
Organizational Resiliency: How Top-Performing Hospitals Respond to Setbacks in Improving Quality of Cardiac Care

*Tashonna R. Webster, PhD student¹; Leslie Curry, PhD, research scientist²;
David Berg, PhD³; Martha Radford, MD⁴; Harlan M. Krumholz, MD⁵; and
Elizabeth H. Bradley, PhD⁶*

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EXECUTIVE SUMMARY

Despite substantial improvement in recent years in hospital performance in many quality measures for acute myocardial infarction (AMI), national performance lags in a key publicly reported quality indicator for AMI—door-to-balloon time, the period from patient (with ST-segment elevation myocardial infarction or STEMI) arrival to provision of percutaneous coronary intervention or balloon angioplasty. Previous research has elucidated distinguishing features of hospitals that routinely achieved recommended door-to-balloon times for patients with STEMI. However, what has not been fully explored is how top-performing hospitals handle setbacks during the improvement process.

In this study, we used qualitative methods to characterize the range of setbacks in door-to-balloon improvement efforts and the strategies used to address these barriers among hospitals that were ultimately successful in reducing door-to-balloon time to meet clinical guidelines. Setbacks included (1) failure to anticipate and address implications of initial changes in door-to-balloon processes for the system as a whole; (2) tension between and within departments and disciplines, which needed to gain consensus about how to reduce door-to-balloon time; and (3) waning attention to door-to-balloon performance as a top priority after the perceived goal of reducing treatment times had been reached.

Our findings demonstrate key aspects of technical capacity, organizational culture, and environmental conditions that were factors in maintaining improvement efforts despite setbacks and hence may be critical to sustaining top performance. Understanding how top-performing hospitals recognize and respond to setbacks can help senior management promote organizational resiliency, leading to an environment in which learning, growth, and quality improvement can be sustained.

For more information on the concepts in this article, please contact Ms. Webster at tashonna.webster@yale.edu. See author affiliations at the end of this article.

Despite substantial and recent performance improvement in many quality measures for acute myocardial infarction (AMI) (Williams et al. 2005), hospital performance in a publicly reported quality indicator for AMI—door-to-balloon time—has lagged nationwide. Door-to-balloon time is the period between the hospital arrival of a patient with ST-segment elevation myocardial infarction (STEMI) and the delivery of percutaneous coronary intervention (PCI) or balloon angioplasty. Based on strong evidence about the importance of door-to-balloon time for survival in patients with STEMI (Cannon et al. 2000; Berger et al. 1999), national guidelines recommend that door-to-balloon times not exceed 90 minutes (Antman et al. 2004). Nevertheless, the most current available data indicate that many hospitals do not meet the guidelines (Bradley et al. 2006b; McNamara et al. 2006).

Our previous work (Bradley et al. 2006b; Bradley et al. 2005) clarified the distinguishing features of hospitals that routinely achieved recommended door-to-balloon times for patients with STEMI. Several operational strategies were in place in top-performing hospitals, such as giving emergency medicine rather than cardiology the charge to activate the catheterization laboratory, implementing a single-call system with page operators to streamline catheterization team activation, having an organizational expectation that the catheterization laboratory team is ready to start the PCI within 20 to 30 minutes of the initial page, and providing prompt data feedback to staff in the emergency department and catheterization labora-

tory about door-to-balloon times. In addition, top-performing hospitals had organizational cultures with team-based approaches and strong senior management support for door-to-balloon time improvement efforts. What has not been fully explored, however, is how hospitals that sustain top performance in this complex aspect of AMI care handle the inevitable setbacks that occur during any successful organizational change.

To understand the organizational responses of top-performing hospitals to setbacks, we conducted a qualitative study of hospitals that have successfully handled door-to-balloon times, focusing on their improvement experience during the previous four years. We conducted in-depth analyses of the descriptions of these hospitals' responses to setbacks and identified strategies that staff reported as helpful in their efforts to maintain improvement. Understanding these approaches may help hospitals prepare for and address unavoidable difficulties and setbacks as they seek to improve door-to-balloon times or other complex clinical processes of care.

METHODS

Study Design and Sample

We used data from a previous qualitative study (see Bradley et al. 2006a) that comprised hospital site visits and in-depth interviews to understand the experiences at hospitals that were successful in improving median door-to-balloon times to meet the recommended guidelines of 90 minutes or less. The hospital sample was selected from those participating from 2001 to 2002 in the National Registry of Myocardial Infarction (NRFMI), at that time

the largest national registry of patients hospitalized with AMI and hospitals from all regions of the United States (French 2000). Eligible hospitals were those that treated 50 or more primary PCI cases in the period of January 1, 2001 and December 31, 2002 and that had a median door-to-balloon time of 90 minutes or less for the most recent 50 cases in 2002. A total of 35 hospitals in NRMI met these eligibility criteria. These 35 hospitals were then ranked by their improvement in median door-to-balloon time within the prior four-year period—January 1, 1999 to December 31, 2002. We selected hospitals with the greatest improvement in median door-to-balloon time during this period.

As is recommended in qualitative studies, we continued to sample hospitals until we achieved theoretical saturation (Glaser and Strauss 1980; Patton 2002)—that is, the point at which no new concepts emerge through review of successive data from a sample that is diverse in pertinent characteristics and experiences. This point was reached after site visits to 11 hospitals and after 122 staff interviews. During site visits, we interviewed all key personnel (e.g., quality improvement staff, emergency medicine physicians, cardiologists, nurses, technicians, administrators) involved in efforts to improve door-to-balloon times. Approximately 10 to 12 individuals were interviewed at each hospital. The institutional review board at Yale University School of Medicine approved our research procedures.

Data Collection and Measurement

We began the in-depth, open-ended interviews (McCracken 1988; Miles and

Huberman 1994; Patton 2002) with the grand tour question, "Would you tell us what your hospital has done, if anything, that you think affected the time to treatment for patients with STEMI?" Interviews lasted one to one and one-half hours, and interviewers came from diverse backgrounds representing public health, cardiology, health services research, nursing, emergency medicine, and internal medicine. All interviews were tape recorded with participant consent and then transcribed by an independent transcriptionist to ensure objectivity. As staff described their various strategies to improve care, a theme emerged that we entitled "setbacks." The theme reflected various problems that hospitals experienced as they started to improve door-to-balloon time. Hence, interviewers probed specifically into the difficulties encountered amid the improvement efforts and the strategies used to work through those difficulties.

Data Analysis

For this article, we focused on the data produced by the questions about setbacks or difficulties that hospitals faced. We employed the constant comparative method of qualitative data analysis (Glaser and Strauss 1980; Miles and Huberman 1994; Strauss and Corbin 1998). Each transcript was reviewed line by line and was coded independently by at least four members of the research team, including the two researchers who conducted the interviews and the two researchers who coded every transcript. After independent coding, we met jointly to discuss and compare codes until we reached consensus. Then, we

integrated the coded data into recurrent themes, using the constant comparative method of analysis (Glaser and Strauss 1980). Recurrent themes identified specific types of setbacks as well as various strategies that participants viewed as useful in addressing these setbacks. All data were entered into Atlas.ti (Scientific Software Development, Berlin) to assist in reporting common themes and illustrative quotations.

RESULTS

Sample Characteristics

The 11 hospitals included in the qualitative analysis were diverse in terms of geographic location, volume, teaching status, and size (see Table 1). The sample of interviewed staff (n = 122) included physicians (19 percent), nurses (30 percent), quality improvement staff and clinical support staff (15 percent), and administrators (36 percent).

Recurrent Types of Setbacks and Organizational Responses

Despite their success in achieving median door-to-balloon times of 90 minutes or less, every hospital reported setbacks. Furthermore, multiple participants within a single hospital often independently described the setback, indicating hospitalwide recognition of the problem and involvement of several staff in addressing the issue. Setbacks included (1) failure to anticipate and address implications of initial changes in door-to-balloon processes for the system as a whole; (2) tension between and within departments and disciplines, which needed to gain consensus about how to reduce door-to-balloon time;

and (3) waning attention to door-to-balloon performance as a top priority after the perceived goal of reducing treatment times had been reached.

Failure to anticipate and address implications of initial changes. Staff reported that system improvements in one component of the door-to-balloon process sometimes created problems in other segments of the overall system. Such setbacks occurred after what teams described as initial improvements in their processes. In one example, the emergency department became so efficient in its part of the door-to-balloon process that when the delays were eliminated, new vulnerabilities were revealed, including inadequate protocols for transporting patients from the emergency department to the catheterization laboratory and uneven response time by on-call catheterization teams. As one interventional cardiologist explained:

A year and a half into the project, we hit a major brick wall. Our team was doing as much as we could, but we did not have the authority to break down the barriers that were coming from this . . . inertia. It all came to a head when the emergency department was getting very good at this. They could get the patient cleared and diagnosed in 20 to 30 minutes, and then the patient would sit in the emergency department.

To address this setback, staff reemployed traditional quality improvement tools, including data collection and feedback and process redesign to refocus process-design efforts on a newly discovered cause of delays. A quality management nurse stated:

TABLE 1
Hospital Characteristics

ID	Region	Number of Beds	Teaching Status
1	Northeast	770	Teaching
2	Midwest	176	Teaching
3	South	870	Teaching
4	Midwest	426	Teaching
5	South	350	Nonteaching
6	West	204	Teaching
7	West	277	Teaching
8	South	633	Teaching
9	West	190	Nonteaching
10	West	111	Nonteaching
11	Midwest	276	Teaching

It was when we were doing real-time data feedback and started to examine some of the delays that it became really clear that there was no one assigned to transport. So we had to decide who was responsible for doing transport and be very prescriptive.

The hospital then designed a new protocol for who could transport patients with STEMI. Extensive training was provided on the new protocol, followed by data monitoring and feedback to ensure unnecessary delays were eliminated to the degree possible. Importantly, the process of improvement included setbacks, and the quality improvement tools (including data collection and feedback) helped the team continue improvement efforts even as other failures in the system design were experienced.

In another example, several staff members described implementation of

a single-call paging system to streamline activation of the catheterization team. Unclear and idiosyncratic call schedules, which had previously been masked by a multiple-call paging system, became apparent and caused unanticipated errors and delays. Setbacks occurred as the wrong people were called and as staff members who were paged were unavailable or were delayed in responding because they did not realize they were on call for the catheterization team. In some cases, door-to-balloon times became worse, even despite efforts to expedite patients.

To address this setback, staff reinvigorated the use of quality improvement tools, including flowcharting with detailed step-by-step procedures to overcome system design problems and data feedback to communicate delays in catheterization team activation (see

TABLE 2
Common Setbacks and Strategies in Door-to-Balloon Time

Setbacks	Strategies
Failure to anticipate and address implications of initial changes	Employed quality improvement tools, such as flowcharting, and data monitoring and feedback, to determine areas of improvement in door-to-balloon time
Tension between and within departments and disciplines	Scheduled regular face-to-face interdisciplinary meetings to discuss difficulties in door-to-balloon time Focused on the quality of patient care as the common ground Involved senior management to apply pressure for greater accountability in reducing door-to-balloon time
Waning attention	Invoked external pressure from the market or regulatory requirements to regenerate commitment to improvement efforts

Table 2). One interventional cardiologist described the power of data for promoting physician awareness and change:

A lot of the physicians thought, "Well, I'm there at the drop of a hat. It doesn't take me a half-hour to get in." But when you actually look at how long it takes the physicians to get in, it really is 20 minutes or a half-hour. People have grossly different perceptions of what times they're doing things and how fast they're doing things than the reality of the situation. So it's very eye opening and powerful to see those numbers written down on paper. Once you see it, then you can, pretty easily, identify what you should try and change.

Tension between and within departments and disciplines. Participants in the improvement efforts described multiple tensions between and within depart-

ments and disciplines, which created substantial setbacks. Staff experienced frustration and anger within their respective department and about their relationships with various disciplines (i.e., emergency department, catheterization laboratory, cardiology, and emergency medicine) as they attempted to collaborate on the process of improving door-to-balloon times. According to one cardiologist, a codirector of adult emergency services who was tracking data and starting to give real-time feedback to staff on door-to-balloon times:

I got my head handed to me a dozen times or more. My computer would explode from the flaming e-mails. I'd hear that we had "an acute" last night, and I knew I'm going to get five different things that people are complaining about. . . . Of course, the most vociferous

doctor against the door-to-balloon project had the first complicated case that went wrong.

In some instances, tension emerged because staff members were uncomfortable or unwilling to relinquish control over specific aspects of the process despite the team's recommendations for process redesign. In other instances, participants described a lack of trust in other departments' ability to perform certain functions as a cause for inter-departmental tension. For instance, as one cardiac clinical nurse specialist described:

We spent months just team building and dealing with all of the personality problems and the vying for control. It was a total waste of time but something that was necessary because it was an interdisciplinary thing. It wasn't something we were trying to change within one service. We were asking the emergency department, the cath lab, and cardiology services—everyone—to sit down around the table and agree about what they were going to do. Some of it meant that spans of control had to be given up, and that didn't set well.

Three strategies were used for addressing tension among people from different departments or disciplines. The first strategy was continued face-to-face meetings and dialogue, which was often challenging because people who were angry about the process did not want to meet or communicate. Nevertheless, face-to-face meetings and discussions, even when heated, generally resulted in stronger teamwork and improved subsequent interactions. Through such interactions, individuals began to understand the sources of intergroup conflicts

and generate potential ways to address the conflicts. One medical director summarized the role of the face-to-face meetings as follows:

When we had problems, we started reviewing outliers. We had a big issue just to measure the time, to agree to measure the time and then [how] to measure the times. There's not one standardized clock. Those things sound trivial, but as we hammered that out somehow those meetings were still kind of a laboratory in which we worked out some of the interpersonal problems.

As a second strategy to address tension, hospitals explicitly focused on patient care as the common ground. Attention to good patient care linked door-to-balloon improvement efforts to values held deeply by clinicians. Framing improvement efforts as a way to deliver good patient care strengthened staff commitment while recognizing differences in approach to reducing door-to-balloon time among departments and disciplines. A catheterization laboratory manager expressed the following:

It took people realizing [what was] the right thing for the patient and to put your territorial and unit concerns out of the way—start thinking about the acute MI, not whose department it is and whose job it is.

In another example, a participant described the process by which her hospital decided to allow emergency medicine physicians, rather than cardiologists, to determine the STEMI diagnosis and activate the catheterization team. Although this change initially created tension, continuous emphasis on high-quality patient care supported

movement toward the common, ultimate goal. According to this participant, a codirector of adult emergency services:

There were some [people] who said, "Nobody's going to decide what's happening with my patient." Every time something came up [like a mistake reading an electrocardiogram], there would be a flurry from [them]... so we just maintained the vision. What if it was your mother, brother, sister, or father in the gurney? [Prompt PCI] is the standard of care, their best chance of living. That is how we taught it.

A third strategy used to address relationship difficulties, especially when differences in opinion among those in authority were present, was to involve senior management who had responsibilities for all of the involved departments. Senior hospital leadership could apply greater pressure for accountability to the common goal of reducing door-to-balloon time. In these cases, senior management voiced their expectation that all departments would take responsibility for their respective roles in reducing door-to-balloon time. As one cardiac clinical nurse specialist stated:

It was once the CEO said, "Let's move it" that these barriers got broken down. The chief of staff was sending out memos [that said], "Look at our time. What's going on? Explain what's happening here." People got very upset with it, [but] I was happy because I thought this is what I need [to make the improvements work].

Waning attention to door-to-balloon performance. A commonly reported setback, waning attention occurred particularly when staff perceived that substantial success in reducing times

had already been achieved. Staff mentioned that during the initial phase of streamlining door-to-balloon times, many innovative protocols were developed and were embedded in the process of care for AMI patients. However, once the goals were reached, less focus was given to maintaining the improved processes. In addition, staff turnover in management and key personnel also challenged the sustained emphasis on door-to-balloon time process improvements. One cardiologist expressed this common theme:

Well, that is the question. How do you keep attention to it once you have been successful? There is a lot running against you. Sometimes the improvement can be ingrained in new protocols that just become the new way of treating patients, but other things are not sustained.

To address this kind of setback, staff used external pressures of the market or regulatory requirements, such as public reporting, to regenerate commitment to improvement efforts. For instance, staff focused on the role of door-to-balloon time in retaining cardiac market share and in building the reputation of being a high-quality institution. This appeal was particularly credible given the mandate for public reporting of door-to-balloon performance by hospitals. As an executive director described:

We have national reporting; we are getting to where patients will be able to tell just how well the organization is doing. That means a lot in market share and perception. We have to be as good as anyone around in AMI. Heart attack and speed—this is known among the public. We're going to reach a point

where [the public will] make decisions on healthcare on the basis of these indicators that will be [posted] on the Web. Public perception of quality will determine your market share.

DISCUSSION AND CONCLUSION

Despite national efforts to improve door-to-balloon times, many hospitals continue to exceed the 90-minute guideline. Although previous research (Bradley et al. 2006b; Quinn and Mannon 2005; Peterson et al. 2007; Mehta et al. 2002) has focused on understanding the processes of improving quality of care, few studies have focused on understanding how organizations are able to sustain improvement efforts over time. This study expands past research by exploring how hospitals managed setbacks to maintain the improvements they have achieved in door-to-balloon time. Our findings suggest key aspects of technical capacity, organizational culture, and environmental conditions that played a role in this maintenance despite setbacks and hence may be critical to continuing top performance.

In the domain of technical capacity, hospitals that endured setbacks were fluent with and committed to quality improvement tools, not only to promote initial enhancements but also to revisit processes when improvements in one component led to or revealed new problems. Data feedback and flowcharting were particular tools used to address such setbacks. In this way, top-performing hospitals possessed technical competency in and applied continuous quality improvement tools and methods.

In the domain of organizational culture, hospitals demonstrated substantial ability to sustain dialogue and communication in the face of tension among departments and disciplines. Disagreements within teams often reflected what has been termed the "paradox of identity" (Berg and Smith 1990), in which team members struggle to yield their identification with one department or discipline to strengthen the group identity as an effective team. These types of conflicts are common when teams are formed and individuals assess how the group's goals coincide with their own (Berg and Smith 1990; Shortell, Bennett, and Byck 1998). Strategies used to manage tension included direct confrontation in face-to-face meetings, taking disagreements to senior managers who could emphasize the importance of the team to its members, and appealing to commonly held values such as providing optimal patient care.

In the domain of environmental conditions, hospitals used market and regulatory pressures effectively to sustain internal efforts. Several participants described how they used public reporting and pay for performance not only to focus initial efforts but also to sustain this attention. Aligning environmental incentives with organizational goals was central to retaining door-to-balloon time as an institutional priority. In the current environment of quality measurement and reporting, top-performing hospitals were able to use environmental pressures effectively to help sustain organizational commitment to the improvement efforts.

The role of senior management in fostering organizational resiliency to

setbacks cannot be overestimated. Leadership from the top has been recognized as a determining factor of successful quality improvement efforts (Deming 2000; Berwick 1996; Bradley et al. 2006a; Shortell 2004; Weiner, Shortell, and Alexander 1997). Participants in our study reported that senior managers were most effective in elevating door-to-balloon time as an organizational goal and in developing a culture for high-quality patient care. Senior managers were also crucial to overcoming criticism and reluctance of clinical staff as well as other barriers that made collaboration across departments difficult. Senior managers were able to diffuse conflicts by communicating that the hospital was committed to providing high-quality care for patient with STEMI and by promoting greater accountability for reducing door-to-balloon time.

One of the characteristics of resilient organizations is their ability to learn from mistakes (Berg and Smith 1990; Shortell, Bennett, and Byck 1998). Setbacks, if embraced, are central to the trial-and-error process by which such resiliency is developed and sustained (Kahn 2005). Top-performing hospitals in our study demonstrated this resilient feature, viewing setbacks as opportunities to learn and to make progress. Whereas improvement is typically equated with an absence of setbacks, in this study setbacks were recognized as a normal, although difficult, part of organizational progress. Furthermore, participants reflected in several cases that such setbacks were important and made substantial contributions to their hospital's ultimate success in reducing door-to-balloon time.

Limitations

This study has several limitations. First, the study included a limited number of top-performing hospitals. We used sampling methods recommended by experts in qualitative research (Glaser and Strauss 1980; Patton 2002), and the limited sample size, although comparatively small by quantitative research standards, was typical of qualitative studies. Smaller samples examined in greater richness are appropriate for qualitative research, which is designed to generate hypotheses and develop in-depth understanding of phenomena rather than to statistically test hypotheses in a representative sample that can be generalized to a larger population (Patton 2002; Sofaer 1999). The sample of hospitals was diverse in terms of geographic region, size, and teaching status; however, the views and experiences of staff members in these hospitals may differ from those of other hospitals not examined in this study.

Second, the sample selection was based on door-to-balloon times as listed in the NRMI database but reflected a sample of hospitals with larger volumes of patients with AMI (Every et al. 1999; Rogers et al. 2000). Third, because of the nature and goals of qualitative research, we were unable to draw statistical conclusions about the relationship between organizational resilience and door-to-balloon time. However, this qualitative study sought to characterize experiences of top-performing hospitals as they faced setbacks in their pursuit of reduced times and to generate hypotheses for future quantitative testing.

We employed a number of accepted techniques to ensure the rigor of

the data collection and analysis (Pope and Mays 1995; Patton 2002; Bradley, Curry, and Devers 2007), including the use of trained interviewers experienced in qualitative methods, audiotape and independent transcription of interviews, application of established procedures for systematic analysis, ongoing and close involvement of a multidisciplinary team that included two to four individuals with diverse backgrounds, and maintenance of detailed documentation of analytic decisions (Miles and Huberman 1994).

Despite these limitations, the study contributes insights into the internal cultures of top-performing hospitals that were able to sustain improvement efforts despite challenges. The findings describe the different types of setbacks that occurred in these hospitals and suggest that such setbacks can be addressed in ways that allow organizations to continue their improvement efforts. Senior management can play an essential role in developing resilient organizations, which recognize and respond effectively to setbacks so that learning, growth, and quality improvement can be sustained.

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Note

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Author Affiliations

1. Tashonna R. Webster, PhD student, Center for Public Health and Health Policy, University of Connecticut, Storrs
2. Leslie Curry, PhD, research scientist, Robert Wood Johnson Clinical Scholars Program, Department of Medicine, Yale University School of Medicine, New Haven, Connecticut
3. David Berg, PhD, clinical professor of psychiatry, Department of Psychiatry, Yale University School of Medicine
4. Martha Radford, MD, chief quality officer and professor of medicine, Cardiology Division, Department of Medicine, New York University School of Medicine
5. Harlan M. Krumholz, MD, Harold H. Hines, Jr. Professor of Medicine and Epidemiology and Public Health, Section of Health Policy and Administration, Yale University School of Medicine, and Section Cardiovascular Medicine, Department of Medicine, Yale University School of Medicine, and Center for Outcomes Research and Evaluation, Yale-New Haven Hospital, New Haven, Connecticut
6. Elizabeth H. Bradley, PhD, professor of public health, Section of Health Policy and Administration, Department of Epidemiology and Public Health, and Section of Cardiovascular Medicine, Department of Medicine, Yale University School of Medicine

PRACTITIONER APPLICATION

Stephen M. Merz, FACHE, vice president, Administration, Yale-New Haven Hospital, New Haven, Connecticut

Has your organization, department, or team hit a hurdle that prevents it from achieving organizational objectives? As a leader, have you struggled in pursuit of the best approach to get the improvement train back on track? Fortunately, you are not alone, as detailed in this article that reviews a very common organizational problem: setbacks in the improvement efforts.

In their study, Webster and colleagues interviewed more than 100 physicians, nurses, and management staff at 11 diverse hospitals whose performance consistently meets the national door-to-balloon time guideline of 90 minutes or less for cardiac patients. These organizations are among the nation's best-performing hospitals in this clinical measure, but each had encountered setbacks or impediments along the way. As often cited in the quality improvement literature, continuous improvement efforts require a consistent process of analyzing, implementing, reexamining, and improving again (e.g., Plan-Do-Check-Act cycle, control charts, Define-Measure-Analyze-Improve-Control process) to progress to a higher level of performance. While many researchers have focused on the tools, techniques, and measures adopted by organizations in their pursuit of improvement, few studies have examined the factors

behind the problems that occur once those improvements are in place. That is a gap that this article fills.

This article outlines specific strategies that successful organizations have pursued in resolving setbacks (some were unexpected) that occur with improving balloon times. More importantly, it also provides insights into the critical role that senior leaders play in breaking the logjam, even in a largely clinical domain or aspects of the improvement process. Among the most interesting findings in this leadership area was the importance of face-to-face meetings, both to maintain dialogue and to proactively de-escalate the tension that emerged. As documented in this study, senior leaders played a key role in establishing common goals and objectives across multiple disciplines and departments often when an overlap in goals was present. Also, leaders were vital in linking the specific improvement effort with broader organizational initiatives such as meeting the National Patient Safety goals or public reporting. This research validates much of management speak: being visible through "walking the talk"; articulating the vision; and advocating for patients, who are often the only voiceless party in clinical discussions among subspecialties and departments. As such, the article confirms that an engaged senior management—not only as active participants but also as supporters—significantly contributes to any form of continuous improvement, helping to erode inevitable problems or obstacles in the process.

I recommend this excellent article to any leader who is struggling with initiating or sustaining the results of an improvement project—whether clinical or operational. This study provides possible approaches to breaking an impasse.