

Stories of Success: Using CUSP To Improve Safety

Prepared for:

Agency for Healthcare Research and Quality (AHRQ)

U.S. Department of Health and Human Services

Contract Number: HHS A2902010000251/HHS A29032000IT, Task Order #1

Prepared by:

Artemis March, M.B.A., Ph.D. for the Health Research & Educational Trust (HRET)

AHRQ Publication No. 13-0043-EF

September 28, 2012

Contents

Contents	2
Acknowledgements.....	4
About This Guide.....	5
What Is CUSP?	5
How To Learn More About CUSP With the CUSP Toolkit.....	6
Peterson Regional Medical Center.....	6
Organizational and Cultural Context.....	7
Vascular Access Team	7
CLABSI Team.....	8
CUSP Team.....	9
CUSP in Practice.....	9
Critical Moments.....	10
Expanding CUSP.....	11
NorthCrest Medical Center	11
Organizational and Cultural Context.....	11
Critical Moments.....	12
Integrating CUSP With Another Improvement System.....	13
CUSP.....	14
Shore Health System.....	16
Target Zero: Senior Leadership, Planning, and Launch.....	16
Organizational and Cultural Context.....	17
Performance Improvement Teams	17
Spreading Ownership	19
CUSP.....	20
Critical Moments.....	20
Ingrain, Sustain, Expand	21
Saint Joseph Mercy Health System–Ann Arbor	21
Keystone ICU Project.....	21
Saint Joe’s ICUs	22
Keystone Team.....	23
CLABSI Elimination Process	24
Going House-Wide.....	24
CUSP and the Culture of Safety.....	25

Expanding Scope.....	26
Sepsis.....	26
Critical Moments in Culture Change	27
What Do These Stories Tell Us?.....	28
Persistent Leadership Engagement.....	28
Engaged Leaders and Champions	28
Getting to Zero Is Possible	28
Culture Matters.....	29
All Staff Must Own Safety.....	29
All Staff Must Be Empowered.....	29
Learning Organizations Are Safer.....	29

Acknowledgements

HRET gratefully acknowledges the insights provided by the following CUSP team members who were interviewed by Artemis March, M.B.A., Ph.D., for this guide.

NorthCrest Medical Center, Springfield, Tennessee

Angie Beard, R.N., M.S.N., Chief Nursing Officer and Vice President of Professional Services
Randy Davis, CIO and Senior Vice President for Performance Improvement
Scott Raynes, President and CEO

Peterson Regional Medical Center, Kerrville, Texas

Kaeli Dressler, R.N., M.S.N., NEA-BC, Chief Nursing Officer
Theresa Hickman, R.N., ICU Nurse, Nurse Educator
Angela Hons, R.N., ICU Nurse
William Morris, M.D., Physician Quality Advisor
Aaron Saul, R.N., former ICU Nurse, PICC/IV Infusion Clinical Supervisor
Barbara Stehling, Director of Quality Services

Shore Health System, Easton and Cambridge, Maryland

Julie Bryan, R.N., CIC, Infection Prevention Coordinator
Rob Carroll, M.B.A., Director of Performance Measurement and Improvement
Christopher Parker, R.N., M.S.N., Chief Nursing Officer and Senior Vice President for Professional Services
Michael Tooke, M.D., Chief Medical Officer and Senior Vice President

Saint Joseph Mercy Health System, Ann Arbor, Michigan

Toy Bartley, R.N., M.S.N., MICU Clinical Nurse Leader
Christine Curran, M.D., MICU Medical Director
Denise Harrison, R.N., M.S.N., Director of Critical Care
Pat Posa, R.N., M.S.A., System Performance Improvement Leader
Mary-Anne Purtill, M.D., SICU Medical Director

About This Guide

This action guide contains the stories of four hospitals that have applied a patient safety model called the Comprehensive Unit-based Safety Program, or CUSP, to dramatically reduce central line-associated bloodstream infections (CLABSIs) and other health care-associated infections (HAIs). Many have heard about **what** CUSP is through two highly publicized demonstrations funded by the Agency for Healthcare Research and Quality (AHRQ)—the Michigan Keystone intensive care unit (ICU) project, begun in 2004, and the national *On the CUSP: Stop BSI* project begun in 2008. These case studies illustrate **how** actual hospitals have applied CUSP to improve care. Each story is unique and detailed. We use quotations extensively because they give a human face to the principles and practices at the heart of the CUSP. The cases address the origins of each facility’s journey to eliminate HAIs, the organizational processes put into place, how CUSP champions overcame resistance and promoted ownership and accountability, and how CUSP is being sustained in units and spread into other areas of the hospital. One story demonstrates how easily CUSP was integrated with another quality improvement method.

There are many more examples of hospitals successfully using CUSP, and we hope to highlight some of them in the future.

What Is CUSP?

CUSP in combination with evidence-based clinical interventions has been proven to dramatically reduce CLABSI. It is a powerful, flexible model for safety improvement that is sustainable, and it is useful for preventing harm in multiple areas. CUSP is comprised of five basic steps:

- Educate staff in the science of safety
- Identify defects
- Engage executive leaders
- Learn from defects
- Implement teamwork tools

Dr. Peter Pronovost at Johns Hopkins in Baltimore, Maryland, developed CUSP with funding from AHRQ to prevent health care-associated infections in hospital intensive care units. In 2004, AHRQ funded a statewide demonstration in more than 125 Michigan ICUs to prevent deadly CLABSIs using CUSP combined with evidence-based technical interventions. AHRQ contracted with HRET in 2008 to implement CUSP nationally. HRET has worked with the Johns Hopkins Medicine Armstrong Institute for Patient Safety and Quality and the Michigan Health & Hospital Association Keystone Center for Patient Safety and Quality to apply CUSP to other hospital units and safety problems nationwide.

More than 1,100 hospital teams in adult ICUs in 46 States and territories participated in the national implementation project. Using CUSP, these hospital teams have reduced the rate of CLABSI by 40 percent. So far, the reduction in the rate of CLABSIs in the project has prevented more than 2,000 CLABSIs, saved more than 500 lives and avoided more than \$34 million in health care expenses. Though the CLABSI prevention bundle had been available to hospitals for some years, applying CUSP was the key ingredient in the project’s success. CUSP is different from other change models because it makes its tools relevant to clinicians by putting them in the

context of a hospital environment at a unit level. With the addition of CUSP tools, the technical intervention was readily accepted due to the culture change that CUSP promotes.

How To Learn More About CUSP With the CUSP Toolkit

In September 2012, AHRQ released the CUSP Toolkit, a science-based “change package” that helps hospital teams understand how to identify safety problems and gives them tools to tackle these problems. The toolkit is applicable to all hospital staff—unit managers; quality, patient safety and infection prevention officers; and senior leaders. Created by clinicians for clinicians, the toolkit is modular and modifiable to meet individual unit needs. The teaching tools and resources support change at the unit level, with step-by-step instructor guides, slides and presentation materials, implementation tools such as checklists, and videos that simulate desired behaviors. The CUSP Toolkit is enhanced with additional patient safety resources such as TeamSTEPPS[®], Just Culture, and Sensemaking, a deliberate process of reflection on defects, failures and near misses. The CUSP Toolkit contains the following nine modules:

- Learn About CUSP
- Assemble the Team
- Engage the Senior Executive
- Understand the Science of Safety
- Identify Defects Through Sensemaking
- Implement Teamwork & Communication
- Apply CUSP
- The Role of the Nurse Manager
- Spread

The CUSP Toolkit is available at www.ahrq.gov/professionals/education/curriculum-tools/cusptoolkit.

The CUSP model has proved its worth in preventing HAIs, and hospitals are successfully using CUSP to address multiple patient safety concerns, such as falls and pressure ulcers. The CUSP Toolkit is an important resource to empower unit teams, supported by engaged leadership, to improve safety culture and thereby save lives and resources.

Peterson Regional Medical Center

Peterson Regional Medical Center’s CEO Pat Murray came back from a Texas Hospital Association (THA) meeting in August 2010 intrigued by CUSP. He asked his Director of Quality Services how Peterson might best use the CUSP culture change model and explored potential projects with nursing leadership. Consensus converged around CLABSI. Theresa Hickman, RN, an ICU nurse, manager, and educator, was asked to lead its implementation because of her prior CUSP experience at another facility, her communication skills, and her passion for CUSP:

“The CUSP program is the most powerful thing that has ever come into health care. It has the most potential to do good for patients. It’s not just the CLABSI, it’s the culture work, getting doctors and nurses to collaborate with each other, allowing nurses to identify and

fix any issue that could cause a patient harm, and having daily goals for patient care. It makes things safer for everyone.”

Organizational and Cultural Context

Peterson is a private, nonprofit, 124-bed, rural hospital that moved in 2008 to a new facility loaded with patient amenities. Nursing leadership gave input into the design of nursing units. Although he did not yet quite consider himself an evangelist for “healing design,” Murray acknowledged it had definitely improved safety and quality, and “makes a difference in how patients are cared for.”

At Peterson, nurses had long felt comfortable speaking out if safety was being compromised. Dr. William Morris, a Peterson internist since 1977, described the evolution in which nurse empowerment grew from being merely accepted to being expected. Nevertheless, some nurses, especially new graduates, lack the confidence and certainty to speak up. Morris said, “That’s one of the things we are working on—letting nurses know they have the support of nursing administration, the general administration, and the Medical Executive Committee to be the safety net for any number of things.”

Vascular Access Team

Aaron Saul, RN, a highly regarded ICU nurse, began inserting peripherally inserted central catheter (PICC) lines in 2006. Based on literature review, connections with other innovators and his own experience, he began augmenting the CLABSI elimination bundle. He added detail on insertion and maintenance, including following up on lines, hub cleanings, and frequency of dressing changes. As fellow ICU nurse Angela Hons said, “Aaron drew from everywhere and made the bundle his own.”

The following year, Saul began to develop criteria for selecting the most appropriate line to best meet the patient’s needs. This protocol considered patient diagnosis, length of stay, length of intravenous (IV) therapy, medication being infused, pH and osmolarity of that medication, and the patient’s venous access history.

As PICC coordinator and then as PICC/IV infusion clinical supervisor, Saul responded to the radiologists’ suggestion that he train nurses to insert PICC lines by developing a PICC team. They used his CLABSI bundle and rounded daily to monitor the lines and teach at the bedside. Late in 2010, the team broadened in scope and became a Vascular Access Team. Saul built a strong case for sometimes using a PICC line as opposed to using a major vessel, and for well-trained and mentored nurses doing vascular access work:

“If nurses like me are placing central lines, it frees up the surgeons who otherwise might be called by the ICU in the middle of a surgery and it stops interrupting radiologists. Doing lines right takes time. Nurses are trained to be meticulous, they learn the anatomy and veins, how to do the proper skin preparation, the full draping from head to toe, matching the size of the catheter to the vein. You have to pay attention to the details. If you miss one thing, you can start a cascade of events. You need to do it exactly the same way every time.”

Saul advocated for the CLABSI bundle to be adopted by any clinician who placed lines whether at the bedside, in surgery, in the ER, or in a radiology suite. He encountered both resistance and support among physicians. He found a champion in Morris who, for the past ten years, had combined his practice with quality improvement (QI) work at the hospital, most recently becoming a full-time quality consultant with the hospital. As the PICC team gradually did more and more of the insertions and physicians did fewer, physician involvement in insertion lessened while acceptance of the PICC team expanded.

CLABSI Team

In 2009, the Joint Commission established a national patient safety goal of preventing CLABSI. Barbara Stehling, now Director of Quality Services, took it to the PICC team for evaluation and to assess what else Peterson needed to do. “Our practice was already pretty much in place, but we needed to be tracking and documenting it.” A CLABSI team was formed. Members included Saul, an ICU nurse, the Director of Quality Services, and a quality analyst.

“CLABSI made the most sense,” Murray agreed. “We had a reasonably good track record, but could we still enhance or improve? Were our systems consistent with best practices? How could we be more consistent with the protocols we already had? How could we further engage the physicians?”

Peterson revised hospital policy and procedures in 2010 to standardize use of the central line insertion and maintenance bundles hospital-wide for any clinician inserting any venous access device. Because the PICC Team was already operating throughout the hospital, these policy and procedural changes did not represent a dramatic change, but gave a significant boost to its house-wide deployment.

Standard, in fact, meant *mandatory* for nurses because they were employees, whereas physicians were independent practitioners. “A couple of whom,” Morris said, “were tough to get on board.” Peterson has a history of “doing everything jointly. Nursing may initiate something, and the physician committees bless or fine tune it.” However, as he pointed out, “We don’t pay them, we only give them privileges. We are a small town with a shortage of doctors. We do keep track of things, and if they have enough variation in outcomes, recredentialing is not automatic.” Sooner or later, resistors came around through peer pressure and one-on-one conversations with Morris.

Morris’s indirect style of engaging physicians and sense of timing did not press or initiate discussion directly. Instead, during the course of a conversation, perhaps over lunch, he might bring out an article to share, “I wonder if you would like to read it,” or, “See what you think.” Morris was keenly aware that,

“Physicians resist being told what to do by quality people, the government, or core measures—especially if it’s different from what they’ve been taught, but they are still scientists. I point out that they were also *told* in medical school, and *this* is what new physicians are being told. If they want to keep up, they might want to take a look.”

Once Peterson “hardwired” the CLABSI bundle into practice and sustained a CLABSI rate of zero, it was no longer necessary for the CLABSI team to meet regularly. Peterson sustained zero through the skills of the Vascular Access Team, adherence to the insertion and maintenance

bundles, daily rounding, educating new nurses, bimonthly IV classes, choice of dressings, changing dressings every few days, and removing lines as soon as possible.

Peterson also educated their board about CLABSI. As Hickman summarized: “These are lay people on the board. What they needed to understand was that before, CLABSI was part of the price of doing business because we didn’t know how not to have them. Now that we know how to prevent them, we do, so now we don’t have any.”

Like many hospitals, Peterson was not collecting CLABSI rate data to know how far it has come. What it does know is that it has gone 32 months without a CLABSI anywhere in the hospital.

CUSP Team

In September 2010, Peterson formed a CUSP team and conducted a safety culture survey that documented some of the hospital’s communication issues. Hons noted, “When we started, it was to improve the ICU, but central lines involve the whole hospital. So it spilled over and evolved, even though not officially.”

Initially, Hickman and the ICU’s Nurse Director led the CUSP Team. They told staff, “tell us where the potholes are, and we’ll do something about it.” They encountered some skepticism because in the past, when problems had been reported, fixes followed too rarely. Kaeli Dressler, Chief Nursing Officer, also recognized that, “it was important to have quick successes and fast turnaround on items identified by staff. This also meant that directors had to become facilitators rather than try to fix things themselves.” Hickman elaborated, “CUSP starts out very leadership driven, but as you have successes and the staff themselves begin to fix things that are wrong, you see the sparkle light up their eyes, and it snowballs to being staff nurse-driven.” The CUSP process soon gained legitimacy and momentum.

As “Learning from Defects” and process changes became hardwired into practice, the team transitioned in May 2011 to being a peer-led, nurse-only group and no longer met formally but on an *ad hoc* basis to address problems as they arose on the floor. Hickman had observed, “When things are moving, problems raise their head. You need to catch them in motion.”

CUSP in Practice

Murray had hoped that the CUSP process would enhance skills such as teamwork and the confidence that “we could do it, too.” He thought that hearing stories of others who have walked similar walks would be more empowering than hearing about it from a quality committee. He was, therefore, gratified by the sense of engagement, empowerment and ownership he was picking up from staff in its wake. “While I can’t say it’s exclusively due to CUSP, there’s a new sense of ownership about infections; it’s *my* job, it’s not just IP’s anymore. We’re in this together.” Hickman described some of her experience with CUSP:

“When I started this work, I thought safety was medical errors and falls, but it is so much larger than that. We must focus on the largeness of patient safety that is full of so many itty-bitty things that are defects and have the potential to cause patient harm. CUSP is a method that allows front line caregivers to tell you the little stuff, and it gets fixed—because they can mostly fix it themselves. There are no more workarounds.”

One of those “little things” arose when an ICU nurse made a drug error because the small vial packaging print was very difficult to read. Now there are magnifying glasses all over the ICU. Hickman noted, “When a defect comes back to you, you fix it better than you did before so it stays fixed.”

There is a CUSP communications book at the nurses’ station, but one of Hickman’s favorite modes of communication was to post fixes and important information in the staff bathroom. She said, “If I know it, you’re going to know it. People come to our bathroom from other floors just to see what’s going on.” Like Morris, she had developed effective ways of communicating with physicians. She didn’t try to have a sit-down meeting, but was always prepared and got right to the point when she ran into one of them in the elevator, hallway, or parking lot. She also spoke to them privately.

Hickman elaborated on CUSP’s effect on safety culture:

“It’s much harder to deal with this big culture balloon and all the things inside of it—like people not talking with each other, not collaborating. Now with CUSP, you’ve got doctors and nurses and others talking to each other and collaborating. Once you get this culture thing going, then it’s easier to take on other health care associated initiatives and get buy-in because people are already connected.”

Like Hickman, Morris was enthusiastic about how CUSP had enhanced nurse-to-nurse and nurse-doctor communication.

“CUSP gives us an objective process (Daily Goals) through which the nurses and the doctors involved discuss the patient’s case on a daily basis—here are the expected outcomes for the day, and here is what is in fact going on. Good doctors have always done this well, and experienced nurses can get it out of the doctors, but CUSP gives new nurses a tool to get mumbling and tight-lipped physicians to tell them what they’re thinking.”

Hons, who now co-leads the CUSP team, described Daily Goals as a “tool to help me be more effective as a nurse, to take better care of my patients while taking care of my coworkers as well.”

Peterson had been working on developing a non-blaming culture for the past several years. Staff have come to understand that when an error is made, or a mistake reaches the patient, most of the time, it’s because the system has failed. Rather than an individual being fired (unless the incident is egregious), they are re-educated, and the system is fixed where possible or made transparent so that everyone is aware of the potential problem. CUSP modules on the science of safety have extended and deepened the shared understanding of how broken systems set staff up to fail, and affirmed a culture where staff are more likely to report system failures or defects.

Critical Moments

Peterson’s journey to standardization of CLABSI and ventilator-associated pneumonia (VAP) bundles and nurse empowerment is marked by evolutionary trends rather than dramatic shifts in practice or culture. When hospital policy and procedures were revised in 2010 to make using the central line insertion and maintenance bundles standard house-wide, it built upon several years of

nurse PICC teams having used the bundles with good results. The bundles were already fairly standard, but with the policy, they were formally institutionalized.

Over decades, Morris had observed changes in attitudes toward nurses' speaking up from accepted to encouraged, to recommended, to expected. This evolution of nursing empowerment was fostered by CUSP. "With CUSP, nurses were able to *formally* identify an issue, and then *formally* and *publicly* fix that issue," Hickman noted. "When she sees that a patient can be harmed, any nurse can formally fix that."

Expanding CUSP

In 2012, the Nursing department extended CUSP to create a wider culture of patient safety. Dressler said: "We had a team to eliminate CLABSI hospital-wide and be accountable for that, but CUSP has a broader nature because it can address any patient safety issue. We have CUSP initiatives underway in falls, pressure ulcers, medication safety, surgical site infection, CAUTI." Staff wear many hats in this small hospital, and different individuals or units take the lead on different safety issues. Hickman summarized the key ingredient of developing a safety culture:

"To change a culture, the leadership must be 101 percent sold on it. It has to be inside of your insides. Your staff looks to see if you are committed. If they even smell flavor-of-the-month on you, they will not buy in, they will not follow you. We are doing it because it is the right thing to do. Failure is not an option. If you fail to change the culture, someone can die. It could even be your parent."

In October 2012, Peterson is launching CUSP in all hospital departments and embarking on a CUSP training program for all hospital staff.

For more information about Peterson, please visit their website at www.petersonrhc.com.

NorthCrest Medical Center

Over the last 8 years, NorthCrest Medical Center, a 109-bed, nonprofit community hospital near Nashville, Tennessee, has become as nimble as it is structured. Under CEO Scott Raynes, NorthCrest embraced Lean and uses "CUSP as a way to become more Lean." At the same time, "nothing that we are trying to improve doesn't have a CUSP team," according to Randy Davis, his CIO and Senior Vice President for Performance Improvement.

Organizational and Cultural Context

When NorthCrest's 8-year contract with HCA ended early in 2005, Raynes was recruited to be President and CEO. The medical staff had no organization or structured process within which to discuss and vet evidence-based practice or improvement initiatives, or to function as a department. Within 18–24 months, Raynes had identified a new senior team, organized medical departments with elected chairs and vice-chairs, and had begun realigning the organization around the "five pillars of excellence" (people, service, quality, financial, growth) extolled by the Baptist Leadership Institute. Resistance of clinicians who were more comfortable with the old "wild West" style was overcome by the "selection of key folks who had great clinical knowledge, were passionate about patient-centered care, stubborn enough to fight the good fight, knew it was a marathon and not a sprint, and believe perfection is our goal," said Raynes. "That's where Lean came in, and zero defects."

As the organization continued to evolve, the development of thoroughly defined goals, action plans and metrics cascaded from one level to the next, creating shared understanding and alignment. Davis, the last of Raynes' senior team to join NorthCrest in 2008, elaborated:

“We believe success is achieved through good communication and explaining the rationale behind what we are doing. I should be able to sit in the boardroom and hear the message, and go down to the cafeteria and hear the cashier describe her piece of it and how she is getting there. We take the pulse of the knowledge of people on the floor, have little daily huddles, and help them with elevator speeches so they can describe what the hospital is trying to do and their own role in it.”

Angie Beard, R.N., M.S.N., Chief Nursing Officer, and Vice President of Professional Services, depicted Raynes' leadership style and the motivating impact of working in an aligned organization:

“That's why I come to work every day. Everyone knows what our organizational goals are and gets the same reports. The same messages and data—about falls, hand washing or patient satisfaction—are posted on every bulletin board. I'm a Southern girl, and we say that you can't lead a team of horses by pulling them. But if you stand behind and drive them, they can take you anywhere. That's how Mr. Raynes leads—by steering, not pulling.”

Once Raynes had a senior team in place and restructuring for alignment and accountability was in process, he turned outward to successful quality and safety initiatives. How to bring them home and build them into NorthCrest's culture and metrics? Being only 30 minutes from Nashville and its choice of hospitals, he was acutely aware that “we have to measure up and differentiate through clinical excellence.”

Raynes worked with the board Chair to put a conversation about quality in front of the board by forming a Quality Review Committee (QRC) composed of senior administrators, physician leaders and board members—including its Chair and the Chair of its Quality Subcommittee. By monitoring and keeping quality and safety initiatives in front of key organizational stakeholders through this board committee, he also furthered his objectives of transparency and accountability.

Critical Moments

Learning from Defects became an occasion for educating and improving. After near-misses and adverse events, all people affected were brought together to conduct a root cause analysis. The scope of such inquiry has now broadened to situations where there *could* have been a serious mistake. Root cause analyses are conducted to change processes to prevent future harm. Beard elaborated: “We want to be in front of the fire, not behind it. The biggest question I ask staff is: ‘How will we harm the next patient?’ The staff always knows the answer. They know where our weak spots are.”

One of those weak spots, the nurses pointed out, was the lack of a pharmacist on site at night to check an order against known patient allergies or interactions with another drug. Now, an off-site pharmacy that is part of the same company as NorthCrest's pharmacy reviews night orders before a nurse gives a dose.

The nursing administration began to take compliance for the central line bundle and the ventilator bundle to the QRC and then to the board during 2008 and 2009. It was necessary for nurses to be empowered to stop a procedure when, for example, a sterile field was broken, a physician was not in full compliance with a standard, or for any patient safety issue. Nurses also had to know that they would be supported. Beard, who had been Chief Nursing Officer (CNO) for the past 3 of her 25 years at NorthCrest, described this moment:

“Our board is very involved; they are responsible for governance and quality of care. The biggest question was: what will you do with noncompliant doctors? It was a huge step for the board when they said that if physicians don’t comply, they cannot work here. This was an enormous cultural change. If a nurse stood up, she knew the board would support her. What stopped most of the noncompliance was the understanding that they would get in trouble if they *didn’t* stop the procedure. The second thing was peer pressure among physicians.”

Raynes described the change:

“It was a huge shift for nurses knowing they would be backed up. It really pushed the patient to the center of care. We had doctors who had done as they pleased, there had been no standardization, and the nurses had had to meet and work with each of them. Once we were structured and had narrowed the variation, then we could start to empower nurses to acknowledge outlying behaviors and care practices. That transition was huge.”

With the possibility of suspension of privileges in the background, conversations usually produced the desired result, as Raynes elaborated:

“Adherence to bundles is addressed by the QRC and escalated, if need be, to the board, and into each department. If you have a physician not adhering to a bundle, the Chair of the medical staff will engage with them and work to change behavior. They have a window before it escalates to a higher level that can lead to suspending privileges. Normally, once you get someone’s attention, they change their behavior.”

The cultural shift of supporting nurses who brought forward safety extended to nurse-nurse relationships as well. To enhance care while not disrupting camaraderie among nurses leadership created an environment in which making recommendations does not single people out. A box for recommendations was set up, and the administration responded to these recommendations. Raynes sent an email to the entire workforce asking for ideas to enhance safety and quality. Ideas were vetted by senior administration, and Raynes replied individually to the individuals who suggested them. Raynes found that staff had begun to trust that, “it really is about patients being safer. Everything is an opportunity to educate and improve.” Those opportunities increasingly arose and were addressed in real time. Raynes said, “Care encounters are fluid, and, thus, so are the opportunities to improve care. Because of our unit structure and having become so Lean, we are able to nimbly address issues as they arise. We are at a size that allows us to operate this way, but we think it’s scalable.”

Integrating CUSP With Another Improvement System

Quality conversations were taking place at every level, and with staff becoming versed in root cause analysis, the stage was set for Lean and CUSP, both pushed by Raynes.

“I set a target of zero with CLABSI, VAP, falls and every other measure that we know is important to patient safety and readmission rates. Everyone from me to unit managers has goals and metrics around safety and quality, so it was easy to establish CUSP teams to plug into what we had already done. We view CUSP as being clinical outcomes, and we deploy it through Lean.”

As staff worked on their root cause analyses of adverse events and near-misses, they realized that many of these events were the products of broken processes that had never been examined. Nursing leaders asked Davis to sit in on their root cause analysis work and take them through a Lean value stream mapping process. As NorthCrest’s process improvement needs became evident, Davis invested in further Lean training and sent four high performing, non-managerial staff to extensive Lean training at a local university so they could serve as Lean guides and facilitators, each serving a set of departments.

Bringing both Lean and CUSP into the organization initially struck some clinicians as too much. Beard said, “We had to show them that you can use Lean for the CUSP team.” Asked how the two complement rather than overwhelm, she said, “We use CUSP to tear a problem down, then Lean it up to rebuild it.”

CUSP

In 2011, NorthCrest revitalized its CUSP work. Raynes put Beard and Davis in charge of CUSP as its senior sponsors, and they set up a new process for setting up teams. Anyone could suggest a CUSP team when they saw an opportunity affecting patient safety. If the senior leadership team agreed, they assigned Davis or Beard to go to the medical department most directly affected, and try to engage a physician to work with the team. Teams had to be multidisciplinary yet small enough to be effective. Each team developed its scope, goals, plans, metrics, and end point and made quarterly reports to the QRC. The first 15 minutes of every monthly QRC meeting is a rotating schedule of CUSP teams.

In early 2012, CUSP teams took off following a state-wide quality improvement collaborative meeting at a local hotel. A group of NorthCrest staff were able to attend that day; besides Davis, Beard, and other nursing leaders, attendees included administrative assistants, a physician, staff nurses, a pharmacist, the quality nurses and a lab technician. As Davis recalled, “a lot of people went and came back almost as if we had been to a revival. It wasn’t as much the meeting itself, but having all these conversations during breaks and lunch outside the hospital setting.”

Davis acknowledged that, at first, senior leadership had allowed managers to be team leaders (partly because of their more polished presentation skills) and that the results were “awful.” They learned that CUSP team leaders need to be front line people who are peers of the other members, and that a peer review was needed every 2 weeks. “They cannot come in with the same status as last time; they have to show progress. Suddenly, the CUSP teams took on a life of their own, coming up with solutions we never would have thought of.” Senior staff also learned that team leaders and members need coaching to communicate more effectively with medical staff and people who are not on their team but are impacted by their work. Training is provided by senior-level sponsors.

CUSP teams are set up to have a finite life cycle. Davis said, “We want teams to see light at the end of the tunnel. They need to know when they are done.” Alternatively, a team may achieve its

original goal, and then develop more aggressive ones and evolve new teams to deal with them. When NorthCrest reached and stayed at zero with CLABSI, team members began asking themselves: Why are we using this many central lines? Are they all really necessary? How can we reduce the number of line days? They developed guidelines about when it is appropriate to use central lines, monitored daily use, and removed lines earlier. They set a goal of reducing central line days by 25 percent by 2013.

When they investigated why central lines had been inserted in the first place, they were surprised to find how often it was for staff convenience. Beard said, “IV access is not a criterion for a central line.” They created an algorithm for when a central line is necessary and trained people to use it. Their next round of questioning: Is all that blood work at the lab really necessary?

The CAUTI team had a similar experience. The Med-Surg unit got very good at removing the indwelling urinary catheter within 2 days post-operatively and getting infections close to zero. Sometimes they would notice a urinary catheter had been put back in a few days later. No urinary tract infection (UTI) developed, so the device was sterile, but why put it back in at all? Was it because it was easier for staff than using bedpans or getting patients to the bathroom? Had bladder scanners been used correctly? Was the patient actually retaining urine? Davis noted, “Nurses drive physician practice. If they suggest a urinary catheter, the doctor will probably go along with it. If instead they say they are willing to check the scanner and think they can keep it out, the doctor will probably go along with that, too.” NorthCrest no longer stocks indwelling catheters in the Emergency Department. Once a catheter is removed, the staff makes sure another one is not put in except when clinically indicated in special circumstances.

Davis highlighted the common foundation of Lean and CUSP. Both “empower employees to continually improve processes” and thus shift management’s role to “clearing roadblocks and hurdles.” And at NorthCrest, Lean and CUSP both “focus on the patient-centered workflow rather than a specific location or unit in the hospital.” The “unit” around which multidisciplinary CUSP teams are formed is not the CCU or Med-Surg, but the “work unit”—the people who interact on their shift to get their work done: nurses, pharmacy, pulmonary care technicians, environmental services, radiologists, and hospitalists. “There is no difference between how we organize our CUSP teams and the Lean process of following the workflow.” Beard made a similar point and drew out the implications for silos. “CUSP is helping to break down silos by putting the patient rather than the department in the center of the organization. The best practice standardization of care that CUSP advocates also works to break down silos.”

Raynes summarized how he saw the Lean-CUSP relationship:

“We have embraced and embedded Lean in all aspects of our organization. We are always looking at what we can eliminate because it brings no value. Lean is built into every thought we have. CUSP is a method that fits like a glove. It is a way to become more Lean. Now we have eliminated this infection; what’s next? We can get rid of all those line days that are unnecessary. We are never not asking why.”

For more information about NorthCrest, visit their website at www.northcrest.com.

Shore Health System

Early in 2009, Julie Bryan, RN, CIC, Infection Prevention Coordinator, and Rob Carroll, MBA, Director of Performance Measurement and Improvement, presented a new way of thinking about HAIs to the senior leadership team of Shore Health System. Bryan and Carroll knew of other institutions that had brought their infection rates to zero in a short time period, rather than improving incrementally. They proposed a similar approach. They were surprised nevertheless when their Chief Executive Officer (CEO) chartered them to “make zero happen” at Shore Health and his team agreed with him. Returning to Carroll’s office afterward, he and Bryan looked at each other: Can we really do this? And if so, how?

Target Zero: Senior Leadership, Planning, and Launch

They began by setting up a multidisciplinary steering committee whose members included the Chief Medical Officer, Chief Nursing Officer, Chief Operating Officer, Director of Organizational Development, and Vice President of Communications and setting up a system-wide patient safety initiative named Target Zero. It aimed to wipe out three major device-related HAIs—CLABSI, CAUTI, and VAP—and take on hand hygiene across the entire Shore Health system. A regional, not-for-profit network of inpatient and outpatient services serving four rural counties on the Eastern Shore of Maryland, Shore Health is composed of two hospitals that merged in 1996, a cancer center, a home healthcare and hospice agency, a multispecialty physician group, and diagnostic and ambulatory centers.

The Target Zero Steering Committee began with the CUSP principle of engaging senior leadership. Bryan said, “some people’s view had been, ‘infections happen, they’re inevitable.’ We had to show them research about what other hospitals had been able to do.” The immediate result, Carroll said, was that “senior leadership got fully on board, supported us, and gave us enough time to plan properly.” Leadership became so engaged that they aligned their goals and objectives with eliminating HAIs, provided a budget, held managers and directors accountable, participated in safety rounds and hand hygiene rounds, participated on the various committees involving Target Zero, empowered staff to do the right thing, reviewed monthly data and progress reports, and attended celebrations for units achieving zero HAIs for at least a year.

Over the next several months, Bryan, Carroll, and the Medical Director for Quality identified best practices for infection prevention from the literature. They also, Bryan said, “found out a lot about CUSP online at the Michigan Keystone ICU Project website to draw on for Target Zero.” The steering committee suggested doing a SWOT (strengths, weaknesses, opportunities, threats) analysis, which was carried out through 50 interviews with people throughout the system to get a baseline on how they thought about infections, and listen for opportunities to improve and to achieve zero. Committee members discussed best ways to get employee buy-in. They also talked with award-winning hospitals, borrowing materials from one that had had enormous success with hand hygiene.

On September 24, 2009, the Steering Committee formally launched Target Zero, which was attended by the entire senior leadership team. They discussed the initiative and their expectations at a meeting of 100 directors and managers. The CEO charged them with getting to zero HAIs, and aligning their resources with this goal. He gave them three principles: Imagine zero is possible, make zero part of the culture, and have fun doing it. Senior executives from marketing,

human resources, and operations each told a personal story about how HAIs affect their areas of responsibility. The chief financial officer told of nearly dying from an HAI during a stay at another hospital. Bryan recalled, “it was a poignant moment. You could have heard a pin drop.”

Christopher Parker, RN, MSN, Chief Nursing Officer, and Senior Vice President for Patient Services then swooped in dressed as a giant, six-foot bug embodying all HAIs. Wherever he loomed, shrieks and laughter rippled. The Bug gave everyone a goodie bag containing a Zero candy bar, a bottle of hand sanitizer, and a card answering the question, “What is Target Zero?” The Bug then made the rounds at both hospitals for several hours well into the afternoon. Now dressed as the Bug, Bryan took the show on the road to all of Shore’s facilities in a four-county area. Altogether, Parker, Bryan, and their helpers handed out over 2,500 bags while talking about Target Zero, and why they wanted everyone involved. Parker recalled,

“Going on the road was important. We went to all of our offsite locations. We got the word out that our high-powered steering committee was really committed and wanted to make Target Zero inclusive. Our tagline, ‘It begins with me,’ says Target Zero belongs to everyone.”

Organizational and Cultural Context

The Target Zero launch took place as Shore Health’s nurses had been working toward Magnet status for 5 years, achieving it in October 2009. Only about 5 percent of all hospitals achieve Magnet status for their excellence in nursing. The Magnet Quality Improvement framework is outcomes driven and encourages organizations to empower nurses, set high performance expectations, and become more patient-centered. Parker said, “A culture of nursing empowerment must be supported at the highest level and allow nurses to learn, grow, and practice to their full potential.”

During 2006, the full continuum of care had begun to be brought together under Parker, adding Patient Services to his CNO responsibilities. By 2009, acute care, pharmacy, home health care, rehabilitation, case management in the community, and hospice had become integrated under him. Through their horizontal restructuring, and through meeting, planning, and solving problems together, silos have broken down, teamwork has grown stronger, and staff members, Parker said, “think beyond their own piece.” A current focus is enhancing handoff communication and preventing readmissions.

Thus, prior to Target Zero, Shore’s nursing staff were already using a QI framework, increasingly taking responsibility for patient outcomes, and collecting central line information that was sent to Infection Prevention. Parker believed the front line should drive process change and be free to innovate; he saw his role as making sure they had process, structure, and resources. “They can tell you the barriers. Our job is to remove them.” Bryan further elaborated the cultural context, “We are rural hospitals. We take care of our neighbors and friends and people we see at the grocery store. After their hospitalization, we will see them again at the YMCA or some community function.”

Performance Improvement Teams

In 2008, Shore had set up two task teams, one charged with implementing a VAP bundle, and the other implementing a central line insertion bundle and checklist. The teams had some success in

reducing infections, but were discovering through the literature that there was more to do to get even better results. They realized they needed to develop a maintenance bundle.

The Target Zero launch generated the momentum for these teams to expand and to evolve into permanent performance improvement (PI) teams focused around specific HAIs. One would deal with both CLABSI and CAUTI prevention because they required the same interdisciplinary cast: representatives from all departments at both hospitals, including home health and hospice. The VAP team dealt only with ventilators in the ICU, and thus had a more specialized set of clinical members: ICU nurses, intensivists, pulmonologists, respiratory therapists, pharmacists, medical directors of IC, and pharmacy. Nurses and respiratory therapists led the VAP team, and front line nurses led the CLABSI/CAUTI team. A third PI team was formed to focus on hand hygiene.

Bryan, who had spent 15 years in staff development and nurse education, described the importance of thought leaders in a relational context. “Nursing is a lot about relationships, and I work through key thought leaders. We made sure we had thought leaders on our PI teams. They are the movers and shakers: they make things happen here, they know how to get things done. They are all over the hospital, some are front line.” Carroll added, “They’re also the early adopters, the mavericks who are motivated to make change. We try and harness their passion on teams. We help them do it as a system and not just as one individual.”

The biggest challenge, in Parker’s view, was creating the expectation that zero was achievable. “Nurses advocated for patients and got the rest of the team to buy into Target Zero. On a day-to-day basis, the process was led by Infection Prevention.” Bryan provided guidance in teams’ literature searches and discussions but, she said, let them come to their own conclusions so that, “now they owned it, ran with it, and owned the success.” Carroll, whose background was QI, said, “These people have day jobs, they can’t learn all these different methods. We steal from all methods, simplify them, make them user-friendly, teach the basics, and pull in tools as needed.”

The teams used the AHRQ Hospital Survey of Patient Safety Culture for everyone in the hospital to measure Shore Health’s baseline. Each department analyzed their own results, drilled down to find the reasons for them, and developed plans for improvement. Teams mapped current processes; identified strengths, weaknesses and opportunities for improvement; and developed plans. They revised their standards and protocols according to best practices.

When they had begun seeking HAI bundles in 2008, the Michigan Keystone Project had been getting some press regarding their CLABSI success, and Shore Health had implemented their CLABSI insertion bundle and checklist. Now the CLABSI team developed a maintenance bundle and revised Shore Health’s policies accordingly: dressing, daily assessment, chlorhexidine patch, changing lines inserted under emergency conditions, etc. The Institute for Healthcare Improvement had a VAP bundle that they implemented.

Shore Health was on its own with prevention of CAUTI, their most frequent infection, which they had tried for years to eliminate. The PI team concluded that the most important thing was to get catheters out as soon as possible. They developed a protocol that switched the default setting: Nursing could take it out as soon as possible, and an order had to be written to keep it in. This change required an extensive education effort with physicians and nurses, and took time to get through the medical staff and Medical Executive Committee. In the year since its implementation, Shore Health has had only four CAUTIs, down from nine in 2010.

Spreading Ownership

Taking the show on the road had symbolically transferred ownership and responsibility for HAIs from belonging solely to the Infection Prevention Department to everyone in the organization. The transfer was expressed in Target Zero's tagline, "it begins with me." Now Infection Preventionists provide data and guidance, but if there is an infection on a surgical unit, it is the unit manager and nurses who investigate why. They dig into medical records to see what could have been done differently, consider different products that could have been used and use every infection as a learning opportunity.

Education played a major role in spreading ownership of eliminating infections to every person in every department. Bryan made a presentation to Housekeeping, for example, that explained how their work impacts the patient. Bryan highlighted the different "wet times" of various disinfectant solutions they used. "I emphasized how important that was, that they are not just 'cleaning'; they are preventing infection. That really engaged them."

Publicizing data had also engaged staff. Shore Health tried several kinds of data and ways of presenting it before they found what spoke to people when Carroll graphed "days since last infection" for all three targeted infections.

Michael Tooke, MD, Chief Medical Officer, and Senior Vice President, whose oversight includes infection prevention, performance improvement and patient safety, believes that empowerment and ownership took hold because "we reinforce it over and over. Target Zero is everywhere; it's a very visible campaign. We publish and disseminate results. And we celebrate." Any unit that completes 12 months or longer without a particular infection gets a party and their picture in the weekly newsletter and on the website. Senior management allots a budget for these celebrations. They are major events that reinforce the fact that Target Zero is a whole system effort in which every person in the organization must do their part to make it happen. Tooke continued, "The celebrations give them ownership: *We* did it. *Our unit* did it. And they don't want to be the one on the unit that breaks the string. We keep finding reasons to celebrate, like with the song contest."

A contest for a hand-hygiene song generated 13 entries. The nurse with the winning song included every part of the organization in her lyrics, reinforcing Shore Health's theme that every area and every person has a part to play in keeping infections at zero. (The top three songs can be heard at www.shorehealth.org/target-zero, near the bottom of the page.)

Having fun about deadly serious things became a hallmark of Target Zero, especially around hand hygiene. During one campaign, when people were caught "doing the right thing" by a senior executive on rounds, they got a card, the card was dropped into a box, and a random drawing was made weekly. Winners got a Target gift card. A Christmas tree was decorated with gloves and hand sanitizers. A 2011 campaign entitled, "Ask me if I've washed my hands," produced signs, taglines on badges, window stickers, pictures, posters and publicity. If patients and visitors could ask the CEO, CMO, and CNO if they had washed their hands, certainly they could ask other physicians, nurses, and administrators the same question and other, even more important ones, related to their own care.

CUSP

In 2010, Maryland became one of the States in a new cohort of *On the CUSP: Stop BSI*, and Shore Health became involved. The health system had done a great deal of work by that time, and its HAIs were falling. Bryan noted, “We were using the five elements of CUSP and many of its tools even before CUSP began in Maryland.”

Shore Health educated staff in evidence-based practices and the “science of safety” using the CUSP program and incorporated the Learning from Defects process. Staff learned more about the importance of having layered checks and balances so that human errors don’t reach the patients. CUSP teams were formed in the two hospital ICUs. Bryan explained the fuzziness in many people’s minds about CUSP:

“We drew on CUSP elements and tools in creating Target Zero, and later we blended CUSP teams into what we had already been doing on the units. I think that is why so many of our team members have difficulty separating Target Zero from CUSP. Target Zero is a CUSP initiative with a different name and logo.”

The ICUs instituted daily rounds and morning briefings, and team members participated in the Collaborative’s calls. Ryan Foster, RN, Nurse Manager for the ICU and the multispecialty care unit at Dorchester General Hospital (DGH), described how she experienced the value of CUSP:

“We had successfully implemented many measures in preventing CLABSIs before we joined the Maryland CUSP initiative, and the culture was already there, so it’s not been a huge change. But CUSP brings the ability to network within our region and the nation, and learn from individuals who’ve been able to achieve great quality. You are able to collaborate with your peers in regards to struggles and successes. You hear about how someone else went down that road and made it work.”

Engagement with CUSP strongly reinforced what Foster also knew from experience. In her view, the most significant shift has been staff ownership of health care associated infections and use of evidence-based practices because, “if the staff don’t own it, they won’t make the practice change. But when they do, they will do what they need to do clinically to make it happen. The cultural and clinical pieces are completely intertwined. Target Zero is not just what we do. It is our culture.”

Critical Moments

While the team had adopted the CLABSI bundle and checklist, a key cultural shift was apparent when the Medical Executive Committee (MEC) made it mandatory. Tooke commented, “The MEC is loath to mandate anything. But by providing the data, the evidence, we were able to achieve a cultural milestone. This was a big step for the MEC.” Target Zero empowered nursing staff to speak up and stop the action when physicians were not adhering to the bundle. Parker said, “Culturally, that’s not an easy place to get to for nurses, but they knew they would be supported when they spoke up and advocated for their patients.”

Once that step was taken, other mandated protocols followed: a clinical pathway for sepsis, a Foley catheter protocol that switches the default position to getting it out unless there is a specific order to the contrary. The MEC also made consulting the pulmonologist mandatory for

intensivists in the ICU to ensure that the ventilator bundle is complied with. Initially, some physicians continued their old practices, but when one of their patients contracted an infection, they were contacted about why they had not abided by mandated practice. It was, Tooke said, an educational process that “took some sorting out.”

Ingrain, Sustain, Expand

Every day is seen as a new day filled with opportunities for zero infections to occur. Bryan says, “It’s not one or two things, it’s a whole system effort. It’s a lot of work to sustain it.” Daily communication between infection prevention (IP) and the front line staff keeps attention proactively on achieving and sustaining zero infections. Bryan said, “Erica (Disharoon, the other Infection Preventionist) and I talk with people on the front line every day. If we see a catheter that’s been in for days, we start talking about that. We look at x-rays daily for people on ventilators. Are there changes we don’t like to see happening? Sometimes bringing attention to things can make a big difference.”

Senior leadership deploys its resources to support Target Zero. When, for example, the team discovered an alcohol-impregnated cap that keeps ports disinfected, they were authorized to buy this more costly product because it saves valuable nurse time and reduces the risk of infection.

Shore Health continues to expand the scope of Target Zero. It has reached out to patients and families to invite them to ask whether staff have washed their hands. This emboldens patients to ask other questions. Staff members have met with nursing home staff and home equipment providers to enlist their attention on preventing infections. Shore Health launched the 100 Ways in 100 Days campaign to elicit staff ideas about how to eliminate HAIs. The campaign knits every part of the organization together working around a shared goal. As Tooke summarized, “The processes of achieving zero and keeping infections at zero has become “the way we do things every day.”

For more information about Shore Health’s Target Zero campaign, please visit their website: www.shorehealth.org/target-zero/.

Saint Joseph Mercy Health System–Ann Arbor

In 2011, Saint Joseph Mercy Ann Arbor (“Saint Joe’s”) in southeastern Michigan was one of four hospitals in its Midwestern region to win the highest level award from HHS and the Critical Care Society for its work in eliminating CLABSI and VAP from its ICUs. The award made visible the results of a complex journey led by a gifted team of nurses and physicians who engaged health care professionals to eliminate HAIs.

Keystone ICU Project

Saint Joe’s journey to control VAP and CLABSI began late in 2003 when the CNO gave Denise Harrison, RN, MSN, then Nurse Manager of the surgical intensive care unit (SICU), some information about the Michigan Health & Hospital Association Keystone Center’s ICU Project introducing CUSP, which they decided to join. Keystone’s aim was to improve patient safety, reduce errors and improve outcomes in Michigan ICUs by getting all ICUs to use the CUSP method to focus on the same thing: eliminating CLABSI and VAP. Harrison quickly realized the scale of the project and enlisted the half-time support of Pat Posa, RN, MSA, a SICU staff nurse

with project management experience. They formed a “Keystone Team” with staff nurses from each unit, physicians and others, and rolled out CUSP across the ICUs. By the spring of 2004, Harrison recognized that she needed Posa full-time on the project, so Posa became full-time Project Manager in the new role of system performance improvement leader for all three ICUs. Harrison reflected,

“We saw some Michigan hospitals falter and drop off because they did not dedicate resources to the project. The number one success factor in sustaining our success all these years is Pat’s full-time leadership and a dedicated, multidisciplinary team that continues to meet bimonthly for two hours.”

Posa has high regard for the support and expertise of the collaborative:

“Being part of the collaborative has been a phenomenal experience. As we began this journey, it was awesome to people sharing their knowledge so that we didn’t have to look up everything ourselves. When some of the hospitals were struggling to get chlorhexidine, Keystone told the hospitals how important it was, and within a month, everyone had it.”

One result of so many Michigan ICUs joining the collaborative was that “ICUs in Michigan no longer compete on safety and quality,” said Posa. Johns Hopkins, the faculty advisors and partner on this AHRQ-funded statewide initiative, openly shared their infection rate data, which encouraged the participating Michigan hospitals to share their own. “By keeping the patient at the center and recognizing that everyone brings something valuable to the table, the sense was that we are all in this together for the patient, so let’s learn together.”

Saint Joe’s ICUs

Saint Joe’s Ann Arbor has 527 beds, 48 of which are ICU beds divided into a medical ICU, a surgical ICU that includes cardiac surgery, and 7 coronary ICU beds. It is part of Saint Joseph Mercy Health System (SJMHS), which includes seven hospitals. SJMHS includes 5 outpatient health centers, 5 urgent care facilities and more than 25 specialty centers in a 5-county area. It is part of Trinity Health, the fourth largest Catholic network of hospitals and health care facilities in the country.

The nurses in each of Saint Joe’s Critical Care Units report to a Nurse Manager, who in turn report to Harrison, now Nursing Director for the ICUs. The MICU is staffed by a single private practice of eight pulmonary/critical care intensivists, and Christine Curran, MD has been its Medical Director since 2008. The SICU is staffed by surgical intensivists who are part of General Surgery, and certified in Trauma and Critical Care. Saint Joe’s is a Level 2 Trauma Center. Since 2008, Mary-Anne Purtill, MD, has been Medical Director of the SICU.

These two medical directors have been the key physician champions for bringing evidence-based practices into the ICU and taking them house-wide. They work collaboratively and co-lead safety initiatives and their meetings. Curran attributes much of their success to having added to each ICU in 2010 the role of clinical nurse leader “to help focus the team on evidence-based practice every day.”

In addition to the “Keystone Team,” the ICUs have developed educational conferences open to everyone, a Morbidity and Mortality Conference that Purtill and Curran co-chair, and regular meetings with physicians and nurses from ICUs and the emergency department (ED). All of this communication and collaboration contributes to having become, “much more evidence-based and protocol-driven,” says Curran. “Physician engagement is much higher now, there’s much more familiarity with what’s being done, nurses and doctors are partnering. Pat’s been instrumental in all that.”

Keystone Team

To do CUSP and evidence-based practice work—initially with CLABSI and VAP—Saint Joe’s ICUs and the ICU at the neighboring hospital formed a multidisciplinary Keystone Team. Its members now include the medical director, clinical nurse leader, and a staff nurse from each ICU, as well as a respiratory therapist, infection preventionist, pharmacist, and physician assistant. The staff nurse representing their unit might also be the coordinator or the Chair of that unit’s practice council, but not its manager. Purtill said, “We needed nurses from each floor to tell us ideas about implementation and where the barriers were on their floor.” She elaborated on their bimonthly meetings:

“For years we lacked a common language around safety, but we’ve been creating that in our work together. We are very real with each other. ‘What prevented you from doing this?’ ‘What system error didn’t allow the individual to get their job done?’ Ninety percent of errors are due to systems. Some mistakes are nurses’, but the majority are physicians’, so you need them both in the room.”

The Keystone Team has evolved to become Saint Joe’s primary forum to evaluate and implement evidence-based practices it wants in its ICUs and to create a culture of safety. That work includes prevention of CLABSI, CAUTI, VAP, falls, pressure ulcers, delirium prevention and management, progressive mobility, and sepsis prevention and treatment. It works closely with the nursing governance council on issues impacting nursing. The Keystone Team is also the forum through which some of the principles of process improvement methods such as Lean and Six Sigma have been introduced to ensure consistent outcomes and reduce errors.

Timing has been important to the success of this work. Toy Bartley, RN, MSN, a former nurse educator, and now clinical nurse leader of the MICU, cautions about managing the timing and buy-in of stakeholders:

“When we have a lot of initiatives, we can’t introduce two in a row. We have to keep on top of the one we’ve introduced, get input from everyone involved in the change, assess how it’s working, and ask staff how to improve it. They need to own it. If they don’t believe in it, it won’t work.”

The basic question Keystone team members asked themselves was: how do we convert evidence into behaviors? They used the Keystone/CUSP approach of engaging key stakeholders, bringing front-line clinicians into decisionmaking, understanding change theory, having an executive champion on stand-by and insuring that people understand why they need to change some of the ways in which they do their work.

To make it easy to do the right thing with central lines, each ICU had a line cart with prepackaged equipment and a checklist. Keystone members from each unit had the responsibility of carrying the flag, making sure their unit was complying, collecting data and using the Learning from Defects tool to improve the culture and prevent errors from reaching the patient. Curran said, “In Keystone, we also look at why something is failing. Pat has structured ways of going through this failure analysis and facilitating our coming up with solutions.”

In alignment with the CUSP model, Keystone advocated having an executive adopt each ICU so that there was, in Posa’s words, “a linkage with executive management that helped break down barriers and provide appropriate resources.” One of Saint Joe’s executives adopted the MICU as his unit. He rounds quarterly, inquiring into their safety concerns. Bartley noted, “He brings our concerns that are out of our control to a higher level so that something can be done about them.” Curran summarized, “Most of our work has been done in the absence of any direct executive involvement. They are very supportive, and they hold us accountable for our ICU outcomes.”

CLABSI Elimination Process

In July 2004, the Keystone Team led the implementation of the CLABSI insertion bundle from Hopkins. CLABSIs dropped from 31 to 13 over the year. This translated to a drop from 7.6 per 1,000 catheter days to 2.12. Posa believed the most important piece of the bundle was the empowerment of nursing staff. “We achieved that when we shared the CLABSI bundle with the chief of the Department of Surgery and Medicine. We got their support that a nurse could stop the line insertion. That was the beginning of culture change.”

This moment in 2004 built upon a more gradual transition over the past 25 years: “Years ago nurses were not given the opportunity to ask questions,” said Bartley. “There were no interdisciplinary rounds, no daily huddles, but now there are. This allows us to be more assertive, to ask questions, and to contribute.”

In 2009, the ICUs implemented a CLABSI maintenance bundle to insure appropriate dressing changes, tubing changes, and scrubbing the hub properly. CLABSIs declined further to 5 per year, and 0.7 per 1,000 line days. In 2010, chlorhexidine was added. By 2011, however, the ICUs were still getting 6 CLABSIs per year. They invested in a disinfection cap on all ports so that it was no longer necessary to scrub the hub for 15 seconds and let it air dry for 10 seconds. Since mid-2011, as of this writing in September 2012, the three ICUs have had no CLABSIs for 14, 9, and 13 months. Harrison summarized the process and the rationale:

“We were always true to the original bundle with which we started, and we added pieces. If we saw rates not going down, we investigated cases and charts. Some hospitals started with a BioPatch, but our thought was that we should do the correct technique from the beginning, and then if there’s a problem, add the BioPatch.”

Going House-Wide

Since 2008, the insertion bundle has gone house-wide, first to the ED, and then to anywhere a central line is inserted. During 2008–2009, Saint Joe’s began using the maintenance bundle in the non-ICU areas.

To take these bundles house-wide, St. Joe's created a multidisciplinary task force on translating evidence into practice. They worked with the nursing practice council that coordinates unit work, education, quality activities, and nursing protocols. They worked with the educators' committee, product value committee, and each floor unit to understand how to integrate bundles into their floor processes. Posa described who was involved:

“Nursing did a lot of the driving in non-ICU units. We had physician champions and residents as well. We engaged middle management and front line staff on the ‘whys,’ the behaviors we needed in place: best practices for line insertion; a checklist to ensure every intervention was completed; and to speak up if best practice not being followed.”

They found that the infrequency of central lines on the floor did not warrant the expense of a line cart, so the task force modified the toolbox another hospital had created. They found a bag in which all of the equipment could fit and be available in case something was contaminated and met with central supply about how to restock it. Cheat sheets were added to the central line bag. They recapped the pre-procedure discussion process between nurse and physician and reviewed the role of the nurse in seeing that all the bundle interventions and steps were complied with. Resistance was considerable, as Harrison described:

“The Keystone project is about standardizing work, and the biggest issue was to get physicians, respiratory therapists, and nurses to follow the new evidence-based guidelines. For a nurse to speak up if a physician broke sterility was huge. We worked with each of them individually, invited them to the team, and showed them data and outcomes. Some of them are now the biggest advocates.”

CUSP and the Culture of Safety

In the Keystone Team, interventions to prevent infection went hand-in-hand with working on their culture of safety. Each ICU examined their culture of safety and created action plans to address it. They began by educating all staff on the science of safety. Posa said,

“Human errors will happen. You have to put in processes to prevent them from reaching the patient. Then you put in a Learning from Defects process so that you see errors as opportunities to do things better. You understand why they are happening and what we can do to prevent there being a next time. While you are doing that, you're also improving teamwork.”

Bundle compliance and developing a culture of safety were challenged by high turnover rates. Attending physicians changed every week, interns and residents every 2 weeks. Both of these terms have now doubled. The Keystone Team and ICUs overcame this challenge with more emphasis on teamwork and communication. The clinical nurse leaders “dog the initiatives, talk about it in huddle, work with the intensivists,” said Harrison. “They are the change agents responsible for coordinating care at the bedside in their unit.”

In the MICU, daily huddle begins at 1:00 P.M., the best time at Saint Joe's for this forum to ensure that everyone is on the same page with regard to the goals for each patient. They share observations and discuss strategies. They use the Learning from Defects tool to ask why something didn't work, and what could they do differently next time. Bartley said, “It's amazing how we see everyone contributing from their own expertise.” That includes Environmental

Services, one of whose members asked, “When you don’t post the right contact precautions outside the door, we are not going to clean the right way.” Bartley continued, “It was eye opening for some of us. She was very nervous as she talked, but then she found that, ‘they are listening to me.’ That’s a powerful experience.” One of the solutions was to make sure that staff put the right isolation precaution sign and the correct protective gear on the yellow caddy outside the rooms of patients who are in isolation.

Multidisciplinary rounds are held every morning. Bartley coordinates rounding, oversees practice and communicates with those who cannot attend. “I feel like a spider in the middle of a web. I collaborate with the charge nurse about incoming patients in order to plan for staffing, update the nutritionist on patients needing tube feedings, alert the case manager about patients who are moving to a different unit or outside the hospital to plan for discharge papers, keep the social worker updated on patient and family issues, collaborate with the respiratory therapist on ventilator and therapy changes that were discussed during rounds.”

Debriefings or specialized huddles are held when a pressure ulcer develops or someone has a fall: How did it happen? What can be done to prevent it from happening again? Goals of the day for each patient are written on a white board that also shows when a central line was started. During shift handoffs, nurses overlap briefly to have direct conversations about the patient at the bedside. Interns and residents go through orientation before they come to the ICU. They participate in simulation training facilitated by the ICU Medical (MICU). Bartley orients and educates staff about MICU practices, evidence-based practices, bundles and proper use of equipment.

CUSP work was understood as such by some at Saint Joe’s, but this work was largely carried out under the umbrella of safety and Keystone, sort of “mushed together,” in Posa’s words. “‘Culture of safety’ pulls on all the components of CUSP.”

Bartley concurred, “When I think of CUSP, it’s all the things we do to make the patient safe: eliminating BSI, CAUTI, UTI, VAP—it’s comprehensive, like its name. It’s about learning from defects. It’s a way of thinking that leads to more exploration of other things.”

Expanding Scope

Posa and other members of the Keystone Team immerse themselves in emerging evidence in caring for critically ill patients. They bring research and ideas to the group and ask if members want to pursue them. Posa is also deeply involved in a two-way flow of evidence-based practice at Saint Joe’s parent organization, Trinity Health and her counterparts in sister hospitals.

When the Michigan grant and work with Johns Hopkins ended, Keystone formed an advisory board of ICU nurses and physicians from across the state. Posa said, “We and other hospitals implement evidence based practices for treating sepsis, preventing delirium and progressive mobility, and then push it up to Keystone, after which it is implemented statewide.”

Sepsis

Through these various conversations, in 2004, the Keystone Team had begun discussing the new Surviving Sepsis Campaign’s guidelines for bringing down the very high mortality rates from sepsis, and led the introduction of the sepsis bundle into the ICUs and ED in 2006. Any patient

with an infection can become septic, and sepsis comes in three degrees: uncomplicated sepsis, severe sepsis, and septic shock.

Harrison noted that, “we have been working on sepsis a long time, but we had to get CLABSI and VAP down as they are so often the causes. Then we moved to sepsis screening in the ICUs, the ED, and the floor. Many sepsis patients don’t start off in the ICU, so it’s critical that every unit screen for sepsis.” Still, there were struggles over accepting a protocol “as better than my clinical judgment.” Once again, data showing the reductions in morbidity and mortality carried the day. Purtill highlighted how Saint Joe’s was reframing its thinking about infections.

“At first, we focused on CLABSI and VAP. Now we’re thinking about the bigger ticket of sepsis. Any form of infection can lead to sepsis, which is why our focus has also included sepsis, not just infection prevention. In the last year, we have saved 116 lives at Saint Joe’s through early identification and evidence-based management of patients with sepsis.”

Critical Moments in Culture Change

Posa marked the beginning of culture change as occurring when nurses were supported by the Department of Surgery and Medicine in 2004 and encouraged to stop line insertion when the CLABSI bundle was not being followed. Another moment occurred in 2008 when a policy was developed that allowed nurses to draw blood and give fluids to patients who met criteria for severe sepsis. Until then, the nurse had to ask for an order to draw blood and ask to give fluids, and the physician might not be responsive.

Early 2010 witnessed a third moment in which it became mandatory to move a patient to the ICU—which then took over their care—if she or he met certain criteria. Drawing on the Surviving Sepsis Campaign, Keystone team members initially set forth guidelines on screening for sepsis and on the set of evidence-based treatments. When many physicians did not respond, they undertook a lengthy educational effort, including the CUSP material on the science of safety. Poor response sent them deeper into the literature and the recognition that instituting this care had to be made mandatory. They carefully crafted a best practice policy for automatically moving a septic shock patient to an ICU bed. That meant that the patient would now be under the management of an ICU physician. “We had to develop a medical staff policy that did not allow them to ignore evidence-based practice by forcing them to institute care,” said Purtill, who first proposed the measure. “We saw a pretty dramatic reduction in mortality, so we stuck with it.”

Getting approval from the Collaborative Practice Team for Critical Care was fairly easy as many of the developers were part of the Keystone Collaborative. The Medical Executive Committee signed off after doing its own extensive, independent review. In the policy’s first full year, nearly 80 percent complied, and that has since risen to 90 percent. Compliance has been aided by the fact that patients do better by earlier admission to the ICU, they return to their regular physician when released and mortality for the patients who were cared for in the ICU dropped to 13 percent from 36 percent.

For more information about Saint Joe’s, visit their website at www.stjoeshealth.org.

What Do These Stories Tell Us?

This guide describes how four hospitals are virtually eliminating some HAIs, sustaining their success and making significant inroads in reducing other HAIs. CUSP played a major role in how these organizations converted evidence-based clinical practice into behavior change that was standardized throughout the hospital.

We saw how CUSP doesn't look the same in every organization, and the tools may be used in initiatives with different names. At Shore Health it is called "Target Zero," and at Saint Joe's it is the "Keystone Team." NorthCrest used their Lean work to keep going deeper with CUSP: when they had eliminated CLABSI, NorthCrest asked whether they could reduce the number of lines inserted and set a goal to cut 25 percent of that "waste" with the potential for harm the next year. Peterson, which has been without a CLABSI for 32 months as of October 2012, is rolling out CUSP to all hospital departments this same month and will be teaching CUSP to all hospital employees in fall 2012. Although CUSP implementation varied in pace and areas in which it was first applied, a common denominator is that it is a method for front-line staff to identify and fix things that impair safety when they are empowered and supported by their immediate managers and senior leadership.

What common themes emerge from these distinct case studies in which CUSP was applied to dramatically reduce CLABSI and other HAIs? The case studies contain many insights and lessons to assist other organizations in their CUSP journey to mitigate and eliminate harm. Several are important to highlight:

Persistent Leadership Engagement

Eliminating HAIs, sustaining their elimination and creating and maintaining a culture of safety requires strong and ongoing senior leadership. Senior leaders must employ different communication methods depending on the audience. The argument that is most persuasive to clinicians is research data that demonstrate clinical effectiveness of various practice bundles and protocols. Public forums to rally the staff, monthly meetings with adopted CUSP units and private one-on-one conversations with resistant clinicians are all important strategies.

Engaged Leaders and Champions

The cases show us three kinds of leaders and champions supporting or engaging directly with front-line efforts to eliminate HAIs: physician, nursing, and senior administrative champions. Leaders' most significant impact is through being fully supportive of the cultural changes that modify the traditional power balance between physicians and staff by promoting teamwork and collaboration, changing clinical default standards and protocols and empowering staff, especially nurses, to speak up when safety may be compromised.

Getting to Zero Is Possible

CUSP fosters a new way of thinking: HAIs are no longer an unfortunate consequence of care and are preventable. The Michigan Keystone ICU project proved this by getting to a median of zero CLABSIs in the State in the first 18 months of the project onset.

Culture Matters

Though the CLABSI prevention bundle had been available to hospitals for some years, CLABSI rates had not declined. With the addition of the CUSP tools, the technical intervention was readily accepted due to the culture change that CUSP promotes. With CUSP, which offers effective strategies where care is delivered—at the unit level—CLABSI rates did decline significantly throughout the United States. Those interviewed for this guide think of CUSP as a way of life in the hospital, one where silos are eliminated by putting the patient, rather than the department, at the center of the organization.

All Staff Must Own Safety

As long as infections are seen as the responsibility of the infection preventionist and his or her role is confined to tracking and reporting, HAIs will not be eliminated, and likely not notably reduced. Infection elimination belongs to everyone, and the entire hospital staff individually and collectively must own the presence or absence of HAIs.

All Staff Must Be Empowered

To own patient safety, staff members have to be empowered. Empowerment of nursing and other staff requires the support of administrative, nursing, and medical leaders, and once staff are confident that they will consistently have that support, they will be enabled to reduce harm.

Learning Organizations Are Safer

CUSP promotes the mindful learning from defects. It teaches staff to figure out for each identified defect: What happened? Why did it happen (what factors contributed and what prevented it from being worse)? What can we do to reduce the risk of it from recurring with different caregivers? How will we know the risk was reduced? With whom should we share the learning? CUSP also promotes continuous learning about the latest developments in the science of safety. Learning from Defects is a powerful tool to protect future patients from harm and reinforces a key practice in true learning organizations.