The 2012 Fifth International High Reliability Conference

Conference Proceedings
Conducted by Strategic Reliability LLC
Hosted by The Joint Commission
May 21-23, 2012

strategicreliability, LLC
Making Better Decisions

The Joint Commission

Thought Leaders Urge Attendees to Aim for Perfect in Quest for High Reliability

Mindfulness and perfection.

These two words summed up a progressive way of thinking about high reliability in health care and other industries, according to thought leaders presenting at the 2012 Fifth International High Reliability Conference, conducted by Strategic Reliability LLC and hosted by The Joint Commission from May 21-23.

Mindfulness refers to the acute awareness that workers in a high-reliability organization must have. They must be mindful that even a small failure in a safety process or procedure can potentially lead to a catastrophically adverse outcome. Originally coined by conference speaker Kathleen Sutcliffe and fellow University of Michigan professor Karl Weick, mindfulness describes the constant searching among workers for the smallest indication of a flaw or hazard that may lead to failure, if some action is not taken to solve or prevent the problem. Mindfulness leads organizations to find flaws at earlier stages when they can be more easily fixed rather than after they have caused harm.

Perfection in reliability is the standard to which an organization must aim, speakers agreed. "Is 99 percent performance good enough?" asked presenter and Joint Commission Executive Vice President Chuck Mowll. "No!," pointing out that errors in 1 percent of 10 million inpatient surgeries annually is more than 100,000 surgical errors, and errors in 1 percent of 35 million medication orders per year is more than 350,000 medication errors. "We must have the courage to aim for perfect," said Geoff Webster, conference presenter and co-founding principal of Value Capture.

About 180 conference attendees represented industries including aerospace, chemical, emergency medical services, health care, military, nuclear power, petroleum, social services, transportation (including airlines), and wildland fire control. Giving attendees the chance to meet and learn from professionals in other industries is one of the main benefits of the conference. Dr. Daved van Stralen, one of the primary conference organizers and assistant professor of pediatrics at Loma Linda University School of Medicine, said all attendees have tried to solve difficult problems and have gained insight or solutions they can share. "This conference is about sharing our experience with each other," he emphasized.

Speakers were knowledgeable about the practice or science of high reliability organizing, or HRO. High reliability principles are used in industries striving for zero defects or errors in order to maximize safety among workers, communities, and customers. These industries, such as aviation and nuclear power, are highly complex and even small errors can cause catastrophic consequences.

Joint Commission president urges health care organizations to commit to high reliability

In the conference's keynote address, Joint Commission President Dr. Mark Chassin said that to achieve high reliability, health care organizations must meet three requirements, citing a paper on high reliability he published along with Joint Commission Executive Vice President Jerod Loeb, Ph.D., in *Health Affairs.*[1]

First, the organization's leadership must commit to the goal of high reliability. Second, the organization must implement a safety culture that supports high reliability. And third, the organization must adopt a fact-based, systematic and data-driven problem-solving methodology such as The Joint Commission's Robust Process Improvement™, or RPI, tools.

Dr. Chassin described how The Joint Commission is incorporating these three principles into its daily work, both internally and with its customers. The organization is training all employees – in ways appropriate to their job responsibilities – in Lean Six Sigma and change management – problem-solving methodologies serving as the primary components of RPI. By using tools from these methodologies, health care organizations can: find a problem's root causes by gathering and analyzing data, identify solutions targeted at the root causes, and make and sustain improvements, he said.

In addition, The Joint Commission is working with customer organizations having adopted RPI methods to find solutions to health care's most pressing challenges through the newly established Center for Transforming Healthcare, Dr. Chassin stated. So far, the Center has developed solutions pertaining to hand hygiene, wrong-site surgery, and hand-off communication and has several other projects in progress. Joint Commission-accredited organizations can access these solutions and apply them to their own unique challenges at no additional cost and without needing any kind of special training or expertise.

Dr. Chassin said he believes the tools and knowledge being developed by the Center are the first steps toward health care achieving high reliability. But getting there "requires a commitment to getting to zero errors that most health care organizations have not accepted yet."

Common principles, different language

The themes of needing strong leadership, safety culture, and process improvement tools to achieve high reliability persisted throughout the conference, even though the language used to describe commonly accepted principles may have differed.

For example, Sutcliffe and other presenters spoke of the need for organizations to *enable, enact,* and *elaborate* a culture in which continual learning fosters safety and reliability. "Enabling" represents actions that motivate the pursuit of safety – such as commitment and direction from leadership. "Enacting" describes frontline actions that improve patient safety and create a safety culture. "Elaborating" is learning practices such as process improvement tools that extend safe practices.

Speaker Joe Martin, Battalion Chief, Los Angeles City Fire Department (retired), shared his experience fighting fires and responding to medical emergencies. He described a mindfulness of carefully analyzing emergency situations *prospectively, circumspectly,* and *retrospectively.* "Prospectively" means that all responders are on the same page about what must be accomplished before a response begins. "Collisions of expectation are where safety breaks down," he said. "Circumspectly" describes a careful approach to any intervention or action – for example, not using water on an oil fire or not feeding flames with oxygen. "Retrospectively" represents the discipline of debriefing afterward to determine the strengths and weaknesses of a response.

The concepts described by Sutcliffe and Martin have much in common with the leadership, safety culture, and RPI tools framework. They all require mindfulness, a quest for perfection, and a mindset open to continual learning and improvement. "A learning orientation mindset is critical to creating HRO," Sutcliffe emphasized, noting that safety practices must be developed and tailored to the proper context. "Practices associated with mindful organizing, building a mindful culture, and facilitating a learning orientation may help to simultaneously improve safe and reliable performance as well as to increase efficiency and reduce costs."

Anyone and everyone can be a leader -- leadership from various perspectives

Several of the speakers emphasized that leadership means more than senior executives setting the proper tone for an organization. In the most effective high-reliability organizations, any worker within it is compelled to lead action in response to a threat or hazard, knowing his or her actions will be valued and rewarded. "In high reliability, the individual believes in himself or herself and moves forward into the uncertainty and, by doing this, creates a strong organization that is agile and adaptive," Dr. van Stralen and retired U.S. Navy Rear Admiral Thomas Mercer stated in the published conference proceedings. "An organization has high reliability when individuals believe in themselves enough to leave the safety of structure and engage uncertainty or threat," Dr. van Stralen added.

While captain of the USS Carl Vinson aircraft carrier, Mercer invited academicians from the University of California, Berkeley, to study his crew with the goal of improving its performance. The Berkeley team was led by Karlene Roberts, Ph.D., who coined the term "High Reliability Organization" as a result of her research. After the study was completed, rather than offering suggestions for improvement, the academicians said Mercer's command philosophy and modern leadership methods exemplified high reliability organizing. To make the aircraft carrier environment as safe as possible, Mercer's high reliability principles emphasize continual learning, formal communication, strict procedural compliance, a questioning attitude, and the ability to provide back-up quickly and forcefully.

The need for accountability and speed

Once safety is recognized as a core value, it becomes a powerful driver of individual decision making, said presenter Steve Kreiser, another retired U.S. Navy commander who is now a senior consultant for Healthcare Performance Improvement. To make high reliability stick in a health care organization, clear behavioral expectations for safe practices at all levels must be set, staff must be trained how to meet those expectations, and then, most importantly, leaders and staff must be held accountable for adopting low-risk behaviors when caring for patients, Kreiser said. However, health care organizations often do not hold individuals accountable when expectations are not met. In the U.S. Navy, on the other hand, a pilot deviating from standard operating procedure or a safety absolute will immediately be in danger of losing the privilege to fly, he said. Echoing Kreiser was Jim Conway, principal, Pascal Metrics, and an adjunct faculty member of the Harvard University School of Public Health. He encouraged health care organizations to "set the expectation, position people for success, and hold them accountable."

The Greater Baltimore Medical Center is an example of setting and meeting high expectations. Dr. John Chessare, president and CEO of the Greater Baltimore Medical Center (GBMC) HealthCare System, said his organization embraced the notion that the only ethical stopping point of improvement was perfection, thereby requiring an acceleration of change. "I am concerned about speed," he stated. "I am excited about conversations about how we can move faster." He identified the absence of rigor in the design of systems and the absence of a culture that would allow for collaboration to get measurable results as the major impediments toward achieving GBMC's new vision: "To every patient, every time, we will provide the care that we would want for our own loved ones."

He said GBMC has made much progress during the two years he has been CEO, with some clinical services demonstrating near-zero failure rates. For example, GBMC went 170 days without a central line-associated bloodstream infection (CLABSI). This experience is consistent with the Agency for Healthcare Research and Quality's (AHRQ) "Comprehensive Unit-Based Safety Program (CUSP) for CLABSI" project implemented in 1,000 hospitals in the U.S. and Puerto Rico. According to Dr. William Munier, director of AHRQ's Center for Quality Improvement and Patient Safety, in a 12-month period the program reduced CLASBI rates by 40 percent, preventing 2,000 CLABSIs and saving 500 lives and $32 million in costs.

In addition to preventing CLABSIs, GBMC purchased and implemented a new system that makes it easier to report errors and near misses and to use the knowledge gained to reduce these adverse events in the future. Through this reporting system, the organization doubled the number of errors reported over a nine-month period, reflecting an improved safety culture. "Still, we have much work to do to get to HRO status," Dr. Chessare said.

Providing team members with the tools, direction and responsibility to succeed

Gary Provansal, division chief, special operations, San Bernardino County (Calif.) Fire Department, spoke of his experience using HRO concepts to organize 12 separate departments within five hours to fight a wildland fire, and then to direct the assembled force 24/7 for 22 consecutive days.

As the quickly spreading fire threatened homes and businesses and caused the evacuation of 155,000 citizens, the fire-fighting team established strategies and tactics through which firefighters could make the best decisions within a constantly changing environment, Provansal stated. "Leadership decided not to make decisions (top-down)," he explained. "We had to focus the firefighters and provide the support they needed to act safety and quickly in a rapidly changing environment."

Team members communicated progress and needs during frequent briefings with leadership and worked to make needed adjustments, Provansal said. Team members were expected to share both positive and negative news and knew they would not be punished for honest mistakes, creating a work environment where team members would be free from blame. "The expectation to act creates the responsibility to act," Provansal stated. Comparing the firefighters to nurses in health care, Provansal said, "nurses know what's going on in the work environment, leaders don't. Nurses know the answers." The values of high reliability and safety were accepted, and change persisted when the firefighters went back to their individual departments.

Showing deference to expertise is an essential trait among effective leaders, many presenters emphasized. During U.S. Marine Corps aviation training, expertise and recommendations from team members are incorporated, regardless of their rank, said Major Randy Cadieux, who developed training tools to mitigate aviation hazards. Deference to expertise is one of many mission-focused attitudes that successful aviators have. These attitudes enable aviators to properly prepare for missions and to maintain an operational and safety focus throughout the mission's execution, Cadieux said.

Effective leadership also requires the ability to integrate the at-first seemingly at-odds HRO qualities of "having a questioning attitude" and "strictly complying with procedures." In many current health care environments, speaking truth to power through a questioning attitude is feared and discouraged. Even when questioning is encouraged, having standardized procedures can be an effective way of achieving consistency and reducing errors, assuming the procedures are designed well.

However, aboard the USS Carl Vinson, rear admiral Mercer kept these two seemingly disparate rules in force, said presenter Patricia Sokol, senior policy analyst, patient safety, at the American Medical Association. "The inability to adhere (to procedure) was reportable to the (ship's captain) immediately, but by no one other than the sailor who could not comply," Sokol explained. He needed to hear the reasons "in the sailor's own voice," she said. Intermediaries did not relate the problem; middle management could not pad problems or hide risk with bureaucracy; the C-suite staff had no opportunity to translate risk into acceptable language or high-level jargon. "A sailor speaking truth to power became part of the solution and was, at once, a leader, learner, and teacher," Sokol stated.

Safety culture – is there a trade-off between safety and efficiency?

As health care organizations take steps to develop a safety culture, there is often consternation that these steps will cause inefficiencies, reduce productivity, and increase costs. Both Sutcliffe and Webster emphasized that improving safety reduces costs. Webster explained that safety risks are associated with inefficient and costly processes, saying he has seen health care organizations achieve "90 percent failure reduction (while cutting) 30 to 50 percent of the costs out of a process." He said safety failures and costs often have the same root causes. "You can solve the problem by simplifying the process – (the process) is costly and error prone. The business and safety cases are identical," he stated. To illustrate these points, Webster showed diagrams illustrating the tremendously complex pathways of fulfilling simple medication and supply orders.

Sutcliffe said HROs can simultaneously enhance safe and reliable performance while producing efficiency gains. "There's a popular myth that high reliability means reliability whatever the costs," she said. "Not so – high reliability management is often the basis for reducing costs and cost reductions can enhance reliability management. This happens through practices that strengthen safety culture and encourage learning."

She gave concrete examples from health care. One study monitored organizations working to implement technology for minimally invasive surgery.[2] More than half of the organizations abandoned implementation. The organizations that succeeded were able to establish a learning mindset, build a team climate of trust and respect, and anticipate possible failures, she said. "What made a difference was how surgical leaders framed the adoption of the technology," she explained. Emphasizing learning and serving patients better worked best. "Those who framed it as a (way of competing for patients) weren't as successful."

An orthopedics unit reduced the average length of patient stay and shortened procedure completion times through learning-oriented collaborative practices that eliminated operational failures and improved coordination.[3] Yet another organization achieved more efficient and safe surgical performance through pre-surgery collaborative briefings among all team members.[4] These briefings increased their ability to anticipate problems and decreased surgical flow interruptions and waste, Sutcliffe said.

Achieving safety culture in practical ways

Presentations by Webster and Racquel Calderon, BS, RRT, director of quality and risk management administration, Totally Kids Specialty Health Care, also showed how safety culture in health care can be achieved in very practical ways. Webster described a "problem log" system through which anyone in the organization can identify barriers to perfect performance and contribute to implementing system-wide solutions in as close to real time as possible.

For example, a staff nurse may log a description of the problem: "three patients unexpectedly came from the PACU at 1 p.m. that needed care," and what immediate action was taken: "called in more staff." From there, the root cause of the problem is identified. "No direct communication between our unit and the PACU."

The log next is used to document what will be done to solve the root problem. "The PACU flow sheet will be automated to make it easier to compile and share, and our unit will share patient flow information with the PACU and OR at the beginning of each day so that our unit will be prepared to meet the need." Last, those who are responsible for developing the necessary tools to solve the root problem are identified, along with deadlines. In addition to empowering staff at the point of care to identify and solve problems, the log also facilitates shared learning with units that may be experiencing similar problems. Webster said the problem log enables health care organizations to learn from every imperfection every day – one of the hallmarks of a safety culture.

Calderon described how she developed safety culture in her organization through a careful process involving data gathering, team building and individual empowerment, compliance documentation, risk management, and mindfulness. In this way, she transformed a freestanding pediatric subacute care facility with four home mechanical ventilators into a chronic intensive care facility with 45 ICU-level mechanical ventilators. Dr. van Stralen commended Calderon's initiative and urged attendees to empower employees who have the ability to develop and advance safety culture. "You all have people like Racquel in your organization," he said.

Relating safety culture to globally recognized accidents and events

Najmedin Meshkati relayed lessons from the BP Deepwater Horizon accident to conference attendees. A professor at the University of Southern California, Meshkati was a member of the National Academy of Engineering/National Research Council's Committee that analyzed the cause of the accident and identified measures to prevent similar accidents in the future. He noted that the opinions he expressed during his presentation were his, and not the views of the committee.

Meshkati said the accident made the concept of safety culture much more recognized around the world. He quoted the findings of the committee report,[5] which stated that "the lack of a strong safety culture resulting from a deficient overall systems approach to safety is evident in the multiple flawed decisions that led to the blowout." He said *The New York Times* endorsed the committee report[6] and, even more notably, industry journals began publishing articles on the need for a stepped-up focus on safety culture.[7] "Creating and nurturing a positive safety culture basically means to instill thinking and attitudes in organizations and individual employees that ensure safety issues are treated as high priorities," he stated.

Presenter Marc Otten discussed how HRO concepts are being used to ensure safety and security at soccer matches organized by the European Football Federation, or UEFA. These matches can be attended by as many as 100,000 spectators and are held at hundreds of venues in 53 countries. Unfortunately, a mix of hooliganism, culture and language differences, and team rivalries frequently results in violence.

Otten discussed what UEFA members are now doing to improve safety in very complex and unpredictable environments. Otten said they have created mindfulness about the potential for violence, as well as an urgency to be prepared for it. UEFA members also developed a shared vision of what kind of change and learning is needed, built a coalition to provide leadership on safety and security issues, and started to communicate good practices they all can share.

It's not the what, it's the how -- using RPI tools to improve performance and safety

During his presentation, Mowll stated that while the health care industry has long known what it has to do – improve quality and safety – "we need information on the how." Toward this aim, The Joint Commission is placing a greater emphasis on helping health care organizations find solutions to problems and spreading this knowledge throughout the industry.

Mowll gave examples of health care organizations that have taken the initiative to improve safety and reduce costs. Led by CEO Rich Miller, Virtua, a New Jersey health care system, has implemented more than 100 Six Sigma projects, reducing medication errors and surgical site infections, making various other safety and quality improvements, and achieving $27 million in savings. Through its STAR initiative, Virtua emphasizes the cultural values of excellent service, caring culture, best people, resource stewardship, and highest clinical quality and safety. "The culture change is amazing," Mowll said. "Each staff member has the patient's interest in mind."

At Denver Health and Hospital Authority, former CEO Dr. Patricia Gabow has led the creation of a clinical and financial success story, despite the organization's mission as a public hospital providing millions of dollars of uncompensated care each year while serving a population with a high percentage of uninsured patients. She is known for attending each of Denver Health's rapid improvement project report-outs – meetings during which project progress, solutions and results are discussed. Through her presence at these meetings and in other ways, she has involved herself personally in quality and safety improvement.

One of Denver Health's most impressive achievements is its health information technology support for safety culture. The organization established a centralized data warehouse integrating clinical and financial data. A patient's health information can be accessed by providers throughout the Denver Health system in real time. This instant access to data uncovers potential errors before they happen, Mowll explained.

Innovations such as the IT support system have enabled Denver Health to achieve the number-one ranking in patient survival among the nation's academic medical centers, as well as a $135 million financial benefit from increased revenue, cost savings, and productivity, according to a *Hospitals and Health Networks Daily article*.[8] Dr. Gabow's proudest achievement, according to the article, is a 60 percent drop in Denver Health's observed-to-expected mortality. "That meant that last year, 250 people walked out of our hospital alive who would have been expected to die at another academic health center," Dr. Gabow said.

Mowll also recognized Houston's Memorial Hermann Healthcare System, which implemented the High Reliability Certified Zero Award to recognize system hospitals that avoided health care-acquired infections or other patient-safety red flags for a year or longer. For example, three of the system's hospitals and eight of its community emergency departments achieved zero iatrogenic pneumothorax cases for a year or longer. A total of 28 Certified Zero Awards were awarded as of summer 2011, according to a *Modern Healthcare* article.[9]

Mowll used Wentworth Douglas Hospital as an example of a small hospital that has achieved a two-to-one return on investment from Lean Six Sigma projects. The hospital has reduced radiology report turnaround times and hospital-acquired infections, for example. Wentworth Douglas has been able to achieve return on investment and improve safety by balancing financial and clinical improvement projects. "There's a clear vision among the board and senior leaders, and a strong commitment to Lean Six Sigma," Mowll said.

He also called attention to Sentara Health's five safety habits – attention to detail, communicate clearly, have a questioning attitude, hand-off effectively, and never leave your wingman. As a result of quality and safety improvement initiatives, various Sentara hospitals have reduced hospital-acquired infections, implemented IT systems to enhance care, and achieved recognitions for cardiac, cancer, stroke, and other care services.

The need for urgency

As the conference's final speaker, Tim Autrey, Practicing Perfection Institute (PPI) founder emphasized the need for urgency. "This isn't rocket science – we can start doing some of these things tomorrow," he urged. "Let's get to the point of actually doing something."

While organizations often can do a good job of conceptualizing and determining strategies for culture change, they fall down during implementation because that's the stage when they must influence human behavior, Autrey said.

You can't fix people," he emphasized. Instead, staff members must be engaged as partners. "The people who do the work are the ones who have the answers; they know where the landmines are," adding that 84 to 94 percent of all human error can be directly attributed to process, programmatic or organizational issues. "The highest and best form of efficiency is the spontaneous cooperation of a free people," he said, quoting Woodrow Wilson.

Autrey said the opportunities to achieve high reliability are unlimited. He challenged conference attendees to ask themselves, "by next year's HRO meeting, what will make you feel happy with your progress?," and to consider "what dangers exist that must be eliminated?," "what opportunities need to be captured?," and "what strengths need to be maximized?"

Through the course of the conference, many speakers emphasized that any organization is perfectly designed to achieve the results it is currently getting. The only way to change the results is to use high reliability principles to bring your organization to the "next level" of safety and quality, Autrey said. To achieve the next level, leaders must create a safety culture where actions come from the heart, not the head. "People don't care how much you know – until they know how much you care," he stated.

To learn more about the 2012 Fifth International High Reliability Conference, go to http://www.jointcommission.org/highreliability.aspx. Podcasts, video presentations, and other resources relating to high reliability are available there.

References

1. Chassin, MR, Loeb, JM. The ongoing quality improvement journey: next stop, high reliability. *Health Affairs*, 2011; 30(4):559–568.

2. Pisano, GP, et al: Organizational differences in rates of learning: evidence from the adoption of minimally invasive cardiac surgery. *Management Science*, June 2001;47(6):752-768.

3. Gittell, JH, et al: A relational model of how high-performance work systems work. *Organization Science*, March/April 2010;21(2):490-506.

4. Henrickson, SE, et al: Development and pilot evaluation of a preoperative briefing protocol for cardiovascular surgery. *Journal of the American College of Surgeons*, June 2009;208(6):1115-1123.

5. Committee for Analysis of Causes of the Deepwater Horizon Explosion, Fire, and Oil Spill to Identify Measures to Prevent Similar Accidents to the Future. National Academy of Engineering and National Research Council. Macondo Well-Deepwater Horizon blowout: lessons for offshore drilling safety. *The National Academies Press*, 2011; downloadable for free. http://www.nap.edu/catalog.php?record_id=13273 (accessed May 29, 2012).

6. Lessons of the Deepwater Horizon. *The New York Times*, Dec. 18, 2011. http://www.nytimes.com/2011/12/19/opinion/lessons-of-the-deepwater-horizon.html?_r=1&ref=off shoredrillingandexploration (accessed May 29, 2012).

7. Parshall, J. US bureau chief stresses safety culture in oil and gas industry. *Journal of Petroleum Technology Online*, May 2, 2012. http://www.jptonline.org/index.php?id=1654&searched=safety+culture&advsearch=oneword&highlight=ajax Search_highlight+ajaxSearch_highlight1+ajaxSearch_highlight2 (accessed May 29, 2012).

8. Weinstock, M. Lean leads to gains in quality and to the bottom line. *Hospitals and Health Networks Daily*, Jan. 17, 2012; http://wnymedia.net/offsite/?aid=159380&offsite_url=http%3A%2F%2Fwww.hhnmag.com%2Fhhnmag%2F HHNDaily%2FHHNDailyDisplay.dhtml%3Fid%3D6770008959 (accessed May 29, 2012).

9. Wolterman, B; Shabot, MM: A new standard: aim for safety of planes, nuclear plants. *Modern Healthcare*, Aug. 1, 2011; http://www.modernhealthcare.com/article/20110801/MAGAZINE/308019973# (accessed May 29, 2011).