Implementation Strategies for Frontline Healthcare Professionals: People, Process Mapping, and Problem Solving

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Implementation science is focused on developing and evaluating methods to reduce gaps between research and practice. As healthcare organizations become increasingly accountable for equity, quality, and value, attention has been directed to identifying specific implementation strategies that can accelerate the adoption of evidence-based therapies into clinical practice. In this perspective, we offer three simple, practical strategies that can be used by frontline healthcare providers who are involved in on-the-ground implementation: people (stakeholder) engagement, process mapping, and problem solving. As a use case example, we describe the iterative application of these strategies to the implementation of a new home sleep apnea testing program for patients in the Veterans Health Administration (VA) healthcare system.

INTRODUCTION

During the past two decades, implementation science has emerged as a prominent field broadly defined as the "study of methods to promote the adoption and integration of evidence-based practices, interventions, and policies into routine health care and public health settings[1]." In practice, implementation science blends theories from sociology and psychology with the methods of traditional research, quality improvement, and business change management[2]. Much of the existing literature has focused on the development of theories and frameworks to guide the design, evaluation, and dissemination of effective strategies[3]. However, the evolving theories, constructs, domains, and classification schemes[4, 5] can sometimes introduce unintended barriers for practical application by the very individuals (frontline clinicians and staff) who are responsible for day-to-day implementation.

As described in the Veterans Health Administration (VA) Quality Enhancement Research Initiative Roadmap,[6] implementation involves three phases: (1) pre-implementation, (2) implementation, and (3) sustainment. Pre-implementation consists of defining a quality gap, identifying an evidence-based practice to reduce this gap, selecting local champions to lead implementation at each target site, and planning how to evaluate the impact of these efforts. During this pre-implementation phase, frontline healthcare professionals often serve as valuable opinion leaders and operational stakeholders but, given the complex and competing demands facing many healthcare leaders, may have limited control over the plan to achieve organizational objectives. Partnering with implementation scientists brings rigor and expertise to the operational approach, selection of outcome metrics, and dissemination of effective strategies.

As a project enters the implementation phase, frontline teams play a critical role in shaping its trajectory and successful sustainment. For the practicing healthcare professional, we propose a simple and practical approach to on-the-ground implementation that involves three essential strategies (*people* engagement, *process* mapping, and *problem* solving) with continuously iterative cycles across these elements during the lifespan of a project. In our experience with national implementation efforts, this approach has proven indispensable for aligning scientists, operational leaders, and frontline staff at local sites. Figure 1 shows how these tools fit into the overall roadmap. As a use case, we describe its application to the implementation of an enterprise-wide home sleep apnea testing initiative.

Process Mapping

Since its origins in the manufacturing industry, process mapping has become a familiar tool used to visually represent the inputs, outputs, and steps of healthcare improvement[7]. Although process mapping has not been a prominent feature in the implementation science literature, it has a well-established place in many quality improvement methods such as the Institute for Healthcare
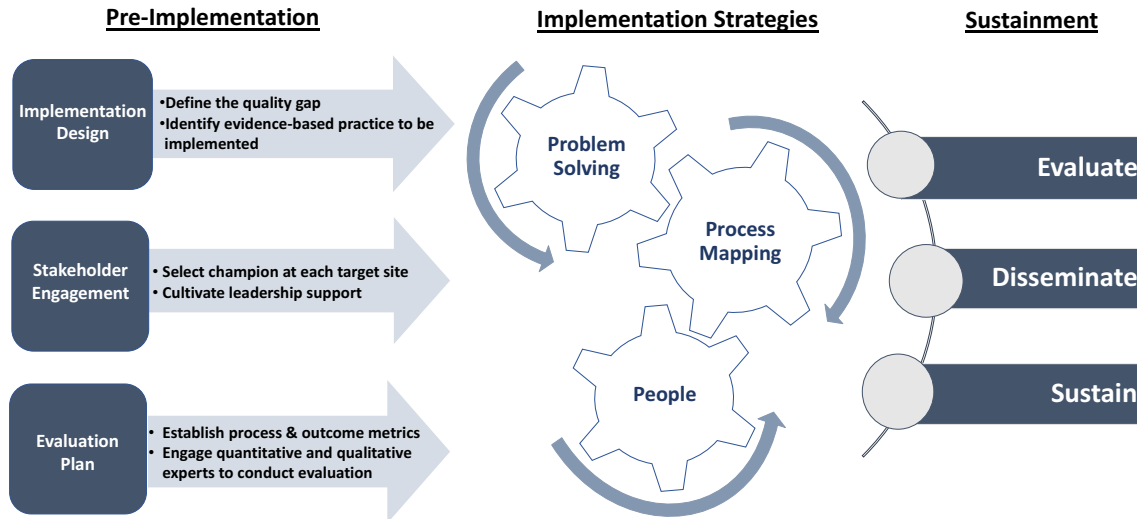
Figure 1 Implementation requires iterative cycles of process mapping, problem solving, and stakeholder engagement (people).

Improvement's Model for Improvement[8] and Lean in Healthcare[9]. The beginning and end of a process map define the boundaries of a specific change initiative. The steps in between highlight key events and the sequence in which they occur. Additional information regarding the operators involved in parallel processes (e.g., swim lane diagrams[10]) or the potential value associated with each step (e.g., value stream mapping[11]) may be provided to enhance clarity.

In the pre-implementation phase of a project, process mapping of the existing structures and practices at each site identifies potential adaptations of the intervention that may be necessary and helps delineate important metrics for future tracking. Process maps can identify workflow nodes that are likely to introduce barriers or serve as facilitators. Understanding local processes can also point to strategic adaptations that may be necessary to meet local needs. Sharing process maps with evaluation partners is also helpful for defining metrics (e.g., number of days required to hire necessary personnel, obtain equipment, seek document approvals) to track progress and evaluate outcomes at the completion of a project.

Once the current state has been determined and agreed upon by relevant stakeholders, mapping the envisioned future state articulates the change initiative to everyone involved and may identify new stakeholders who need to be engaged. Implementation ventures typically involve multiple departments and services, including human resources, information technology, supply chain management, facilities operation, and clinical staff. Process mapping allows the site champion to ensure fidelity to essential elements of the evidence-based intervention while identifying potential adaptations to fit local needs. Finally, seeking input from frontline staff on the future state map communicates the importance of their roles and increases their ownership of the new process.

People (Stakeholder) Engagement

Just as identification of a local champion is the most critical aspect of pre-implementation, stakeholder engagement sits at the core of successful implementation. Ideally, the local champion will be a provider embedded in the clinical setting whose workflow will be directly affected by the proposed intervention. Early involvement of leadership and endorsement of the project as an organizational priority is another crucial element in the successful launch of a new initiative. Continuous involvement of stakeholders (including ancillary and support staff) and repeated tailoring of implementation strategies to new stakeholders throughout a project are also key factors in achieving sustained adoption of evidence-based practices.

Although the value of stakeholder engagement has been clearly demonstrated in the literature[12], there is surprisingly little evidence to support best practices for the identification and alignment of stakeholders in a proposed initiative, or practical guides for how to gather their valuable input before and during the implementation process[3]. Frameworks such as the Consolidated Framework for Implementation Research[13] and the 7Ps[14] (Patients, Providers, Purchasers, Payers, Policymakers, Product Makers, and Principal Investigators) suggest stakeholder categories to consider at the outset of a project. Practically speaking, whoever is touched by the process map, its inputs or its outputs, is a stakeholder. If not invested in a project's success, stakeholders can (consciously or unconsciously) introduce barriers that make it difficult to implement an intervention. Accordingly, we recommend an intuitive approach: (1) identify "who," (2) determine "what" they must do for the project to be successful, and (3) articulate "why" or "how" this might align with their interests (Table 1). If a stakeholder is reluctant to embrace the new initiative, focus on how it might align with the interests of his or her supervisor.

Once active implementation is underway, stakeholder engagement takes on a more dynamic form. Repeatedly engaging frontline champions who are viewed as local thought leaders can generate urgency and encourage others to adopt the intervention[15]. Providing brief monthly updates refreshes stakeholders about the goals of the initiative, highlights the

Table 1 Key Questions for People (Stakeholder) Engagement

Identify "Who"	Establish "What" they must do for successful implementation	Articulate "Why" or "How" the intervention aligns with their interests
• Who will implement the change? • Who will be (directly or indirectly) impacted by the change? • Who else might feel ownership in this space?	• What specifically is each person being asked to do? • How will success be monitored and measured? • Where can cross-training occur?	• What do they care about? • How does the proposed project align with their interests? • What reservations might they have? • To whom do they report?

project's importance amidst competing demands, and reminds them that their progress is being monitored. Whenever possible, cross-training individuals for different roles such as the implementer, evaluator, and team leader can help mitigate the substantial loss of momentum resulting from unanticipated personnel changes during the fragile early stages of implementation. Finally, celebrating victories both large and small boosts moral and ensures sustained engagement.

Problem Solving

While many useful frameworks, theories, and strategies are available to guide implementation, no playbook will ever anticipate all the challenges that can arise. Successful implementation relies on motivated people crafting innovative solutions[16] or workarounds to solve problems as they arise in real-time. When frontline staff are committed to an initiative, problems are recognized early and solutions are implemented quickly. Given the idiosyncrasies of local culture and customs, however, isolating a problem and identifying potential solutions often require iterative cycles of process mapping and new stakeholder engagement. Revisiting the existing process map can help localize the source, identify potential downstream consequences, and discover new processes to bypass barriers. Depending on how and why the problem is occurring, additional stakeholders and their interests may need to be considered and leveraged. Potential solutions can then be tested in small Plan-Do-Study-Act (PDSA) cycles[17] before further scale up and spread. Regularly scheduled meetings with the program evaluation team are important for communicating any delays or process changes that may affect data collection or analysis.

Case Example: Implementation of Home Sleep Apnea Testing

Over the past decade, the number of veterans referred for suspected sleep apnea has markedly increased resulting in limited access to timely sleep testing. By 2015, Sleep Medicine had become the second most backlogged clinical service in the VA nationally. One factor contributing to the backlog was the model for diagnosing sleep apnea. Historically, patients underwent overnight in-laboratory polysomnography (PSG), but space and insufficient staffing often limited the number of PSGs that could be performed. Home sleep apnea testing (HSAT) is an alternative method to PSG that was being promoted within VA as a best practice for diagnosing sleep apnea. Yet, as of 2016, few VA facilities offered HSAT. Faced with increasing demands for sleep services and finite resources, an initiative to integrate HSAT into standard practice was created. The San Francisco VA was one of 54 VA facilities involved in this initiative.

Process Mapping

Process mapping of complex patient and provider workflows was critical in establishing how to transition from PSG to HSAT. A simplified pre- and post-implementation diagram (Fig. 2) was developed to begin communication with stakeholders. Process mapping itself is an iterative endeavor; input from dynamic groups of stakeholders helped refine and improve the workflow diagrams over time. Additional maps, which detailed specific operator swim lanes and identified ways to capture workload, were developed to align frontline staff and delineate individual responsibilities at specific nodes. For example, the use of the HSAT devices required process maps for purchasing, testing, storing, provisioning, tracking, returning, and cleaning the equipment. Scheduling grids had to be created and populated with appointments; referring providers and patients had to be educated about the new system. Sleep clinicians established processes for determining patient eligibility for HSAT and interpreting the sleep test recordings. Documentation of each step provided a useful template for implementation at subsequent deployment sites.

People (Stakeholder) Engagement

Several VA program offices provided resources and technical support for HSAT expansion and promoted the initiative as an organizational priority. This alignment of stakeholders at the outset allowed for expedited development of infrastructure. At the San Francisco VA, groups of local and regional stakeholders also played key roles including the (1) facility director and leadership team, (2) sleep clinicians, (3) respiratory therapists, (4) sleep technologists, (5) scheduling clerks, (6) human resource specialists, (7) procurement staff, (8) mailroom personnel, (9) biomedical engineers, (9) information technologists, and (11) patients. Engaging each of these groups required an understanding of local organizational structure and roles.

The local clinical champion started by arranging one-on-one meetings with each of the service chiefs or clinical leads

Pre-Implementation Sleep Testing Process

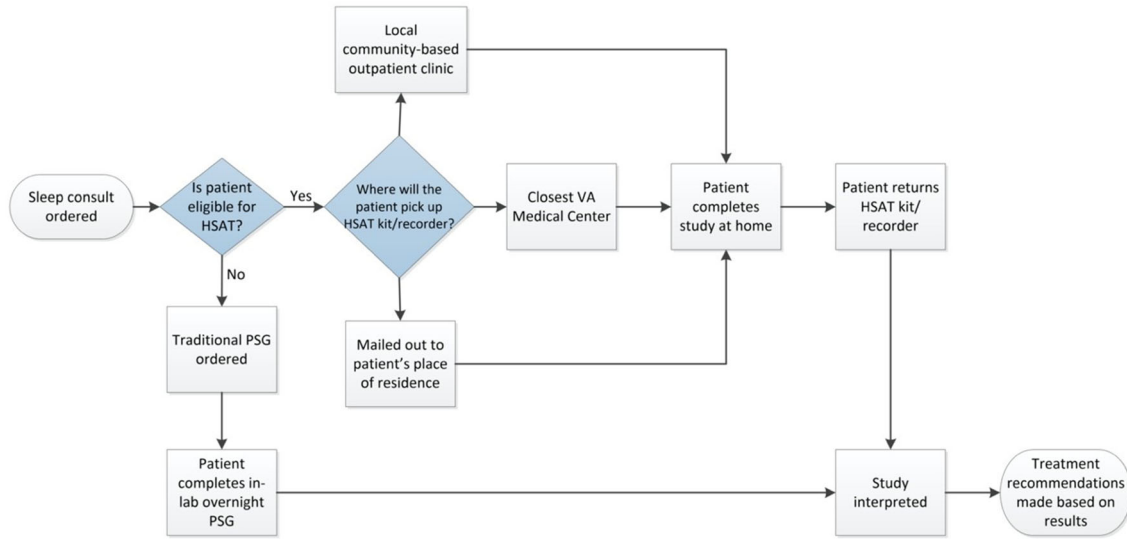Post-Implementation Sleep Testing Process

Figure 2 Simplified process maps for implementation of Home Sleep Apnea Testing (HSAT). Transition from polysomnography (PSG) to HSAT eliminated the need for Veterans to spend a night in the hospital, increased capacity for sleep testing, and reduced the amount of time between referral and diagnosis of sleep apnea.

responsible for organizational units that would be affected by the intervention. That service chief or clinical lead would then identify who in their organizational unit should be involved in subsequent meetings with the local champion. For example, planning meetings with procurement and mailroom staff were required to arrange purchasing, receiving, cataloging, and testing of the HSAT devices. Separate planning meetings with clinical staff were required for respiratory therapists and sleep

technologists to learn how to mail HSAT devices to patients, educate patients on usage, upload study results, and clean recorders for reuse.

Problem Solving

Several problems arose during HSAT implementation. Initially, negotiating contracts with HSAT vendors led to significant delays in equipment acquisition. After procurement,
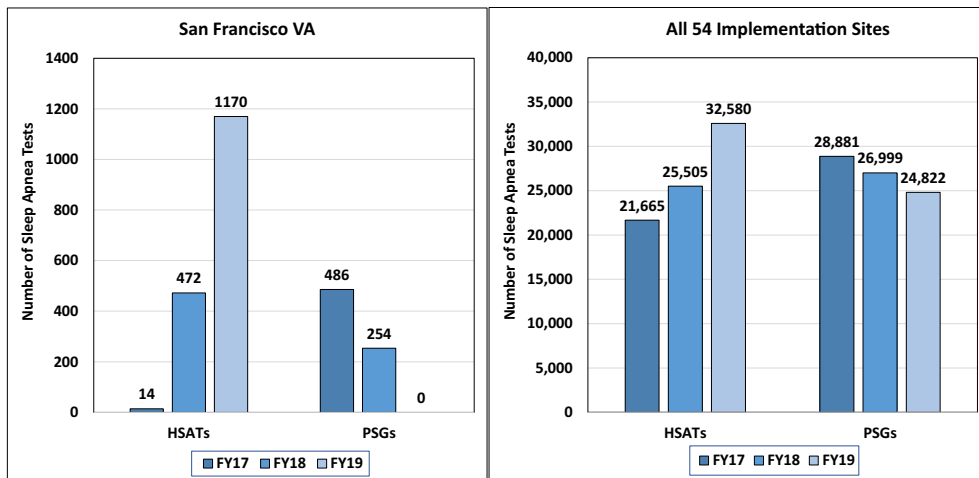

Figure 3 Number of overnight sleep tests completed using home sleep apnea testing (HSAT) or polysomnography (PSG) during fiscal years 17, 18, and 19.

equipment had to be categorized and inventoried by local biomedical device offices. A new workflow had to be established for mailing HSAT devices to patients, enclosing postage-paid return packaging to ensure device retrieval and downloading and interpreting recordings. At each step, a new set of stakeholders were engaged, and new process mapping cycles were required to understand workflows and develop targeted solutions. As a result, the number of HSATs sharply increased between fiscal years 17 and 19, and the number of PSGs was reduced to zero (Fig. 3). A national contract for purchasing and distributing HSAT devices at the San Francisco VA was eventually established to streamline implementation and enhance further dissemination.

In summary, successful implementation relies on the following: (1) people (stakeholder) engagement, (2) process mapping, and (3) problem solving. It involves motivated individuals working together to engage stakeholders, understand workflow processes, and overcome barriers in the delivery of evidence-based care. These three strategies are straightforward, intuitive, and do not require extensive training in implementation science. We hope that frontline teams will be empowered to apply these tools to their daily practice and embrace continued efforts to improve the efficiency and effectiveness of Learning Healthcare Systems.

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Compliance with Ethical Standards:

Conflict of Interest: The authors declare that they do not have a conflict of interest.

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