Medicare beneficiaries. The MCBS asks respondents whether they ever skipped taking their medication, took smaller doses or failed to fill a prescription due to cost. Control variables included age, sex, race, income, education, self-reported health status, limitation in activities of daily living, number of comorbidities and knowledge of Part D program.

**Population Studied:** MCBS inclusion criteria were 1) Medicare dual eligibility in both 2005 and 2006, 2) Continuous Medicare Part A and B benefits, and 3) community dwelling.

**Principal Findings:** The study cohort included 1,798 Medicare dual eligibles. Almost half were under 65 years old (49%) with sizable fractions of whites (66%), low income (65% under $10,000 annually), and education below high school (53%). 32 states (62%) had no prescription limits, but 12 states (24%) limited up to 6 prescription fills per month. Prior to Part D implementation, the unadjusted CRNA in 2005 was significantly higher among dual eligibles with the most (21.7%) and moderate (27.6%) restrictions compared to dual eligibles with no prescription limit (14.8%). Dual eligibles who faced the most restrictive (-6.1%) and moderate (-17.6%) fill limits in 2005 had a greater reduction in CRNA compared to those in states with no prescription limits in 2005 (-0.1%).

**Conclusions:** In the pre-Part D period, restrictive prescription fill results in high levels of CRNA. The implementation of Part D resulted in greater reduction in CRNA among dual eligibles who faced the restrictive state policies in 2005.

**Implications for Policy, Delivery, or Practice:** Restrictive Medicaid prescription fill limits have deleterious effects on CRNA. The study findings reinforce the need to reconsider policies that place restrictive limits on prescription fills. Future research should examine the effects of CRNA on long-term health outcomes.

**Funding Source(s):** No Funding

**Poster Session and Number:** A, #72

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**Antipsychotic Treatment and the Impact on Hospital Admissions, Emergency Department Visits, and Transitions in Placement Among Youth in Foster Care**

Ming-Hui Tai, University of Maryland; Susan dosReis, University of Maryland; Bansri Desai, University of Maryland; Gloria Reeves, University of Maryland; Terry Shaw, University of Maryland

**Presenter:** Ming-Hui Tai, MS, MHPA, Graduate Student, Pharmaceutical Health Services Research, University of Maryland
Research Objective: The increase in antipsychotic use among youth in foster care, despite the mounting evidence of adverse metabolic effects, is a critical national concern that has resulted in federal mandates for better monitoring of utilization to ensure clinical appropriateness. The goal of antipsychotic treatment is to minimize symptoms so that youth can be maintained successfully in community settings. However, few studies have examined the impact of treatment with antipsychotics on improved mental health-related and child welfare-related outcomes among youth treated in community settings. The objective of this study was to examine the association between antipsychotic use and a) hospital admissions, b) emergency department (ED) visits; and c) transitions in foster care placement.

Study Design: This retrospective, cross-sectional study used data from the 2010-2011 child welfare administrative records and the Medicaid claims for all mental health and pharmacy services during the study period. Antipsychotic exposure was categorized as single versus concomitant use. Concomitant use was defined as 30 days or more of overlap with two or more antipsychotics. The dependent variables, measured over the 24-month study period, were: a) number of hospital admissions; b) number of ED visits; and c) number of transitions in foster care placement. Poisson regression models were used to examine the association between concomitant versus single antipsychotic use with each dependent variable, adjusting for age, gender, and race/ethnicity.

Population Studied: The focus of this study was the 2,463 youth who were entered the child welfare system on or before January 1, 2010 and remained in child welfare through December 31, 2011.

Principal Findings: Of the 2,463 youth, 511 (21%) received at least one antipsychotic medication during the study period and 119 of the 511 (23%) received concomitant antipsychotic treatment. Youth who received antipsychotics concomitantly had a 3.9 and 1.5 higher rate of hospital admissions and ED visits, respectively, compared to youth who received a single antipsychotic, even after adjusting for age, race/ethnicity, and gender. In terms of foster care placement, 81 (21%) of youth with single antipsychotic use had 4 or more transitions in foster care placement compared with 43 (36%) of youth with concomitant antipsychotic use. Compared to single antipsychotic users, concomitant users had a 1.4 higher rate of transitions in foster care placement.

Conclusions: Nearly one-quarter of youth with any antipsychotic received more than one agent concomitantly. The greater number of hospital admissions and ED visits among youth receiving antipsychotics concomitantly may represent subgroup with more severe impairment. The greater number of transitions in foster care placement among youth receiving concomitant antipsychotic use reflects the challenges in establishing a stable and consistent placement for youth with the most severe problems.

Implications for Policy, Delivery, or Practice: The findings carry important implications for cross-agency collaboration to meet federal mandates for enhanced monitoring and oversight of antipsychotic treatment for youth in foster care. This potentially could result in less complex medication therapy, less use of costly inpatient and ED services, more family unification, and ultimately better child outcomes.

Funding Source(s): No Funding

Poster Session and Number: A, #73

Reported Weight and its Associations with Smoking, Alcohol and Marijuana Use among Adolescents

Elliott Tolbert, UNC Charlotte

Presenter: Elliott Tolbert, M.H.A., Graduate Teaching Assistant, CHHS, UNC Charlotte, eetolbert@gmail.com

Research Objective: To examine the relationships between self-reported weight and smoking, alcohol and marijuana use among U.S. youth ages 14 to 18 years.

Study Design: Data from a nationally representative sample of U.S. high school students were examined. Prevalence rates of smoking, alcohol and marijuana use were determined. The associations between using these substances and reported weight (reported as very underweight, slightly underweight, about the right weight, slightly overweight and very overweight) were examined by logistic regression and domain analysis modeling. Covariates included race/ethnicity, grade and gender.

Population Studied: The 2009 Centers for Disease Control and Prevention (CDC) Youth Risk Behavior Surveillance Survey (YRBSS)
included 16,460 high school students. The survey, conducted every two years, monitors priority health-risk and the prevalence of obesity and asthma among youths and young adults. The 2009 sample was the result of a three-stage cluster sample design among students in grades 9–12 who attend public and private schools. Black and Hispanic students were oversampled in order to achieve representativeness of racial/ethnic groups. The overall response rate was 71%.

**Principal Findings:** Overall, 4% reported being very overweight and 24% were slightly overweight. Hispanics reported being very overweight (5%) more often than whites (3%) and blacks (3%). This was also seen in regards to being slightly overweight, as Hispanics reported 24%, while whites reported 24% and blacks, 20%. Females were more likely to report being very overweight (4%) and slightly overweight (24%) than males (2% and 16%, respectively). Self-reported weight did not vary between grade levels. Smoking, drinking and marijuana use was highest among whites (44.28%) while blacks and Hispanics reported much less use (12% and 14%, respectively). Domain analysis modeling produced one significant result. Youth reporting their weight as about the right weight were significantly less likely than those who reported being very overweight to participate in smoking, drinking and marijuana use (OR 0.70, 95% CI: 0.534-0.925).

**Conclusions:** There is an association between self-reported weight and smoking, alcohol and marijuana use among adolescents. Studies show that obesity and risky behaviors are widespread, costly and emerging at younger ages. This study revealed that some health-risk behaviors are associated with perceived weight.

**Implications for Policy, Delivery, or Practice:** Research should continue to examine how adolescent body image is associated with behavior in order to direct the most effective interventions.

**Funding Source(s):** N/A

**Poster Session and Number:** A, #74

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**Nurse Staffing Inputs on Resident Infections in VA Nursing Homes**

May Uchida, Columbia University; Patricia Stone, Columbia University; Ciaran Phibbs, Health Economics Resource Center, Palo Alto VA Health Care System

**Presenter:** May Uchida, Ph.D. Candidate, Nursing, Columbia University, mu2188@columbia.edu

**Research Objective:** Healthcare associated infections (HAIs) in nursing homes (NHs) are common, costly resident safety problems that are largely preventable. While associations between nurse staffing and adverse outcomes such as infections are well-documented in hospitals, the evidence base that examines these relationships in NHs is limited. The purpose of this study is to examine the relationship of nurse staffing inputs on resident HAIs across the nation’s Veterans’ Administration (VA) NH units.

**Study Design:** Guided by the Donabedian framework of Healthcare Quality, an existing unit-level panel dataset of VA NH resident and employee data from the years 2003 through 2008 was examined. A series of descriptive statistics were computed to describe and assess the impact of nurse staffing inputs on resident pneumonia and urinary tract infections (UTI). Panel regression models are also being computed.

**Population Studied:** Unit level averages using monthly data from multiple VA NH units were obtained. Specialty NH units (e.g., long-term psychiatric units) were excluded. Nursing inputs included staffing variables such as nursing hours per resident day, skill mix, and tenure which were obtained from the VA decision support system and VA payroll data. Resident data were obtained from Minimum Data Set assessments.

**Principal Findings:** There were 9,155 monthly-unit observations from January 2003-December 2008 including 161 VA NH units. On average, residents received 4.63 hours of nursing care per day. The mean staffing skill mix was 32% registered nurses, 26% licensed practical nurses, and 40% aides. The mean nursing unit tenure was 4.26 years. There was wide variation across units with higher staffing levels among units that provided more short stay (<90 days) care. The mean pneumonia and UTI counts were higher on units that provided more short stay than long stay (>90 days) care.

**Conclusions:** More research and additional data analyses are needed to understand the relationship between nursing inputs and resident HAIs. Future research should also consider process variables which affect the kind of infection prevention care residents receive in NHs.
Implications for Policy,Delivery,or Practice:
Because the VA is a major component of the U.S. healthcare delivery system, understanding how to reduce infections efficiently in this setting is important in itself. Although there are differences between the VA and the general NH setting, there are also similarities and therefore these results may inform other NHs throughout the U.S. healthcare delivery system. NH administrators and policymakers should consider the type of NH stay (short vs. long) and different staffing measures when examining resident quality measures.

Funding Source(s): NIH

Poster Session and Number: A, #75

Disparities in Medical Care by Socioeconomic Status: A Case for Investment in Nursing
Molly Viscardi, University of Pennsylvania School of Nursing

Presenter: Molly Viscardi, R.N., Predoctoral Fellow, Center for Health Outcomes and Policy Research, University of Pennsylvania School of Nursing, mkreider@nursing.upenn.edu

Research Objective: A large body of literature suggests that socioeconomic status is related to health outcomes through multiple pathways, although the causal mechanisms remain unclear. It is plausible that patients of low socioeconomic status may receive care at hospitals of lower quality. The socioeconomic composition of a hospital is notoriously difficult to measure, but recent work with census data offers promise. This research builds that work. The aim of this research is to categorize hospitals according to the socioeconomic status of the population that they serve and examine whether there is variation in structural inputs—specifically those related to the nursing workforce.

Study Design: This is a cross-sectional secondary analysis of linked data from the University of Pennsylvania Multi-State Nursing Outcomes study, patient discharge abstracts and census data. Hospital Service Areas for individual hospitals were created using zip codes from 2006 discharge data. These zip codes were linked with census data including multiple measures related to individual and neighborhood socioeconomic status, including percentage under 150% of the Federal Poverty Line (FPL). Characteristics of the population served by a given hospital were weighted to reflect the proportion of people from each zip code who received care at that hospital within that year. For each hospital, hospital-level measures of nurses' survey responses were created. Hospital characteristics from the AHA Annual Survey of Hospitals were incorporated. Descriptive and correlative statistics examined the relationship between nurse-reported measures and the socioeconomic status of the patients served by the hospitals.

Population Studied: This study examined 806 non-federal acute care hospitals in four states: California, New Jersey, Florida and Pennsylvania.

Principal Findings: Preliminary, unadjusted, descriptive analysis showed that a 1% change in the proportion of hospital population within 150% FPL is correlated with an 11-fold increase in the likelihood that nurses at that hospital rate care on their unit as "fair" or "poor". Additionally, an increase in proportion is significantly associated with a decrease in nurses' confidence that patients can manage their care after discharge. These early results suggest differences in nurse reports of quality. Additional analysis will be completed for this presentation, including multivariate regression accounting for hospital and nurse characteristics to further understand this relationship. Patient outcomes will be added to the model.

Conclusions: This research describes variations in nursing characteristics at hospitals that serve different proportions of patients with low socioeconomic status. Characteristics of the nursing workforce, such as education, staffing, skill mix and nursing work environment, have been linked to patient outcomes. Exploring whether nursing care varies at hospitals with different proportions of patients of low socioeconomic status may offer insight into the pathway to outcomes.

Implications for Policy, Delivery, or Practice: For many patients, the choice of care provider is influenced by factors beyond personal preference: location, insurance status, referral patterns, experience, social network and more. In other words, many patients do not choose the hospital at which they receive care. If members of a vulnerable population, such as patients of low socioeconomic status, are systematically receiving care of a lower quality because that is the only place available to them, this is a social injustice. Understanding the link between the structure of nursing care, care quality and patient outcomes will identify an area for intervention.
Access to Services and Quality of Care for Caregivers of Children with Autism Spectrum Disorders

Rini Vohra, West Virginia University; Suresh Madhavan, West Virginia University; Usha Sambamoorthi, West Virginia University

Presenter: Rini Vohra, B.Pharm., Graduate Student, Pharmaceutical Systems and Policy, West Virginia University, rinievohra@gmail.com

Research Objective: To examine problems with access to services and quality of care reported by caregivers of children with ASD as compared to caregivers of children with other developmental disorders (DD) and mental health conditions (MHC).

Study Design: A cross sectional study was conducted using the 2009-2010 National Survey of Children with Special Health Care Needs (N = 18,702). Access to care was measured as: difficulty using services, difficulty getting referrals, lack of source of care, and inadequate insurance coverage. Quality of care was assessed as problems reported with: care coordination, shared decision making with the primary care providers, and timely screening. Chi-square analyses and binomial logistic regressions were performed to examine the likelihood of reporting problems with the seven measures across ASD, DD only, MHC only, and DD & MHC group, after adjusting for socio-demographics, number of special children in the household, child’s functional ability, and presence of a physical condition. All analyses were adjusted for complex survey design.

Population Studied: Caregivers of children aged 3-17 years diagnosed with either ASD, a developmental disorder (Developmental Delay, Mental Retardation, Cerebral Palsy, or Down syndrome), or a mental health condition (ADHD, Depression, Anxiety, Behavioral/Conduct problems).

Principal Findings: Majority of the sample were older children (6-17 years), Whites, caregivers with greater than or equal to 200% FPL income and greater than high school education. Sixteen percent (n = 3,025) of the caregivers had a child with an ASD diagnosis. For access to services, caregivers of ASD group reported greater difficulty using services (AOR = 1.56, 95% CI = 1.30-1.89) and inadequacy of insurance coverage (AOR = 1.71, 95% CI = 1.37-2.14), as compared to MHC only group. For quality of care, caregivers of ASD children were more likely to report problems with care coordination (AOR = 3.37, 95% CI = 2.73-4.16) and shared decision making (AOR = 1.53, 95% CI = 1.26-1.85), as compared to the MHC group. As compared to the MHC/DD group, caregivers of ASD were more likely to report difficulty using services (AOR = 1.27, 95% CI = 1.01-1.60), care coordination (AOR = 1.87, 95% CI = 1.43-2.44), and shared decision making (AOR = 1.32, 95% CI = 1.05-1.67).

Conclusions: As compared to caregivers of children MHC/DD caregivers of children with ASD reported more likely to report difficulties access to services and receiving poor quality of care.

Implications for Policy, Delivery, or Practice: Our findings suggest that children with ASD may have a high degree of unmet needs. Innovative programs may need to be tailored to improve access and quality healthcare available to children with ASD.

Funding Source(s): Other, CoHORTS

A Life Course Perspective of Chronic Disease and the Impact of Surface Transportation

Karyn Warsow, Johns Hopkins Bloomberg School of Public Health

Presenter: Karyn Warsow, M.P.H., M.S., DrPH Candidate, Health Policy Management, Johns Hopkins Bloomberg School of Public Health, warsowreverence@yahoo.com

Research Objective: To develop a conceptual framework that demonstrates the synergy of risk and protective factors involved in the development of chronic disease over the life course and the impact of surface transportation.

Study Design: A novel conceptual framework based on the principles of the socio-ecological model.

Population Studied: The proposed theoretical framework is applicable to all populations utilizing surface transportation modalities.

Principal Findings: This process oriented approach demonstrates the synergy of risk and protective factors involved in the development of chronic disease accounting for the psychological/behavioral, social and biological contexts over time beginning with preconception and extending through to old age. The emphasis is on individual choice and how choice sets in...
motion one’s life trajectory and social well-being. Thus, the choice of transportation modality is dependent upon place of residence (urban, suburban or rural) in which an individual may choose to walk; bicycle; use public transit, rail; or drive a motor vehicle. These choices are influenced by the availability of transportation alternatives within a community, perceived personal and budgetary constraints, attitude, habit and educational information. This poster graphically depicts the manner in which human utility and the interplay of life stressors manifest in the body as chronic disease.

Conclusions: Transportation is a vital component to community sustainability in terms of accessing health care, education, employment, leisure activities, and social networks. Transportation mode choice is correlated with life trajectory events such as employment and education, which are interconnected with maximizing individual utility. Thus, activity patterns, personal decision processes, behavioral rules and the travel environment characterize a person’s behavior with respect to the multidimensional nature of choice and the development of chronic disease.

Implications for Policy, Delivery, or Practice: Analysis of chronic disease based on a systems approach that considers the synergy of risk and protective factors as opposed to a single exposure such as surface transportation. This poster was previously accepted and presented at the 140th Annual American Public Health Association Meeting, October 29, 2012, in San Francisco, California. This poster can be seen at:

http://www.transpotohealthlink.com/accepted-abstracts–presentations.html

Funding Source(s): No Funding
Poster Session and Number: A, #78

Functional Limitations, Home Support, and Medication Self-management among Medicare Beneficiaries
Christopher Whaley, UC Berkeley; Mary Reed, Kaiser Permanente Division of Research; John Hsu, Mongan Institute for Health Policy; Vicki Fung, Mid-Atlantic Permanente Research Institute

Presenter: Christopher Whaley, A.B., Student, Health Services and Policy Analysis, UC Berkeley, cwhaley@berkeley.edu

Research Objective: Many Medicare beneficiaries have conditions or disabilities that affect their functional status, which in turn could influence their ability to care for themselves. In particular, beneficiaries with severe functional limitations might have limited ability managing or taking their medications. We investigated the association between functional limitations and medication self-care activities, and how informal caregivers might influence any association.

Study Design: We conducted telephone interviews in a stratified random sample of Medicare beneficiaries. We examined drug cost-related changes in medication use: cost-reducing behaviors (e.g., switching to generics), cost-related non-adherence (e.g., not refilling), and financial stress (e.g., cutting back on necessities). Participants reported their functional status as measured by activities of daily living (ADLs, e.g., bathing) and instrumental activities of daily living (IADLs, e.g., preparing meals), and whether they received any support from family members or caretakers in obtaining, paying for, or taking medications. We also examined drug cost-related changes in medication use: cost-reducing behaviors (e.g., switching to generics), cost-related non-adherence (e.g., not refilling), and financial stress (e.g., cutting back on necessities). We used multivariate logistic regression to assess associations between functional status, support with medications, and drug cost responses, adjusting for patient characteristics.

Population Studied: Community-dwelling Medicare Advantage beneficiaries in an integrated delivery system, age 65+ years (N=1,201, response rate=70.0%).

Principal Findings: Nearly half of respondents (42%) reported having a functional limitation: 26.7% reported 1-2; and 15.6% reported 3+. Among beneficiaries with functional limitations, 15.8% received help with their medications versus 4.8% among those without limitations (p<0.001). Overall, 17% reported a cost-reducing behavior, 3% non-adherence, and 8% financial stress due to drug costs; these behaviors were more common among beneficiaries with functional limitations. In multivariate analyses, beneficiaries with 3+ functional limitations who did not receive help with their medications had higher rates of cost-related non-adherence (OR=6.06, 95% CI: 1.71-21.51) and financial stress (OR=4.06, 95% CI: 1.73-9.51) than those without limitations and without help with their medications. Beneficiaries with 3+ functional limitations who received help with their medications were also more likely to experience financial stress (OR=2.81, 1.13-
Affordable Care Act (ACA) and other factors, there may be as many as 21 million new Medicaid enrollees by 2022, dramatically increasing the population's aggregate demand for primary care. To help address this growing deficit, the ACA increases Medicaid fees for primary care services to 100% of Medicare fees during 2013 and 2014. While research has demonstrated that PCPs accept more Medicaid patients in response to fee increases, I examine how PCP, group, and market characteristics mediate this response. I describe how responses vary across PCPs and implications for different states' Medicaid payment and access policies.

**Study Design:** I construct a large linked dataset and evaluate linear and non-linear models of the PCP's choice to accept new Medicaid patients. My preferred specifications include state and year fixed effects and cluster errors at the state level. The specifications and interpretations of these models are informed by a generalized adaptation of Sloan, Mitchell, and Cromwell’s (1978) model of Medicaid participation and charity care provision. I introduce interaction terms to examine how select physician-, group-, and market-level covariates affect physician responses to varying Medicaid fees (measured as the ratio of Medicaid fees to Medicare fees for primary care services). I also conduct split-sample analyses to validate the robustness of my estimates when extrapolated out-of-sample.


**Principal Findings:** The average marginal effects of indicators for being salaried or an international medical graduate, not owning one’s practice, practicing in very competitive markets, and practicing in institutional settings (hospitals, medical schools, or HMOs) all suggest these factors significantly predict a PCP is more likely to accept new Medicaid patients, all else equal, in my preferred specifications. These indications are consistent with previous findings. These models also present evidence that many of the same PCPs – in particular salaried PCPs, international medical graduates, and those practicing in institutional settings – are less responsive to increases in Medicaid’s relative

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Past Year Unmet Healthcare Need Increases Ambulatory Care Sensitive Emergency Room and Inpatient Utilization among Children in the United States

Lauren Wisk, University of Wisconsin Madison; Whitney P. Witt, PhD, MPH, Department of Population Health Sciences, University of Wisconsin, Madison

Presenter: Lauren Wisk, B.S., Doctoral Candidate, Department of Population Health Sciences, University of Wisconsin Madison, wisk@wisc.edu

Research Objective: Ambulatory care sensitive (ACS) emergency room and inpatient utilization is costly and may contribute to adverse child health outcomes. We sought to determine if unmet healthcare need was associated with ambulatory care sensitive emergency room and inpatient utilization among children in the US, using a nationally representative, population-based sample.

Study Design: We examined data on 22,581 children from the 2002-2007 Medical Expenditure Panel Survey. Unmet healthcare need was defined as delayed or forgone healthcare for the child during the first survey year. ACS emergency room visits and inpatient hospitalizations during the second survey year were evaluated using standard algorithms, indicating whether the child experienced any versus zero ACS visits. Multivariable logistic regression was used to determine if children who experienced past year unmet healthcare need had higher rates of ACS utilization in the following year, adjusting for relevant covariates (including: child age, gender, race/ethnicity, health insurance, activity limitation status, usual source of care, parental education, family size and composition, family income, US region of residence, urbanicity, and chronologic time).

Population Studied: US children aged 0 to 17 years.

Principal Findings: Overall, 3.12% of children experienced any ACS utilization, 2.85% of children had an ACS emergency room visit, and 0.71% had an ACS hospitalization. Additionally, 5.96% of children experienced any unmet healthcare need. The unadjusted rate of ACS utilization among children with unmet need was 4.77%, compared to 3.02% for those without unmet need (p<0.01). Children who experienced any unmet healthcare need during the first survey year were 1.69 times more likely to have any ACS emergency room or inpatient utilization during the second survey year (95% CI: 1.15-2.49), adjusting for health insurance, usual source of care, family income and sociodemographics. Children who were younger, publicly insured, had an activity limitation, had fewer siblings, and were living in the South were all also more likely to have any ACS emergency room or inpatient utilization during the second survey year.

Conclusions: Multivariable analyses revealed significant disparities in ACS utilization for children in the US; most notably, past year unmet healthcare need and activity limitation status increased the likelihood of ACS use. Interestingly, although decreasing family income is significantly associated with unmet healthcare need, it was not associated with ACS utilization.

Implications for Policy, Delivery, or Practice: Children's experience of unmet healthcare need increases subsequent ACS emergency room visits and hospitalizations. Such findings suggest that families may be substituting prior delayed or forgone ambulatory care with emergency room and inpatient care. Reducing unmet healthcare need for children, by removing barriers to access, may therefore improve health outcomes for children by increasing their opportunity to receive timely and appropriate preventive care, rather than more costly acute care.

Funding Source(s): Other, AHRQ T32 and RWJ Dissertation Grant

Poster Session and Number: A, #81
Charges and Expenditures from Ambulatory Care Sensitive Emergency Room and Inpatient Visits Predicted by Past Year Unmet Healthcare Need among Children in the United States

Lauren Wisk, University of Wisconsin Madison

**Presenter:** Lauren Wisk, B.S., Doctoral Candidate, Department of Population Health Sciences, University of Wisconsin Madison, wisk@wisc.edu

**Research Objective:** We sought to determine if unmet healthcare need was associated with ambulatory care sensitive (ACS) emergency room and inpatient charges and expenditures among children in the US, using a nationally representative, population-based sample.

**Study Design:** We examined data on 22,581 children from the 2002-2007 Medical Expenditure Panel Survey. Unmet need was defined as delayed or forgone healthcare during the first survey year. Charges, expenditures and out-of-pocket (OOP) costs associated with ACS utilization were evaluated during the second survey year. Expenditures for non-ACS utilization during the second year were also evaluated as a comparison. Multivariable two-part models were used to determine if children who experienced past year unmet healthcare need had higher ACS expenditures in the following year, adjusting for relevant covariates (including: child age, gender, race/ethnicity, health insurance, activity limitation status, usual source of care, parental education, family composition, family income, US region of residence, urbanicity, and time).

**Population Studied:** US children aged 0 to 17 years.

**Principal Findings:** 4.77% of children with unmet need experienced any costs associated with ACS visits, compared to 3.02% for those without unmet need (p<0.01); while 11.57% of children with unmet need experienced any costs associated with non-ACS visits, compared to 12.23% for those without unmet need (p=0.03). Multivariable analyses revealed that children with unmet need were 1.69 times more likely to have any ACS charges than children without unmet need (95% CI: 1.15-2.49), but there were no significant difference in the odds of experiencing any non-ACS charges for children with and without unmet need (OR 1.19, 95% CI: 0.97-1.45). Non-ACS expenditures and OOP costs were not significantly different for those children with and without unmet need. Children with unmet need were more likely to have any ACS expenditures than children without unmet need; while among those with any ACS costs, children with unmet need had significantly lower charges and expenditures but significantly higher OOP costs.

**Conclusions:** As unmet need was associated with increased ACS costs but not non-ACS costs, it is less likely that the difference in ACS costs were driven by a general preference to receive care in a hospital. Instead, families may be substituting prior delayed or forgone ambulatory care with emergency room and inpatient care. Charges and expenditures for children with unmet need and any ACS costs may be lower because their conditions are less severe, while co-occurring OOP costs may be higher due to less generous insurance coverage. Ironically, families may be seeking care in the ER instead of a clinic because of their less generous insurance coverage. Alternatively, charges and expenditures may be lower because families are refusing expensive services because the associated OOP costs are at too great, possibly also due to less generous insurance coverage.

**Implications for Policy, Delivery, or Practice:** Regardless of the mechanism, children with unmet need and high ACS costs reflect families with clear barriers to accessing appropriate preventive care. Ensuring that families understand their insurance benefits may help to ensure appropriate utilization while simultaneous decreasing their OOP costs. Both insurers and providers can play a role in ensuring appropriate utilization by preventing unmet need.

**Funding Source(s):** Other, RWJF Dissertation Grant

**Poster Session and Number:** A, #82

Disparities in Guideline Appropriate Influenza Vaccination among Pregnant Women in the United States

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**Research Objective:** Experts recommend that all pregnant women get a flu shot, however the
nasal spray flu vaccine is not approved for pregnant women. We sought to determine the predictor of receipt of flu shot and spray among a nationally representative, population-based sample of pregnant women.

**Study Design:** We examined data on 4,180 women who were currently or recently pregnant (at the time of the survey) from the 2005-2010 National Health Interview Survey. Receipt of flu shot (inactivated, intramuscular vaccine) or spray (live attenuated influenza vaccine) was examined during a 12 month window. We examined a number of predisposing, enabling and need factors as predictors of the influenza vaccination, including maternal age, race/ethnicity, marital status, educational attainment, number of children in the household, US region of residence, survey year, period effects for the H1N1 outbreak, chronic condition status, pregnancy status, health insurance, family income, and usual source of care. Descriptive analyses were used to compare these characteristics between women who received the shot, women who received the spray, and women who received no vaccine. Multivariable logistic regression was used to model the receipt of the flu shot as a function of predisposing, need, and enabling characteristics. Disparities in receipt of the vaccine among pregnant women were also compared against disparities in receipt of the vaccine among US mothers (N=28,324) to determine if certain disparities were specific to pregnant women.

**Population Studied:** Pregnant women in the US.

**Principal Findings:** Overall, 24.8% of pregnant women received the flu shot, with rates substantially increasing over time. Although pregnant women’s receipt of flu spray was generally low before the H1N1 outbreak (0.3%), it jumped to 2.7% during the outbreak. Multivariate logistic regression revealed that black (non-Hispanic) women were significantly less likely to receive a flu shot during pregnancy than white (non-Hispanic) women. Women with intermittent or no insurance were significantly less likely to receive a flu shot during their pregnancy. Women of higher socioeconomic status, with a usual source of care or with any chronic condition were more likely to receive the flu shot. Racial and socioeconomic disparities were more pronounced among pregnant women than among US mothers. Publicly insured US mothers were less likely to receive the shot than privately insured mothers, while there was no such difference among pregnant women. There were regional disparities for US mothers that were not observed for pregnant women.

**Conclusions:** Despite recommendations, influenza shot levels among pregnant women are generally low and pregnant women are receiving the flu spray against recommendations. There are important differences in the disparities associated with vaccination among pregnant women and among US mothers.

**Implications for Policy, Delivery, or Practice:** Getting the flu shot while a woman is pregnant has also been shown to prevent influenza and flu-related hospitalizations in their infants up to 6 months of age. Therefore, receipt of the flu shot has implications for the health of multiple generations across the life course. Given the clear disparities, targeted public health efforts directed at priority populations should be made to improve influenza vaccination among pregnant women.

**Funding Source(s):** AHRQ

**Poster Session and Number:** A, #83

**Do Risk Averse Individuals Engage in More Healthful Behaviors?**

Susan Yeh, Johns Hopkins School of Public Health

**Presenter:** Susan Yeh, M.A., B.A., Doctoral Student, Health Policy and Management, Johns Hopkins School of Public Health, syeh@jhsph.edu

Research Objective: This study aims to assess the relationship between an individual’s level of risk aversion and their engagement in healthful behavior. Specifically, this study examines whether an individual’s level of risk aversion is related with: 1) whether they are more likely to have had a regular annual checkup in the last 2 years and 2) whether they are more likely to engage in moderate to vigorous physical activity at least 3 times a week.

**Study Design:** Individual-level were obtained from the 2010 Medical Expenditure Panel Survey Household Component (MEPS-HC). Risk preference data was obtained from the Adult Self-Administered Questionnaire (SAQ), which is a supplementary component of the MEPS-HC. Participating individuals are adults within each household that responded to the mail-back survey during rounds 2 and 4. The level of an individual’s risk aversion is obtained from four separate questions within the SAQ that
elicited an individual's attitudes around 1) whether they thought insurance was worth the cost, 2) whether they are more likely to take risks than the average person, 3) whether they are healthy enough such that insurance is not needed and 4) they can overcome illnesses without help from medical professionals. Dichotomous indicator variables are created for whether an individual is risk averse, whether they have had a checkup in the last two years and whether they engage in physical activity on a weekly basis. Logistic regression was conducted while controlling for variables related to age, gender, race/ethnicity, education, income, insurance status, and region.

**Population Studied:** All adults who completed the risk preference data obtained from the Adult Self-Administered Questionnaire (SAQ) in the 2010 MEPS.

**Principal Findings:** Individuals who are risk averse according to the SAQ are 2.02 (1.76-2.33) times as likely as non-risk averse individuals to have had a routine checkup in the past two years even after controlling for individual level covariates. Interestingly, risk averse individuals are only .69 (0.62-0.77) times as likely as non-risk averse individuals to engage in physical activity on a weekly basis.

**Conclusions:** Individuals who are risk averse are more likely to have had a routine checkup in the last two years but are also less likely to engage in regular physical activity. This provides some indication for presence of moral hazard for individuals who place a high value on medical care and insurance.

**Implications for Policy, Delivery, or Practice:** Better understanding individual behavior stemming from risk preference can be essential for better developing and targeting intervention and public health campaigns that are meant to educate and encourage more healthful behavior.

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**Poster Session and Number:** A, #84

**Use of Diabetes Self-Management Education and Its Effectiveness in the Medicare Population**

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**Presenter:** Candice Yong, B.S.Pharm., Graduate Research Assistant, Pharmaceutical Health Services Research, University of Maryland School of Pharmacy. cyong001@umaryland.edu

**Research Objective:** Diabetes self-management education (DSME) is recognized as a critical element of care in the management of diabetes and is recommended among all individuals with diabetes. The objectives of this study were to identify factors that affect the use of DSME, and to examine the effectiveness of DSME in relation to five diabetes self-care behaviors in the Medicare population. Diabetes self-care behaviors examined included: self-monitoring of blood glucose, diet control, regular physical activity, checking of feet for sores or irritations, and self-monitoring of blood pressure.

**Study Design:** This was a retrospective, cross-sectional study that used data from the 2006 Medicare Current Beneficiary Survey (MCBS). Participation in a DSME course and the practice of diabetes self-care behaviors were obtained from self-report. Modified Poisson regression models with log-link function were used to determine factors that affect participation in a DSME course, and to measure the associations between DSME course participation and the likelihood of practicing each self-care behavior.

**Population Studied:** Medicare beneficiaries living in the community who reported ever being diagnosed with diabetes by a physician.

**Principal Findings:** 1009/2650 (38.1%) community-dwelling Medicare beneficiaries with diabetes reported ever participating in a DSME course. Statistically significant determinants of DSME course attendance included: race/ethnicity, education level, current insulin use, and any diabetes complication. Compared to white non-Hispanics, black non-Hispanics and Hispanics were 0.80 and 0.78 times less likely to attend a DSME course (p<0.001). The probability of attending a DSME course increased with increasing levels of education (p<0.001). Insulin users were 1.31 times more likely to attend a DSME course compared to non-insulin users (p<0.001). In comparison to beneficiaries without any diabetes complications, those with diabetes complications were 1.20 times more likely to attend a DSME course (p<0.001). Compared to beneficiaries who did not attend a DSME course, beneficiaries who attended a DSME course were 1.06 times more likely to monitor their blood glucose (95% CI: 1.03-1.08), 1.09 times more likely to practice diet control (95% CI: 1.06-1.13), 1.25 times more likely to exercise regularly (95% CI: 1.16-1.33), 1.12 times more
likely to check for sores on feet (95% CI: 1.08-1.15), and 1.11 times more likely to monitor their blood pressure (95% CI: 1.02-1.21).

Conclusions: The proportion of Medicare beneficiaries who attended DSME, at 38.1%, is low. Individuals of minority race or with lower levels of education were significantly less likely to have attended DSME. Medicare beneficiaries who participated in DSME were statistically significantly more likely to practice diabetes self-care behaviors compared to beneficiaries who did not participate in DSME.

Implications for Policy, Delivery, or Practice: This study establishes the effectiveness of DSME on multiple pertinent self-care behaviors in a nationally representative sample of the Medicare population. The finding of low access to DSME courses suggests a need for the development and implementation of target-specific strategies to increase use of DSME. Since individuals of minority race or with lower levels of education were significantly less likely to have attended DSME, these patient populations should be targeted for more intense efforts in offering DSME.

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Factors Affecting Job Satisfaction among Home Health Aides
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Research Objective: Home health aides are front-line workers in delivering home health care. Job satisfaction among these important workers has been associated with patient health outcomes and quality of services. However, there is limited research into factors that affect job satisfaction among health care workers in home care agencies.

Study Design: A cross-sectional study was conducted using data from the 2007 National Home Health Aides Survey, a nationally representative sample of home health aides conducted by the National Center for Health Statistics of the Centers for Disease Control and Prevention. Job satisfaction, the dependent variable, was measured by response to the question “how satisfied are you with your current job as a home health aides as [agency]?” The agency characteristics and personal characteristics refer to the backgrounds of individuals and organizations. Work environment/organizational support are defined as the support organizations provide to aides, both financial and directly work-related. Attitudes were defined as aides’ perception of their jobs, supervisors, and workers themselves that are socially constructed from workplaces and experiences. Structural equation modeling method (SEM) was used to examine the latent relationships between personal backgrounds, organizational factors, job related characteristics, and job satisfaction.

Population Studied: Home health aides in a nationally representative sample of home health and hospice workers (n = 3,377), restricted to female respondents (n = 3,274).

Principal Findings: Most home health aides were “extremely” (46.7%) or “somewhat” (41.1%) satisfied with their jobs. At the personal level, increasing age, being separated/divorced versus other conditions, and personal health were positively associated with satisfaction. Structurally, health insurance and training were positively associated with job satisfaction. Attitudinally, being trusted and having confidence in one’s ability were significantly associated with satisfaction. Perceived supervisor quality was highly associated with satisfaction. SEM analysis suggested that personal factors were positively associated with attitude (β = .03, p<.05) and attitude was positively associated with job satisfaction (β = .30, p<.05). No significant relationship was found between agency type and support. However, there was positive relationship between support and job satisfaction (β = .12, p<.05). Organizational support was positively related to attitude (β = .16, p<.05). The final model was a good fit for the data (χ² = 725.63, df = 85, p = 0.0000, CFI = 0.94, RMSEA = 0.048, the standardized RMR = 0.053).

Conclusions: Both organizational support and personal characteristics were associated with attitude, which in turn was associated with job satisfaction. Organizational support, operationalized as the availability of health insurance and the provision of job training, was related to job satisfaction both directly and through its influence on worker attitudes toward elements of the work environment, such as perceptions of the supervisor.

Implications for Policy, Delivery, or Practice: Organizational support and attitudes are
important determinants for job satisfaction among home health aides. Managers in home and hospice care agencies should provide health insurance as an option for workers. It is also necessary to provide training that workers perceive to have value. Linking training to professional recognition and promotion might also be valuable.

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