

A Comprehensive Model to Build Improvement Capability in a Pediatric Academic Medical Center

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ABSTRACT

Cincinnati Children's Hospital Medical Center developed a comprehensive model to build quality improvement (QI) capability to support its goal to transform its delivery system through a series of training courses. Two online modules orient staff to basic concepts and terminology and prepare them to participate more effectively in QI teams. The basic program (Rapid Cycle Improvement Collaborative, RCIC) is focused on developing the capability to use basic QI tools and complete a narrow-scoped project in approximately 120 days. The Intermediate Improvement Science Series (I²S²) program is a leadership course focusing on improvement skills and developing a broader and deeper understanding of QI in the context of the organization and external environment. The Advanced Improvement Methods (AIM) course and Quality Scholars Program stimulate the use of more sophisticated methods and prepare Cincinnati Children's Hospital Medical Center (CCHMC) and external faculty to undertake QI research. The

Advanced Improvement Leadership Systems (AILS) sessions enable interprofessional care delivery system leadership teams to effectively lead a system of care, manage a portfolio of projects, and to deliver on CCHMC's strategic plan. Implementing these programs has shown us that 1) a multilevel curricular approach to building improvement capability is pragmatic and effective, 2) an interprofessional learning environment is critical to shifting mental models, 3) repetition of project experience with coaching and feedback solidifies critical skills, knowledge and behaviors, and 4) focusing first on developing capable interprofessional improvement leaders, versus engaging in broad general QI training across the whole organization, is effective.

KEYWORDS: capability; education; interprofessional; leadership; quality improvement; transformation

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MORE THAN A decade since the publication of Institute of Medicine reports documenting serious and extensive shortfalls in the quality of health care, specifically safety,^{1,2} there seems to have been little change in the way care is delivered, and medical errors remain a substantial threat to patient and safety.^{3–6} From this, we can conclude that nothing short of fundamental and transformational change of America's health care delivery system by a diverse and highly trained interprofessional workforce⁷ will close the gap between care as usual and best practice.

As Cincinnati Children's Hospital Medical Center (CCHMC) worked to transform its care delivery system, we realized that we needed to build improvement capability for changing systems of care. We defined improvement capability as knowledgeable and skilled human resources able to lead the design of improvement initiatives to achieve measurable results, execute (ie, develop, test, measure, and implement changes) the improvement efforts, and sustain the results. This is distinct from improvement capacity, defined as organizational resources that enable it to initiate and sustain a transformation effort. Capacity includes capable individuals at the macrosystem,

mesosystem, and microsystem levels^{8–10} in sufficient numbers to form a critical mass for changing the culture and behaviors. Capacity also includes processes, such as alignment of measurement and accountability strategies that are critical but not discussed here. In addition, capacity includes infrastructure such as centralized quality experts and measurement experts.

This article describes the strategy we used and the comprehensive model we developed to build improvement capability. The distinction between improvement capability and improvement capacity was an important first element in developing our strategy as it enabled us to focus on developing improvement leaders (capability) while assuring that they had sufficient support resources (capacity) to use their new knowledge and skills.

Our strategy and model are influenced by the fact that we are a large, urban pediatric academic medical center with an active medical staff of 1516, including community physicians and 784 employed faculty members. The entire medical center has more than 12,000 employees. Our centralized capacity infrastructure exists within the CCHMC James M. Anderson Center for Health Systems

Excellence, which includes staff with training and experience in data collection and analysis, measurement of both processes and outcomes, quality improvement (QI) methods, evidence-based care, and team facilitation. We have a robust system of measurement and reporting, including the use of dashboards¹¹ at various levels of the organization. The commitment of senior leadership is evident in both clinical and administrative leaders, thus providing a supportive culture and environment.¹²

Our QI and QI education efforts have been grounded in a solid foundation of learning from a diversity of academic areas,¹³⁻¹⁶ including reliability science¹³ and operations research, organizational behavior and development, systems thinking and social networking, and statistics. Peter Senge's work as described in *The Fifth Discipline*,¹⁴ Chris Argyris's work on double loop learning and action learning,¹⁵ and Clayton Christiansen's work on hypothesis development¹⁶ guided our efforts. This approach is consistent with our choice of W. Edwards Deming's System of Profound Knowledge¹⁷ as the conceptual framework for our QI efforts and QI education. Within the Anderson Center, faculty and staff of the Leadership Academy are responsible for building and continually refining our comprehensive improvement capability model and delivering the different component courses offered.

BUILDING A COMPREHENSIVE IMPROVEMENT CAPABILITY MODEL

GUIDING PRINCIPLES

We developed a conceptual framework for a comprehensive model for improvement science education that would both meet our needs and be practical. Our experience convinced us that applying sound adult education principles was a necessity. David Kolb's theory of experiential learning^{18,19} forms the basis for many adult education efforts and became the pedagogical foundation for our development of a more comprehensive system of building improvement capability. On the basis of our experiences, and with Kolb's work as an academic foundation, we committed to using a practical, QI project-based instructional design wherever it was feasible.

Ultimately, we developed the following guiding principles as a strategic framework for our efforts:

- Building improvement capability at CCHMC must go beyond acquisition of knowledge and skills to action-oriented improvement that achieves critical results and accelerates transformation.
- As an academic medical center, CCHMC's strategy for building improvement capability must focus on engaging and developing faculty as improvement leaders who can partner with nursing and allied health leaders, educating trainees, and advancing the scholarship of health care improvement through rigorous methods and QI research.
- Patient-centered transformation requires a nonhierarchical interprofessional team effort because our systems of care are complex networks of interdependent processes. These complex processes can only be

improved by bringing together the complementary skills and knowledge of the full care team.

- Different groups of people have different levels of need for improvement knowledge and skill to achieve results; each group should receive the training they need, when they need it, and in the appropriate amount.
- All members of the organization should incorporate improvement into their daily work and have the ability to advance their improvement knowledge and skills to achieve critical results and function at any level of the CCHMC improvement ladder.

COMPETENCIES, SKILLS, AND KNOWLEDGE

Through conversations with our Anderson Center QI leadership group and by engaging a broad range of stakeholders, such as physician division directors, senior leaders in nursing and allied health services, nonclinical leaders, middle management, and frontline physicians and staff, we identified the competencies needed by various target audiences of CCHMC faculty and staff to accelerate our organizational transformation (Table 1).

Our model to build improvement capability was developed to support the transformation of our care delivery system. Our theories about how best to structure the model evolved over time, distinguishing the anticipated needs for individual contributors, microsystems, mesosystems, and the macrosystem. Within each category, we recognized that there was a diversity of needs. For example, faculty span all the target audiences listed in Table 1, but, because of their commitment to the academic development of their discipline, the need to apply QI to improving care delivery and outcomes is expanded to also include the need to integrate QI with research. To deal with the diversity in each category, we focused on the minimum set of skills and knowledge^{11,17,20-25} needed to effectively integrate improvement science in each general functional role, assuming that the diversity of needs beyond what we were providing in formal programs would be met through coaching and mentoring at a more local level. Our theory was that all leaders (clinical and nonclinical), regardless of their scope of responsibility, need to be grounded in the basics of how to execute a QI project to measurably improve systems.

PROGRAM COMPONENTS

Table 2 provides a brief description of the programs and the structure we designed to accomplish our model of improvement capability. The programs include 2 online modules intended to orient staff to basic concepts and terminology. We make no assumption that completing the modules will prepare staff to do improvement projects on their own. Rather, our goal is to prepare them to be able to participate more effectively in teams that are led by individuals who have gained more education and experience in QI.

The basic program (Rapid Cycle Improvement Collaborative, RCIC) is focused on developing the capability to use

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