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Analysis of Barriers to Implementation of the Defense Health Agency Procedural Instruction (DHA-PI) on Pain Management and Opioid Safety in the Military Health System

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DISCLAIMER: Due to the impact of the COVID19 Pandemic, 2020 graduates of the Daniel K. Inouye Graduate School of Nursing were deemed critical to the mission of caring for the health of the nation and had an accelerated graduation. All phases of the DNP Project were complete and met the standards and rigors of a quality DNP Project with an abbreviated dissemination timeframe.

Abstract

Phase II Site: Keesler Air Force Base

Project Title: Analysis of Barriers to Implementation of the Defense Health Agency Procedural Instruction (DHA-PI) on Pain Management and Opioid Safety in the Military Health System (MHS).

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Background: DHA-PI 6025.04 provides the MHS, an evidenced-based framework for pain management guided by clinical practice guidelines. Additionally, it seeks to establish the MHS Stepped Care Model for Pain Management (SCM-PM) for standardization of care across the enterprise, education to clinicians, clinical decision support tools, and pain research. The DHA-PI implementation and execution have been identified as an area of improvement at Keesler Medical Center (KMC) by stakeholders.

Clinical Question: What are the barriers to implementation of DHA-PI 6025.04 at KMC using the Consolidated Framework for Implementation Research (CFIR), as the basis of analysis?

Project Design: Semi-structured interviews of stakeholders as detailed in DHA-PI 6025.04 at KMC. Each interview was conducted using open-ended standardized questions selected from the CFIR construct domains. Using the CFIR-Expert Recommendations for Implementing Change (ERIC) matching tool, interviewee data were coded, aggregated, and analyzed. Data was used to identify the top ERIC strategies that provide the most benefit in addressing the implementation of the DHA-PI.

Analysis of Results: Assessment of data indicates considerable heterogeneity in opinions regarding barriers to implementation. Of the CFIR constructs, approximately 10% were

identified as the most pressing barriers. Nine Tier 1 and 30 Tier 2 ERIC strategies were identified as the most likely approaches to address the barriers to implementation.

Organizational Impact: Adopting targeted strategies to the most significant barriers identified in this study will assist in implementing DHA-PI 6025.04 at KMC. Implementing this procedural instruction will enable the organization to provide a standardized, evidence-based platform for pain management services that effectively treats acute and chronic pain for beneficiaries.

Introduction

Poorly managed chronic pain has profound economic implications in the provision of healthcare and can lead to adverse patient outcomes (Institute of Medicine, 2011). The DHA recently disseminated DHA-PI 6025.04, which mandates compliance with the Department of Veterans Affairs and Department of Defense (VA/DoD) clinical practice guideline (CPG) for the management of opioid therapy for chronic pain, management of acute pain, and promote non-pharmacological treatments. DHA-PI adherence has been identified as an area of improvement by stakeholders at KMC. This project intends to analyze the factors that are inhibiting the implementation of the DHA-PI within KMC. The end goal is to provide recommendations that can be implemented to optimize pain management, opioid safety, and enhance patient outcomes.

Significance of the Problem

Chronic pain, which is defined as pain lasting longer than three months, is a pervasive and costly diagnosis (Lipman & Webster, 2015). According to the Institute of Medicine, roughly 100 million Americans suffer from chronic pain (2011). The prevalence of chronic pain in U.S. adults is anywhere from 2% to 40% and is known to increase with age (Walk & Poliak-Tunis, 2016). The Institute of Medicine estimates nearly $300 billion is lost annually due to decreased work productivity associated with chronic pain, which leads to missed workdays, lost wages, and reduced work hours. Additionally, annual healthcare costs associated with chronic pain are estimated to be between $261 and $300 billion. The annual medical cost of treating and managing chronic pain is higher than the expenses affiliated with cancer, diabetes, or heart disease (Institute of Medicine, 2011).

The DHA-PI directs each facility to establish the MHS Stepped Care Model for pain management (SCM-PM). Additionally, it mandates the appointment of a Primary Care Pain

Champion (PCPC), pain management education, provides medication assistance therapies (MAT) for substance use disorders (SUD), monitors prescription practices amongst providers, and initiates a quality improvement program (DHA, 2018). Implementing DHA-PI 6025.04 would facilitate an evidence-based, standardized approach in managing patients with both acute and chronic pain.

KMC, as the first United States Air Force hospital aligned under the auspices of DHA, has not implemented the DHA-PI. This Doctor of Nursing Practice (DNP) Project was developed in response to a newly published DHA-PI mandating the standardization of pain management practices throughout the Military Health System (MHS).

Clinical Question

What are the barriers to implementation of DHA-PI 6025.04 at KMC using the Consolidated Framework for Implementation Research as the basis of analysis?

Relevance to Military Nursing

According to the American Association of Colleges of Nursing (2006), the Doctor of Nursing Practice prepared advanced practice registered nurse (APRN) can recognize pain management as a population health concern that is amenable to quality improvement (QI) initiatives and policies. One of these communities is the military healthcare system, where there is an overall increased incidence of chronic pain when compared to patients managed through civilian healthcare organizations (Toblin, Mack, Perveen, & Paulozzi, 2011). Chronic pain is a pervasive diagnosis in military service members attributed to operational and physical training requirements (Toblin et al., 2011). It has a profound adverse impact on military readiness; in fact, chronic pain is the most common reason to curtail a service member's deployment and is a contributing factor to early military discharge (Amoroso, 2004). With the current downsizing of

military forces, the ability of providers to appropriately manage pain is imperative for retaining experienced personnel and ensuring medical readiness (Pujol, Sussman, Clapp, Nilson, Gill, & Boge, 2015). The Advanced Practice Registered Nurse (APRN) has the educational preparation to implement pain management initiatives, such as DHA-PI 6025.04, in enhancing patient outcomes and optimizing military readiness.

Focus Areas

The focus of this project is to identify the barriers in implementing DHA- PI 6025.04 within KMC. These barriers were identified through a series of semi-structured questions and qualitative interviews with key executive leadership personnel, including the Chief of Medical Staff, Chief Nurse, Chief Pharmacist, Chief of Clinical Quality, and the Medical Operations Squadron Commander, among others (Opioid Therapy for Chronic Pain Work Group, 2017). Interviews were conducted by project team members utilizing a standardized questionnaire synthesized from the Consolidated Framework for Implementation Research. Barriers identified via the interviews were then matched to evidence-based implementation strategies using the Expert Recommendations for Implementing Change (ERIC) process. This process entailed the utilization of a validated query tool that analyzes barriers and ERIC implementation strategies as weighted constructs. These strategies were developed and refined from experts in the field of implementation science (Powell et al., 2015). Recommendations were briefed to stakeholders after implementation strategies were identified for the most significant barriers.

Organizing Framework

CFIR is a framework that provides standardized implementation constructs that can be applied across the spectrum of implementation research. CFIR consists of five domains (Intervention Characteristics, Outer Setting, Inner Setting, Characteristics of Individuals, and

Process) divided into 39 constructs (see Appendix B). These domains can be used to analyze potential barriers or facilitators to a project's implementation. Users of the questionnaire have the flexibility not to address each of the constructs as each evaluation may focus on specific aspects; for example, a study by Damschroder & Lowery (2013), only used 31 of the 39 constructs due to the setting the study was conducted. The framework is additionally useful because it can be used in any phase of a project's implementation and has been validated both in and out of hospital settings as well as other nations (Kirk et al., 2016).

Project Design

General Approach

The project was designed to evaluate the barriers to implementation of DHA-PI 6025.04. The team's goal was to conduct standardized interviews of stakeholders, as designated in the DHA-PI. Ten interviews were completed. However, several key leaders were unable to be interviewed due to scheduling or a self-perceived limited role in the implementation of this particular DHA-PI. Despite only interviewing ten individuals, a review of the literature illustrates that 92-95% of the most relevant ideas can be obtained with just ten interviews (Turner-Bowker et al., 2018; Weller et al., 2018).

Setting

Keesler Air Force Base (KAFB) is located along the Mississippi Gulf Coast in the city of Biloxi. The base is one of Air Force Education and Training Command's initial training locations for multiple Air Force occupations, with a student throughput of approximately 28,000 student trainees per year, as well as over 7,800 active-duty personnel, permanently assigned to the base. KMC provides over 140,000 outpatient appointments annually (Keesler Air Force Base, n.d.).

Procedural Steps

Data Collection

The interviews were conducted face-to-face using open-ended standardized questions selected from the CFIR Guide Interview Guide Tool. The interview questions encompassed all five domains and omitted several constructs due to the lack of relevance to our population (see Appendix C) (CFIR Research Team-Center for Clinical Management Research, 2020). The interviews were standardized to 30 minutes, primarily due to the interviewee's positions within the organization and associated time constraints. The conversations were captured using computer typed notes and recordings of each session. Individual interviews were then analyzed by each team member using the CFIR Codebook as a guide, which had inclusion and exclusion criteria for each construct to determine if the interviewee considered the construct as a barrier (CFIR Research Team-Center for Clinical Management Research, 2014). Each barrier per interviewee was then inputted into the CFIR-ERIC Matching Tool version 1.0. The tool then calculated which strategies applied to each barrier using a weighted algorithm. The tool characterized each approach into Tier 1 or 2 strategies in which Tier 1 strategies were those considered a high probability of affecting implementation and were noted as those ranked higher than 50%. In comparison, Tier 2 consisted of those strategies between 20-49% (CFIR Research Team-Center for Clinical Management Research, 2018).

Sustainment

We anticipate relaying our findings to the PCPC and brief KMC key stakeholders upon completion of the project. Our project will be sustained long-term by the primary and alternate PCPC. Key to the sustainment of the DHA-PI will be the capacity of KMC to stand up as a

robust DHA market and the continued effort of stakeholders in conveying the value of DHA-PI 6025.04 as an essential aspect of readiness. We expect further studies by future Uniformed Services University (USU) cohorts to refine and expand on the ideal implementation strategies across KMC.

Dissemination

Approval to disseminate will be obtained through the KAFB Public Affairs Office (PAO). The results will be made available to the interviewed KMC stakeholders. Furthermore, results will be furnished to USU students, faculty, family members, and the staff of the Henry M. Jackson Foundation for the Advancement of Military Medicine when finalized. Plans for publication have been discussed amongst the team and will be pursued following the symposium.

Health Insurance Portability and Accountability Act (HIPAA) Concerns and Institutional Review Board (IRB) Review

Our project entailed the application of CFIR constructs to gauge the challenges in the implementation of DHA-PI and offer recommendations for improvement. The project did not require approval by the MDG's privacy board as the data collection process does not require accessing protected health information (PHI) in the electronic health records (EHR). As a safeguard, though, we submitted the project through the DHA IRB to ensure compliance with all regulatory requirements. (Letter of Determination is attached)

All data collected conformed to the strict standards established in the Health Insurance Portability and Accountability Act (HIPAA) of 1996 (Office for Civil Rights, 2013). All project members have completed their annual HIPAA training (Office for Civil Rights, 2013; Office for Civil Rights, 2018).

Project Results

Table 1

Interviewee Demographics n=12

Participant	Gender	Education	Job Title
1	M	Masters	Director of Staff
2	M	Masters	Compliance Officer
3	M	Masters	Chief of Clinical Quality
4	M	Masters	MDOS Squadron Commander
5	M	MD and MPH	Chief of Aerospace Medicine
6	M	Masters	Chief Nurse
7	M	MD	Chief of Medical Staff
8	M	Masters	Chief Administrator
9	M	MD	Internal Medicine Clinic Medical Director
10	M	DO	Family Health Clinic Medical Director
11	M	PharmD	Chief Pharmacist/Pharmacy Flight Commander
12	M	PharmD	Pharmacy Operations Officer

Results

The top-weighted constructs included *Cost* (n=12 interviewees), *Available Resources* (n =11 interviewees), *Planning* (n=9 interviewees), *Culture* (n=8 interviewees), *Readiness for Implementation (n=8 interviewees), Organizational Incentives and Rewards* (n=7 interviewees), *Knowledge and Beliefs about the Intervention* (n=7 interviewees), Adaptability (n=6 interviewees), and Implementation Climate (n=6 interviewees) (Table 2 for additional barriers). Kirk et al. (2016), noted that the top constructs among studies were *Knowledge and Beliefs about Intervention, Complexity, Self-Efficacy, Relative Advantage, Networks, and Communication*. The differences between our findings and those included in the systematic review may be attributable to the timing of the project, as the majority were done either during or post-implementation, the setting of the study and the focus of our project on policy implementation vs. a clinical practice change (Kirk et al., 2016).

Table 2

Barriers with Weighted Mitigation Strategies

Barriers	**Strategies**	**Ratio**	**Rates (12)**
Cost	Access new funding	**72%**	12
Available Resources	Access new funding	**78%**	11
Planning	Develop a formal implementation blueprint	**73%**	9
Planning	Conduct local needs assessment	**50%**	9
Culture	Identify and prepare champions	**52%**	8
Readiness for Implementation	Assess for readiness and identify barriers and facilitators	**81%**	8

Organizational Incentives & Rewards	Alter incentive/allowance structures	**71%**	7
Knowledge & Beliefs about the Intervention	Conduct educational meetings	**56%**	7
Adaptability	Promote adaptability	**73%**	6
Implementation Climate	Assess for readiness and identify barriers and facilitators	**52%**	6
Goals and Feedback	Audit and provide feedback	**61%**	4
Champions	Identify and prepare champions	**67%**	4
Networks and Communication	Promote network weaving	**57%**	2
Networks and Communication	Organize clinician implementation team meetings	**52%**	2
Opinion Leaders	Identify and prepare champions	**64%**	2

Opinion Leaders	Inform local opinion leaders	**57%**	2
Formally appointed internal implementation leaders	Identify and prepare champions	**64%**	2
Cosmopolitanism	Build a coalition	**62%**	1
Cosmopolitanism	Develop academic partnerships	**50%**	1
Cosmopolitanism	Promote network weaving	**50%**	1
Patient Needs & Resources	Obtain and use patients/consumers and family feedback	**76%**	1
Patient Needs & Resources	Involve patients/consumers and family members	**71%**	1
Patient Needs & Resources	Conduct local needs assessment	**57%**	1

Analysis of the Results

CFIR Domains

The top-weighted domains, signified by a positive response in 50% or more of the interviewees, included *Inner Setting, Process, Intervention Characteristics, and Characteristics of the Individuals*. Of the previous domains, five barriers were noted for *Inner Setting*, two for

Intervention Characteristics, and one construct each for *Process and Characteristics of the Individuals* were highlighted due to their corresponding constructs nestled within each domain (Table B1 for domain and construct definitions). When examining data unweighted by the total number of interviewees selecting the associated construct as a barrier, the top areas were *Inner Setting* (seven), *Process* (four), *Outer Setting* (two), *Intervention Characteristics* (two), and *Characteristics of Individuals* (one) (Table 2). The results highlight the differences between weighted and non-weighted strategies. For instance, the challenge to resource allocation is better served by addressing barriers cited by more interviewees such as *Intervention Characteristics* despite only addressing two constructs, *Cost* and *Adaptability*, consisting of 12 and six interviewees respectively noted that these were essential barriers (Table 2). The authors noted that the top domains included *Characteristics of Individuals, Outer Setting, Intervention Characteristics, Inner Setting, and Process* in weighted order (Kirk et al., 2016). When comparing the weighted domains in our data vs. the literature, the *Inner Setting and Intervention Characteristics* are both weighted higher in our interviews as domains which may be attributable to the different military setting our interviews occurred in compared to those included within the systematic review.

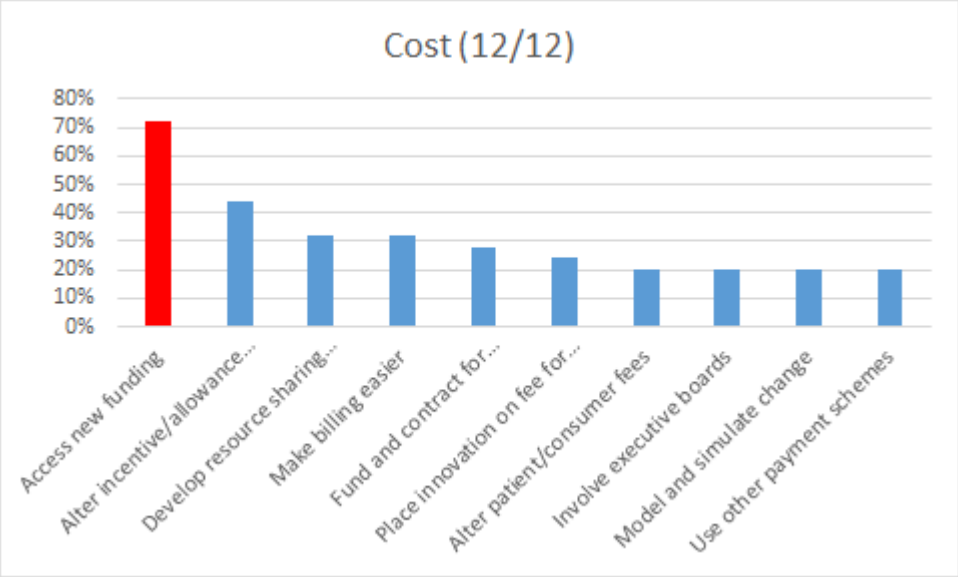
Cost Construct

Per the analysis of interviewee responses for constructs, the top construct constituting a barrier was *cost* (12 of 12 interviewees). The Tier 1 strategy noted through the CFIR-ERIC Matching Tool was access to new funding, with all 12 interviewees agreeing that this was a top concern among them. Additionally, nine Tier 2 strategies were identified through the tool as additional methods to target to mitigate this barrier (Figure 1). Waltz et al. (2015) noted that accessing new funding was considered a Zone IV strategy, which meant that while the strategy is

deemed necessary, the feasibility of achieving this strategy was lower than the mean average (Appendix E). A systematic review by Ross, Stevenson, Lau, & Murray (2016) on the use of ERIC in implementing e-health initiatives notes that cost is usually a significant impediment to implementation not only with initiating projects but also in sustainment. Additional studies reinforced that costs upfront, during sustainment, and many unanticipated costs tended to be a limiting factor. Interestingly, one study noted that the internal shifting of the budget was a method of addressing cost as a barrier. Another method of solving this budgetary shortfall is in determining the trade-off of one clinician vs. another in accomplishing the same goal. This fiscal challenge was primarily seen with physician reimbursement as compared to a non-physician clinician in supervising a clinical weight loss program, noting it may be more cost-effective to employ the non-physician clinician to manage the program. (DeSisto et al., 2019; Sopcak et al., 2016). One study done within the VA system noted the challenges with annual budget allocations and the balance with both staffing and program growth, which is a similar limitation within the MHS. In particular, the authors noted that assigning existing staff to an intervention may decrease the reach of the intervention (Kramer, Cote, Lee, Creekmur, & Saliba, 2017).

Figure 1

Top ERIC Strategies for Cost Construct



Available Resources Construct

The second most common barrier noted was *Available Resources* by 11 of 12 interviewees with access to new funding being the only Tier 1 strategy. As stated above, access to new funding is considered a Zone IV strategy (see Appendix E). An additional seven Tier two strategies were also recommended in this section for mitigation (see Figure 2). Two systematic reviews highlighted the need for suitable infrastructure as an aspect of this construct, which included not only the physical space but also the associated equipment to running clinical operations. Additionally, they both illustrated that inadequate or overtasked staff become barriers to implementation. Of note, both studies advocated a transitional period to give end-users time to become competent with new systems or processes (Ross et al., 2016; Weir et al., 2019).

Figure 2

Top ERIC Strategies for Available Resources Construct

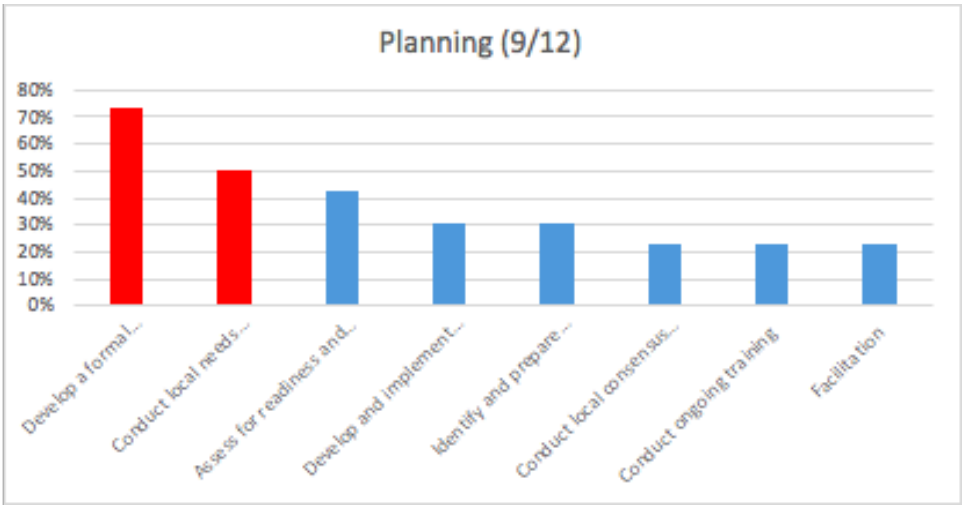
Planning Construct

The next most common barrier was *Planning* by 9 of 12 interviewees with two Tier 1 strategies noted, such as developing a formal implementation blueprint and conducting a local needs assessment with respective ratios. Waltz et al. (2015) noted that both a formal implementation blueprint and conducting a local needs assessment were considered Zone I interventions, which meant that both implementation and feasibility were above the mean as compared to other ERIC strategies. Six additional Tier 2 strategies were also associated with this barrier (see Figure 3). In the literature, several studies noted that planning was particularly crucial for the overall success of an implementation. The authors particularly pointed out that a plan that emphasized gradual implementation was preferable to an extensive rollout and that planning for maintenance was a particular facet of the planning process that was usually left out. Additionally, early identification of the end-user needs was seen as necessary, and that poor planning in this area would offset the successful accomplishment of implementation. Also noted was the importance of early engagement of senior leadership and champions; long term execution of any project would be challenging. Additionally, they indicated that establishing

clear goals was critical to stakeholder engagement. (Ross et al., 2016; Sopcak et al., 2016; Kramer et al., 2017).

Figure 3

Top ERIC Strategies for Planning Construct



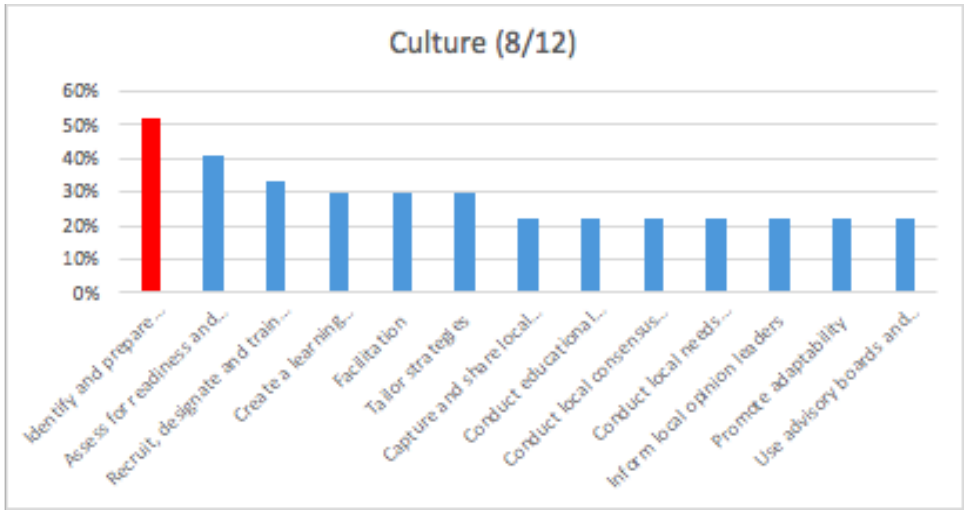
Culture Construct

An additional barrier identified from our interviewees included *Culture* with eight of 12 interviewees stating that it was a barrier. The only Tier 1 strategy noted through the CFIR-ERIC matching tool was identifying and preparing champions, which is considered a Zone I intervention (see Appendix E) (Waltz et al., 2015).

Additionally, a further 12 Tier 2 strategies were identified as mitigation strategies (see Figure 4). Alishahi Tabriz, Birken, Shea, Fried, & Viccellio (2019), noted that failure to acknowledge institutional *Culture* leads to implementation failure, with the example of each hospital unit presenting a unique implementation challenge to the authors. One additional study noted that an organization's Culture was a neutral factor in implementation and could potentially help or hinder depending on the intervention. Of note, the same study stated that stakeholder turnover was a negative factor in implementation as it led to communication failures and distrust (Maguire et al., 2016).

Figure 4

Top ERIC Strategies for Culture Construct

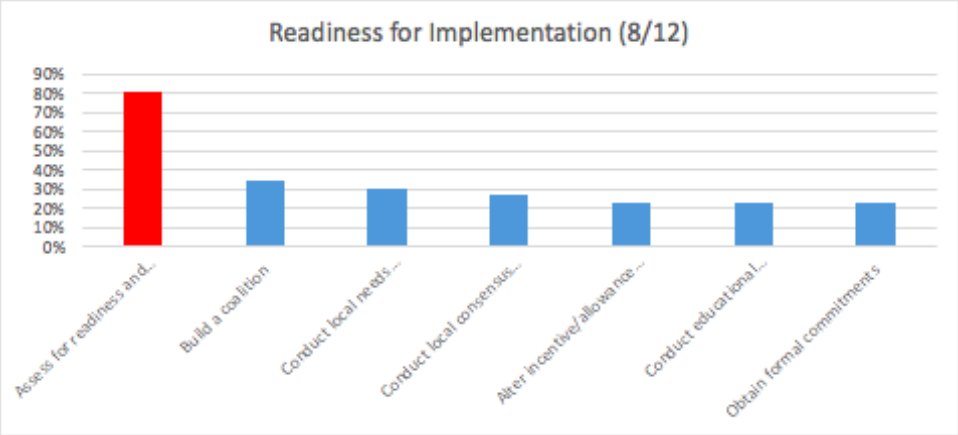


Readiness for Implementation Construct

Readiness for implementation was considered one of the top barriers by eight of 12 interviewees. Assess for readiness and identifying barriers and facilitators was the only Tier 1 strategy recommended addressing this barrier, which is designated as a Zone I intervention (Waltz et al., 2015). Six more Tier 2 barriers were identified as additional strategies to help mitigate this obstacle (see Figure 5). One study noted that leadership engagement tended to be an essential factor that could help or hinder implementation with poorly engaged leadership directly impacting implementation, while engaged leadership tends to improve implementation (Damschroder & Lowery, 2013).

Figure 5

Top ERIC Strategies for Readiness for Implementation Construct



Organizational Incentives and Rewards Construct

Organizational Incentives and Rewards was considered a barrier by seven of 12 interviewees. One of the top ERIC strategies is altering incentives or allowance structures, which is regarded as a Zone III intervention, is described as both moderately relevant and feasible and is below the mean for all ERIC strategies (Waltz et al., 2015). An additional seven Tier 2 strategies were recommended for mitigation (see Figure 6). The literature notes that most organizations lack the means to authorize or approve incentives to work to influence implementation and tends to be seen as an intervention with little to no utility (Damschroder & Lowery, 2013). A systematic review noted that setting organizational goals may be perceived negatively by staff if they feel it is focused on income generation vs. being patient-centered. Additionally, the report noted that providing non-financial incentives was another method to motivate a team (Weir et al., 2019).

Figure 6

Top ERIC Strategies for Organizational Incentives & Rewards Construct

Knowledge and Beliefs about the Intervention Construct

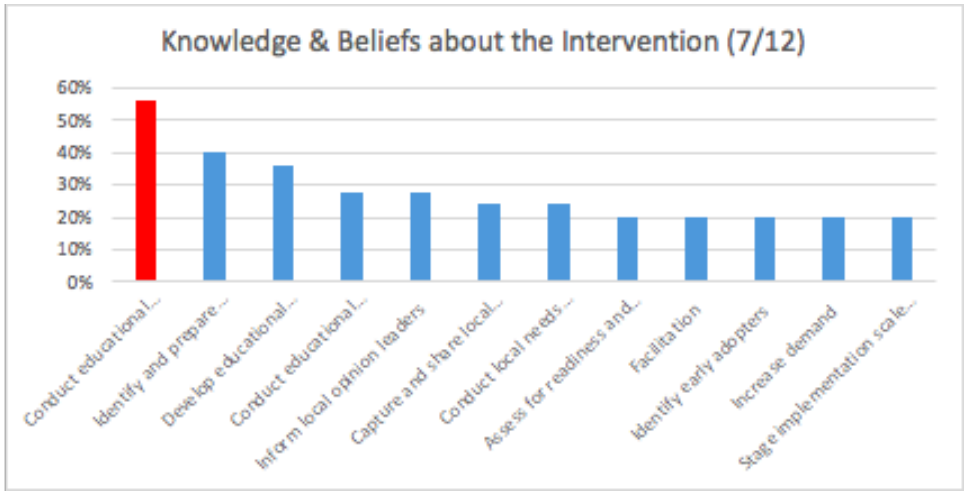
Knowledge and Beliefs about the Intervention is another barrier noted by seven of 12 interviewees. The Tier 1 strategy recommended by interviewees is in conducting educational meetings, which is considered a Zone I intervention (Waltz et al., 2015). An additional 11 Tier 2 strategies were also recommended to mitigate this barrier (see Figure 7). One study noted that if staff were familiar with the intervention at hand, mainly if it was an extension of an existing one, the authors noted it improved implementation of the intervention. The study's authors also noted that educational activities both before the intervention and ongoing were critical for improving implementation (Kramer et al., 2017). The authors in a systematic review noted trends in studies reviewed that positive attitudes, such as the belief that intervention would help patients, contributed to improvement in implementation.

In contrast, negative attitudes led to poor implementation, which staff in the reviewed studies described as disruption in care delivery, decrease in quality of care, loss of autonomy, and increase in liability (Ross et al., 2016). The authors of another systematic review noted that of the studies they reviewed, knowledge and beliefs about the intervention had overall mixed views with various positive and negative perceptions noted. Additionally, the authors noted that

there was an additional theme of lack of awareness or knowledge of the intervention among staff in the various studies they reviewed (Weir et al., 2019).

Figure 7

Top ERIC Strategies for Knowledge & Beliefs about the Intervention Construct

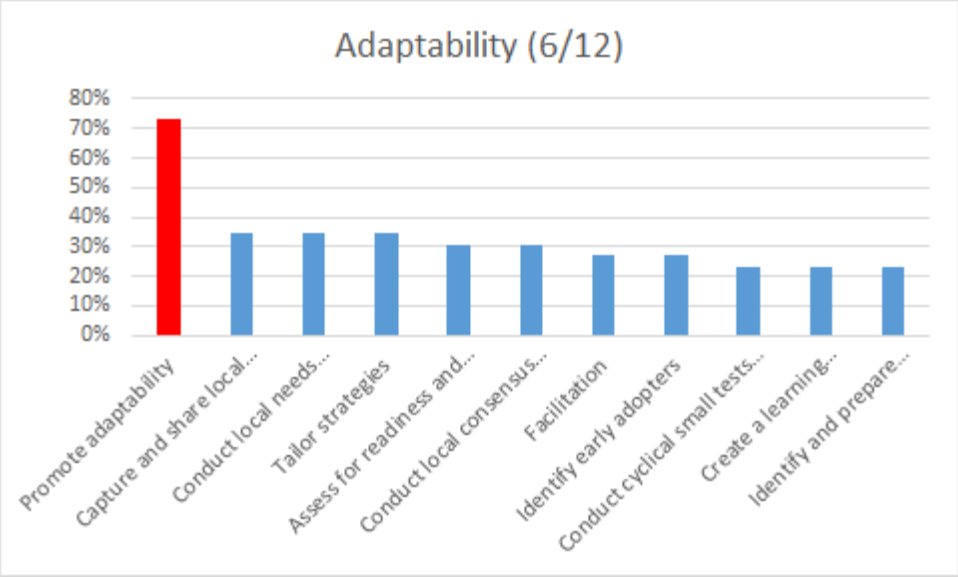


Adaptability Construct

Adaptability is another barrier noted by six of 12 interviewees. The Tier 1 strategy recommended by interviewees is to promote adaptability, which is considered a Zone I intervention. An additional 10 Tier 2 strategies were also recommended to mitigate this barrier (see Figure 8). Several studies noted that allowing for localized adaptation of the intervention was a decisive factor in implementation. Additionally, a systematic review noted that end-user input into the development of the intervention was another positive contributor to implementation and also noted that interoperability of the intervention into already present processes and systems was seen as a mitigator of barriers to implementation (Damschroder & Lowery, 2013; Ross et al., 2016).

Figure 8

Top ERIC Strategies for Adaptability Construct



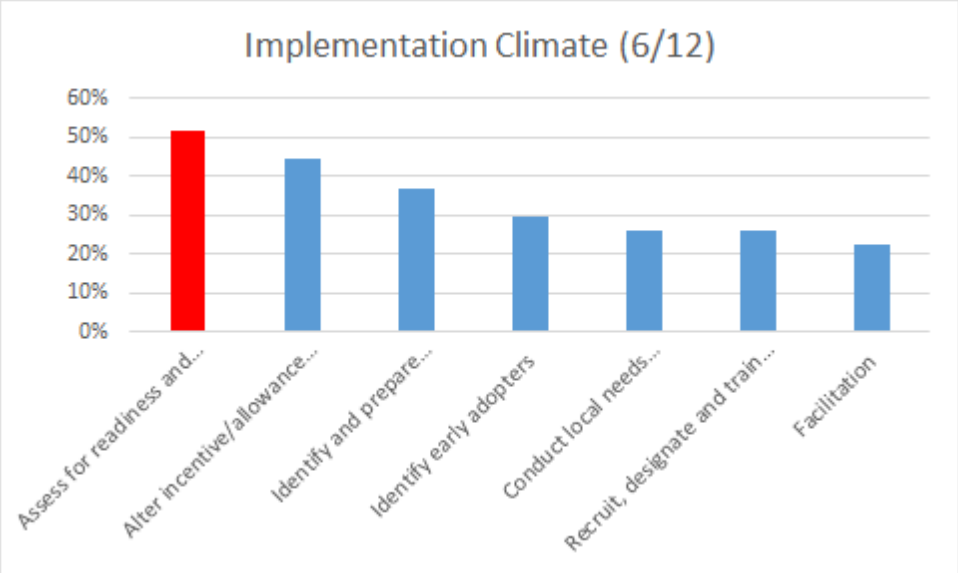
Implementation Climate Construct

Implementation Climate is another barrier noted by six of 12 interviewees. The Tier 1 strategy recommended by interviewees is to assess for readiness and identify barriers and facilitators, which is considered a Zone I intervention. An additional 6 Tier 2 strategies were also recommended to mitigate this barrier (see Figure 9). Two studies noted that stable implementation team members and support from leadership facilitated implementation, while turnover and political sensitivity to the intervention were perceived as detractors to implementation. Also, the staff noted that frequent team collaboration in an environment made implementation better (Kramer et al., 2017; DeSisto et al., 2019). Several studies, including a systematic review, noted that tension for change in leadership, along with a relative priority for the intervention, had a strong effect on implementation efforts. Authors also acknowledged that compatibility with existing processes and with institutional values at both the unit and institutional level affected implementation. Also, the study noted that a positive learning culture within the organization was helpful in implementation. One study noted that weakness in evaluating the implementation processes was a weakness, as intervention sites did not have the

data to make intra-implementation adjustments to ensure an optimal outcome (Damschroder & Lowery, 2013; Ramsey, Lord, Torrey, Marsch, & Lardiere, 2016; Ross et al., 2016).

Figure 9

Top ERIC Strategies for Implementation Climate Construct



See Appendix F for the remainder of the barriers selected by less than half of the interviewees.

Organizational Impact / Implications to Practice & Policy

The goals of this project were three-fold: to identify a theoretical tool and method to assess barriers in implementing the already disseminated DHA-PI 6025.04; to use the tool to outline strategies to overcome the obstacles, and to communicate the ranked strategies of the top barriers to the organization. These goals were accomplished through the utilization of the CFIR construct domains and the ERIC strategy matching tool. As outlined in Table 2, multiple barriers with respective Tier 1 strategies were identified. *Cost* was noted as the most significant barrier with *accessing new funding* matched as the most robust ERIC strategy in addressing this barrier. Similarly, the second most significant barrier, *available resources,* was matched to the ERIC strategy of *accessing new funding*. Recommendations in facilitating this strategy include

redistributing or transferring existing funds as has been given to both KMC and the DHA Mississippi Coast Market. Other methods noted in the literature include creating a business case analysis for additional funding or staffing from DHA (Powell et al., 2015). Of note, many of the literature-supported interventions require substantial lead time. Additionally, funding may not be reprogrammed from its original intent to support new requirements (United States Air Force Financial Management & Comptroller, n.d.).

Planning was identified as the third most significant barrier with *developing a formal implementation blueprint* as the strongest Tier 1 strategy in addressing this barrier. This blueprint should include the purpose of the implementation, the breadth of the change, a timeline, and progress measures. Additionally, the literature recommends continually updating the document to aid in implementation over time. Also recommended was the use of a pre-implementation needs assessment as well as a monitoring process to provide an organized approach to guide ongoing efforts. Another ERIC strategy that addresses planning is *conducting a local needs assessment*. A needs assessment analyzes data related to the implementation and should include information about gaps in care, processes, outcomes, and stakeholder opinions (Powell et al., 2015).

The fourth barrier identified in implementing DHA-PI 6025.04 was *culture*. The ERIC strategy that addresses this barrier is *identifying and preparing champions.* Champions are change agents that will drive innovation. They provide staff training, monitor implementation success, and can help sustain innovation. Ideally, in the case of KMC, beyond the PCPC, a champion in each clinic would provide a local resource for clinicians to discuss cases with, and per the DHA-PI would be appropriate in different product lines (Powell et al., 2015; DHA,

2018). See Appendix D for additional implementation information on the remaining Tier 1 and Tier 2 ERIC strategies noted in Table 2.

The organizational impact in adopting the identified ERIC strategies would lead to the effective implementation of DHA-PI 6025.04. These strategies target each of the noted barriers that are currently impeding policy adoption, as reported by key stakeholders. Implementing DHA-PI 6025.04 would standardize the organization's pain management practices with other DHA Military Treatment Facilities, and establish the MHS Stepped Care Model for Pain Management (SCM-PM). This standardized approach in managing acute and chronic pain will enhance outcomes and optimize the delivery of safe patient care.

Future Directions for Research and Practice

Future studies will be crucial in continuing to refine and expand the implementation strategies identified for DHA-PI 6025.04 to generalize across Military Treatment Facilities. The use of CFIR and ERIC tools seems encouraging to finding implementation strategies to prioritizing, gauging strategies selection, and teasing out gaps to assist implementation efforts. Because CFIR has been validated and is comprehensive, we find its use apt for implementation projects but caution that future cohorts will have to be keen when coding the interview responses because of the variabilities. Additionally, future projects should incorporate more extensive stakeholder participatory methods to gain insight into other nuanced implementation strategies not captured from a small sample pool.

Conclusion

Understanding implementation barriers before the initiation of an intervention are essential to mitigate barriers before implementation successfully. Damschroder et al. (2013),

communicated the importance of prioritizing the dissemination and implementation of programs using validated tools to ease the application. A systematic review of 15 studies that used CFIR to evaluate implementation primarily during and post phase of the project noted that the use of CFIR in the pre-implementation period of a plan had been a missed opportunity in its use (Kirk et al., 2016).

This project gauged the barriers to the implementation of DHA-PI 6025.04 within KMC using the CFIR. It used the CFIR-ERIC strategy matching tool to adapt targeted interventions to provide the most significant impact on the successful implementation of DHA-PI 6025.04. This project discovered that CFIR and ERIC could be utilized by stakeholders to evaluate the conditions within the healthcare organization to guide implementation during all phases of the intervention. Importantly this project used the CFIR in the pre-implementation phase, which researchers report is a unique yet valuable approach in implementation science (Kirk et al., 2016). This project can be adapted for future consideration during the development and propagation of procedural instructions and practice guidelines to improve the success of the implementation.

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Appendix A

Table A1

Project Timeline Year 1 (2018)

Activity/Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
USUHS VPR Submission and Approval												**X**
Project Planning												**X**
Site IRB Submission and Approval												
Baseline Data Collection												
Project Implementation/Data Collection												
Data Analysis												
Dissemination												

Table A2

Project Timeline Year 2 (2019)

Activity/Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

USUHS VPR Submission and Approval	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Project Planning	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Site IRB Submission and Approval												
Baseline Data Collection												**X**
Project Implementation/Data Collection												
Data Analysis												
Dissemination												

Table A3

Project Timeline Year 3 (2020)

Activity/Month	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
USUHS VPR Submission and Approval	**X**											
Project Planning	**X**	**X**										

Site IRB Submission and Approval	**X**	**X**	**X**									
Baseline Data Collection	**X**	**X**										
Project Implementation/Data Collection		**X**	**X**									
Data Analysis		**X**	**X**	**X**								
Dissemination			**X**	**X**	**X**							

Appendix B

Table B1

Description of the five CFIR domains and constructs within each domain

Domain 1: Intervention – characteristics of the intervention itself
● Intervention source: Perception about whether intervention is externally or internally developed ● Evidence Strength & Quality: Perception of the quality and validity of evidence supporting the belief that the intervention will have desired outcomes ● Relative Advantage: Perception of the advantage of implementing the intervention versus an alternative solution ● Adaptability: Degree to which an intervention can be tailored to meet the needs of an organization ● Trialability: Ability to test the intervention on a small scale, and to reverse course if warranted ● Complexity: Perceived difficulty of implementation ● Design Quality & Packaging: Perceived excellence in how the intervention is bundled and presented ● Cost: Cost of the intervention and costs associated with implementing the intervention
Domain 2: Outer Setting – factors external to the organization
● Patient Needs & Resources: Extent to which patient needs are accurately known and prioritized by the organization ● Cosmopolitanism: Level of connectedness and networks with other organizations ● Peer Pressure: Competitive pressure to implement an intervention ● External Policy & Incentives: external strategies to spread interventions, including policy and regulations, mandates, recommendations, and guidelines
Domain 3: Inner Setting - characteristics of the organization implementing the intervention
● Structural characteristics: Age, maturity, or size of the organization ● Networks & Communication: Nature and quality of webs of social networks and the nature and quality of formal and informal communications within an organization ● Culture: Norms, values, and basic assumptions of a given organization ● Implementation climate: Relative priority of implementing the current intervention versus other competing priorities ● Readiness for Implementation: Access to resources, knowledge, and information about the intervention
Domain 4: Individuals - characteristics of the individuals involved in implementation

● Knowledge and Beliefs about Intervention: Individual staff knowledge and attitude towards the intervention ● Self-efficacy: An individual's belief in their capabilities to execute the implementation ● Individual State of Change: Phase an individual is in as he or she progresses toward skilled, enthusiastic, and sustained use of the intervention ● Individual Identification with Organization: Individuals' perception of the organization and their relationship and degree of commitment to the organization ● Other Personal Attributes: Personal traits such as tolerance of ambiguity, intellectual ability, motivation, etc.
Domain 5: Process – processes of implementation
● Planning: Planning for the implementation ● Engaging: Engaging individuals in implementation processes ● Executing: Executing the implementation plan ● Reflecting & Evaluating: Reflecting and evaluating the progress of implementation

Note. Reprinted from *Kirk et al., 2016*.

Appendix C

Table C1

ERIC discrete implementation strategy compilation

Strategy	Definitions
Access new funding	Access new or existing money to facilitate the implementation
Alter incentive/allowance structures	Work to incentivize the adoption and implementation of the clinical innovation
Alter patient/consumer fees	Create fee structures where patients/consumers pay less for preferred treatments (the clinical innovation) and more for less-preferred treatments
Assess for readiness and identify barriers and facilitators	Assess various aspects of an organization to determine its degree of readiness to implement, barriers that may impede implementation, and strengths that can be used in the implementation effort
Audit and provide feedback	Collect and summarize clinical performance data over a specified time period and give it to clinicians and administrators to monitor, evaluate, and modify provider behavior
Build a coalition	Recruit and cultivate relationships with partners in the implementation effort
Capture and share local knowledge	Capture local knowledge from implementation sites on how implementers and clinicians made something work in their setting and then share it with other sites
Centralize technical assistance	Develop and use a centralized system to deliver technical assistance focused on implementation issues

Change accreditation or membership requirements	Strive to alter accreditation standards so that they require or encourage use of the clinical innovation. Work to alter membership organization requirements so that those who want to affiliate with the organization are encouraged or required to use the clinical innovation
Change liability laws	Participate in liability reform efforts that make clinicians more willing to deliver the clinical innovation
Change physical structure and equipment	Evaluate current configurations and adapt, as needed, the physical structure and/or equipment (*e.g.*, changing the layout of a room, adding equipment) to best accommodate the targeted innovation
Change record systems	Change records systems to allow better assessment of implementation or clinical outcomes
Change service sites	Change the location of clinical service sites to increase access
Conduct cyclical small tests of change	Implement changes in a cyclical fashion using small tests of change before taking changes system-wide. Tests of change benefit from systematic measurement, and results of the tests of change are studied for insights on how to do better. This process continues serially over time, and refinement is added with each cycle
Conduct educational meetings	Hold meetings targeted toward different stakeholder groups (*e.g.*, providers, administrators, other organizational stakeholders, and community, patient/consumer, and family stakeholders) to teach them about the clinical innovation
Conduct educational outreach visits	Have a trained person meet with providers in their practice settings to educate providers about the clinical innovation with the intent of changing the provider's practice

Conduct local consensus discussions	Include local providers and other stakeholders in discussions that address whether the chosen problem is important and whether the clinical innovation to address it is appropriate
Conduct local needs assessment	Collect and analyze data related to the need for the innovation
Conduct ongoing training	Plan for and conduct training in the clinical innovation in an ongoing way
Create a learning collaborative	Facilitate the formation of groups of providers or provider organizations and foster a collaborative learning environment to improve implementation of the clinical innovation
Create new clinical teams	Change who serves on the clinical team, adding different disciplines and different skills to make it more likely that the clinical innovation is delivered (or is more successfully delivered)
Create or change credentialing and/or licensure standards	Create an organization that certifies clinicians in the innovation or encourage an existing organization to do so. Change governmental professional certification or licensure requirements to include delivering the innovation. Work to alter continuing education requirements to shape professional practice toward the innovation
Develop a formal implementation blueprint	Develop a formal implementation blueprint that includes all goals and strategies. The blueprint should include the following: 1) aim/purpose of the implementation; 2) scope of the change (*e.g.*, what organizational units are affected); 3) timeframe and milestones; and 4) appropriate performance/progress measures. Use and update this plan to guide the implementation effort over time

Develop academic partnerships	Partner with a university or academic unit for the purposes of shared training and bringing research skills to an implementation project
Develop an implementation glossary	Develop and distribute a list of terms describing the innovation, implementation, and stakeholders in the organizational change
Develop and implement tools for quality monitoring	Develop, test, and introduce into quality-monitoring systems the right input—the appropriate language, protocols, algorithms, standards, and measures (of processes, patient/consumer outcomes, and implementation outcomes) that are often specific to the innovation being implemented
Develop and organize quality monitoring systems	Develop and organize systems and procedures that monitor clinical processes and/or outcomes for the purpose of quality assurance and improvement
Develop disincentives	Provide financial disincentives for failure to implement or use the clinical innovations
Develop educational materials	Develop and format manuals, toolkits, and other supporting materials in ways that make it easier for stakeholders to learn about the innovation and for clinicians to learn how to deliver the clinical innovation
Develop resource sharing agreements	Develop partnerships with organizations that have resources needed to implement the innovation
Distribute educational materials	Distribute educational materials (including guidelines, manuals, and toolkits) in person, by mail, and/or electronically

Facilitate relay of clinical data to providers	Provide as close to real-time data as possible about key measures of process/outcomes using integrated modes/channels of communication in a way that promotes use of the targeted innovation
Facilitation	A process of interactive problem solving and support that occurs in a context of a recognized need for improvement and a supportive interpersonal relationship
Fund and contract for the clinical innovation	Governments and other payers of services issue requests for proposals to deliver the innovation, use contracting processes to motivate providers to deliver the clinical innovation, and develop new funding formulas that make it more likely that providers will deliver the innovation
Identify and prepare champions	Identify and prepare individuals who dedicate themselves to supporting, marketing, and driving through an implementation, overcoming indifference or resistance that the intervention may provoke in an organization
Identify early adopters	Identify early adopters at the local site to learn from their experiences with the practice innovation
Increase demand	Attempt to influence the market for the clinical innovation to increase competition intensity and to increase the maturity of the market for the clinical innovation
Inform local opinion leaders	Inform providers identified by colleagues as opinion leaders or “educationally influential” about the clinical innovation in the hopes that they will influence colleagues to adopt it
Intervene with patients/consumers to enhance uptake and adherence	Develop strategies with patients to encourage and problem solve around adherence

Involve executive boards	Involve existing governing structures (*e.g.*, boards of directors, medical staff boards of governance) in the implementation effort, including the review of data on implementation processes
Involve patients/consumers and family members	Engage or include patients/consumers and families in the implementation effort
Make billing easier	Make it easier to bill for the clinical innovation
Make training dynamic	Vary the information delivery methods to cater to different learning styles and work contexts, and shape the training in the innovation to be interactive
Mandate change	Have leadership declare the priority of the innovation and their determination to have it implemented
Model and simulate change	Model or simulate the change that will be implemented prior to implementation
Obtain and use patients/consumers and family feedback	Develop strategies to increase patient/consumer and family feedback on the implementation effort
Obtain formal commitments	Obtain written commitments from key partners that state what they will do to implement the innovation
Organize clinician implementation team meetings	Develop and support teams of clinicians who are implementing the innovation and give them protected time to reflect on the implementation effort, share lessons learned, and support one another's learning
Place innovation on fee for service lists/formularies	Work to place the clinical innovation on lists of actions for which providers can be reimbursed (*e.g.*, a drug is placed on a formulary, a procedure is now reimbursable)

Prepare patients/consumers to be active participants	Prepare patients/consumers to be active in their care, to ask questions, and specifically to inquire about care guidelines, the evidence behind clinical decisions, or about available evidence-supported treatments
Promote adaptability	Identify the ways a clinical innovation can be tailored to meet local needs and clarify which elements of the innovation must be maintained to preserve fidelity
Promote network weaving	Identify and build on existing high-quality working relationships and networks within and outside the organization, organizational units, teams, etc. to promote information sharing, collaborative problem-solving, and a shared vision/goal related to implementing the innovation
Provide clinical supervision	Provide clinicians with ongoing supervision focusing on the innovation. Provide training for clinical supervisors who will supervise clinicians who provide the innovation
Provide local technical assistance	Develop and use a system to deliver technical assistance focused on implementation issues using local personnel
Provide ongoing consultation	Provide ongoing consultation with one or more experts in the strategies used to support implementing the innovation
Purposely reexamine the implementation	Monitor progress and adjust clinical practices and implementation strategies to continuously improve the quality of care
Recruit, designate, and train for leadership	Recruit, designate, and train leaders for the change effort
Remind clinicians	Develop reminder systems designed to help clinicians to recall information and/or prompt them to use the clinical innovation

Revise professional roles	Shift and revise roles among professionals who provide care, and redesign job characteristics
Shadow other experts	Provide ways for key individuals to directly observe experienced people engage with or use the targeted practice change/innovation
Stage implementation scale up	Phase implementation efforts by starting with small pilots or demonstration projects and gradually move to a system wide rollout
Start a dissemination organization	Identify or start a separate organization that is responsible for disseminating the clinical innovation. It could be a for-profit or non-profit organization
Tailor strategies	Tailor the implementation strategies to address barriers and leverage facilitators that were identified through earlier data collection
Use advisory boards and workgroups	Create and engage a formal group of multiple kinds of stakeholders to provide input and advice on implementation efforts and to elicit recommendations for improvements
Use an implementation advisor	Seek guidance from experts in implementation
Use capitated payments	Pay providers or care systems a set amount per patient/consumer for delivering clinical care
Use data experts	Involve, hire, and/or consult experts to inform management on the use of data generated by implementation efforts
Use data warehousing techniques	Integrate clinical records across facilities and organizations to facilitate implementation across systems

Use mass media	Use media to reach large numbers of people to spread the word about the clinical innovation
Use other payment schemes	Introduce payment approaches (in a catch-all category)
Use train-the-trainer strategies	Train designated clinicians or organizations to train others in the clinical innovation
Visit other sites	Visit sites where a similar implementation effort has been considered successful
Work with educational institutions	Encourage educational institutions to train clinicians in the innovation

Note. Reprinted from *Powell et al., 2015*.

Appendix D

Table D2

Additional File 6: Expert Recommendations for Implementing Change (ERIC) – Discrete Implementation Strategy Compilation with Ancillary Material

Access new funding Access new or existing money to facilitate the implementation. ***Ancillary Material:*** Accessing new funding sources could involve new uses of existing money, accessing block grants, shifting funding from one program to another, cost-sharing, passing new taxes, raising private funds, or applying for grants. These monies may be used to fund the delivery of a clinical innovation, or to support other time limited actions needed for initial implementation, such as to purchase material or logistical support, training, and consultations.
Alter incentive/allowance structures Work to incentivize the adoption and implementation of the clinical innovation. ***Ancillary Material:*** Incentives may be based on the performance of individual clinicians or larger performance units at the organizational level. The incentive could be in the form of an increased rate of pay to cover the incremental costs associated with implementing the clinical innovation. The incentive could be through loan reduction or forgiveness to clinicians to learn an innovation. This category of financial strategies also includes the elimination of any perverse incentives that become a barrier to receiving appropriate care. An incentive suggests the payment is tied to performing a clinical action or improving outcomes. An allowance suggests that the clinician or organization is not required to perform the clinical action or meet the performance standard.
Alter patient/consumer fees Create fee structures where patients/consumers pay less for preferred treatments (the clinical innovation) and more for less-preferred treatments. ***Ancillary Material:*** None

Assess for readiness and identify barriers and facilitators

Assess various aspects of an organization to determine its degree of readiness to implement, barriers that may impede implementation, and strengths that can be used in the implementation effort.

Ancillary Material:

Readiness assessments may focus on agency finances, staffing levels, and other material or logistical resources needed, or available, to support the implementation effort. Further this assessment may also focus on leadership support, the organizational priority for change, and the presence of successful experience with quality improvement techniques and change management. Additional aspects for assessment may include other services provided, as well as community support, stakeholder attitudes, and beliefs and perceptions of evidence for the innovation or change. Rationale for current practices, organizational climate and culture, structure, decision-making styles, and the perceived needs of frontline stakeholders to implement the change or innovation (consider adaptation needs and limits) are also important aspects to consider in this assessment. Readiness assessments can be used to vet, eliminate, or prioritize implementation sites. More so, the assessment can help make internal decisions about whether to go ahead with an implementation initiative. Some barriers can be difficult to observe prior to implementation. Specific measures have been created to assess readiness for change, which may be useful (e.g., [1–3]).

Audit and provide feedback

Collect and summarize clinical performance data over a specified time period and give it to clinicians and administrators to monitor, evaluate, and modify provider behavior.

Ancillary Material:

The information may be obtained from a variety of sources, including medical records, computerized databases, observation, or feedback from patients. Performance evaluations may also be considered as audit and feedback data if the evaluation included specific information on clinical performance. Feedback summaries may include recommendations. Feedback may be displayed publicly, and often involves comparisons to peers or to local, state, national, or international norms. Feedback may be designed to guide a clinician in improving fidelity. It should also be noted that audit and feedback data can be helpful in promoting the continuation of intended behavior. Performance data may include process variables, outcomes, or fidelity measures. Feedback can include mandatory performance measures, which are related to benchmarks from the literature or normative data within an organization or industry.

Build a coalition

Recruit and cultivate relationships with partners in the implementation effort.

Ancillary Material:

Partnerships can develop around cost-sharing, shared resources, shared training, and the division of responsibilities among partners. This work may proceed naturally from local consensus discussions. Coalition members commonly have defined roles in the implementation effort.

Capture and share local knowledge

Capture local knowledge from implementation sites on how implementers and clinicians made something work in their setting and then share it with other sites.

Ancillary Material:

This strategy is often coordinated with centralized technical assistance and learning collaboratives. There are multiple techniques for capturing local knowledge, which could be presented in multiple formats. For example, short YouTube videos could be created that document testimonials from clinicians who have successfully used a given innovation. Another example would be maintaining a running list of a team's response to specific implementation barriers that could be shared readily through a platform like GoogleDocs or Microsoft SharePoint. Additional techniques can be found at www.liberatingstructures.com.

Centralize technical assistance

Develop and use a centralized system to deliver technical assistance focused on implementation issues.

Ancillary Material:

This could be the designation of a lead technical assistance organization (could also be responsible for training). The lead technical assistance entity can develop other mechanisms (e.g., call-in lines or websites) in order to share information on how to best implement the clinical innovation.

Change accreditation or membership requirements

Strive to alter accreditation standards so that they require or encourage use of the clinical innovation. Work to alter membership organization requirements so that those who want to affiliate with the organization are encouraged or required to use the clinical innovation.

Ancillary Material:

None

Change liability laws

Participate in liability reform efforts that make clinicians more willing to deliver the clinical innovation.

Ancillary Material:

Liability reform can also make clinicians less willing to deliver alternatives to the clinical innovation.

Change physical structure and equipment

Evaluate current configurations and adapt, as needed, the physical structure and/or equipment (e.g., changing the layout of a room, adding equipment) to best accommodate the targeted innovation.

Ancillary Material:

None

Change record systems

Change records systems to allow better assessment of implementation or clinical outcomes.

Ancillary Material:

These changes may include modifying the format of progress notes and treatment plans to reflect the innovation (evidence-based practice) being implemented.

Change service sites

Change the location of clinical service sites to increase access.

Ancillary Material:

Changing service sites can include collocating different services to better implement complex clinical innovations that require multiple disciplines or services, telemedicine, or bringing the services to the client in their home, the community, or other clinically relevant settings, such as busy public spaces for a client with PTSD.

Conduct cyclical small tests of change

Implement changes in a cyclical fashion using small tests of change before taking changes system-wide. Tests of change benefit from systematic measurement, and results of the tests of change are studied for insights on how to do better. This process continues serially over time, and refinement is added with each cycle.

Ancillary Material:

Two common small tests of change cycling strategies are "Plan-Do-Study-Act" from Deming's quality management work [4], and six sigma's Define- Measure- Analyze-Improve-Control sequence [5].

Conduct educational meetings

Hold meetings targeted toward different stakeholder groups (e.g., providers, administrators, other organizational stakeholders, and community, patient/consumer, and family stakeholders) to teach them about the clinical innovation.

Ancillary Material:

The content of the education may include information regarding what to expect as implementation moves forward. It is useful to ensure that meeting attendees are relatively homogeneous so that the education can be targeted toward the stakeholder group's needs. For example, some educational meetings may inform the stakeholder group about the clinical innovation in a way intended to increase demand, while others may preview the clinical innovation for providers and administrators. It is often useful to have recordings or other materials from the educational meetings available to those who cannot attend the meetings (e.g., those covering patient care at the time of the meeting, new hires subsequent to the meeting).

Conduct educational outreach visits

Have a trained person meet with providers in their practice settings to educate providers about the clinical innovation with the intent of changing the provider's practice.

Ancillary Material:

Visits to the site may be in-person or virtually via the Internet. Some initiatives may require regular educational outreach as part of maintaining the innovation/practice change. Academic detailing is another commonly used term, although academic detailing typically involves many additional discrete implementation strategies (e.g., conduct ongoing training, modeling, developing and distributing educational materials; [21, 22]).

Conduct local consensus discussions

Include local providers and other stakeholders in discussions that address whether the chosen problem is important and whether the clinical innovation to address it is appropriate.

Ancillary Material:

Identify stakeholders relevant to each project. Further, with each project, there will be a need to identify whether the goal of the consensus discussion is to characterize consensus or build consensus. Utilizing community based participatory research principles may be relevant to many innovations. Notably, the chosen problem needs to be a high enough priority, compared to other problems, that attention and resources will be dedicated to addressing the problem.

Conduct local needs assessment

Collect and analyze data related to the need for the innovation.

Ancillary Material:

This assessment could be focused on:

- Outcomes of usual care
- Process of care
- Description of usual care and its distance from evidence-based care (e.g., gaps in care)
- Opinions from stakeholders (including patients) on (a) barriers and facilitators to the desired outcome (e.g., recovery from mental illness), (b) the need for any innovation (i.e., tension for change), (c) the need for a specific innovation, or (d) the special considerations for delivering the innovation in the local context.

Common needs assessment methods include surveys, focus groups, key informant interviews, direct observation, and data mining of administrative records utilized to identify target populations, as well as identify baseline care process and outcome clinical care data. If the change involves multiple sites or facilities, then it is necessary to examine practice variation across facilities, and outline strategies for the needs assessment to support a standardized approach across sites. Collecting data from a random sample of stakeholders may be necessary to reduce response bias and decrease chances that the level of need is not over or under-estimated.

Conduct ongoing training

Plan for and conduct training in the clinical innovation in an ongoing way.

Ancillary Material:

This can include follow-up training, advanced training, booster training, purposefully spaced training, training to competence, integration of off the- job and on-the-job training, structured supervision, the introduction of concepts in a specific sequence to ensure mastery, and trainings based on the level of clinician knowledge. Ongoing training efforts need to reach across shifts and accommodate staff turnover, as well as rotating staff (e.g., residents). Training can be in-person, on the web, or technology-assisted (e.g., simulation lab training), and may focus on individuals or involve groups. When planning for ongoing training, it is important to describe the training components, including the timing and frequency of training. Issues related to the dynamics of training can be found in the strategy, making training dynamic.

Create a learning collaborative

Facilitate the formation of groups of providers or provider organizations and foster a collaborative learning environment to improve implementation of the clinical innovation.

Ancillary Material:

There are several approaches to this in the literature including peer consultation networks, online communities of practice, quality circles, and learning collaboratives. Groups may meet in person or interact using a wide variety of media. The inclusion of a quality manager within the collaborative may be useful. Positive deviance approaches use "discovery and action dialogue" among peers to promote collaborative learning [23–25].

Resources specific to learning collaboratives include:

The Health Resources and Services Administration (HRSA) [26]

The Institute for Healthcare Improvement (IHI) [27, 28]

Key terms for searching literature specific to collaborative learning include:

learning community, learning network, and community of practice.

Create new clinical teams

Change who serves on the clinical team, adding different disciplines and different skills to make it more likely that the clinical innovation is delivered (or is more successfully delivered).

Ancillary Material:

None

Create or change credentialing and/or licensure standards

Create an organization that certifies clinicians in the innovation or encourage an existing organization to do so. Change governmental professional certification or licensure requirements to include delivering the innovation. Work to alter continuing education requirements to shape professional practice toward the innovation.

Ancillary Material:

None

Develop a formal implementation blueprint

Develop a formal implementation blueprint that includes all goals and strategies. The blueprint should include: 1) aim/purpose of the implementation; 2) scope of the change (e.g., what organizational units are affected); 3) timeframe and milestones; and 4) appropriate performance/progress measures. Use and update this plan to guide the implementation effort over time.

Ancillary Material:

The implementation blueprint or manual may be informed by one or more theories or conceptual frameworks and/or data from pre-implementation needs assessments. This blueprint can also provide a useful historical record of the implementation process, as well as provide a mechanism to track changes over time. The implementation blueprint is often useful to ensure feedback is received from prospective frontline users of the blueprint prior to implementation.

Consider coordinating this strategy with the development of a fidelity monitoring tool.

Issues to consider separately, especially for research purposes:

- Number and type of implementation strategies
- Organizational levels involved—this can vary by type of intervention. It may be possible to do some interventions at the lowest level. Others may require top management.
- Pre-implementation assessments would be separate step

Other examples of how to create an implementation blueprint include the CDC's Replicating Effective Programs [6, 7].

Examples of projects using a blueprint include:

- HI-TIDES [8]
- Depression in a substance abusing population [9]
- Mental health services in federally qualified health centers [10]

Develop academic partnerships

Partner with a university or academic unit for the purposes of shared training and bringing research skills to an implementation project.

Ancillary Material:

HIPAA, and other legal limitations are common to encounter with academic partnerships. Formal relationships (e.g., contracts, MOUs) will be required in some instances. Not all academics have a full understanding of practice level stakeholder needs and this should be considered while developing this partnership. In settings where 'research' is not a commonly supported practice, evaluation or developmental evaluation may be more useful ways of characterize the activity [18].

Develop an implementation glossary

Develop and distribute a list of terms describing the innovation, implementation, and the stakeholders in the organizational change.

Ancillary Material:

When compiling a glossary, reflect as to whether the terms being introduced are essential.

Develop and implement tools for quality monitoring

Develop, test, and introduce into quality-monitoring systems the right input—the appropriate language, protocols, algorithms, standards, and measures (of processes, patient/consumer outcomes, and implementation outcomes) that are often specific to the innovation being implemented.

Ancillary Material:

These tools should be flexible enough to reflect fidelity, even after adaptations to the setting or client. Performance sites can benefit when these tools are available locally, particularly to help clinicians develop a sense of ownership for the change process. Quality monitoring tools can be coordinated with other strategies to encourage or reward performance that is in alignment with the clinical innovation. See Krein et al. [11] for an example of this process.

Develop and organize quality monitoring systems

Develop and organize systems and procedures that monitor clinical processes and/or outcomes for the purpose of quality assurance and improvement.

Ancillary Material:

This includes developing systems for monitoring through peer reviews, collecting data from patients and consumers, clinicians, and supervisors, and using administrative and electronic record data. This category of strategies also includes the design of disease-specific clinical registries, where clinical information and tools (graphical representations, real-time report cards, comparisons with benchmarks, etc.) are available to care team members. These systems may inform audit and feedback strategies. Some intensive fidelity monitoring activities (e.g., psychotherapy recordings) are more practical at random, but not infrequent, intervals.

Develop disincentives

Provide financial disincentives for failure to implement or use the clinical innovations.

Ancillary Material:

In addition to direct financial disincentives, this strategy could include tying promotion decisions to the use of certain innovations.

Develop educational materials

Develop and format manuals, toolkits, and other supporting materials in ways that make it easier for stakeholders to learn about the innovation and for clinicians to learn how to deliver the clinical innovation.

Ancillary Material:

Create eye-catching, easy-to-use educational documents. Distill complex information into easier-to-learn components. Consider teaching skills modularly. Use different forms of media, and target messages for different audiences. Educational materials should reflect principles of adult learning theory. Assessment of current, available technology infrastructure to accommodate educational media (e.g., firewalls, old hardware, old software) is merited. Consider how the educational materials will be used over time. For example, will the educational materials' primary use be to train new or rotating staff; or to refresh staff knowledge; or to be incorporated into existing supervision, competency, and performance review structures. Educational materials may be refined through the use of formative evaluation feedback.

Relevant suggestions are provided via the REP framework, under its 'packaging' domain [7]. Further support related to developing educational materials can be found on the Training Within Industry Service website [29].

Develop resource sharing agreements

Develop partnerships with organizations that have resources needed to implement the innovation.

Ancillary Material:

For example, this could involve data sharing agreements, agreements to share necessary equipment (e.g., telemedicine equipment), or sharing the cost of bringing in experts who provide training and consultation. Resource sharing agreements could involve formal memorandums of understanding (MOUs), or be much more informal in nature.

Distribute educational materials

Distribute educational materials (including guidelines, manuals and toolkits) in person, by mail, and/or electronically.

Ancillary Material:

None

Facilitate relay of clinical data to providers

Provide as close to real-time data as possible about key measures of process/outcomes using integrated modes/channels of communication in a way that promotes use of the targeted innovation.

Ancillary Material:

For recommendations regarding how to introduce innovation or change of any kind into existing work flows, please see May [30].

Facilitation

A process of interactive problem solving and support that occurs in a context of a recognized need for improvement and a supportive interpersonal relationship.

Ancillary Material:

Facilitation can be internal or external to a system. This interactive support process can include a combination of any implementation strategies, and typically bundles multiple strategies as needed.

Fund and contract for the clinical innovation

Governments and other payers of services issue requests for proposals to deliver the innovation, use contracting processes to motivate providers to deliver the clinical innovation, and develop new funding formulas that make it more likely that providers will deliver the innovation.

Ancillary Material:

None

Identify and prepare champions

Identify and prepare individuals who dedicate themselves to supporting, marketing, and driving through an implementation, overcoming indifference or resistance that the intervention may provoke in an organization.

Ancillary Material:

This strategy includes preparing individuals for their role as champions. Champions are primarily internal to the organization. Additional issues raised include the need for guidance regarding:

a) Methods and considerations related to the selection and identification of champions. Social network theory and methods may be useful in this regard.
b) Training and or providing champions support materials.
c) Addressing incentives or disincentives to the champion role.
d) Whether there are needs for champions at different levels of an organization (e.g., clinic, region, national).

Champions are often distinguished from opinion leaders. Opinion leaders may be considered more of an objective third party with relevant expertise.

Identify early adopters

Identify early adopters at the local site to learn from their experiences with the practice innovation.

Ancillary Material:

Early adopters are a good pool for identifying implementation champions. Recruit early adopters to attend stakeholder meetings to present their experiences. Investigating the adoption chasm between early adopters and the early majority has been found to be useful. Different engagement techniques for these two groups are typically needed. For further discussion see Moore [19].

Increase demand

Attempt to influence the market for the clinical innovation to increase competition intensity and to increase the maturity of the market for the clinical innovation.

Ancillary Material:

One way of increasing demand is to educate patients about the clinical innovation so that they demand it from their providers (e.g., what pharmaceutical companies do).

Inform local opinion leaders

Inform providers identified by colleagues as opinion leaders or 'educationally influential' about the clinical innovation in the hopes that they will influence colleagues to adopt it.

Ancillary Material:

The opinions of individuals who refer people to services, or who initiate the connection to services also function in a key opinion role. Keeping opinion leaders informed from pre-implementation through maintenance of the clinical innovation is important. Ensuring that opinion leaders do not serve as implementation obstacles if they are not actively promoting the innovation is also important.

Intervene with patients/consumers to enhance uptake and adherence

Develop strategies with patients to encourage and problem solve around adherence.

Ancillary Material:

This includes patient/consumer reminders and financial incentives to attend appointments. Feedback regarding patient/consumers' understanding and use of the treatment is also important to collect.

Involve executive boards

Involve existing governing structures (e.g., boards of directors, medical staff boards of governance) in the implementation effort, including the review of data on implementation processes.

Ancillary Material:

Other types of leadership with 'top-down' powers may be involved for settings that do not have a governing board. Examples include administrative leadership, clinical leadership, policy makers, and insurance providers or other payment systems.

Involve patients/consumers and family members

Engage or include patients/consumers and families in the implementation effort.

Ancillary Material:

Feedback from stakeholders can be obtained at any stage of the implementation process depending on the needs and goals of project. Involving stakeholders in the pre-implementation phase for many innovations is advantageous. Training in the innovation, and relevant advocacy, may also be included

in stakeholder involvement. Informal caregivers such as neighbors, friends, and other key sources of support may also be prudent to include.

Make billing easier

Make it easier to bill for the clinical innovation.

Ancillary Material:

Making billing easier might involve requiring less documentation, 'block' funding for delivering the innovation, and creating new billing codes for the innovation. Developing progress note templates to facilitate documentation of the clinical innovation can also decrease the burden for obtaining payment.

Make training dynamic

Vary the information delivery methods to cater to different learning styles work contexts, and shape the training in the innovation to be interactive.

Ancillary Material:

Making training dynamic includes efforts to divide material into small time intervals, the use of small group breakouts, audience response systems, and other measures, such as having learners try new skills between training sessions. Interactive components of training can be very dynamic with participants actively contributing to the training content, engaging in problem solving, and identifying solutions that can be tested.

Mandate change

Have leadership declare the priority of the innovation and their determination to have it implemented.

Ancillary Material:

It is important to ensure that the individuals mandating the change have the power to do so, as implementers often lack such authority. Working with organizational leadership to develop buy-in and lobby for a change mandate is often needed. It can also be important to inform other stakeholders (e.g., auditors, groups that review services for billing) about the mandate to ensure they are on the same page.

Model and simulate change

Model or simulate the change that will be implemented prior to implementation.

Ancillary Material:

Computer simulations, walkthrough simulation exercises, or modeling the potential overall impact of stakeholder's behavior change may be used. System dynamics modeling is one example of a specific method that may be used [20]. This approach is often more relevant for complex multi-component innovations.

Obtain and use patients/consumers and family feedback

Develop strategies to increase patient/consumer and family feedback on the implementation effort.

Ancillary Material:

This can continue throughout the implementation effort. Strategies could include complaint forms, or methods, which funnel feedback to change managers or advisory boards. Consider whether anonymous feedback formats are appropriate.

Obtain formal commitments

Obtain written commitments from key partners that state what they will do to implement the innovation.

Ancillary Material:

Formal commitments should clarify roles, responsibilities, and detail tangible and non-tangible benefits (e.g., community partnerships). Ensure that key roles are supported within the organization (e.g., workload release credit for providing and receiving supervision in a new clinical practice). Formal commitments in no way diminish the importance of informal commitments to a change effort.

Organize clinician implementation team meetings

Develop and support teams of clinicians who are implementing the innovation and give them protected time to reflect on the implementation effort, share lessons learned, and support one another's learning.

Ancillary Material:

None

Place innovation on fee for service lists/formularies

Work to place the clinical innovation on lists of actions for which providers can be reimbursed (e.g., a drug is placed on a formulary, a procedure is now reimbursable).

Ancillary Material:

None

Prepare patients/consumers to be active participants

Prepare patients/consumers to be active in their care, to ask questions, and specifically to inquire about care guidelines, the evidence behind clinical decisions, or about available evidence-supported treatments.

Ancillary Material:

Preparing consumers to inquire about specific practices can involve asking questions, and educating patients/consumers about the existence of treatments supported by evidence, as well as explicitly inviting them into the process of treatment decision-making.

Promote adaptability

Identify the ways a clinical innovation can be tailored to meet local needs and clarify which elements of the innovation must be maintained to preserve fidelity.

Ancillary Material:

Preserving fidelity to the innovation can be an uncertain process if the core elements of the innovation are not empirically defined.

Promote network weaving

Identify and build on existing high quality working relationships and networks within and outside the organization, organizational units, teams, etc. to promote information sharing, collaborative problem-solving, and a shared vision/goal related to implementing the innovation.

Ancillary Material:

Individuals functioning as network weavers usually have external links outside of the community to bring in information and ideas. An example would be nurses and doctors who staff hospitals and skilled nursing facilities, and the patients who rotate among these facilities. Networks are somewhat more organic than collaboratives and are often enduring and durable. See: http://www.networkweaver.com/

Provide clinical supervision

Provide clinicians with ongoing supervision focusing on the innovation. Provide training for clinical supervisors who will supervise clinicians who provide the innovation.

Ancillary Material:

Clearly defining the role of supervision and providing ongoing resources to ensure that it occurs can be important. Supervisor training often needs to include specific training in how to supervise the innovation.

See Nadeem et al. [13] for a discussion of the distinction between consultation and supervision.

Provide local technical assistance

Develop and use a system to deliver technical assistance focused on implementation issues using local personnel.

Ancillary Material:

Local technical assistants can be connected with a broader or centralized network of technical assistants. Technical assistance for both the clinical innovation and the implementation processes may be important. For example, the VA aims to have mental health Evidence-Based Psychotherapy coordinators, Military Sexual Trauma coordinators, and OEF/OIF/OND coordinators in each facility who can provide technical assistance to other local clinicians for relevant initiatives.

Provide ongoing consultation

Provide ongoing consultation with one or more experts in the strategies used to support implementing the innovation.

Ancillary Material:

Ongoing consultations could include in-person or distance consultation and feedback on taped clinical encounters. Consultations are tailored to the clinician's actual practice, thus, differentiating a consultation from ongoing trainings. Feedback may be from a consultant external to the organization, which distinguishes consultation from clinical supervision. Some practice changes can involve a recertification process, thus, involving consultation ensures adequate fidelity. Consultation may also be necessary for non-clinical staff such as administrators and those responsible for billing, constructing feedback systems, or other staff with duties that impact the implementation process.

Purposely reexamine the implementation

Monitor progress and adjust clinical practices and implementation strategies to continuously improve the quality of care.

Ancillary Material:

It is beneficial to use a concrete schedule for monitoring rather than 'as needed.' Time-sensitive benchmarks for determining when adjustments are needed have also been found to be useful.

Recruit, designate, and train for leadership

Recruit, designate, and train leaders for the change effort.

Ancillary Material:

Change efforts require certain types of leaders, and organizations may need to recruit accordingly, rather than assuming that their current personnel can implement the change. Designated change leaders can include an executive sponsor and a day-to-day manager of the effort. Change leaders should consider how to establish effective supervisory lines for clinical practice innovations that are enacted by clinicians when the change leader does not have similar clinical responsibilities.

Remind clinicians

Develop reminder systems designed to help clinicians to recall information and/or prompt them to use the clinical innovation.

Ancillary Material:

Reminders could be patient or encounter-specific, provided verbally, on paper, or electronically. Computer-aided decision support, and drug dosages are included in this strategy. Reminders may be delivered at various time points (prior to service, during service, or following service delivery).

Revise professional roles

Shift and revise roles among professionals who provide care, and redesign job characteristics.

Ancillary Material:

Revising professional roles includes the expansion of roles to cover provision of the clinical innovation and the elimination of service barriers to care, including personnel policies.

Shadow other experts

Provide ways for key individuals to directly observe experienced people engage with or use the targeted practice change/innovation.

Ancillary Material:

While shadowing traditionally has involved in-person observation, creative use of technology may provide additional opportunities for individuals to observe and learn from those experienced in the innovation.

Stage implementation scale up

Phase implementation efforts by starting with small pilots or demonstration projects and gradually moving to a system wide rollout.

Ancillary Material:

This involves an iterative process that often results in adaptations. Strategies for integrating pilot feedback into the scale-up or spread process should be established in advanced. Depending on the innovation, piloting may also involve phasing in elements or components of the practice change. Many innovations involve more than one service (e.g., inpatient and outpatient; primary care and specialty care), and the scaling-up or spread process may have different needs to address the interactions among services (e.g. needs related to ensure continuity of care while connecting services). For more details see the Institute for Healthcare Improvement's white paper, which describes a framework for spread [12].

Start a dissemination organization

Identify or start a separate organization that is responsible for disseminating the clinical innovation. It could be a for-profit or non-profit organization.

Ancillary Material:

This strategy can address concerns (e.g., conflict of interest) for situations in which it is desirable to have fidelity monitors that are independent from the care setting. The dissemination organization could be a for-profit or nonprofit organization. The organization could be 'licensed' by a university, if the innovation was born within an academic setting. It is important for dissemination organizations to be aware of organizations' approaches to implementing other interventions in order to build upon existing practices.

Tailor strategies

Tailor the implementation strategies to address barriers and leverage facilitators that were identified through earlier data collection.

Ancillary Material:

The tailoring process tends to be idiosyncratic and driven by multiple factors. It is important to identify the core components of the intervention and implementation strategies that are required to maintain fidelity and effectiveness, and to distinguish those components amenable to modification/adaptation. Flottorp et al. [14] and Langley et al. [15] provide guidance regarding many of the multiple factors to consider. Wensing et al. [16, 17] provide an example of a structured approach to tailoring strategies.

Use advisory boards and workgroups

Create and engage a formal group of multiple kinds of stakeholders to provide input and advice on implementation efforts and to elicit recommendations for improvements.

Ancillary Material:

Consider how group composition (or heterogeneity) impacts stakeholder participation and take active steps to reduce response bias. For example, inclusion of supervisors and supervisees in these groups can be problematic and it may be a desirable strategy to ensure that these situations are avoided due to the power difference in the relationship. Supervisees, for example, may feel pressure to report positively to put a good face on for the supervisors, and supervisors may feel pressure to deny having any problems with implementation to save face. It can be useful to distinguish between internal stakeholders and representatives (in a participatory approach to maintain buy-in and relevance) versus external experts and advisors. Similarly, depending on the input or oversight need, the workgroup composition may include multiple-level or multi-disciplinary stakeholders.

Use an implementation advisor

Seek guidance from experts in implementation.

Ancillary Material:

This could include consultation with outside experts such as university-affiliated faculty members, or hiring quality improvement experts or implementation professionals.

Use capitated payments

Pay providers or care systems a set amount per patient/consumer for delivering clinical care.

Ancillary Material:

This is an implementation strategy to the degree that it frees the clinician to provide services that they may have been disincentivized to provide under a fee-for-service structure. This may be helpful to motivate clinicians to use certain clinical innovations. These changes often come about as part of policy changes that alter fee structures, alter coverage, or add items to reimbursement formularies.

Use data experts

Involve, hire, and/or consult experts to inform management on the use of data generated by implementation efforts.

Ancillary Material:

Consider engaging data experts early in the implementation planning process.

Use data warehousing techniques

Integrate clinical records across facilities and organizations to facilitate implementation across systems.

Ancillary Material:

Records that include variables that can serve as outcome measures are particularly useful. When outcomes of interest are not available, it may be useful to examine proxy measures.

Use mass media

Use media to reach large numbers of people to spread the word about the clinical innovation.

Ancillary Material:

Mass media may include television, newspapers, magazines, radio, electronic social media, listservs, mass email campaigns, mass mailings, and robocalls as methods for spreading information. Targets of these media campaigns may be clinicians, potential consumers of the innovation, or their associates. Other commonly used terms include marketing or social marketing.

Use other payment schemes

Introduce payment approaches (in a catch-all category).

Ancillary Material:

Payment scheme approaches may involve prepayment and prospective payment for service, provider salaried service, the alignment of payment rates with the attainment of patient/consumer outcomes, and the removal or alteration of billing limits, such as numbers of encounters that are reimbursable. Payment may also be based on measures of treatment fidelity. Payment schemes are implementation strategies to the degree that they free the clinician's time to provide the clinical innovation. Others strategies motivate clinicians to provide better service.

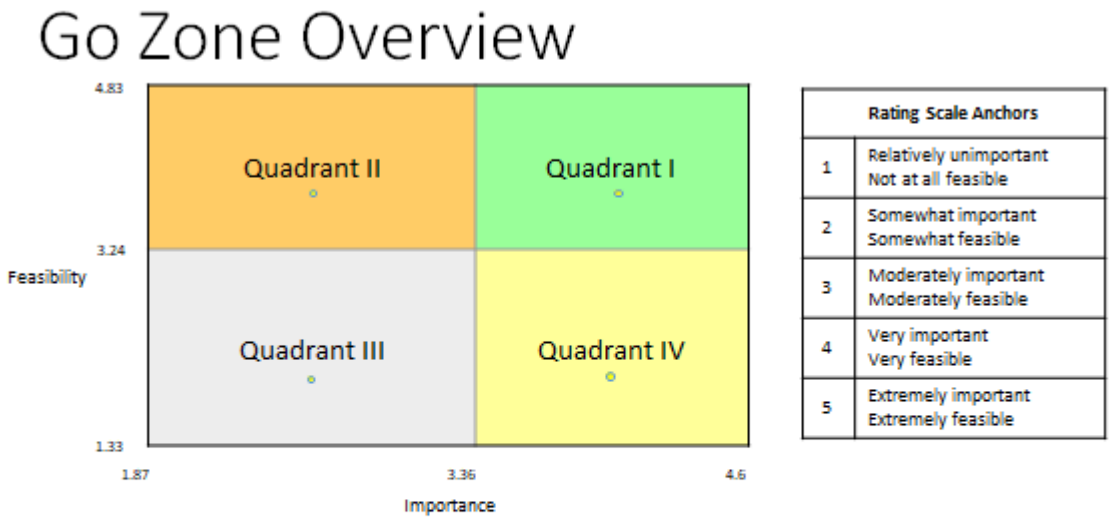
Use train-the-trainer strategies Train designated clinicians or organizations to train others in the clinical innovation. ***Ancillary Material:*** Restrictions regarding who can serve as a trainer are idiosyncratic to the innovation or practice change, for example, some innovations may require that supervisors have specific levels of education, training, or experience, and such restrictions should be explored in the planning phase. Train-the-trainer strategies may also apply to those responsible for administrative procedures, and who are part of implementing the innovation.
Visit other sites Visit sites where a similar implementation effort has been considered successful. ***Ancillary Material:*** Clarifying the goals of the site visit prior to making the visit is particularly useful. Comparing and contrasting the features of one's own site with the comparison site in preparation for the visit may better inform the visit objectives. Clarifying goals, in part includes developing a plan for using the information upon returning to your setting. Identify adaptations made in implementing the innovation and any perceived impact on the effectiveness of the innovation/practice change. It is important to document facilitators and lessons learned. Much can be learned from visiting sites that have a strong track record for successfully implementing a wide variety of other innovations/practice changes. Consulting with sites where implementation has stalled or failed can also provide useful information. Sites also benefit from sharing implementation planning and execution notes virtually (i.e., information exchange is not limited to physical visits).
Work with educational institutions Encourage educational institutions to train clinicians in the innovation. ***Ancillary Material:*** This strategy fits well with innovations requiring clinical training and other skills where training expertise is more likely to be housed in educational institutions.

Note. See Powell et al. 2015, for additional references associated with strategies in the original compilation.

Appendix E

Figure E1

Go Zone Overview Chart

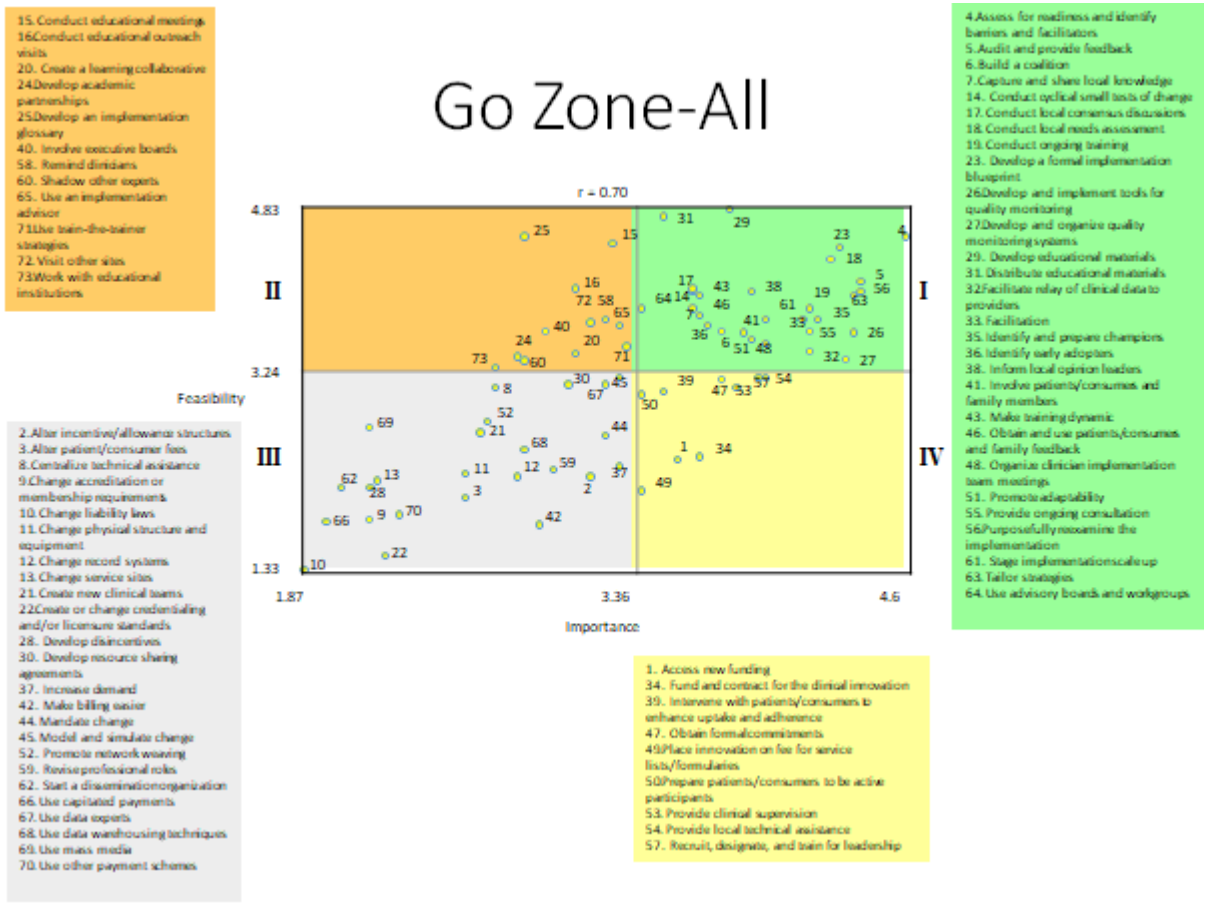


Note. The range of the x and y axes reflect the range of mean values obtained for all 73 of the discrete implementation strategies for each of the rating scales. The plot is divided into quadrants on the basis of the overall mean values for each of the rating scales. Different means are calculated for each identifying the quadrants of each of the plots where only from the ratings of the strategies that compose the cluster under analysis (above the divisions reflect the means for all 73 strategies).
Strategies falling in Quadrant I fall above the mean for both the importance and the feasibility ratings. Thus, these strategies are those where there was highest consensus regarding their relative high importance and feasibility. Conversely, Quadrant III reflects the strategies where there was consensus regarding their relative low importance and feasibility. Quadrants II and IV reflect strategies that were relatively high in feasibility or importance, respectively, but low on the other rating scale.

Note. See Waltz et al., 2015 for additional references associated with strategies in the original compilation

Figure E2

ERIC Strategies Go Zone-All Map



Note. See Waltz et al., 2015 for additional references associated with strategies in the original compilation

Table E1

A summary of the 73 implementation strategies, organized by cluster with mean importance and feasibility ratings

		Importance	**Feasibility**	**Go-zone quadrant**
	Use evaluative and iterative strategies	4.19	4.01	–

4	Assess for readiness and identify barriers and facilitators	4.60	4.57	I
5	Audit and provide feedback	4.40	4.13	I
56	Purposefully reexamine the implementation	4.40	4.03	I
26	Develop and implement tools for quality monitoring	4.37	3.63	I
27	Develop and organize quality monitoring systems	4.33	3.37	I
23	Develop a formal implementation blueprint	4.30	4.47	I
18	Conduct local need assessment	4.27	4.33	I
61	Stage implementation scale up	3.97	3.77	I
46	Obtain and use patients/consumers and family feedback	3.67	3.80	I
14	Conduct cyclical small tests of change	3.63	4.03	I
	Provide interactive assistance	3.67	3.29	–
33	Facilitation	4.13	3.77	I

54	Provide local technical assistance	3.97	3.20	IV
53	Provide clinical supervision	3.83	3.10	IV
8	Centralize technical assistance	2.73	3.10	III
	Adapt and tailor to context	3.59	3.30	–
63	Tailor strategies	4.37	4.00	I
51	Promote adaptability	3.90	3.57	I
67	Use data experts	3.23	3.13	III
68	Use data warehousing techniques	2.87	2.50	III
	Develop stakeholder interrelationships	3.47	3.64	–
35	Identify and prepare champions	4.20	3.77	I
48	Organize clinician implementation team meetings	3.97	3.53	I
57	Recruit, designate, and train for leadership	3.93	3.20	IV
38	Inform local opinion leaders	3.90	4.03	I

6	Build a coalition	3.77	3.63	I
47	Obtain formal commitments	3.77	3.17	IV
36	Identify early adopters	3.70	3.70	I
17	Conduct local consensus discussions	3.63	4.07	I
7	Capture and share local knowledge	3.63	3.87	I
64	Use advisory boards and workgroups	3.40	3.87	I
65	Use an implementation advisor	3.30	3.70	I
45	Model and simulate change	3.30	3.20	II
72	Visit other sites	3.17	3.73	II
40	Involve executive boards	2.97	3.63	II
25	Develop an implementation glossary	2.87	4.57	II
24	Develop academic partnerships	2.83	3.40	II
52	Promote network weaving	2.70	2.77	III

	Train and educate stakeholders	3.43	3.93	–
19	Conduct ongoing training	4.17	3.87	I
55	Provide ongoing consultation	4.17	3.63	I
29	Develop educational materials	3.80	4.83	I
43	Make training dynamic	3.67	4.00	I
31	Distribute educational materials	3.50	4.77	I
71	Use train-the-trainer strategies	3.33	3.50	I
15	Conduct educational meetings	3.27	4.50	I
16	Conduct educational outreach visits	3.10	4.07	II
20	Create a learning collaborative	3.10	3.43	II
60	Shadow other experts	2.87	3.37	II
73	Work with educational institutions	2.73	3.30	II
	Support clinicians	3.23	3.06	–

32	Facilitate relay of clinical data to providers	4.17	3.43	I
58	Remind clinicians	3.23	3.77	II
30	Develop resource sharing agreements	3.07	3.13	III
59	Revise professional roles	3.00	2.30	III
21	Create new clinical teams	2.67	2.67	III
	Engage consumers	3.25	2.95	–
41	Involve patients/consumers and family members	3.87	3.63	I
39	Intervene with patients/consumers to enhance uptake and adherence	3.50	3.07	IV
50	Prepare patients/consumers to be active participants	3.40	3.03	IV
37	Increase demand	3.30	2.33	II
69	Use mass media	2.17	2.70	III
	Utilize financial strategies	2.86	2.09	–

34	Fund and contract for the clinical innovation	3.67	2.43	IV
1	Access new funding	3.57	2.40	IV
49	Place innovation on fee for service lists/formularies	3.40	2.10	IV
2	Alter incentive/allowance structures	3.17	2.23	III
42	Make billing easier	2.93	1.77	III
3	Alter patient/consumer fees	2.60	2.03	III
70	Use other payment schemes	2.30	1.87	III
28	Develop disincentives	2.17	2.13	III
66	Use capitated payments	1.97	1.80	III
	Change infrastructure	2.40	2.01	–
44	Mandate change	3.23	2.63	III
12	Change record systems	2.83	2.23	III
11	Change physical structure and equipment	2.60	2.27	III

22	Create or change credentialing and/or licensure standards	2.23	1.47	III
13	Change service sites	2.20	2.20	III
9	Change accreditation or membership requirements	2.17	1.80	III
62	Start a dissemination organization	2.03	2.13	III
10	Change liability laws	1.87	1.33	III

Strategies are organized by rank order of mean importance ratings from the highest to the lowest within each cluster. The importance rating scale ranged from 1 (relatively unimportant) to 5 (extremely important), and the feasibility scale ranged from 1 (not at all feasible) to 5 (extremely feasible). The rightmost column depicts the Go-zone quadrant into which each of the strategies falls based on the scale mean cutoffs (see Fig. 2). Go-zone quadrant I: Importance and feasibility are both above the scale means. Go-zone quadrant II: Importance rating is lower, and the feasibility rating is higher than the scale means. Go-zone quadrant III: Importance and feasibility ratings are both below scale means. Go-zone quadrant IV: Importance rating higher and feasibility lower than scale means.

Note. See Waltz et al., 2015 for additional references associated with strategies in the original compilation.

Appendix F

Figure F1

Top ERIC Strategies for Goals and Feedback Construct

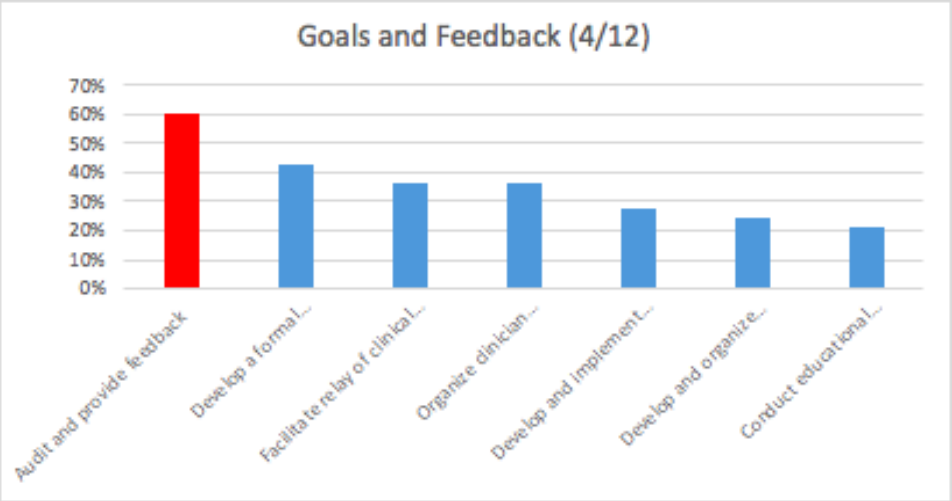


Figure F2

Top ERIC Strategies for Champions Construct

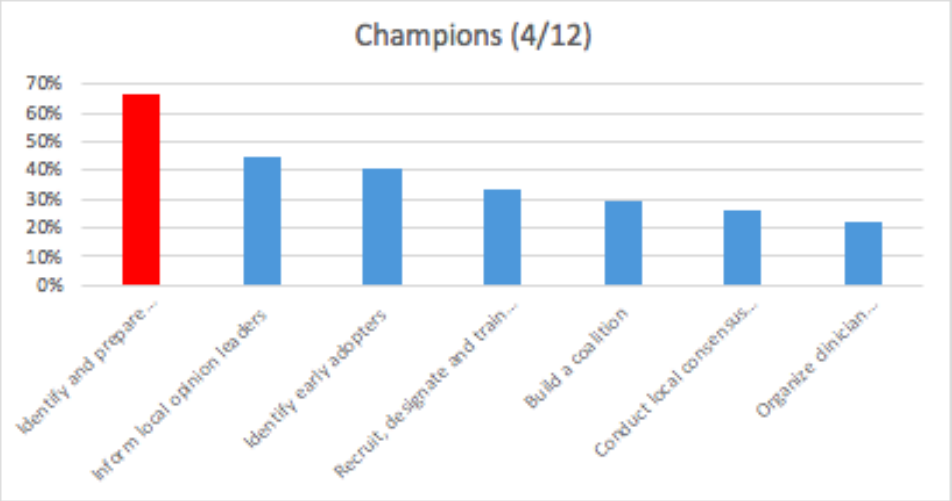


Figure F3

Top ERIC Strategies for Networks and Communication Construct

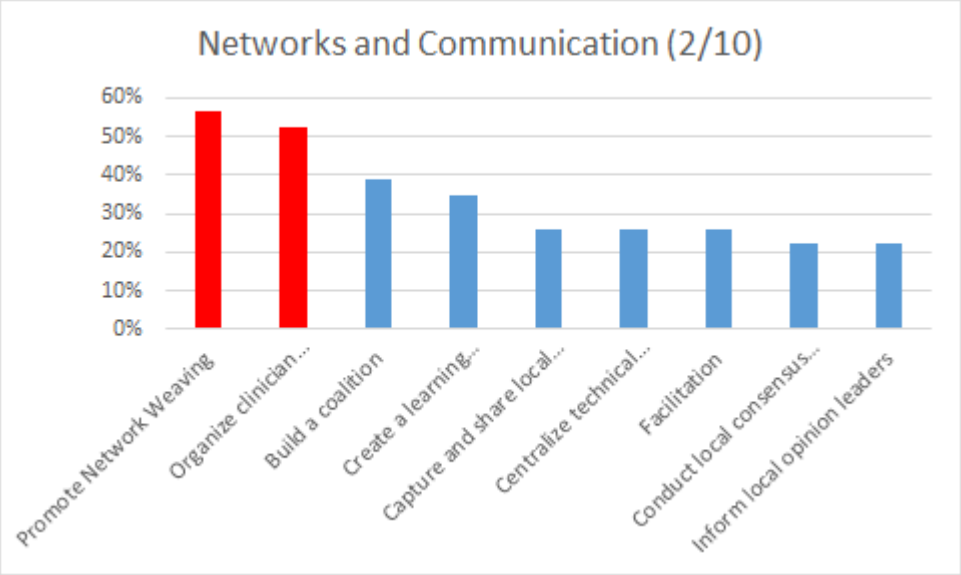


Figure F4

Top ERIC Strategies for Opinion Leaders Construct

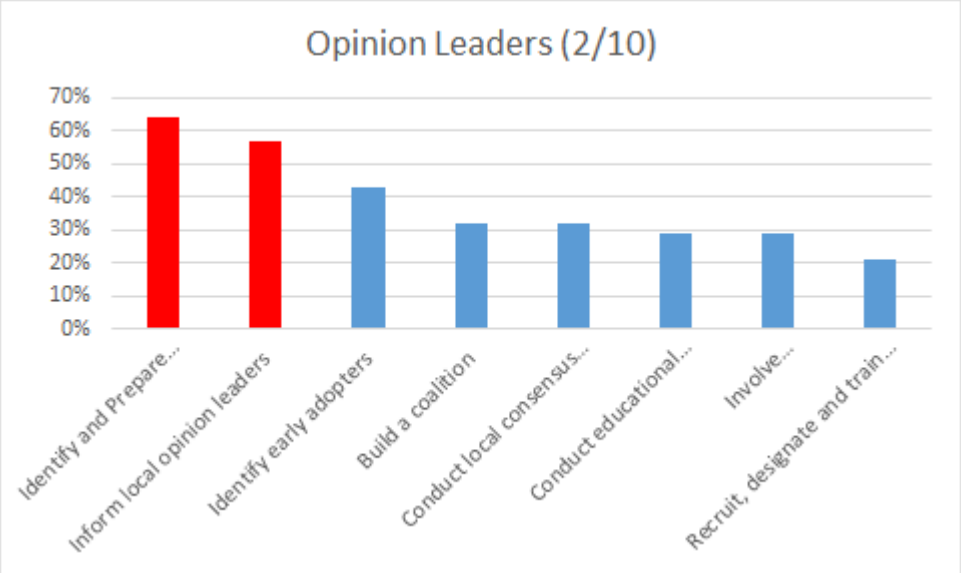


Figure F5

Top ERIC Strategies for Formally Appointed Internal Implementation Leaders Construct

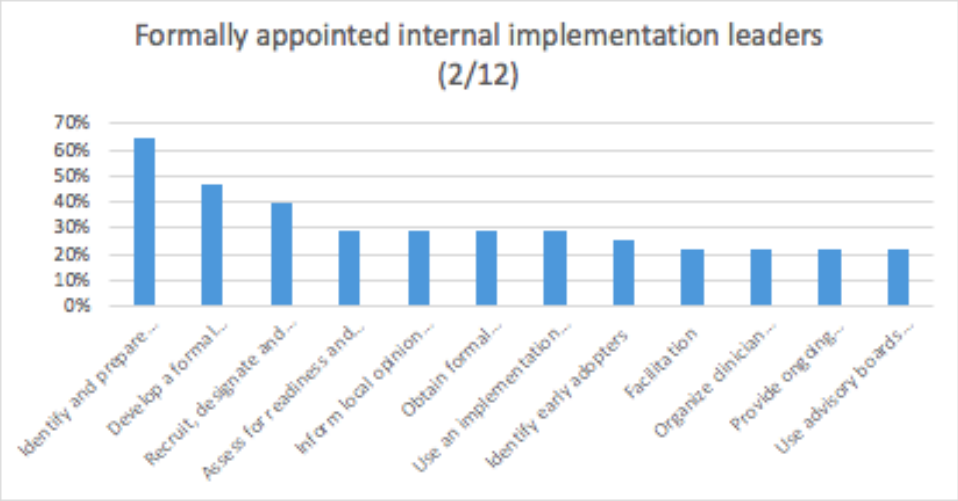


Figure F6

Top ERIC Strategies for Cosmopolitanism Construct

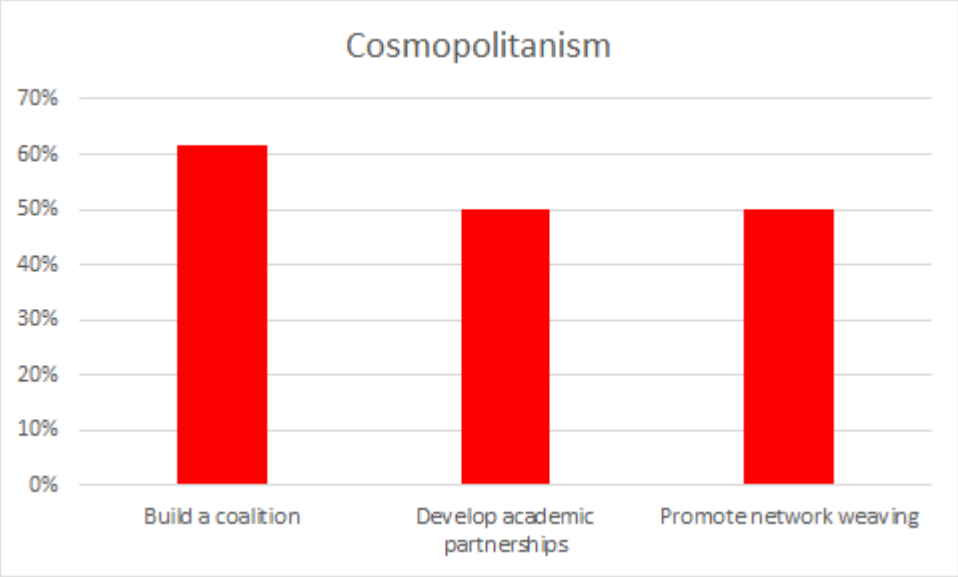
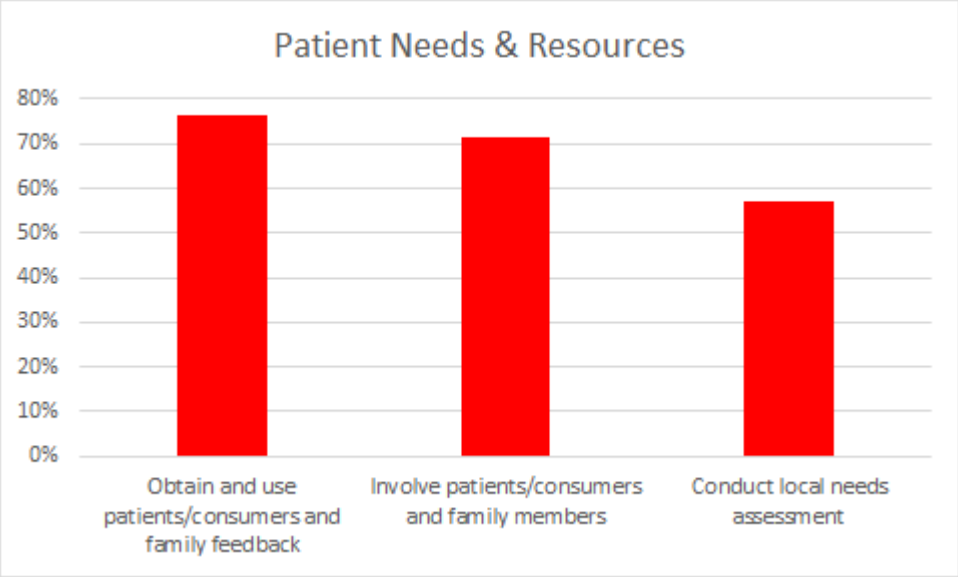


Figure F7

Top ERIC Strategies for Patient Needs & Resources Construct


Patient Needs & Resources
80%
70%
60%
50%
40%
30%
20%
10%
0%
Obtain and use patients/consumers and family feedback
Involve patients/consumers and family members
Conduct local needs assessment

Appendix G

Figure G1

Edwin Fernandez CITI Certificate

Figure G2

Leigh Kimmell CITI Certificate

CITI PROGRAM

Completion Date 28-Aug-2017
Expiration Date 27-Aug-2020
Record ID [redacted]

This is to certify that:

Leigh Kimmell

Has completed the following CITI Program course:

OUSD P&R Human Research (Curriculum Group)
Biomedical Investigators and Research Study Team (Course Learner Group)
1 - Biomedical Investigators (Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w8ab8c8bb-404a-4026-9584-122bb5218702-24342388

Figure G3

Geoffrey Obia CITI Certificate

CITI PROGRAM

Completion Date 23-Aug-2017
Expiration Date 22-Aug-2020
Record ID [redacted]

This is to certify that:

Geoffrey Obia

Has completed the following CITI Program course:

OUSD P&R Human Research (Curriculum Group)
Biomedical Investigators and Research Study Team (Course Learner Group)
1 - Biomedical Investigators (Stage)

Under requirements set by:

Office of the Under Secretary of Defense (Personnel and Readiness)

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w35d94b40-d3f2-4824-81f1-b82056776618-24285935

Appendix H

USUHS FORM 3202N
DANIEL K. INOUYE GRADUATE SCHOOL OF NURSING
EVIDENCE-BASED PRACTICE/PERFORMANCE IMPROVEMENT PROPOSAL

VPR Date Stamp

Project Number: _____ (VPR will assign)

Project Title: **Analysis of Barriers to Implementation of Defense Health Agency Procedural Instruction (DHA-PI) on Pain Management and Opioid Safety in the Military Health System (MHS)**

SECTION A: STUDENT POC INFORMATION

1. Name (Last, First, MI): **Kimmell, Leigh E.** Student E-mail: [redacted]
2. Home Address: [redacted]

SECTION B: COMMITTEE CHAIR / SENIOR MENTOR INFORMATION

3. Name (Last, First, MI): **Taylor, Laura A.**
4. Telephone: **(301) 295-1124** Fax: E-mail: **laura.taylor@usuhs.edu**
5. USUHS Building/ Room No.: **E/1012**

SECTION C: PROJECT INFORMATION

6. Attach the Abstract for the proposal, including the following sections: Site Location of the Project, Title, Authors, Background or Problem/Issue, Clinical Question/Purpose, Project Design, Anticipated Organizational Impact/Implications for Practice and also include the Proposed Timeline. Single space the abstract and use Times New Roman font, size 12.
7. Is this proposal related to an active research project of the Chair/Senior Mentor identified in Section B? ☐ Yes ☒ No
   If yes, complete below; if no, proceed to Part 8.
   Project Number: _____
   Project Title: _____
   Project Start Date: _____ Project End Date: _____
8. Anticipated period of performance: Project Start Date: **6/1/2019** Project End Date: **3/26/2020**
9. Performance Site(s):
10. Does this project involve any classified information? (Contact the USUHS Security Office for guidance) ☐ Yes ☒ No
11. Do you have a funding source for this project? ☐ Yes ☐ No ☒ NA
    If yes, specify the funding agency and the amount provided:

SECTION D: SIGNATURES

The following signatures attest to the validity of the above information:

Leigh Kimmell [redacted] [redacted] 30 March 2020

Student (Project Point of Contact for [redacted] VARNEY.JENNIFER.LYNN.1 [redacted]) — Chair/Senior Mentor (Signature and Date)

Chair/Program Director (Signature and Date) — Chair/Program Director (Signature and Date)

DNP Project Director or PhD Director (Signature and Date) — Associate Dean for Academic Affairs, GSN (Signature and Date)

Associate Dean for Research, GSN (Signature and Date) — Dean, DKI Graduate School of Nursing (Signature and Date)

In light of the above signatures, the project is approved.

USUHS Vice President for Research — Date

USUHS Form 3202N (VPR) - Revised Sep 2015 v1.2
Previous versions are obsolete

Appendix I

DISCLAIMER: Due to the impact of the COVID19 Pandemic 2020, the eIRB approval has been halted at KMC. The application is being administratively processed as of 30 March 2020 by the Research Cell at KMC. All HIPAA guidelines were followed, and no PHI was obtained during this project. Approval for disclaimer was obtained from Senior Mentor and by GME Director at KMC.

Appendix J

Standardized CFIR Interview Questions

Intervention Characteristics

Evidence Strength & Quality

1. What kind of information or evidence are you aware of that shows whether or not the intervention will work in your setting?
    - What evidence have you heard about from your own research? Practice guidelines? Published literature? Co-workers? Other settings?
    - How does this knowledge affect your perception of the intervention?
2. *In a healthcare setting, influential stakeholders may include influential and well-respected clinicians, where as in an education setting, this may include influential and well-respected teachers or educators.*

    What do influential stakeholders think of the intervention?
    - What do administrative or other leaders think of the intervention?
3. What kind of supporting evidence or proof is needed about the effectiveness of the intervention to get staff on board?
    - Co-workers? Administrative leaders?

Relative Advantage

Coding between Tension for Change, Relative Advantage, and Needs and Resources of Those Served by the Organization will be nuanced but here are some general guidelines:

- *Tension for Change: Statements that demonstrate a strong need for the intervention and/or that the current situation is untenable.*
- *Relative Advantage: Statements that demonstrate the intervention is better (or worse) than existing programs.*
- *Needs and Resources: Statements regarding specific needs of individuals that demonstrate a need for the intervention, but do not necessarily represent a strong need or an untenable status quo.*

1. How does the intervention compare to other similar existing programs in your setting?
    - What advantages does the intervention have compared to existing programs?
    - What disadvantages does the intervention have compared to existing programs?
2. How does the intervention compare to other alternatives that may have been considered or that you know about?
    - What advantages does the intervention have compared to these other programs?
    - What disadvantages does the intervention have compared to these other programs?
3. Is there another intervention that people would rather implement?
    - Can you describe that intervention?
    - Why would people prefer the alternative?

Adaptability

1. What kinds of changes or alterations do you think you will need to make to the intervention so it will work effectively in your setting?
    - Do you think you will be able to make these changes? Why or why not?

2. Who will decide (or what is the process for deciding) whether changes are needed to the intervention so that it works well in your setting?
    - How will you know if it is appropriate to make any changes?

3. Are there components that should not be altered?
    - Which ones should not be altered?

Complexity

- *This construct addresses the complexity of the intervention, not the complexity of the implementation. Challenges related to implementation should be coded to the appropriate CFIR code, e.g. challenges with engaging staff should be coded to Engaging: Key Stakeholders or challenges related to making the intervention*

a priority for leadership should be (double) coded to Leadership Engagement and Relative Priority.

1. How complicated is the intervention?
    - Please consider the following aspects of the intervention: duration, scope, intricacy and number of steps involved and whether the intervention reflects a clear departure from previous practices.

Cost

1. What costs will be incurred to implement the intervention?
2. What cost were considered when deciding to implement the intervention?

Inner Setting

Structural Characteristics

1. How will the infrastructure of your organization (social architecture, age, maturity, size, or physical layout) affect the implementation of the intervention?
    - How will the infrastructure facilitate/hinder implementation of the intervention?
    - How will you work around structural challenges?
2. What kinds of infrastructure changes will be needed to accommodate the intervention?
    - Changes in scope of practice? Changes in formal policies? Changes in information systems or electronic records systems? Other?
    - What kind of approvals will be needed? Who will need to be involved?
    - Can you describe the process that will be needed to make these changes?

Networks & Communications

1. Are meetings, such as staff meetings, held regularly?
    - Do you typically attend?

- Who typically attends?
- What proportion of staff typically attend?
- How often are the meetings held?
- What is a typical agenda? How helpful are these meetings?

2. How do you typically find out about new information, such as new initiatives, accomplishments, issues, new staff, staff departures?

Culture

1. How do you think your organization's culture (general beliefs, values, assumptions that people embrace) will affect the implementation of the intervention?
   - Can you describe an example that highlights this?
2. To what extent are new ideas embraced and used to make improvements in your organization?
   - Can you describe a recent example?

Implementation Climate

1. *This question is likely to uncover topics to explore more within other sub-constructs, but be attentive to other themes that may not be included in your assessment.*

What is the general level of receptivity in your organization to implementing the intervention?

- Why?

Tension for Change

1. Is there a strong need for this intervention?
   - Why or why not?
   - Do others see a need for the intervention?

2. How essential is this intervention to meet the needs of the individuals served by your organization or other organizational goals and objectives?
3. How do people feel about current programs/practices/process that are available related to the intervention?
    - To what extent do current programs fail to meet existing needs? Will the intervention meet these needs?
    - How will the intervention fill current gaps?

Compatibility

1. How well does the intervention fit with existing work processes and practices in your setting?
    - What are likely issues or complications that may arise?
2. Can you describe how the intervention will be integrated into current processes?
    - How will it interact or conflict with current programs or processes?
3. Will the intervention replace or compliment a current program or process?
    - In what ways?

Relative Priority

1. What kinds of high-priority initiatives or activities are already happening in your setting?
    - What is the priority of getting the intervention implemented relative to other initiatives that are happening now?
    - Will the implementation conflict with these priorities?
    - Will the implementation help achieve (or relieve pressure related to) these priorities?
2. Describe activities or initiatives that (appear to) have highest priority for you (for the organization)?
    - What kind of pressure are you feeling to accomplish this? Where is it coming from? Why?

3. To what extent might the implementation take a backseat to other high-priority initiatives going on now?
    - How important do you think it is to implement the intervention compared to the other priorities?
    - How important is it to others, such as your coworkers or leaders, to implement the intervention compared to the other priorities?

Goals & Feedback

1. To what extent does your organization/unit set goals for current programs/initiatives?
    - How are goals communicated in the organization? To whom are they communicated?
    - Can you give an example of a goal? How and to whom is it communicated?
    - Are changes made based on how things are going? Can you give an example?
2. To what extent are organizational goals monitored for progress?
    - Can you give an example of monitoring in terms of the type of information, who is informed, and how?
3. *This question can be framed in terms of the intervention. For example, in a healthcare setting: How does implementation of the intervention align with organizational goals related to preventing*

    How does implementation of the intervention align with other organizational goals?

Learning Climate

1. Can you describe a recent quality improvement initiative or an implementation of a new program?

- Can you describe the new initiative/program and the motivation to improve/implement it?
- Can you tell me the major milestones or key accomplishments along the way?
- What factors helped make it successful/fail?
- Who were the key "players"?
- What was your involvement?
- Were people happy with the outcome/initiative?
- Can you tell me about how leaders were involved? Who? Their roles? How they helped/hindered?

2. If you saw a problem in your own setting, what would you do?
    - Can you tell a story about a recent problem you resolved or initiative you participated in?
3. To what extent do you feel like you can try new things to improve your work processes?
    - Do you feel like you have the time and energy to think about ways to improve things?
    - Did you feel valued/respected by your supervisor for the role you played?
    - What role did your supervisor (or other leaders) play? What actions did they take?

Readiness for Implementation

Leadership Engagement

1. What kind of support or actions can you expect from leaders in your organization to help make implementation successful?

- Who are these leaders? How do attitudes of different leaders vary?
- Do they know about the intention to implement the intervention?
    - What kind of support can you expect going forward? Can you provide specific examples?

- What types of barriers might they create?

Available Resources

1. Do you expect to have sufficient resources to implement and administer the intervention?
    - [If Yes] What resources are you counting on? Are there any other resources that you received, or would have liked to receive?
    - What resources will be easy to procure?
    - [If no] What resources will not be available?

2. How do you expect to procure necessary resources?
    - Who will be involved in helping you get what is needed?
    - What challenges do you expect to encounter?

Access to Knowledge & Information

1. What kinds of information and materials about the intervention have already been made available to you?

Characteristics of Individuals

Knowledge & Beliefs about the Intervention

1. What do you know about the intervention or its implementation?
2. Do you think the intervention will be effective in your setting?
    - Why or why not?
3. How do you feel about the intervention being used in your setting?
    - How do you feel about the plan to implement the intervention in your setting?
    - Do you have any feelings of anticipation? Stress? Enthusiasm? Why?
4. At what stage of implementation is the intervention in your organization?
    - How do you think the program is going?

- Why do you say that?

Self-efficacy

1. How confident are you that you will be able to successfully implement the intervention?
    - What gives you that level of confidence (or lack of confidence)?
2. How confident are you that you will be able to use the intervention?
    - What gives you that level of confidence (or lack of confidence)?
3. How confident do you think your colleagues feel about implementing the intervention?
    - What gives them that level of confidence (or lack of confidence)?

Opinion Leaders

1. Who are the key influential individuals to get on board with this implementation?

Formally Appointed Internal Implementation Leaders

1. Who will lead implementation of the intervention?
    - How did/will this person come into this role? Appointed? Volunteered? Voluntold?
    - What attributes or qualities does this person have that makes them an effective leader of this implementation? What attributes or qualities does this person lack?
    - Does this person have sufficient authority to do what is necessary to implement the intervention?
2. Who else is involved with leading the implementation?

Champions

1. Other than the formal implementation leader, are there people in your organization who are likely to champion (go above and beyond what might be expected) the intervention?
    - Were they formally appointed in this position, or was it an informal role?
    - What position do these champions have in your organization?
    - How do you think they will help with implementation? Getting people to use the intervention?

Key Stakeholders

1. Who are the key individuals to get on board with the intervention?
    - To encourage individuals to use the intervention? To help with implementation?

Reflecting & Evaluating

1. What kind of information do you plan to collect as you implement the intervention?
    - Which measures will you track? How will you track them?
    - How will this information be used?
2. How will you assess progress towards implementation or intervention goals?
    - How will results of the evaluation be distributed to stakeholders?
3. Will feedback be elicited from staff? From the individuals served by your organization?
    - [If yes] What kind of feedback?

Note. Questions obtained from CFIR Research Team-Center for Clinical Management Research. (2020).

Appendix K

Figure K1

CFIR-ERIC Matching Tool

Clear All / Select All	Topic/Description	Related Barrier
	INTERVENTION CHARACTERISTICS	
0	Intervention Source	Stakeholders have a negative perception of the innovation because of the entity that developed it and/or where it was developed.
0	Evidence Strength & Quality	Stakeholders have a negative perception of the quality and validity of evidence supporting the intervention.
0	Relative advantage	Stakeholders do not see the advantage of implementing the innovation compared to an alternative solution or keeping things the same.
0	Adaptability	Stakeholders do not believe that the innovation can be sufficiently adapted, tailored, or re-invented to meet local needs.
0	Trialability	Stakeholders believe they cannot test the innovation on a smaller scale within the organization or undo implementation if needed.
0	Complexity	Stakeholders believe that the innovation is complex based on their perception of duration, scope, radicalness, disruptiveness, centrality, and/or intricacy and number of steps needed to implement.
0	Design Quality and Packaging	Stakeholders believe the innovation is poor quality based on the way it is bundled, presented, and/or assembled.
0	Cost	Stakeholders believe the innovation costs and/or the costs to implement (including investment, supply, and opportunity costs) are too high.
	OUTER SETTING	
0	Patient Needs & Resources	Patient needs, including barriers and facilitators to meet those needs, are not accurately known and/or this information is not a high priority for the organization.
0	Cosmopolitanism	The organization is not well networked with external organizations.
0	Peer Pressure	There is little pressure to implement the innovation because other key peer or competing organizations have not already implemented the innovation nor is the organization doing this in a bid for a competitive edge.
0	External Policy & Incentives	External policies, regulations (governmental or other central entity), mandates, recommendations or guidelines, pay-for-performance, collaborative, or public or benchmark reporting do not exist or they undermine efforts to implement the innovation.
	INNER SETTING	
0	Structural Characteristics	The social architecture, age, maturity, and size of an organization hinders implementation.
0	Networks & Communications	The organization has poor quality or non-productive social networks and/or ineffective formal and informal communications.
0	Culture	Cultural norms, values, and basic assumptions of the organization hinder implementation.
0	Implementation Climate	There is little capacity for change, low receptivity, and no expectation that use of the innovation will be rewarded, supported, or expected.
0	Tension for Change	Stakeholders do not see the current situation as intolerable or do not believe they need to implement the innovation.
0	Compatibility	The innovation does not fit well with existing workflows nor with the meaning and values attached to the innovation, nor does it align well with stakeholders' own needs and/or it heightens risk for stakeholders.
0	Relative Priority	Stakeholders perceive that implementation of the innovation takes a backseat to other initiatives or activities.
0	Organizational Incentives & Rewards	There are no tangible (e.g., goal-sharing awards, performance reviews, promotions, salary raises) or less tangible (e.g., increased stature or respect) incentives in place for implementing the innovation.
0	Goals and Feedback	Goals are not clearly communicated or acted upon, nor do stakeholders receive feedback that is aligned with goals.

0	Learning Climate	The organization has a climate where: a) leaders do not express their own fallibility or need for stakeholders' assistance or input; b) stakeholders do not feel that they are essential, valued, and knowledgeable partners in the implementation process; c) stakeholders do not feel psychologically safe to try new methods; and d) there is not sufficient time and space for reflective thinking or evaluation.
0	Readiness for Implementation	There are few tangible and immediate indicators of organizational readiness and commitment to implement the innovation.
0	Leadership Engagement	Key organizational leaders or managers do not exhibit commitment and are not involved, nor are they held accountable for implementation of the innovation.
0	Available Resources	Resources (e.g., money, physical space, dedicated time) are insufficient to support implementation of the innovation.
0	Access to knowledge and information	Stakeholders do not have adequate access to digestible information and knowledge about the innovation nor how to incorporate it into work tasks.
	CHARACTERISTICS OF INDIVIDUALS	
0	Knowledge & Beliefs about the Intervention	Stakeholders have negative attitudes toward the innovation, they place low value on implementing the innovation, and/or they are not familiar with facts, truths, and principles about the innovation.
0	Self-efficacy	Stakeholders do not have confidence in their capabilities to execute courses of action to achieve implementation goals.
0	Individual Stage of Change	Stakeholders are not skilled or enthusiastic about using the innovation in a sustained way.
0	Individual Identification with Organization	Stakeholders' are not satisfied with and have a low level of commitment to their organization.
	PROCESS	
0	Planning	A scheme or sequence of tasks necessary to implement the intervention has not been developed or the quality is poor.
0	Opinion Leaders	Opinion leaders (individuals who have formal or informal influence on the attitudes and beliefs of their colleagues with respect to implementing the intervention) are not involved or supportive.
0	Formally appointed internal implementation leaders	A skilled implementation leader (coordinator, project manager or team leader), with responsibility to lead implementation of the innovation, has not been formally appointed or recognized within the organization.
0	Champions	Individuals acting as champions who support, market, or 'drive through' implementation in a way that helps to overcome indifference or resistance by key stakeholders are not involved or supportive.
0	External Change Agents	Individuals from an outside entity formally facilitating decisions to help move implementation forward are not involved or supportive.
0	Key Stakeholders	Multi-faceted strategies to attract and involve key stakeholders in implementing or using the innovation (e.g., through social marketing, education, role modeling, training) are ineffective or non-existent.
0	Patients/Customers	Multi-faceted strategies to attract and involve patients/customers in implementing or using the innovation (e.g., through social marketing, education, role modeling, training) are ineffective or non-existent.
0	Executing	Implementation activities are not being done according to plan.
0	Reflecting & Evaluating	There is little or no quantitative and qualitative feedback about the progress and quality of implementation nor regular personal and team debriefing about progress and experience.

Note. Obtained from CFIR Research Team-Center for Clinical Management Research, 2018.

Appendix L

Appendix G: Daniel K. Inouye Graduate School of Nursing
DNP Project Completion Verification Form

DOCTOR OF NURSING PRACTICE PROJECT
Completion Verification Form

The DNP Project titled: Analysis of Barriers to Implementation of Defense Health Agency Procedural Instruction (DHA-PI) on Pain Management and Opioid Safety in the Military Health System (MHS) was completed at Keesler Air Force Base by the following student(s):

(type student name)	*(signature)*	*(date)*
Edwin Fernandez Jr.	[redacted]	30Mar20
Leigh E. Kimmell		30March2020
Geoffrey O. Obia		30Mar2020

The DNP Practice Project Team verifies that the following components of the DNP project, accomplished by the above students, is of sufficient rigor and demonstrates doctoral level scholarship to meet the requirements for USUHS GSN graduation:

- Presentation of DNP project to the leadership/stakeholders at the Phase II Site,
- Abstract/Impact Statement (*Appendix F*), and
- DNP Project written report.

Verified by:

(type name)	*(signature)*	*(date)*	
Laura A. Taylor, PhD	[redacted]	30 Mar 2020	Senior Mentor
Jennifer L. Varney, DNP		30Mar20	Team Mentor & Phase II Site Director

Form Version: 26 Aug 2017