THE COMMONWEALTH FUND

Case Study

Keeping the Commitment: Progress in Patient Safety

March 2011

Johns Hopkins Medicine: Embedding Patient Safety in a University-Affiliated Integrated Health Care Delivery System

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ABSTRACT: Johns Hopkins Medicine—an academic medical center and nonprofit integrated health care delivery system—set a goal in 2002 of making its care the safest in the world. The Comprehensive Unit-Based Safety Program, which trains frontline teams to identify and mitigate patient safety hazards, is a key strategy. The model has been spread to hospitals nationwide and was associated with reductions in central line–associated bloodstream infections in intensive care units. Through its safety efforts, Hopkins has achieved improvements in safety practices such as increased hand-washing, in patient outcomes such as fewer pressure ulcers among patients, and in the hospital staff's perceptions of the organizational safety culture. Safety principles have been spread outside the hospital setting to the system's home care group. Success factors include setting ambitious goals, empowering frontline staff to make improvements, involving executives and the board in change, and rigorously measuring and holding units accountable for results.

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OVERVIEW

In the decade since the Institute of Medicine (IOM) issued its landmark report, *To Err Is Human,* there have been a number of successful efforts made to improve patient safety in the United States.[1] Nevertheless, the nation appears far from realizing the vision of eliminating harm to patients from care that is meant to help them.[2] A series of Commonwealth Fund case studies conducted on the fifth anniversary of the IOM report identified several health care organizations that had taken promising steps toward realizing one of the IOM's key recommendations: creating an organizational culture of safety.[3]

This case study, part of a new series documenting the progress that can be achieved with sustained effort, provides a fifth-year update on patient safety initiatives at a site profiled earlier.[4] Johns Hopkins Medicine is an academic medical center and nonprofit integrated health care delivery system headquartered in Baltimore, Maryland. In 2002, following two tragic and highly publicized

lapses in patient safety, Johns Hopkins Medicine created a Center for Innovation in Quality Patient Care to spur innovation in quality and patient safety, with the goal of making its hospitals and health care services the safest in the world. In collaboration with experts throughout the organization, the center developed a set of customizable tools and resources to help frontline clinicians identify and mitigate hazards to quality patient care.

Chief among these tools is the Comprehensive Unit-Based Safety Program (CUSP), which provides frontline staff with training on the science of safety and emphasizes the importance of using a systematic, team-based approach to quality improvement work. Use of the model in combination with other evidence-based interventions to prevent the occurrence of hospital-acquired infections resulted in 75 percent to 100 percent reductions in rates of central line–associated bloodstream infections observed in surgical intensive care units at Johns Hopkins Hospital from 2001 to 2010. Units employing CUSP also have experienced improved staff morale and lower nursing turnover. The model has been disseminated to hospitals nationwide. In participating intensive care units in Michigan hospitals, it was associated with a sustained 66 percent reduction in the observed incidence of central line–associated bloodstream infections.

Other key approaches include the internal publication and distribution of process and outcomes measures related to patient safety and the engagement of the system's trustees and executives to reinforce the importance of patient safety efforts. The trustees set specific goals for the institution, tied to actionable metrics. These metrics in turn are tied to bonus payments for executives and clinicians. Together, these interventions were associated with improvement in safety practices, such as staff adherence to a rigorous hand-hygiene protocol, and a steady increase in staff-reported safety attitudes at Johns Hopkins Hospital from 2006 to 2008.

Patient safety efforts are amplified by the institution's participation in the American Nurses Credentialing Center's Magnet Recognition Program, which links structures and processes with outcomes to focus attention on effective interventions. As a result of such efforts, the hospital has reduced its rates of patient falls and injuries from falls by more than 20 percent over seven years and the proportion of at-risk patients with hospital-acquired pressure ulcers by 56 percent over the same period.

Johns Hopkins' patient safety program has evolved and expanded beyond the hospital setting. For instance, the Johns Hopkins Home Care Group has adapted these methods to engage clinical and non-clinical staff in proactively identifying and correcting unsafe conditions, such as the use of faulty equipment, that could jeopardize the safety of patients receiving care in their homes. Systems thinking also led to improvements in surgical wound care and in care transitions between the hospital and home care.

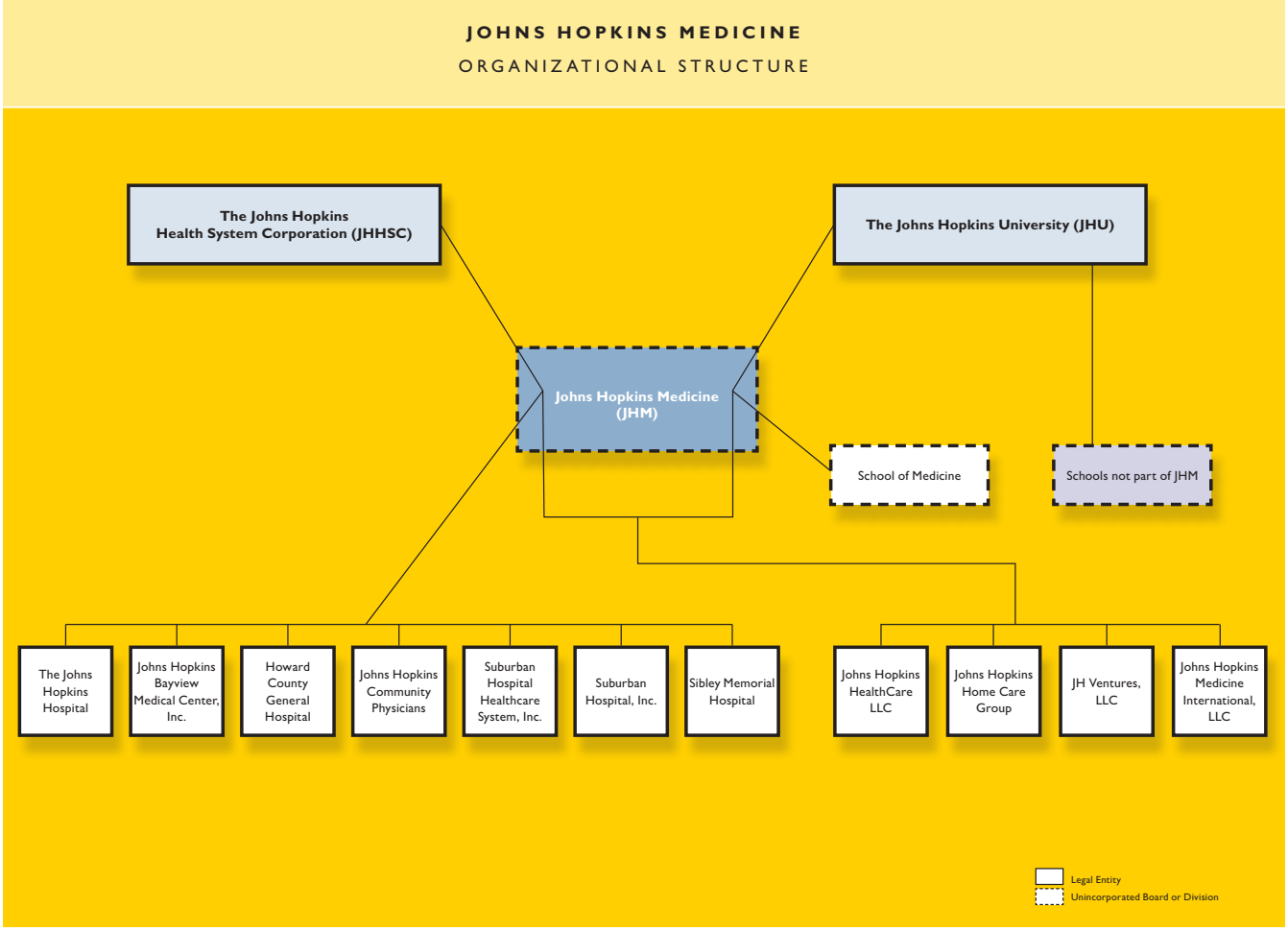
ORGANIZATIONAL CONTEXT FOR PATIENT SAFETY IMPROVEMENT

Organization

Johns Hopkins Medicine unites the faculty, physicians, and scientists of Johns Hopkins University's School of Medicine with the Johns Hopkins Health System, a nonprofit integrated health care delivery system (Exhibit 1). The health system encompasses five acute care hospitals (located in the Baltimore and Washington, D.C., metro areas), four suburban ambulatory care centers, a community physicians group providing care in 25 primary care outpatient clinics throughout Maryland, a long-term care facility, a home health care provider, and managed care plans covering 260,000 people. The organization employs more than 30,000 staff, including 3,850 physicians.

This case study focuses on patient safety interventions in two settings: Johns Hopkins Hospital, a 945-bed academic medical center in Baltimore, and the Johns Hopkins Home Care Group, which provides home health services, infusion therapy, respiratory services, durable medical equipment, and outpatient pharmacy services to approximately 10,000 patients in their homes each day.

Exhibit 1. Johns Hopkins Medicine Organizational Structure



Source: Johns Hopkins Medicine.

Laying the Foundation

In 2001, there were two tragic and highly publicized incidents that resulted in the deaths of two young patients at Johns Hopkins Hospital.[5] These incidents prompted the institution to embark on "a quality revolution," called for by William R. Brody, the university president at the time. To accomplish its stated goal of creating the safest hospital in the world, Johns Hopkins Hospital changed its approach to quality by abandoning the use of top–down directives. Instead, it assigned accountability for identifying and remedying issues of quality and patient safety to the frontline staff of individual departments. These teams were held accountable for performance by senior staff.

To build local capacity to analyze, improve, and maintain performance and support innovation in patient safety, Johns Hopkins Medicine created the Center for Innovation in Quality Patient Care. The center, which is funded with $1.5 million from the health system, the medical school, and the university, provides departments with tools and resources, including training in "lean" production and Six Sigma—two business improvement methodologies—to pursue quality and patient safety initiatives.[6,7]

One of the first initiatives the center developed was the Comprehensive Unit-Based Safety Program (CUSP), which was first employed in an intensive care unit (ICU) at Johns Hopkins Hospital. CUSP provides frontline staff with training on the science of safety to help them recognize hazards, provides tools to improve communication and teamwork, and creates a structure through which staff members can investigate and learn

from defects they identify within their units. CUSP has created a supportive organizational culture for improving medication safety. The program has reduced hospital-acquired infections, such as bloodstream infections in patients with central line catheters and pneumonia in patients on mechanical ventilation, and length of stay in ICUs.[8]

STRATEGIES AND TOOLS FOR CHANGE

The key strategies for promoting a culture of safety at Johns Hopkins Medicine include:

1. encouraging leadership to set goals and reinforce the importance of patient safety as an organizational priority;
2. teaching the science of safety to enable all staff to effectively recognize and address threats to patient safety in their daily work;
3. linking patient safety efforts to the institution's core values of research and discovery;
4. spreading the Comprehensive Unit-Based Safety Program to build capacity among frontline teams to systematically improve patient safety; and
5. enhancing transparency of performance on safety measures.

Encouraging Leadership to Set Goals and Reinforce the Importance of Patient Safety as an Organizational Priority

Establishing leadership support for patient safety initiatives has been vital to the success of Johns Hopkins Medicine's patient safety efforts. "We had to demonstrate as leaders that we were going to take it seriously. It wasn't just the flavor of the week," said Richard "Chip" Davis, Ph.D., vice president of innovation and patient safety and executive director of the Center for Innovation in Quality Patient Care. Toward that end, Johns Hopkins Medicine Board Chairman C. Michael Armstrong made patient safety his first priority.

As a signal of the strategic importance of quality and patient safety, the board put both items first on its meeting agendas and housed the center in the office of Edward Miller, M.D., the dean of the medical faculty and the CEO of Johns Hopkins Medicine. Trustees have repeatedly said that "they wanted Johns Hopkins to become the safest place in the world to receive care," Davis said.

Teaching the Science of Safety to Enable All Staff to Effectively Recognize and Address Threats to Patient Safety in Their Daily Work

Johns Hopkins Hospital has developed a curriculum on the science of safety, which is incorporated into the orientation for physicians and nurses.[9] A short (35-to-40-minute) session on the subject is delivered by Peter J. Pronovost, M.D., Ph.D., director of the division of adult critical care medicine and medical director of the Center for Innovation in Quality Patient Care, and covers four principles that the hospital considers critical to a culture of safety (see box). These principles help to persuade nurses and doctors that delivery of health care is science and not an art, Pronovost said.

To emphasize the first principle, Pronovost points out each caregiver must recognize that high- and low-quality care is the product of a system, not an individual. To overcome the false notion that "personal effort controls everything," he encourages providers to view health care quality as a function of training and supervision, teamwork, distractions in the work environment, and department or institutional problems, among other factors. Each of these could contribute to or defend against harm but for the most

Principles of Safety at Johns Hopkins Medicine

Every system is perfectly designed to achieve the results it gets

To ensure safe design: standardize, create checklists, and learn when things go wrong

Recognize that safety principles apply to teamwork as well as to technical procedures

Teams make wise decisions when there is diverse and independent input

part are invisible to those who are not trained to look for them, Pronovost said. Believing that one individual can overcome all of these factors is not realistic and works against an honest assessment of the weaknesses in the system. "We have to admit that we are fallible," Pronovost said

The second principle is safe design. All staff can promote safe design by standardizing work processes, creating independent checks to ensure critical processes are completed correctly, and having a structured process in place to prevent the recurrence of mistakes. To illustrate this principle, Pronovost uses the example of the airline industry. Airplane departures and landings are far safer because the airlines follow standardized protocols and have ways to check critical steps to avoid human error. At Johns Hopkins, staff standardized the collection of equipment needed to safely insert central line catheters by putting all of the precautionary materials to prevent infections (caps, gowns, masks, and full barrier drape) in a single place.

The third principle emphasizes the importance of communication among team members. Pronovost notes that the vast majority of conflicts among care teams can be traced to "decoding errors;" that is, misinterpretation caused by the use of vague language. For example, when a doctor says that a patient "can leave when their vital signs are stable" or asks the nurse to "hold the tube feeds if the patient is not tolerating them," the nurse may have a different interpretation of stability and tolerance than the physician. Hence, physicians need to give precise directions and nurses need to ask for clarification if they are uncertain what the physician means. The principle "is simple and transformative because we all use ambiguous language," Pronovost said.

Techniques for reducing the risk of communication errors at Johns Hopkins include:

- team briefings focused on patients' daily goals of care,[10]
- read-backs in which the listener repeats key information so that the transmitter can confirm its correctness[11]; and
- SBAR, or situation–background–assessment–recommendation, a technique for structuring communication about a patient's condition.[12]

The fourth principle stresses the importance of teamwork. The metaphor Pronovost uses to make this point is: "don't play man down." This is a reference to sports teams that are disadvantaged by the loss of a team member to the foul box. "Involving a nurse isn't a nicety and it doesn't compromise your authority as a physician; it helps you make better decisions," Pronovost said.

The training helps staff to see hazards as opportunities to take action, rather than examples of "normalized deviance" in health care practices, according to Lori Paine, R.N., M.S., director of patient safety for Johns Hopkins Hospital. For example, an ICU nurse discovered that a paralytic agent in the refrigerator looked very similar to an antibiotic. "She recognized it as an accident waiting to happen, reported it, and within a week there was a fix in place," Paine said. The paralytic agent was placed in a clearly labeled resealable plastic bag. The fix also reinforced to employees the value of reporting such incidents, and demonstrated that the system will work with them to quickly address patient safety problems.

The training program is effective in part because it provides clinicians with the theory behind patient safety programs, not just jargon. Once clinicians have the theory, along with examples of what it means in practice, they can improvise solutions to problems they identify, in a way that makes sense to them, Pronovost said. He often tests new ways of explaining the theory to see what sticks best in the minds of caregivers.

Johns Hopkins Hospital's effort to promote safety is facilitated by its ongoing work to maintain its designation by the American Nurses Credentialing Center as a Magnet hospital (see box). The Magnet program stresses the importance of nurse empowerment, proactive risk assessment, and correlation of structures and processes with outcomes, according to Patricia Dawson, R.N., M.S.N., assistant director of nursing for clinical quality and Magnet coordinator.

The Magnet Recognition Program

The American Nurses Credentialing Center awards the Magnet designation to hospitals that excel in the delivery of nursing services to patients, disseminate best practices, and promote quality in a setting that supports professional practice. The program is based on a 1983 study by the American Academy of Nursing, which sought to identify distinctive characteristics of hospitals that attract and retain well-qualified nurses.

Since the Magnet program first awarded the designation in 1994, the number of qualifying institutions has increased to 372. The criteria for inclusion have increased as well. Hospitals must not only demonstrate empirical quality outcomes, they must show they engage in innovative quality improvement programs, have transformational leadership, and provide nursing staff with structure and direction necessary to fulfill professional and organizational goals.

Source: American Nurses Credentialing Center.

The Magnet program has amplified the hospital's focus on risk assessment, particularly for fall rates and hospital-acquired pressure ulcers. The hospital researched evidence-based practices to reduce falls, developed a risk assessment tool and protocol, and trained nurses. As a result, the hospital has reduced its fall rate and fall injury rate by more than 20 percent from 2003 to 2010 (Exhibit 2).* After adopting a tool to predict the risk of pressure ulcers, the proportion of patients with hospital-acquired pressure ulcers dropped 61 percent. Among at-risk patients, the proportion with hospital-acquired pressure ulcers dropped 56 percent from 2003 to 2010 (Exhibit 3).

The Magnet program also emphasizes using internal resources to improve care, which is consistent with CUSP. Nursing staff have tapped the expertise of certified wound care nurses and created advisory groups for falls and pressure ulcers to review results and determine which methods should be spread across the institution. One unit piloted the use of orange-colored vests by nurses when they are dispensing medication as a way to limit interruptions that can compromise their ability to detect and avert potential errors. This intervention led to a 52 percent reduction in combined interruptions and distractions.

* The rate of patient falls declined by 20 percent within three years of the intervention.

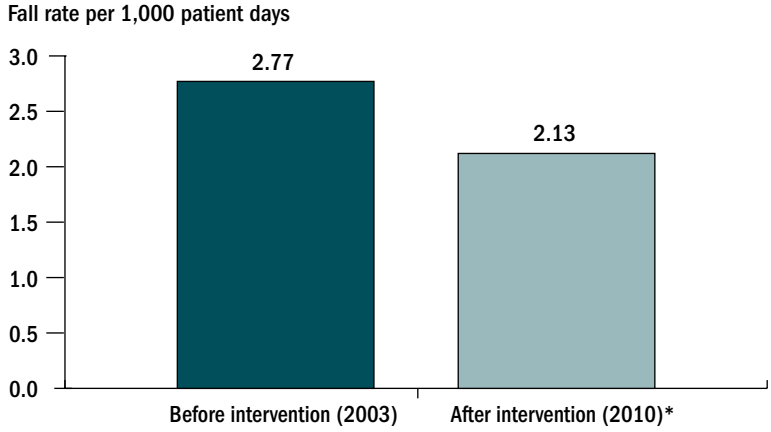
Linking Patient Safety Efforts to the Institution's Core Values of Research and Discovery

To encourage research on patient safety, the Center for Innovation in Quality Patient Care works with academic clinicians to help them obtain grant funding and publish the results of their work. "If academic clinicians don't believe it is science and they can't get rewarded for it, they don't engage in it," Pronovost said.

Because some of this implementation research may not be suitable for publication, Johns Hopkins University is proposing new promotion criteria that will credit academic staff for applied research that results in measurable improvements both within and outside the Johns Hopkins Health System, without requiring that the work necessarily appear in a peer-reviewed publication. Instead, the researcher will document the impact of their work in an "improvement portfolio" that is reviewed by their peers. The portfolio is structured like an abstract, answering the following questions:

- What was the problem?
- What did I do?
- How did I know it worked?
- Where did it get spread?
- How did it get people to focus on this work?

Exhibit 2. Impact of Applying Evidence-Based Practices, Risk Assessment Tools, and Staff Training on Patient Falls at Johns Hopkins Hospital



* First quarter of 2010.
Source: Johns Hopkins Hospital.

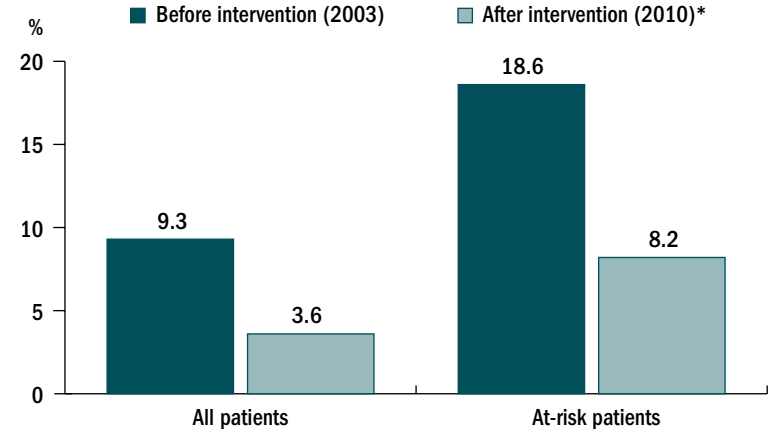
Pronovost believes this change will help expand the goal of academic medicine from developing new knowledge to improving the health of patients.

Spreading the Comprehensive Unit-Based Safety Program to Build Capacity Among Frontline Teams to Systematically Improve Patient Safety

Perhaps the single most important feature of Johns Hopkins Medicine's approach to patient safety is its engagement of frontline caregivers in identifying patient safety hazards and developing solutions to mitigate them. Johns Hopkins Hospital has encouraged this by spreading the Comprehensive Unit-Based Safety Program (CUSP) to high-risk areas such as the ICU, the emergency department, step-down down units that treat patients after they are discharged from the intensive care unit, other high-risk procedural areas, and more recently, into general medical and surgical inpatient units. CUSP has been adopted in almost half of approximately 80 inpatient care units.

To identify units that may benefit from CUSP, Johns Hopkins Hospital uses the results of the Safety

Exhibit 3. Percentage of Patients with Hospital-Acquired Pressure Ulcers Before and After Intervention



Note: The measures of hospital-acquired pressure ulcers were based on a prevalence survey.
* First quarter of 2010.
Source: Johns Hopkins Hospital.

Attitudes Questionnaire, a tool designed to elicit caregivers' assessments of safety, teamwork, job satisfaction, stress recognition, working conditions, and perceptions of unit-level and hospital-level management.[13] Staff in all departments delivering clinical care or services in the hospital began completing the questionnaire in 2006. Units that receive poor scores on teamwork or safety climate (defined as a score less than 60 percent) are encouraged to participate in the CUSP program. The hospital does not mandate participation, as experience has shown that unit managers and staff must be self-motivated to succeed.

A unit that expresses interest in CUSP must demonstrate its commitment by forming a team that includes a physician and a unit staff member (typically a nurse) to champion the effort, plus other staff members who wish to join. The team is assigned a coach, who provides support by scheduling meetings, keeping records of data collection, and tracking progress from month to month. The coaches are recruited from throughout the institution and have included nurses, administrative residents, and master's students from the school of public health. They receive mentoring from the hospital's safety coordinator and typically serve a one- or two-year term. A hospital executive also partners with each CUSP team, joining meetings to help solve problems and remove bureaucratic barriers to safe care, such as by fixing patient transport bottlenecks or acquiring needed equipment. The opportunity to gain the support of an executive is often a key motivator for a unit to join CUSP, according to Paine, the director of patient safety.

The teams are given dedicated time each month to develop patient safety interventions. The process often begins with two questions: 1) how will the next patient be harmed, and 2) what do we need to do to prevent it? Teams also use data from the hospitalwide error reporting system, liability claims, and sentinel events, among other sources, to identify relevant patient safety issues.

Whatever focus the team chooses, it is critical that it represent the concerns of the frontline staff, and not an agenda set by the Joint Commission or hospital administration (although there may be overlap). "The magic of CUSP is about generating enthusiasm and passion among the frontline staff," Paine said.

Each unit-level team is asked to learn from one defect per month. To accomplish this, the teams must be able to answer the following questions:

- What happened?
- Why did it happen?
- What did you do to reduce the risk of it happening it again?
- How do you know the risk was actually reduced?

"Many of these exercises are skill-building," Pronovost said. "[Clinicians] now have the self-efficacy of the skills to do what we're asking them to do. Far too often, clinicians feel powerless to change things. With CUSP they are energized because they realize they can improve safety."

The problem the units identify and the solutions they develop often reflect common concerns, such as medication safety, but can be idiosyncratic to a particular unit. For example, one surgical floor discovered that nurses were having trouble following the plan of care because they could not round with the care team. The impediment was unique to the unit: eight different services were admitting patients and there were too many teams meeting at once. With executive and physician support, the unit began to group patients by service and assign dedicated nurses to those groups, which enabled nurses to round with the care team and clarify the criteria for patient discharge. The surgical unit employed a number of other interventions to address issues of communication, inefficient coordination, delays in care, and poor teamwork, including the introduction of a team-based daily goals sheet and the addition of a night-shift charge nurse to the morning rounds.

As a result of these efforts, nurses on the surgical floor made fewer calls to residents (calls dropped from 65 to 2 per day), nurse turnover declined from 27 percent to zero, and staff morale and perceptions of the safety culture improved dramatically (Exhibit 4).[14]

This improvement occurred in the context of generally increasing staff ratings of safety culture among all the hospital's clinical areas (which are described later in this brief).

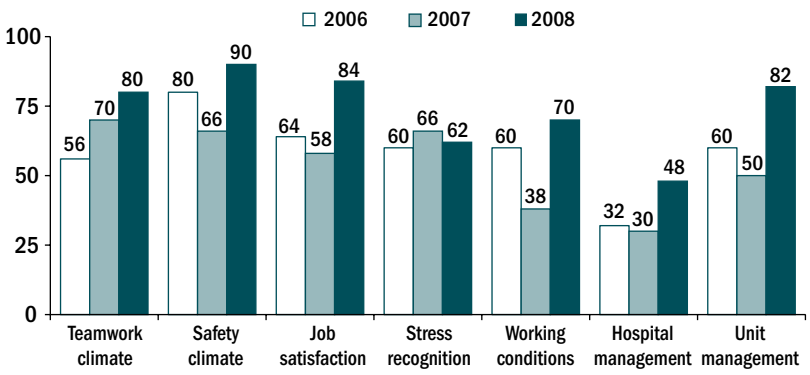
Another unit discovered a problem with the use of bed exit alarms that are intended to alert staff when patients who are at high risk for falling attempt to get out of bed unassisted. Because the alarms do not have a silence feature, staff turned off the alarm when they got patients out of bed and often forgot to re-engage them. Staff members explored how they could leverage the skills and roles of all members of their teams and use the available technology to address the problem by assigning unit clerks to ensure that bed alarms are turned on for high-risk patients. By using a combination of frequent patient rounding and alarm monitoring, the fall rate was reduced by more than 70 percent. Other units using a team approach to fall prevention monitoring have also similarly decreased fall rates (Exhibit 2).

The CUSP approach is used to address problems at the departmental, hospital, and systemwide level. Departments and hospitals that form units are asked to learn from one defect per quarter. A similar process occurs in the health system. Hospital and health system-level units typically address risks that span departments and require some centralized resources. For example, the hospital developed a program to reduce risks from anticoagulation, to improve glucose control, and to reduce risks from hypoglycemia.

CUSP units can also organize to address particular issues that emerge or that are endemic to types of units, such as intensive care, surgical care, or admitting services. Pronovost occasionally links all the ICU CUSP teams and asks them to identify common ICU safety problems. For example, the ICU CUSP teams joined together to develop a solution to the problem of feeding tubes accidently being placed in the trachea (lungs) rather than the esophagus (stomach). They developed a standard protocol for placing the tube that requires physicians to use an X-ray to confirm that the tube is properly placed before proceeding beyond 20 centimeters.

Applying CUSP has advanced quickly in the ICU because of the strong teamwork that exists in such units. Applying the program in units without a strong team model can be a slower process. "Bringing CUSP into a culture or into a unit is not a quick fix. It's a process of teaching them how empower themselves," said Rhonda Wyskiel, R.N., a nurse in one of the hospital's intensive care units and a patient safety fellow with the Center for Innovation in Quality Patient Care. This

Exhibit 4. Staff Perceptions of Patient Safety Culture: One Surgical Floor at Johns Hopkins Hospital



Note: Results, based on a survey of one surgical floor at Johns Hopkins Hospital, for all domains except stress recognition improved significantly in 2008, seven months after CUSP was launched in this unit. A positive score means a response of 4 or 5 on a 5-point response scale. Scale scores reflect the average of item responses in each domain. Survey response rates were 89 percent in 2006 and 100 percent in both 2007 and 2008.
Source: Adapted by permission from The Joint Commission. J. Timmel, P. S. Kent, C. G. Holtzmueller et al., "Impact of the Comprehensive Unit-Based Safety Program (CUSP) on Safety Culture in a Surgical Inpatient Unit," *Joint Commission Journal on Quality and Patient Safety,* June 2010 36(6):252–60.

may require that the coach step back and let the team learn on its own.

Although that process takes more time than simply directing staff on what to do, Pronovost believes the result is more sustainable. "Staff develop solutions that really work and that can actually be implemented. It's a slower process [than simply mandating a fix], but I think in the end probably more effective and efficient," he said.

Enhancing Transparency of Performance on Safety Measures

Johns Hopkins Hospital and Health System use internal reporting to encourage staff to improve patient safety. The Center for Innovation in Quality Patient Care publishes the "Weekly Report of Harm," which provides data that demonstrate how effective different units have been in preventing hospital-acquired infections or in complying with hand-hygiene programs. The report also notes important policy changes and corrective actions that result from identified defects in care.

The report is sent via e-mail to 400 people in the institution, including trustees of the board, senior leaders, and managers, every Friday afternoon. Individual units play close attention to the results, as do trustees, who often comment on or inquire about specific results. The report has elevated the importance of the initiatives in the minds of staff and focused attention on them. "It's been effective at helping change the organizational conversation around improvement. The data and actions needed to improve become the focus of attention rather than fighting the measurement methodology to justify lower scores," said Davis, the executive director of the Center for Innovation in Quality Patient Care. It has also encouraged a healthy competition between units. "Any ICU in this hospital can tell you how many weeks since their last bloodstream infection and which unit is in the lead," said Stephanie Peditto, M.H.S., director of innovation at the center.

The center removes measures from the report once it becomes apparent the patient safety issue is addressed. For instance, the report used to contain data on medication errors, but after 6 million doses with only one medication-related sentinel event, the metric was removed "not because we were not worried about it, but because we kept seeing it was zero and it wasn't actionable," Davis said. In its place, the center added the hand-hygiene metric.

In addition to the system-level metrics, each department has a patient safety scorecard that includes at least four priorities that are measured and tracked (see box; in addition, a mock version of this scorecard appears in Appendix A). Two of the measures must reflect goals for improvement and two must reflect maintenance goals. They may be process measures that capture adherence to evidence-based policies or guidelines. They may also be measures that gauge the efficiency and timeliness of patient care, teamwork, patient satisfaction, and safety attitudes of staff, among others. Outcomes measures, such as reductions in inpatient and outpatient medication errors, monthly survival rates, patient falls, potentially preventable conditions (e.g., hospital-acquired wounds), are also used. Data in the scorecard are reported monthly to the department and Johns Hopkins has plans to makes these data available across departments.

All the senior leadership, clinical chiefs, administrators, and directors of nursing have 30 percent of their bonuses directly linked to safety metrics. The bonus is intended to ensure leaders are paying attention to these measures.

The center's leaders believe that for reporting to be effective, it must contain data that are actionable so departments can investigate and learn from low ratings. The data must also be credible. Before Johns Hopkins began employing a rigorous approach to monitoring hand hygiene, it used self-reported hand-hygiene rates, which were close to 100 percent. After switching from self-reported data to reports from blinded observers who were using a new metric (percent of opportunities in which clinicians wash their hands or use hand sanitizer both before and after seeing a patient), the rates dropped to between 30 percent to 40 percent (based on 6,000 observations per month, or 30 per unit). After these data were published internally, at the department level, rates increased to mid-70 percent (and at times have reached the mid-80s). Recent data show a statistically significant drop in methicillin-resistant

Elements in the Oncology Department's Safety Dashboard

- Inpatient medication errors
- Outpatient medication errors
- Medication errors in the inpatient/outpatient continuum
- Rates of survival to discharge for critical care patients
- Process measures, such as compliance with recommendations for delirium screening, hand hygiene, and outpatient immunization
- Number of days (in a month) that one patient was discharged by 12:00 noon
- Percentage of new appointment calls that receive a definitive answer within 24 hours
- Percentage of units that complete the survey of safety and teamwork culture
- Measures of patient satisfaction

Staphylococcus aureus, vancomycin-resistant enterococci, and blood stream infections over the campaign's life span.

Honesty in self-assessment is important. "I think that 10 years later we're very good at saying this is our reality. This is our dirty laundry. This is what is real and this is what we've got to fix," Peditto said. The approach can evoke scrutiny from the trustees, which helps motivate improvement. In contrast, Peditto noted that in some other hospitals, data may be reported at an artificially high rate that masks the severity of the problem, as was the case at Johns Hopkins previously.

RESULTS

The implementation of CUSP in combination with other interventions, such as a daily goal sheet to improve team communication and a checklist to ensure adherence to evidence-based infection-control practices, has lowered rates of observed hospital-acquired infections in ICUs at Johns Hopkins Hospital (as previously reported in the peer-reviewed literature).[15] For example, rates of central line–associated bloodstream infections (CLABSIs) declined by a range of 75 percent to 100 percent in three surgical ICUs from 2001 to 2010 (Exhibit 5).

CUSP and related evidence-based infection-control practices are now being spread to hospitals nationwide with funding from the Agency for Healthcare Research and Quality. The approach, used in the Michigan Health and Hospital Association's Michigan Keystone ICU project, was associated with a 66 percent reduction in the incidence of CLABSIs in participating Michigan ICUs in the first 18 months of the project (Exhibit 6).[16] The lower rate was sustained for an additional 18 months.[17] During the post-implementation period, hospital mortality also declined significantly more among Medicare patients treated in Michigan ICUs than among a comparison group of patients treated in other Midwestern hospital ICUs.[18] These results lend support to the proposition that reducing harm to patients can make a measurable difference in their survival.

CUSP and other patient safety interventions at Johns Hopkins Hospital also have been associated with improved staff-reported safety attitudes, with significant increases from 2006 to 2008 on six of seven domains of the Safety Attitudes Questionnaire (Exhibit 7). For the safety climate measure, the hospital reached its goal of a 60-percent positive threshold or a 10-point improvement for 79 (55%) of the 144 units surveyed in 2006 and for 118 (82%) of the 144 units in 2008. Likewise, the hospital achieved its goal on the teamwork climate measure for 89 (62%) of the units in 2006 and for 119 (83%) of units in 2008.[19] The results for all 144 units appear in Exhibit 7.

EXTENDING PATIENT SAFETY TO THE COMMUNITY CARE SETTING

Johns Hopkins Medicine has extended its patient safety interventions to the home care setting through the Johns Hopkins Home Care Group. The patient safety strategies, which are similar to those used in the hospital setting, include:

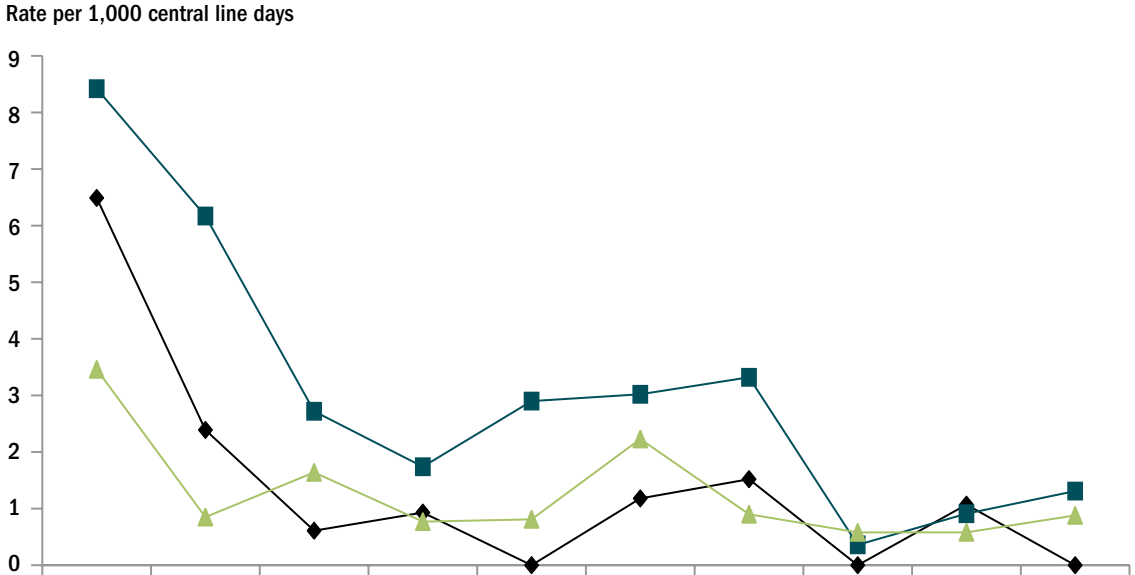
- engaging caregivers in the identification of patient safety hazards;
- learning from defects;
- launching leadership campaigns to encourage reporting of patient safety concerns by eliminating the fear of retaliation;
- using transparency in reporting on performance to encourage improvement;
- checking techniques used for high-risk procedures on an annual basis; and
- having executives visit caregivers at home sites to learn about safety issues.

Engaging Caregivers in the Identification of Patient Safety Hazards

Although many of the home care group's employees work in the field and infrequently visit the office, the group has inculcated a strong culture of patient safety through a variety of means that illustrate the value of including diverse perspectives and expertise on teams.

The group established a cross-functional team to review standards of care and assess whether policies and practices meet the best standards of practice. The team includes 20 to 30 employees representing

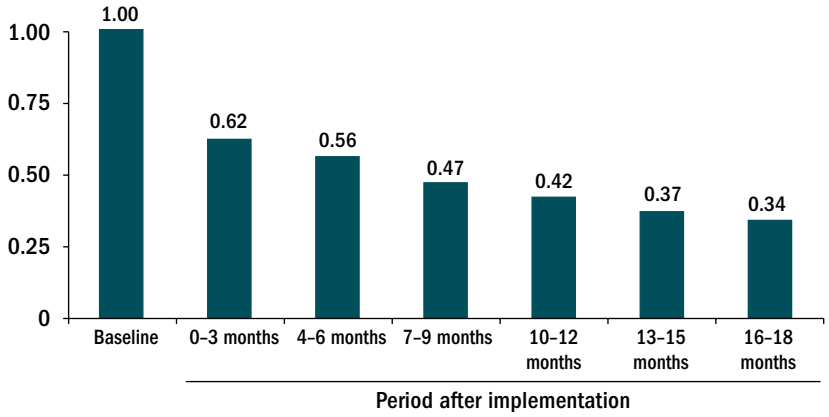
Exhibit 5. Rates of Central Line–Associated Bloodstream Infections in Surgical Intensive Care Units at John Hopkins Hospital



	2001	2002	2003	2004	2005	2006	2007	2008	2009	Q1–Q3 2010
SICU	6.49	2.39	0.61	0.93	0	1.18	1.52	0	1.07	0
CSICU	8.42	6.17	2.72	1.74	2.9	3.02	3.32	0.36	0.91	1.31
WICU	3.46	0.85	1.64	0.77	0.81	2.23	0.9	0.58	0.58	0.88

ICU = intensive care unit; SICU = surgical ICU, CSICU = coronary surgery ICU; WICU = Weinberg ICU.
Source: Johns Hopkins Hospital Epidemiology and Infection Control Department.

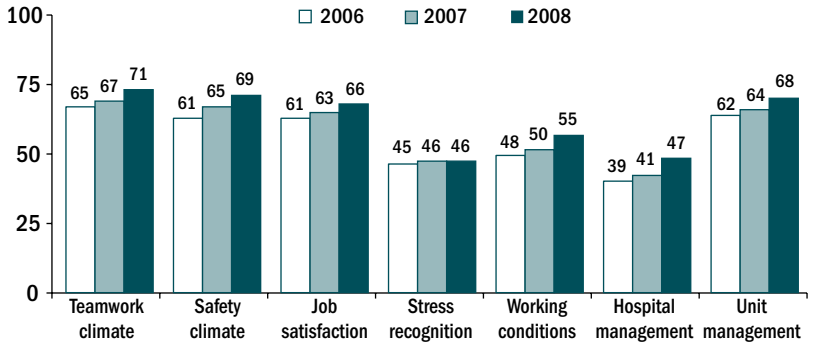
Exhibit 6. Incidence-Rate Ratios for Central Line–Associated Bloodstream Infections at Michigan Keystone ICU Project



Note: Incidence-rate ratios were calculated with the use of a generalized linear latent and mixed model with robust variance estimation and random effects to account for clustering of central line–associated bloodstream infections within hospitals and clustering of hospitals within geographic regions. Rates of central line–associated bloodstream infection during and after implementation of the study intervention were compared with baseline (pre-implementation) values, adjusted for the hospital's teaching status and number of beds.
Source: P. Pronovost, D. Needham, S. Berenholtz et al., "An Intervention to Decrease Catheter-Related Bloodstream Infections in the ICU," *New England Journal of Medicine,* Dec. 28, 2006 355(26):2725–32.

Exhibit 7. Staff Perceptions of Patient Safety Culture: 144 Johns Hopkins Hospital Clinical Areas

Percent reporting a positive score on the Safety Attitudes Questionnaire



Note: Results for all domains except stress recognition improved significantly from 2006 to 2008. A positive score means a response of 4 or 5 on a 5-point response scale. Scale scores reflect the average of item responses in each domain. Overall survey response rates ranged from 75 percent to 79 percent across years. Results reflect 144 units at Johns Hopkins Hospital with survey results from all three years.
Source: Adapted by permission from BMJ Publishing Group Limited. L. A. Paine, B. J. Rosenstein, J. B. Sexton et al., "Addressing and Improving Safety Culture Throughout an Academic Medical Centre: A Prospective Cohort Study," *Quality and Safety in Healthcare,* Dec. 2010 19(6):547–54.

the group's five areas of operation: adult home care services, pediatric home services, infusion services, durable medical equipment supply, and pharmacy. The team reflects the range of employees in the home care group, including adult and pediatric nurses, intravenous pharmacists, and rehabilitation and respiratory therapists.

The team is subdivided into groups to study home care regulations and explore how the divisions meet those requirements. Through this process, the team has discovered hazards to patient safety, including the need for preventive maintenance for equipment and the fact that certain staff members had purchased their own equipment to use in patients' homes.

The home care group also provides training to its employees on the science of safety in collaboration with experts from Johns Hopkins Medicine. This training covers the culture of safety, event identification and reporting, and case review, as well as an annual safety summit where best practices are discussed.

Learning from Defects

The home care group has also established a quality and safety committee, composed of executives, managers, and staff who meet to discuss case studies and learn from internal incidents.

An internal team comprising performance improvement specialists and clinical managers reviews event reports daily. On a bimonthly basis, the performance improvement staff, together with management, review reports in aggregate to identify trends and opportunities for improvement in existing practices. They also rely on a Web-based database, created by the University Health System Consortium, which contains reports of events that may have caused patient harm. Employees from multiple arms of the group are involved in conducting a root cause analysis to learn from one another's mistakes and apply risk reduction strategies, according to Mary Myers, chief operating officer of the home care group.

Employee report trends have revealed a number of patient safety risks, many the result of faulty or defective equipment. One physical therapist reported a patient fall from a wheelchair and a second near-fall when attempting to transfer patients in and out of the wheelchair. The employee noted that the wheelchair brake became disengaged when swinging open the leg rest. Two other near-falls were reported within a month of the first event. A rehabilitation manager, the equipment manager, and a performance improvement coordinator investigated, identified the pattern, and informed the manufacturer, which agreed the company needed to make a design change, Myers said.

In a separate incident, a nurse reported that a baby's feeding tube infused earlier than programmed. Assuming the family had improperly programmed the equipment, the nurse reeducated the family on proper procedure. After two other nurses identified similar problems, the home care group informed the manufacturer, which identified and modified a defect in the equipment.

By analyzing medication errors, the group identified a problem with medication names that looked alike or sounded alike. There were visual cues in place and the medications were kept separate, yet the event still occurred. The pharmacy implemented tall-man letters (the practice of writing part of a drug's name in upper case) to provide an additional cue when items looked or sounded alike. No errors have been reported since the system went into place, Myers said.

Launching Leadership Campaigns to Encourage Reporting of Patient Safety Concerns by Eliminating the Fear of Retaliation

Leaders of the home care group needed to encourage employees to bring concerns to light. One strategy is sponsoring breakfasts and lunches for employees, during which the executive team conveys the message that employees should always speak up if they feel uncomfortable. The breakfasts and lunches are typically attended by pharmacists, technicians, and nurses, as well as intake, administrative, and reimbursement staff. At these meetings, the executive team asks these three questions:

- What's the next way we're going to harm a patient?
- If there's one thing you could change about this agency, what would it be?
- If there's one thing that you don't want to see change, what would it be and why?

To make employees comfortable, the answers are written on slips of paper and circulated so the source of the suggestion is not identifiable.

Anecdotal evidence suggests that the campaign is working. For example, a driver from the durable medical equipment division noticed that he was picking up the same type of enteral pump frequently for different issues. "He brought it to his boss, saying 'Can you look into this to see if there's any type of trend because it seems like there's a problem with this type of equipment?'" Myers said. "The manufacturer initially said there wasn't an issue, but within a month they called and there was a major recall because of what this driver recognized."

Using Transparency in Reporting on Performance to Spur Improvement

The home care group displays its performance publicly to create healthy competition among divisions to improve. Along a main office corridor is a display called the pillars of operational excellence, which provides current performance on indicators of employee engagement, patient satisfaction, progress toward national patient safety and quality goals, as well as goals related to finance and growth.

The group also uses dashboards organized around the Institute of Medicine's six domains of health (safety and effectiveness domains are shown in Appendix B). The results are sent to three professional advisory committees, which include physicians, pharmacists, nurses, therapists, consumers, clergy, and social workers, all of whom meet quarterly to suggest improvement based on the data. For example, one of these committees recommended creating a remote monitoring system for patients with surgical wounds to enable field staff to transmit photos to a wound specialist who can confer with physicians to make treatment changes as necessary.

The home health services unit also implemented standardized education on surgical wound care, which led to a more proactive approach to wound management. Using the remote monitoring system, the wound specialist nurse reviews the care of all new patients with a surgical wound and accompanies nursing staff on visits with patients that are experiencing a difficult recovery. These steps led to an increase in the proportion of patients with improvement in wound status from 67 percent during July–September 2009 to 83 percent during April–June 2010. (In comparison, the state and national rates were 76 percent and 80 percent, respectively, during 2009.)

To improve care transitions, the clinical team reviewed best practices and decided to increase the number of visits to patients immediately after a hospital discharge and improve handoffs between providers in the acute setting and those providing home care at discharge. The home care group's monthly hospital admission rate subsequently fell from 28 percent of all patients transferred or discharged from home care in August 2009 to 19 percent of patients in December 2009 (Exhibit 8).

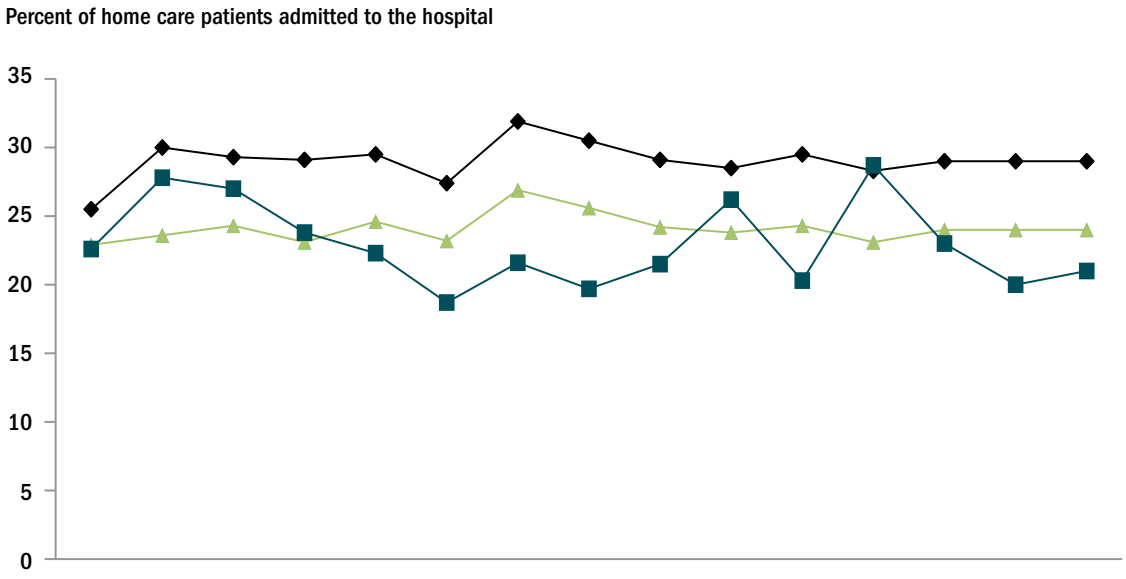
After seeing a subsequent increase in its hospitalization rate, the home care group began reviewing every unplanned admission to identify root causes and plan improvements, such as using "clinical pathways" to standardize the provision of chronic care during home visits. The group implemented remote monitoring for high-risk patients, such as those with heart failure or chronic obstructive pulmonary disease. When these patients' vital signs or symptoms fall outside of parameters, a remote monitoring nurse will contact them or send a home care nurse to check their status. The remote nurse then works with the patient's physician to adjust treatment or expedite a follow-up visit when needed to prevent clinical deterioration. The home care group also collaborates with Johns Hopkins Health System's hospitals, physician group, and health plan in a broader initiative to identify systemic causes of hospital readmissions and to ensure that home care plays a vital role in interventions to improve care transitions, according to Myers.

As a result of such efforts, the Johns Hopkins Home Care Group's annual hospitalization rate remained below the state and national averages for the fiscal year ending June 2010 (23% as compared with 24% and 29%, respectively). As of July 2010, the group achieved its goal of ranking at the 80th percentile (top 20 percent) of home health agencies nationwide on the acute care hospitalization measure.

Standardizing Training and Checking for Consistency

The home care group also works with the Johns Hopkins Hospital to ensure orientation material and training for more specialized practices, including infusion and respiratory care, are consistent with hospital programs to reduce risk of variation in care. To check that employees are using appropriate techniques for high-risk procedures, the home care group also sponsors a biannual event at which employees must demonstrate competency in hand-off communication, care of patients on ventilators, use of peripherally inserted central-line catheters, as well as hand-hygiene techniques

Exhibit 8. Acute Care Hospitalization Rate at Johns Hopkins Home Care Group



	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10
National	26	30	29	29	30	27	32	31	29	29	30	28	29	29	29
State	23	24	24	23	25	23	27	26	24	24	24	23	24	24	24
JHHCG	23	28	27	24	22	19	22	20	22	26	20	29	23	20	21

Note: Population includes all Medicare and Medicaid patients discharged or transferred from home care.
Source: Johns Hopkins Home Care Group based on Home Health Quality Improvement Project.

and infusion pump programming. Staff also receive training at the event.

To verify that staff follow procedures and learn about safety risks in the field, the group's executive management team also performs the equivalent of "executive walk rounds" in the field on a monthly basis. "You may see the president, myself, or many other executives get in the car and spend the day with one of the field staff," Myers said. As a result of the walk rounds, the home care group learned employees were concerned that distractions in the warehouse would lead to an error in filling an order. The home care group has restricted access to the warehouse to prevent such distractions, Myers said.

THEMES AND INSIGHTS

Johns Hopkins Medicine's success in achieving patient safety goals requires providing frontline staff with the knowledge, techniques, and resources (including time and coaching) to recognize safety threats, set local priorities for addressing these threats, and take action to mitigate them. Such work requires reinforcement by leaders, who create motivation and accountability for achieving these goals. Executives also play a critical role in identifying and removing bureaucratic obstacles to high-quality care and in setting a high bar for transparency with the board of trustees, who will ask hard questions about the institution's shortcomings, when warranted.

The organization has reduced resistance to patient safety efforts by translating quality improvement techniques into terms that resonate with staff. For example, the system's experts in lean production developed clinical examples to illustrate the concepts commonly explained in manufacturing terms. Leaders were careful to separate any discussion of patient

safety objectives from issues related to financial operations. This was critical for engaging department heads, faculty, and staff who had come to equate process reengineering with budget cuts.

Patient safety advocates within the institution use motivational techniques to engage the interest of frontline staff, such as posters that showed the days or weeks since the last hospital-acquired infection or another type of safety incident. Eliciting and acting on staff reports about safety concerns helps to instill confidence about managers' commitment to safety efforts. The system also makes ample use of compelling anecdotes and stories, which illustrate the benefits of an engaged frontline staff in improving safety. Unit-level improvements accumulate across the organization to reinforce a culture of mindfulness for safety.

The results of the safety survey and anecdotal evidence suggest a safety culture is permeating the organization. Davis, executive director of the Center for Innovation in Quality Patient Care, recounted a story about the registration clerks who work in the ambulatory care center. "They stopped me one day and said, 'We think we could help.' I said, 'Great. What do you want to do?' They said, 'We think we should be trained as first responders because frequently somebody will code (i.e., go into cardiopulmonary arrest) on the first floor and our job is to call the code team. But it sometimes takes two or three or four minutes for them to get here and we clear the area, but then we have to stand around and wait,'" Davis said. Three weeks after the group was trained in cardiopulmonary resuscitation, the clerks resuscitated a pulseless baby brought to the front door of the facility, Davis said.

Despite such successes, staff at Johns Hopkins Medicine see far more work to be done. Paine, the director of patient safety for Johns Hopkins Hospital, expects to devote the next five years to developing better measures of outcomes. Better assessment of risk is also needed, Pronovost said. In the science of safety, "we've tried to pretend everything could be measured as a rate when it is completely biased when measured as a rate," he said. As an example, he points to reporting of medication errors, which may reflect only those that are serious enough to be detected because they result in observable patient harm.

Others see the need for greater involvement by human factors engineers to conduct more robust investigation of errors and to design more effective solutions. At the same time, more care must be given to researching the impact adverse patient safety events have on the caregivers themselves. "We have bred caregivers up to this point to be rough and tumble and shake it off and move on. We've neglected the fact that they're human, too. And it takes a toll," Paine said.

CONCLUSION

Johns Hopkins Medicine sets a high aspiration for its safety program: to be the safest in the world. This aspiration appears to reflect leaders' realization—borne of well-publicized patient safety lapses—that the institution's reputation depends on rigorous efforts to identify and address threats to patient safety. The organization puts this aspiration into action by setting goals, empowering frontline staff to make improvements, and rigorously measuring results through cascading levels of accountability from clinical units to the system as a whole. Through such concrete actions, the institution reinforces its commitment to becoming a model of patient safety. This commitment not only increases the performance expectations for all Johns Hopkins employees, it elevates the standard for patient safety at hospitals nationwide.

A summary of findings from all case studies in this series, *Keeping the Commitment: A Progress Report on Four Early Leaders in Patient Safety Improvement,* will be available in spring 2011 on www.commonwealthfund.org.

NOTES

1 D. M. Berwick, D. R. Calkins, C. J. McCannon et al., "The 100,000 Lives Campaign: Setting a Goal and a Deadline for Improving Health Care Quality," *Journal of the American Medical Association,* Jan. 18, 2006 295(3):324–27; and P. J. Pronovost, G. A. Goeschel, E. Colantuoni et al., "Sustaining Reductions in Catheter Related Bloodstream Infections in Michigan Intensive Care Units: Observational Study," *BMJ,* Feb. 4, 2010 340:c309.

2 R. M. Wachter, "Patient Safety at Ten: Unmistakable Progress, Troubling Gaps," *Health Affairs,* Jan. 2010 29(1):165–73; and C. P. Landrigan, G. J. Parry, C. B. Bones et al., "Temporal Trends in Rates of Patient Harm Resulting from Medical Care," *New England Journal of Medicine*, Nov. 25, 2010 363(22):2124–34.

3 D. McCarthy and D. Blumenthal, *Committed to Safety: Ten Case Studies on Reducing Harm to Patients* (New York: The Commonwealth Fund, April 2006); and D. McCarthy and D. Blumenthal, "Stories from the Sharp End: Case Studies in Safety Improvement," *Milbank Quarterly,* March 2006 84(1):165–200.

4 For a synthesis of findings across sites, see D. McCarthy and S. Klein, *Keeping the Commitment: A Progress Report on Four Early Leaders in Patient Safety Improvement* (New York: The Commonwealth Fund, March 2011).

5 In February 2001, Josie King, an 18-month-old girl recovering at Johns Hopkins Children's Center from burns she received falling in a tub of scalding water, died of dehydration. Hospital staff missed the warning signs her mother had observed (E. Niedowski, "How Medical Error Took a Little Girl's Life," *The Baltimore Sun,* Dec. 14, 2003). Later that year, Ellen Roche, a healthy 24-year-old technician participating in an asthma study, died of acute respiratory distress less than one month after inhaling the chemical hexamethonium, which constricts the airway. The U.S. Food and Drug Administration faulted the university's oversight of clinical trials involving human subjects (S. Levine, "FDA Faults Clinical Research at Hopkins: Report Cites Conflicts, Communication Lapses," *Washington Post,* Sept. 8, 2001).

6 The phrase "lean production" was coined in the late 1980s by John Krafcik of the Massachusetts Institute of Technology and is derived from the Toyota Production System and manufacturing principles in use for decades. Supported by a congruent organizational culture, lean is a management strategy for organizing and managing various operations through the identification of the value-added and non-value-added steps in any process or value stream. Lean eliminates waste by requiring less time, money, material, and labor while generating higher quality through the standardization of processes. The essence of lean is doing more with less. The lean model defines the value of a service or product in terms of the needs and satisfaction of customers or stakeholders. One example of a lean effort in health care is the standardization of processes associated with an evidence-based "bundle" of steps for ventilator care to reduce the rate of ventilator-acquired infections.

7 Six Sigma is a business improvement methodology that was first implemented by Motorola, Inc., in 1986 to increase performance and decrease process variation in its manufacturing division. The method for eliminating defects in products or service has evolved over the last two decades and is now employed in many fields. Each project is carried out through a defined sequence of steps, designed to identify process weaknesses and potential improvements.

8 P. Pronovost, B. Weast, M. Schwarz et al., "Medication Reconciliation: A Practical Tool to Reduce the Risk of Medication Errors," *Journal of Critical Care,* Dec. 2003 18(4):201–5; S. M. Berenholtz, P. J. Pronovost, P. A. Lipsett et al., "Eliminating Catheter-Related Bloodstream Infections in the Intensive Care Unit," *Critical Care Medicine,* Oct. 2004 32(10):2014–20; S. M. Berenholtz, S. Milanovich, A. Faircloth et al., "Improving Care for the Ventilated Patient," *Joint Commission Journal on Quality and Safety,* April 2004 30(4):195–204; and P. Pronovost, B. Weast, B. Rosenstein et al., "Implementing and Validating a Comprehensive Unit-Based Safety Program," *Journal of Patient Safety,* March 2005 1(1):33–40.

9 The safety curriculum is available at www.safercare.net.

[10] P. Pronovost, S. Berenholtz, T. Dorman et al., "Improving Communication in the ICU Using Daily Goals," *Journal of Critical Care,* June 2003 18(2):71–75.

[11] Agency for Healthcare Research and Quality, Patient Safety Network Glossary, http://psnet.ahrq.gov/glossary.aspx.

[12] SBAR had its origins on nuclear submarines and was first adapted to health care at Kaiser Permanente; see McCarthy and Blumenthal, *Committed to Safety,* 2006; and M. Leonard, S. Graham, and B. Taggart, "Effective Teamwork and Communication in Patient Safety," in *Achieving Safe and Reliable Healthcare*, edited by M. Leonard, A. Frankel, and T. Simmonds (Chicago: Health Administration Press, 2004), 37–64.

[13] J. B. Sexton, R. L. Helmreich, T. B. Neilands, et al, "The Safety Attitudes Questionnaire: Psychometric Properties, Benchmarking Data, and Emerging Research," BMC Health Services Research 2006, 6:44; http://www.uth.tmc.edu/schools/med/imed/patient_safety/questionnaires/SAQBibliography.html.

[14] J. Timmel, P. S. Kent, C. G. Holzmueller et al., "Impact of the Comprehensive Unit-Based Safety Program (CUSP) on Safety Culture in a Surgical Inpatient Unit," *Joint Commission Journal on Quality and Patient Safety,* June 2010 36(6):252–60.

[15] Interventions to prevent CLABSIs included educating clinicians about a bundle of five evidence-based infection-control practices (hand washing, using full-barrier precautions during the insertion of central venous catheters, cleaning the skin with chlorhexidine, avoiding the femoral site if possible, and removing unnecessary catheters), instituting a checklist to assure adherence to the bundle, creating a "central-line cart" to assure availability of needed infection control supplies, stopping the procedure (in nonemergency situations) if these practices are not followed, discussing the removal of catheters during daily rounds, and collecting and giving teams data on the number and rates of CLABSIs using a standard definition (see Berenholtz, Pronovost, Lipsett et al, "Eliminating Catheter-Related Bloodstream Infections," 2004).

[16] P. J. Pronovost, D. Needham, S. Berenholtz et al., "An Intervenion to Decrease Catheter-Related Bloodstream Infections in the ICU," *New England Journal of Medicine,* Dec. 28, 2006 355(26):2725–32.

[17] Pronovost, Goeschel, Colantuoni et al., "Sustaining Reductions in Catheter-Related Bloodstream Infections," 2010.

[18] A. Lipitz-Snyderman, D. Steinwachs, D. M. Needham et al., "Impact of a Statewide Intensive Care Unit Quality Improvement Initiative on Hospital Mortality and Length of Stay: Retrospective Comparative Analysis," *BMJ,* Jan. 28, 2011 342:d219.

[19] L. A. Paine, B. J. Rosenstein, J. B. Sexton et al., "Assessing and Improving Safety Culture Throughout an Academic Medical Centre: A Prospective Cohort Study," *Quality and Safety in Health Care,* Dec. 2010 19(6):547–54.

Appendix A. Department-Level Patient Safety Scorecard

Department of Oncology

FY10 Safety Dashboard

MOCK DATA

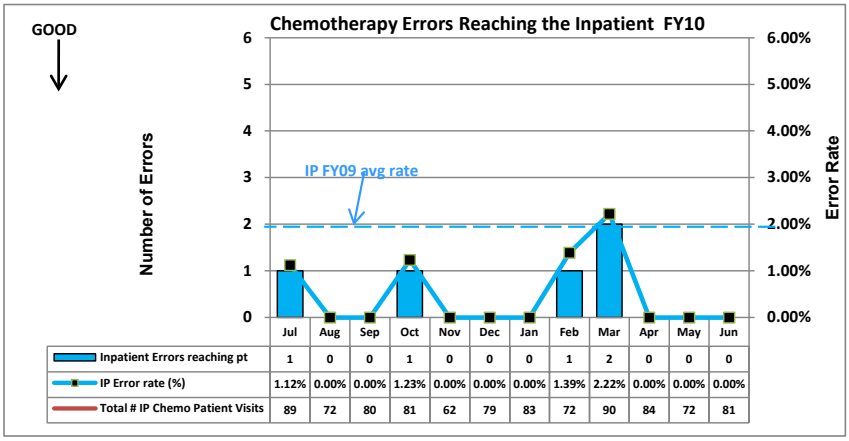
SAFE (OUTCOME MEASURES)

Shared Measure- Onc/Pharm

Measure: Chemotherapy Medication Errors Reaching Inpatient

Chemo med errors reaching pt per # inpatient chemotherapy admissions

Frequency: Monthly
Source: PSN, email, verbal reports
Benchmark: FY09 data
Baseline: FY09 data
IP FY09 average rate = 2.4%
Target: Maintenance

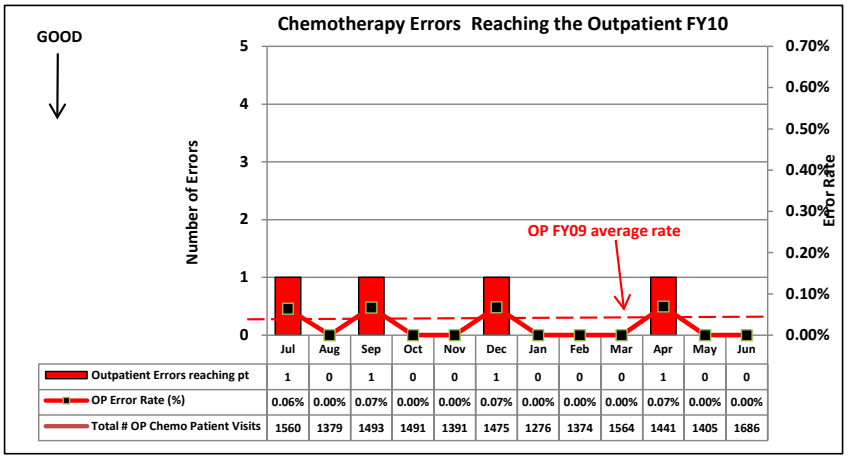


	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Inpatient Errors reaching pt	1	0	0	1	0	0	0	1	2	0	0	0
IP Error rate (%)	1.12%	0.00%	0.00%	1.23%	0.00%	0.00%	0.00%	1.39%	2.22%	0.00%	0.00%	0.00%
Total # IP Chemo Patient Visits	89	72	80	81	62	79	83	72	90	84	72	81

Measure: Chemotherapy Medication Errors Reaching Outpatient

Chemo med errors reaching pt per # outpatient chemotherapy visits

Frequency: Monthly
Source: PSN, email, verbal reports
Benchmark: FY09 data
Baseline: FY09 data
OP FY09 average rate = 0.10%
Target: Maintenance



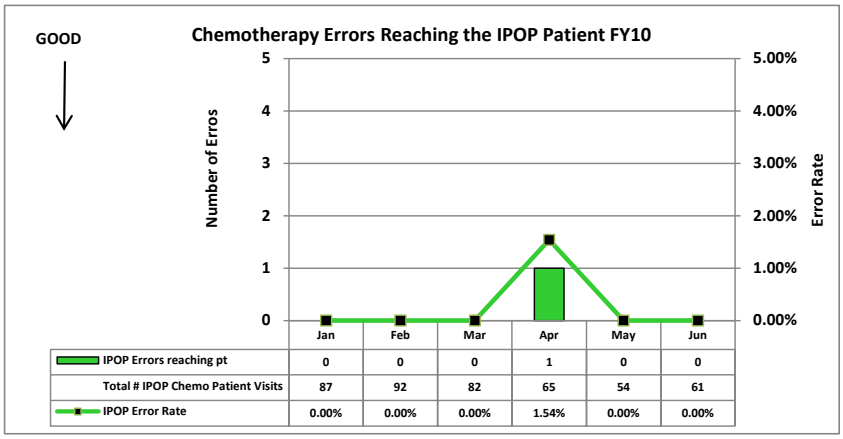
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Outpatient Errors reaching pt	1	0	1	0	0	1	0	0	0	1	0	0
OP Error Rate (%)	0.06%	0.00%	0.07%	0.00%	0.00%	0.07%	0.00%	0.00%	0.00%	0.07%	0.00%	0.00%
Total # OP Chemo Patient Visits	1560	1379	1493	1491	1391	1475	1276	1374	1564	1441	1405	1686

Measure: Chemotherapy Medication Errors Reaching IPOP Patient

Chemo med errors reaching pt per # IPOP chemotherapy visits

Frequency: Monthly
Source: PSN, email, verbal reports
Benchmark: FY09 data
Baseline: FY09 data

Target: Maintenance



	Jan	Feb	Mar	Apr	May	Jun
IPOP Errors reaching pt	0	0	0	1	0	0
Total # IPOP Chemo Patient Visits	87	92	82	65	54	61
IPOP Error Rate	0.00%	0.00%	0.00%	1.54%	0.00%	0.00%

Mock Data

SAFE (continued)

Measure: Survival to Discharge of Critical Care Patients FY2010 to Date

# of patients who received critical care and survived to DC / total # patients who received critical care*

Frequency: Monthly
Source: Eclipsys Reports of Critical Care
Benchmark: FY08-09 rate
Target:
Goal: Improvement

*Definition: * Critical care patient is anyone who received mechanical ventilation &/or CVVHD.*

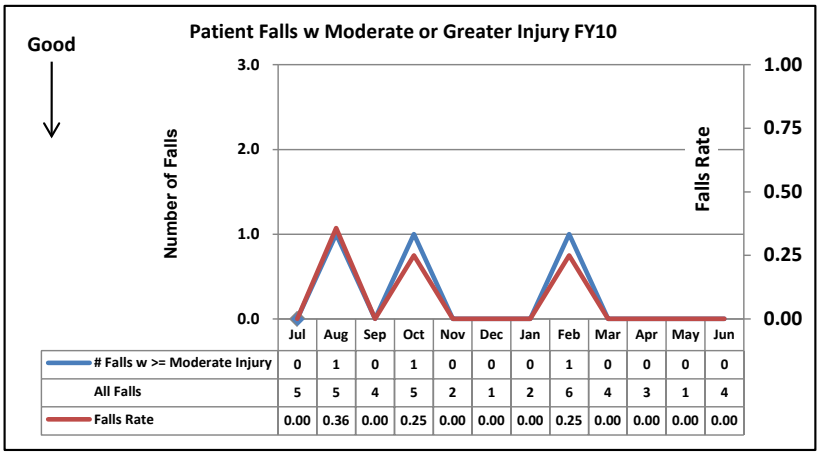
Month	# Critical Care Pts	Monthly Survival Rate
Jul	15	33%
Aug	10	50%
Sep	12	42%
Oct	8	38%
Nov	13	54%
Dec	11	46%
Jan	15	53%
Feb	10	40%
Mar	12	58%
Apr	14	58%
May	7	29%
Jun	14	36%

Measure: Patient Falls with Injury Rate

Patient falls with moderate or greater injury

Frequency: Monthly
Source: Dept of Nursing, PSN
Benchmark: NDNQI standard
Target: 1 fall with moderate or severe injury *(1 fall/1,000 pt days)*
Goal: Maintenance

FY09 average = 0.09 falls per 1000 pt days



	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
# Falls w >= Moderate Injury	0	1	0	1	0	0	0	1	0	0	0	0
All Falls	5	5	4	5	2	1	2	6	4	3	1	4
Falls Rate	0.00	0.36	0.00	0.25	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00

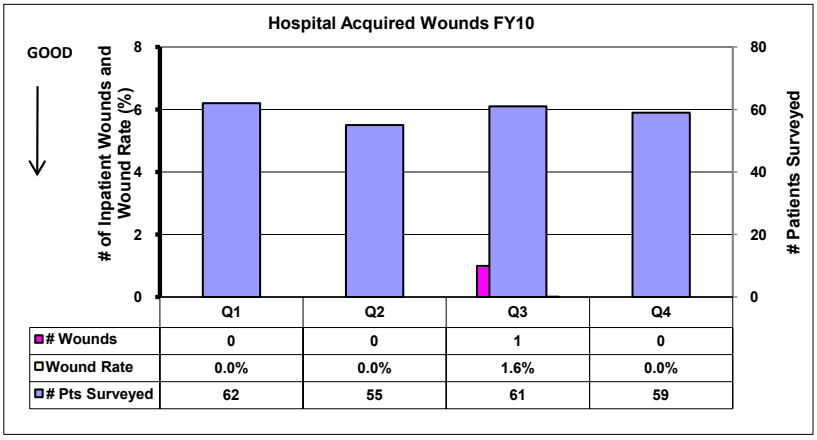
Potentially Preventable Condition

Measure: Hospital-Acquired Wounds

% of patients who acquired pressure ulcers as IP

Frequency: Quarterly
Source: Hospital Pressure Ulcer Report
Benchmark: NDNQI standard (less than the quarterly % below)
Target: Less than 8% of screened IPs acquiring pressure ulcers
Goal: Improvement

FY 09 average = 2.0% (none > stage 2)



	Q1	Q2	Q3	Q4
# Wounds	0	0	1	0
Wound Rate	0.0%	0.0%	1.6%	0.0%
# Pts Surveyed	62	55	61	59

Mock Data

EFFECTIVE (PROCESS MEASURES)

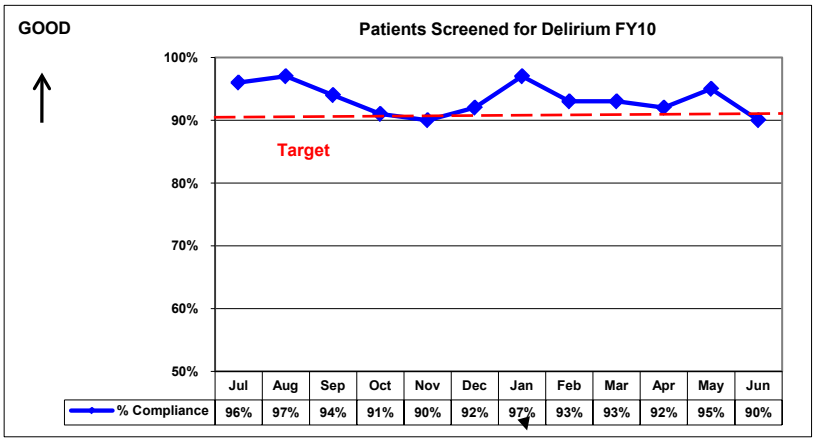
Adherence to Evidence-Based Policy or Guidelines

Measure: Delirium Screen Compliance

Percent of patients screened for delirium.
Average of 0500 and 1700 screenings.

Frequency: Monthly
Source: Delirium Screening Unit Audits
Benchmark: Historical Data
Baseline: 80%
Target: 90%
Goal: Improvement

FY09 Avg = 93%



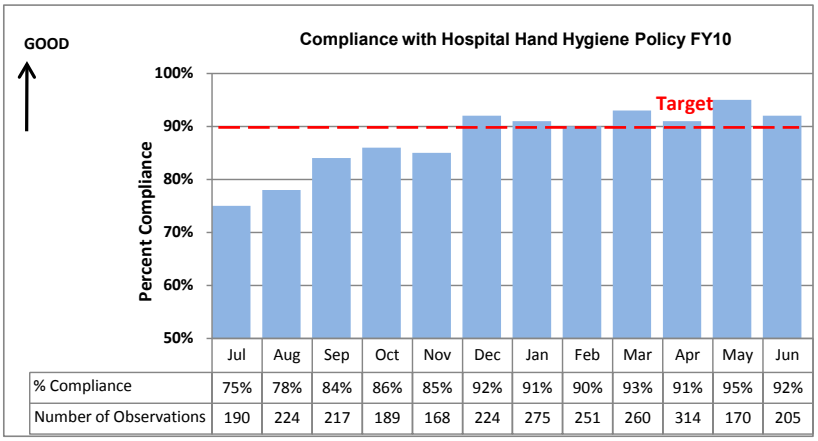
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
% Compliance	96%	97%	94%	91%	90%	92%	97%	93%	93%	92%	95%	90%

Adherence to Evidence-Based Policy or Guidelines

Measure: Hand Hygiene Compliance

Compliance with Institutional policy regarding hand washing

Frequency: Monthly
Source: Hand Hygiene Dashboard
Benchmark: Historical Data
Baseline: 71% (Q4 FY09 avg.)
Target: 90% compliance
Goal: Improvement



	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
% Compliance	75%	78%	84%	86%	85%	92%	91%	90%	93%	91%	95%	92%
Number of Observations	190	224	217	189	168	224	275	251	260	314	170	205

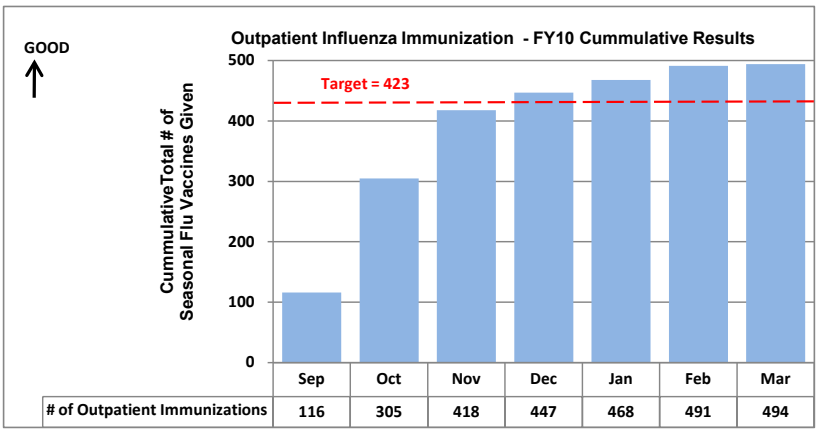
Measure: Outpatient Immunization

Influenza immunizations received

Frequency: Monthly *(during flu season)*
Source:
Benchmark: Historical Data
Baseline: 385 pts

Baseline data collected from Sept 08-Mar 09.

Target: 10% Improvement
Goal: Improvement



	Sep	Oct	Nov	Dec	Jan	Feb	Mar
# of Outpatient Immunizations	116	305	418	447	468	491	494

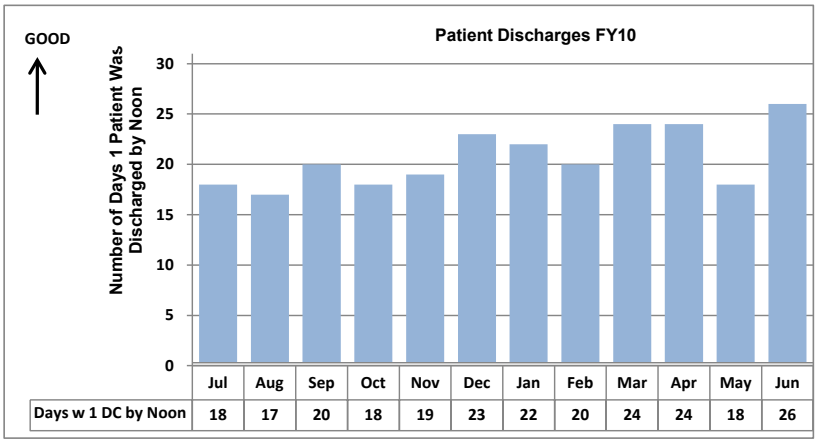
Mock Data

Efficient/Timely Patient Care

Measure: Patient Discharge Time

1 discharge per day by noon from 5th floor units

Frequency: Monthly
Source: Datamart
Baseline: 79% accomplished
(based on Q4FY09 data)
Target: 100% accomplished
Goal: Improvement



	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Days w 1 DC by Noon	18	17	20	18	19	23	22	20	24	24	18	26

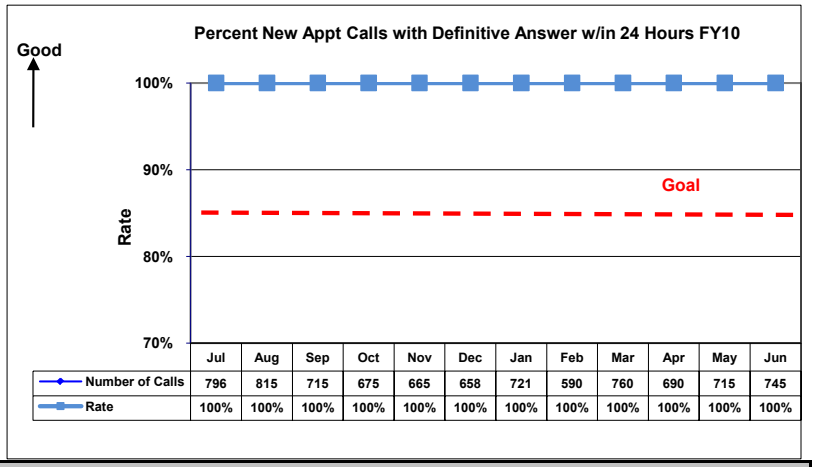
EFFECTIVE (continued)

Measure: New Patient Appointment

*% Patients who received definitive Answer**** w/in 24 hrs*

Frequency: Monthly
Source: Oncology Referral Office
Baseline: 81%
Goal: 85%

***Definitive answer is defined as:
1) appointment; 2) no appt; or
3) medical record review.



	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Number of Calls	796	815	715	675	665	658	721	590	760	690	715	745
Rate	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

SAFETY/TEAMWORK CULTURE (CONTEXT MEASURES)

Measure: SAQ Response Rate

% staff survey responses received for annual SAQ survey

Source: Annual Survey
Goal: 100% of units have ≥ 40% response rate*

** Prior to 09-10 survey, response rate cutoff was 60%*

	2007	*2008*	***2009-10***
Number of Units with ≥ 40% Response *& N>5	8	9	**8**
Total Number of Units	8	10	**14**
% of Units with > 40% Response*	100%	90%	**57%**

Measure: Safety Attitudes Questionnaire

% of units with > 60% of staff reporting a positive safety climate

Source: Annual Survey
Goal: 100% of units reporting >60% positive scores

For Units with ≥ 40% Response*	*2007*	*2008*	***2009-10***
Safety - % of units with ≥ 60% positive	100%	100%	**100%**
Teamwork - % of units with ≥ 60% positive	100%	100%	**88%**

For consultation about details of your Department's SAQ results, please contact Lori Paine.

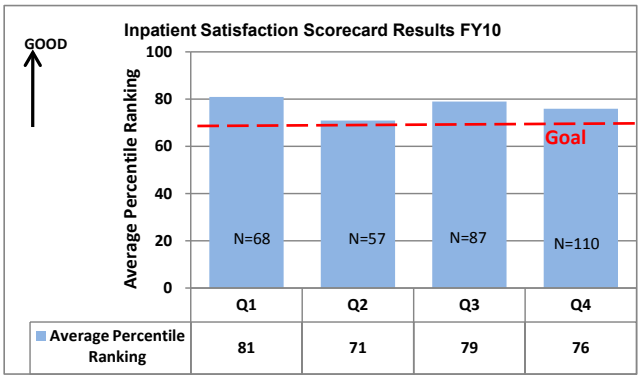
Mock Data

PATIENT CENTERED: Measures of Patient Satisfaction

Measure: Overall Oncology Inpatient Satisfaction

Press Ganey Average Inpatient Percentile Ranking

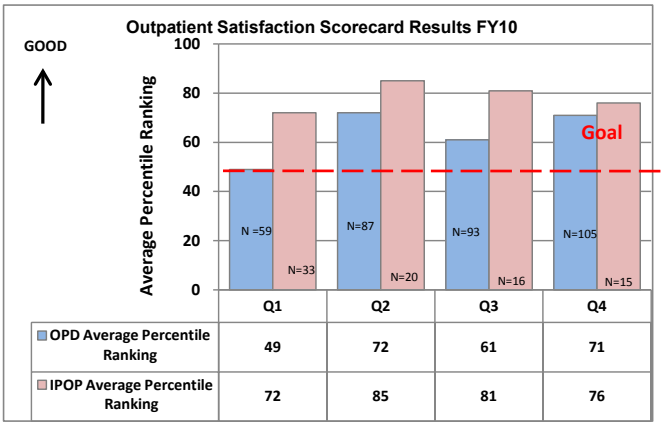
Source: Press Ganey Scorecard
Benchmark: Large Press Ganey Database
Goal: ≥ 70 percentile



Measure: Overall Oncology Outpatient Satisfaction

Press Ganey Percentile Rankings for OPD and IPOP

Source: Press Ganey Scorecard
Benchmark: Large Press Ganey Database
Goal: ≥ 50th percentile



QUALITATIVE ACCOMPLISHMENTS (Optional)

(E.g., safety issues addressed, remedied, and sustained 3 months after implementation.)

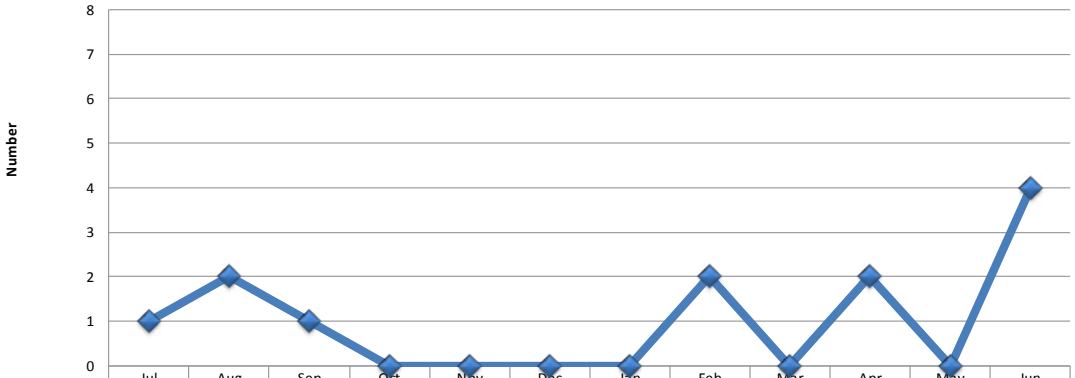
This space may be used to list qualitative accomplishments that improve patient safety and the quality of care.

Mock Data

Appendix B. Quality and Patient Safety Dashboard Organized Around Institute of Medicine Aims

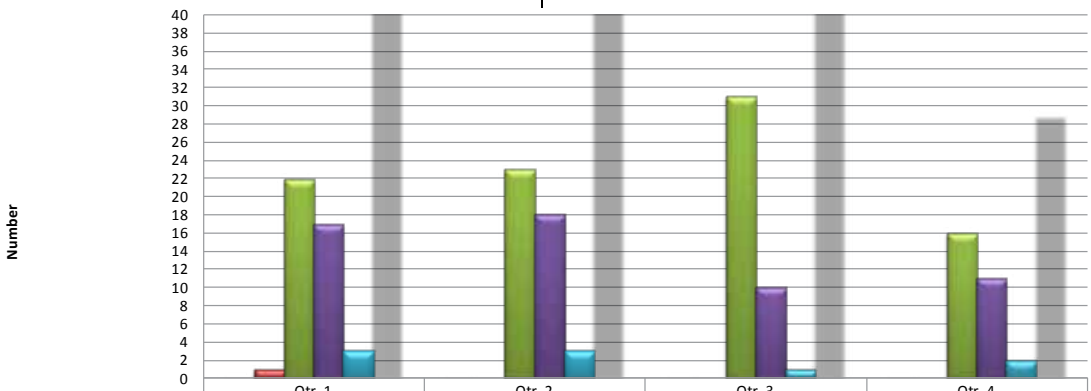
HHS Performance Improvement for FY 2010 (continued)
HHS Quality/Safety Dashboard

Activity	***Outcome***
SAFE CARE ▪ UTIs ○ Goal: No significant trends ○ Catheter related UTI's	▪ Goal met ▪ N= 34 foley catheters/month 12 reported for FY 10



	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Cath UTIs	1	2	1	0	0	0	0	2	0	2	0	4

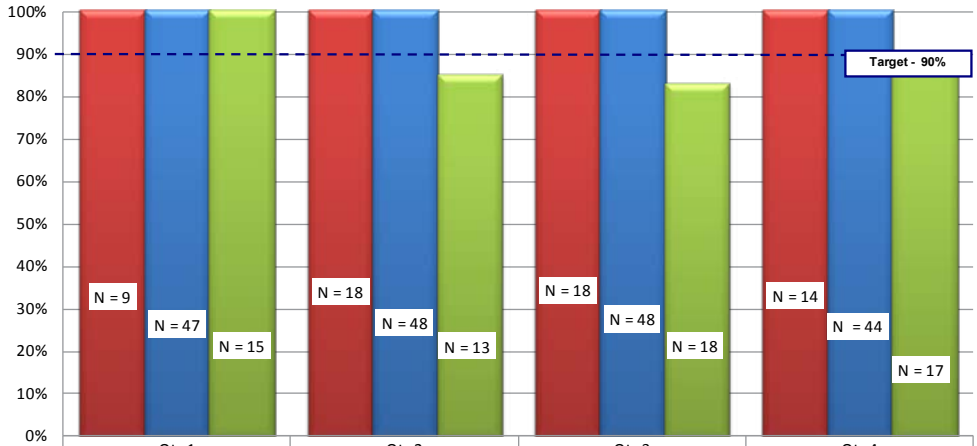
Activity	***Outcome***
SAFE CARE ▪ Patient Falls ○ Goal: Increase number of reported falls ○ Goal: Decrease number of falls resulting in hospitalization	▪ Goal met. ▪ Total falls reported: FY 10 – 157 FY 09 – 156 ▪ Hospitalized: FY 10 –6 FY 09– 8



	Qtr. 1	Qtr. 2	Qtr. 3	Qtr. 4
Harm Score "A, A1, A2"	0	0	0	0
Harm Score "B1, B2"	1	0	0	0
Harm Score "C"	22	23	31	16
Harm Score "D"	17	18	10	11
Harm Score "E and Above"	3	3	1	2
Total	43	44	42	29

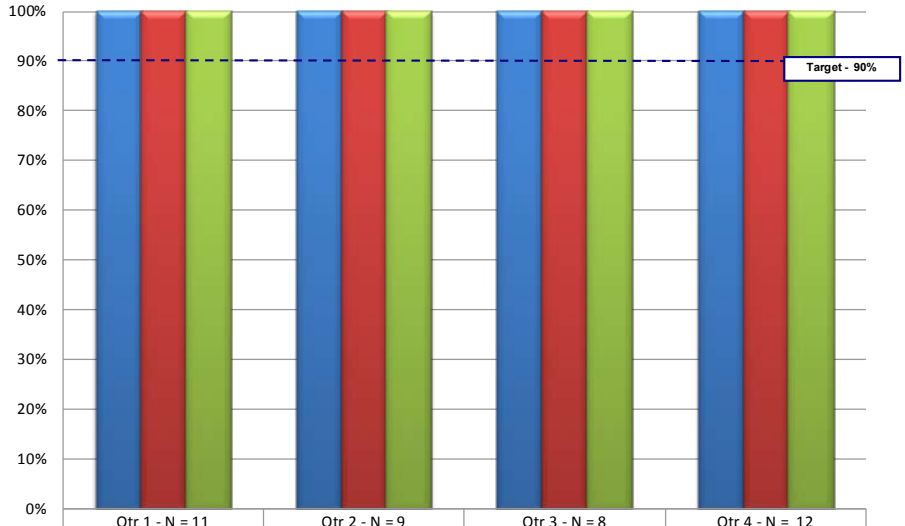
Performance Improvement for FY 2010 (continued)
HHS Quality/Safety Dashboard

Activity	***Outcome***
SAFE CARE ▪ NPSG Medication Reconciliation on Admission ○ Goal: 90%	▪ Goal met at 100%



	Qtr 1	Qtr 2	Qtr 3	Qtr 4
Discrepancies are resolved	100%	100%	100%	100%
Medication Reconciliation on Admission	100%	100%	100%	100%
Potential interactions reported	100%	85%	83%	88%

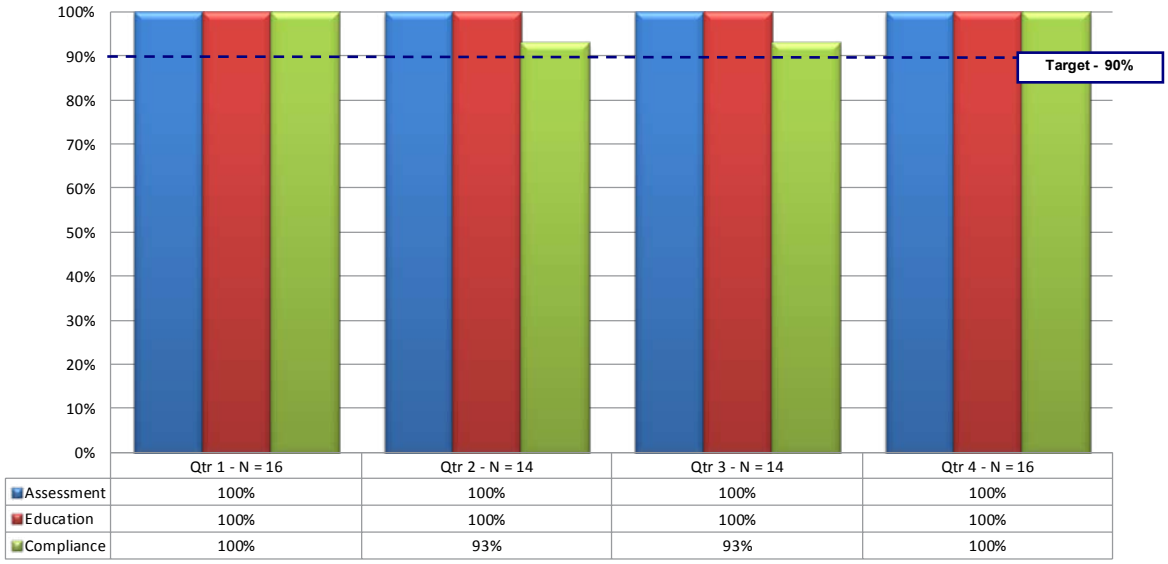
Activity	***Outcome***
SAFE CARE ▪ NPSG Medication Reconciliation on Transfer/Discharge ○ Goals: 90%	▪ Goal met at 100%



	Qtr 1 - N = 11	Qtr 2 - N = 9	Qtr 3 - N = 8	Qtr 4 - N = 12
Transfer-med list sent to facility	100%	100%	100%	100%
Discharge - med list sent to next provider	100%	100%	100%	100%
Discharge - med list sent to patient	100%	100%	100%	100%

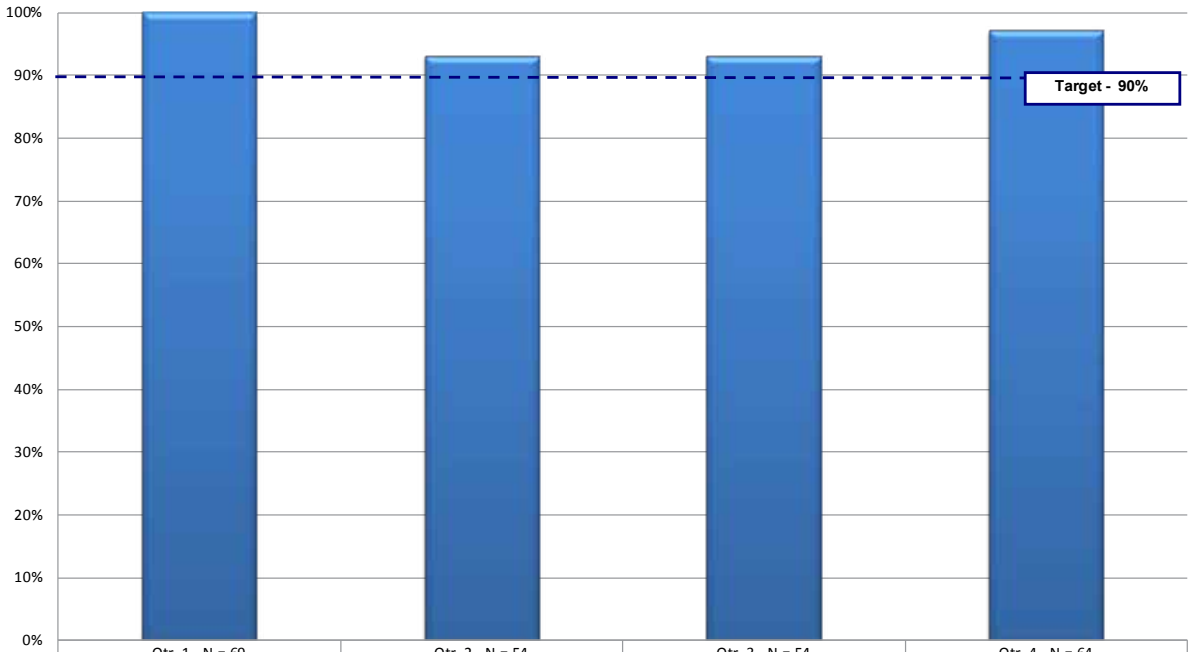
Performance Improvement for FY 2010 (continued)
HHS Quality/Safety Dashboard

Activity	***Outcome***
SAFE CARE ▪ NPSG Oxygen Safety ○ Goals: 90%	▪ Goal met at 98%



	Qtr 1 - N = 16	Qtr 2 - N = 14	Qtr 3 - N = 14	Qtr 4 - N = 16
Assessment	100%	100%	100%	100%
Education	100%	100%	100%	100%
Compliance	100%	93%	93%	100%

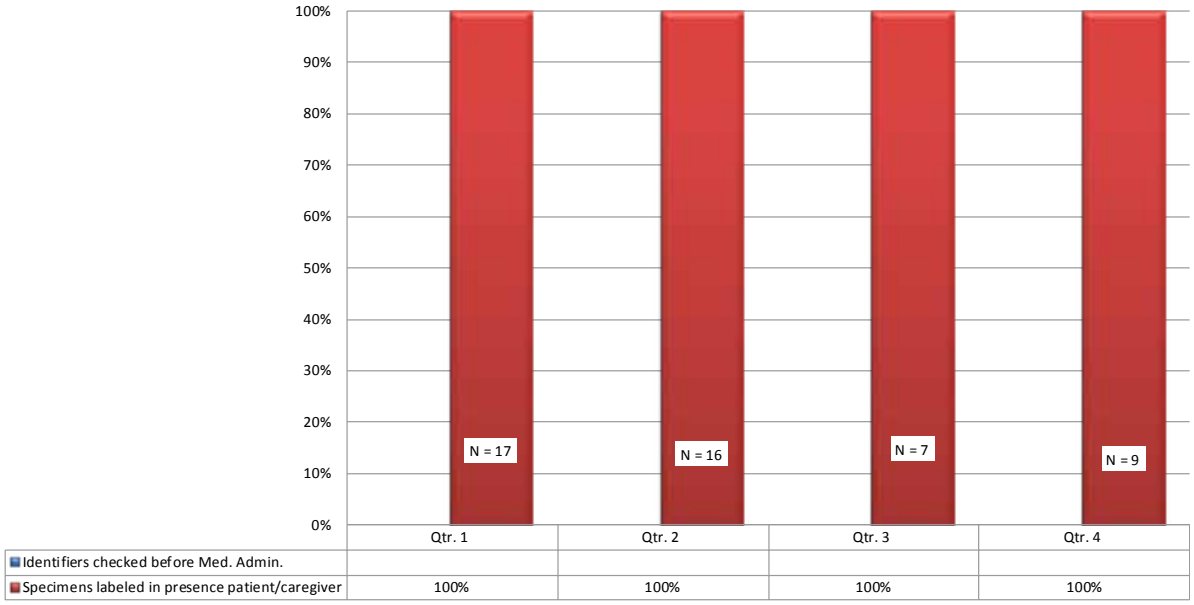
Activity	***Outcome***
SAFE CARE ▪ NPSG Hand-Off Communication ○ Goals: 90%	▪ Goal met at 96%



Qtr. 1 - N = 69	Qtr. 2 - N = 54	Qtr. 3 - N = 54	Qtr. 4 - N = 64
100%	93%	93%	97%

Performance Improvement for FY 2010 (continued)
HHS Quality/Safety Dashboard

Activity	***Outcome***
SAFE CARE ▪ NPSG Accuracy of the Use of Two Patient Identifiers ○ Goal: 90% for 2 patient identifiers for medication administration ○ Goal: 100% for specimens labeled with 2 patient identifiers in presence pt/CG	▪ Goal met at 100% ▪ Goal not met at 100%

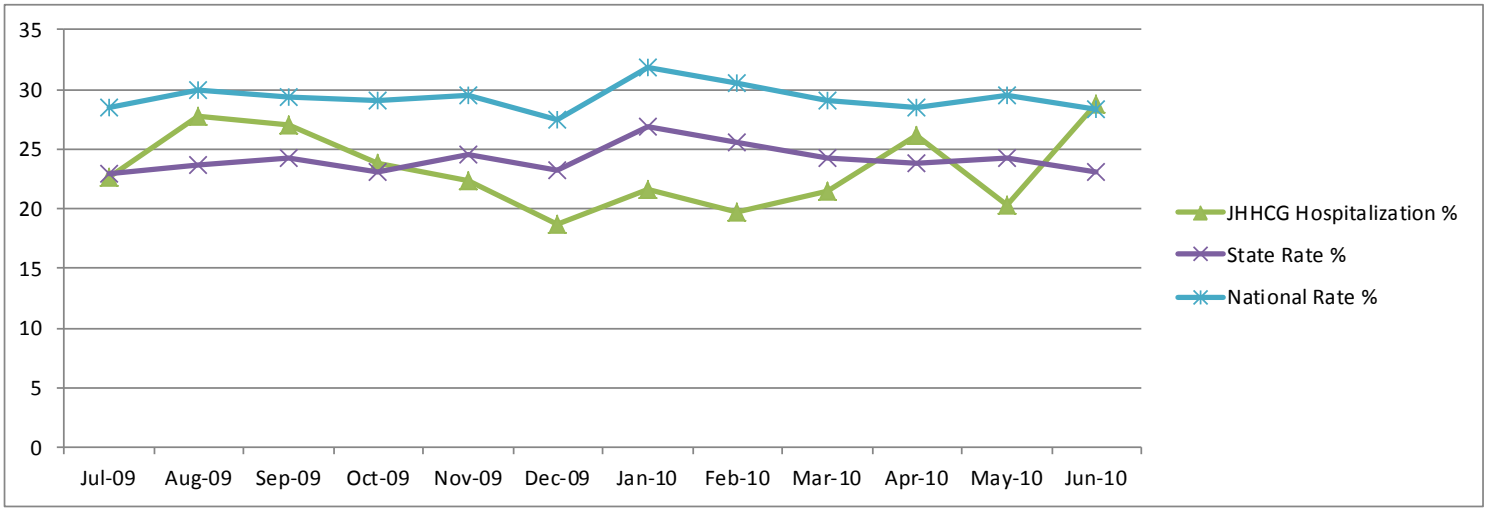


Performance Improvement for FY 2010 (continued)
HHS Quality/Safety Dashboard

Activity	***Outcome***
EFFECTIVE CARE ▪ Acute Care Hospitalization Rate ○ Goal: Maintain 24% using Home Health Quality Improvement (HHQI) data Due to OASIS C changes data from HHQI is based on monthly hospitalizations vs. transfer/discharges	▪ Goal met: HHS ranges from 19% to 28%. ▪ HHS Hospitalization rate for FY10 was 23.3%.

Monthly Hospitalizations vs. Transfers/Discharges
Number of Monthly Hospitalizations out of Total Transfers/Discharges

	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Total
JHHCG Hospitalizations	58	70	76	69	63	55	50	46	63	79	56	72	757
Transfers/Discharges	257	252	282	290	282	294	232	233	293	301	276	251	3243
JHHCG Hospitalization %	22.6	27.8	27	23.8	22.3	18.7	21.6	19.7	21.5	26.2	20.3	28.7	23.3
State Rate %	22.9	23.6	24.3	23.1	24.6	23.2	26.9	25.6	24.2	23.8	24.3	23.1	24.1
National Rate %	28.5	30	29.3	29.1	29.5	27.4	31.9	30.5	29.1	28.5	29.5	28.3	29.2



Performance Improvement for FY 2010 (continued)
HHS Quality/Safety Dashboard

<table>
<tr><th>Activity</th><th>Outcome</th></tr>
<tr><td>EFFECTIVE CARE
• Wound Care Improvement Program
○ Goal: Implement standardized education from intake to discharge based on best practice guidelines/HHS protocols</td><td>• Verified HHS existing wound protocols met best practice
• Referral process education provided to Home Care Coordinators, Surgical and Medical staff at JHH, and Case Managers and WOCNs at JHH and HCGH to ensure wound measurement and appropriate wound orders
Measures
<table><tr><td>Process measures</td><td>10/09</td><td>7/10</td></tr><tr><td>Wound measurement</td><td>26%</td><td>86% ↑</td></tr><tr><td>Appropriate wound orders</td><td>25%</td><td>96% ↑</td></tr></table></td></tr>
<tr><td>○ Goal: Implement standardized education regarding required elements of documentation</td><td>• Wound Advisor and camera implemented. Education to clinicians, ongoing monitoring with feedback to supervisor followed by education to clinician
Measures
<table><tr><td>Process measures</td><td>10/09</td><td>7/10</td></tr><tr><td>Picture at SOC</td><td>46%</td><td>92% ↑</td></tr><tr><td>WOCN affiliated to wound cases at SOC</td><td>7%</td><td>92% ↑</td></tr></table></td></tr>
<tr><td>○ Goal: Establish a proactive approach to wound management using Wound Advisor as a tool</td><td>• WOCN reviews all new and stalled wounds and co-visits with Nursing staff on difficult cases.</td></tr>
<tr><td>○ Goal: Increase “Improvement in Status of Surgical Wounds” from 70% to 80%</td><td>Measure
<table><tr><td>Outcome measure</td><td>Qtr1 FY 10</td><td>Qtr2</td><td>Qtr3</td><td>Qtr4</td><td>State</td><td>Nat’l</td></tr><tr><td>Improvement in status of surgical wounds</td><td>67%</td><td>57%</td><td>78%</td><td>83%</td><td>76%</td><td>80%</td></tr></table></td></tr>
</table>

About the Authors

Sarah Klein has written about health care for more than 10 years as a reporter for publications including *Crain's Chicago Business* and *American Medical News*. She serves as editor of *Quality Matters*, a newsletter published by The Commonwealth Fund. She received a B.A. from Washington University and attended the Graduate School of Journalism at the University of California, Berkeley.

Douglas McCarthy, M.B.A., president of Issues Research, Inc., in Durango, Colorado, is senior research adviser to The Commonwealth Fund. He supports the Commonwealth Fund Commission on a High Performance Health System's scorecard project, conducts case studies of high-performing health care organizations, and is a contributing editor to the bimonthly newsletter *Quality Matters*. His 25-year career has spanned research, policy, operations, and consulting roles for government, corporate, academic, and philanthropic organizations. He has authored and coauthored reports and peer-reviewed articles on patient safety and other health care–related topics. Mr. McCarthy received his bachelor's degree with honors from Yale College and a master's degree in health care management from the University of Connecticut. During 1996–1997, he was a public policy fellow at the Hubert H. Humphrey School of Public Affairs at the University of Minnesota.

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