University of California Center for Health Quality and Innovation: Experiences from a System Approach to Scaling Up Effective Interventions

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Panelists: Wendy Anderson, MD, MS, University of California, San Francisco; Maxime Cannesson, MD, PhD, University of California, Irvine; Nathaniel Gleason, MD, University of California, San Francisco

The challenge of improving outcomes, costs, and access in health care among academic health systems is not a dearth of innovative research; but the difficulties encountered when attempting the dissemination and implementation of effective interventions throughout health systems.

The University of California (UC) Center for Health Quality and Innovation (CHQI) was established to mitigate barriers to improvements among UC academic health systems. UC recognizes that engagement by leadership, strong evaluation processes, and innovator champions are key to overcoming dissemination and implementation barriers within large health systems. CHQI, led by five UC health system CEOs, six medical school deans, and the UC Senior Vice President of Health Sciences and Services, integrates evidence-based interventions by supporting a collaborative approach to innovative research and spreading best practices through grants, leadership, change management training, and convening task forces to facilitate system-wide change.

CHQI employs a tactical and methodical performance-monitored approach to disseminating and implementing proven models of care, including quantifying the ROI (in quality and costs) of all programs prior to initiating a spread program. Once the ROI is assessed for scale and feasibility, a team of senior UC researchers provides guidance by reviewing program implementation and process measures with a focus on spreading best practices, as well as ongoing cost and outcome analyses. Since 2011, CHQI has funded 50 innovation projects, and trained and supported 23 fellows who additionally manage their own innovation projects.

This panel presents CHQI’s approach and experiences with scaling up effective interventions, through 3 of its multi-site programs that demonstrated a proven ROI before integrating and spreading evidence-based interventions across 5 UC health systems. The panelists will discuss barriers, challenges and successes of project design, evaluation, and implementation, such as data integration issues, organizational barriers (including culture and policies) among health systems, institutional impediments (workflow, workforce), and future plans.

IMPACT-ICU-Integrating Multi-disciplinary Palliative Care into the ICU
Wendy Anderson, MD, MS, University of California, San Francisco

One fifth of Americans die after receiving care in an ICU. These patients receive interventions that may not be consistent with their wishes, families experience significant distress, and the costs of unwanted care burden our health system. When integrated into ICUs, palliative care improves management of patients’ symptoms, decreases family distress, and increases satisfaction. It also decreases ICU length of stay and costs. The IMPACT-ICU is a quality improvement program to increase integration of palliative care into the ICU by educating ICU nurses to identify and address needs in 3 domains: 1) patient symptom management, 2) family support, and 3) multidisciplinary communication about prognosis and goals of care. A pilot program at UCSF improved ICU nurse confidence and skills in palliative care discussions, and increased palliative care consults from the ICU. The objective of this project is to increase the integration of palliative care in the ICUs at the 5 UC medical centers. This objective is accomplished through a multidisciplinary collaborative of ICU and palliative care nurse and physician leaders from the 5 medical centers. The collaborative achieves two aims: 1) Expand a training program to
increase the involvement of ICU nurses in communication about prognosis, goals of care and palliative care for seriously ill patients, 2) Identify best practices in ICU-palliative care integration and implement them to complement and support the nurse education intervention. This program has now trained 250 ICU nurses and has again demonstrated improvements in ICU nurse confidence and skills in palliative care discussions.

Dissemination of Enhanced Recovery After Surgery (ERAS) Toolbox for High Risk Surgery Patients
Maxime Cannesson, MD, PhD, University of California, Irvine

Every year about 240 million surgical procedures are performed globally. For the UC system alone, 110,000 patients undergo surgery each year. While high-risk surgery procedures represent only about 12.5% of this surgical volume, they account for about 80% of overall patient mortality related to surgery. In addition, the incidence of postoperative complications in patients undergoing high-risk surgical procedures is about 30%. As such, there is urgent need to develop and adopt interventions that are direct at improving the outcomes of high-risk surgical procedures. Enhanced Recovery After Surgery (ERAS) is a bundle of best evidence based practices aimed at enhancing patient postoperative recovery and outcomes following high-risk surgery. This innovative program includes management of perioperative pain, nausea and vomiting, transfusion, and goal directed fluid administration and hemodynamic optimization. Where ERAS is embedded, participating sites report improved patient experience, clinical outcomes, and multi-disciplinary team collaboration and reduction in length of stay and risk of hospital acquired infections. The UCI Enhanced Recovery After Surgery (ERAS) program for patients undergoing high-risk abdominal surgery patients demonstrated a reduction in length of stay by 2 days. A “Toolbox” for the dissemination of this program system-wide includes online pre-tests and post-tests, online training, written protocols, handouts for Goal Directed Therapy application at the bedside, and documents explaining the key factors for success and the barriers to implementation and how to overcome them. This Toolbox is currently being disseminated to all UC medical centers for patients undergoing high-risk abdominal, gynecologic, urological, and orthopedic surgeries.

e-Referrals and e-Consults
Nathaniel Gleason, MD, University of California, San Francisco

The UCSF eConsult program allowed Primary Care Providers to receive timely, low-cost input from specialists on lower-complexity and data-oriented clinical questions that do not require an in-person evaluation. Impact: One year after its launch, the UCSF experience demonstrated significant impact on referral rate, specialty care utilization, specialty care access time, and costs. eConsults now represent 8.2% of referrals to participating specialties. The referral rate for standard office visits declined by 20%. Access to a specialty care input within 14-days (via e-Consult or office visit) improved from 29% to 46%, a 59% improvement. Mean professional-fees during the 120-day period following all referrals or e-Consults decreased by 7.2%. Adoption of the program is robust, with 2/3 PCPs using e-Consult, and high acceptability among providers. Conservative modeling yields an anticipated savings of $250,000 annually per 50,000 primary care patients. Program costs for that same population will be approximately $45,000 per year for e-Consult fees (to be replaced ultimately by payer reimbursement), as well as site-leader and site-analyst support, with personnel cost dropping sharply after the first year. The UCSF e-Consult program is now in the process of being spread to the other 4 UC medical centers to further drive integration of primary care and specialty care – an essential step to deliver higher value care. Some initial factors that this spread effort has had to account for are the differences in electronic health record systems among the UC medical centers.
Going to Scale: Dissemination and Implementation of EBPs Across Large Publicly-Funded Health Care Systems – Initiatives Targeting System-Level Change

Chair: Stephen Crystal, PhD, Director, Center for Health Services Research, Institute for Health, Health Care Policy and Aging Research, Rutgers University, Rutgers University
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Panelists: Sheree Neese-Todd, MA, Rutgers University; Joel C. Cantor, ScD, Center for State Health Policy, Rutgers University; Todd Gilmer, PhD, University of California, San Diego

Co-authors: Neese-Todd Co-authors: Scott Bilder, PhD, Rutgers University; Stephen Crystal, PhD, Rutgers University
Cantor Co-authors: Jolene Chou, MS, Rutgers University; Margaret Koller, MS, Rutgers University
Gilmer Co-authors: Marian L. Katz, MD, University of California, Los Angeles; Ana Stefancic, MA, Columbia University; Lawrence A. Palinkas, PhD, University of Southern California

This panel will examine strategies and outcomes across three initiatives aimed at translating evidence-based care models and practices in the treatment of low-income, disadvantaged patients with behavioral health and other complex conditions at scale, across states and cities. The initiatives include translation across states of measurement-driven QI initiatives in mental health in the six-state MEDNET consortium; translation across cities of the care coordination model developed for low-income super-utilizers by Brenner and colleagues in Camden; and the implementation across 91 California sites of the Full Service Partnership (FSP) model for persons with severe mental illness who are homeless or at risk of homelessness.

The discussion will initially be framed by a brief overview from the organizer/discussant placing the three interventions within an overall conceptual model. Following the presentations, comments from the discussant will compare and contrast the effectiveness of the alternative strategies utilized across care processes and sites. Common themes across the three initiatives will be discussed, in terms of types of barriers and facilitators experienced in the process of dissemination at scale. We will discuss the barriers and facilitators experienced with respect to sustainability of the interventions beyond the initial project period; e.g., variations in successful incorporation metrics for evidence-based practices into ongoing management processes in public programs, and in incorporating guidelines for the use of evidence-based practices into state and health plan clinical guidelines, such as the Texas foster care psychotropic prescribing parameters and clinical guidelines promulgated by health plans across sites. We will discuss the important distinction between the types of barriers and facilitators experienced in the translation of specific program models across sites at small to medium scale, and the different set of barriers and facilitators that are encountered in efforts to bring these translational efforts to statewide and other large-scale systems with sustained impact.

Meaningful Antipsychotic Metrics for State Medicaid Programs: Strategies for Sustainable Change and Quality Mental Health Care
Sheree Neese-Todd, funded by the Agency for Healthcare, Research and Quality (AHRQ), 1R18HS019937

Objective: Safe and effective use of antipsychotic medications across multiple populations, often off-label, presents many challenges for Medicaid programs. We will discuss the experience of a 6-state consortium, the Medicaid Mental Health Network for Evidence Based Care (MEDNET), in developing consensus quality metrics for safe and judicious antipsychotic use and translating measurement-driven QI initiatives at scale in large statewide populations. The presentation of barriers and facilitators experienced in development and use of metrics and translation of interventions across states with different policy and organizational environments.

Data Sources: The state Medicaid and mental health systems in Texas, California, Missouri, Oklahoma, Maine and Washington.
Study Design: Using mixed methods we assessed the uptake of metrics across states and the incorporation into sustainable, QI processes.

Principal Findings: The metrics are feasible to implement, were spread to related agency projects, and integrated into ongoing QI efforts, with overall success but significant variation. Working with the National Collaborative for Innovation in Quality Measurement (NCINQ), several MEDNET metrics were adopted by NCQA as HEDIS 2015 measures. Significant impacts occurred in some settings: for example, a prior authorization requirement for antipsychotic prescriptions for children under age 3 in Texas led to a 57% decrease in the monthly number of very young children with such prescriptions and QI initiatives in six Washington community mental health centers were followed by 45% reduction in rate of polypharmacy. Factors associated with successful translation and sustainability included stable leadership, engagement of clinical champions, and willingness of state agencies to collaborate.

Advances the Science of D & I: Translation across states requires creative adaptation of the models to differing policy and organizational environment. Identification of the factors associated with successful translation is key to translating effective practices at large scale.

Adapting the High Utilization Team Model in Four Diverse Sites
Joel Cantor, Sc.D., Rutgers University, funded by, Centers for Medicaid and Medicare Services, Innovation Center ID# 1C1CMS330995

Problem/Objective: This project seeks to adapt an evidence-based care coordination program of the Camden Coalition of Healthcare Providers in four diverse clinical sites. The sites vary widely in delivery system and organizational characteristics - two health centers, one non-profit safety net medical center and one for-profit Independent Practice Association. One of the health centers has established a successful partnership with a behavioral health provider organization.

Setting: Allentown PA, Aurora CO, Kansas City MO, and San Diego CA.

Data Source/Study Design: Administrative and patient reported data are used to examine project implementation and fidelity to the Camden model. We hypothesize that the degree to which the Camden model is successfully adapted and the extent to which patient outcomes improve depends on organizational, delivery system, and policy context.

Principal Findings: Achieving financial sustainability after three years of operations is a key project goal, but opportunities for sustainability will depend on the state policy context, which varies greatly across the sites. Data for the first 719 enrolled patients show that the majority is covered by Medicaid (including dual eligibles) or is uninsured, bears a high burden of chronic illness (e.g., 41% diabetes, 37% depression, and 21% COPD), and faces substantial social challenges. The composition of enrollees (i.e., demographics, health status, and social needs such as housing), fidelity to the Camden model (e.g. intensity and duration of the intervention), and indicators of patient outcomes also vary widely across the sites. All sites evinced reductions in patient-reported unhealthy physical and mental health days and most decreased hospital utilization to varying degrees.

Advances the Science of D & I: This project illustrates the challenges of program replication/adaptation as a dissemination strategy.

Variation in the Implementation of California’s Full Service Partnerships for Persons with Serious Mental Illness
Todd Gilmer, PhD, UCSD, funded by the Agency for Healthcare, Research and Quality (AHRQ)

Objective: This study examined a large-scale implementation of supported housing programs under, California’s Mental Health Services Act. Full Service Partnerships (FSPs), supported housing programs that do ‘whatever it takes’ to improve outcomes among persons with SMI who are homeless or at risk of homelessness evaluated. An emphasis on integrated, recovery-oriented care; flexible funding; and stakeholder influence led to the implementation of a diverse array of FSP programs.
Data Sources: Ninety-three FSPs in California.

Study Design: A mixed methods approach was selected to develop a better understanding of the complexity of the FSP programs. The design structure was a combined explanatory and exploratory sequential design where a focus group was used to develop a quantitative survey that was followed by site visits and analysis of administrative data. The survey was used to describe the breadth of variation based on fidelity to the Housing First model, while the site visits were used to provide a depth of information on high vs. low fidelity programs and the administrative data provided information on housing and services use.

Principal Findings: Substantial variation in implementation exists among FSPs. Fidelity was particularly low along domains related to housing and service philosophy. Analysis of semi-structured interviews with program directors revealed fifteen themes organized into three domains of the Consolidated Framework for Implementation Research: individual characteristics of program directors, the inner setting and the outer setting. Interviews with front-line providers allowed us to identify an emergent model of recovery-oriented practice that integrated client choice with client agency. Additional analysis showed that higher fidelity programs enrolled clients with greater histories of homelessness who were less engaged in outpatient services.

Conclusions: There remains room for improvement in the fidelity and recovery-orientation of FSPs. We have identified several processes to increase fidelity.
Implementation of a System-wide Health Promotion Intervention to Reduce Early Mortality in High Risk Adults with Serious Mental Illness and Obesity

Chair: Stephen Bartels, MD, MS, Professor of Psychiatry, Community & Family Medicine, and TDI, Geisel School of Medicine at Dartmouth
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Discussant: Gail Daumit, MD, MPH, Johns Hopkins School of Medicine

Panelists: Stephen Bartels, MD, MS, Geisel School of Medicine at Dartmouth; Mary Brunette, MD, Geisel School of Medicine at Dartmouth; Kelly Aschbrenner, PhD, Geisel School of Medicine at Dartmouth

Overview: Persons with serious mental illness (SMI) experience a high rate of medical comorbidity, resulting in reduced life expectancy of 7–30 years less than that of the general population largely due to cardiovascular disease. High rates of obesity and smoking are major factors contributing to early mortality, associated with sedentary behavior, poor diet, and prescription by physicians of high-weight-gain antipsychotic medications. This panel will describe a multicomponent approach to addressing one of the nation’s leading health disparities through a rigorous statewide implementation effort aimed at transforming mental health services by integrating health promotion and obesity prevention through organizational change, prescriber behavior change, and patient engagement in service design and implementation. The first presentation on organizational change describes how the results of an NIMH-funded RCT of the In SHAPE health promotion intervention were applied to a statewide implementation study including process outcomes of a learning collaborative, system level (organizational change) outcomes, and patient-level outcomes. The second presentation on prescriber behavior change will describe outcomes of a statewide academic detailing/audit and feedback intervention to decrease prescribing of high weight gain propensity antipsychotic agents for individuals with SMI. The third presentation on patient-peer engagement describes the results of a pilot study designed by patients, providers and academic researchers with the goal of increasing uptake and reach of the professionally-led In SHAPE health coach fitness model by phasing out one-on-one fitness coach training sessions with individual and group-based peer support, motivational text messages, and physical activity sensors for monitoring and feedback. The discussion will consider how these findings may inform future systems change, national efforts, and implementation research to improve the health and longevity of high-risk adults with SMI and cardiovascular risk factors.

Organizational Change and Participant Outcomes in a Statewide Implementation of a Health Promotion Intervention for Serious Mental Illness and Obesity
Presenter: Stephen Bartels, MD, MS, Geisel School of Medicine at Dartmouth

Objective: To describe organizational change and patient-level outcomes of a statewide implementation of health promotion addressing obesity in persons with serious mental illness (SMI) in public mental health settings.

Method: We evaluated the statewide implementation of an evidence-based health promotion program (In SHAPE) through a naturalistic study involving: (1) assessments of patient-level outcomes for 120 mental health consumers and (2) assessments of organizational change through in-depth interviews with senior leaders, program directors, and staff at participating community mental health centers (CMHCs). The stepped implementation created a naturally occurring “intervention group” consisting of one urban and one rural CMHC and a “usual care” comparison group with the same geographic composition. Participants were assessed at baseline, 6-, and 12-month follow-up. Organizational change assessments were conducted during the implementation phase at each of the four sites at baseline, 6-, 12-, and 24-month follow-up. Implementation was assessed based on ratings on the General Organizational Index adapted for In SHAPE consisting of 11 organizational change domains.

Findings: Major barriers to implementing health promotion programming at CMHCs were financing, competing priorities, and integrating health promotion into team operations. Facilitators of implementation
were leadership buy-in, organizational culture prioritizing wellness, staff interest, and high consumer demand. Mean GOI score (range 1-5) increased from baseline (1.9) to 2-year follow-up (3.7) with higher organizational change associated with high program uptake. Implementation vs. waitlist organizations were associated with significantly greater weight loss, increased fitness, increased vigorous exercise and physical activity, and dietary change.

Impact: Organizational change supporting integrated health promotion may reduce cardiovascular risk among obese adults with serious mental illness. Based on these promising results we have been recently funded to compare the effectiveness of a virtual IHI Learning Collaborative vs. targeted technical assistance in implementing health promotion (In SHAPE) in 48 mental health organizations across the nation.

Funding: NIMH R01 MH089811 “Statewide Intervention to Reduce Early Mortality in Persons with Mental Illness” and NIMH R01 MH102325 “RCT of a Learning Collaborative to Implement Health Promotion in Mental Health” (PI Bartels)

Academic Detailing and Audit and Feedback to Decrease Prescribing of High Weight Gain Antipsychotic Medications
Presenter: Mary Brunette, MD, Geisel School of Medicine at Dartmouth

Objective: To evaluate changes in prescribing behavior associated with an academic detailing/audit and feedback intervention occurring in a statewide health promotion program implementation.

Method: We assessed whether three in-person sessions of group academic detailing with audit and feedback could improve prescribing across a state mental health system. Using Medicaid claims for antipsychotic medications, we conducted regression discontinuity analyses assessing changes in the proportion of people getting antipsychotics with low cardiometabolic risk, high cardiometabolic risk, or in combination with other antipsychotics among all Medicaid recipients getting antipsychotics, comparing the year before and the year after the intervention. Additional regression analyses were conducted over a five-year period 2009-13 to assess longer term changes.

Findings: Discontinuity analyses demonstrated a significant decrease in the proportion of people in community mental health center treatment obtaining high-risk antipsychotic agents following the initiation of the prescriber intervention.

Impact: Our data suggest that academic detailing focused on evidence-based prescribing with audit and feedback on prescribing practices can shift the pattern of antipsychotic utilization in public mental health settings.

Funding: NIMH R01 MH089811 “Statewide Intervention to Reduce Early Mortality in Persons with Mental Illness” (PI Bartels)

Peer Support and Technology to Enhance Sustainability and Reach of Community-based Health Promotion for Obese Persons with Serious Mental Illness
Presenter: Kelly Aschbrenner, PhD, Geisel School of Medicine at Dartmouth

Objective: To partner with key stakeholder groups to adapt and pilot test a novel health promotion intervention enhanced with peer support and technology delivered in a public mental health center.

Method: Academic researchers partnered with peer support specialists and mental health and fitness providers to design and implement an adapted version of the professionally-led In SHAPE health coach model that included phasing out one-on-one coached fitness training sessions with individual and group-based peer support and exercise, motivational text messages, and physical activity sensors for monitoring and feedback. Ten participants were recruited and assessed at baseline and post-intervention using a mixed-methods framework. Feasibility was evaluated through qualitative interviews with key stakeholders in addition to a preliminary exploration of descriptive health outcomes.
Findings: The peer support and technology-enhanced model was desirable, feasible, and associated with possible improvements in exercise, physical activity, healthy eating, and readiness to change health behaviors.

Impact: Incorporating “wellness peers” and mHealth technology into health promotion programs for persons with serious mental illness holds promise for enhancing program sustainability and reach. This pilot data furthers our understanding of how professionally-driven models of health promotion can be adapted and delivered by “peers” in public mental health settings to potentially extend the reach valuable health promotion resources to a high-risk patient population.

Funding:  NIMH R01 MH078052 “Health Promotion and Fitness for Younger and Older Adults” with SMI (PI Bartels) NIMH R01 MH089811 “Statewide Intervention to Reduce Early Mortality in Persons with Mental Illness” (PI Bartels)
Pressing Ahead: Developing and Testing of New Measures in Implementation Science

Chair: Bryan J. Weiner, PhD, Professor, University of North Carolina at Chapel Hill
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Discussant: Stephen Taplin, MD, MPH, Process of Care Research Branch, Behavioral Research Program, National Cancer Institute

Panelists: María E. Fernández, PhD, University of Texas Health Science Center at Houston
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Measurement forms the foundation of any scientific field; yet, systematic reviews reveal that many available measures of implementation context, process, and outcomes lack reliability or validity. An urgent need exists for psychometrically strong measures in implementation science; without them, the field cannot produce cumulative knowledge about implementation barriers, facilitators, processes, or generate sound evidence about which implementation strategies work best, when, and for whom. In this panel session, three researchers will report their efforts to develop and test new measures of constructs featured in the Consolidated Framework for Implementation Research (CFIR). Maria Fernandez will describe the work of the CDC/NCI-funded Cancer Prevention and Control Research Network to create measures for seven constructs in the inner-setting domain of CFIR and assess the psychometric properties of those measures using data from a multi-state sample of community health centers. Shuting Liang will report on the Network's effort to develop and assess measures of selected constructs in other CFIR domains and discuss the inter-relationships of these constructs at both the individual and clinic level of analysis. Sara Jacobs will explore in two different study contexts the psychometric properties of, and measurement issues associated with, a new theory-based measure of implementation climate. Building on the presentations, Stephen Taplin will moderate a discussion between panelists and participants about the role of theory in measurement, the challenges of adapting existing measures, the implications of item-wording choices, the effects of context on measurement properties, and the measurement of organization-level constructs using individual-level data. Participants will learn about new measures they could use in their own research; in addition, they will engage in dialogue about needs, opportunities, challenges, and recommended practices in measurement in implementation science.

Developing Measures to Assess Constructs from the Inner Setting of the Consolidated Framework for Implementation Research

Background: Implementation scientists and practitioners alike need reliable, valid measures of contextual factors that influence implementation success. Yet few existing measures demonstrate reliability or validity. To meet this need, we developed and assessed the psychometric properties of measures of several constructs within the inner setting domain of the Consolidated Framework for Implementation Research (CFIR).

Methods: We searched the literature for existing measures for seven inner-setting domain constructs (available resources for implementation, culture overall, culture stress, culture effort, implementation climate, learning climate, and readiness for implementation). We adapted items for the healthcare context, pilot-tested the adapted measures in 4 CHCs, and fielded the revised measures in 78 CHCs in seven states (N=327 respondents). To psychometrically assess our measures, we conducted confirmatory factor analysis (structural validity), assessed inter-item consistency (reliability), computed scale correlations (discriminant validity), and calculated inter-rater reliability and agreement (organization-level construct reliability and validity).
Results: CFAs for each construct exhibited good model fit (CFI>0.90, TLI>0.90, SRMR<0.08, RMSEA<0.08), with factor loadings exceeding .40. A seven-factor CFA failed to converge but a five-factor CFA with the three culture constructs modeled as a single factor exhibited a good model fit when resources and implementation climate were allowed to covary (CFI=0.848, TLI=0.835, SRMR=0.079, RMSEA=0.065). Scale reliabilities ranged from good (0.7≤α<0.9) to excellent (α≥0.9). Scale correlations fell below .85, indicating discriminant validity. Inter-rater reliability and agreement were sufficiently high to justify measuring constructs at the clinic level.

Implications: Our findings provide psychometric evidence in support of the CFIR inner setting measures. Our findings also suggest that the inner setting measures can be aggregated to the clinic level and at the CHC system level. Measurement of inner-setting constructs can be useful in better understanding and predicting implementation in CHCs and can be used to identify targets of strategies to accelerate and enhance implementation efforts in CHCs.


Measuring Constructs from the Consolidated Framework for Implementation Research in the Context of Increasing Colorectal Cancer Screening at Community Health Centers

Background: The Consolidated Framework for Implementation Research (CFIR) is a comprehensive meta-framework widely applied to implementation related studies. Yet, few have used validated measures to operationalize constructs in CFIR in real-life settings. In this study, we operationalized selected CFIR constructs in an assessment to identify factors influencing implementation of evidence-based practices for increasing colorectal cancer screening in Community Health Centers (CHC).

Methods: We selected 16 constructs from all five domains of CFIR. Measures were developed and tested in a cross-sectional survey with CHCs’ clinical staff and leaders respectively. We performed a separate confirmatory factor analysis (CFA) for measures with three or more items, computed inter-item consistency (Cronbach’s alpha), inter-rater reliability (ICC) and agreement (rWG(J)) statistics, and assessed construct validity via inter-correlations among constructs at individual and organizational levels.

Results: A total of 277 individuals and 59 CHC clinics were included in the analysis. CFA showed satisfactory structural validity (CFI>0.90, TLI>0.90, SRMR<0.08, RMSEA<0.08); all measures showed reasonable reliability (alpha>0.70). The ICCs (>0.1) and rWG(J)s (>0.75) suggest it appropriate to aggregate individual responses by computing clinic means. Results also suggest good construct validity at both individual and clinic levels. Inner setting and process-related constructs are correlated with most variables across domains; correlations between outer setting and intervention characteristics and other domains vary more noticeably by construct.

Implications: Our study is one of the first to quantitatively measure constructs from all five domains of CFIR and demonstrate their psychometric properties. We depicted their inter-correlations at multiple levels, which set the foundation for establishing predictive models, causal pathways and developing interventions that target these factors. These findings could contribute to further development of the CFIR.


Measuring Implementation Climate: Context Matters

Background: Implementation climate is considered a primary driver of effective innovation implementation. However, issues surrounding the measurement of implementation climate, or the extent to which organizational members perceive that innovation use is expected, supported and rewarded by
their organization remain. Specifically, we examined whether implementation climate can be measured as a global construct, whether individual or group-referenced items should be used to measure implementation climate, and whether implementation climate can be assessed at the group or organizational level.

Methods: This research includes two cross-sectional studies with data collected via surveys. The first study assessed the climate perceptions of physicians participating in the National Cancer Institute’s Community Clinical Oncology Program. The second study assessed the climate perceptions of children’s behavioral health clinicians implementing a treatment innovation. To address our first objective, we used confirmatory factor analysis. To address the second and third objectives, we followed an established protocol, which includes exploratory factor analysis and correlations to assess differences between items and intra-class correlations, inter-rater agreement statistics to determine the appropriate level of measurement.

Results: Results indicated that implementation climate can be measured as a global construct reflecting expectations, support and rewards for innovation use. Results were mixed about how implementation climate should be measured and at what level. In our first study, where physicians were geographically dispersed and practice independently, there were no differences based on the type of items used, and little basis for assessing climate at the organizational level. In the second study, in which clinicians practice in a central location and interact more frequently, group-referenced items seemed more appropriate and implementation climate could be assessed at the organizational level. In sum, results were (study) context-specific.

Implications: These results advance implementation science by addressing measurement issues regarding a key construct that appears in widely used conceptual frameworks in the field. Funding Sources: This work was supported by the National Cancer Institute (R25CA116339 and R01CA124402) and the National Institute of Mental Health (T32MH019117) at the National Institutes of Health.
Testing a Comprehensive Model of Implementation and Sustained Use for EBTs for PTSD: A National Investigation in VA Residential Settings

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Panelists: Richard Thompson, PhD, University of Illinois at Chicago
Paula P. Schnurr, PhD, Dartmouth University and National Center for PTSD
Josef Ruzek, PhD, National Center for PTSD

Co-authors: Rani Hoff, MPH, PhD, VA Connecticut Healthcare System and Yale School of Medicine; Vanessa Simiola, MA, Yale School of Medicine; James C. Coyne, PhD, University of Pennsylvania

The national roll-outs of evidence-based psychotherapies in the Department of Veterans Affairs (VA) afford an unusual opportunity to study both implementation and sustainability. Although unique in some aspects of management and resources, the VA also serves as an excellent laboratory to understand the implementation of best practices as it is a more organized and controlled environment, free of the barriers faced in other more fragmented segments of the U.S. health care system. In a two-year NIMH grant, we utilized a theory-based model to collect baseline data regarding the adoption of two evidence-based treatments for Posttraumatic Stress Disorder (PTSD), Prolonged Exposure (PE) and Cognitive Processing Therapy (CPT), in a national sample of 38 VA PTSD residential treatment programs with over 200 providers. In a subsequently funded NIMH R01, we are extending our investigation with the same population and model to see: (1) how well PE and CPT are sustained over time, (2) what organizational and individual factors influence sustainability, and (3) what effects implementation and sustained use of PE and CPT have on patient outcomes. Implications for implementation in and outside of the VA health care system will be discussed.

Updates on Measurement of a Model of Implementation for Health Care: Advances Toward a Testable Theory
Richard Thompson

One comprehensive theoretical model for understanding implementation of innovations was initially developed by Rogers (1962) and elaborated on by others (Greenhalgh et al. 2005). This model construed implementation as a complex process influenced by five broad constructs: (a) perceived characteristics of innovation, (b) potential adopter characteristics, (c) communication and influence, (d) system antecedents and readiness, and (e) outer context. Although a considerable evidence-base was used to develop the model, the authors did not fully operationalize their model, making it difficult to test formally. Our group undertook a systematic review of the literature and, using an iterative process, we examined existing measures and utilized or adapted items. Where no one measure was deemed appropriate, we developed other items to measure the constructs through consensus. The review and iterative process of team consensus identified three types of data that could be used to operationalize the constructs in the model: survey items, interview questions and administrative data. Over three waves of data collection concerning the implementation of two evidence-based psychotherapies disseminated nationally within Department of Veterans Affairs, we have made changes to the quantitative measurement of aspects of this model including the exclusion of the measurement of some constructs (e.g., learning style, locus of control, tolerance of ambiguity) as well as refinement of others (e.g., needs, motivation, knowledge-seeking). This presentation will review these changes as well as psychometric properties of other constructs and their items.

Testing the Model Using Quantitative Data For Implementation of Two Evidence-Based Psychotherapies for PTSD In VA Residential Treatment Programs: Outcomes For Two Yearly Time Points
Josef Ruzek
This study examined the implementation of two evidence-based psychotherapies, Prolonged Exposure (PE) and Cognitive Processing Therapy (CPT), in the Department of Veterans Affairs (VA) residential Posttraumatic Stress Disorder treatment programs. The current analyses focused on continued implementation a year after an initial assessment of implementation and of provider and site variables thought to be related to implementation. Seventy-five providers from 38 programs provided complete quantitative data on both baseline and follow-up. At one year follow-up, there was continued effect of supportive organizational context (i.e., dedicated time and resources and incentives and mandates) on the implementation of both PE and CPT delivered in a group format. Unlike at baseline, effects of perceived characteristics of treatment on implementation of PE and of supportive organizational context on CPT delivered individually were no longer significant. Rather, social connections predicted a lower likelihood of implementation of CPT individually. These effects all remained, even after taking into account baseline levels of implementation.

Implementation of Two Evidence-Based Psychotherapies for PTSD In VA Residential Treatment Programs: Patient-Level Outcomes
Paula Schnurr

This presentation will discuss the effects of implementation of two EBTs for PTSD (PE and CPT) in the U.S. Department of Veterans Affairs (VA) residential treatment programs on patients’ PTSD symptom severity, alcohol and drug use, and treatment satisfaction. The instruments were administered to patients upon admission and four months post-discharge. The short form of the Mississippi Scale for Combat-Related PTSD was used to measure PTSD and alcohol and drug abuse were measured using the composite indexes from the Addiction Severity Index. Controlling for length of stay and baseline symptoms, implementation of PE and CPT predicted improvement in PTSD symptom severity and alcohol use. The implications of these findings are that two EBTs for PTSD can be feasibly and effectively disseminated to routine clinical settings and implementation produces favorable patient outcomes.
Improving the Management of Chronic Non-Cancer Pain in Primary Care: Results of a Multifaceted Quality Improvement Initiative

Chair: Daren Anderson, MD, Weitzman Institute/Community Health Center, Inc. 631 Main St., Middletown, CT 06457 Tel: 8603476971 | Email: khatrik@chc1.com


How the research advances dissemination and implementation research: The management of chronic pain poses a significant challenge for primary care practices, particularly those caring for medically underserved patient populations. Experience in the Veterans Health Administration (VHA) has demonstrated that implementation of a Stepped Care Model for Pain Management (SCM-PM) can improve outcomes for patients with chronic pain. In this project, we advance the dissemination and implementation research by describing the use of the Promoting Action on Research Implementation in Health Services (PARIHS) Framework to guide the adaptation, implementation, and dissemination of the SCM-PM to a non-VHA setting - a large, statewide Federally Qualified Health Center.

Funding: The primary source of funding for this project was the Mayday Fund.

Overall Project Implementation
Daren Anderson, MD

Background: Chronic pain is extremely common in safety-net practices. The Stepped Care Model for Pain Management (SCM-PM) has been shown to improve outcomes in the Veterans Health Administration (VHA) system. To examine whether this model is transferable to non-VHA settings we undertook a three-year quality improvement project to adapt and implement the SCM-PM in a large, statewide Federally Qualified Health Center.

Methods: This project used an observational mixed methods evaluation framework and used the PARIHS Framework to guide the design of the intervention. Study subjects included all patients and providers (PCPs) of the health center. The principal goals of the project were 1) to improve the screening for and management of routine pain complaints in primary care using basic tools and protocols to improve the assessment, documentation, treatment, and monitoring of pain; and 2) to provide additional resources and supports for PCPs to assist in managing more complex cases.

Summary of findings: The use of opioid treatment agreements among patients using opioids chronically (COT), increased from 49% to 64%. The number of COT patients with a urine drug test within the preceding six months increased from 867 (66%) to 1,097 (86%). Patients with a completed pain functional assessment increased from 428 (33%) to 589 (46%). The percentage of patients co-managed by an onsite behavioral health provider increased from 22.5% to 24.4%. Referrals to chiropractors also increased. There was a decline in number of patients with pain receiving any opioid prescriptions from 43% to 40%, and in those receiving COT from 17.5% to 15.9%. The percentage of patients with an episode of severe pain decreased from 74% to 61%. Surveys showed that CHCI PCPs expressed increased confidence in their ability to manage pain effectively and had an increase of 9.2% in pain management knowledge scores.

Identifying Patients with Chronic Non-Cancer Pain in Large Datasets
Ianita Zlateva, MPH

Objective/Background: To implement successfully the Stepped Care Model for Pain Management (SCM-PM) at our statewide Federally Qualified Health Center, we had to identify all patients with chronic non-cancer pain (CNCP). A straightforward method for identifying patients with CNCP solely using structured electronic health record (EHR) data does not exist. Individual data elements such as pain scores or
diagnostic codes (ICD9) are not sufficiently reliable or comprehensive. Our objective was to develop and validate an accurate method to identify patients with CNCP using EHR data.

Methods: We identified patients with CNCP in our EHR system using a comprehensive set of data elements including diagnostic codes, patient-reported pain scores, and prescription opioid medications. Reviews of the medical chart were used to evaluate the accuracy of these data elements in all their combinations. Based on these evaluations we developed an algorithm to more accurately identify patients with CNCP. The algorithm’s results were validated by comparing them with the documentation of chronic pain by the patient’s treating clinician in 381 random patient charts.

Results: The new algorithm, using pain scores, prescription medications, and ICD9 codes had a sensitivity and specificity of 84.8% and 97.7%, respectively. The algorithm was more accurate (95.0%) than pain scores (88.7%) or ICD9 codes (93.2%) alone. The Receiver Operating Characteristic was 0.981.

Discussion: The newly developed and validated algorithm uses a combination of readily available elements from the EHR system to accurately identify patients with CNCP. By applying the algorithm to our patient population, we were able to gain a better understanding of the extent of chronic pain and how it is managed in our health centers. This helped us to better tailor our implementation efforts to the needs of the patients with CNCP and their primary care providers.

Pain Care Quality Documentation Chart Reviews
Brent Moore, PhD

Objective/Background: The Veterans Health Administration (VHA) has engaged in a system-wide transformational effort to implement the Stepped Care Model of Pain Management (SCM-PM) as its single standard of care for Veterans with painful conditions. Successful organizational improvement processes typically rely on reliable metrics to establish targets for improvement and to monitor progress. This project examined the utility of the measure of Pain Care Quality (PCQ) documentation in evaluating implementation of the SCM-PM at one VHA healthcare system and to explore its generalizability in a non-VHA Federally Qualified Health Center undergoing a similar organizational improvement effort.

Methods: From 2009 to 2012 a comprehensive pain management performance improvement approach was implemented at the VHA. Two hundred progress notes per year (July 2008 – June 2012) were randomly sampled from VHA primary care prescribers of chronic opioid therapy (COT). Using the PCQ extraction tool, each note was reviewed and coded for the presence of key dimensions of PCQ documentation, namely pain assessment, treatment, and reassessment of outcomes. General Estimating equations (GEE) controlling for provider and facility, with post-hoc pair comparisons were used to examine changes in PCQ items over the four years. This approach was replicated in a multi-site FQHC for two consecutive years (2011-2012).

Results: Significant Improvements were noted in pain reassessment and patient education, with trends in improvement noted for pain assessment and treatment planning. Several specific dimensions of pain assessment and treatment planning also improved significantly, including documentation of functional assessments (p<.001). Although post hoc comparisons generally documented improvements over time, some variability across the four years of observation suggest that these trends are not entirely linear. Although none of the dimensions of PCQ at the FQHC were significant, results suggest trends in a positive direction across all dimensions of PCQ.
Improving Care Quality Through Hybrid Implementation/Effectiveness Studies: Best Practices in Design, Methods, and Measures

Chair: Amy N. Cohen, PhD, Psychologist/Health Services Investigator, Greater Los Angeles VA and University of California, Los Angeles
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Discussant: Alexander S. Young, MD, MSHS, Greater Los Angeles VA and University of California, Los Angeles

Panelists: Alison Hamilton, PhD, MPH, Greater Los Angeles VA and University of California, Los Angeles; Mona Ritchie, PhD(c), MSW, VA Mental Health QUERI, University of Arkansas for Medical Sciences

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Panel Overview Abstract: Implementation research is the scientific study of methods that promote systematic uptake of research findings and other evidence-based practices into routine practice, thereby improving the quality and effectiveness of health services. As the field has progressed over the past decades, substantial advances continue in the development and application of implementation-related theories as well as innovative implementation strategies and methods.

This session will provide three examples of implementation research studies that are designed to improve care through the use of evidence. The examples come from three health services areas: primary care, mental health, and HIV; from funded NIH and VA studies; and from community and hospital settings in rural and urban sites. Across the three examples, six different theories were used—providing ample examples of linking conceptual models and frameworks to study design, implementation strategies, and measurements. Each presentation will highlight the ways in which the conceptual theory was configured into the overall research design and evaluation, as well as common challenges and lessons learned while conducting implementation research.

Blended Facilitation to Enhance PCMH Program Implementation: Conceptual, Design, and Measurement Considerations

Integrated primary care mental health evidence-based programs improve care. The Department of Veterans Affairs mandated and provided limited national level implementation support for Primary Care – Mental Health Integration (PC-MHI) but VA facilities were slow to implement them. The Blended Facilitation study was funded by the VA to implement and evaluate an innovative implementation facilitation (IF) strategy that included a national external expert facilitator with expertise in implementation science and PC-MHI who mentored and worked with two internal regional facilitators to help clinics implement PC-MHI.

According to the PARIHS framework, successful implementation is a function of the dynamic interaction between evidence, context and facilitation. This presentation will describe how PARIHS guided the application of the IF strategy and the study’s design. For this quasi-experimental, Hybrid Type 3 study, we used mixed methods to test the effectiveness of the IF strategy and assess organizational context, perceptions of evidence, and facilitation activities. We used a consensus matching approach to select
sixteen clinics that were unlikely to implement PC-MHI without assistance across four VA regions. The RE-AIM framework guided our test of IF’s effectiveness using administrative data and program component interviews to measure RE-AIM dimensions. We conducted monthly debriefing interviews with and collected time data from facilitators and measured site level contextual and evidence factors through key informant interviews. We also conducted intensive case studies at four IF clinics to assess stakeholders’ perception of IF’s processes and value.

There are limited examples of Hybrid Type 3 studies and this is an excellent large-scale example of one that also details how the conceptual frameworks guide design, strategies, and measurement. This presentation will discuss the strengths and weaknesses of the conceptual framework, the IF strategy and the study design we selected and lessons we learned about the challenges of conducting implementation research within the context of a VA policy initiative.

**Implementing High Priority Evidence-based Practices for Individuals with Schizophrenia: Conceptual, Design, and Measurement Considerations**

Most individuals with schizophrenia receive about half of the indicated treatments that have been shown to improve quality of life and health. As a result, outcomes in routine practice are much worse than in state-of-the-art care. This gap in implementation--both in delivery and uptake of services--was addressed in the VA HSR&D QUERI-funded EQUIP study.

This Hybrid Type 2 study integrated two conceptual frameworks. The Simpson Transfer Model (STM) is a program change model that examines readiness to change at the organizational and provider levels and posits that research moves into practice through 5 phases: exposure, adoption, implementation, practice, and sustainability. Since the STM does not recommend specific behavior change tools, the PRECEDE model guided the choice of a multifaceted implementation strategy to influence the adoption of behavior changes necessary for implementation success and positive patient outcomes.

Across four states, eight specialty mental health programs were assigned to implementation or usual care. Two evidence-based services were targeted: Wellness and Supported Employment. Veterans with schizophrenia (n=801) and clinicians (n=201) were enrolled. At implementation sites, organizational readiness data were used to tailor implementation. The implementation strategy included patient-facing kiosks for routine assessment, evidence-based quality improvement methods, social marketing, opinion leaders, provider and patient education, and continual feedback to staff. Mixed methods were used to evaluate implementation and effectiveness. Patients and clinicians were surveyed and interviewed at baseline and 15 months. Intervention clinicians were also interviewed mid-study. A cost effectiveness evaluation was included.

This presentation will discuss the key decisions made in selecting the conceptual frameworks and how those decisions impacted the study design including preparation and implementation, measure choice, and assessment timing. This is one of the first studies to improve care quality in specialty mental health in diverse VA settings and therefore provides an excellent example for the application of integrated conceptual frameworks and a multifaceted implementation strategy.

**Implementation and Effectiveness of an Evidence-based Intervention in Community-based Organizations: Conceptual, Design, and Measurement Considerations**

The HIV/AIDS epidemic continues to disproportionately affect African American communities in the US, particularly those located in urban, resource-constrained areas. This five-year Hybrid Type 2 study investigates community-based implementation, effectiveness, and sustainability of ‘Eban II,’ an evidence-based risk reduction intervention for African-American heterosexual, serodiscordant couples.

Key decisions in the design of this study included how to balance investigating implementation and effectiveness (and resources associated with each), which models/theories to apply in order to guide organization-level implementation and couples-level behavioral change, which implementation strategies to select for optimal uptake, how to measure implementation, how to analyze organizational-level data,
how to capture implementation costs, and how to conceptualize and measure sustainability. Each of these decisions will be described in this presentation. Specifically, we will describe our: hybrid design and dynamic waitlisted effectiveness study, application of the Program Change Model (PCM, a phased model of organizational change) and social cognitive theory, selection of implementation strategies and tools for each phase of the PCM, quantitative and qualitative implementation and effectiveness measures/instruments, multi-level hierarchical modeling with a multi-level nested structure analysis, measures of implementation costs and potential cost savings, and approach to sustainability as defined by research-independent delivery of the intervention and relative use of technical assistance.

This study provides an excellent example of a funded study using a hybrid design in resource-constrained community settings. The study provides an illustration of the value of community supports and expertise throughout the study to shape the design, implementation strategies, and measurements. The impact of the organizational feedback and contingencies will be briefly articulated with regard to lessons learned for future community-based implementation studies.
Innovative Methods for Using Expert Panels in Identifying Implementation Strategies and Obtaining Recommendations for Their Use

Chair: Thomas J. Waltz, PhD, PhD, Assistant Professor, Eastern Michigan University
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Discussant: Enola K. Proctor, PhD, Washington University in St. Louis

Panelists: Byron J. Powell, PhD, Center for Mental Health Policy and Services Research, University of Pennsylvania; Thomas J. Waltz, PhD, PhD, Eastern Michigan University; Monica M Matthieu, PhD, LCSW, Saint Louis University

Co-authors: Matthew J Chinman, PhD, VISN 4 MIRECC, RAND Corporation; Jeffrey L Smith, MS, Department of Veterans Affairs Mental Health QUERI; Laura J Damschroder, MS, HSR&D Center for Clinical Management Research, Diabetes QUERI, VA Ann Arbor Healthcare System; Enola K Proctor, PhD, Washington University in St. Louis; JoAnn E Kirchner, MD, Mental Health Quality Enhancement Research Initiative (QUERI), Central Arkansas Veterans Healthcare System, University of Arkansas for Medical Sciences

A variety of research questions can be addressed using expert panels to synthesize existing knowledge and issue recommendations. Our three presenters will describe the use of innovative methods for engaging expert panels comprised of implementation scientists and clinical managers in complex recommendation processes to match implementation strategies with evidence based practices in real world service settings as part of the Veterans Health Administration (VA) funded ‘Expert Recommendations for Implementing Change’ (ERIC) project (QLP 55-025). The innovative sequence of methods used highlights the value of structured tasks that support transparent, quantitative characterizations of expert panel recommendations. The majority of this expert panel’s activities involved asynchronous use of a variety of software platforms, reducing logistical barriers often involved in engaging a large panel of experts. Activities that required synchronous consensus meetings also utilized technology to host structured discussions and post-discussion voting that provided participants with real time feedback on the recommendation outcomes. The sequence of methods employed in the ERIC project (Waltz et al., 2014) can serve as a model for developing context-sensitive expert recommendations for other dissemination and implementation initiatives.

Building Expert Consensus for Characterizing Discrete Implementation Strategies

Efforts to identify, develop, and test implementation strategies have been complicated by the use of inconsistent language and inadequate descriptions of strategies in the scholarly literature. A literature-based compilation of strategies was developed to address this problem (Powell et al., 2012); however, its development was not informed by the participation of a wide-range of implementation and clinical experts. This presentation describes our effort to further refine that compilation for use in the VA by establishing expert consensus on strategy terms, definitions, and categories that can be used to guide implementation research. Purposive sampling was used to recruit an expert panel comprised of implementation science experts and VA clinical managers. Specifically, a reputation-based snowball sampling approach was used in which an initial list of experts was developed by members of the study team. This list included the editorial board of the journal Implementation Science, Implementation Research Coordinators from the VA QUERI program, and faculty from the NIH-funded Implementation Research Institute. The Expert Panel was engaged in a three-round modified Delphi process to generate consensus on strategies and definitions. The first and second rounds involved web-based surveys that prompted comments on implementation strategy terms and definitions. The initial survey was seeded with strategy terms and definitions from the Powell et al. (2012) compilation. After each round, iterative refinements were made to the compilation based upon participants’ feedback. The third round involved a live, web-based polling process and consensus process that yielded a final compilation of 73 strategies and definitions. This presentation highlights the advantages and challenges associated with using asynchronous and live web-based methods for obtaining wide participation of experts.
Primary funding for this research was provided by the U.S. Department of Veterans Affairs Veterans Health Administration’s Mental Health Quality Enhancement Research Initiative (QLP 55–025).

**Concept Mapping: Harnessing the Power of an Expert Panel to Conceptualize Relationships among 73 Implementation Strategies**

After obtaining the compilation of discrete implementation strategies in the earlier phase of the Expert Recommendations for Implementing Change (ERIC) project, we were faced with a practical challenge of how to realistically ask experts to consider 73 different implementation strategies when making recommendations. One strategy to reduce the cognitive burden of a complex multicomponent recommendation development process is to organize strategies by similarity. Concept mapping is a method that allows you to engage an expert panel in a structured task that can be completed asynchronously and online. For this study, expert panel members were given a deck of virtual “cards”, each with one of ERIC’s 73 implementation strategies. Participants then sorted these cards into piles on the basis of similarity and then rated each strategy in terms of its relative importance and relative feasibility considering all 73 implementation strategies. The benefit of concept mapping is the ability to quantitatively characterize how your target audience conceptualizes a wide range of topics. For the ERIC project, concept mapping provided us with a structured, participant driven approach to organizing our data into 9 expert-derived categories. This organization scheme was then used to structure additional expert panel tasks. This presentation will focus on concept mapping as a tool for characterizing an expert panel’s shared understanding of key concepts to be used in a subsequent recommendation process. While data from the ERIC project will be used to illustrate this method, discussion will include how this method can be used to support active and structured stakeholder engagement in a variety of dissemination and implementation activities.

Primary funding for this research was provided by the U.S. Department of Veterans Affairs Veterans Health Administration’s Mental Health Quality Enhancement Research Initiative (QLP 55–025).

**Development and Application of a Menu-based Choice Framework to Structure Expert Recommendations for Implementing Complex Practice Changes in the VA**

The Expert Recommendations for Implementing Change (ERIC) project sought to utilize methods to support a highly structured and transparent recommendation process that actively engaged key stakeholders throughout the project’s execution. The ERIC project’s penultimate activity involves a menu based choice (MBC) task. MBC methods are used in consumer marketing research for product development and these tasks are useful for providing a context rich structure for making decisions that involve multiple elements. In ERIC’s MBC tasks, panelists were presented with 73 implementation strategies structured into nine categories. They were tasked with building multi-strategy implementation approaches for particular clinical practice changes being implemented across three settings, each with specific relative strengths and weaknesses (i.e., varying contextual characteristics).

The clinical practice changes were identified by national VA leadership as high priority areas for clinical quality improvement efforts (e.g., improving safety for patients taking antipsychotic medications, depression outcome monitoring in primary care mental health, prolonged exposure therapy for treating post-traumatic stress disorder). Scenarios describing these practice changes were developed using key informant interviews with front line providers, clinical managers, health service researchers, and implementation scientists. These experts all practice in the respective area and were able to provide common and realistic challenges they face in routine service delivery in VA settings. ERIC project staff then expanded the scenarios to address varying organizational contexts (e.g., organizational culture, leadership, evaluation infrastructure) and across levels of evidence (e.g., strength and quality, relative advantage, compatibility, adaptability). Stakeholders were repeatedly engaged in an iterative process of evaluating the scenarios for reliability, credibility, and transferability. This presentation will highlight the critical role partnering with key stakeholders plays in executing this structured recommendation method. Primary funding for this research was provided by the U.S. Department of Veterans Affairs Veterans Health Administration’s Mental Health Quality Enhancement Research Initiative (QLP 55–025).
Juvenile Justice-Translating Research Interventions for Adolescents in the Legal System (JJ-TRIALS): A Multi-site, Cooperative Implementation Science

Chair: Tisha Wiley, PhD, and Dionne Jones, PhD, Health Scientist Administrator, National Institute on Drug Abuse
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Discussant: Gregory Aarons, PhD, University of California, San Diego

Panelists: John Bartkowski, University of Texas at San Antonio; Steven Belenko, Temple University; Angela Robertson, Mississippi State University; Carl Leukefeld, University of Kentucky, Gail Wasserman, Columbia University

Supported by the National Institute on Drug Abuse

The purpose of this panel is to introduce and describe NIDA’s implementation science initiative for justice-involved youth. The goal of JJ-TRIALS is to test implementation strategies for improving the delivery of a continuum of evidence-based substance abuse services as well as improving prevention efforts (for HIV/STDs and substance use disorders) among 36 juvenile justice sites located in Florida, Georgia, Kentucky, Mississippi, New York, Pennsylvania, Texas, and the District of Columbia. The study is scheduled to go into the field July, 2015. The proposed panel will include 3 presentations and a discussant. The first paper describes Aaron’s (2011) the Exploration-Preparation-Implementation-Sustainment (EPIS) Model which provides the theoretical framework for the process improvement efforts. The implementation strategies that will be used in this study will also be presented. The second paper described research study design, methods and measures. The third paper describes the diverse settings in which this study will be initiated and will discuss the involvement of juvenile justice partners in the planning of the study protocol. The implications of JJ-TRIALS, including how it fits within NIDA’s portfolio, will be highlighted by the discussant.

Using the EPIS Model to Enhance Service Delivery in Juvenile Justice Agencies: Implementation Science in the Context of JJ-TRIALS
Authors: John Bartkowski, University of Texas at San Antonio, Ralph DiClemente, Emory University

Abstract: Juvenile justice (JJ) agencies have long faced service delivery challenges, particularly concerning substance use disorders (SUDs) among their clients. This paper describes the use of Aarons’ EPIS model as the implementation science framework governing JJ-TRIALS (Juvenile Justice-Translating Research Interventions for Adolescents in the Legal System). Given SUD prevalence among JJ clients, all youth served by the JJ system should be screened for SUDs, after which they should be referred (as needed) for evidence-based treatment and receive this vital service. JJ-TRIALS seeks to reduce unmet SUD needs by assisting JJ agencies in their efforts to implement best practices and improve service provision along a behavioral health cascade. Each phase of the EPIS model (Aaron, 2011)—Exploration, Preparation, Implementation, and Sustainment—is discussed conceptually and in relation to the JJ-TRIALS project. The Exploration phase features training in behavioral health and data-driven decision-making, after which an agency-identified goal is selected. The Preparation phase consists, among other factors, of decisions to adopt best practices in the pursuit of agency goals and the generation of an agency action plan. The Implementation phase is organized around Plan-Do-Study-Act (PDSA) cycles wherein progress toward agency goals is expected to be exhibited through the application of a series of PDSA cycles conducted by Local Change Teams (LCTs). Finally, the Sustainment phase is characterized by the implementation of key facets of the action plan that were shown to be effective during LCT-led PDSA cycles. The paper concludes by discussing the merits of Aarons’ EPIS model in JJ settings when compared with other implementation science paradigms and by reviewing EPIS model adaptations that were necessary to maximize this framework’s suitability for use in a JJ context. This project advances the field by addressing how EPIS can be fruitfully applied to enhance service delivery in JJ agencies.

An Overview of the JJ-TRIALS Study Protocol
Abstract: It is well established that a substantial proportion of adolescent offenders have substance abuse problems, and that linkage to services to identify and treat these problems is often lacking. Successfully linking young offenders (especially those under community supervision) to appropriate and effective services requires several steps that may involve different staff in different agencies. Efforts to reduce unmet behavioral health needs of youth involved in the juvenile justice system requires system-level change. The JJ-TRIALS study targets juvenile justice agencies and the treatment partners to which juveniles are referred in an effort to improve community behavioral health linkages. JJ-TRIALS will compare the effectiveness of two implementation interventions: a Core Intervention, that provides training to staff of juvenile justice agencies on behavioral health needs of juvenile offenders, evidence-based screening, assessment and treatment practices, and Data-driven Decision Making (DDDM) strategies to promote change across the EPIS phases, versus an Enhanced Intervention, that provides the Core interventions plus support for DDDM through facilitation and implementation teams. A clustered randomized design with a phased roll-out will be used to evaluate the effectiveness of the 2 Intervention arms (direct comparison and comparison of each to baseline). A total of 36 sites representing 7 states and the District of Columbia will be randomized to Core (n=18) or Enhanced (n=18) and to one of three start times (to facilitate management by Research Centers). Primary research questions address whether DDDM strategies and facilitation of DDDM tools/implementation teams improve (a) the provision and quality of services along a behavioral health cascade (screening, assessment, referral, and treatment of youth with substance use disorders) and (b) attitudes toward best practices among staff working with justice-involved youth. Exploratory research questions focus on aspects of the implementation process, inter-organizational collaboration, costs associated with each study arm, and youth outcomes.

Community Partner Involvement in a Juvenile Justice Behavioral Health Service Organizational Implementation Trial
Authors: Angela Robertson, Mississippi State University, Carl Leukefeld, University of Kentucky, Gail Wasserman, Columbia University

Abstract: Each of the six research centers (Columbia University, Emory University, Mississippi State University, Temple University, Texas Christian University, and University of Kentucky) involved in the JJ-TRIALS Cooperative established collaborative partnerships with a state-level juvenile justice agency during the development of their respective proposals. A representative from each of the participating juvenile justice systems committed to participate in the design, planning, and conduct of the research and to attend monthly conference calls and semi-annual in-person meetings of the Cooperative’s Steering Committee. The purpose of this presentation is to describe the diverse settings in which the JJ-TRIALS implementation study will be initiated and how partners are involved in designing the study protocol that is feasible for the sites, meets partners’ needs, and is scientifically rigorous.
Computational and Technical Approaches to Improve the Implementation of Prevention Programs

Chair: C Hendricks Brown, PhD, Professor, Northwestern University
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Discussant: Craig PoVey, Division of Substance Abuse & Mental Health, Utah Department of Human Services

Panelists: C Hendricks Brown, PhD, Northwestern University; Arthur Hjorth, PhD Candidate, Northwestern University; Carlos G Gallo, PhD, Northwestern University

Co-authors: Uri Welinsky, PhD, Northwestern University; Juan Villamar, MSEd, Northwestern University

Introduction: A potential new arena that could lead to major advances in implementation science involves the integration of computational and technologic approaches with behavioral and organizational sciences. While some attention has been given to the use of systems science methods, specifically agent-based modeling, social network analysis, and system dynamics, there is actually a much broader set of tools that could be used to improve adoption, assessment of fidelity, and sustainability. This panel provides a broad perspective and illustrates how such tools can aid implementation especially given the unique challenges in the prevention field.

Methods: In Brown et al (2013) we propose (1) the use of advance computational approaches to address implementation of effective prevention programs and (2) a general systems model to support the implementation of prevention programs. Regarding computational approaches, an automated fidelity system that uses computational linguistics is shown to provide reliable and cost-effective means for monitoring fidelity of a behavioral intervention. Also, a machine learning algorithm is used to monitor text and discover when organizations are or are not making consistent progress in implementation. Agent-based modeling using Netlogo is used to inform policy makers and community leaders regarding the impact they are likely to see in their communities. In terms of technology, a mobile phone app is used as a pilot for teachers, that is implementation agents, to improve the fidelity of delivering a prevention program.

Results: Computational approaches provide a platform in which to design and test tools that aid the implementation and dissemination of evidenced-based prevention programs.

Discussion: We discuss how these automation tools can be used to increase health equity as well as provide more cost-effective and supportive feedback systems for implementation.

Computational Approaches to Implementing Effective Programs to Prevent HIV in Minority Communities

C. Hendricks Brown, David C. Mohr, Carlos G. Gallo, Guillermo Prado, Sheppard G. Kellam, Hilda Pantin, Jeanne Poduska, Mitsunori Ogihara, Geoff Sutcliffe, Juan Villamar, Christopher Jacobs

Introduction: African Americans and Hispanics in the United States have much higher rates of HIV than non-minorities. There is now strong evidence that a range of behavioral interventions are efficacious in reducing sexual risk behavior in these populations. Although a handful of these programs are just beginning to be disseminated widely, we still have not implemented effective programs to a level that would reduce the population incidence of HIV for minorities.

Methods: We proposed that innovative approaches involving computational technologies be explored for their use in both developing new interventions and in supporting wide-scale implementation of effective behavioral interventions. Mobile technologies have a place in both of these activities. First, mobile technologies can be used in sensing contexts and interacting to the unique preferences and needs of individuals at times where intervention to reduce risk would be most impactful. Second, mobile technologies can be used to improve the delivery of interventions by facilitators and their agencies. Systems science methods including social network analysis, agent-based models, computational
linguistics, intelligent data analysis, and systems and software engineering all have strategic roles that can bring about advances in HIV prevention in minority communities.

Results: We first illustrate how 8 areas in the implementation process can use innovative computational approaches to advance intervention adoption, fidelity, and sustainability. We next discuss how a mobile app can improve implementation of the Good Behavior Game, a behavioral intervention delivered by teachers in first-grade classes. Thirdly we describe how machine learning can automate assessment of the implementation stages of the Familias Unidas intervention, which is delivered to families of Hispanic adolescents.

Implications: These methodologies have promise in overcoming the large number barriers in addressing implementation challenges especially for prevention.

Funding: The Center for Prevention Implementation Methodology was funded by NIDA under P30 DA027828.

Using Agent-Based Modeling to Visualize the Effects of Prevention Implementation Strategies for Policy
Arthur Hjorth, Uri Wilensky, Juan Villamar, C Hendricks Brown

Introduction: In contrast to treatment, the effects of behavioral prevention programs are challenging to see, as it is the absence of problem behavior, diagnoses, and disorders that characterize successful programs. Lessening such outcomes, often occurring over years and never completely extinguished, are not at all evident for policy makers or community leaders. In considering whether to implement a prevention program, community leaders would like to visualize how outcomes would be affected by such a program and compare projected outcomes in real-time.

Methods: In response to this need, we have developed a NetLogo agent-based model as a general visualization tool to compare outcomes with, as well as without, implementing such an intervention. Agent-based modeling is a computer-based simulation approach in which the modelers specify behaviors at the agent-level and explore the system-level outcomes that emerge. Its focus on interactions among heterogeneous individuals makes it particularly well-suited for studying implementation of behavioral interventions. The model can be customized to the risk and protective factors of the existing community, developmental trajectories of subjects with and without exposure to an intervention, much like viewing two movies side by side with different endings.

Results: This side-by-side comparison uses input from longitudinal studies, preventive and implementation trials to simulate short and longer-term outcomes. We illustrate this approach by examining the effects of the Good Behavior Game, a prevention program tested in first grade that reduces aggressive disruptive behavior as well as long-term sequelae of drug abuse/dependence disorder, conduct disorder, juvenile and adult arrests, and suicidal ideation and attempts. We highlight how interactions among highly aggressive youth in classes where aggression is normative versus non-normative lead to differential effects. Implications for when implementation of this program is likely to have maximal impact are given.

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Using Computational Linguistics to Overcome Implementation Barriers in Fidelity Assessments of a Behavioral Intervention
Carlos G. Gallo, Hilda M. Pantin, Juan Villamar, Guillermo Prado, Maria Tapia, Mitsunori Ogihara, Gracelyn Cruden, C Hendricks Brown

Research Goals: Careful fidelity monitoring and feedback are critical to implementing effective interventions. Most procedures to assess fidelity are derived from observational assessments [2]. However, these fidelity assessments are resource intensive for research teams in efficacy/effectiveness trials, and often unattainable or unmanageable for host organizations. Thus, it is difficult to evaluate when
the intervention is implemented on a large scale. Our goals are to 1) operationalize fidelity using a rule based system, and 2) develop tools that use these rules to assess fidelity automatically.

Methods: Our data consists of 40 video taped sessions from the effectiveness trial of the Familias Unidas, an evidence-based, family-centered preventive intervention found to be efficacious in reducing conduct problems, substance use, and HIV sexual risk behaviors among Hispanic youth. We use an innovative mixed methods approach to 1) uncover linguistic patterns linked to "joining," which measures the quality of the working alliance of the facilitator with the family, 2) to use computational linguistics to reduce human effort and provide real-time fidelity assessments to supervisors. Quantitative assessments of reliability are provided. Kappa scores between a human rater and a computer rater for the new method for measuring joining reached 0.83.

Implications for D&I: Early findings suggest that this approach can reduce 1) the high cost of fidelity measurement, 2) the time delay between session delivery and fidelity feedback to facilitators, 3) the number of sessions (~90%) for which fidelity is not assessed. This approach also has the potential for informing parent training intervention theory about effective language to engage participants.

Funding: Support for this research was provided by the Center for Computational Science at the University of Miami and Department of Psychiatry and Behavioral Sciences at Northwestern University.
Advancing the Science of Dissemination and Implementation: Three “6th NIH Meetings” on Training, Measures, and Methods

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Discussant: Gregory Aarons, Ph.D., University of California, San Diego

Panelists: C Hendricks Brown, PhD, Northwestern University; Christopher Carpenter, MD, MSc, Washington University in St. Louis

Co-authors: Gila Neta, PhD, MPP, National Cancer Institute; Russell Glasgow, PhD, University of Colorado, Boulder; Jeremy Grimshaw, PhD, University of Ottawa; Borsika Rabin, PhD, MPH, PharmD, National Cancer Institute; Maria Fernandez, PhD, University of Texas; Ross Brownson, Washington University of St. Louis; Geoff Curran PhD, VA / UAMS; Brian Mittman PhD, VA / Kaiser; Linda Collins, PhD, Penn State; Larry Palinkas, PhD, University of Southern California; Naihua Duan, PhD, Columbia University; Andrea Wallace, PhD, RN, University of Iowa; Ken Wells, PhD, University of California, Los Angeles; Rachel Tabak, PhD, Washington University of St. Louis

Introduction: Building on momentum in five NIH-supported meetings, “Advancing the Science of Dissemination and Implementation,” the NIH convened three separate meetings during 2013-4, each addressing an overarching issue: "Developing a field-based approach to D&I research training"; "Measurement & Standardized Reporting"; and “Fit between Investigation and Research design?”

Methods: Meeting themes were selected by the NIH D&I Workgroup, addressing pressing needs in the field and high-demand topics from prior meetings. Targeted groups of participants were invited to the meetings, each led by a team of researchers and NIH staff.

Results: The training meeting yielded a map of current training, a field wide training vision, and a set of tensions—notably training for a rapidly evolving field. The research design workgroup produced a common terminology that crosses diverse fields of medicine and public health as well as disciplines, and categorized 27 different designs that have been used for dissemination and implementation research. The reporting workgroup identified four broad areas, planning, delivery, evaluation, and long-term outcomes as well as cross-cutting issues to provide reporting consistency. The meetings further generated a set of issues that cross-cut the three topics, including how to reflect the evolution of measurement, design and reporting within training programs and how to train reviewers, editors, decision-makers, and practitioners?

Discussion: The three issue-focused meetings provided opportunity to take stock of the field ten years after the initial NIH D&I meeting and generated papers that both synthesize the stimulate important advances for the field.

Developing Dissemination and Implementation Reporting Guidelines
Authors: Christopher Carpenter, MD, MSc (Washington University, St. Louis), Gila Neta, Ph.D., MPP, (National Cancer Institute), Russell Glasgow, Ph.D., (University of Colorado- Boulder), Jeremy Grimshaw, Ph.D., (University of Ottawa), Borsika Rabin, Ph.D., MPH, PharmD, (National Cancer Institute), Maria Fernandez, PhD, (University of Texas), Ross Brownson (Washington University, St. Louis)

Introduction/Objectives: Reporting guidelines improve the overall depth and quality of manuscripts across specialties and journals. No reporting guidelines for Dissemination and Implementation (D&I) research yet exist. We sought to develop a framework from which D&I reporting guidelines can be derived and to identify ideal metrics.
Methods: The National Institutes of Health held a series of invited state-of-the-science meetings to address key gaps and opportunities in D&I research in 2013. One of these focused on reporting and evaluation/measurement. This workgroup's objective was to identify key areas in need of better measurement and reporting at all stages of D&I research.

Results: The workgroup concluded that the existing plethora of reporting guidelines mandated additional exploration before deriving D&I-specific reporting guidelines, and decided that a D&I framework divided into the planning, delivery, evaluation, and long-term outcome phases of research was an essential first-step.

Discussion: The overriding objective of the D&I framework was to improve population health, health equity, social well-being, and health system efficiency. The workgroup identified the following stages to be essential: Planning: D&I intervention's evidence-basis and mechanism of change, setting characteristics like organizational capacity for change and resources, evaluability and scalability of the implementation strategy, key partnerships, and study design. Delivery: reach; adoption; implementation fidelity, dose, adaptation, and costs. Evaluation: primary outcome effectiveness including measured unintended consequences; explicit description of settings and intervention adaptation, including PRECIS criteria for pragmatism, and robustness of implementation effort. Long-term Outcomes: sustainability, evolvability, transportability; conditions under which the findings hold; and an economic evaluation. In addition, participants identified multiple cross-cutting elements extending across all stages, including: multilevel context; multiple stakeholder perspectives; and societal costs. The next step is to contrast existing reporting guidelines with this new D&I framework to highlight overlap or deficiencies relative to complete and consistent D&I research reporting, and to identify appropriate measurement instruments.

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An Overview of Research Designs for Dissemination and Implementation

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Introduction: The fields of medicine and public health have made great progress in determining whether an intervention is efficacious or effective by conducting carefully crafted randomized clinical trials. In contrast to these designs to evaluate an intervention’s efficacy or effectiveness, the designs for dissemination and implementation (D&I) research are not yet well established, a factor that has no doubt has impeded developing our knowledge of effective D&I. By its very nature D&I research is intimately connected to understanding how programs, practices, or policies work in different contexts, so there is more attention in D&I research on external validity, as contrasted to the heavy emphasis on internal validity that many of the randomized efficacy and some effectiveness trials address.

Results: This presentation is a product of a workgroup meeting of 10 scientists and NIH staff, convened by NIH to facilitate D&I research. This committee addressed differences in terminology and provided a summary of the designs that have been used in D&I research, including both randomized and non-randomized studies. We identified 27 designs and found it useful to categorize these designs into several broad categories. One category of designs involves what can be termed the “traditional translational pipeline” of interventions that move step by step from efficacy, to effectiveness, to implementation research. A second major class of designs involves “hybrid designs,” which combine elements of effectiveness and implementation research in one single design. Thirdly, we describe designs that are focused on quality improvement as the primary goal, in contrast to producing generalizable knowledge. Several of these latter designs borrow from diverse areas of engineering.

Discussion: We provide illustrations of these alternative designs and discuss cross-cutting issues, including community engagement and ethics in conducting implementation research.

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Advancing the Science of Dissemination and Implementation: Training, Measures, and Methods
Author: Enola Proctor, PhD, MSW, Washington University in St. Louis

Introduction: Demand for training in the science of dissemination and implementation is high, reflected in oversubscribed registrations for the NIH meetings on Advancing the Science of D&I and applications to existing training programs. D&I training is provided in a small number of national programs, but given local university courses and degree programs and the growth of on-line webinars, a field-wide perspective on training is needed.

Methods: NIH convened a meeting of representative U.S. and Canadian trainers and trainees to in September 2013 to assess the field, identify cross-cutting themes, and develop a field-based training vision.

Results: The training meeting yielded a map of current training, including NIH funded summer training institutes, a handful of Master’s and PhD programs, individual graduate courses, CTSA Cores, and on line webinars. Program aims, participants and funding sources vary, as do training deliverables (content, skills, certificates, degrees, grant applications). Training gaps were identified, including programs at the doctoral level and those designed for decision-makers, and practitioners. Several serious challenges were identified, including: shaping and continually evolving training for a rapidly advancing field, establishing boundaries with related fields, targeting appropriate levels of training specificity versus generality, and sustaining high-intensity training. The meeting also generated issues that cross-cut with the measures/reporting and research design meetings. Participants underscored the importance of a regular national meeting to provide an intellectual home for those trained in D&I. Meeting products will include papers for publication reporting a field-based training vision.

Discussion: The meeting yielded a map of current training in dissemination and implementation research as well as gaps and needs to be met through new training initiatives and a repository of training resources.

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Evaluation of an Implementation Facilitation Strategy for Settings That Experience Significant Implementation Barriers

Chair: Mona J. Ritchie, PhD(c), MSW, Co-Implementation Research Coordinator, VA Mental Health QUERI, University of Arkansas at Fayetteville, University of Arkansas for Medical Sciences
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Discussant: Amy Kilbourne, PhD, MPH, VA QUERI, VA Ann Arbor Healthcare System, University of Michigan Medical School

Panelists: JoAnn E. Kirchner, MD, VA Mental Health QUERI, University of Arkansas for Medical Sciences; Louise E. Parker, PhD, VA Mental Health QUERI, University of Massachusetts; Mona J. Ritchie, PhD(c), MSW, VA Mental Health QUERI, University of Arkansas at Fayetteville, University of Arkansas for Medical Sciences

Co-authors: Geoff Curran, PhD, Central Arkansas Veterans Healthcare System; John Fortney, PhD, University of Washington; Jeff Pitcock, MPH, VA Mental Health QUERI; Laura Bonner, PhD, VA Puget Sound Healthcare System

Though several implementation and quality improvement strategies have been shown to be effective in implementing programs and practices in routine clinical settings, little work has been done in developing and testing implementation strategies in settings that experience significant implementation barriers. This VA funded study evaluated a highly partnered implementation facilitation (IF) strategy within the context of a Department of Veteran Affairs (VA) mandate for implementation of Primary Care–Mental Health Integration (PC-MHI). The IF strategy consisted of a national expert external facilitator (NEEF) and two internal regional facilitators (IRFs) who partnered with regional, medical center, and clinic leadership and staff in two VA regional networks to implement PC-MHI. Facilitators helped partners design/adapt their PC-MHI programs, develop site-specific implementation plans, and identify/address implementation barriers. They also identified and engaged key stakeholders at all organizational levels; conducted academic detailing, marketing, staff training, patient education, formative evaluation, and audit and feedback; assisted with technical issues; and established learning collaboratives. The NEEF had expertise in the evidence-base for PC-MHI and implementation activities. The IRF had protected time to support implementation activities, was embedded within the clinical organization at the regional level, and was familiar with local and regional organizational structures, procedures, culture, and clinical processes. We used a quasi-experimental, Hybrid Type III design and mixed methods to test effectiveness of the IF strategy and document IF activities. National VA MH leadership has adopted this IF strategy for sites facing challenges adopting evidence-based practices. This panel presents findings from the project’s three components: A quantitative study of facilitation outcomes, a qualitative study of the facilitation process and its outcomes, and a qualitative study of facilitation skill transfer.

Quantitative Outcomes of Using Facilitation in Implementing Primary Care – Mental Health Integration
JoAnn E. Kirchner, MD, Mona J. Ritchie, MSW, PhD Candidate, Jeffery A. Pitcock, MPH, Louise E. Parker, PhD, Geoffrey M. Curran, PhD, John C. Fortney, PhD

The study tested the effectiveness of the implementation (IF) strategy hypothesizing that, compared to national technical assistance support alone, national support plus IF would improve implementation of PC-MHI.

The RE-AIM (Reach, Effectiveness, Adoption, Implementation, and Maintenance) Framework guided testing of the IF strategy’s effectiveness. Two regions were recruited to receive the IF strategy and two matched regions were recruited for comparison. Regional MH leadership identified PC clinics unlikely to implement PC-MHI without assistance. PC clinics in comparison regions were matched to clinics in IF regions. The sample included 14 PC clinics, 174 PC providers and 98,758 PC patients. To evaluate implementation outcomes, administrative data was extracted for two six month periods, 9-15 months and
21-27 months following completion of an implementation plan at IF clinics. Generalized estimating equations were used to control for observations clustered within sites.

For the first six month period, primary care (PC) patients at clinics receiving IF were more likely to be seen by PC-MHI providers (Reach) (OR=8.93, p<0.001) than patients at comparison clinics. PC providers were more likely to refer at least one patient to PC-MHI (Adoption) (OR=7.12, p=0.029) than providers at comparison clinics and a greater proportion of PC providers’ patients were referred to PC-MHI (Adoption) (β=0.027, p<0.001) at IF clinics. There was no difference between IF and comparison clinics in the likelihood of patients being referred for a first time visit to specialty mental health care (Effectiveness) or the percentage of patients receiving same day access to PC-MHI (Implementation). Similar results occurred during the second six month period (Maintenance).

This study documents the effectiveness of IF compared to technical assistance in the VA PC-MHI mandate and provides an evidence-based intervention for sites unable to implement programs without additional assistance. VA MH leadership has adopted the IF strategy for sites facing challenges adopting evidence-based practices.

Examining Inside the Black Box of Implementation Facilitation: Process and Effects on Program Quality
Louise E. Parker, PhD, Mona J. Ritchie, PhD(c), MSW, Laura Bonner, PhD, JoAnn E. Kirchner, MD

We explored inside the IF black box to document how the process changes over time and in response to circumstances. Specifically, we conducted monthly qualitative debriefings with the facilitators and semi-structured interviews with the facilitators and clinicians and managers at clinics, affiliated medical centers and regional networks over a two and half year period. Additionally, we asked experts to rate program quality and fidelity to evidence at the IF clinics and their matched comparisons.

Based on a qualitative content analysis, we determined that although certain IF activities tended to occur predominantly during particular periods, ever evolving context dictated the presence and intensity of most activities at particular times and in particular places. We observed systematic differences between the two regions and identified both regional and facilitator characteristics that may explain these differences. We also examined what facilitators, clinicians, and managers valued most about facilitation and found systematic variation. We explored the widely held assumption that facilitation activities fall into two broad categories, “doing” for others and “enabling” others to do things for themselves. We found that although some activities appear to fit exclusively into one category, most do not.

Additionally, we examined the IF’s effect on clinics’ ability to implement evidence-based and high quality programs. Midway through the study, seven IF but only three comparison clinics had implemented a program; experts rated IF clinic programs’ quality and adherence to evidence most highly. At the end of the study, all IF but only five comparison clinics had programs. All but one IF clinic had a higher rated program than its comparison.

In summary, we found that IF can foster implementation of high quality and evidence-based practices. We also found that facilitation activities do not occur according to a defined series of stages but rather flexibly in response to local circumstances.

Transferring Implementation Knowledge and Skills to Improve Healthcare Delivery Systems
Mona J. Ritchie, MSW, PhD Candidate, Louise E. Parker, PhD, JoAnn E. Kirchner, MD

We explored how experts in implementation facilitation (IF) can help healthcare system change agents learn how to facilitate implementation of evidence-based programs. For two and a half years, we conducted monthly debriefing interviews with a national expert external facilitator (NEEF) who was mentoring and coaching two internal regional facilitators (IRFs) in facilitating implementation of a VA policy initiative for Primary Care-Mental Health Integration (PC-MHI) at eight primary care clinics. Interviews focused primarily on the NEEF’s efforts to help the IRFs become experts in IF processes. We
also conducted two semi-structured qualitative interviews with each facilitator, midway through and at the end of the intervention.

Our qualitative content analysis revealed that although the NEEF helped IRFs learn general implementation facilitation knowledge and skills, the NEEF also identified IRFs’ individual strengths and weaknesses and tailored mentoring and coaching activities to their characteristics. The NEEF used a variety of methods to help IRFs learn IF skills, including both active methods (providing information, modeling and coaching) and participatory ones. She also used cognitive supports (making thinking visible, using heuristics, sharing IF experiences) and psychosocial supports, as well strategies to promote self-learning. Additionally, the NEEF tailored the process to sites’ implementation needs. Over time, the NEEF pulled back from IRFs, increasingly turning responsibility for IF activities over to them. IRFs responded differently to this process with one IRF independently “breaking away” and the other being “pushed out of the nest.” In addition to helping IRFs learn the skills they needed for facilitating PC-MHI implementation, the NEEF helped IRFs to identify and modify interpersonal styles that could hinder success of facilitation efforts.

This study addresses the critical but understudied area of how implementation scientists can transfer facilitation skills that incorporate evidence-based implementation interventions and strategies to internal change agents to help healthcare organizations implement effective programs.