

The “State of Implementation” Progress Report (SIPREP): A Pilot Demonstration of a Navigation System for Implementation

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Short report

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Abstract

Background: Implementation of new clinical programs across diverse facilities in national healthcare systems like the Veterans Health Administration (VHA) can be extraordinarily complex. Implementation is a dynamic process, influenced heavily by local organizational context and the individual staff at each medical center. It is not always clear in the midst of implementation what issues are most important to whom or how to address them. In recognition of these challenges, implementation researchers within VHA developed a new systemic approach to map the implementation work required at different stages and provide ongoing, detailed and nuanced feedback about implementation progress.

Methods: This observational pilot demonstration project details how a novel approach to monitoring implementation progress was applied across two different national VHA initiatives. Stage-specific grids organized the implementation work into columns, rows and cells, identifying specific implementation activities at the site level to be completed along with who was responsible for completing each implementation activity. As implementation advanced, item-level checkboxes were crossed off and cells changed colors, offering a visual representation of implementation progress within and across sites across the various stages of implementation.

Results: Applied across two different national initiatives, the SIPREP provided a novel navigation system to guide and inform ongoing implementation within and across facilities. The SIPREP addressed different needs of different audiences, both described and explained how to implement the program, made ample use of visualizations, and revealed both what was happening and not happening within and across sites. The final SIPREP product spanned distinct stages of implementation.

Conclusions: The SIPREP made the work of implementation explicit at the facility level (i.e., who does what, and when) and provided a new common way for all stakeholders to monitor implementation progress and to help keep implementation moving forward. This approach could be adapted to a wide range of settings and interventions, and is planned to be integrated into the national deployment of two additional VHA initiatives within the next 12 months.

Contributions To The Literature

- Implementation of new programs within healthcare systems can be extraordinarily complex, occurring under conditions that can change rapidly and unexpectedly, where individuals within the same healthcare organization can have different perspectives on how implementation unfolds, and where local context can vary widely.
- In a pilot demonstration spanning two national VA initiatives, the SIPREP offered a systematic and comprehensive way to map the implementation work required at different stages of the implementation process and provided ongoing, detailed and nuanced feedback about implementation progress over time across multiple facilities.

- As a novel approach to navigating the process of implementing new programs across multiple sites, the SIPREP makes the work of implementation explicit at the facility level (i.e., who does what, and when) and provides a new, dynamic approach for local staff, national program team members, and operational partners to pinpoint areas where extra support and intervention might be focused to help keep implementation moving forward.

Background

Implementation of new programs within healthcare systems can be extraordinarily complex, unfolding differently across sites due to variation in local context and conditions.[1,2,3] A structured approach to capturing implementation progress that helped organize and manage this complexity could play an important role in supporting and improving active implementation. A prospective and longitudinal approach could also help maintain accuracy in the reporting of implementation-related information while minimizing retrospective recall, which can introduce memory and hindsight bias.[4]

Several approaches already in use in health services relate to the systematic capture and reporting of implementation-related work. For example, Rapid Evaluation and Assessment Methods (REAM) have long offered a way for researchers in diverse settings to collect and analyze data on an accelerated timetable while retaining rigor.[5,6,7] Matrix displays integrate and organize large amounts of data in rows and columns that can be easily sorted and sifted and offer a visual method to support the identification of emergent themes and findings.[8,9]. The Stages of Implementation Completion (SIC) is a validated instrument that maps key implementation tasks across eight stages and tracks progress through completion dates. [10]. “Implementation playbooks” provide users with detailed guides or blueprints about how to implement programs, along with practical tips and resources. [11,12,13]

Building on these prior approaches, a team of implementation scientists sought to develop a new system to capture and report implementation progress across time and space in ways that supported active implementation of new programs at multiple sites. We conducted a demonstration evaluation of two different applications to determine the feasibility of this approach.

Methods

In 2016, the Precision Monitoring (PRIS-M) QUERI (Quality Enhancement Research Initiative) based at the Roudebush VA Medical Center in Indianapolis, Indiana was charged with supporting and studying the implementation of the VHA Tele-Stroke Robotic Rehabilitation program at four pilot sites around the United States. The 7-person implementation team based in Indianapolis included three doctoral-level implementation scientists who collectively had been working in implementation science for over 30 years in VHA, a senior physician-researcher, a masters-level program manager, and a research assistant.

As part of this work, the implementation support team developed general specifications of a new “State of Implementation” Progress Report (SIPREP) over a 6-month period in 2018. They drew upon multiple

sources of information to map the implementation work: weekly national program phone calls, discussions with individual participants, site visits, notes from implementation team meetings, and online resources. Stage-specific grids organized the implementation work into columns, rows and cells, identifying specific implementation activities to be completed; who was responsible for completing each implementation activity; and the timing/level of each activity (early/basic, intermediate or late/advanced). Additional links provided access to specific tips and resources that could assist local staff in completing particular implementation activities.

The SIPREP was subsequently applied independently by two different teams working on two different and unrelated national VHA QI initiatives. The first initiative was the Tele-Stroke Robotic Rehabilitation program based at the Atlanta VA Medical Center. The Tele-Stroke Robotic Rehabilitation program provided rural Veterans recovering from a stroke with an innovative, in-home solution for physical rehabilitation that especially benefited Veterans living in rural areas distant from Veterans Health Administration medical centers. The program was a quality improvement (QI) project funded by the VA Office of Rural Health as an Innovations Project to be implemented at four pilot sites.

In FY17, the PRIS-M implementation support team assisted the Atlanta-based clinical team with implementation of the program, and was specifically charged with providing ongoing feedback to the Tele-Stroke Robotic Rehabilitation program about implementation progress at the participating sites as well as providing guidance for any future scaling up of the program if it received approval for a larger rollout. With these aims in mind, the team developed the new “State of Implementation” Progress Report (SIPREP) approach.

Each of the four participating VA medical centers was given its own designated grid for each stage of implementation. Within each grid, item-level checkboxes were checked off and cells changed colors as particular activities were completed, offering a visual representation of implementation progress within and across sites across the various stages of implementation. The SIPREP was hosted on a VA SharePoint platform, and the implementation support team created, maintained and updated the SIPREP for all four VA medical centers.

Two key concepts used to organize the SIPREP were “milestones” and “stages.” Milestones were significant implementation achievements that occurred in a chronological order. In the implementation of the Tele-robotics program, there were five milestones: Initial Agreement to Participate; Kickoff; Enrolling 1st Patient; Enrolling 10th Patient; and Adoption/Sustaining. Stages involved from getting from one milestone to the next.

Stage-specific “grids” organized the implementation work into columns, rows and cells, identifying specific implementation activities to be completed; who was responsible for completing each implementation activity; and the timing and level of each activity. Grid columns specifying who completed particular implementation activities, and grid rows indicated the timing/level of each activity.

Additional links provided access to specific tips and resources that could assist local staff in completing particular implementation activities.

Each of the four participating VA medical centers was given its own designated grid for each stage of implementation. Within each grid, item-level checkboxes were checked off and cells changed colors as particular activities were completed, offering a visual representation of implementation progress within and across sites across the various stages of implementation.

A different implementation support team located in a different part of the United States independently applied the SIPREP to evaluate implementation progress on another national VHA program. The PeRsonalizing Options for Veteran Engagement (PROVE) QUERI program based at the VA Ann Arbor Healthcare System began using the SIPREP as part of implementing and evaluating a web-based, provider-facing tool for enhancing shared-decision making with patients eligible for lung cancer screening.

The Lung Decision Precision (LDP) tool was initially implemented using a six-month, virtual quality improvement training approach in four VA medical centers beginning in 2017. Four other VA medical centers served as a control group, in which the tool was implemented using a one-time provider education approach.

In 2018, midway through implementation of LDP across the eight participating sites, the PROVE QUERI lead investigator learned about the SIPREP from a VHA webinar series and discussed potential use of the tool with the project manager in charge of the LDP implementation. The eight participating sites were all progressing with implementation at different rates, and had implemented lung cancer screening in different ways, which affected their interest in and ability to use LDP. As a result, it was challenging for the national team in Ann Arbor to keep track of implementation progress at individual sites. The lead investigator thought the SIPREP would be an apt mechanism for capturing the status of implementation at each site and clearly delineating next steps.

Results

Similar to how a navigation system works in a moving vehicle, the SIPREP as a general approach offered a dynamic, telescoping view of implementation progress that was capable of being big-picture or ultra-granular, oriented users as to current position, showed what loomed ahead, and provided detailed options for how to get to the next destination. The SIPREP offered multiple color-coded, single-page visualizations of implementation progress both within and across sites as well as within and across stages.

In the VHA Tele-Stroke Robotic Rehabilitation project, the SIPREP allowed for “assessment at a glance” of the progress of an individual site across all four implementation stages.

Figure 1 below displays the implementation progress of one medical center - the "Montoya VA" – across all four stages. Within each grid, implementation support team changed cell colors as particular activities were completed, offering a visual representation of implementation progress. Green indicates "completion"; orange indicates "in progress"; white/blank indicates "not yet started." This visualization also shows flexibility in the SIPREP in that a facility could work on activities in a more advanced stage even if all activities in an earlier stage have not yet been completed; unfinished activities from an earlier stage can be completed at a later point in time. Each "link" is a hyperlink providing immediate connections to specific grids or cells.

Figure 1. Implementation progress across all four stages of implementation at a single medical center for the Tele-Stroke Robotic Rehabilitation project.

Figure 2 below displays the implementation progress of all four medical centers for Stage 1 at one point in time. This view shows substantial variation in implementation progress across sites. The grids for the Montoya and Chilton VA medical centers are solid green, as they both have completed all implementation activities. The grid for the Mann VA medical center is about half green and half orange, indicating it has completed about half of the implementation work in the stage. The grid for the Davison VA medical center is largely white/blank, indicating that little implementation work has been undertaken so far. This visualization shows how the SIPREP made the work of implementation explicit at the facility level (i.e., who does what, and when) and provided a new way for VHA participants, national program team, and operational partners to understand what was happening - and not happening - at the facility level, pinpointing areas where extra support and intervention might be focused to help keep implementation moving forward.

Figure 2. Implementation progress across four sites for Stage 1 of implementation for the Tele-Stroke Robotic Rehabilitation project.

These visualizations only represent a small subset of possible views within the SIPREP Tele-Stroke Robotic Rehabilitation project. In the actual SIPREP, a nested relationship dynamically connected grids, cells, and items via hyperlinks. Users could zoom in or out at will with a progression from a birds-eye view of all sites and all stages of implementation all the way to the level of a single item, in effect unifying five different implementation resources in one place: a how-to manual, a knowledge base, an implementation progress report, a diagnostic tool and a focused checklist. [14]

In the second project, the LDP implementation support team used four milestones in their application of the SIPREP: pre-implementation; enhanced implementation; evaluation; and dissemination. The SIPREP allowed for updated visualizations of differences in implementation status across the different project arms, saving time on email updates and meeting agendas. Figure 3 below shows how the LDP implementation support team used the SIPREP system to map out across four stages the facility-level implementation work needed to put the Lung Decision Precision (LDP) tool project into practice.

Figure 3. Four stages of implementation work for the Lung Decision Precision (LDP) tool project.

To assist in documentation, the LDP team also added a “Project History” feature to their version of the SIPREP which allowed the implementation support team to document information including individuals involved and completion dates related to the local accomplishment of specific implementation activities.

Discussion

In this cross-initiative pilot demonstration project, the SIPREP navigational system was successfully applied across two different VHA initiatives by independent VHA implementation support teams. Like a map application on a phone or a navigation system in a moving vehicle, the SIPREP offered telescoping perspectives on implementation progress, ranging from the macro-perspective of a “birds-eye view” to the micro-perspective of a “street view”.

The format of the SIPREP was influenced by the prior experience of the implementation team members in using matrix displays and applying rapid evaluation and assessment methods on earlier QUERI projects, including the Prospectively-Reported Implementation Update and Score (PRIUS).[15] The “SIPREP” name itself is a nod to the term “sitrep,” shorthand in intelligence, planning, military, and emergency response contexts for a “situation report” that captures salient “on the ground” information about the current state of affairs in a particular setting.[16]

The SIPREP approach seems to be highly adaptable to a wide range of settings and interventions, and is already planned to be integrated into the national deployment of additional national VHA initiatives within the next 12 months. As part of this initiative, work is now underway to develop a web-based SIPREP application that allows different users to customize the SIPREP for individual projects. Once it is field-tested, the SIPREP application will be made broadly and freely available both within and outside the VHA healthcare system.

4.1 Limitations

The SIPREP system has been used so far to support active implementation in two national VHA initiatives. It may not generalize to other projects or other healthcare contexts substantially different from these two examples. Using the SIPREP system during project implementation requires additional time and resources on the part of national implementation support teams as well as participating sites, and this information was not collected as part of this pilot demonstration project; future studies of the SIPREP should consider capturing cost data. This demonstration project employed an observational design, whereas a trial would be necessary to ascertain the relative effectiveness of the SIPREP.

Conclusions

As a novel approach to mapping implementation progress, the SIPREP made the work of implementation explicit at the facility level (i.e., who does what, and when) and provided a new way for facility-level staff, national program team members, and operational partners to understand what was happening - and not happening - at the facility level, pinpointing areas where extra support and intervention might be focused

to help keep implementation moving forward. The SIPREP approach was dynamic and prospective and addressed the different needs of different audiences. As a navigation system for implementation, the SIPREP appears to offer original insights and actionable recommendations to users that support the dynamic and complex process of implementation within healthcare settings.

Declarations

Ethics approval and consent to participate

This was a quality improvement (QI) project and thus considered exempt by the Indiana University Institutional Review Board. Participation in this project was entirely voluntary with minimal risk of harm.

Consent for publication

Not applicable

Availability of data and materials

Data generated during this pilot demonstration project are included in this published article. An earlier and longer version of this article that features additional visualizations is available in a preprint format. [14]

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

EJM, AL, NR, and TMD participated actively in the development of the SIPREP, with AJB and KP providing important feedback for improving the system. EJ, AL, JCL, NR and TMD assisted in data acquisition and interpretation. EJ drafted and revised the overall manuscript with AL contributing sections specifically related to Ann Arbor. JL, AJB, KP, NAR, LSP, JM and TMD provided substantive feedback on drafts of the manuscript. All authors gave final approval of the version of the manuscript submitted for publication.

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Not applicable

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Figures

Stage 1: Getting from Initial Agreement to Participate to Kickoff



Figure 1

Implementation progress across all four stages of implementation at a single medical center for the Tele-Stroke Robotic Rehabilitation project.

VA Ann Arbor VA Medical Center, Lung Decision Precision (LDP) tool project: ALL Stages

Stage 1: Pre-implementation

	C	T	M
3	<ul style="list-style-type: none"> Email link to Usability Survey to PCPs (or opt out) Help T identify PCPs who may be interested in Usability Interview (or opt out) Participate in Usability Interview (or opt out) Participate in Background Interview LINK	<ul style="list-style-type: none"> Conduct Background Interview(s) with C Randomize site to SI or EI Schedule Usability Interviews with C and PCPs Conduct Usability Interviews with C and PCPs Send link to Usability Survey for PCPs to C LINK	<ul style="list-style-type: none"> Sample of PCPs participate in Usability Interview (or opt out) Sample of PCPs complete Usability Survey (or opt out) ISO/PO to review project and raise potential concerns about adding link to CPRS (or opt out) LINK
2	<ul style="list-style-type: none"> Schedule time for Background Interview Provide information for project contact list Consider making changes to LCS pgm to start capturing risk data (or not required) LINK	<ul style="list-style-type: none"> Identify local CAC Identify local ISO/PO, notify of project, ask if any objection to adding LDP link into CPRS Learn process to start capturing risk data and assist C to make this happen (or not needed) Schedule Background Interview(s) with C Schedule Usability Interviews with C LINK	<ul style="list-style-type: none"> Lung cancer risk can be assessed from EMR Develop mechanism to collect lung cancer risk at site (or not needed) LINK
1	<ul style="list-style-type: none"> Member of LCS Program agrees to participate as site lead LINK	<ul style="list-style-type: none"> Identify leaders of LCS Program Notify leaders of "Implementing Guidelines for Shared Decision Making in Lung Cancer Screening" project Request support LINK	<ul style="list-style-type: none"> Lung Cancer Screening Program in place at site LINK

[LINK](#)

Stage 2: Enhanced Implementation

	C	T	M
3	<ul style="list-style-type: none"> Communicate changes in LCS process/program to T Discuss initial A&F report with T and tailor message for distribution to PCPs Disseminate initial A&F report to PCPs Site lead meets with Joe and Tanner to discuss AD LCSC meets with Joe to help tailor to site (or no LCSC) Participate in LEAP maintenance (or opt out) LINK	<ul style="list-style-type: none"> Check in with C regularly to track/document changes to LCS program and PCP trainings Provide A&F reports quarterly to C Work with site leads to tailor A&F for distribution to PCPs Offer LEAP maintenance Offer Academic Detailing Meet with site lead to plan AD Meet with LCSC to tailor AD to site (or no LCSC) AD site visit LINK	<ul style="list-style-type: none"> Primary Care leadership to assist site lead in disseminating A&F information to PCPs (or not needed) PC leadership to assist Academic Detailer to set up meetings with PCPs AD with PCPs (or opt out) LINK
2	<ul style="list-style-type: none"> Participate in LEAP program Announce LDP including link in CPRS to PCPs LINK	<ul style="list-style-type: none"> Provide LEAP facilitation including PULSE website Provide draft materials to announce LDP (including CPRS link) to site PCPs LINK	<ul style="list-style-type: none"> PC leadership to assist C in disseminating LDP information to PCPs (or not needed) LINK
1	<ul style="list-style-type: none"> Work with T to plan wording/location for LDP link to best fit site workflow Agree to participate in LEAP Establish LEAP team LINK	<ul style="list-style-type: none"> Invite site to LEAP Establish LEAP meetings that will work for the LEAP team Work with C to tailor wording/location for link to LDP in CPRS to best fit site workflow Work with local CAC to have link to LDP inserted into CPRS LINK	<ul style="list-style-type: none"> CAC to insert link to LDP into CPRS CAC to update link location/wording to best fit into workflow (if needed) LINK

[LINK](#)

Stage 3: Evaluation

	C	T	M	V
3	<ul style="list-style-type: none"> Participate in Formative Evaluation / Usability Interview LINK	<ul style="list-style-type: none"> Send survey to PCPs (usability, did implementation strategies influence use of tool) Schedule/conduct Formative Evaluation / Usability Interviews with C Schedule/conduct Usability Interviews with subset of PCPs Close project with R&D/IRB Reflex and evaluate re-local program data LINK	<ul style="list-style-type: none"> PCPs complete survey (usability, did implementation strategies influence use of tool) (or opt out) R&D/IRB close project LINK	
2	<ul style="list-style-type: none"> Work with T to confirm correct Vets are being surveyed and help troubleshoot as needed LINK	<ul style="list-style-type: none"> Send surveys to Vets who have had initial LCS discussion in previous ___ weeks Answer Vet Questions Work with C to make sure correct Vets are being surveyed and track methods as needed Schedule and conduct post AD interviews LINK	<ul style="list-style-type: none"> Subset of PCPs participate in usability interview (or opt out) LINK	
1	<ul style="list-style-type: none"> Work with T to develop method to best identify Vets who have had a recent initial LCS discussion LINK	<ul style="list-style-type: none"> Work with site leads to develop programming to best identify patients who have had recent initial LCS discussions Submit R&D/IRB applications for Vet survey LINK	<ul style="list-style-type: none"> Subset of PCPs participate in post AD interview (or opt out) R&D/IRB review Vet survey LINK	<ul style="list-style-type: none"> Complete/return survey (or opt out) LINK

[LINK](#)

Stage 4: Implementation

	C	T	M
3	<ul style="list-style-type: none"> Disseminate results to site leads LINK	<ul style="list-style-type: none"> Submit manuscripts to journals Submit final report to QUERI LINK	<ul style="list-style-type: none"> CHCR to complete final revisions on LDP
2	<ul style="list-style-type: none"> Assist in paper writing (if didn't opt out) LINK	<ul style="list-style-type: none"> Data analyses Manuscript and report writing LINK	<ul style="list-style-type: none"> NCP to post version of initial LCS screening clinical reminder that includes link to LDP to LCS toolkit LINK
1	<ul style="list-style-type: none"> Notify T of interest in paper writing (or opt out) LINK	<ul style="list-style-type: none"> Maintain list of recommendations for further revisions to LDP site Annual conference calls with partners Provide NCP with PCP information sheet for using LDP Provide NCP with guidance for CACs on adding link to LDP to existing reminders Ask NCP if we can have national LCS reminder set updated to include link to LDP Plan for manuscripts/reports LINK	<ul style="list-style-type: none"> Partners participate in annual conference calls NCP to post PCP information sheet for using LDP and CAC guidance on adding link to LDP to initial LCS clinical reminder to LCS toolkit LINK

[LINK](#)

Figure 3

Four stages of implementation work for the Lung Decision Precision (LDP) tool project.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [SIPREPFigures.zip](#)