

## ORIGINAL RESEARCH

# Behaviors of Successful Interdisciplinary Hospital Quality Improvement Teams

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**BACKGROUND:** Although interdisciplinary hospital quality improvement (QI) teams are both prevalent and associated with success of (QI) efforts, little is known about the behaviors of successful interdisciplinary QI teams.

**OBJECTIVE:** We examined the specific behaviors of interdisciplinary QI teams in hospitals that successfully redesigned care for patients with ST-elevation myocardial infarction (STEMI) and reduced door-to-balloon times.

**DESIGN:** Qualitative study.

**PARTICIPANTS:** Researchers interviewed 122 administrators, providers, and staff in 11 hospitals with substantial improvements in door-to-balloon times.

**MEASUREMENTS:** Using data from the in-depth qualitative interviews, the authors identified themes that described the behaviors of interdisciplinary QI teams in successful hospitals.

**RESULTS:** Teams focused on 5 behaviors: (1) motivating involved hospital staff toward a shared goal, (2) creating

opportunities for learning and problem-solving, (3) addressing the impact of changes to care processes on staff, (4) protecting the integrity of the new care processes, and (5) representing each involved clinical discipline effectively.

**CONCLUSIONS:** The behaviors observed may enhance a QI team's ability to motivate the various disciplines involved, understand the care process they must change, be responsive to front-line concerns while maintaining control over the improvement process, and share information across all levels of the hospital hierarchy. Teams in successful hospitals did not avoid interdisciplinary conflict, but rather allowed each discipline to contribute to the team from its own perspective. Successful QI teams addressed the concerns of each involved discipline, modified protocols guided by clinical outcomes, and became conduits of information on changes to care processes to both executive managers and front-line staff. *Journal of Hospital Medicine* 2011;6:501–506. © 2011 Society of Hospital Medicine

Interest in healthcare teams has surged in recent years. A majority of the interest has been devoted to teamwork in the interdisciplinary clinical teams that staff operating rooms,<sup>1</sup> emergency departments,<sup>2</sup> and other inpatient settings.<sup>3</sup> Interventions that enhance elements of teamwork like communication, mutual support among team members, and leadership have demonstrated effectiveness.<sup>4</sup>

Less attention has been paid to improving the success of hospital quality improvement (QI) teams, which gather individuals from different disciplines to improve a defined aspect of care. Studies suggest that QI teams

can enable transformational change in healthcare systems,<sup>5–7</sup> and that interdisciplinary representation,<sup>8,9</sup> physician involvement,<sup>10,11</sup> and clear goals<sup>12,13</sup> are associated with successful QI efforts. However, few studies have examined the behaviors of the QI teams that planned and implemented these efforts. Understanding how QI teams work to achieve their goals will allow hospitals to encourage these behaviors, and allow researchers to design interventions to augment these behaviors.

Accordingly, we sought to characterize the behaviors of successful interdisciplinary hospital QI teams. We previously reported on the strategies used by hospitals to reduce door-to-balloon times for patients with ST-elevation myocardial infarction (STEMI)<sup>14,15</sup> to the evidence-based guideline of 90 minutes.<sup>16</sup> Our objective is to examine how QI teams designed and implemented these strategies. We believe that studying high-performing QI teams is a first step to developing testable hypotheses about the effectiveness of QI team behaviors and mechanisms by which these behaviors might produce positive team outcomes.

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## METHODS

We designed a qualitative study using in-depth interviews. We selected a qualitative methodology, since behaviors, social norms, and interpersonal interactions can be most appropriately examined using qualitative methods.<sup>17,18</sup> In addition, we used a “positive deviance” approach,<sup>19</sup> where we focused on hospitals with top performance and the most improvement in door-to-balloon times. We sampled from hospitals in the National Registry of Myocardial Infarction (NRFMI) who perform percutaneous coronary intervention (PCI, n = 151). We selected hospitals whose median door-to-balloon times were ≤90 minutes (n = 35). Then, we ranked hospitals in descending order according to their improvement during the previous 3 years (1999–2002). We sampled hospitals in descending order until we reached theoretical saturation where, as recommended for qualitative inquiry,<sup>20–22</sup> additional site visits did not uncover new concepts or patterns regarding our study questions. All sampled hospitals agreed to participate.

The first contact at each hospital was typically the director of QI. We asked to interview anyone with substantial involvement in the effort to reduce door-to-balloon times, and suggested that a wide variety of disciplines and roles be represented. We also used the snowball technique,<sup>22</sup> where we asked participants to provide the names of individuals with substantial involvement in the reducing door-to-balloon times. Participants had varied levels of participation in QI teams. We purposely asked for minority and dissenting views from all participants.

At least 2 members of the research team conducted in-depth interviews during hospital site visits. Interviews were conducted individually or in small groups, and lasted 1 to 1.5 hours. All data were audiotaped after verbal consent. Our interviews began with the grand tour question: “What, if anything, has this hospital done to reduce its door-to-balloon times for patients with STEMI?” The research team used standardized probes<sup>20,23</sup> to guide the discussion and achieve a complete understanding of the phenomena under study, including leadership and activities of the QI teams, and recommendations to other hospitals that wished to reduce door-to-balloon times. As recommended by experts,<sup>23</sup> our interview guide was purposefully open-ended to capture the range of experiences with QI teams. We did not specifically probe for facilitating or challenging behaviors. Audiotapes were transcribed by an independent, professional transcriptionist.

For this analysis, we defined QI teams as groups of administrators, providers, and staff who designed, implemented, and monitored processes to reduce door-to-balloon times. Each analysis team member independently cataloged quotes about team behaviors using a list of concepts (or codes). We then analyzed the quotes to identify recurrent

**TABLE 1.** Description of the Study Sample (Hospitals)

Hospital	Region	Teaching Status	No. of Beds	STEMI Annualized Volume*	Median Door-to-Balloon Time (min) <sup>†</sup>
1	Northeast	Yes	770	68	85.5
2	Midwest	Yes	176	33	75.5
3	South	Yes	870	187	55.5
4	Midwest	Yes	426	85	70.5
5	South	No	350	94	69.0
6	West	Yes	204	89	82.0
7	West	Yes	277	41	89.0
8	South	Yes	633	124	86.5
9	West	No	190	43	89.5
10	West	No	111	51	87.0
11	Midwest	Yes	276	95	87.0

Abbreviation: STEMI, ST-elevation myocardial infarction.

\*Based on 1999–2002 volume.

<sup>†</sup>Based on most recent 50 percutaneous coronary intervention (PCI) cases in 2002.

themes relevant to the behaviors of interdisciplinary QI teams. We used the constant comparative method of analysis,<sup>20,24,25</sup> which stipulates that the initial list of codes is refined as new transcripts are analyzed, and the final list is applied to all the transcripts. The analysis team included experts in QI, medicine, qualitative and health services research, as well as organizational psychology, and one of the interviewers. The presence of diverse perspectives in the analysis team,<sup>21</sup> and a detailed audit trail<sup>20</sup> to document the emergence of codes and themes, helped enhance researcher neutrality, data accuracy, and validity. We used *Atlas.ti* version 5.2 (Scientific Software Development GmbH, Berlin, Germany) to assist in the analysis.

## RESULTS

Our sample (n = 11) included hospitals that varied on several characteristics (eg, geographic location), and median door-to-balloon times ranged from 55.5 to 89.5 minutes (Table 1). Hospitals in our sample had higher mean improvements in door-to-balloon times compared with non-sampled NRFMI hospitals (n = 140, 24 minutes vs 3 minutes over 3 years). Our interview participants (n = 122) included physicians, nurses, QI personnel, and administrative staff (Table 2). Five behaviors emerged from the data analysis. We found that interdisciplinary QI teams in successful hospitals focused on: (1) motivating involved hospital staff towards a shared goal, (2) creating opportunities for learning and problem-solving, (3) addressing the impact of changes in care processes on staff, (4) protecting the integrity of the newly developed care processes, and (5) representing each involved clinical discipline effectively. These behaviors were recurrent across our diverse set of hospitals.

**TABLE 2.** Description of Study Sample (Participants)

Participants	No. in Sample (n = 122)
Cardiology	
MD	20
Nurse	15
Emergency Medicine	
MD	15
Nurse	9
EMS	3
Executive managers	20
QI personnel	17
Other nurses	13
Other clinical/support staff	10

Abbreviations: EMS, emergency medical services; MD, doctor of medicine; QI, quality improvement.

### Motivating Involved Hospital Staff Toward a Shared Goal

As with any team, the QI teams in our sample had to motivate others in order to be successful:

Making certain that we have common goals [and] figuring out the best way to get there. It has to be a team, a partnership. It can't be I'm better than you, or this discipline is better than that discipline. We're all here for one reason.

—Hospital #11, Administrator

To redesign the door-to-balloon care process, successful QI teams engaged clinical disciplines that felt disempowered previously:

[ED physicians] were receptive, but they said, "Cardiology won't let us do this." It's not going to be [just] cardiology anymore; it has to be everybody, because we really need to improve this time.

—Hospital #7, QI personnel

Teams also promoted reduction in door-to-balloon times as a goal that required shared participation from clinical disciplines including cardiology and emergency medicine, but also laboratory medicine, critical care, pharmacy, and transport. Achieving this goal would positively impact institutional standing:

When people get entrenched in their little domes they have a hard time seeing the overall benefit. Stress the institutional importance of this issue and the importance of cooperation and how it translates to better patient outcomes. [This is what] we're being monitored on; a very clear way in which we can be judged.

—Hospital #7, Catheterization Lab Medical Director

### Creating Opportunities for Learning and Problem-Solving

The work of these QI teams resulted in interdisciplinary conflict, but when individuals voiced frustration with other disciplines, it was seen as a necessary step in the redesign of a complex, interdisciplinary care process:

The first 6 to 8 months were spent team building and dealing with the vying for control. It was a total waste of time but necessary because now it was an interdisciplinary thing. It wasn't something we were trying to change within one service. We were asking everyone to sit down and agree about what they were going to do. The first [meetings] were shouting matches. The ED

was becoming a scapegoat; the problem was never in the cath lab. We were able to act on some of those issues. You need to see both sides and understand what the barriers are.

—Hospital #1, Cardiology Nurse

Although challenging, interdisciplinary QI teams allowed team members to gain the detailed knowledge about front-line operations that they needed:

We cardiologists don't really deal with what is happening behind the scenes—exactly what a unit clerk does, and where the bottlenecks are. I discovered that lots of ideas come from unexpected places.

—Hospital #11, Cardiologist

To facilitate learning, teams cultivated a nonjudgmental, mutual trust atmosphere:

Throughout the whole process, there's been a lot of dialogue. Everybody throws their assumptions on the table, assumptions are respected; there is a lot of open communication.

—Hospital #3, Cardiology QI personnel

In addition, reducing door-to-balloon times required iterative problem-solving. QI teams in our sample welcomed opportunities to learn from less effective strategies:

I'm one that's never too upset to ditch something if something was working and you switched to something else and now it's not working. You tried it. Go back. Or maybe it needs to be fine tuned.

—Hospital #1, Administrator

### Addressing the Impact of Changes in Care Processes on Staff

Many hospitals in our sample required staff to arrive at the catheterization lab within 20–30 minutes of being paged. This resulted in more demanding call schedules and changing roles (eg, activation of the cath lab by emergency department [ED] physicians instead of cardiologists). Participants conveyed both the burden of, and the satisfaction with, new processes:

It is a tremendous commitment time-wise. We had a first call schedule but had to go to a second call schedule. There's no way you can get around the fact that it's very disruptive to your life. You're sitting down to dinner and suddenly you've got to go, and you don't have a chance to kiss the kids goodbye. You're out the door and heading to the hospital. It's been very disruptive, but it's a good program. No one regrets it.

—Hospital #5, Cardiologist

Successful QI teams validated staff concerns about the impact of these changes on workflow and quality of life:

We have few people who are nay saying for the sake of nay saying. People have legitimate concerns. I value those concerns as they affect the people who are involved.

—Hospital #4, Cardiologist

Teams responded to these concerns by testing solutions and eliminating negative consequences where possible:

[ED said]: "We're uncomfortable with being the ordering physicians for labs drawn after patients leave the ED." I said, "Let's

make that issue go away.” If they perceive it as a risk, let’s make that fear go away because that removes a barrier.

—Hospital #4, Cardiologist

### Protecting the Integrity of the New Care Processes

Once the necessary changes to the care of patients with STEMI were in place, these teams ensured that new processes were followed consistently. Rather than allowing customization of the processes by front-line staff, QI teams monitored cases, gathered feedback, and made necessary modifications. Small modifications to the protocols helped incorporate front-line feedback and reinvigorate staff:

People got comfortable and slower, and I quit hassling the group. We reinvigorated the Emergency Room, met with them, and changed the process a little bit. Change always perks people’s attention.

—Hospital #8, Cardiologist

Another strategy to protect the integrity of the redesigned process was to highlight its value by publicizing clinical successes:

[We] let them know what we found and how the patient is doing. It’s a pat on the back saying you did a good job. Next time [the ED physicians] will be screening that much closer. When we’re leaving the hospital at 3 a.m. they’ll say “How did it go?” They want to know; that adds to that team feeling because everybody is important. They help us do our job and we help them do theirs.

—Hospital #9, Catheterization Lab Technologist

Lastly, QI teams empowered front-line staff to comply with the new process by emphasizing benefit to patients. This allowed staff to overcome hierarchical boundaries:

ED staff told us that sometimes patients waited because the cardiologist was getting a history and physical. They’ve been empowered to say “We’re ready to go.” Before nurses felt that they couldn’t really do that. Now we’re getting through to them that time is muscle and that guy is costing the patient.

—Hospital #5, QI personnel

### Representing Each Involved Clinical Discipline Effectively

Participants remarked on the importance of team member selection. Successful QI teams had members who could effectively represent each involved discipline. Effective representation involved in-depth knowledge of one’s aspect of the care process and communicating that perspective to the team:

The lab director got together with the ED director, who got together with the radiology director, who asked “Who’s transporting the patient?”; “How are we going to get blood drawn, what’s going to happen?” That middle management team became critical.

—Hospital #10, Administrator

Effective representation also required the authority to endorse and implement necessary changes:

The people that head councils are not people in the position to make changes in the workflow of the hospital.... For example, having the ED doctor activate the cath lab. You’d say “Well, the Chairman of Medicine would probably have something to do

with this.” Wrong. The Chairman of Medicine has no interest in STEMI care. Go to the Chairman of Cardiology. Sounds good, but you have to talk to the interventional guys. Go to the head of the cath lab. Sounds good, but it really has to go to a cath lab committee meeting.

—Hospital #1, QI personnel

In addition to knowledge of processes and authority to implement changes, team members in these successful QI teams had to be proficient in disseminating information on performance and changes to processes. Teams developed regular communication channels across levels of the hospital hierarchy, from front-line staff to executive management:

Communication, communication, communication. Make sure you have a system set up where there’s opportunity for back and forth between all the different levels. Set up the infrastructure from the beginning where there’s a mechanism to relay information up and down.

—Hospital #1, Cardiology Nurse

### Discussion

We identified 5 behaviors of successful interdisciplinary QI teams based on our analysis of hospitals that reduced door-to-balloon times for patients with STEMI. These QI teams: (1) motivated involved hospital staff to consider lowering door-to-balloon times, a shared goal, (2) created opportunities for learning and problem-solving, (3) addressed the impact of changes to care processes for patients with STEMI on staff, (4) protected the integrity of new care processes, and (5) represented each clinical discipline effectively by having members with in-depth knowledge and authority.

Experts suggest that the key elements of effective teamwork in healthcare include prioritizing team over individual goals, mutual understanding, leadership, adaptability, and anticipation of the needs of others.<sup>26</sup> These elements are supported by mutual trust and closed-loop communication. The behaviors of QI teams in our study represent adaptive responses to the unique demands of QI in a complex organization. These teams went beyond an improvement model of identifying and analyzing a problem, and then developing and testing solutions by: (1) motivating and gathering information from each discipline, regardless of interdisciplinary conflicts; (2) responding to the concerns of front-line staff, while maintaining control over the improvement process; and (3) sharing information across the hospital hierarchy. Table 3 illustrates potential relationships between the team behaviors in our data, the demands on hospital QI teams, and known elements of effective teamwork.

The behaviors in our study suggest effective teamwork strategies for QI. For example, our data suggest that successful interdisciplinary QI teams need effective representation from each involved discipline. This representation is necessary for motivation of front-line staff, gathering of detailed information about processes, and the effective implementation of changes.

**TABLE 3.** Examples of QI Team Behaviors in Our Data and Possible Relationships to Demands on Hospital QI Teams and to Established Elements of Teamwork

Demands on Hospital QI Teams—What QI Teams Must Do to Improve Care	Elements of Teamwork*	Behaviors of QI Teams in Our Study	Examples
Gather information from and motivate each involved discipline	Team rather than individual goals	Motivating all involved hospital staff towards a shared goal	Promote parity among disciplines Invite every involved discipline Emphasize benefit to patients
Gather information from and motivate each involved discipline	Mutual understanding	Creating opportunities for learning	Allow for interdisciplinary disagreements Gather detailed operational knowledge in a mutual-trust environment Guide changes using objective data
Respond to the concerns of front-line staff while maintaining control over the improvement process	Anticipate the needs of others	Addressing the impact of changes on staff	Validate concerns from all disciplines Test solutions to negative consequences (eg, call schedules, laboratory forms)
Respond to the concerns of front-line staff while maintaining control over the improvement process	Adaptability	Protecting the integrity of new protocols	Monitor data and respond to performance losses Document and publicize successes Empower front-line staff to respond to lapses in protocol
Keep all levels of the hospital hierarchy informed during the improvement process	Leadership	Representing each involved clinical discipline effectively	Select members with in-depth knowledge about processes Select members with authority to implement changes within their discipline Exchange information with executive management and front-line staff

Abbreviation: QI, quality improvement.

\*Elements of teamwork adapted from Salas et al.<sup>26</sup>

Although this level of representation might challenge the cohesiveness of some teams,<sup>27</sup> the teams in our sample managed conflict among disciplines without sacrificing the shared goal. By allocating attention and resources to the concerns of each discipline, the teams we studied prioritized team over individual goals and promoted mutual understanding.

Similarly, deciding when to modify the new protocols required leadership, adaptability, and anticipation of the needs of others. Successful QI teams in our sample modified protocols based on data and feedback, and created the mutual trust environment that is known to facilitate learning among disciplines.<sup>28–30</sup> Their willingness to learn, however, did not deter teams from protecting the integrity of new protocols. Lastly, participants stressed the importance of managing information across hierarchical boundaries. Managing reliable, timely, and accurate information across all levels is crucial to teamwork, and to the power and influence of a team.<sup>31</sup>

Our conclusions should be interpreted in light of several limitations. First, our study did not include a comparison group of low-performing hospitals. We followed the recommendations of qualitative research experts<sup>23</sup> who recommend sampling those with the most information on, and experience with, the phenomena under study (QI teams in high-performing hospitals). The hypotheses we present here require further testing in quantitative studies of hospitals with diversity in QI team outcomes. Second, it is possible that sampled participants favored responses that they

considered more desirable. To minimize this bias, we interviewed multiple participants per hospital, assured their confidentiality, and asked them to elaborate their responses. We sampled participants with a wide range of clinical and operational roles in each hospital, and also used the snowball sampling method to augment our sample. The range of responses collected, including frank discussions about setbacks, argues against the existence of contrasting behaviors to those captured. Third, although our sample included hospitals of various size and location, our findings might not reflect those of a larger sample of US hospitals. Last, the behaviors of QI teams may differ for other clinical processes.

Translating these findings into practice will require future studies of the impact of QI team behaviors on sustainability of quality gains. Since QI teams are not typically permanent, additional research is needed to identify behaviors associated with sustainable improvements. In addition, we must test whether the relationship between behaviors and team outcomes depends on whether the QI team strives to reach an evidence-based goal or to improve a process as much as possible. Our sample demonstrated a combined approach, where the evidence-based goal was followed by a desire to continue to further reduce door-to-balloon times. Similarly, the relationship between behaviors and team outcomes might depend on the catalyst for improvement (eg, regulatory pressure, an adverse event). The confluence of strong evidence and regulatory pressure that fueled these teams might not

be true for other measures. Lastly, studies of team-work in QI teams will require objective measures of team behaviors. A combination of surveys and direct team observation will likely be required to measure these behaviors, especially effective representation.

Our study highlights behaviors common to successful interdisciplinary QI teams in high-performing hospitals. Previous studies have identified elements of teamwork and the importance of teams to QI, but have not examined team behaviors. In the era of an ever-growing list of quality measures and of movement toward performance-based reimbursement models,<sup>32–34</sup> hospitals have embraced the use of interdisciplinary teams as a key component of QI efforts. Our findings suggest that hospitals could enhance QI team effectiveness by promoting behaviors associated with successful interdisciplinary teams. When applied to QI teams, teamwork training could be supplemented with knowledge, attitudes, and skills regarding information-gathering, problem-solving, and communication across disciplines and levels of the hospital hierarchy.

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