

# Fair and Just Culture, Team Behavior, and Leadership Engagement: The Tools to Achieve High Reliability

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**Background.** Disparate health care provider attitudes about autonomy, teamwork, and administrative operations have added to the complexity of health care delivery and are a central factor in medicine's unacceptably high rate of errors. Other industries have improved their reliability by applying innovative concepts to interpersonal relationships and administrative hierarchical structures (Chandler 1962). In the last 10 years the science of patient safety has become more sophisticated, with practical concepts identified and tested to improve the safety and reliability of care.

**Objective.** Three initiatives stand out as worthy regarding interpersonal relationships and the application of provider concerns to shape operational change: The development and implementation of Fair and Just Culture principles, the broad use of Teamwork Training and Communication, and tools like WalkRounds that promote the alignment of leadership and frontline provider perspectives through effective use of adverse event data and provider comments.

**Methods.** Fair and Just Culture, Teamwork Training, and WalkRounds are described, and implementation examples provided. The argument is made that they must be systematically and consistently implemented in an integrated fashion.

**Conclusions.** There are excellent examples of institutions applying Just Culture principles, Teamwork Training, and Leadership WalkRounds—but to date, they have not been comprehensively instituted in health care organizations in a cohesive and interdependent manner. To achieve reliability, organizations need to begin thinking about the relationship between these efforts and linking them conceptually.

**Key Words.** Safety, teamwork, leadership, walkrounds, reliability, culture

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In health care we excel in defining projects and tackling them with zeal, yet the end result, particularly in the safety-based ones, is that most do not achieve the desired outcomes. Instead, projects suffer from inadequate design, and we harvest, at best, modest results. Five years after the IOM report "To Err Is Human" there is general consensus that we have not accomplished our goal to

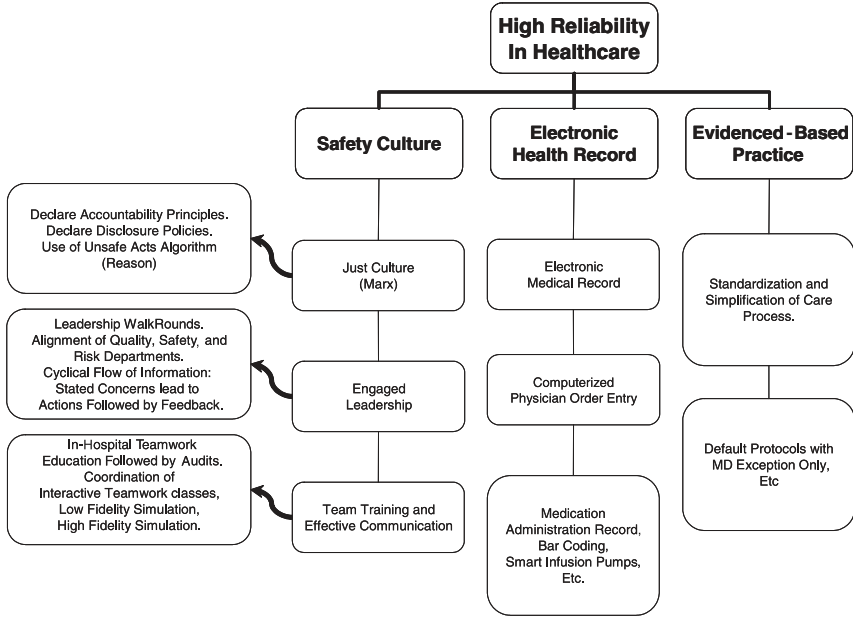
appreciably decrease harm, and have little solid evidence that the delivery of health care is safer and more reliable (Kohn, Corrigan, and Donaldson 2000; Leape and Berwick 2005). Other industries, those labeled “highly reliable,” have a more systematic approach to achieve greater success.

Highly reliable industries foster “mindfulness” in their workers. Mindfulness is defined by Roberts, Weick, and Sutcliffe as being comprised of five components: A constant concern about the possibility of failure even in the most successful endeavors, deference to expertise regardless of rank or status, an ability to adapt when the unexpected occurs (commitment to resilience), an ability to both concentrate on a specific task while having a sense of the bigger picture (sensitivity to operations), and an ability to alter and flatten hierarchy as best fits the situation (Weick and Sutcliffe 2001). These common characteristics together appear to generate reliably dependable processes with minimal and manageable errors. Health care aspires to high reliability but has not, to date, clearly framed the steps necessary to achieve such. Our historical approach mimics early steps in other industries as evidenced by a preoccupation with fancy technology and outcome-based initiatives, but without the systematic effort to build the mindfulness necessary to make all other initiatives successful. As the science of patient safety deepens, health care’s path to mindfulness and high reliability is becoming clearer. This article’s goal is to fully relate three initiatives that are underway in many hospitals and health care systems, and to argue that the three together comprise a cornerstone necessary for any comprehensive patient safety plan. These three initiatives are critical and must be pursued with and integrated into all other operations. They are (1) the development of a Fair and Just Culture (Marx 2001), (2) leadership intelligently engaged in WalkRounds safety by using frontline provider insights to directly influence operational decisions (Frankel et al. 2003), and (3) systematic and reinforced training in teamwork and effective communication (Helmreich and Musson 2000; Gaba 2001; Cooper and Gaba 2002; Leonard, Graham, and Bonacum 2004; Baker et al. 2005). The success of these pursuits is interdependent, and hospitals interested in transforming care must spend equal effort on them. That effort must be substantial and equal to what is currently spent on information technology and outcome-based initiatives (see Figure 1), such as IHI’s 100,000 lives campaign (Davis 2005),

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Figure 1: Determinants of high reliability in health care



NQF's Patient Safety Practices (Kizer 2001), and the Leapfrog initiatives (Milstein 2002). If pursued in this manner, the likelihood is that outcome-based initiatives will reach their goals more frequently and faster, failure to do so is likely to ensure that safe and effective care remains an elusive goal. The tools work synergistically, are reasonably simple in concept but less easily implemented, and are difficult to measure. Ultimately they are essential for all other efforts. This article relates the components of Just Culture, Engaged Leadership, and Teamwork and Communication and suggests a framework for action in each, including specific tools.

## FAIR AND JUST CULTURE: APPROPRIATE ACCOUNTABILITY

### *Define Fair and Just Culture*

A Fair and Just Culture is one that learns and improves by openly identifying and examining its own weaknesses. Organizations with a Just Culture are as willing to expose areas of weakness as they are to display areas of excellence. Of critical importance is that caregivers feel that they are supported and

safe when voicing concerns (Marx 2001). Individuals know, and are able to articulate, that they may speak safely on issues regarding their own actions or those in the environment around them. They feel safe and emotionally comfortable while busily occupied in a work environment, able and expected to perform at peak capacity, but able at any moment to admit weakness, concern, or inability, and able to seek assistance when concerned that the quality and safety of the care being delivered is threatened. These workers are comfortable monitoring others working with them, detecting excessive workload and redistributing the work when appropriate to maintain safety and reliability.

Each individual feels as accountable for maintaining this environment as they do for delivering outstanding care. They know that they are accountable for their actions, but will not be blamed for system faults in their work environment beyond their control. They are accountable for developing and maintaining an environment that feels psychologically safe. They will not be penalized for underreporting when it feels unsafe to voice concerns.

This is not utopian; it boils down to the comment, “I feel respected by everyone in each work interaction I have.” This state is achievable when outstanding leadership ensures that every employee clearly understands his own accountability and models such.

### *Defining Accountability*

Accountability—being held to account—is based on a relationship between two or more parties in which the product of one party—individual or group—is evaluated by another party. This process can be contractually formalized or molded over time by social pressures and historical norms.

The components of accountability include the individual’s understanding that they are to perform an action, a clear expectation what that action is, and the means by which they will be evaluated. Consider a surgeon performing an operation. She is accountable to other members of the “team,” to the hospital as a whole, to state licensing and accrediting bodies, to the patient. She may have to account for the number of surgeries performed, or perhaps only account for those surgeries that are problematic, or only those that go awry so badly that a patient is hurt. What becomes immediately apparent in this simple description of an operation is that accountability in health care encompasses multiple expectations about actions and the reporting of them; each group’s expectations differ based on social mores, regulation, law, and historical precedent. The tenets of a Fair and Just Culture should help organizations develop a framework for consistent accountability, and begin to repair

the current environment, where accountability is poorly defined and individuals are unclear what the rules are or whether the rules are constantly changing.

Today, adding up the surgeon's various accountabilities, she is accountable for increased risk, regardless whether knowingly or not; for not following rules, regardless whether to increase or decrease risk; and for outcomes based on the outcome severity, not the causative activity. In a Fair and Just Culture, the surgeon will be held accountable for knowingly unnecessarily increasing risk. The severity of the outcome and the breaking of rules will be subject to that principle. To be absolutely clear, health care organizations, and occasionally individual providers, are ethically responsible, through insurance mechanisms and otherwise, for aiding and possibly compensating a harmed patient. However, from the perspective of systems improvement, learning and positive change are more likely to occur when compensation is uncoupled from the evaluation of an adverse event. A Fair and Just Culture can be cultivated in health care organizations regardless whether this aspect of adverse events is fully reconciled; in fact a Fair and Just environment is likely a viable mechanism for diminishing the sting of the current malpractice tort process. Open discussion and transparency are characteristics that lead to mediation and resolution, not litigation.

### *Industries Outside of Health Care*

The environment described, while rare in health care, is embedded and evident in other industries we perceive as reliable and safe. In aviation, for example, insights about human behavior 45 years ago led to the science of human factors, which helped shape the industry through the adoption of standardization and simplification rules to produce greater reliability and safety. The importance of acknowledging employee concerns and hazards is evident. For over a quarter century an error reporting system paid for by the federal government through the Federal Aviation Administration and managed by NASA has been extensively used (McGreevy and Ames Research Center 2001). It has evolved to open reporting systems administered within specific airlines. Pilots have been trained for the past 30 years to understand and admit their fallibility, and the industry they work in promotes a discussion, on a regular basis, of individual failing. Pilots are regularly evaluated for both their technical skill and their ability to promote effective teamwork. The application of human factors is uniformly manifest (GABA 2001). The result is an extraordinary safety record.

*Relationship to Teamwork and Leadership Involvement*

In contrast, as surgeons and anesthesiologists walk into hospital operating theatres, they do so with the underlying expectation, based on training and habit, that everyone in the room is “expertly” trained and will manage their specific job without error. No real briefing of the team consistently occurs before each procedure between surgeon, anesthesiologist, nurse, and technician (albeit per JCAHO requirements they may now stop to insure the correct side of the procedure—an act that is a fraction of the full briefing that should occur). The operating room team’s optimal functionality depends on the open discussion of teamwork and team expectation, and that is greatly dependent on how the hospital culture promotes such discussions. It is quite possible to envision strategically, and then produce structurally, an environment where each individual’s personal concerns can be voiced about that particular surgical case, and to voice concerns when they arise, in real time, to the best advantage of the patient. How our hospitals strategically approach accountability, followed by the structures put into place to make the strategy manifest, will greatly affect whether the care providers will speak up in that operating room. This will in great part determine the speed and efficacy in surfacing a problem, which affects the reliability of operating room care. The opportunities for improved care are endless, through improved communication and other systematic improvements directed by the knowledge gained from voiced concerns. What would this look like in real life? A perinatal unit provides a good example.

*Clinical Example: Brigham and Women’s Hospital (BWH) Perinatal Unit*

BWH in Boston delivers about 8,600 babies each year, and a significant percentage of those patients are delivered by private practice obstetricians, individuals with excellent reputations. A pregnant woman chooses an obstetrician to care for her (presuming she has the insurance to do so), and over the course of the pregnancy develops a bond with that physician. The obstetrician is duty bound—and accountable—to deliver the best care possible to the couple, and shepherds the pregnant woman over 9 months with the one goal of a healthy child and mother. The obstetrician may be part of a group, but if the patient is asked, she is likely to identify whom she thinks of as “her” obstetrician.

When the expectant mother enters the hospital, she expects expert decisions to be made about her labor by her skilled obstetrician, and because many of the obstetricians at the BWH deliver hundreds of babies each year in

an environment where excellence is the norm, she is quite likely to achieve her desired outcome. But obstetricians are human and fallible. What happens when obstetricians mis-step, when they become fixated on a particular diagnosis they have made and/or ignore new information that is clinically relevant? When they become fatigued, preoccupied, or are slightly less than expert in a given situation? The unique bond between physician and patient actually undermines the ability of other physicians or providers to even know that a poor decision has been made and to intervene. In the current environment on most obstetrical units today, only some percentage of the nurses would feel comfortable speaking up with their concerns if they perceived a problem with the patient's care.

The BWH has instituted twice daily "board" rounds where each patient is discussed jointly with the group of physicians and nurses covering the obstetric service at that point in time. There are always a fair number of providers present, with physicians representing both the teaching service and private staff. Through the board rounds, these clinicians have an opportunity to hear from their equals about the care being delivered—in real time. While it is quite likely the majority of their thinking will be precisely on target, there is now an opportunity for input and reconsideration of the care plan from additional experts. This added perspective is perceived as valuable, not meddling, and is now accepted as the norm. Teamwork, team coordination, and collaboration have been artfully developed by Dr. David Acker, BWH's Chief of Obstetrics and Margaret Hickey, R.N., Nurse Manager for Labor and Delivery, through these twice daily board rounds. Nurses can speak their minds without fear of repercussions and actively advocate for the patients. So can residents-in-training and the more experienced senior staff. The rounds are not just an opportunity for teaching; they are, following the example of their two designers, manifest teamwork in action, based on the concepts of transparency engendered by a Fair and Just Culture; secondarily, and of equal import, they promote cross-professional and cross specialty teaching.

## HOW DO WE GET THERE?

### *Develop a Just Culture Strategic Vision Document*

Ultimately, a Just Culture is about fair, enlightened, and reasonable assessment of behavior and produces a work environment that supports high reliability. Health care organizations are now writing and promoting Just Culture documents. Partners HealthCare and the Dana Farber Cancer

Institute have similar Commitment to Patient Safety (Frankel, Gandhi, and Bates 2003) statements, developed by the organizations' Patient Safety Leaders, signed by the Boards of Trustees of each component organization. While a Just Culture is not derived from the documents alone, a critical step is the clear articulation of the principles to be followed. The commitments state, in essence that:

Figure 2:

<p><b>FIRST AND FOREMOST WE STRIVE TO DELIVER EVER SAFER AND MORE EFFECTIVE CARE.</b></p> <p><b>WE SUPPORT THE EFFORTS OF EVERY MEMBER OF THE HEALTHCARE TEAM TO DELIVER THE BEST CARE POSSIBLE.</b></p> <ul style="list-style-type: none"><li>➤ We view accountability for patient harm or potential harm in the context of individual and system influences.</li><li>➤ We commit to supporting simplification, standardization, effective teamwork and open communication in order to foster an environment to minimize error.</li><li>➤ We believe that individuals are accountable for their own performance but should not carry the burden for system flaws.</li></ul> <p><b>WE PROMOTE OPEN DISCUSSION WITHIN OUR ORGANIZATIONS TO LEARN ABOUT ADVERSE EVENTS AND POTENTIAL CAUSES OF PATIENT HARM.</b></p> <ul style="list-style-type: none"><li>➤ We commit to developing and maintaining easily accessible and constructive ways for healthcare workers and patients to discuss adverse events and concerns about the safety of care delivery.</li><li>➤ We encourage sharing what we learn within the Partners organizations because this information helps lead us to actions that improve the healthcare environment.</li></ul> <p><b>WE PROMOTE INTERDISCIPLINARY DISCUSSION AND THE ANALYSIS OF ADVERSE EVENTS AND POTENTIAL PATIENT HARM.</b></p> <ul style="list-style-type: none"><li>➤ We commit to eliciting different points-of-view to identify sources of patient harm and to use the information to improve safe delivery of care.</li><li>➤ We believe that patient input is indispensable to the delivery of safe care and we commit to promoting patient participation on our care delivery teams.</li><li>➤ We commit to analyzing episodes of patient harm or potential harm in an unbiased fashion to determine the contribution of system and individual factors.</li><li>➤ We commit to fostering a team approach to the analysis of adverse events and potential patient harm and the actions taken to address them.</li></ul> <p><b>WE WILL ACT TO IMPROVE SAFETY BY IMPLEMENTING CHANGES BASED ON OUR ANALYSIS OF ADVERSE EVENTS AND POTENTIAL PATIENT HARM.</b></p> <ul style="list-style-type: none"><li>➤ We commit to identifying actions designed to address the causes of adverse events.</li><li>➤ We commit to assigning responsibility for implementing actions to specific individuals or groups.</li></ul> <p><b>WE WILL INFORM PATIENTS AND FAMILY MEMBERS, HEALTHCARE PROVIDERS, LEADERSHIP AND TRUSTEES ABOUT ACTIONS THAT HAVE BEEN TAKEN TO IMPROVE PATIENT SAFETY.</b></p> <ul style="list-style-type: none"><li>➤ We commit to fostering an environment that is concerned with safety through continuous education, reminders and leadership.</li><li>➤ We commit to ensuring that our leaders and all healthcare workers are cognizant of the complexities of delivering safe patient care and support the efforts to address those complexities.</li></ul> <p><b>WE WILL MEASURE OUR SUCCESS IN PROMOTING AN ENVIRONMENT OF PATIENT SAFETY.</b></p>
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What are the components of an organization that will make these principles come alive?

*Use the Unsafe Acts Algorithm*

A mechanism to assess individual versus system accountability has been developed by James Reason in his “Unsafe Acts” algorithm (Reason 1997), and is a practical method of ensuring a just assessments of individual acts. (The full algorithm may be viewed on the National Health Systems NPSA website.) Kaiser Permanente has adapted this algorithm into practical use for hospital managers by streamlining the process to four simple questions:



Did the employee intend to cause harm?

Did the employee come to work drunk or equally impaired?

Did the employee knowingly and unreasonably increase risk?

Would another similarly trained and skilled employee in the same situation act in a similar manner (Reason's substitution test)?

If the first three answers are "No" and the last "Yes" the origin of the unsafe act lies in the organization, not the individual. This algorithm is currently actively used in three hospitals in Boston (North Shore Medical Center, Dana Farber Cancer Institute, and Brigham and Women's Hospital), has been adopted by many other U.S. hospitals, and is available in the United Kingdom nationally through the National Patient Safety Agency website.

### *Open Commitments to "Good Citizenship"*

Another structural component being used by hospitals to support the development of Just Culture is open commitment to good citizenship. Employees and all care providers should understand that they have a responsibility to support transparency and open communication. OSF Saint Francis Medical Center in Peoria, Illinois has a limited number of "red rules," which if broken will result in censure and potentially dismissal. One "red rule" is not participating in briefings before invasive procedures. Strategy, structure and design for transformation to reliable care are elegantly evident in this practice (Whittington 2006).

### *Educate in Safety Concepts*

The basic concepts underlying patient safety and reliability are human factors, system complexity, high reliability, and effective communication and teamwork. Each has teachable core components, which should be an integral part of physician credentialing, nursing competencies and new employee orientation. Education efforts in these three areas should be integrated to produce consistent thematic content.

## ENGAGED LEADERSHIP

### *Coordinating Organizational Departments*

As noted in the Just Culture section, every individual involved in the organization—patient, employee, physician, unit secretary—should feel safe to voice their concerns, know how to do so, and be able to do so easily. With leadership oversight, the departments of quality, safety, risk management and

patient advocacy should jointly receive and evaluate such concerns and comments. Each of these departments has particular expertise and areas of unique responsibility. In the evaluation process emphasizing these distinctions can undermine the potential organizational benefit. Their common interests with reported information are essentially the same—what are the contributing factors leading to a voiced concern, adverse event or comment, and how can the organization learn and improve itself? Engaged leaders manage these relationships and deftly guide the process of identifying addressing factors that contribute to risk and suboptimal care.

*Use Data Wisely: VA Administration Patient Safety Center*

A useful example of how the lessons from contributing factors may be used comes from the Veterans Administration Patient Safety Center in Detroit. Here Jim Bagian and John Gosbee oversee the collection of root cause analyses from their 144 hospitals, analyze the findings and develop algorithms and protocols that are then disseminated back to the hospitals for evaluation or required implementation (Bagian et al. 2002). While this is an example from the largest U.S. health care system, it is equally applicable in a single small hospital. The VA hospitals have effective mechanisms for performing root cause analyses on real cases and near misses, and the fruits of those efforts are sent to the VA Patient Safety Center. Frontline providers must be able to comfortably express their concerns in those RCA sessions, and what makes them feel that these sessions are worthwhile is the assurance that their information will be acted upon. The structure to actualize this is quite straightforward: common sense combined with rigorous attention to detail.

This common sense use of information requires a committee or relational structure within the organization that ensures any learning gathered from the frontline will be turned into action that makes a difference. A paradigm for this process is the Executive or Leadership WalkRounds (Frankel et al. 2003).

*The Cyclical Flow of Information: WalkRounds*

The WalkRounds concept has now been widely applied in hospitals, but many organizations mistakenly think the key component is leadership walking around, and that WalkRounds is an informal conversation between leadership and providers. In fact, the real power is that these conversations elicit useful information within a formal structure, the information is then documented and analyzed, combined with relevant information from root cause analyses and

other reporting systems, and regularly discussed in meetings involving the Clinical chairs, chiefs, and senior leaders. These leaders of the organization accept and have clear responsibility for actions to resolve identified problems. Learning around these issues and the actions to be taken then become part of the operations-committee agenda. Patient safety personnel are responsible for tracking the intervention and no issue is considered closed until it has been fully explored *and* the information sent back to the provider(s) or employee(s) who voiced the concern that began the process. Cyclical flow of information, leading to action that can be tracked over time—this is the power of Walk-Rounds—and the structural component that matches the articulated vision of transparency and openness.

WalkRounds should not stand alone in manifesting this cyclical process. All elicited information should have a cyclical component to it, so that the providers from whom we ask for transparency, from whom we expect the courage to speak their concerns, constantly receive affirmation that their efforts to promote open communication are rewarded by changes in their work environment for which they can feel they played a role.

## EFFECTIVE TEAMWORK AND COMMUNICATION

### *Critical Components*

It is increasingly clear that future improvements in health care will depend progressively more on our ability to promote excellent teamwork and effective communication across the spectrum of clinical care. Our technology infrastructure, now on a fast track deployment of electronic medical records and the spread of computerized physician order entry, is ultimately an enabler to the “peopleware,” the clinicians who must translate such information into clinical practice, and comprise the teams effectively applying protocols and guidelines in the care of patients. Currently, we can assure our patients that their care is always provided by a team of experts, but we cannot assure our patients that their care is always provided by expert teams. There are two components required to successfully train and implement effective teamwork and communication in clinical practice. First, there are critical tools and behaviors that support effective collaborative work. At a minimum, structured language, effective assertion/critical language, psychological safety, and effective leadership are required components. The second aspect is the use of medical simulation to embed and practice such skills. The current question is how to most practically teach and practice such skills so they become

embedded in the delivery of patient care systematically and in a manner that provides value to patients, clinicians and institutions. Teamwork requires learned skills in leadership, group participation, and communication—but such skills cannot be fully implemented by those who have them unless co-workers have been afforded similar new insights and language. The time has come to evaluate the efforts underway in our numerous simulation centers and educational departments, and to strategically define how to bring excellent teamwork and communication consistently into our hospitals. We can reasonably expect that an investment in teamwork and communication strategies will do more than improve quality and safety. The efforts are also likely to decrease patient harm, potential malpractice suits, and increase patient satisfaction. There is extensive experience in other high reliability industries, like commercial aviation, the military, etc., that we can draw on.

We have at our disposal today three main mechanisms to teach teamwork and effective communication skills (Figure 3), and as a result of extensive teamwork training in other industries we can define the most useful components.

### *Visible Leadership Involvement*

To successfully apply and sustain effective teamwork and communication requires three components: visible and consistent senior leadership involvement, clinical physician leadership, and embedding the tools and behaviors in clinical work that people do every day. The key and consistent message by senior leaders must be that these efforts are important, and appropriate resources will be available to support them. In the culture of medicine, with physicians being de facto leaders, respected physicians as champions is critical. This requires physicians who are willing to publicly commit their support among their peers and express the importance of such efforts. They must also be willing to openly deal with resistance from their colleagues in an open, constructive manner. When clear physician support is lacking, and it is left to nurses and others to deal with physician resistance, the results will be suboptimal.

Practically applying the tools and behaviors needed for effective teamwork and communication is challenging because clinicians are busy and not terribly interested in more work to do. Framing the adoption of such techniques as practical tools to make one's day simpler, safer and easier is a good approach. Being seen as practical and relevant to the clinical work makes it far easier to embed the changes so they become the way care is routinely delivered.

### *Teaching Tools and Behaviors of Effective Teamwork and Communication*

The basic core skills are structured language (SBAR, which stands for situation, background, assessment, and recommendation), effective assertion, critical language, psychological safety, and effective leadership. Situational awareness and debriefing are also valuable.

Structured language increases predictability and provides a common template for communication. Communication styles are personality dependent, and effective communication is affected by factors such as the confidence and skill of a nurse and how receptive a physician is to the communication. SBAR is a situational briefing model adopted from the U.S. Nuclear Navy that helps providers organize their thoughts and communications to increase the likelihood of a mutually understood and agreed upon conclusion.

Assertion/critical language is a core element of effective teamwork, as it provides a mechanism that allows any team member to voice a concern relative to patient care and trigger active communication among the team about the expressed concern. Having structure to this process is quite important, as we know from risk management data that often people speak up softly, indirectly, or not at all.

Psychological safety means that one can voice a concern or ask for help and know that the response will always be respectful. Unless this environment of respect is consistently present, and a basic property of the organizational culture, people will hesitate to express concern and avoidable harm will occur.

Effective physician leaders actively work to flatten the existing hierarchy, share the plan of care with other team members, actively and repeatedly invite others into the conversation, and create familiarity by knowing the names of individual team members. Some doctors naturally have these skills. Many do not, and we have not systematically taught leadership skill in medical education.

### *The Spectrum of Teamwork Education*

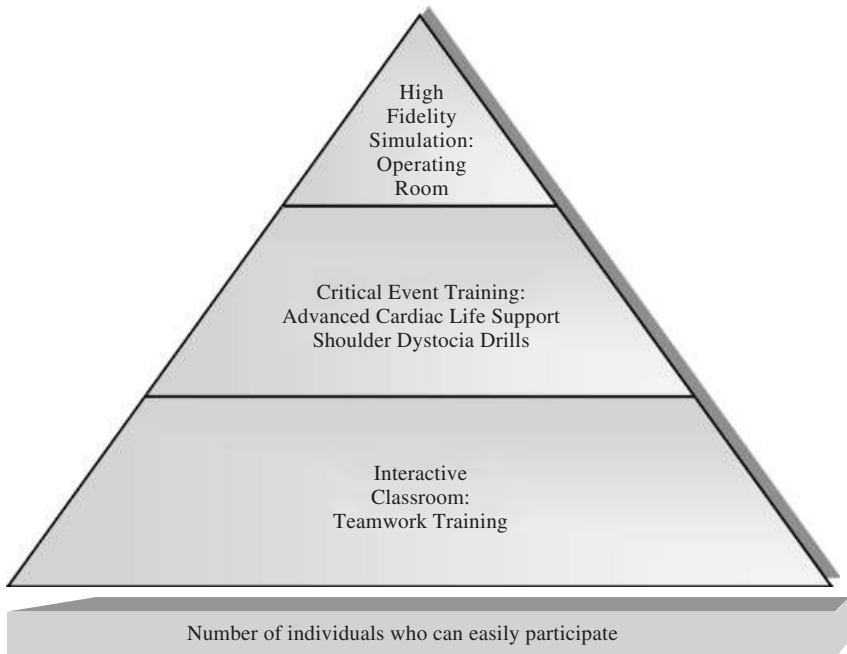
Teamwork training falls along a spectrum from interactive classroom training to full-bore simulation where skills can be practiced in realistic scenarios, evaluated, and debriefed. Low fidelity simulation models include table-top simulations or simply walking through the steps of a process. Although there is a tradeoff with regard to realism and complexity, the advantage is low cost and flexibility. Mid-range simulation is done with computerized mannequins that allow multiple protocols and provide a dynamic response depending on the effectiveness of the team in responding to the situation. Another advantage of

this mode of simulation is that training can be done in the clinical units where people regularly deliver care, so it is quite realistic and often system weakness is readily uncovered. High fidelity simulators provide a great degree of realism and are very effective. The potential limiting factor is they are resource intensive by their very nature. They are also generally removed from the clinical care units. Historically, these devices originated medically in the domain of anesthesia and operating rooms. They have become quite sophisticated and are now applied in cardiac catheterization techniques, surgical skills, and other domains.

As the pyramid in Figure 3 suggests, the number of individuals an organization is likely to be able to teach using interactive classroom training is significantly higher than in the high fidelity simulators, which are much more costly, and are not as easy or simple to access.

Interactive classroom training requires a curriculum, as noted above, and a skilled facilitator who is able to combine didactic material with audience engagement and role playing. Multidisciplinary classes are essential but no

Figure 3: The spectrum of teamwork training



specific technology is required. This teaching should incorporate an explanation of each of the components of teamwork, how human factors knowledge identifies why they are critical to delivering safe care, and how they may be implemented. Fully robust interactive classroom trainings would likely be taught by a clinician known to, and respected by, the group being trained, repeated on a regular basis, and required of all the disciplines in a unit who work together. For example, on an obstetric floor, the group attending a session would include an anesthesiologist, obstetrician, neonatologist, nurse, nurse midwife, secretary, and cleaning staff—and all would be required to, together, attend these sessions.

Each simulation modality has a valuable role to play in a robust teamwork and effective communication development plan, but to understand their roles, it is useful to examine the history of high fidelity training, specifically to appreciate that high fidelity simulators have been available to health care for many years and have had, at best, limited impact. Why? High fidelity simulators, beginning with anesthesia simulation, have played a major role in improving the safety of surgical procedures. Participants come away with awareness that a different set of skills is required to manage available resources than is required to manage the concomitant clinical problems. An anesthesiologist or surgeon may have the clinical knowledge necessary to stop massive blood loss or control an intraoperative cardiac arrhythmia, but to actually do so also requires an ability to maintain oversight of the emergency, and direct others to work collaboratively and effectively with regard to specific task and communication. Jeff Cooper and David Gaba's sentinel efforts in the development and implementation of these simulators into health care has been a significant factor in saving untold lives in our operating rooms and elsewhere (Cooper and Gaba 2002; Lighthall et al. 2003; Gaba 2004). However, for all its positive benefit, the acceptance of simulation into health care training has been slow at best, and in the initial evaluations of patient safety, beginning in 1999 with the IOM report, the role of simulation was not highlighted, nor suggestions made at that point to extensively incorporate simulation. There are a few plausible answers as to why.

### *Simulation: Strengths and Weaknesses*

Simulators have been expensive to buy and maintain, and the need for actors, technicians, and facilitators to run them meant with each training ongoing expense were upwards of a few thousands dollars for a day's training of 10 or 12 individuals. Second, while almost every clinician who has trained in a

simulator appreciates the new insights they gain, they do not necessarily enjoy the experience. Physicians do not usually comfortably or willingly “suspend disbelief” when acting out a simulated scenario, and often find the experience inherently uncomfortable even before the scenario exposes their knowledge limitations and forces them, as a teaching process, to fail. More problematic, and an essential drawback that is less a fault of simulation than of the health care profession as a whole, is that the select group that is trained often go back to work in hospital environments with other providers who neither understand or appreciate the lessons learned. This can make the training difficult to use, and until very recently hospital leaders have not fully appreciated how better teamwork lessens error and improves the reliability of care. Hospital leaders often have not felt capable of influencing their providers, specifically physicians, to participate. None of these qualities endear simulation to its participants. Lastly, a single day’s simulation training, as powerful as the experience might be, still has limitations, encapsulated by one observer who stated, “It was like watching a religious conversion because the experience was powerful enough to generate in a single day whole new insights in each person about the importance of Team Behavior and how to manage resources in a crisis, but the problem was that the conversion was solely of each individual, not the group. Very few left the sessions with enough understanding of the concrete behaviors to utilize in the clinical care setting, nor did they really understand the concepts or theories that would make sense of the behaviors. Each individual knew, and most importantly believed, that when they went back to work they needed to do something differently, but not necessarily exactly what, with whom, or how” (Maynard 2005). A great credit to these simulations is that they create the environment to generate wholesale conversion of skeptics into believers in less than a full day, but then there is not enough time to also expand the new belief into usable knowledge. This comment leads back to the overall issues of strategy, structure, and implementation.

#### *Teamwork: Strategy, Structure, and Implementation*

The high fidelity simulators are a component of the structure and implementation of teamwork—but their power to effect change is thwarted if they are not part of a health care-wide organizational teamwork and communication educational strategy. That is, a strategy with thematic content taught through physician credentialing, nursing competency, and new-hire orientation that is repeated appropriately and evaluated periodically with surveillance and audit. The evolution of thinking about patient safety is leading organizations to think



more globally about this issue, and to consider how the extraordinary teachings promulgated by Gaba, Cooper, Salas, Simon (Salas and Cannon-Bowers 2001), Helmreich (Helmreich 2000; Helmreich and Musson 2000), and others may be more widely disseminated into the health care environment. This will require an organization wide coordinated effort of interactive classroom training coupled with periodic low fidelity skill drills, managed cohesively by clinical chairs and hospital administrators, and supported by facilitators who will likely be trained in the high fidelity simulated environment. In conjunction with and linked to this organizational effort, specific high fidelity skills training will need to be available in the student period of training (i.e., medical and nursing school environments), the specialty period of training (residency programs) and, afterwards, as a part of specialty recertification. There are so many nascent efforts in these areas; the time to develop this strategy is now—before the small projects become better formed and less malleable.

### *Conclusion*

Leadership by our trustees, CEOs, and physician leaders is the single most important success factor to turning the barriers of diminished awareness, accountability, ability, and action into accelerators of performance improvement and transformation (Denham 2005). Awareness is the first critical dimension of innovation adoption. Leaders must be aware of performance gaps before they can commit to adoption of any innovation. Few leaders are fully aware of the magnitude of the problem common to organizations like their own. Fewer still are aware of the performance gaps at their own organization that can only be defined by direct measurement and communication to leadership teams.

Accountability of leaders for closing performance gaps is critical. For innovation adoption to occur, leaders need to be directly and personally accountable to close the performance gaps. Although initiatives like pay for performance are re-calibrating many to focus on quality as a strategic priority, few leaders are directly accountable for specific patient safety performance gaps, especially in the difficult to measure arena of “culture.” Organizations must also be accountable to their patients, their communities, and the national community through public reporting.

Leaders can be aware of performance gaps and accountable for those gaps; however, they will fail to close them if their organizations do not have the ability to adopt new practices and technologies. The dimension of ability may be measured as capacity. It includes investment in knowledge, skills, com-

pensated staff time, and the “dark green dollars” of line item budget allocations. Finally, to accelerate innovation adoption, organizations need to take explicit actions toward line of sight targets that close performance gaps that can be easily scored. Miscommunication, for example, is a component of almost every adverse event, but difficult to measure. Barriers exist along each of these dimensions. Such barriers can often be converted into accelerators by specific performance improvement interventions (Denham 2005, 2006).

It is clear that leaders drive values, values drive behaviors, and behaviors drive performance of an organization. The collective behaviors of an organization define its culture (Rhoades 2005). Without the right values supported by robust structures and systems established and sustained by the governance boards, senior administrative leaders, and clinical leaders it will be impossible to become a high reliability organization that embodies a true culture of patient safety.

A Just Culture, the engagement of leadership in safety, and good teamwork and communication training, are critical and related requirements for safe and reliable care. Developed and applied concurrently they weave a supporting framework for the effective implementation of new technologies and evidence-based practices. The mechanisms and tools now exist to do this work. We are late in development and implementation because we have relied too heavily on technology-based solutions and the broad expectation that every clinical project, even those based on social science, must have numerically measurable results. Numerical results for these endeavors are indirectly attainable (through outcome-based projects) if appropriate effort is apportioned to developing mindfulness through the tools described.

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