

Transformational change in health care systems: An organizational model

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Background: The Institute of Medicine's 2001 report *Crossing the Quality Chasm* argued for fundamental redesign of the U.S. health care system. Six years later, many health care organizations have embraced the report's goals, but few have succeeded in making the substantial transformations needed to achieve those aims. **Purposes:** This article offers a model for moving organizations from short-term, isolated performance improvements to sustained, reliable, organization-wide, and evidence-based improvements in patient care. **Methodology:** Longitudinal comparative case studies were conducted in 12 health care systems using a mixed-methods evaluation design based on semistructured interviews and document review. Participating health care systems included seven systems funded through the Robert Wood Johnson Foundation's *Pursuing Perfection* Program and five systems with long-standing commitments to improvement and high-quality care.

Key words: alignment, health system change, integration, organizational change, transformation

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Findings: Five interactive elements appear critical to successful transformation of patient care: (1) *Impetus* to transform; (2) *Leadership* commitment to quality; (3) *Improvement initiatives* that actively engage staff in meaningful problem solving; (4) *Alignment* to achieve consistency of organization goals with resource allocation and actions at all levels of the organization; and (5) *Integration* to bridge traditional intra-organizational boundaries among individual components. These elements drive change by affecting the components of the complex health care organization in which they operate: (1) *Mission, vision, and strategies* that set its direction and priorities; (2) *Culture* that reflects its informal values and norms; (3) *Operational functions and processes* that embody the work done in patient care; and (4) *Infrastructure* such as information technology and human resources that support the delivery of patient care. Transformation occurs over time with iterative changes being sustained and spread across the organization.

Practice Implications: The conceptual model holds promise for guiding health care organizations in their efforts to pursue the Institute of Medicine aims of fundamental system redesign to achieve dramatically improved patient care.

In 2001, the Institute of Medicine (IOM) released the report *Crossing the Quality Chasm: A New Health System for the 21st Century*. Highly critical of the U.S. health care system, the IOM argued that current systems of care fail to provide Americans with the high-quality health care system they need, want, and deserve. To achieve safer, high-quality care, intensive efforts are needed at all organizational levels to fundamentally redesign systems of care (IOM, 2001). Today in 2007, many health care systems are striving to respond to the challenges of the *Quality Chasm*. Few, however, have succeeded in making substantial transformations to achieve the IOM aims. Using traditional quality improvement (QI) techniques, many have attained short-term improvements in targeted areas through hard work and focused attention. However, few QI efforts have yielded sustained system change because they were not supported by the culture and structure of the larger organization (Repenning & Sterman, 2001; Rondeau & Wagar, 2002). Transformational change, by contrast, is pervasive and involves not only structures and processes but also the inherent culture and values of the health care organization (NHS Institute for Innovation and Improvement, 2006).

The question, then, is how can health care systems transform to provide consistently safe, high-quality care for patients? We address this question by identifying factors critical to successful system redesign, or transformation, from the experiences of 12 health care systems striving to provide superior—and in some cases, perfect—patient care. Our work stems from the national evaluation of the *Pursuing Perfection* (P2) Program, a major initiative of the Robert Wood Johnson Foundation (RWJF) created in 2001 in response to the *Quality Chasm*. P2 health care organizations sought to achieve

dramatic improvements in patient outcomes by pursuing perfection in all major care processes, with technical assistance from the Institute for Healthcare Improvement (IHI), the national program office for P2.

The evaluation, which was aimed toward understanding the factors that contributed to (or impeded) the health care systems' abilities to achieve their goals, drew upon theoretical constructs and disciplinary perspectives regarding complex organizational change (Greenhalgh, Robert, Macfarlane, Bate, & Kyriakidou, 2004; Grol, Bosch, Hulscher, Eccles, & Wensing, 2007; Poole & Van de Ven, 2004). The initial conceptual framework was based on research on microsystem effectiveness—including concepts of communication, coordination, organizational culture, and management support and involvement (Donaldson & Mohr, 2001; Nelson et al., 2002)—and on organizational diffusion of innovation (Rogers, 1995). This framework reflected IHI's intervention strategy to focus first on achieving perfect patient care in two clinical areas, then expand to five areas, and finally expand to all areas. We also used the IOM's *Quality Chasm* aims (IOM, 2001) and the Malcolm's Baldrige National Quality Program guidelines (2005) as frames of reference because many study systems used them. The data collection strategy, however, was designed to capture key system experiences, dynamics, and learnings that were not necessarily emphasized in the original frameworks. The factors reported here are those that emerged from the data as most important in the systems that we studied.

This article offers a conceptual model for understanding how organizations move from short-term performance improvements to sustained, organization-wide patient care improvements. The elements identified as critical to successful transformation have been

studied before. Our contribution lies in bringing them together and sometimes extending their conceptual basis, to show how they behave and interact in health care systems striving for perfection.

Methods

Using a mixed-methods evaluation design, we conducted comparative case studies in 12 health care systems over 3.5 years.

Study Sites

Participating health care systems included seven systems that received RWJF funding (*P2 systems*) and five systems that were selected initially to provide a basis for distinguishing the effects of P2 participation from other improvement efforts in the health care environment (*expanded-study systems*). The 12 systems are described in Table 1. The P2 systems were selected competitively by RWJF, with each receiving \$2.4 million in funding over 4 years in addition to ongoing technical support from IHI. The P2 systems are named in Table 1 because their identities have been widely publicized. However, they are identified as Sites A–G throughout the article to protect the confidentiality of their interviews. The expanded-study systems were selected to exemplify organizations of different size and complexity with long-standing commitments to QI, as recognized through public ratings and professional networks. Two systems received small P2 planning grants but were not selected for implementation funding. Expanded-study systems are identified throughout the article as Sites H–L.

Data Sources

We used *semi-structured interviews* to conduct more than 750 sessions in the 12 systems over the 3.5-year study period (2002–2005). We visited each system up to seven times, conducting 5 to 21 interview sessions each time, as shown in Table 1. Interviewees were selected to obtain perspectives from across the organization and included the following: the CEO; clinical executive staff; senior QI manager(s) and staff; members of interdisciplinary QI project teams (e.g., middle managers, improvement staff, physicians, nurses, and other frontline staff); representative frontline physicians and nurses affected by improvement initiatives; and managers responsible for information technology, human resources, customer service, and other business functions. Many interview sessions involved multiple participants. Except for the interdisciplinary team interviews,

individuals generally were interviewed with their peers. Although we recognized the drawbacks of group interviews, we opted to talk with more people than would have been possible with only individual interviews because of the project's broad scope. Two- or three-person teams conducted interviews of 1 to 2 hr in length. Altogether seven team members participated in interviews, rotating their assignments to visit as many systems as possible while also ensuring that at least one team member was present at consecutive visits for each system. Detailed interview notes were taken and subsequently transcribed. Materials provided by the systems also were reviewed, including strategic plans, improvement team workplans, team and organizational performance measures, and communication materials.

Analytic Approach

We conducted longitudinal comparative case studies, using an explanation-building analytic strategy applied to build, test, and refine our conceptual model. After the first three waves of interviews, we coded and sorted the interview transcripts into descriptive meta-matrices organized by domains specified in the earliest conceptual model and by new themes that emerged from the site visits. Consistent with Miles and Huberman's (1994) guidelines for comparative case studies, we first created individual site matrices and analyzed them separately before seeking cross-site explanations and then cycled back and forth between analytic strategies to understand both case dynamics and the effects of key variables. For each emerging domain, we added questions to the interview guides for subsequent rounds to enable further definition and refinement of domains. This iterative process followed Denzin's interpretive synthesis approach of collecting multiple instances and inspecting them for essential elements (Miles & Huberman, 1994). As we gained deeper understanding of each system's approach to improvement and transformation over time, we were able to validate domains and interactions between elements. We further refined the model by presenting it iteratively to the study systems for feedback, validation, and revision.

Finally, as the basis for a summary rating of model presence in each system, each team member independently rated the system on each model element on a 1 to 5 scale (1 = *no or negligible evidence of that dimension present*, 5 = *fully present*). Cross-member ratings were reasonably consistent, with consistency defined as all ratings being within one or two adjacent points on the scale. We aggregated scores across elements and averaged them across raters to create a summary score of the extent of model presence in each site.

Table 1**Description of study systems and data collection**

P2 Systems	Site Description	Number of Site Visits	Interview Sessions/Site Visit
Cambridge Health Alliance	Academically affiliated public health care system in Cambridge, MA, area with 3 community hospitals, 20 primary care sites, and a city public health department; 200–300 hospital beds and approximately 3,500 employees; ethnically diverse patient population with approximately 60% uninsured	7	7–18
Cincinnati Children's Hospital Medical Center	Pediatric academic medical center in Cincinnati, OH, serving approximately 30 regional counties; 300–400 beds and approximately 6,000 employees; diverse racial and socioeconomic patient population with 40% of children below the federal poverty level	6	11–16
Hackensack University Medical Center	Academically affiliated hospital subsidiary of a health system, which includes 6 other satellite locations serving patients in the greater metropolitan New Jersey and New York area; 600–700 beds with approximately 7,000 employees and approximately 1,500 affiliated physicians; approximately 5% of the county population is below the U.S. poverty line, 4% receive Medicaid, and 6% receive uncompensated care; approximately 25% of the population is from ethnic minority groups	7	8–16
HealthPartners	Nonprofit integrated care delivery and financing system headquartered in the Minneapolis/St. Paul, MN, area with 2 hospitals and approximately 50 clinics and practice locations; 1000 beds, 9,000 employees, and over 10,000 contracted providers for approximately 700,000 members and 100,000 fee-for-service patients including recent immigrants from Africa and Asia; approximately 20% of patients are insured through Medicare/Medicaid.	7	8–13
McLeod Regional Medical Center	Nonprofit, academically affiliated multifacility health care provider in Florence, SC, serving rural Pee Dee county with 500–600 beds, approximately 400 medical staff and 4,000 employees, approximately 25% of the population is below the poverty line, and almost half are from ethnically diverse backgrounds	7	8–13
Tallahassee Memorial Hospital	Flagship hospital of a nonprofit integrated health care system including the hospital, a home health agency, and more than 10 primary care clinics serving the metropolitan Tallahassee, FL, area and surrounding rural counties; around 800 beds and almost 4,000 employees; mixed demographic patient population with approximately 25% below the poverty line	7	7–13
Whatcom County/Peace Health	County-wide collaboration of health care providers, including St. Joseph Hospital, part of the academic and religiously affiliated Peace Health system, a number of community health centers and physician group practices and a nonprofit insurer in rural Washington state; the hospital has 200–300 hospital beds and approximately 1,700 employees including 300 medical	7	9–12

(continues)

Table 1

Continued

	Site Description	Number of Site Visits	Interview Sessions/Site Visit
	staff; the patient population is overwhelmingly Caucasian, and more than 60% are insured through government health care programs		
Expanded-Study Systems			
H	Physician-led integrated health care system in a relatively rural part of a midwestern state, part of a larger academically affiliated medical system; hospital has 300–400 beds and almost 200 physicians serving patients with a median household income of approximately \$30,000 and little ethnic diversity	5	8–12
I	Religiously affiliated medical system of approximately 20 hospitals and 2 nursing homes in 4 Midwestern states with approximately 5,000 affiliated physicians and 24,000 employees	2	15–21
J	Hospital that is part of a nonprofit, academically affiliated regional health care system in a rural area of a midwestern state; the hospital serves patients from 32 counties with approximately 400 beds and 400 affiliated physicians	3	10–16
K	Academically affiliated health system including multispecialty group practices, approximately 30 ambulatory care facilities, and a major hospital with 900–1,000 beds and a staff of approximately 4,000 (including 1,000 physicians) located in a midwestern urban area serving a patient population consisting of approximately 90% African Americans	3	13–18
L	Academically affiliated nonprofit health care system consisting of approximately 20 hospitals, 2,000–2,500 beds, approximately 2,500 employees serving patients in 1 urban area and several rural areas in a western state	1	5

Note. P2 = Pursuing Perfection.

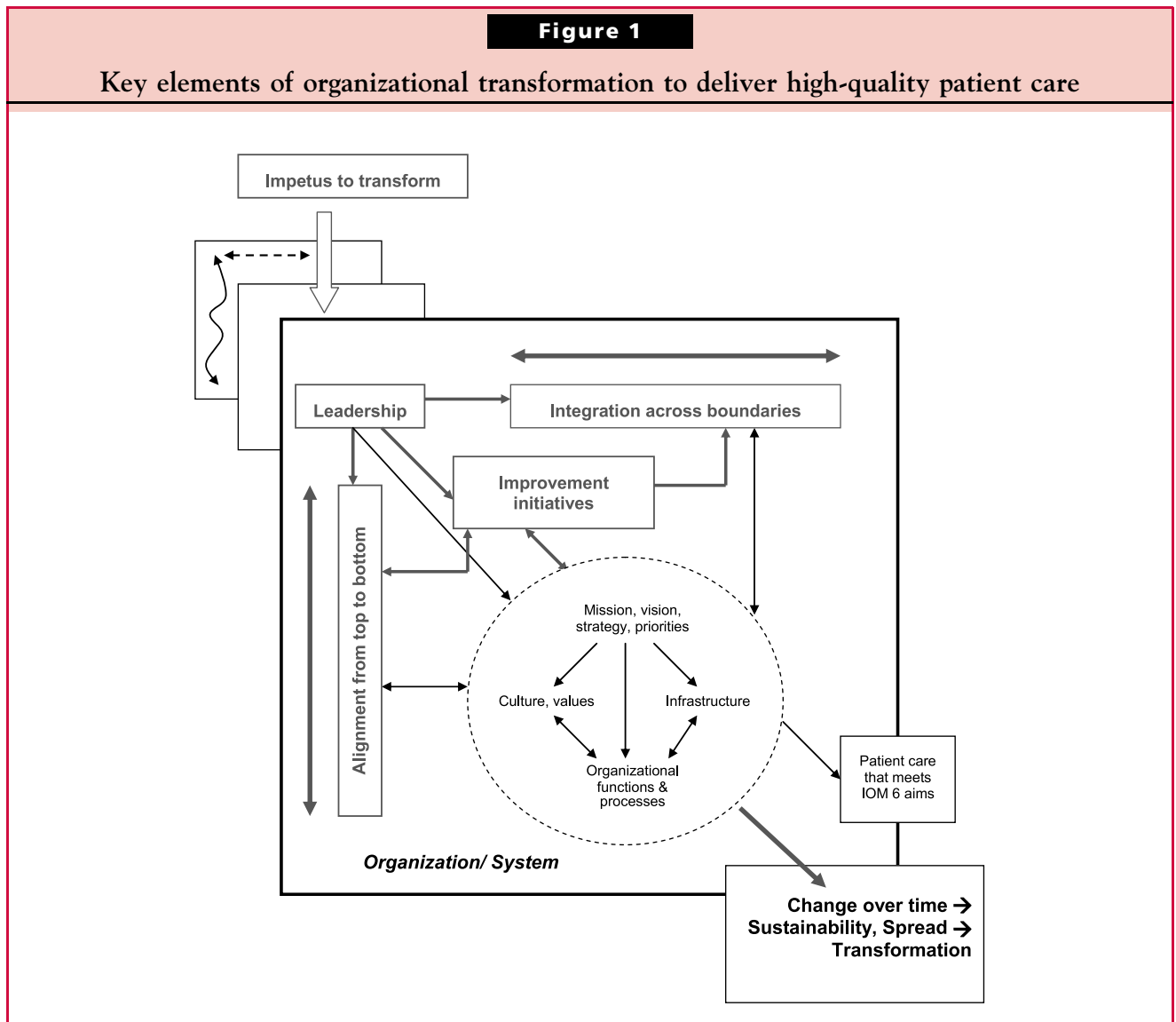
Model Overview: Framework for Organizational Transformation

In the P2 program, RWJF and IHI translated the *Quality Chasm’s* aims into a standard of perfect patient care, emphasizing patient-centered care driven by the needs and preferences of patients rather than by professional or organizational judgments. Although none of the 12 study systems achieved perfect care for all patients during the 4-year grant period, most made substantial progress in improving clinical performance in targeted areas, and some made notable strides in redesigning systems to support broader organizational changes.

From our analyses of all 12 site experiences, we identified five elements, or key drivers, that appear

critical to a health care organization’s success in moving to sustained, highly reliable, evidence-based improvements that ultimately lead to patient care transformation across the organization. Through the comparative case study analysis, we recognized experiences of the expanded-study systems that fit the same model as those of the P2 systems. Although some factors played out differently in the expanded-study sites, the same factors appeared critical to transformation. Therefore, we present findings from all 12 systems together rather than contrasting them as would be done with a usual comparison group.

The five critical elements, shown in Figure 1, include the following: (1) *Impetus* to transform; (2) *Leadership* commitment to quality; (3) *Improvement initiatives* that



actively engage staff in meaningful problem solving; (4) *Alignment* to achieve consistency of organization-wide goals with resource allocation and actions at all levels of the organization; and (5) *Integration* to bridge traditional intra-organizational boundaries between individual components.

In highlighting these factors, we run the risk of presenting them as isolated and static. In reality, these elements effect the transformation by driving change in complex and dynamic health care organizations. As illustrated inside the dotted circle in Figure 1, we define the organization—or network of organizations comprising the system—in terms of four basic components: (1) *Mission, vision, and strategies* that set its direction and priorities; (2) *Culture* that reflects its values and norms; (3) *Operational functions and processes* that embody the work that is done in patient care; and (4) *Infrastructure* such as information technology, human resources, fis-

cal services, and facilities management that support the delivery of patient care. Changes in these four components reflect the transforming health care system. Transformation occurs over time, as illustrated by the shadow boxes and diagonal line, leading to changes that spread across the organization and are sustained.

We expand here on the five model elements and their interactions, providing examples to illustrate each element in practice and how it interacts with other parts of the organization.

Key Drivers: Elements of the Model

Impetus to Transform

Each study system had a strong impetus to change. In Figure 1, impetus appears outside the organization to

emphasize external pressures for change that often were strongest. However, in some cases, impetus for change came from within the organization and often was stimulated by multiple factors.

Among P2 systems, each reported that its P2 grant was a major driving force behind its improvement efforts. Although most systems had well-defined improvement programs in place by the time that P2 began, the program brought renewed focus. For systems with serious financial challenges, P2 funding contributed importantly to their improvement efforts. For all P2 systems, however, the prestige and visibility engendered by P2 seemed more important than the financial gain. As one senior manager in Site F said,

Pursuing Perfection gives legitimacy to the [clinical improvement] efforts... by building a coalition of people... and hopefully having a lasting impact. It provides a focus and gives a framework for changing culture in different parts of the organization... P2 challenges us to think about the next level. We are better thinkers than before...

Among the expanded-study systems, the impetus for change varied. For example, in Site I, the impetus was the recognition by system leaders that organizational performance had plateaued and that the Baldrige Award criteria provided a framework for linking clinical improvement efforts with the organization's business strategy. The Baldrige application process, with its deadlines and feedback opportunities, also created a powerful urgency to change. In contrast, in Site J, medical errors created urgency. The institution was stunned when one of its own physicians suffered a medication error while undergoing treatment. This sentinel event spurred the leadership to action.

Regardless of its source or nature, the impetus had to be sustained within the organization to motivate and engage staff in ongoing change efforts. Senior leaders shaped their system's response to the impetus by setting organizational priorities and choosing the best strategy around which to rally the entire staff. They also engaged staff in change efforts by communicating about performance gaps, by holding staff accountable for improvement goals, and by actively participating in change-oriented activities.

Leadership

Leadership commitment to quality and change—beginning at the top of the organization but including all levels—was a critical element for organizational transformation. In Figure 1, leadership is shown in the upper left corner to reflect the importance of senior leadership promoting change down through the organization.

In our study systems, senior leadership drove change in two ways. First, senior leaders steered change through the organization's structures and processes to maintain urgency, set a consistent direction, reinforced expectations, and provided resources and accountability to support change. They set the path for other model elements and for the interactions among those elements in the larger organization. Second, to create the climate and momentum for dramatic improvement in patient care, leaders needed to demonstrate authentic passion for and commitment to quality. Many expended significant personal capital to inspire and motivate staff, often leading by example through personal involvement in QI efforts. At Site D, for instance, the CEO spoke of engendering an "edgy, impatient culture" around patient care quality. Although QI operations were led by a highly effective physician leader, the CEO remained personally involved, both as a champion for a clinical improvement team (despite not being a clinician) and as a member of the quality integrating committee. The CEO also worked actively behind the scenes to clarify expectations and to resolve problems.

Leadership involved more than the CEO. Engagement of the larger senior leadership team provided important linkages and facilitated cultural change throughout the organization. At Site F, the full senior leadership team (including the CEO) began each day with patient rounding in which team members asked patients and frontline staff specific questions about their experiences and then engaged in a debriefing session to resolve identified issues. Senior leaders also were required to serve as champions for improvement projects, with responsibility for linking the team to other senior managers who could help to resolve barriers.

Although leadership strategies began at the top of the organization, improvement was greater when middle and frontline managers were also committed to quality, being actively involved in supporting process redesign, and wholly aligned around the importance of QI. One strategy used in several systems was to include in improvement teams process owners who had operational responsibility for redesigned work processes. Their participation in the change process allowed them to successfully implement new work methods developed by the teams.

Improvement Initiatives

Targeted microsystem improvements were central to IHI's strategy in P2. Expanded-study sites also were committed to a strategy involving improvement initiatives, which are shown in the center of Figure 1 to signal their importance to transformation. Improvement initiatives contributed to transformation in at least three ways.

First, these initiatives, such as clinical redesign, improved operations. Those with sustained impact progressed beyond short-term improvement to build into routine work new practices that were visible, easier to perform, more reliable, and more efficient than old practices. Leaders in Site F, for example, found that improvement changes did not stick once special project resources were removed unless the system itself changed. In a surgical infection project, the site initially improved prophylactic antibiotic use through the use of guideline-based reminders and education but changed its approach after performance plateaued. To reach a zero-defect level, the site reengineered its practices to provide patients with antibiotics at a specific moment in the preoperative process signaled by explicit physical cues. As a result, the site attained consistently high performance without additional resources.

Second, improvement initiatives actively engaged staff across disciplines and hierarchical levels in problem solving around a concrete, meaningful, urgent problem. In the study systems, such engagement resulted in skill development, a newly honed sense of inquiry and problem solving, and more rigorous use of data. Equally important, engagement in problem solving generated a palpable sense of enthusiasm and accomplishment. As one person in Site F said,

It was very rewarding to see how excited staff and physicians were about making these changes. It became a competition; it was fun and we celebrated successes, in part by posting the successes. . . It is part of the 'pull.' Doctors, respiratory therapists, etc. travel to all units and communicate 'what's doing' to other units. If it is good, people say 'why can't we have that?'

Third, successful initiatives built momentum for further change and improvement. They contributed to culture change when the clinical focus for improvement was aligned with the organizational mission and strategic direction, was an area needing improved performance, and had scientifically valid evidence on which to base redesigned practices. Projects included improving clinical care for patients with acute conditions, such as heart attack or stroke, and with chronic conditions, such as asthma. Such projects engaged clinical staff because of their unmistakable clinical importance and because of the momentum built by incremental, short-term gains.

Alignment

Alignment, as defined in the Baldrige framework (Baldrige National Quality Program, 2005), refers to consistency of plans, processes, information, resource decisions, actions, results, and analysis to support key

organization-wide goals. An important factor in successful organizational change, alignment is represented in Figure 1 as a vertical line to signify its role in moving work at all levels of the organization in a consistent direction.

The study systems used different methods to convey their messages to ensure consistent visions and purposes across the organization. The leadership at Site D, for example, identified 18 corporate strategies that defined the organization's direction and priorities. Staff members throughout the organization became familiar with these strategies and their meaning.

Effective alignment required not only shared understanding of purposes and goals but also deployment of resources to reinforce the behaviors, operations, and processes that supported organizational goals. Study systems varied in how they accomplished this deployment, with several actively employing the Baldrige framework to create highly aligned priorities. In most systems, though, organizational priorities were translated into department goals for which managers were held accountable. Some systems carried alignment down to the front line of the organization. Site I, for instance, cascaded its organizational objectives to the front line through individual employee goals, with each employee expected to maintain a document containing position-specific goals that were measurable, time-dependent, and aligned with department and organizational goals. To illustrate, a nurse on a patient unit might have an individual goal of responding to patient call requests within y minutes to support the unit goal of improving patient satisfaction scores by x percent to support the organization's overall patient satisfaction goal.

Aligning goals down to the level of individual employees was challenging for most organizations. As one manager in Site F expressed it,

We need to do a better job of connecting our front-line supervisors to our plan, connecting the dots. We are creating a web or a map so we can easily update each other on where we are relative to our 30-40 [quality and other strategic] initiatives.

Accountability was a key aspect of alignment, ensuring that behaviors, operations, and processes were, in fact, aligned to support organization-wide goals. All study systems used performance measures in some form to encourage alignment. In some cases, managers' performance evaluations and bonuses were tied to their performance on strategic quality measures and, in a few systems, these measures were a component of physician compensation.

Even so, most systems admitted that effective alignment and accountability were difficult to achieve. Site E managers acknowledged that a high-level goal not met in a fiscal

year was not likely to incur penalty or corrective action; instead, the goal simply was moved to the next year.

Integration

Integration across traditional organizational boundaries occurred at a later stage of transformation in our study systems. Consistent with the Baldrige framework, integration was needed to break down and bridge boundaries between individual components so that a system operated as a fully interconnected unit to support organization-wide goals (Baldrige National Quality Program, 2005). In Figure 1, integration is represented as a horizontal line to signify the importance of working across intra-organizational boundaries. In our model, integration is a multifaceted concept that applies to all organizational levels and is both an end state for a high-performing system and a strategy for transformation. As a strategy, integrating structures and processes can facilitate the spread of improved clinical practices across the organization.

All study systems worked to integrate clinical care to improve coordination and continuity of care. At the front line, extensive work on patient flow, case management, and electronic support systems (e.g., clinical reminders and registries) was aimed toward improving care for individual patients or populations. Several study systems developed comprehensive planned care models to integrate patient care processes across workgroups, microsystems, or the entire organization. Some systems used service lines to integrate providers and support staff to improve coordination of patient care. However, some service line structures also created new silos, integrating care within the lines but impeding integration across them.

Also at the front line, all systems facilitated care integration through multidisciplinary improvement teams that encouraged communication and problem solving across work units. However, by themselves, improvement teams ran up against the limits of traditional intra-organizational boundaries. Often teams could not obtain the commitment of resources or the cooperation from other departments needed to effect change. Without such collaboration, improvement efforts could not fully make the changes necessary to address sources of problems and to build improvement into the organization such that lasting change occurs. For example, some study systems working on medication errors were unable to acquire resources to implement new technologies, such as bar coding, which resulted in less than fully effective work-arounds.

To move beyond the limits of a team's or service line's authority and resources, integration also was needed at the systems or organizational level in the form of structures and processes that involved managers with decision-

making authority and responsibilities spanning the organization. However, integration at these high levels in our study sites appeared to be more difficult to achieve. As one manager in Site G expressed it,

Getting people to talk to each other, breaking down silos, and getting people to work across units [is frustrating]...Hospitals really do have silos and they are there for good reasons. What would be ideal is a tunnel that goes all the way across that would allow us to share each other's goals. You need a dynamism that takes people out of the structure and creates a new way of doing things.

A deliberate focus on integration often occurred after an organization had learned to do redesign work and to address alignment. Many study systems used quality management steering committees to address cross-organizational issues in high-priority QI efforts, but only a few moved beyond integration around improvement projects to build integration into the way they worked by using standard or newly invented management structures. Site D, for instance, redesigned its horizontal management structures to create multidisciplinary groups responsible for care processes defined by patients' experiences (e.g., inpatient, outpatient, and emergency care teams). In addition, an integration committee staffed by senior leaders, including the CEO, addressed redundancy, conflicts, and the spread of best practices across groups. Site D saw these structures as transitional, recognizing inconsistencies with other structures in the medical center.

A Dynamic Model: Interaction and Iteration

The five critical elements of the model did not operate in isolation. Rather, they occurred in and through the context of complex and dynamic health care organizations. Substantial systemic change required interaction of the key elements with one another and with the rest of the organization, as illustrated in Figure 1. Our model shows the interconnections among elements that support transformational change, as called for in the *Quality Chasm* (IOM, 2001).

To illustrate the importance of these interactions, we found that improvement initiatives were unlikely to be sustained or spread across the organization if they were not linked to the organization's management structure and work processes. Structures and processes to create alignment and integration were critical to establishing those links. When an improvement initiative was aligned with the organization's priorities and strategic direction, senior managers were more likely to provide the needed infrastructure resources (e.g., staff time, funds, and data systems) and to hold staff accountable for

making necessary changes. Alignment also increased the likelihood that specific redesign would build momentum for further change as staff understood how their roles in achieving project objectives contributed to larger organizational goals. Integration facilitated redesign efforts by ensuring that all parts of the organization affected by redesign engaged in the redesign process, by fostering implementation through shared lines of communication and authority, and by resolving conflicting priorities and needs when multiple improvement projects affected common systems. This fundamentally changed how work was done throughout the organization, an important building block of sustainability.

Alignment and integration also interacted with each other. For example, Site D integrated its horizontal management structures around care processes and defined key priorities that cut across the horizontal management groups. To create alignment, each horizontal group was expected to address for each key priority how the group would contribute to meeting organizational goals and would collaborate with other groups. In our view, study systems that addressed alignment and integration at this level of the organization had a more advanced understanding of the need for consistency and interconnectedness throughout the organization. Even so, these organizations had not perfected an integrative approach. Although Site D had been developing its approach for almost 2 years, it still believed that it was a work in progress. The evolving integration structures sometimes conflicted or were redundant with traditional structures that remained in place. Patient safety, for instance, was a priority addressed by the horizontal integrating groups, but there was tension with the Patient Safety Committee's plans.

To achieve transformation, the five elements not only interacted with each other but also drove change through the organization's mission, culture, infrastructure, and operations. For example, some improvement initiatives interacted with the organizational infrastructure, such as information technology. Thus, infrastructure development ensured that organizational resources were in place to support improvement initiatives, but improvement projects also led to infrastructure enhancements. For example, in Site B, the medication reconciliation project stimulated the development of an online, interactive tool for patient use, and in Site G, work on patient flow triggered the design of an automated bed availability board to facilitate patient movement from the emergency department (ED) to the floor.

Improvement initiatives also interacted with other care processes, stimulating the spread of change across the organization and its incorporation into regular practices. Site F's first project involved work with county ambulance staff to improve triage of acute myocardial

infarction (AMI) patients entering the hospital ED. These changes stimulated the broader redesign of ED processes for acute myocardial infarction patients, which led, in turn, to redesigned processes for patients coming to the ED with other conditions.

In addition to being interactive, organizational transformation was iterative. Individual improvements fed into one another and occurred over time. Making one system improvement often set the stage for others or uncovered new problems or opportunities requiring attention.

Conclusions

Based on interviews and discussions with 12 health care systems actively working to transform their organizations, we identified five elements that appear to be critical to successful organizational change to improve patient care. Other factors, such as effective communication, contribute to and are necessary for successful change, but the five identified elements were most prominent in driving the study systems toward transformation.

Progress toward transformation was consistent with the model in all study systems, although the model was more evident in some systems than in others and no system had fully implemented all elements. The model fits across different types of health care organizations. Although the P2 initiative accelerated transformation efforts, the factors affecting the transformation in P2 systems were not systematically different from those in the expanded-study systems.

Our conclusion that the model reflects key factors associated with successful transformation is supported by preliminary findings from a survey of staff in eight study systems (seven P2 systems and one expanded-study system), to be reported in a separate article. The analyses show that systems with stronger presence of model elements also scored higher on survey items reflecting progress to transformation, including ratings of patient care quality in the organization and judgments regarding the impact of the organization's QI efforts on productivity/efficiency, patient outcomes, medical errors, and staff involvement in QI efforts.

Each of the five model elements is supported by a substantial literature. The principal contribution of this article is the finding that *all* five elements are needed for organizational transformation that substantially improves patient care. Transformation occurs when the five factors interact with each other over time and drive change through the larger organization. The article adds to the growing literature on multilevel theories of change and innovation (e.g., Poole & Van de Ven, 2004). For example, it extends the multilevel framework of Nelson et al. (2002), which focuses on clinical

microsystems as an essential building block of system transformation, by elaborating on the nature of the links between the microsystem and the larger organization. As another example, it extends the multilevel system redesign framework of Wang, Hyun, Harrison, Shortell, and Fraser (2006) by adding integration and alignment as important elements to direct and coordinate work across the multiple levels of the system.

One limitation of the study is the lack of a common set of clinical performance measures across systems that might serve as indicators of success in improving patient care. All P2 systems began with specific objectives, but the project content, goals, and metrics were site-specific and often changed over the life of P2. The evaluation would have benefited from shared clinical measures, but any such measures would not have equally reflected the priorities of participating systems and thus would not have evaluated them on a level playing field.

Another study limitation from some perspectives is that it focused on 12 leading systems that were committed to making major changes to improve patient care. By design, our evaluation tracked attempts at transformation under the most favorable conditions. However, we recognize that many health care systems are not at the same stage of organizational readiness for change. We did not study the processes by which an organization and its leadership decide to engage in transformation. Further research is needed in this regard to understand the motivation behind major system redesign and the capabilities necessary for the transformation journey.

Practice Implications

Transformation of health care systems is a complex and difficult undertaking. The P2 systems had the advantage of sharing ideas and working with IHI, but no system had a roadmap for achieving perfect care, and each learned as it went along. Their experiences, however, provide important lessons that can facilitate the process in other systems.

First, each model element as described earlier in the article offers direct practice implications for system managers seeking to change their systems to improve patient care.

Second, however, no single element is sufficient to achieve organizational transformation. For example, successful improvement projects can contribute importantly to improved quality, but improvement projects alone do not ensure sustainability of the improvements, including the spread of core values and expectations, the engagement of staff in delivering near-perfect care, and the skills and methods for achieving it. Managers should recognize that all model elements need to be part of organizational transformation and that the challenge is to maximize the likelihood that the elements and the

organization will interact in complementary ways to maintain urgency to change and to move the organization forward. Full transformation may be attained only when multiple improvements are *spread* across the system and *sustained* over time.

Third, successful transformation takes time. All study systems acknowledged that transformation (and the attainment of near-perfect care) most likely unfolds over a decade or more. No study system became fully transformed in the sense that values and expectations for near-perfect care were completely shared or that organizational functions operated to achieve near-perfect care in all major care processes. Although many systems demonstrated considerable progress, they described transformation as a continuing journey with no fixed end point. They argued that changes and adaptations always are needed to stay abreast of the volatile health care environment and the discovery of new areas for improvement. Clearly, organizations embarking on this journey require persistence and constancy of purpose.

Although based on 4 years' experience in only 12 health care systems, the conceptual model nonetheless holds promise for guiding other organizations in their efforts to pursue fundamental system redesign for dramatically improving patient care. In the meantime, we continue to test and refine the model through further research, including a Veterans Affairs-funded project that assesses the implementation of model elements to support the use of evidence-based practices and a second RWJF-funded project to validate the model in other health care systems.

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