New England Baptist Hospital

CASE STUDY

LEADing by Example: New England Baptist Hospital

When Aerosmith front man and Rock and Roll Hall of Famer Steven Tyler required knee surgery, he knew where to go—New England Baptist Hospital, Massachusetts' leader in orthopedic care. When former Boston Red Sox second baseman and Emmy winning sportscaster Jerry Remy needed spine surgery, he was directed to the Baptist, an orthopedic specialty hospital sitting atop Parker Hill with a view of several other prestigious Boston hospitals. When world-famous violinist Roman Totenberg's back became too painful to tolerate, he found relief only at NEBH's Spine Center. "I must admit, I admire the way they run the Hospital," Totenberg says. "When you arrive, people are ready for you and know what's going on. It gives you a feeling of confidence."

That's a familiar refrain heard from many of the 12,550 patients undergoing surgery and tens of thousands of others seeking care at the Baptist each year. Often it's the Baptist's service and positive experience patients first remember, from the red rose that greets each patient upon admission, to the hotel-quality robe, room service meals and other hallmarks of NEBH's legendary service. It's the reason the Baptist consistently scores above the 95th percentile in patient satisfaction nationally. "It's clear that they treat every patient like they are the most important patient in the Hospital," says singer Tyler. "That kind of service makes an impression no matter who you are."

What's lesser known about the Baptist is the work that goes on behind the scenes to keep patients safe. It's one thing to hand a rose to each patient, it's another to consistently prevent them from harm as a result of infections, blood clots or the medication errors while in the hospital—events that occur in many facilities with alarming frequency. Producing stellar outcomes requires a fastidious dedication to preventing hospital readmissions and ensuring patients don't get harmed or sicker from preventable hospital-acquired conditions. That's hard work.

"We pay close attention to our outcomes," says Mary Beth Hamilton, RN, a Surgical Unit Nurse and NEBH Clinical Leader. "We look at our systems. We look at every problem and to solve it down to the root cause to create the perfect system for our patients." U.S. News & World Report, the Centers for Medicare and Medicaid Services, the Commonwealth Fund Quality Study, the Betsy Lehman Center for Patient Safety and others recognize the Baptist's performance. Its track record is also one of the reasons the world champion Boston Celtics have considered New England Baptist Hospital their official team hospital for more than 22 seasons.

Despite the accolades, the Baptist, until two years ago, like many hospitals, was trying to improve itself one initiative at a time—a common but not highly successful

strategy to become a truly safe organization. Hospital Leadership believed they created a culture of safety and shared accountability, but frontline workers weren't so sure, and were concerned individuals may suffer for systemic mistakes. Leadership was supportive of the quality improvement efforts, but too much of the weight fell on the shoulders of a handful of internal safety champions. In 2007, things began to change. The Baptist became one of five leading health care organizations seeking to become America's safest hospitals. Thanks to the LEAD program, a Blue Cross Blue Shield of Massachusetts initiative to help a handful of high performing, high-quality provider entities pursue organization-wide quality improvement, the Baptist could truly focus on achieving transformational results.

Under LEAD, NEBH committed to audacious goals—to eliminate medication events, surgical site infections and post-operative blood clots within the institution. Committing to these goals was the easy part. The hard work was to follow. This case study highlights the two-year odyssey the Baptist has taken in its quest to become one of the nation's safest hospitals, its results to date, and the challenges along the way, and ahead.

Background

Hospitals are dangerous places. In its 1999, landmark report, "*To Err is Human*," the Institute of Medicine (IOM) estimated that as many as 98,000 patients die in U.S. hospitals due to preventable medical errors. That's more than fatalities caused by traffic accidents, AIDS or breast cancer in the U.S. Over the last decade, the nation's hospitals have focused on quality and patient safety improvements. While notable achievements have been made, overall results are disappointing. In fact, in its May 2009 report, the U.S. Agency for Healthcare Research and Quality noted that patient safety actually declined by almost 1% per year over the six years since the IOM report.[i] The Agency still points to the IOM's decade-old report as the best estimate of the magnitude of medical errors.

There are many reasons for the slow rate of progress. Patient safety is still a nascent field. The work largely has been left to each hospital or provider organization to do—or not do — on its own. It involves changing an organization's culture and systems of care delivery, as well as improving communication and teamwork. These concepts have been slow to take root in the fragmented health care system. Until recently, the business case for quality improvement has been a weak one given our fee-for-service health care system. Investing in patient safety efforts may not bring a direct return on investment, at least not quickly. Even for the many hospitals whose leaders would like to make the investment in quality improvement, tight margins and budgetary pressures often take priority. Patient safety improvements demand a tenacious focus and a commitment from the Board and CEO that is lacking in many hospitals. The reality becomes a half-hearted commitment to patient safety that tends to be experimental, uneven and short lived. Other hospitals, meanwhile, are committed to improving their patient safety record, but in incremental fashion, either as a very specified quality improvement—reducing patient falls, for example—or in aims, shooting for a 10% reduction in medication mishaps, perhaps.

Such an outlook, however, is costly in lives and dollars. The IOM estimated that medical errors cost the nation as much as $29 billion each year. More recently, research shows that insurers pay an additional $19,480 on average, or nearly 50% more, for surgery patients who experience preventable post-operative infections and $7,838 in additional costs for patients suffering preventable blood clots.[ii] Insurers understand this and are acting differently. For example, nearly half of the annual increase the Baptist receives each year from Blue Cross Blue Shield of Massachusetts is tied to quality metrics, says CFO Tom Gheringhelli. The Blues comprise 37% of the Baptist's revenue. Meanwhile, NEBH's biggest payer, Medicare, as of October 2008, stopped paying hospitals for the costs of several hospital-acquired conditions, including certain types of infections. The list will only grow. What's more, as part of his 2010 budget plan, President Obama has proposed saving Medicare an estimated $26 billion by bundling some payments to include follow-up care. Hospitals with high rates of readmission within 30 days would be paid less. Medicare and Blue Cross combined accounts for two-thirds of the Hospital's business. "That becomes very tangible," Gheringhelli says. More importantly, it's tangible in the lives of patients and their families.

The Baptist, meanwhile, is thinking and acting differently. Its goals of eradicating medication errors, surgical site infection and post-operative blood clots are audacious compared to other hospitals that simply want to reduce such incidents. In an intensively competitive orthopedic marketplace—NEBH does more orthopedic surgery in Massachusetts than any other hospital, about 10.91% of the market share in 2007—an institution's reputation and outcomes is what it trades on. But the changing payment scene is only one of the reasons for the Baptist's commitment.

"I don't want to run a financially sound hospital when people I know come in and get an infection," says Helen Strieder, the Baptist's Interim President and CEO, and long-time NEBH board member. For Strieder, patient safety gets personal. It's a big factor in why patient safety gets encoded into the Baptist's DNA. It's also a factor in why Blue Cross sought NEBH to participate in the LEAD program. Karen Smith, former director of health care services at the Massachusetts Blues Plan noted "Their existing work around quality, particularly with infections," grabbed the insurer's attention. When Strieder headed the Board, shortly after the IOM's report came out, "the Board pushed for the infection rate going to zero," Strieder notes.

Surgical site infections aren't routine. Take an infection, for example, that settles in a new replaced hip. Organisms are drawn to the metal implant. The area has no blood supply, and as a result, antibiotics won't work. To get rid of that infection, surgeons now have to take out that new hip and replace it with a so-called spacer, limiting patients' mobility. For several weeks, even months, patients are infused with antibiotic therapy. If they are lucky, the artificial hip can be put back in with another surgery. Some patients aren't so lucky.

When looking to transform its patient safety efforts, Baptist administrators looked outside of health care for models. Aviation and manufacturing are places where health care organizations tend to look for models when approaching safety, teamwork, communication, root cause analysis to fix problems, as well as efforts to prospectively reduce risk.

Baptist administrators were attracted to the Toyota Production System method. The Toyota model combines attitudes, themes and specific techniques into an integrated socio-technical system in order to produce quality products and outcomes efficiently. The principles of the Toyota method focus on waste elimination, employee participation, systems thinking and accountability.

Meanwhile, Maureen Broms, RN, MS, NEBH's Vice President of Health Care Quality and Patient Safety, looked to the Toyota model to transition the Baptist from being a solid organization to a truly great one. A crucial ingredient to get staff to report errors or near misses in order to begin fixing problems is creating an atmosphere where employees don't fear they will be blamed or reprimanded if mistakes are made and reported. Broms also saw Toyota was a way to begin transferring knowledge of top executives to frontline staff so safety and efficiency become engrained in the Baptist's DNA. That approach has become a business maxim for how great organizations remain great when key leaders leave.

The Baptist looked to consultants, Value Capture, who are well versed in the Toyota method. Value Capture worked with NEBH leaders and workers to train them in the ways of Toyota, as well as jointly develop ways in which Toyota principles could be applied specifically on the units at the Baptist.

The principles that guide NEBH's organizational transformation include:

1. **Simple and direct processes**. All pathways, whether it's delivery of a medicine or manufacturing a car, should be void of loops, forking processes or workarounds. The pathway to deliver a medicine from the time it is ordered to the patient's mouth included 54 steps when charted out. That has been reduced to six steps on the medical unit, for example.

2. **Binary connections are made at key steps in the process**. The concept is that all customer-supplier connections are direct, between two people, with a yes-no way to make a request and receive a response. Applied to the medication process, a physician's medication order for a patient is made directly to a pharmacist stationed on the unit, who ensures the order is clear, complete, correct and can be filled.

3. **Each person's work or activity is highly specified**. As a result, the outcome, timing, sequence and content are all expected. No surprises. If something unexpected occurs, people are empowered to "stop the line," or the process, in order to resolve the issue.

4. **All improvement occurs using the scientific method**, under the guidance of a teacher, at the level closest to the patient, all toward the characteristics of the ideal process.

The Baptist created three multidisciplinary teams, with all members of each team trained in the Toyota Production System method, to oversee each of its initiatives—eliminating medication events, surgical site infections and post-operative blood clots. These include:

- Using the key principles above to design the ideal process;
- Creating a help chain to resolve issues that arise—so that issues are addressed as they occur and problem-solving occurs on the frontlines of the organization;
- Identifying key metrics to measure success; and
- Implementing a comprehensive communication plan so that successes are highlighted.

"People started seeing the significant progress we were making (under LEAD) versus the incremental approach we had been doing before," says Broms.

Striving for Excellence: Yesterday, Today and Tomorrow

Since it's origins more than a century ago, the Baptist has pursued excellence. The Hospital is the site of one of the first artificial hip replacements in the nation, and continues to lead the way in new methods to diagnose and treat all forms of musculoskeletal disorders and disease. More recently, the Baptist has been focused on providing safe and high quality care with legendary service.

Since the IOM's *To Err is Human* report in late 1999, the Baptist has been working to make patients even safer. That work gained new focus and meaning in 2002 when the Board simply asked, "Where's the data?" While quality efforts were underway at the Hospital and the Baptist had superior outcomes, the Board wanted to see the proof. The result: Hospital staff designed clinical dashboards so that Baptist officials could set and measure progress on quality and outcome goals.

The dashboards give direction and perspective to Hospital staff, management and its Board of Trustees on key areas of patient safety. One dashboard, for example, keeps tabs on how the Baptist is performing on infection rates, unanticipated deaths, readmissions, medication events, patient falls and skin breakdown. A second dashboard tracks other indicators, those measured for Joint Commission accreditation purposes for example, allowing Baptist management to compare its performance against national quality benchmarks. To this day, the quality snapshots are presented at each month's Board meeting front and center. "People know that this comes even before the Finance Committee report," Strieder says.

Getting to zero. It was around this time that the NEBH Board, then led by Strieder, "pushed for the infection rate going to zero," she says. The former CEO was right on it. "He got the resources allocated to get the program running," Strieder says. Baptist management had both a directive and the dashboards allowing a clear view of the patient safety course ahead. In 2003, the Hospital set its sites on reducing healthcare-acquired infections (HAIs), which harm nearly 2 million U.S. hospital patients each year, and results in 99,000 deaths and $20 billion in health care costs, according to the Centers for Disease Control and Prevention (CDC). Most HAIs are preventable. Diagnostic failures, prevention and treatment errors, communication and equipment failures are contributors to HAIs. An estimated 2.6% of nearly 30 million operations each year are complicated by surgical site infections.[iii] Translated, that means U.S. hospital patients suffer some 780,000 surgical site infections each year.

Preventable surgical site infections can be a death knell for hospitals whose specialty is fixing knees, hips, shoulders and spines. Orthopedic procedures are seen as elective surgeries. In many cases, they are a choice, and so too is the decision at which hospital to have such procedures done. Hospitals are currently well reimbursed for orthopedic procedures and competition among hospitals in the Boston area to provide such services is intense.

Yet, a plethora of dangers lurk for patients at many such facilities. Some of the most basic threats, lack of hand washing by doctors, nurses and clinicians, for example, are among the biggest threats to patients and a hospitals' reputation. A survey of hospitals in 2007 by The Leapfrog Group found 87% of hospitals don't consistently follow guidelines for preventing some of the most common HAIs.

When the Baptist began its attack on surgical site infections, its infection rate was 0.7%, half of the 1.5% national average among orthopedic facilities. Hospital officials convened a multidisciplinary team—which included operating room nurses, orthopedic surgeons, anesthesiologists, and managers from infection control, health care quality, facilities and environmental management. While the intent of working toward zero healthcare-associated infections was clear, there were many who doubted it could be done. At first, "none of us believed it, even myself," says Baptist Chief Nursing Officer Diane Gulczynski, RN, MS, CNOR.

The team first made sure Hospital policies and procedures were being followed. "We had to look at the whole environment," says Maureen Spencer, RN, the Hospital's Infection Control Manager. "We found some discrepancies." The team oversaw a host of changes from improving traffic control in the operating room with new signage and a monitoring system, retraining staff in the use of surgical scrub solution, ensuring that cloth caps were used consistently in and around the operating room, maintaining the HVAC system regularly, and replacing a quarter-century old steam sterilizer. These changes reduced the infection rate from 0.7 to 0.6%, from 63 infections in 8,837 cases in 2003 to 60 infections in 9,669 cases in 2004.

Years later under the LEAD initiative, these approaches to process and workflow changes would yield dividends. The new approach in essence, was sowing the seeds of transformation. The team followed with increasing education around hand washing, changing surgical dressings and using antibacterial sutures. Investing in safety isn't cheap. It costs $20,000 a year just to scrub and sanitize 1,500 pieces of equipment used in the operating room, radiology and nursing units, for example. Yet, infection control's approach—always steeped in evidence-based research—also saved money. Routine use of Bacitracin/Polymixin irrigation was halted due to a lack of evidence that the product prevented surgical site infections. That saved the Hospital $110,000 a year.

Hand washing is targeted. One of the most effective infection control practices remains one of the most basic: hand washing. Yet, hand hygiene is one of the toughest for hospitals to master. In 2007 only 35% of hospitals saw full compliance with hand hygiene practices.[iv]

In 2004 Baptist officials focused on its hand hygiene compliance, a crucial step to get surgical site infections to zero. Basic steps were taken; more dispensers filled with Soft N Sure, an effective anti-germ quick acting soap were put around the Hospital, while the operating room started using a one-step alcohol/iodopher surgical skin scrub. But the hand-washing effort needed a marketing campaign, figured Spencer, who was a common fixture in the NEBH cafeteria, chatting with staffers, giving away yoga mats, stuffed animals and hundreds of products to promote hand hygiene. "She's a zealot," says John Richmond, MD, Chair of Orthopedics at NEBH of Spencer.

Over the years, Baptist infection control officials have posted dozens of different infection control educational posters. One such effort spoofed the successful "Got Milk?" campaign, entitled "Got Soap?" Other campaigns, including "Don't Catch the Flu Bear Blues" and the "Bug Beat Fair," were attended by more than 300 staff members doing a bean bag toss, a raffle and other games. Flowerpots with hand-washing products were given away. A monthly *Bug Beat* newsletter was launched, surgical grand rounds were instituted on preventing surgical site infections, and Infection Control began attending orthopedic staff meetings.

At department head meetings and in the Boardroom, meanwhile, attention focused on the quality dashboards. "We'd see the progression of the teams producing outcomes," recalls Spencer. Surgical site infections, for example, fell again in 2006 to 0.5%, or 46 infections out of 9,027 cases. All these efforts led to more aggressive steps and audacious goals, including the launch of a full-scale attack the super bug, MRSA.

A Platform to be Audacious: Transformation under LEAD Program

In the fall of 2006, Blue Cross Blue Shield of Massachusetts was looking to work with five high-performing, high-quality provider organizations to "raise the expectations of what is possible and accelerate the pursuit of dramatic quality improvement in

other organizations," says Karen Smith, former director of health care services at the Massachusetts Blues Plan. BCBSMA sought out NEBH because of its reputation for striving for excellence and its commitment to eradicate surgical site infections. The Baptist's Vice President of Health Care Quality and Patient Safety, Maureen Broms, jumped at the insurer's offer.

The deal: in exchange for a $1.5 million two-year grant, the Baptist would sign onto a so-called community of practice, a collaborative learning forum for CEOs and other leaders of each of the five LEAD organizations. NEBH would also have to set "audacious" goals under the project, engage trustees and hospital/physician leaders in quality improvement, use improvement strategies that engage the entire organization, and involve affiliated physicians.

"We were asked to transform care," says Broms, who pushed Hospital leaders to commit to zero not just in one but three quality improvement areas—zero medication errors reaching patients, zero surgical site infections and zero dangerous post-operative blood clots.

Setting such audacious goals was a new way of thinking in health care. That was the easy part. Broms then faced the hard part. Could she get the CEO to buy in? What about physician leaders? Support from top leadership, , says Broms, would be the most important element to pulling this off. "We first had to break the barrier in thinking whether is it possible to get to zero," recalls Broms. "The goal was a stretch. There were a lot of naysayers."

Thankfully, the Baptist had planted some seeds early on with its effort to reduce surgical site infections. That helped to cultivate some key ingredients, such as listening to and learning from frontline workers, teamwork and communication. For example, behind the eye-catching, entertaining, hand-washing campaign, Baptist infection control and quality champions had introduced social learning theory to change staff behavior. Akin to positive parenting, social learning theory focuses on the learning that occurs with a social context. People learn from one another by observing , imitating and modeling, for example. "The reinforcement is positive, not punishment," Spencer says. "It's more about positive teamwork and constant reinforcement." It is never punitive.

It's also about listening to frontline workers. Many of the best ideas captured on infection control's hand hygiene posters came from the connection between infection control personnel and orthopedic staff nurses. "You listen to the staff," Spencer insists. That relationship is essential in disseminating information, implementing infection control measures and monitoring infection rates. "We have infection control liaisons who meet each month. They bring issues to us and they interface back on the floor."

Many of these successful efforts depended on internal champions, such as Spencer, Broms, Gulczynski and Dr. Susan Davidson. You need champions to preach the virtues of evidence-based practices, as a way to win over other staff and to ensure

things are implemented. Spencer, for example, got disparate players on board, preaching hand washing and other infection control practices in orthopedic and surgical grand rounds, making sure clinicians and staff were practicing proper infection control, meeting regularly with housekeeping staff, presenting monthly to the hospital operations and nurses operations committees. "Basically, you don't give up," Spencer says. Broms also knew that if quality champions or a key leader left NEBH, the energy, effort and focus of quality improvement and safety could be lost. Quality and safety were too important to leave to one individual, it had to be an organizational mindset. Broms saw LEAD as the route to achieve this.

But first it required her to continue her quality champion role. Broms immersed herself in the LEAD program, went to every meeting, read, and learned about the Toyota Production System. She began introducing concepts of the model—binary connection, call outs and problems logs—in leadership meetings, identifying operational issues, and offering ways to overcome such issues with real-time problem-solving. "They would hear about it and it would sink in," Broms says.

Medication Management

The Baptist's first effort under LEAD, notes Broms, was "to eliminate medication events that reach the patient, through perfect medication delivery, every time." That's a tall order in health care, as medication errors are the most pervasive of medical errors. But if achieved, they can have the biggest potential payoff.

Baptist leaders understood the complexity of the goal, and realized they needed help. Value Capture was tapped. After learning about the Toyota method, Baptist staff conducted a comprehensive six-week assessment of the hospital's current system for ordering, fulfilling and delivering medication. What they found was not pretty—it took a circuitous 54 steps from a physician's medication order to the point the medicine reached the patient. The medication pathway, in short, had too many places where things can go wrong.

Using Toyota's system as a model, consultants worked with NEBH staff to craft a new process to safely deliver nearly 30,000 doses of medicines each month. Dozens of steps were taken out of the process. Among the most important changes: putting a pharmacist on the units to facilitate medication safety, patient care collaboration and reduce the need for workarounds. This face-to-face interaction, referred to as a binary connection, lets the pharmacist clarify and verify each medication order from a physician personally, reducing the common and time-consuming practice of order-entry pharmacists or nurses tracking down physicians whose orders were unclear, incomplete or illegible. As part of the redesigned medication pathway, the pharmacist on the unit reads back the order to the physician or other prescriber to ensure it is legible and correct, increasing the likelihood that patients get the right does of the right medicine at the right time.

The face-to-face interaction helps to improve communication and teamwork, as the medication expert is there to work with doctors to provide the best medication

regime to patients. Perhaps more importantly, it begins building a team approach to patient care. “Communication is a huge factor,” says Sharon Connolly, RN, Nurse Manager of NEBH’s medical unit. “The team building has been very, very rewarding. I think that’s the biggest satisfier.”

Analyzing its existing processes, Hospital leaders discovered nearly one-third of each pharmacist’s time, or 2.5 hours of each 8-hour shift, was devoted to resolving problems related to incomplete, unclear or illegible medication orders. The result: the Hospital was spending $155,000 a year on confirming medication orders, a substantial waste. Charting the medication pathway also allowed staff and leaders to see how workarounds were built into the system, often by nurses who wanted to make sure they did right by patients. “We saw then that staff did not trust us and the system we put in place,” recalls Gulczynski.

The first two units targeted for implementation of the streamlined medication process were the medical unit and Pre-Admission Screening Unit (PASU). The former would test the unit in practice to see if events could be reduced and whether medications themselves would be delivered more quickly and efficiently. The PASU made sense as an early target, as that would give an onsite pharmacist an opportunity to reconcile the medicines of incoming patients, so there would be less chance of an adverse medication event occurring when they returned for surgery.

Under redesigned medication delivery, when the pharmacist and prescriber have completed the binary connection, the patient chart is given to the unit secretary, allowing nurses to act immediately when the patient reaches the nursing unit. As part of the revamped process, everyone has a specific function that produces an expected outcome. The process has become more precise science, less improvisational art. As a result, nursing staff report that the average amount of time it takes to get medications to patients has been cut in half.

Within this process, if someone forgets or fails to complete their specified task in the process, they can be called on it. “And anyone can call it out,” notes Broms, from secretaries, nurses, pharmacists or physicians. The “call out” may be the most powerful aspect of the redesigned medication process. In essence, it stops the line, in manufacturing parlance. “We need to do real-time problem solving,” says Broms, who said that was the biggest “aha moment” for her.

When a call-out occurs—perhaps after a physician who writes an order leaves the unit, making the binary connection—the goal becomes solving that issue on the spot so decreasing the likelihood it will happen again. When a call out occurs, staffers are taught to ask “five whys.” Asking questions is a more comfortable way of getting to root cause , especially if it’s a nurse calling out a doctor. “And it’s never about the person,” Broms emphasizes, “it’s always about a system.”

When a call out is sounded, the issue is documented in NEBH’s computerized Problem Log. “The Problem Log is available for anyone to look at, all the dirty laundry is out there,” Broms says. Strieder and other executives browse the log

regularly, never to blame anyone, but to see how issues are getting resolved, identify potential weak spots, and ensure issues get addressed. “Sometimes having the CEO just asking questions starts a flurry of activity,” Broms notes. “And it teaches others about what it takes to solve problems forever.”

For those issues that can’t be solved on the spot, a problem-solving help chain is employed. If it’s the third time, say , that a physician has walked off the unit without having the binary connection with the pharmacist, “that’s clearly an issue you can’t solve,” notes Broms, “so you may kick it up to your manager so they can try to solve the problem with their peer.” If unresolved, the issue gets kicked up the chain. “Each department has a help chain…they go across levels, clinical leader to clinical leader or manager to manager,” says Broms. “It’s never manager to vice president, and that’s because of safety.” A nurse or pharmacist may be reticent to seek help when they are forced to take it to a vice president. Under the old way, incidents were reported, sat in a queue and may or may not have gotten addressed for weeks. “The idea behind this: you call it out and you implement real-time problem solving,” says Broms. “This is built off the Toyota model.”

The change has produced results. On the medical unit, for example, the median time to process a medication order fell to less than five minutes today, half the time it takes on average hospital-wide. Only 38 orders per month, or 0.02%, on average, are put on hold for further clarification; about 2%, or 200 orders, are put on hold each month for the same reason hospital-wide. “You want the nurse to be spending time with the patient, not having to go back and forth to the chart and reinvent the wheel on some of these things,” says Hamilton. “You want to keep the nurse at the patients’ bed side.”

“Patients are happier, nurses are happier,” says Connolly. Patient satisfaction scores on the medical unit rose from 87.3 to 89.8 since the medication management effort was introduced; patients’ perception of the extent they are informed about their medicines on the unit rose from 88.3% to 92.8% this year. The medication safety initiative also helped cement earlier sporadic approaches to Hospital culture change. It was the medication effort under LEAD that got both leaders and frontline staff buying into the no-blame culture. “Staff understands leadership will back you up,” Connolly says.

Pre-Admission Screening Unit (PASU) was pegged as an initial target to implement the new medication delivery system. There, the notion was to station a pharmacist in the unit directly dealing with patients, reconciling their medications, and directly connecting with physicians and nurses so that orders were clarified on the spot and the impact on care more instantaneous. “That’s the first step in the perfect medication pathway, because if we get their medications right when they come through the door they we have a much better chance of continuing to get it right all the way along,” Broms says.

When Broms and team did observations in the PASU before implementing the reworked medication pathway, it quickly became clear the unit as a whole needed

attention. It took patients half a day to go through pre-admission screening; 30-minute waits were common in between clinician visits. “We said we can’t do medication pathway redesign in a broken system,” Broms recalls concluding. A redesign of PASU was initiated, making the process more logical. Patients would first see the on-site pharmacist to compare the list of at-home medications with those being prescribed in the Hospital, then go to a room where the nurse practitioner would see the patient, followed up by a medical technician. Rather than patients wondering around looking or waiting for providers, clinicians now go to them. A checklist was instituted so “everyone knows when someone else is finished with a patient,” says Broms.

The result: patients went through the PASU in 2.5 hours, rather than 4 on average; patient throughput in the unit increased from 28 to 35 patients per day; and both patient and staff satisfaction rose.

Key location. When a satellite pharmacist was introduced in the Post-Anesthesia Care Unit (PACU) in late 2008, the number of problems with post-op medication orders dropped from 34% to 10%. This is notable since 70% of all medication orders at NEBH are given immediately after surgery. Unlike the PASU, the goal here was to see how quickly a patient in immediate need gets his or her medicine. Meanwhile, the number of post-operative medication orders placed on hold by nurses for unclear orders dropped by 42%. The number of pages to the ordering practitioner to clarify an order has plummeted by 85%.

The introduction of the revamped medication process in the PACU had a significant impact on the orthopedic surgical unit, where patients are moved after recovering from anesthesia in the PACU. “The minute the patient arrives, their medications are available to us,” says Mary Beth Hamilton, RN, Nurse Manager of the surgical floor. “One of the things we learned was to put the resources at the root of the problem.” Previously, two issues impacted the surgical unit, 1) the failure to consistently get needed medicines to patients in the first hours after surgery , and 2) failures occurring at the front end of the process, when admitted patients did not have access to their regular medicines because they weren’t on the Hospital formulary or because that information wasn’t conveyed to doctors. As a result, nurses were running around trying to work around the problem rather than caring for patients. Putting a pharmacist in the PACU and revamping the PASU process has led to a 66% drop in the calls surgical unit nurses are making to the pharmacy to get patient medicines, clarify orders and deal with other medication issues.

“You need to have successes before the buy in is going to happen,” Hamilton adds. For surgical unit nurses, buy in started in late 2008 when a pharmacist was put in the PACU. “It saved so much time for nurses. The nurses saw that and we’re building on that,” she says.

Still there are challenges. “The area we still struggle with is trying to get to the real time problem solving, that’s probably the biggest hurdle,” says Hamilton. “We still have to meet the patients’ needs. So sometimes the real-time problem solving

doesn't happen in real time because you have to get beyond the crisis. We're still working with that, but we've made tremendous strides." The Baptist also hopes to roll out the new medication pathway and the Toyota method to other parts of the Hospital by late 2009.

Taking on MRSA

After addressing environmental and hand-washing concerns, NEBH infection control introduced other efforts to prevent surgical site infections including; ; administering antibiotics a half hour before surgery, controlling patients' blood sugar, and using silver dressings and antimicrobial sutures. Infection control also began setting its sights on the super bug, methicillin-resistant Staphylococcus aureus (MRSA).

MRSA, a highly dangerous, antibiotic-resistant staphylococcus infection, is the most common HAI. The number of MRSA-associated hospital stays more than tripled after 2000 reaching 368,600 in 2005,[v] and increasing nearly tenfold since 1995.[vi] Patients hospitalized for MRSA spend more time in the hospital and have a higher death rate than non-MRSA-infected patients. About one of every 20 of the 368,600 patients treated for MRSA in U.S. hospitals in 2005died.[vii]

The Baptist has become one of the very few hospitals in the nation pre-screening surgery patients for both MRSA and methicillin-sensitive staph (MSSA). While some hospitals screen patients on admission, NEBH screens for MRSA and MSSA during patients' pre-screening admission several days or weeks before admission. So the same process that has pharmacists conducting upfront medication reviews for safety in the PASU sees unit nurses swabbing the noses of prospective patients. Before patients leave the unit, it's known whether they are among the 5% of people carrying the superbug.

"Some hospitals are screening patients on admission but that's too late, and they don't get the right antibiotic," says Susan Davidson, M.D., NEBH infectious disease and internal medicine specialist. Individuals testing positive for MRSA are cleaned, given an ointment and placed on Vancomycin,the only effective antibiotic for the MRSA. It's given again before surgery. "It only makes sense," Davidson says, "you want to prevent the organism from getting down in to the surgical site." MRSA represents more than half of all staph infections that occur in hospitalized patients, and can cause serious complications, particularly if it enters the bloodstream. Patients testing positive for staph aureus are treated with another antibiotic and undergo bathing.

"It's rare for us to see a staph aureus these days or MRSA," Spencer says. It's an expensive and time-consuming process, but it has helped to bring surgical site infections to 0.2%, within striking distance of zero. "I've been doing this for 36 years and it's the first hospital, from the top down, that buys into this and says do whatever you need to do," Spencer says.

NEBH laid the groundwork in its fight against MRSA in 2006, but applied precepts from the Toyota Production System a year later to help bolster its battle against the superbug. "The consultants educated the staff to the level where they could talk to doctors," says Spencer. "We saw a real cultural change with the staff." Call outs were applied to the process, which helped infection control and quality staff get to the root cause when someone didn't do their specific job.

"Its hard for surgeons who are used to being on their own and doing their own thing for years and years to have people come in and start to change the culture they have, and to start doing things as a team," Spencer says, adding that they adjusted, as they saw the common enemy, surgical site infections, decrease. "The last thing surgeons want to have to deal with is taking out an infected joint."

"There is pushback with each new thing," says Dr. Davidson. "They say 'no this is not going to work'. We explain the theory and offer evidence. Some doctors try it, then others eventually follow. "

Another Audacious Goal: Eliminating Postoperative PEs and DVTs

Blood clots that originate in deep veins in the thigh and calf, called deep vein thrombosis (DVT), most often occur in people who can't move around well or who have had recent surgery. Such blood clots can break loose and move to other parts of the body posing serious threats. Blood clots moving to the lungs, called a pulmonary embolism (PE) can be life threatening. Individuals between ages 50 and 80, and obese patients are among those at higher risk. Without therapy, as many as 85% of orthopedic patients could develop DVT.

A pulmonary embolism resulting from DVT is the most common cause of preventable hospital death.[viii] Giving appropriate patients prophylaxis anticoagulants is key to reducing this risk. While using blood thinners has become more common practice in hospitals, just how to optimally coagulate before orthopedic surgery has been a huge area of controversy, says John Richmond, MD, Chair of Orthopedics. "Anytime you try to treat someone, particularly to try to prevent a blood clot, you potentially create a bleeding situation. In orthopedic surgery, post-operative bleeding from a knee or hip replacement is a disaster because it can lead to drainage from the wound and secondary infection."

The occurrence of pulmonary emboli at NEBH is lower than national benchmark rates—2.3% for PEs vs. 3.7% nationally, and 4% for DVT vs. 12% nationally in Fiscal Year 2007. Looking simply at statistics and a low rate can lull surgeons or an institution into complacency. Seeing the threat blood clots pose to their patients continues to drive NEBH orthopedic surgeons to do better. The quest: how do you prevent a serious clot but at the same time not contribute to causing complication from bleeding? NEBH orthopedic surgeons believe they have found the answer, one that may lead them to that audacious goal of zero post-operative blood clots.

A motivating factor for Richmond and his NEBH peers comes from the shortcomings of a recognized guideline developed by the American College of Chest Surgeons

(ACCP). The issue: "We regard these guidelines as being potentially dangerous if they were routinely applied" to all orthopedic patients, he says. Patients with co-morbidities require specialized management, for example.

The LEAD initiative came just in time. Regulatory agencies were requiring that orthopedic surgeons apply the ACCP guidelines to the nearly 4,000 total joint replacements Baptist surgeons perform each year. "A lot of orthopedic surgeons regard this as dangerous," Richmond states. Under LEAD, a multidisciplinary group set to work on what could be done to eliminate PEs and DVTs. Current practices were evaluated, and the team defined its goal of tracking symptomatic blood clots. The team studied and conducted a focused review of patient readmissions and another of risk factors for DVTs and PEs, such as diabetes, obesity and poor nutrition. A review of anticoagulation management was conducted as well.

Surgeons challenge the Toyota method. Richmond speaks highly of the efforts using the Toyota Production System to facilitate how the Baptist transformed medication delivery and safety. "We think it has significantly decreased medication errors," says Richmond, pointing to advantages of upfront medication reconciliation and pharmacists being in the PACU, the point at which most medication orders are written. Richmond also gives kudos to the application of Toyota principles to fight surgical site infections. "We've seen the biggest effect with the MRSA screening program. It knocks the smarter staph out of the picture."

But when it came to the "improve-as-we-go" approach, orthopedic surgeons pushed back. Rather than wanting to adopt a modified Toyota approach to improvement, says Broms, they were more comfortable with "study it and then improve."

"The challenge is the individual physician practitioners," says Richmond. "Everybody has their own practice, and it takes some evidence to get them to alter their practice. The issue for physicians is that they wait for published findings."

An alternative for getting to zero. Not that NEBH surgeons were satisfied with simply beating national benchmarks. They wanted better results, but felt a better approach for DVTs was grounded in something more in their comfort zone—research. Hospital officials acquiesced, as they saw that such an approach could help decrease DVT and surgical site infection rates toward zero.

The approach, developed by NEBH surgeons and published in 2007 in a peer-reviewed journal, was called the Coumadin 1 mg. Protocol. The protocol is a specific low-dose Coumadin process that has very low risk of bleeding but which orthopedic surgeons think is very effective. It relies on 1 mg of Coumadin daily for seven days before surgery to induce an antithrombotic state without anti-coagulating the patient. Patients are discharged on 1 mg, dosing is monitored by a nurse practitioner while the patient is in the hospital, but not at home. Adjusted-dose Coumadin is used on high-risk patients. NEBH's multidisciplinary committee developed a risk assessment instrument for all lower extremity orthopedic surgeries.

“We have a system where we try to identify the high-risk patients for DVTs and use adjusted-dose Coumadin for those patients,” Richmond says. “So it’s a combination of using low-dose Coumadin on low-risk patients, and adjusted dose Coumadin on high risk patients.“ The results of the LEAD DVT program were encouraging: NEBH had a symptomatic DVT rate of 0.2% and 0.1% for non-fatal PEs. Meanwhile, only 0.4% of patients suffered bleeding complications.

“This is an opportunity to both decrease our DVT rate and decrease the surgical site infection rate,” Richmond says. “It’s a huge quality step for us.”

Last fall, the teaching hospital did what it has done with many other quality improvement efforts, test it under a rigorous research study. The orthopedic department designed a three-arm randomized controlled study to evaluate standard warfarin vs. low-dose Coumadin vs. fondaparinux, a pure factor X inhibitor with the lowest bleeding complications.

Conclusion

tTo transform an organization into a truly safe one requires several important ingredients, most importantly a commitment from the top of the organization.

“The CEO absolutely has to be hands on,” Broms concludes. Safety and quality improvement has to start from the top of the organization in order for it to filter down. In order to be a truly safe institution, the CEO and Board need to set clear safety priorities.

The NEBH Board, for example, begins its monthly meetings with a patient safety update—highlighting both good and bad—and reviews the quality dashboards. From the top of the organization, quality is where it begins, even before Finance Committee reports are considered. It also requires the CEO and other top leaders to be actively engaged in quality. Besides frequently appearing on the units, Interim CEO Strieder pays close attention to the Hospital’s Problem Log, which highlights issues that have been called out. Strieder wants to see which issues get resolved and which aren’t. She asks questions of staff in order to facilitate solutions to those issues that don’t get immediately resolved. And she never points a blaming finger. Creating a culture where workers feel safe reporting medical errors and near misses are essential to really transform into a safe institution.

At the Baptist, that culture took hold when the Hospital’s reworking of medication delivery showed progress under the LEAD program. “Before, the person who committed the error could often be the focus,” Broms says. “Now, it’s about what we need to do differently in the system.” Committing to quality also requires funding safety and quality improvement. It does cost, but hospitals can reduce inefficiencies and waste in their processes and workflow, saving money. It is also increasingly important as payers shift to paying hospitals on performance.

What the Blue Cross Blue Shield of Massachusetts LEAD grant did for the Baptist was provide the Hospital and its leaders the opportunity to focus and commit to

transforming the institution based on quality. The LEAD grant also provided the funds to bring in consultants, Value Capture, to teach the Toyota Production System model of quality improvement and covered the costs of staff time to learn and be trained in the Toyota method. The grant also allowed Baptist officials the opportunity to hear from Atul Gawande, M.D., and other notable quality improvement experts.

The LEAD initiative also impressed upon Baptist leaders perhaps one of the hardest things for executives and managers to do—let go. "The biggest lesson I learned," says CNO Gulczynski, "is we as leaders do not have all the answers. We need to [trust] the workforce who does the work"

While the Baptist has been able to significantly reduce medication events, surgical site infections and post-operative blood clots, it has not yet eliminated them. "It's an evolving process," says Broms. And while Broms would have preferred that orthopedic surgeons adopt the Toyota model and its concepts on the DVT and PE project, she has learned that one method may not be the correct approach to solve all problems.

But sustainability is on NEBH leaders' minds as well, both keeping it fresh at the staff level and alive on the institutional level. Now that the LEAD grant has concluded, the Baptist is trying different ways continue its transformation to becoming America's safest hospital.

In transforming its institution, Baptist leaders say there have been many pleasant surprises along the way. Broms notes a high point was the time surgical unit nurses approached her wanting to roll out the redesigned medication delivery process, as they heard from their counterparts how helpful it was both to patients and the nurses' work. Another lesson Broms says she learned: non-adopters are not always a detriment. They end up following the leaders.

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