BRIEF REPORT

Agile Implementation: A Blueprint for Implementing Evidence-Based Healthcare Solutions

Malaz Boustani, MD, MPH,[*†‡] *Catherine A. Alder, JD, MSW,*[†] *and Craig A. Solid, PhD*[§]

OBJECTIVES: To describe the essential components of an Agile Implementation (AI) process, which rapidly and effectively implements evidence-based healthcare solutions, and present a case study demonstrating its utility.
DESIGN: Case demonstration study.
SETTING: Integrated, safety net healthcare delivery system in Indianapolis.
PARTICIPANTS: Interdisciplinary team of clinicians and administrators.
MEASUREMENTS: Reduction in dementia symptoms and caregiver burden; inpatient and outpatient care expenditures.
RESULTS: Implementation scientists were able to implement a collaborative care model for dementia care and sustain it for more than 9 years. The model was implemented and sustained by using the elements of the AI process: proactive surveillance and confirmation of clinical opportunities, selection of the right evidence-based healthcare solution, localization (i.e., tailoring to the local environment) of the selected solution, development of an evaluation plan and performance feedback loop, development of a minimally standardized operation manual, and updating such manual annually.
CONCLUSION: The AI process provides an effective model to implement and sustain evidence-based healthcare solutions. **J Am Geriatr Soc 66:1372–1376, 2018.**

Key words: agile implementation; evidence-based care; dementia

From the *Center for Health Innovation and Implementation Science, Indiana Clinical Translational Science Institute, Indiana University; †Sandra Eskenazi Center for Brain Care Innovation, Eskenazi Health; ‡Center for Aging Research, Regenstrief Institute, Inc., Indiana University, Indianapolis, Indiana; and the §Solid Research Group, LLC, St. Paul, Minnesota.

Address correspondence to Dr. Malaz Boustani, Indiana University Center for Health Innovation and Implementation Science, Indiana Clinical Translational Institute, 410 W. 10th St., Suite 2000, Indianapolis, IN 46202. E-mail: mboustan@iu.edu

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Fewer than half of recommended healthcare services are evidence based,[1] and current healthcare services research activities have largely focused on acquiring new knowledge rather than implementing existing knowledge.[2] Although some time lags between the discovery of new treatments and their implementation into real-world practice are necessary to ensure safety and efficacy, the current discovery-to-delivery translational process can take decades,[3] and when the Institute of Medicine (IOM) called for healthcare organizations to become adaptive learning entities, the IOM cited inefficiencies in applying new medical evidence to patient care.[4]

Over the past decade, implementation science has emerged as a new discipline to overcome the inefficiency in the current discovery-to-delivery translational cycle. Implementation science is defined as the "scientific study of methods to promote the systematic uptake of research findings and other evidence-based practice into routine practice."[5] In 2013, Indiana University launched the Center for Health Innovation and Implementation Science (CHIIS) to create a cadre of implementation scientists capable of developing tools, processes, and strategies to rapidly implement evidence-based healthcare solutions in healthcare delivery systems. Since its inception, the CHIIS has labored to discover a reproducible methodology for agile implementation (AI) of evidence-based healthcare solutions on a large scale. We present the IU CHIIS AI model and a case study to demonstrate how AI was successfully used to implement and sustain the Healthy Aging Brain Center (HABC), an evidence-based collaborative dementia care model at Eskenazi Health, an integrated safety net healthcare delivery system.

METHODS

The AI Model

The AI model is based upon theoretical frameworks of complex adaptive systems (CAS) and social cognitive theories. A CAS is an open, dynamic network of semiautonomous individuals who are interdependent and connected in multiple nonlinear ways.[6–9] Within the framework of CAS, healthcare delivery systems are regarded as unique in their member diversity and culture, member interactions, surrounding environment, previous history, and evolving and learning processes (Figure 1).

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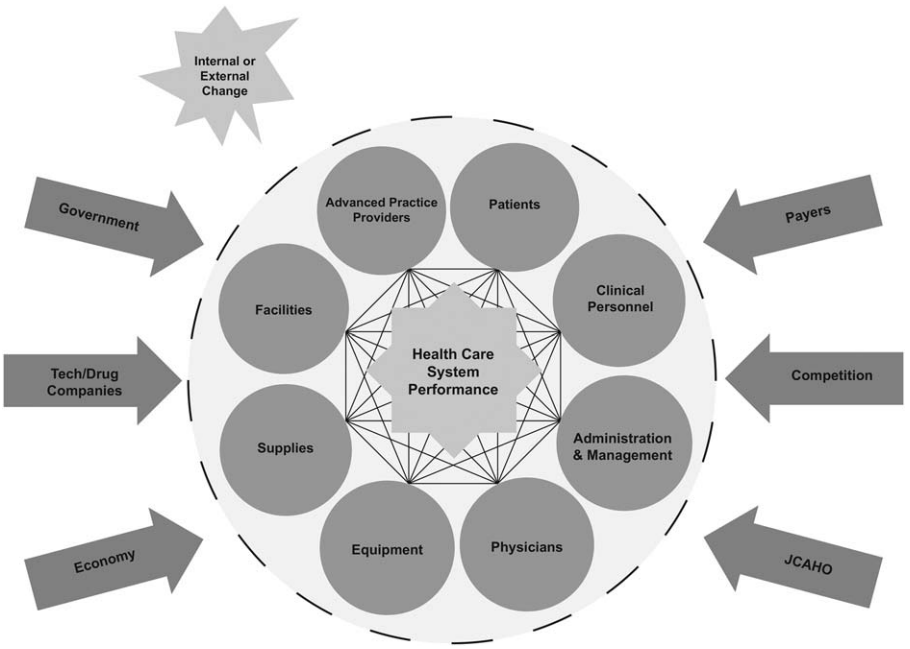

Figure 1. Health care as a complex adaptive system. Considering a health system as a complex adaptive system acknowledges that there are multiple interdependent parts that interact and function together dynamically to create the health system's performance. Internal and external factors and changes, which may "push" or "pull" on different individual parts but ultimately affect the functioning of the entire interdependent system, constantly affect the system.

Social cognitive theories suggest that two types of cognitive processes govern individuals' behavior in response to environmental stimuli: one that is automatic and intuitive and another that is reflective and rational. These theories provide a template for creating choice architectures—or "nudges"—that leverage human tendencies in information processing and behavior that can encourage sustainable implementation of evidence-based innovations.

Developed within the above theories, the AI model involves several components.

Proactive Surveillance and Confirmation of Clinical Opportunities

"Proactive surveillance" refers to the continuous, systematic collection, analysis, and interpretation of data for the planning, implementation, monitoring, and evaluation of evidence-based healthcare solutions. The goal is to detect and confirm the presence of clinical opportunities that may benefit from the implementation of evidence-based healthcare solutions. Clinical opportunities typically involve service gaps (lack of a needed clinical service) or service failures (falling short of achieving the goal of providing high-quality, accessible, cost-efficient, person-centered care). For each opportunity, the readiness of the organization to invest the necessary time and resources to effect change is determined by assessing the level of executive support; the engagement of administrators and clinicians; the strength of supporting evidence; the effect on the goal of providing high-quality, accessible, cost-efficient, person-centered care; and the potential to expand. Securing support from the healthcare delivery organization leadership is crucial. The leadership's willingness to allocate sufficient time and resources towards the clinical opportunity must reflect the necessary level of support.

Selecting the Right Solution

Providing quality care with limited resources requires dynamic, "learning" healthcare systems that continuously mature, adapt, and improve based on feedback.[4] In a learning healthcare system, leaders respond to clinical opportunities by searching for evidence-based solutions that have demonstrated ability to achieve the quadruple aim: care that is high quality, accessible, cost-efficient, and person-centered.[1] When deciding which solution is best, leaders must consider effectiveness (ability to achieve each element of the quadruple aim), reliability and volume of evidence supporting effectiveness, viability and sustainability (cost of resources required to implement and maintain over time), and scale and spread (ability to accommodate future growth).

Although a formal return-on-investment analysis is not required as part of the AI model, during identification of the opportunity in the previous step, the value to the organization must be established, including relevant financial considerations when securing the backing of leadership. When selecting the right solution, in addition to selecting a solution that has already been demonstrated to be cost-effective, the team ensures that it is sustainable from operational and cost perspectives.

Localizing the Selected Solution

The success of introducing evidence-based solutions into the daily operation of any complex adaptive healthcare

delivery organization relies heavily on localization of the content (i.e., tailoring the content to the local environment and setting), delivery processes, and the desired outcomes of the selected evidence-based solution. Such a localization method is essential to accommodate the unique characteristics of each healthcare delivery organization. Furthermore, the localization must occur at all levels of the organization and must consider the unique personnel, resources, processes, and culture of all groups and individuals who the change will affect.

Successfully localizing a solution requires repeated cycles of learning (ongoing performance feedback loops) that include piloting a solution, learning from the success or failure of the solution, and applying the lessons to guide the next cycle of learning. During this process, it is critical to detect and remove a failed solution as early as possible so that more-promising solutions can be tested.

During this localization step, the implementation team should include clinical providers (e.g., physicians, nurses, social workers) and facility administrators with knowledge of the financial implications of the clinical opportunity and the selected evidence-based solution; one team member should be designated as the project champion. The implementation team should establish a timeline and specific criteria for evaluating the success or failure of each iteration of the localization effort. These criteria should be based on past research, program and organizational goals, and overall effect on patients and the healthcare organization and, at a minimum, should include measurements of progress in the implementation process, fidelity to the evidence-based intervention, cost, and clinical outcomes.

Understanding the specific nature of any failure is critical to designing an improved solution that is more likely to succeed. A solution should not be turned off before the implementation of all of its core components, although if the implementation cannot be completed as planned or cannot meet the established timeline, the implementation team must reassess the implementation strategy, understand the specific barriers to successful implementation, and design a new strategy and timeline for reevaluation.

Evaluating Effectiveness: Performance Feedback

A performance feedback loop is essential to the localization process, but successful localization does not ensure sustained change. Sustainability requires that the solution become an integral part of the health system.

To support sustainability, the performance feedback loop should be expanded beyond the factors critical to early success to include data necessary to monitor the long-term, system-wide effect of the implemented solution. Scientifically appropriate methods for identifying, measuring, and monitoring the effect of the implemented solution on the entire system must be established to allow for timely identification and analysis of emergent behaviors, as well as unintended consequences.[10]

Scaling and Spreading

"Scaling" is the process of expanding the capacity of an existing site to serve a larger number of patients, and "spreading" is the process of implementing the intervention at one or more new sites. The success of either process requires documentation of the content of the care innovation and the processes required to deliver the care in clinical environment. The content should be documented as minimum standard specifications that represent the standard of care, regardless of how the solution is to be localized. A minimally standard operating procedure is created and reviewed at time intervals that the implementation team recommends to ensure that the document continues to complement the current vision, mission, organizational chart, and strategic plans of the organization.

Setting for Case Study

Eskanazi Health is a safety net integrated health system in central Indiana; elderly adults make more than 90,000 visits to Eskenazi each year. The health system serves a diverse population through a variety of inpatient and outpatient settings, including a community mental health center. A group of dementia care specialists from Eskanazi and implementation scientists from the Indiana University Center for Aging Research sought to identify and implement an evidence-based solution to provide high-quality, accessible, cost-efficient, person-centered care for individuals with dementia within Eskanazi.

RESULTS

Starting in 2007, the interdisciplinary team began to develop the HABC at Eskenazi. Their journey to develop, open, and sustain the HABC illustrates the critical components of the AI model (Table 1).

Proactive Surveillance and Confirmation of Clinical Opportunities

In 2007, individuals with dementia were typically cared for at Eskenazi in primary care settings. Providers had inadequate time and resources to manage this high-risk population appropriately, and individuals with dementia lacked the ability to self-manage their disability. Therefore, the clinical opportunity was easily identified: reduce the burden of symptoms and caregiver stress, improve access to high-quality care, reduce healthcare-related costs, and improve the experience of the individuals with dementia and the caregiver.

Selecting the Right Solution

In September 2007, Eskenazi confirmed the readiness of the healthcare system to address the gap in service and selected the Providing Resources Early to Vulnerable Elders Needing Treatment for Alzheimer's disease (PREVENT) model[11] as the solution. The PREVENT model was chosen because it was specifically designed to enhance the quality, improve the safety, and reduce the cost of dementia care. The study outcomes demonstrated that the collaborative care model improves quality of care and satisfaction with care and reduces neuropsychiatric symptoms and caregiver distress.[11] A second randomized controlled trial testing a community-

Table 1. The Indiana University Agile Implementation Model Components As Used by Ezkenazi Health

Component	Case Study Example
Proactive Surveillance and Confirmation of Clinical Opportunities	Identified current dementia care as an opportunity to improve quality, increase access, reduce costs, and improve patient experience.
Select the Right Solution	A scientifically rigorous study demonstrated the efficacy and cost effectiveness of the PREVENT model of collaborative dementia care; cost analysis indicated its viability and sustainability, and no concerns about future growth were identified.
Localize the Selected Solution	A multidisciplinary team developed a care plan, a timetable for assessment and evaluation, and metrics for clinical quality and cost reduction.
Evaluate Effectiveness: Performance Feedback	Clinical and cost outcomes were continuously monitored and used to adjust the selected solution; data demonstrated successful symptom management, reduction in caregiver burden, and cost-savings through reduced use of healthcare services.
Scaling and Spreading	A minimally standardized operational procedure was produced after a year and subsequently used to develop a larger population health management program.

based model produced similar results, confirming the effectiveness of collaborative care for dementia.[12]

A preliminary cost analysis indicated that the solution was viable and sustainable. The effectiveness of the intervention and the reliability of the supporting evidence (combined with the absence of significant concerns about cost and future growth) suggested that the PREVENT collaborative care model was the right solution for Eskenazi.

Localizing the Selected Solution

A team of providers and administrators were assembled and met biweekly to adapt the selected dementia care model to the unique needs of clinical care at Eskanazi. This team delivered 7 minimum specifications for care in the new HABC, including a care plan focused on the person with dementia and his or her caregiver, a periodic needs assessment and evaluation of the care plan, management and treatment of comorbid conditions and disability, and coordination of care.

The specifications were delivered in phases. First, an individual care plan was created after assessing individuals with dementia and caregivers. Second, follow-up care was delivered and on-going assessments and care-plan modifications made. Eskenazi leadership agreed on an evaluation plan to monitor clinical outcomes during the first year. Performance metrics included a set of quality indicators and ambulatory and acute care use. The plan also included a strategy to compare the performance of primary care centers that delivered care for individuals with dementia within the same time period. The HABC was announced to the health system, and in early 2008, the clinic began serving people in 3 half-day clinics per week.[13]

Evaluating Effectiveness: Performance Feedback

Performance feedback loops have been used throughout various phases of the HABC. During the design phase, clinical and cost data were examined to understand the demand for dementia care services and potential sources of revenue and cost savings. During the first year of the program, the implementation team monitored clinical outcomes and processes and made adjustments to care delivery along the way. After 1 year, the implementation team reviewed clinical outcomes and the performance metrics that Eskenazi leadership prescribed for the HABC. The clinical outcomes demonstrated effective symptom management and reduction in caregiver burden, both consistent with the results of the foundational PREVENT trial. Data also demonstrated cost savings through reduced inpatient, emergency department, and related outpatient care expenditures, with a net saving of more than $900 per person per year.[13]

Scaling and Spreading

After 1 year and several localization iterations, the implementation team created a minimally standardized operational procedure for annual updates. In the fall of 2015, Eskenazi announced plans to fund the new Sandra Eskenazi Center for Brain Care Innovation. HABC was asked to evolve from a clinic-based program into a brain-focused population health management program and once again the AI model is providing the blueprint for success.

DISCUSSION

The AI model presented here was developed within the frameworks of CAS and social cognitive theories. Included in this model are a structure and practical tools to promote more efficient and sustainable implementation of evidence-based healthcare solutions. The case study of the HABC at Eskenazi provides evidence of the model's functionality and effectiveness; HABC is in its tenth year of operation. Although the AI model provided the blueprint for implementation, there were obstacles and challenges associated with implementation of the HABC that required specific attention. First, obtaining the support of leadership necessitated learning and understanding their needs regarding the overall management of the health system. Several members

of the implementation team volunteered their time to serve on quality-based committees with administrators and experts from the local community. This fostered open channels of communication, which allowed the team to build a value proposition that could be personalized for the leadership and that responded to changes in the local market demand. Another challenge that the team faced was to build a performance feedback loop that would ensure fidelity of the model over time. To address this need, the team collaborated with outside entities, including the National Institutes of Health, to develop care coordination support software compatible with the healthcare system's electronic medical records and health information exchange. This software armed the team with tools to demonstrate the value of the implementation over time to individuals with dementia, family caregivers, and the leadership of the healthcare delivery organization. Challenges like these are not unique to this case study; the characteristics of the AI model promote and encourage collaborative solutions like those presented here.

As our understanding of healthcare systems as CAS has grown, it has become increasingly clear that current designs of care delivery do not allow for expedient implementation of evidence-based care solutions into everyday practice and that traditional quality improvement models fail to acknowledge and account for the complex nature and unique characteristics of individual healthcare systems. Just as the landscape of healthcare payment and reimbursement policies is undergoing significant changes in an effort to encourage more person-centered care, our understanding of how best to adopt and sustain meaningful changes in care delivery must also evolve. Acknowledging healthcare systems as CAS can allow for more efficacious and cost-effective care to reach people sooner, accelerating improvements in quality that are identified in the ever-growing research literature.

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