

## Patient Safety: Bringing a Safety Culture to Healthcare

### *Executive Summary*

When the Institute of Medicine published its report on medical errors last November, it started a wildfire in the mainstream press that still has not run its course. While the ensuing publicity has undeniably generated pressure on provider organizations to come up with patient safety solutions quickly, many organizations—including many members of Scottsdale Institute—were attacking the issue of medical errors for some time before the IOM report was published.

In this issue of *Information Edge* we bring a sampling of those efforts to the fore. Scottsdale Institute member Partners HealthCare System in Boston, for example, has pursued a highly focused computer strategy aimed at cutting medication errors. Minneapolis-based Allina, another SI member, is applying lessons gleaned from "high reliability" cultures such as the airlines and nuclear industries. It's clear that patient safety is not solely an IT issue, but one rife with organizational and workflow challenges. Indeed, successful prevention of medical errors may ultimately require heavy doses of "culture" from outside healthcare.

The good news is that the recent attention on medical errors is spurring healthcare organizations to pool their knowledge, experience and resources in the area of patient safety. The proposed Scottsdale Institute patient safety collaborative has engendered interest from more than half of SI's members, organizations interested in researching and/or developing innovative solutions to the problem. For those interested in participating in this initiative, please contact Shelli Williamson at 312-706-0200.



### **Allina's Balik scans other industries for answers**

Barbara Balik, MSN, Ed.D., CEO of United Hospital in St. Paul, Minn., part of Allina Health System, is responsible for Allina's system-wide program for patient safety. In that role she participates in an environmental assessment each year that has taught her to be cautious about technological quick fixes. While technology like electronic medical records (EMRs) has become

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## Scottsdale Institute member conference

We enjoyed two beautiful days at the Marriott Camelback resort in Scottsdale during April. Our 78 attendees rated this meeting as the best ever.

Presentations and discussions included eHealth, Patient Safety, Drug Utilization and Costs, Achieving Value from IT Investments, Outsourcing, and Health Plan and Delivery System Cost Management. If you would like to attend a **conference call** to review the eHealth, Outsourcing, Patient Safety or IT Value materials with the presenters, please let us know. These sessions could also be conducted for you onsite as **Executive Workshops**.

Based on survey feedback, future conferences will address fewer topics but in more depth. Patient Safety, eHealth, A/R, and Achieving IT Value are the issues that you rate as the most critical, and we will have collaboratives or other programs in each of these areas this year.

Mark your calendars for next year's meeting: Marriot Camelback, **April 4-6, 2001**

absolutely necessary, such tools must be "nested" within a culture of safety, she says. United and Allina have made safety such a priority that they conducted a "Culture of Patient Safety" workshop for their senior leaders on May 8, 2000.

The focus of that workshop, and its safety initiative in general, is to learn from non-healthcare industries like the airlines, aerospace and nuclear power how to build "high-reliability" cultures and organizations. A key challenge in carrying out such a transformation in healthcare is the industry's underlying professional and expert model, a culture that worked successfully early on but that has increasingly become a hindrance to progress in systematically identifying and reducing medical errors. "That traditional model is why we have gotten into environments of blame," says Balik. "It also gets us into expectations of perfection by each person," she says.

Fortunately, there has been extensive research on human factors involved in building such a culture. Such research has determined that reliance on memory, increased vigilance or educating people to do a better job will result in failure—especially in cultures that require high reliability. The airlines in the past, for example, believed that safety was dependent only upon the pilot doing a better job. Today the strategy, though still led by physicians, is much more team focused and reliant on collective judgement.

### **Simplify and standardize**

High-reliability industries have focused on four main safety-related goals:

- 1. Simplification of processes***
- 2. Standardization of processes and equipment***
- 3. Teams that work together train together***
- 4. Leadership***

#### ***1. Simplification of processes***

Medication delivery provides a good example of how healthcare might simplify a process because it involves a huge opportunity for error. There are at least eight steps, each of which is an opportunity for error:

1. Physician assesses the patient.
2. Physician writes the order or verbally gives it.
3. A person transcribes the order.
4. The order is read.
5. Pharmacist reviews it.
6. Pharmacy dispenses drug (based on details such as dose and amidst complications such as look-alike drugs).
7. Medication is delivered to unit.
8. Nurse selects drug and administers to patient.

#### ***2. Standardization of processes and equipment***

Anesthesia is a service line in healthcare that has done an exemplary job of approaching the Six Sigma level. The anesthesia profession achieved this by standardizing processes and equipment. For example, anesthesia equipment now incorporates design standards that make it nearly impossible to connect the wrong tube or confuse the increase and decrease controls.

### **3. Teams that work together, train together**

The concept of training together with a multidisciplinary team is counter to traditional physician and nurse education. For the airlines and the nuclear industry, however, the issue of training teams together has long been a top priority.

### **4. Leadership commitment to achieve the outcomes of high reliability**

Without top-down support even the most ardent advocates of safety and reliability will not be able to focus attention on the issue.

### **Not a new idea**

United Hospital and Allina Health System have always worked to reduce medical errors, but formalized the effort over the last two years—ahead of the current wave of attention—because of several managers interested in overall process improvement. That interest was sparked by the famous Dana Farber incident three years ago, when a reporter from the Boston Globe, Betsy Lehman, received toxic doses of chemotherapy and eventually died. A review of the case found that error compounded upon error, not because of bad personnel but because of poor systematic controls.

Because Dana Farber is a cancer center renowned for quality of care, it was clear to Balik and others at Allina that all healthcare institutions, including their own, were vulnerable to the same tragic mishaps. "We said: how do we not become the next Dana Farber," recalls Balik. Still, it's slow going in converting a traditional healthcare culture to a high-reliability one, even given parent Allina's traditional pride in quality care, she says.

That top-down commitment to patient safety received a major boost a year ago when Allina CEO Gordon Sprenger attended the Harvard Executive Session on patient safety at the Harvard School of Public Health. Says Balik, "Gordon became a major champion of patient safety. Leadership can't do it all, but if leadership doesn't identify the issue as important, what can we do to get it proper attention?" As a result of the Harvard meeting, Gordy's commitment led to a major organizational goal.

Part of the difficulty for healthcare is that it has always been slow to adopt advances from other industries because it considers itself unique, she says.

### **Creating a blame-resistant culture**

United and Allina have chosen to focus initially on two areas:

- Improving safe medication practices;
- Creating a "blame-resistant" or "just" culture.

In its move to improve safe medication practices, the hospital has adopted the model from the Boston-based Institute for Healthcare Improvement. Embedded in its goal: identify short-term fixes while mapping out a long-term electronic medical record.

The first step in creating a blame-resistant culture was to create awareness of just what the attributes are of a high-reliability culture. It's that objective that

### **Achieving Value from IT Investments**

This SI collaborative is nearing completion with the development of a tool (The Case for Change), that would be used to *plan for* as well as *capture* the clinical and financial value from IT investments.

If you are about to evaluate a new IT initiative and would be willing to apply the tool as you go through the process of evaluation, please let Shelli Williamson know at 312-706-0200 or [swilliamson@fcg.com](mailto:swilliamson@fcg.com). She will send you the work in process and put you in touch with the collaborators on the project.

We hope that the results of this collaborative will be a common approach for all of you to use as you evaluate IT capital expenditures in the future.

## Patient Safety

The SI Patient Safety/Medical Errors initiative is beginning. However, it is not too late to participate. Please call Shelli Williamson at 312-706-0200 or email [swilliamson@fcg.com](mailto:swilliamson@fcg.com) if you are still interested but not yet registered.

spurred Balik to study industries like nuclear and the airlines. She's found that her job has been helped by the public visibility accompanying the release of the Institute of Medicine report. Despite the acceleration, patient safety remains a multi-year strategy. "That's why we're looking at IS solutions," says Balik.

Even in light of the attention, however, there still aren't enough believers out there. "Far too many healthcare executives think patient safety is a public relations issue," she says. Part of the problem is the parochial view of many executives. "If you rely on your own internally generated data, it's easy to think, 'we're ok.' We as an industry have a ways to go [before we resolve the issue]."

However, the tools are available to start improving patient safety right away. Research shows, says Balik, that prudent use of IS can lower medical error rates. And what keeps the issue alive with individual institutions is realizing how much they themselves are paying for errors. She predicts that within 18 months, demand for IT solutions will go up as skeptics realize that medical errors are more than PR problems.

The problem in the short term is that capital is drying up for provider organizations. EMRs and applications such as automated order-entry provide a foundation for automating clinical information and gaining control over errors. "Of our own four metropolitan hospitals, only one is close to being completely automated. Technology solutions will be in demand, but not this fall [because of funding cutbacks]."

### Medicating for safety

Gilad "Gil" J. Kuperman, M.D., director of clinical IS research and development at Partners HealthCare System in Boston, says Partners' major emphasis is on medication safety. For an organization as large and complex as Partners, that's a big effort in itself.

An integrated delivery network in eastern Massachusetts formed in 1994 from the merger of Brigham and Women's Hospital and Massachusetts General Hospital, Partners has since added three community hospitals, a psychiatric hospital and a rehabilitation hospital, and it has also entered into a joint venture with Dana Farber Cancer Institute and has become affiliated with 1,000 primary care physicians. The system handles 2.2 million outpatient visits and 120,000 inpatient admissions a year and has \$3.5 billion in annual revenues.

To date, most of the work has occurred at Brigham and Women's and Mass General. In attempting to improve methods to cut medication errors and adverse drug events, Partners has focused on two areas:

- Chart-review-based techniques
- Computer-based solutions

The chart-review approach involves examination of databases for certain medication orders and laboratory results that might infer errors. For exam-

ple, a physician order to reverse the effect of morphine may imply that an overdose of morphine occurred.

Computer strategies work well, says Kuperman, but are not perfect. "Computers offer a good starting place for an institution interested in launching a patient-safety initiative. It takes much less manpower than chart review," he says.

### **Monitor thyself**

Kuperman says that incident reporting has not proven very successful in curbing medical errors. "You need to do special things, some kind of explicit monitoring technique—you have to go out and look for errors," he says.

Once a monitoring mechanism is in place and adverse events identified, an organization then needs to analyze root causes of those events. Partners has done a great deal of work on why such events occur and, among other things, has discovered that a whopping 56% of them occur because of errors made when an order for a prescription is written. Another 34% are due to errors of administration. The remainder of errors happen at the dispensing and transcription stages.

"Once you know the cause, then you can set about trying to prevent the adverse event. Because so many occur at the ordering stage, we built a physician order-entry system to reduce adverse drug events through decision support," says Kuperman.

The order-entry system incorporates the following checks:

- Requires a complete order to be input
- Offers suggested doses
- Screens for drug/drug interactions
- Screens for drug/allergy interactions
- Has several dosing checks for chemotherapy orders

### **Famously successful**

The success of the system, in place at Brigham and Women's since 1993, is well known, having been documented in a 1998 article in the Journal of the American Medical Association, which found that it reduced serious medication errors by 55%. That same year Partners expanded the system to Mass General; Partners plans to install the system in its community hospitals in the next two-to-three years.

The obvious need for chart-review and computer-based strategies hardly constitutes the end of the story. Organizational and workflow-related efforts also play key roles in improving patient safety. In continuing to attack the ordering phase, for example, Partners has put pharmacists on rounds in its intensive care units, making them available in the decision-making process with physicians on their rounds. In studies conducted in 1993 and 1995, this move alone cut preventable adverse drug events by two-thirds.

### **"In the works":**

- The Patient Safety initiative begins in May, with the collaborators' conference being planned for late summer.
- eHealth data from the survey has been distributed to all survey respondents; please call if you are interested in a workshop for your organization.
- IT Value collaborators are piloting the "Case for Change" business-planning tool.
- A clinician technology readiness-assessment tool is being evaluated.
- A collaborative in the area of Accounts Receivable will also be introduced in the next few weeks.

## Reminder:

Please return the "Interest Survey" sent by email and included with this report. You may email or fax back your responses. As soon as several members express interest in a particular topic, we will convene a conference call to define the initiative, identify resources and begin working.

The survey will be updated and sent each month along with the *Information Edge* report and by email. You don't need to check the same items again, but feel free to check new items or add suggested topics to the list.

Thank you. We need your input!

## Future strategies

In the future, Partners plans to focus on improving medication administration by giving computers to the nurses who perform that task, a strategy that the Veterans Administration has done successfully. The IDN will also extend its medication-safety program to outpatient sites.

Kuperman advises organizations starting out to scrutinize vendors' order-entry systems before buying. "Commercial ordering systems are still early in development, but if an organization has not done a lot of internal development previously, buying is better than building," he says. He recommends low-tech interventions such as the tracking of lab results around Coumadin ordering. There are also workflow changes that require little or no IT, such as the pharmacist rounds.

But Kuperman emphasizes that each organization must understand its IT strengths and limitations before embarking on a patient-safety strategy. "There are still a lot of problems that IT does not solve, especially in areas involving complicated workflows. The computer is not a magic bullet and cannot replace sound analysis of your problems."

### Patient Safety Resources

"If you try to constrain the problem of patient safety to be one that can be listed in 10 steps, you might as well not launch a patient-safety initiative," says Richard I. Cook, M.D., a leading national expert on patient safety at the University of Chicago, when asked to suggest 10 "bullet points" that could guide busy healthcare executives. His instructive *point*: a chief obstacle to developing solutions for patient safety is the view that patient safety can be reduced to a set of key "talking points" for executives. The problem is much too complex for that type of reduction, he argues.

Cook, an assistant professor in the department of anesthesia and critical care and director of the Cognitive Technologies Laboratory at the university, reminds us that patient safety is not a new effort but the culmination of many efforts over a long period. "Those efforts have brought us to this point. Now we need a new kind of effort. People are trying to grapple with what all this means. Healthcare executives are very uncomfortable with the issue. What we don't want to do is substitute a new fiction [to make it more palatable]. We don't want to spell it out in 10 points."

The following chart (Fig.1) from David Classen, M.D.'s, presentation at Scottsdale Institute's April conference shows dramatically that, even in a highly non-punitive environment where reporting is encouraged, most errors are missed. It is necessary to design and implement very explicit computerized-detection systems.

Classen warns, however, that simply installing a computer system is not enough. He cites the example of a prestigious university teaching hospital

that installed an automated order-entry system for physicians. While medication errors declined 55%, adverse drug events (ADEs) dropped only 17%, which was deemed to be not statistically significant. This fact—that it is possible to prevent a preponderance of medication errors and not prevent any ADEs—is clear in the following graphic, (Fig. 2) also from Classen's presentation.

Figure 1

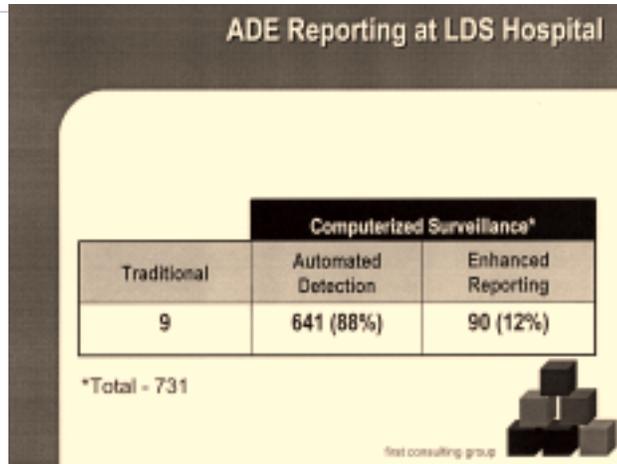
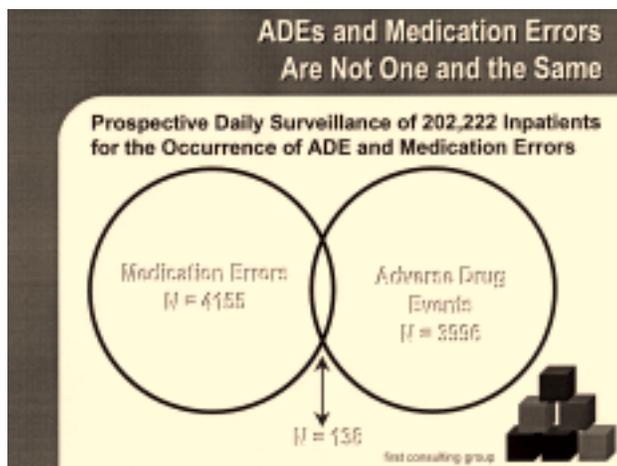


Figure 2



### National Patient Safety Foundation Website

Those interested in pursuing more in-depth ideas on patient safety can read "A Tale of Two Stories: Contrasting Views of Patient Safety," a 1998 report written by Cook and David Woods that is on the National Patient Safety Foundation's Website at [www.npsf.org](http://www.npsf.org). Cook also recommends the book "Sources of Power: How People Make Decisions" by Gary Klein (MIT Press, 1998), which analyzes the errors that can arise from the decision-making process in several working environments including healthcare and firefighting.

The NPSF site offers many excellent resources in addition to books and reports, including a list of more than 30 related sites on patient safety.

Be sure to check it out if you have not already done so. Those of you on the interest group mailing list will receive the link.

## **Texas Forum on Health Safety June 16**

Scottsdale members M.D. Anderson Cancer Center and Memorial Hermann Health System, both located in Houston, are actively involved in the leadership of an organization that is making a difference. The Texas Forum on Health Safety, a coalition of leading healthcare organizations in the state, will convene its second annual meeting, "A Culture of Safety in Action," on Friday, June 16, at the Omni Hotel in Houston. The underlying premises of the Texas Forum are based on lessons learned from high-risk industries such as aviation, aerospace and nuclear power.

"Evidence shows that a proactive approach, which applies scientific knowledge to correct design problems in the system, is far more effective in preventing medical error than blaming the individuals at the "sharp end"—doctors, nurses and pharmacists—who just happen to be in the wrong place at the wrong time," says Sherry Martin, Forum chair and associate VP for quality management at M.D. Anderson Cancer Center. She encourages anyone interested to attend the forum, even if you're not from Texas! For more information contact Martin at 713-791-4579.

The Forum features nationally known speakers in the patient-safety arena:

**Keynote: "Patient Safety—Why Bother?"**

James P. Bagian, MD, PE, Director, National Center for Patient Safety

**"NPSF Action Plan and Legislative Update"**

Henri Manasse, Jr., Ph.D., ScD, RPb, Chairman, National Patient Safety Foundation Board of Directors

**"Non-Punitive Reporting Systems"**

Michael R. Cohen, MS, FASHP, President, Institute for Safe Medication Practices and author of "200 Medication Errors and How to Avoid Them"

**"Error, Stress and Teamwork in Medicine"**

Robert Helmrick, Ph.D., Professor, University of Texas at Austin, Co-author of "Culture at Work in Aviation and Medicine"

Eric Thomas, MD, MPH, Assistant Professor of Medicine, University of Texas/Houston Medical School

