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# Healthcare Performance Improvement and High Reliability: A Best Practice Methodology

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## Recommended Citation

Johnson, Kerry, Randle D. Raggio, Carole Stockmeier, and Clarence S. Thomas, Jr. "Healthcare Performance Improvement and High Reliability: A Best Practice Methodology." In *Healing Without Harm: 21st Century Healthcare through High Reliability*, 17-26. Atlanta: Center for Health Transformation, 2010.

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Center for Health Transformation  
Better Health, Lower Cost

## 21ST CENTURY INTELLIGENT HEALTH SYSTEM

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# Healing without Harm

*21st Century Healthcare through High Reliability*

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## Executive Summary

It has now been over a decade since the Institute of Medicine's [IOM's] report *To Err is Human* was published, bringing to the attention of the American people that up to 98,000 people are dying each year from avoidable medical errors. The Center for Health Transformation formed the Patient Safety and Quality Working Group, a subset of the 21<sup>st</sup> Century Intelligent Health System Project, to accelerate the identification and adoption of policies and solutions that will dramatically and swiftly decrease this number.

We set out to learn from some of the leaders in the areas of patient safety and quality and to find out what has changed in the past ten years, where progress has been made and where more progress needs to be made, and to identify those policies and solutions that can transform our healthcare system. This report is the first in a series about what we are learning.

Our conclusion from listening to and learning from many of the experts is that advances have been made, but much more needs to be done; that we are safer in many places more of the time, but that overall healthcare is not safe. We identified "islands of excellence," some of the exceptional organizations on the patient safety and quality journey that are doing amazing work and seeing results. It is our hope that by sharing this information with policymakers, healthcare stakeholders and the public, we can accelerate the transformation of the current healthcare system into a 21<sup>st</sup> century intelligent health system that saves lives and saves money.

### Section One: High Reliability Healthcare, A New Vision

High Reliability Organizations [HROs] are organizations in which errors can have catastrophic consequences, but that are managed so well that errors infrequently occur. HROs achieve a defect rate of one in 100,000 to one in 1,000,000. All would agree that healthcare is not an HRO. In fact, using the IOM estimate of 44,000-98,000 deaths yearly due to medical error, healthcare on average has a rate of one preventable death per 616 admissions, a far cry from an HRO. This section explores the characteristics of HROs using models from nuclear power and aviation and how they apply to healthcare.

Weick and Sutcliffe have extensively researched HROs and have identified five common principles divided into two distinct areas that characterize an HRO:

#### *Principles of Anticipation:*

1. Preoccupation with failure: The organization regards small, inconsequential errors as a symptom that something's wrong,
2. Sensitivity to operations: The HRO pays attention to what's happening on the front-line, and
3. Reluctance to simplify: The HRO encourages diversity in experience, perspective, and opinion.

### *Principles of Containment:*

1. Commitment to resilience: The HRO has developed capabilities to detect safety events, contain an event and minimize any impact to the organization and bounce-back from events that do occur; and,
2. Deference to expertise: Decision making is pushed to the person with the most related knowledge and expertise.

Applying these principles to healthcare will accelerate the movement of the industry towards becoming an HRO.

## **Section Two: Healthcare Performance Improvement and High Reliability: A Best Practice Methodology**

Over the last few years, the lessons and methods from organizations with extraordinarily low defect rates have been adapted and applied to hospital care. The results have been dramatic. Implementation of these methods has lowered rates of medical error leading to harm by more than 80 percent in some organizations, with a potential to accomplish even more. A highly structured methodology is presented in this section that defines actions by staff, management, and leadership to minimize error and profoundly change culture. The approach is a lesson on how to systematically create a culture of reliability. The roadmap to success relies on four steps: [1] intense evaluation of current status; [2] creation of an action plan; [3] training every staff member, physician, and leader on their individual responsibilities; and [4] culture change - instilling the prescribed interventions as the normative behavior of each member of the staff.

Implementing this methodology will dramatically decrease defect rates in the healthcare industry.

## **Section Three: “Islands of Excellence”**

Key to transformation is continuous innovation. Constantly creating or acquiring information and quickly turning it into new tools or solutions for rapid distribution is central to the innovative excellence that is at the heart of transformation [Gingrich & Desmond, *The Art of Transformation*]. This section contains interviews with several organizations leading the patient safety and quality movement. Our approach was to learn from these “islands of excellence” so that we could capture their unique journeys including their leadership, culture, processes, outcomes, lessons learned and thoughts on the critical role of patient safety and quality in health reform and share these learnings. The healthcare organizations that participated in the interview process were Gundersen Lutheran Health System, SSM Health Care, Sanford Health, Sutter Health, and WellStar Health System.

## **Section Four: Institute for Healthcare Improvement: A Catalyst for Change and Transforming the Future**

A major focus of this conversation between James B. Conway, MS, Senior Vice President, Institute for Healthcare Improvement [IHI] and Marcia L. Delk, M.D., MBA, Senior Vice President for Medical Affairs and Chief Quality Officer, WellStar Health System, is the role that leadership plays in patient safety. Middle management is identified as an area with a huge gap in leadership development and competencies for middle managers are discussed. IHI is now beginning to develop middle management content that addresses this gap.

When asked if we are safer than we were when the IHI began the 100,000 Lives Campaign, James Conway replied, “Overall it certainly is safer in many places more of the time. We are still watching significant variation within the industry despite all of the amazing organizations we see. We’re seeing organizations whose journey has yet to begin.”

## **Section Five: Highlights from the Journeys**

Five amazing organizations shared their stories of patient safety and quality with us. These organizations were found to share a core set of principles that guided unique approaches. Although the destinations were the same, each took their own paths that built on their organizational strengths.

It is our hope that this paper will both help those who are on their safety journey, as well as motivate others to begin their own journey.

## Contributors

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## Section Two

### Healthcare Performance Improvement and High Reliability: A Best Practice Methodology

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*Healthcare Performance Improvement (HPI) improves reliability in healthcare by helping organizations achieve and sustain high performance outcomes in safety, quality, and satisfaction. Safety is the core value of the healthcare organization. Yet safety – protection from harm – doesn't just happen. HPI provides a method for reducing the Serious Safety Event Rate through translating safety from a core value to specific behavior expectations of leaders, staff, and physicians. The HPI method and techniques are based on the best practices of high-reliability organizations (such as nuclear power and aviation) that get it right in safety. While healthcare has focused on traditional process improvement as a means to better outcomes, high-reliability organizations recognize that optimizing outcomes requires a concurrent focus on human behavior accountability. Our method focuses on preventing human errors and detecting and correcting system weaknesses that can lead to events of harm and unwanted outcomes.*



Healthcare usually is not thought of as a high-reliability industry. Long the recipient of advice on how to improve its practice, the advice was neither sufficiently organized nor sufficiently specific enough to give those responsible the guidance required to set the course to zero defects. But over the last few years, the lessons and methods from organizations with extraordinarily low defect rates have been adapted and applied to hospital care. Implementation of these methods has lowered rates of medical error leading to harm by over 80 percent in some organizations, with a potential to accomplish even more. The approach presented here is a highly structured methodology that defines actions by staff, management, and leadership to minimize error and profoundly change culture. The approach is a lesson back to industry on how, systematically, to create a culture of reliability where presently it does not exist.

Twenty years ago there was much discussion about the art of medicine and revulsion at the concept of standard approaches, or “cookbook medicine.” The present reality is that a growing percentage



of care can be scripted with predictably excellent results. These standardized approaches to patient care, based on substantial research, are commonly called evidence-based medicine. An example is a “time out” prior to beginning a surgical procedure during which there is verification that this is the right patient for the right procedure on the correct side. This intervention alone can totally eradicate wrong side, wrong site, wrong patient surgery, egregious errors that still plague operating rooms across the nation. But a culture change is required to overcome doctors’ resistance to standardized approaches, resistance similar to that experienced by the airline industry several decades ago when it introduced checklists and standard approaches for pilots and crew and began to view all crew members as equal partners in producing airline safety. Error eradication requires not only a new level of teamwork and joint responsibility but also individual accountability using clearly defined methodology. The idea is to move beyond evidence-based medicine to add evidence-based leadership and evidence-based individual error prevention techniques. But before the approach presented below was developed and trialed, a genuinely structured system of culture change for an error-free environment in healthcare had not been developed. Today, expectations for behavior at every level of the organization have been created, tested, and widely applied. Fully implemented, these interventions directly address each of the five principles of a high-reliability organization as described by Weick and Sutcliffe and hold the potential to regularly reduce rates of serious error by more than 80 percent.<sup>1</sup>

Following the described approach, a hospital in Georgia began with one serious safety event (an error leading to patient harm) every 16 days and ultimately went one year without one. A six-hospital system in Virginia has had a decrease of over 50 percent in its serious safety event rate (SSER), with one hospital having over an 80 percent reduction sustained over several years. A seven hospital system in the Columbus, Ohio, area, has, likewise, maintained a greater than 50 percent reduction. A leading children’s hospital in Ohio and a hospital in Tennessee have experienced nearly a 60 percent reduction in the first two years of implementation. Observation of implementations to date suggests the potential to reach and sustain a greater than 90 percent reduction in SSER. Based on in-depth conversations with more than 100 organizations that have struggled with such culture change, we offer advice on how, systematically, to create a culture of reliability where presently it does not exist.

### **Technical Approaches to Adaptive Challenges:**

In their book, *Leadership on the Line*, Heifetz and Linsky contrast the concepts of adaptive challenges and technical challenges in organizations seeking to improve their outcomes, whatever they might be.<sup>2</sup> Technical challenges can be addressed with a specific set of prescribed interventions. These are procedural roads to improvement that often can be replicated across

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<sup>1</sup> Quoted in Nelson, EC, Bataldin, PB, Godfrey, MM: *Quality by Design: A Clinical Microsystems Approach*. Jossey-Bass, San Francisco, CA, 2007. p,98.

Weick, KE & Sutcliffe, KM: *Managing the Unexpected*, Second Edition. John Wiley and Sons, Inc., San Francisco, CA, 2007

<sup>2</sup> Heifetz, RA & Linsky, M: *Leadership on the Line: Staying Alive through the Dangers of Leading*. Harvard Business School Press, Boston, MA, 2002.

industries. Adaptive challenges, by contrast, require changes in organizational norms that produce a new culture. The emphasis in the methodology described here is that adaptive challenge may not be entirely philosophical; in fact, our goal is to provide technical solutions to seemingly intractable adaptive challenges.

Exhortations to frontline staff to be more diligent and pay more attention to detail will never eradicate human error. The sharp end worker (e.g., the nurse giving medication or doctor performing surgery) needs a set of technical interventions that may be explicitly described and implemented. The number of interventions in any given hospital is limited in number but is comprehensive in scope. One hospital system has only seven fundamental interventions and two “red rules.” One common intervention involves the expectation of peer checking. Peer checking is based on the concept that proceeding in the face of uncertainty is anathema. Peer checking sets the expectation that when the situation is not clear and not fully understood the individual will confer with a knowledgeable cohort for confirmation as to the valid course of action. “Red rules” are a limited set of expectations from which deviance is unacceptable, usually only two per hospital. An example would be verifying patient identity using two identifiers prior to any treatment, therapy, transport, or procedure. Adherence to this one rule would avoid a substantial number of errors that have historically harmed patients in every hospital of which the authors are aware.<sup>3</sup> Adherence to the prescribed expectations has been proven to have a remarkable effect upon minimizing error and improving patient safety. But simply giving the staff a set of interventions certainly does not guarantee they will be embraced or consistently implemented.

The crucial variable here is leadership. Liker gives a clear mandate for leadership from the Toyota experience: “The executive or manager must go, see, and really understand the actual situation at the working level. Managers are not just managing technology or tasks, they are promoting the culture. The absolute core of the Toyota philosophy is that the culture must support the people doing the work.”<sup>4</sup> The crucial role of leadership is reiterated in the Columbia [space shuttle] Accident Investigation Board report: “Leaders are responsible for establishing the conditions that lead to their subordinates’ successes and failures.”<sup>5</sup> But this work is no more intuitive to the executive leadership than it is to the physicians and nurses delivering care. Leaders must be given specific expectations and methods if they are to give the necessary guidance to workers and to imbue a new culture. They must demonstrate a personal commitment and an institutional obligation to change by continuously pointing out examples of adherence, applauding those who apply the methods, and telling safety success stories in every public forum, including Board of Directors’ meetings. Success breeds success, as suggested by John Kotter.<sup>6</sup> The goal is an institution continuously applying well defined interventions with a universal pride in the results and a commitment to patient safety shared by all within the institution to the point that true culture change is achieved. A pertinent corollary is that these leadership methods can be extrapolated to

<sup>3</sup> The response to failure to follow a red rule is defined in a human resources policy which, at the least, begins with a discussion and verification of the discussion in the personnel file escalating significantly with repetition.

<sup>4</sup> Liker, J: *The Toyota Way: 14 Management Principles*. McGraw-Hill, New York, NY, 2004. p. 176.

<sup>5</sup> Columbia Accident Investigation Board Report: <http://www.nasa.gov/columbia/PDSF/VOL1/PART02.PDF> Chap. 7, p 203.

<sup>6</sup> Kotter, JP & Cohen, DS: *The Heart of Change: Real-Life Stories of How People Change Their Organizations*. Harvard Business School Publishing, Boston, MA, 2002.

every aspect of institutional improvement from patient and employee satisfaction to efficiency of care delivery and to industries beyond healthcare.

Finally, success must be calibrated with goals set around specific measures. The Serious Safety Event Rate (error leading to significant patient harm per 10,000 patient days as a rolling one year average), is the primary outcome indicator. Everyone in the institution should be continuously aware of this rate and the time from the last event. In addition, there are other measures of success that are tracked. Hospitals are now required to perform a culture of safety questionnaire of their staff at least every two years. This survey provides an excellent perspective on the attitudes of staff toward the institutional commitment to patient safety. Paradoxically, there should be an increase in reporting of events. With success there is more reporting but a decreasing ratio of serious events to precursor and near miss events. A culture of teamwork, flattened hierarchy, and personal accountability has the potential to create a positive working environment that will lead to much reduced personnel turnover and increased employee satisfaction.

The thread of continuity in various approaches to a high-reliability industry are effectively summarized by Weick and Sutcliffe. Unfortunately, none of this is intuitive, but the HPI approach provides a step-by-step road map to success. We outline the four steps below, but first we discuss the patient safety context in which they were developed.

## **Patient Safety**

A growing emphasis on patient safety evolved over the last twenty years. Prior to that time, there was a sense of complacency in assuming that each physician acting on his or her own knowledge base would create consistently excellent results. The deluge of new scientific knowledge beginning in the 1950s and the increasingly complex interventions available made this concept anachronistic. Nevertheless the physician as “captain of the ship,” acting independently as an autocrat in the processes of care, was slow to disappear. Healthcare leaders and the general public were shaken from their complacency with this concept by the 1999 Institute of Medicine (IOM) report which extrapolated that there were as many as 98,000 deaths from medical error per year in the United States. The exact numbers have been challenged but the magnitude of the problem is now accepted as real by both the medical profession and the public. The IOM publication initiated intense activity throughout the healthcare delivery system. Not only are these errors not acceptable for humanitarian reasons but every error adds unnecessary cost in a healthcare system that represents 16 percent of the GDP, a growing burden on our economy.

Spurred on by a sense of urgency, and with the leadership of the Institute for Healthcare Improvement (IHI), the National Patient Safety Foundation, the Joint Commission, Leapfrog, and other organizations, there has been an intense effort to improve clinical outcomes and minimize error through implementation of standard processes of care. Using a set of prescribed interventions, central-line sepsis, ventilator-associated pneumonia, and pressure ulcers can be eliminated. There has been amazing success in this sort of effort nationally with over 100,000 lives saved in a single IHI project. Within Ascension Health’s over 60 hospitals, an estimated 3,200 lives a year are saved. The Joint Commission has prescribed certain process of care measures for acute

myocardial infarction, congestive heart failure, community-acquired pneumonia, and surgical infection. The adherence to these guidelines is reaching a level greater than 90 percent in many institutions.

In spite of the substantial process improvements accomplished nationally and the increased attention from administrators, government and the public, hospital patient safety officers and risk managers continue to see harm from medical error. Nationally, payments for malpractice claims and suits have continued to rise. The problem is that while across-the-board process improvements may substantially improve care delivery, medical error, the focus of the IOM report, tends to be an individual event. The basic thesis of HPI is that process improvement may decrease error to 1/1,000 but reaching a 1/1,000,000 defect rate requires a level of individual accountability to error avoidance that cannot be addressed through process improvement alone. Human error, using the Rasmussen nomenclature, may result from the failure of accomplishing a routine task (skill-based error), from failure to follow a protocol or policy or the right policy (rule-based error), or from lack of knowledge (knowledge-based error).<sup>7</sup> These errors are inherent in human interaction and are not necessarily avoided by an improved processes of care delivery built around a given clinical diagnosis or problem.

Healthcare Performance Improvement (HPI) has measured the SSER in more than 100 hospitals over six years. In these hospitals, self selected as those seeking improvement and making significant procedural changes, the SSER remained essentially flat, even after processes and procedures were dramatically improved. Leadership in hospitals with national prominence in improving care delivery were shocked that their “much improved care” had not affected their error rate to any discernable degree. Distressingly, error with harm averaged about one event every 15 to 25 days for a 250-bed hospital. Approximately one third of these patients died. The specific behaviors that minimize error on a carrier deck or in a nuclear power plant must be taught and become part of culture, or “how we do things around here.”

There are two major challenges to developing a technical solution to the creation of a culture of safety in healthcare. First, a menu of safety methods that are most likely to affect care delivery in hospitals must be found. Each hospital may require a somewhat different set of interventions based on the unique challenges of a given institution. Second, once the methods are defined managers and leaders must be given a set of expected actions to continuously reinforce these behaviors. The frontline accountability and the leadership skills to inculcate this new culture must be sufficiently defined so that each individual can clearly articulate their individual expectations. HPI’s four-step process overcomes the obstacles associated with the previously ill-defined adaptive challenge of creating culture change.

#### **Four Steps in the Process of Culture Change:**

**1. Intense evaluation of current status.** The evaluation begins with an analysis of all safety events in the institution which have been reported over at least a three-year period. There are 33

<sup>7</sup> As described in Reason, J: *Managing the Risks of Organizational Accidents*. Ashgate Publishing Company, Burlington, VT, 1997.

types of healthcare safety events, using a categorization that is based on the National Quality Forum Never Events. These events are analyzed in-depth as to the active failure (“sharp-end” error) and the latent condition (“blunt-end” error). There are 20 individual failure modes and 26 system failure modes. Sharp-end errors are also analyzed as to whether they were skill-based, rule-based, or knowledge-based errors using the Rasmussen nomenclature. The resultant common cause analysis allows in-depth evaluation such that the specific areas for improvement in a given organization are identified.

Additionally, the results of culture of safety surveys in the institution are evaluated in depth. Initially these surveys were done by consultants as requested, but as mentioned above, the Joint Commission has mandated these surveys be done at least every other year, creating a national comparative database.

The last step in the evaluation is a set of structured interviews that encompasses all levels of executives and workers in the institution from board chairman to maintenance worker. Physician leaders and selected other members of the medical staff are interviewed. The structure of the interviews is such that a clear picture of the current attitude and effort towards patient and staff safety is defined. Additionally, the readiness of the organization to undertake vigorous change is determined.

A synopsis of each aspect of the analysis is completed and a Safety Governance Index is calculated. This index is created by giving a numerical score to each of the various components of the analytic process. Creating optimal inter-rater reliability in this complex index is a challenge but the outcome number consistently gives a picture of the relative state of commitment to error prevention in a given hospital.

More importantly, a summary is created of where and why errors occur in the institution, allowing a clear basis for the specific interventions most likely to have effect in that particular hospital. The potential for a successful intervention program and the impediments to likely success are defined.

**2. Create an action plan.** Based on the initial evaluation, action plans designed specifically for the organization are created. Separate action plans for frontline workers, leaders, and physicians are developed. These plans are based on a set of interventions derived from industry and made specific for healthcare. Since the sharp-end component, that is, the actions of those directly touching the patient, is ultimately crucial, a large multidisciplinary group, usually 50 people or more, studies the outcome of the institutional evaluation and learns the methods for eradication of these failure modes which have been successful in other institutions. This group then sets the curriculum for the frontline. From this set of frontline expectations, those for physicians and leadership are created. The interventions for most hospitals are very similar as the failure modes are fairly predictable. The value of staff and leadership involvement in setting the organization-specific goals is the sense of ownership created, a critical component of the adaptive challenge aspect of the effort.

Both physicians and leaders must thoroughly understand and support the frontline expectations in order to reinforce these behaviors on a daily basis. A group of physician leaders establishes further responsibilities of the medical staff as team leaders. The concept of the physician as team leader, and not just an independent practitioner moving through the organization, is pivotal to the success

of the program. This physician role presents a concept common in healthcare (i.e., an essential worker who may not be part of the paid staff of the institution), that increasingly can be found in other industries where outsourcing of critical operational functions occurs with increasing frequency, such as electrical utilities' line maintenance crews.

The major challenge is the creation of leadership expectations. This set of requirements will differ minimally from institution to institution. A format has been developed to guide leadership and managers in activities that should be accomplished daily, weekly, monthly, and yearly. Although this may sound excessively prescriptive, absolute adherence is not necessary and there is much room for improvisation in terms of how leaders accomplish the activities. The aim is to give each individual the knowledge of what he or she needs to do on a regular basis to implement a successful program. Prior to this approach even the most committed leaders were not sure of what their respective expectations might be. The goal is evidence-based leadership for culture change. The methods are sufficiently generic that a very similar set of interventions will apply to any culture change.

**3. Training.** Every staff member, physician, and leader is made fully aware of his or her individual responsibilities. The curriculum is presented as a standardized approach, but there is much interaction from the trainees with stories of successes and failures of the system from their experience. Numbers of trainees per class are limited to allow for this interaction. Training is mandatory for everyone in the healthcare delivery system, including non-employed physicians and contracted entities such as food service providers. The involvement and leadership, not just acquiescence, on the part of the medical staff is critical in the institutions that have been most successful.

**4. Culture change.** As might be expected, the real challenge is instillation of the prescribed interventions as the normative behavior of each member of the staff. With the initial push the results are constantly evaluated at all leadership and managerial meetings. Safety success stories are presented at each of these meetings and the individuals responsible are singled out for accolade. Workers throughout the organization must be continuously aware of progress toward zero defects. The serious safety event rate and time from last event are known by all staff. Transparency is key. As described, leadership expectations must be fully implemented. Upper level leadership must “walk around” the workplace asking about progress on a frequent basis. Managers must be pointing out appropriate and inappropriate behavior continuously. The rule of thumb is five to one feedback; five positive comments for every critical comment. Microsystem managers who prove to be the most effective early adopters have their progress made very public so that they are seen as role models for the hospital.

An essential component of the culture change is the presence of “safety coaches” in every clinical unit. These are frontline workers who have specific allotted times to observe and coach their peers. The safety coaches undergo specialized training. The challenge is to create effectively the environment in which these individuals are seen as coaches and not inspectors, with the negative connotation of the latter.

The program will not work unless employee performance evaluations include the individual's progress in the effort. This evaluation process includes the CEO who should be responsible to the

board of his or her institution for showing continuous improvement in the serious safety event rate, along with stories of success.

An essential component of the culture change is the assurance of reporting of all safety events, including near misses. Reporting of events has been pivotal in improving safety in both commercial airlines and military aircraft. To create a reporting environment where individuals feel free to report even their own events requires what James Reason calls a “just culture.” Censure occurs only for specific and well understood situations that are incorporated as an official part of human resources protocol. Free flow of information up and down the hierarchy is a critical ingredient of program success.

In the final analysis, the culture change required for creating a high-reliability organization is the same as is required to create any sustained culture change. Upper level leadership must be fully committed and continuously reinforce the required changes. Recognition that culture change will require three or more years to be fully incorporated into the fabric of the organization requires perseverance on the part of the leadership. As mentioned above, “Leaders create culture. It is their responsibility to change it.”<sup>8</sup> The difference here is that leadership is given the specifics of how to create the culture change and make it stick.

## Outcomes

In early 2009 there were 103 hospitals contracted with HPI. Of these, more than 30 have completed full implementation of the program, an effort which requires a year or more to accomplish. The outcomes in hospital systems with full implementation universally show, at a minimum greater than 50 percent reduction in serious safety events. In addition to those mentioned in the introduction, a major pediatric hospital nationally renowned for its excellence in process improvement began with 17 serious safety events a year and is at less than half that rate in less than two years. The goal is no more than four events this year on the way to zero. Such improvements have dramatic effects on costs such as malpractice insurance, which have been increasing yearly. In the first system to be a part of the HPI effort, malpractice loss per bed decreased from \$2,008 per bed to \$1,808 per bed while the national average was rising from \$4,100 to \$4,800 per bed. Two other hospitals have shown analogous outcomes. Diminution of direct costs in the hospitals by nonevents is more difficult to evaluate but is currently being analyzed.

Overall, the goal of an 80 percent reduction in events within three years is considered feasible. The basis for this optimism is, to no small extent, dependent on the results in institutions with full commitment by leadership and the reality that full implementation fulfills the five principles of high reliability organizations as described by Weick and Sutcliffe. As an example, for the principle “Preoccupation with Failure”: For frontline workers the behavior expectations include peer checking, peer coaching, structured handoffs, stop/think/act/reflect when beginning a familiar but crucial activity, and “red rules,” violations of safety which are never considered acceptable. For this same principle, leadership expectations include daily check-ins, daily walk rounds, and

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<sup>8</sup> Columbia Accident Investigation p. 203

continuously keeping a top 10 problem list with continuous urgent action on each. Analogous expectations apply to each of the other four principles.

The most difficult of the principles to achieve effectively is “Commitment to Resilience.” And yet in a complex, tightly coupled system with continuously unpredictable variables, as is the case in healthcare, this principle is crucial. For the purposes of the current endeavor, the emphasis is on minimizing the impact of a potential serious event and rapid and in-depth learning from events which have unfolded, not just serious but precursor events and near misses. A central focus of the program is 200 percent accountability. This accountability means that individuals are responsible not just for their own actions but for the actions of others in their environment. This 200 percent accountability means that there are multiple eyes on the situation at any moment. The accountability transcends hierarchy, an essential part of airline safety. Individual and joint responsibility should mean that there is a level of awareness of impending failure, not presently in place in most hospitals. Another example, specific to healthcare, is the presence of rapid response teams, mandated by Joint Commission, to be available when there is a question regarding a patient’s stability status. The challenge here is making frontline workers sensitive to harbingers of trouble. Recall the HPI principle mentioned above: Never proceed in the face of uncertainty.

As for learning from error, root cause analysis has been mandated in healthcare for several years but has been applied in an inconsistent manner, each institution creating, to no small extent, its own methods. HPI takes root cause analysis from industry and presents a curriculum for its participating hospitals which is consistent and more robust than what is currently offered in all but few hospitals.

As discussed above, the point of greatest interest in this approach is how much adaptive or normative challenge can be addressed with a technical solution. At the outset, with effective initial presentations and staff input, there will be some degree of compliance with the effort at the frontline and at the managerial and leadership levels. The goal is to move from compliance to animated, enthusiastic commitment at all levels. Since very few hospitals at this time have consistently reached a greater than 90 percent reduction in their serious safety event rates, the answer is not yet complete. Reaching the potential outcome remains as the intrinsic struggle to give everyone in the institution the methods and the will to create the success that is needed in healthcare and desired by industry.

### **About the Authors:**

Recognizing the challenge and opportunity in healthcare, approximately six years ago a pair of engineers with experience in the nuclear submarine navy and nuclear power industries began to take the lessons learned in high-reliability industries and develop a set of specific behaviors that could be instituted in a hospital, which, over time, would change culture to create the low defect level that is a moral imperative for an industry with vulnerable individuals in its care. Their engineering minds inevitably were attracted to the concept of specific behavior as opposed to some nebulous call for change. Their consulting practice, Healthcare Performance Improvement (HPI), today has over 100 hospitals actively involved on its client list and its results in decreasing SSER,



error with harm per 10,000 patient days on a rolling one year average, have been dramatic. Mr. Johnson is one of those original engineers. Mrs. Stockmeier is responsible for organizational effectiveness of the firm. Dr. Thomas was the Chief Quality Officer at Saint Thomas Hospital in Nashville, TN. He worked with HPI to inculcate a culture of safety at the St. Thomas Medical System's three hospitals in Tennessee and in 10 hospitals in Ascension Health, the largest not-for-profit healthcare system in the nation. Ascension Health has set the goal of extension of the results accomplished through this approach to all its greater than sixty hospitals. Dr. Raggio studies relationship marketing strategies across a variety of industries, and is particularly interested in implementation issues.