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Eliminating Catheter-Associated Urinary Tract Infections

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Emergency Nurses Association
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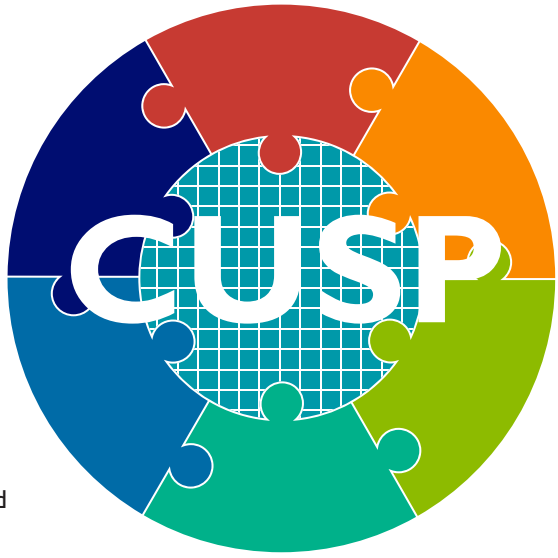
Society of Hospital Medicine

Executive Summary

Hospitals and care systems can achieve great change and positive impact by improving patient safety and quality through a culture of safety rooted in evidence-based technical interventions. A culture of safety reduces errors and enhances communication among hospital staff. The Comprehensive Unit-based Safety Program, or CUSP, model creates a foundation for physicians, nurses, other clinical care team members and supporting departments to work together.

Figure 1. CUSP Model



Implement Teamwork and Communication Tools:
Practical teamwork models and communication tools can be used to address issues that may present hazards to safety.

Identify and Learn from Defects:
What has happened on the unit that you do not want to happen again, and what underlying causes can be addressed to ensure safer care?

Assemble the Team:
Every unit-based safety improvement team should have an identified team leader, members of diverse opinions, and a majority of members who provide direct care.

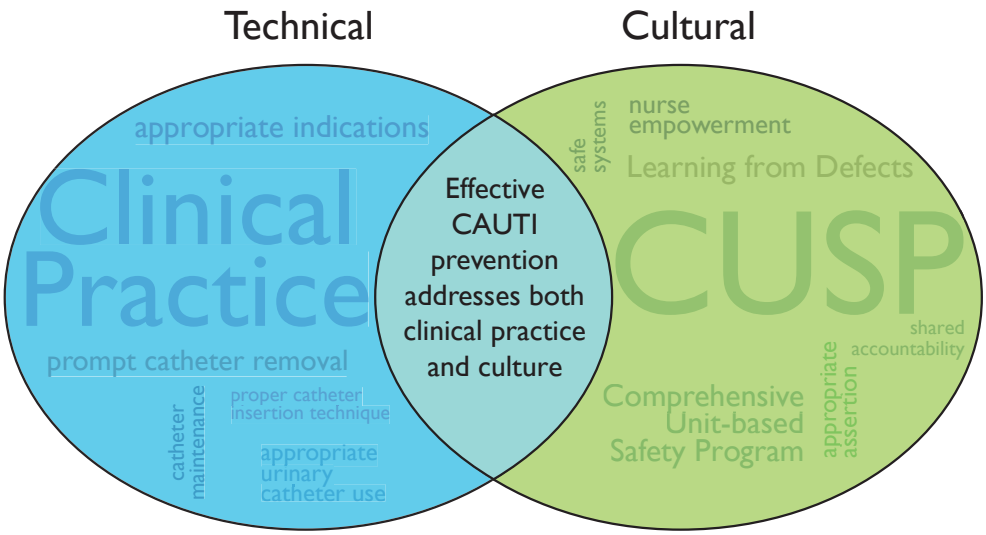
Engage the Senior Executive:
It is the senior leader's role to discuss safety issues identified with unit teams and front-line caregivers and to help remove barriers to improvement.

Understand the Science of Safety:
Care is delivered within complex systems, and input is needed from front-line providers to address safety defects at the system level.

Source: Agency for Healthcare Research and Quality, 2012.

Several national quality improvement projects for health care delivery use the culture of safety model to improve patient safety. These national quality improvement projects combine a strong safety culture with proven clinical, or "technical," interventions to reduce health care-associated infections. One example of a national project is the effort to eliminate catheter-associated urinary tract infections (CAUTI), through *On the CUSP: Stop CAUTI* project. Hospitals and care systems that are successful in achieving and sustaining reductions in infection rates have taken an approach that combines best clinical practices with a culture of change. The technical interventions to reduce CAUTI are clearly defined and relatively straightforward. With a strong safety culture, hospitals and care systems can tailor the specific interventions for reducing CAUTI rates.

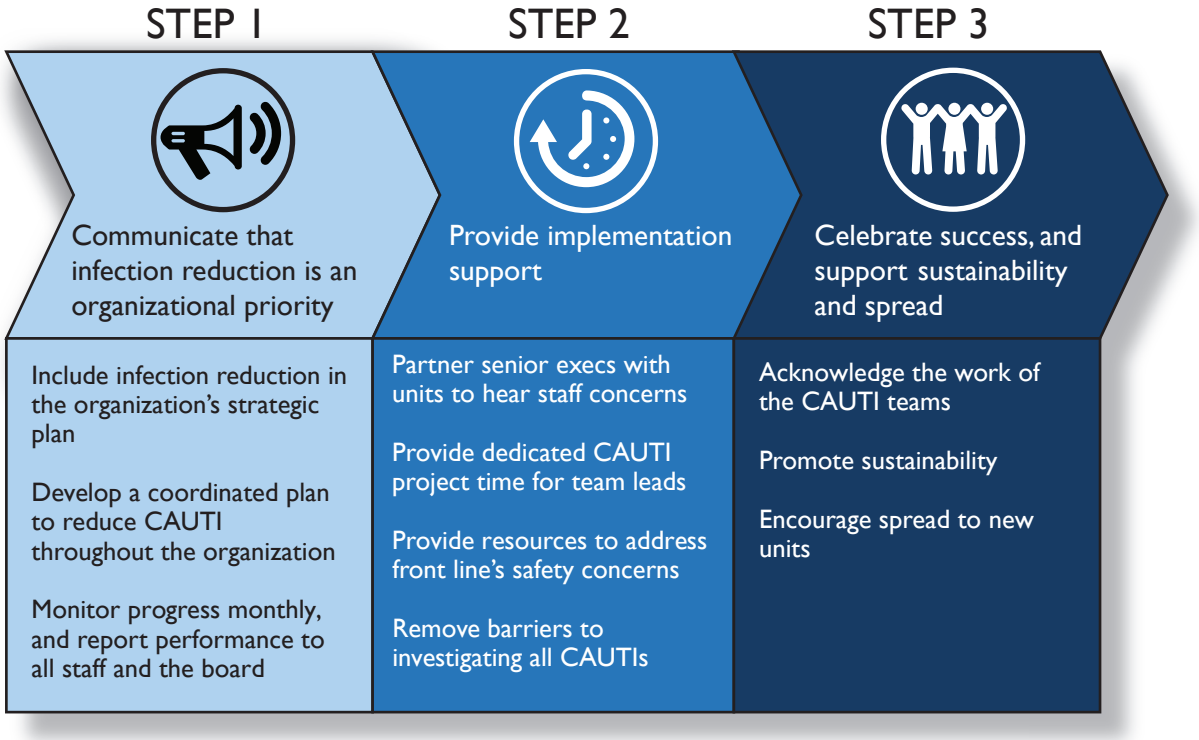
Figure 2. Combining Technical and Cultural Interventions



Source: American Hospital Association, 2013.

To reduce CAUTI rates, the hospital or care system should follow the three-step action plan outlined in Figure 3.

Figure 3. CAUTI Action Plan



Source: American Hospital Association, 2013.

The *On the CUSP: Stop CAUTI* project provides intensive coaching and significant data collection support to unit teams working to reduce CAUTI. Through this coaching and support, participating hospitals have identified several key lessons critical to successfully reducing and preventing CAUTI rates, including:

1. Demonstrate senior leadership commitment
2. Assemble a diverse and engaged multidisciplinary team on each implementation unit
3. Empower front-line staff
4. Ensure processes for data collection and reporting are established
5. Provide dedicated resources to the project
6. Engage staff with patient stories
7. Communicate successes—large and small—both early in the project and long term

Eliminating Catheter-Associated Urinary Tract Infections

Introduction

Health care organizations that commit to safety at all staff levels produce high reliability and improved patient outcomes. According to the Agency for Healthcare Research and Quality (AHRQ), establishing a "culture of safety" involves:

1. Acknowledgment of the high-risk nature of an organization's activities and the determination to achieve consistently safe operations
2. A blame-free environment where individuals are able to report errors or near misses without fear of reprimand or punishment
3. Encouragement of collaboration across ranks and disciplines to seek solutions to patient safety problems
4. Organizational commitment of resources to address safety concerns

A culture of safety is critical to preventing and reducing medical errors and improving the quality of health care delivery. Measured improvements sustain and improve a culture that otherwise is difficult to change. Several national quality improvement projects for health care delivery use the culture of safety model to impact patient safety. National projects such as the comprehensive unit-based safety program (CUSP) developed by Johns Hopkins Medicine Armstrong Institute for Patient Safety and Quality combine a strong safety culture with proven clinical, or "technical," interventions to reduce health care-associated infections. The CUSP model creates a foundation for physicians, nurses, other clinical care team members and supporting departments to work together. Through the development of a safety culture in the health care organization, these projects reduce harm and improve care delivery.

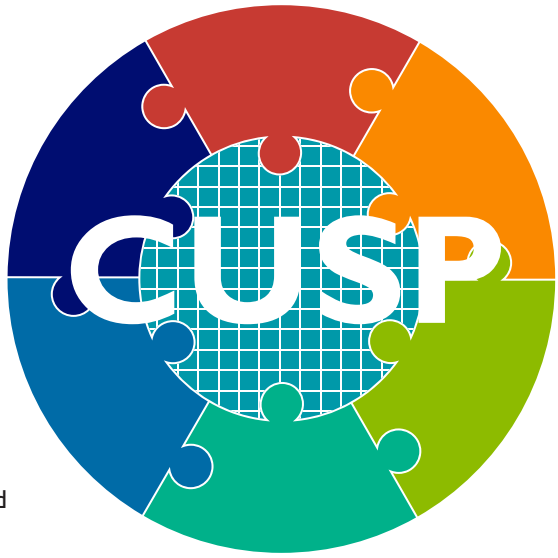
A national initiative to eliminate catheter-associated urinary tract infections (CAUTI), *On the CUSP: Stop CAUTI* uses the CUSP model and proven technical interventions. Funded by AHRQ, it is led by the Health Research & Educational Trust of the American Hospital Association in partnership with the Michigan Health & Hospital Association's Keystone Center for Patient Safety & Quality (MHA Keystone), the University of Michigan Health System, St. John Hospital and Medical Center and the Johns Hopkins Medicine Armstrong Institute for Patient Safety and Quality. The project also works closely with the Society of Hospital Medicine, the Association for Professionals in Infection Control and Epidemiology, the Society for Healthcare Epidemiology of America, and Emergency Nurses Association.

This guide assists hospitals and care systems in combining a safety culture with technical interventions to reduce CAUTI rates. Each hospital and care system highlighted in the case examples has achieved considerable success in reducing CAUTI rates by developing a culture of safety and using proven technical methods.

Developing a Culture of Safety

CUSP addresses changing culture at the department or unit level. CUSP creates a foundation for physicians, nurses, other clinical care team members and supporting departments to work together. Provided by AHRQ, the CUSP toolkit contains resources relevant to multidisciplinary teams, including front-line caregivers, nurse managers, infection prevention professionals, physicians, and safety and quality improvement leaders (found at www.ahrq.gov/cusptoolkit). Figure 4 highlights the five steps in the CUSP model.

Figure 4. CUSP Model



Implement Teamwork and Communication Tools:
Practical teamwork models and communication tools can be used to address issues that may present hazards to safety.

Identify and Learn from Defects:
What has happened on the unit that you do not want to happen again, and what underlying causes can be addressed to ensure safer care?

Assemble the Team:
Every unit-based safety improvement team should have an identified team leader, members of diverse opinions, and a majority of members who provide direct care.

Engage the Senior Executive:
It is the senior leader's role to discuss safety issues identified with unit teams and front-line caregivers and to help remove barriers to improvement.

Understand the Science of Safety:
Care is delivered within complex systems, and input is needed from front-line providers to address safety defects at the system level.

Source: Agency for Healthcare Research and Quality, 2012.

Catheter-Associated Urinary Tract Infections

The Centers for Disease Control and Prevention estimate that roughly 2 million health care-associated infections occur each year. These infections result in approximately $40 billion in excess health care costs and as many as 99,000 deaths. More people die as the result of HAIs than from breast cancer, AIDS and auto accidents combined. However, most HAIs are preventable.

CAUTIs are the most common type of HAI. Complications associated with CAUTI result in increased length of stay, patient discomfort, excess health care costs and mortality. An estimated 560,000 CAUTI cases occur annually, resulting in approximately $425 million in excess health care costs and 13,000 deaths (Anderson et al. 2007) (Klevens et al. 2007).

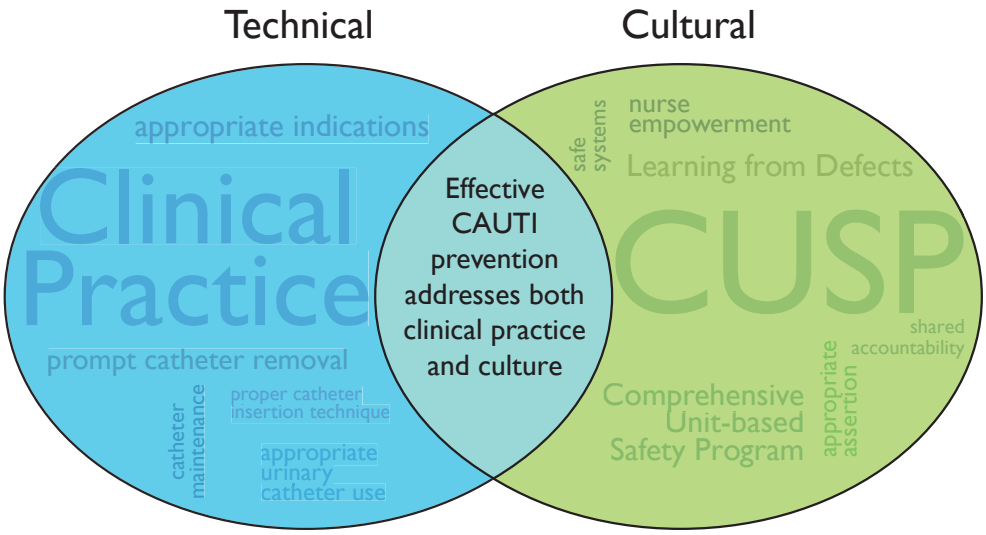
Reducing and preventing CAUTIs help hospitals and care systems avoid unnecessary costs and reduced reimbursements. Starting in 2014, hospital-acquired CAUTIs will no longer be reimbursed by Medicare, driving health care organizations to significantly reduce their infection rates. Additionally, a hospital's or care system's Medicare Annual Performance Update (APU) of 2 percent can be reduced if CAUTI data is not submitted. To find out the associated costs with CAUTIs, a hospital or care system can use the CAUTI Cost Calculator available online at http://cauti.umms.med.umich.edu/PHP/CAUTI_input.php.

As many as one-fourth of all hospital inpatients may have a urinary catheter placed during their hospital stay. Additionally, many catheters are medically unnecessary. Approximately one-third of physicians surveyed were not aware that their patients even had a urinary catheter (Saint et al. 2000).

Preventing CAUTI

Hospitals and care systems that have been most successful in achieving and sustaining reductions in infection rates have taken a two-pronged approach that combines best clinical practices with a culture change. The clinical, or technical, interventions to reduce CAUTI are clearly defined and relatively straightforward. However, fully integrating these best practices into standard operating procedures is fraught with challenges and complexities within the care environment. Reducing CAUTI through technical interventions requires a simultaneous cultural, or adaptive, approach to create a care environment that facilitates and encourages improvement.

Figure 5. Combining Technical and Cultural Interventions



Source: American Hospital Association, 2013.

Technical Interventions for CAUTI Prevention

Clinical evidence exists to guide CAUTI prevention, with three key steps for hospitals to focus on:

1. Appropriate urinary catheter use
2. Proper catheter insertion and maintenance
3. Prompt catheter removal

Integration of these steps into daily clinical practice demands engagement of the entire care team, from front-line caregivers to nurse managers to physicians. Figure 6 breaks down action items for the entire care team to implement the three technical interventions. Many of these actions items include both technical and cultural methods. Refer to additional resources in Appendix A.

Figure 6. Action Items for Multidisciplinary Team Members

Physician Champions

- Explain the CAUTI project and need for prevention to medical staff who have patients on the participating unit(s)
- Educate fellow physicians on appropriate indications for urinary catheter placement
- Advocate for nurse empowerment and participate in monthly CAUTI project team meetings and CAUTI root cause investigations
- Participate in the Learn from Defects process

Infection Prevention Professionals

- Select unit(s) in which to pilot the project. Collaborate with clinical and administrative leaders to develop a coordinated plan for CAUTI reduction throughout the organization
- Ensure that all infection prevention professionals are skilled in the use of the CDC's National Healthcare Safety Network CAUTI definitions and surveillance methods
- Maintain an active infection surveillance program using CDC Healthcare Infection Control Practices Advisory Committee criteria and ensure the accuracy and efficacy of staff education on strategies to prevent CAUTI
- Provide monthly unit-level CAUTI data to project leads for posting and transparent tracking, along with weekly reports to hospital leaders
- Lead efforts to assess the utility and necessity of infection-related interventions

Nurse Leaders

- Collaborate with clinical and administrative leaders to develop a coordinated plan for CAUTI reduction throughout the organization
- Explain the CAUTI project to nursing staff on the participating unit(s), highlighting prevention a ctions including appropriate indications for urinary catheter placement
- Work with nursing staff to embed a daily process for continually collecting data on number of catheters present, indications for each, and need for removal
- Participate in monthly CAUTI project team meetings, Learn from Defects process and CAUTI root cause investigations
- Select unit(s) in which to pilot the project and post monthly unit-level CAUTI data in a prominent place on the unit
- Share with nursing staff unit-specific weekly reports on the number of people infected with CAUTI, the weeks without CAUTIs, and quarterly rates of CAUTI

Data Collectors

- Work with nursing leadership and staff to embed a daily process for continually collecting data on number of catheters present, indications for each, and need for removal
- Ensure that monthly and quarterly CAUTI rates are shared with the unit team, nursing leadership, and medical staff
- If a team has low rates, share the number of inappropriate catheters or days between infections with the unit team, nurse leadership, and medical staff
- Collect process data on catheter presence and appropriateness of indications
- Assist in review of reports on catheter prevalence and CAUTI rates at team meetings

Source: American Hospital Association, 2013.

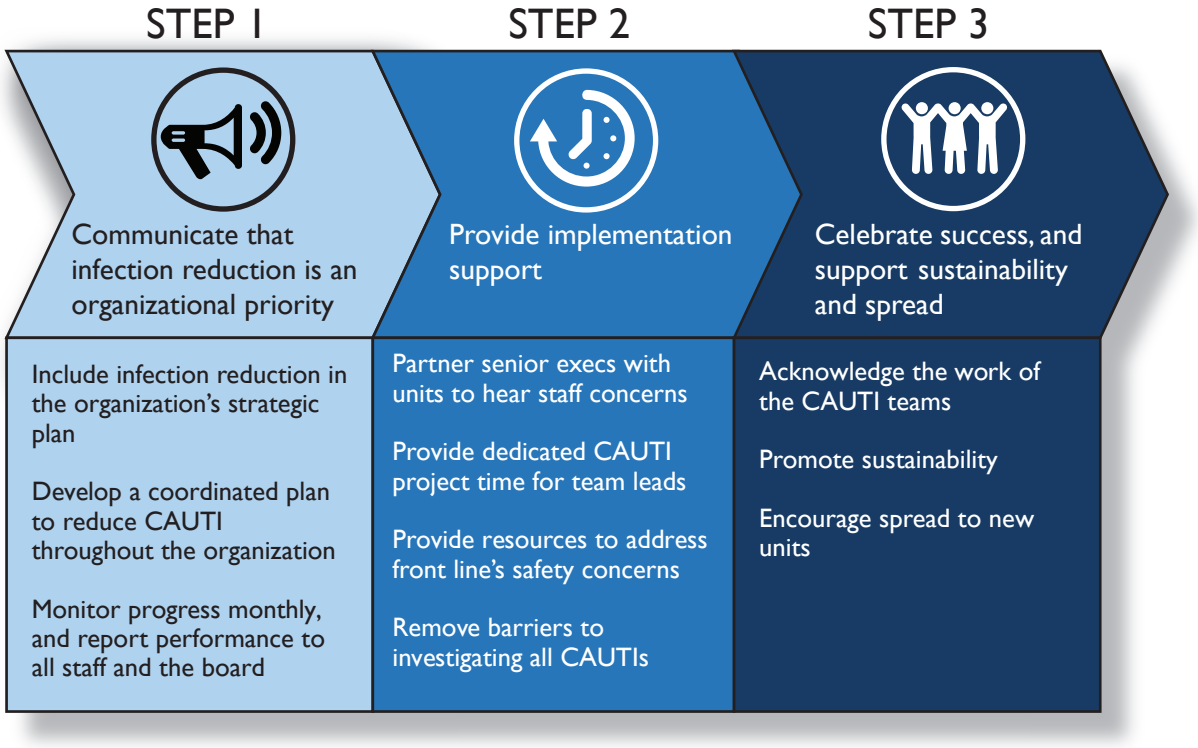
Cultural Interventions for CAUTI Prevention

A robust safety culture creates the conditions under which CAUTI reduction is possible. Achieving and sustaining reductions in CAUTI both require an environment that promotes transparent communication, shared accountability and continuous improvement. The behaviors inherent to a culture of safety enable the types of process improvements that prevent infections. Checklists, policies and procedures are necessary to improve safety, but sustaining consistent use of these tools demands strong working relationships in which open communication is the norm. Long-term improvement demands a culture that ensures that the technical work will be effective. Project fatigue is challenging in quality improvement practices, and hospitals have found that the CUSP model combines very well with other change models, such as the Kotter Leading Change Model, the IHI Model and TeamSTEPPS implementation. Please refer to Appendix C, which details different change models.

Action Plan to Reduce CAUTI Rates

With a strong safety culture, hospitals and care systems can tailor the specific interventions for reducing CAUTI rates. To reduce CAUTI rates, the hospital or care system should follow the three-step action plan in Figure 7.

Figure 7. CAUTI Action Plan



Source: American Hospital Association, 2013.

Step 1: Communicate that infection reduction is an organizational priority

The senior leadership team supports CAUTI prevention efforts by clearly demonstrating the project is a priority for the hospital or care system.

Include infection reduction in the organization's strategic plan

Incorporating infection reduction with patient safety goals in the hospital or care system's strategic plan communicates the priority of this effort to staff. Included in this strategic plan would be various infection rates, including CAUTI. This data allows leadership to align this initiative with other safety projects, laying the foundation for sustaining improvement over time.

Develop a coordinated plan to reduce CAUTI throughout the organization

Working with the infection prevention team and safety leadership, identify one or two pilot units to launch the CAUTI project. Appendix B contains a recommended process for selecting the pilot unit(s). Composed of engaged front-line providers, the CAUTI prevention team takes ownership of patient safety. The team collaborates with nursing, case management, infection prevention professionals, physicians and other disciplines. Recruiting the appropriate personnel for a unit-based multidisciplinary team is crucial, because the team oversees the process to guide implementation and management of the program and is the driving force for sustaining the program. An engaged and empowered front-line staff is an essential component to an effective safety intervention. Giving staff the tools and support to speak up appropriately, identify, and learn from defects is the most effective route to eliminating potential barriers to CAUTI reduction.

Monitor progress monthly, and report performance to all staff and the board

Achieving success in reducing various infections, including CAUTI, depends on the ability of the project team to effectively collect and monitor data. The project should assign specific team members to be responsible for data collection and reporting and develop a process to evaluate the prevalence and appropriateness of urinary catheters on the unit(s). The hospital board should receive monthly reports on the various interventions to reduce hospital infections.

Data collection is not just an exercise in collecting information, but it is a key part of the intervention. Unit teams, nursing leadership and medical staff receive the routine data that include the number of people infected per month and quarterly infection rates. If a unit team has low CAUTI rates, it may be better to share the number of inappropriate catheters or monitor days between infections. CAUTI prevention teams review reports on catheter prevalence and CAUTI rates at monthly team meetings to monitor. The team uses data to identify areas of improvement, posts rates on the unit in a highly visible place—perhaps by posting a CAUTI calendar banner—and recognizes achievements in the employee newsletter or on the organization's intranet.

Step 2: Provide Implementation Support

Partner senior execs with units to address safety concerns

Identify a member of the senior leadership team to sponsor each pilot unit and become better acquainted with challenges faced by the front-line caregivers. Leadership sponsors should attend unit CAUTI team meetings, help the unit prioritize and address safety concerns and help communicate lessons and successes broadly through the organization. If front-line caregivers communicate with senior leadership about challenges they face while providing patient care each day, the impact on senior leaders' perspectives and understanding can be profound.

Senior executives may be unaware of system defects that exist in the hospital. Many nurses, physicians, and other caregivers have valuable insights into how to improve care delivery systems and eliminate barriers. Executives who meet monthly with a unit team frequently report the value of these meetings.

One of the most effective approaches to bridging the gap between senior management and front-line providers is to conduct executive safety rounds for the executive to meet with unit providers and discuss safety issues. Meeting with unit providers is preferable to meeting in a conference room, as presence on the unit helps give senior leaders a greater sense of ownership of the project and a sense of being an integral part of the unit team. Meeting on the patient care unit also allows senior executives to be more visible to front-line staff and imparts a stronger sense of commitment to the project.

Provide dedicated CAUTI project time for team leads

Allow dedicated staff time for participation in CAUTI prevention team meetings, provide data collection resources and foster collaboration between other departments such as IT and central supply. Roughly 10 percent of time in each unit should be devoted entirely to CAUTI prevention by three key team members: a physician champion, a nurse leader and a data collector.

Tasked with participating in monthly unit CAUTI team meetings, physician champions educate clinicians and staff and facilitate root cause investigations of actual CAUTIs. Physician champions educate fellow doctors on appropriate indications for urinary catheter placement and on the value of the CAUTI reduction project.

Nurse leaders will have the greatest amount of interaction with and influence on those who are the heart of the CAUTI prevention effort: the front line. Nurse leaders are key in educating staff, supporting data collection, advocating for the project among clinicians and coaching for nurse empowerment.

The project should dedicate specific team members who will be responsible for data collection and reporting and should develop a process to evaluate the prevalence and appropriateness of urinary catheters on the unit(s). The data collection process should be one that best fits each unit. This may be a part of the existing rounding process. Most importantly, this process must be standardized and used consistently.

Provide resources to address front line's safety concerns

One of the most important factors in a strong culture of safety is the response by senior leaders to safety concerns of staff. Senior leaders should follow through to address defects identified by staff and communicate with staff on issues, solutions and resources on an ongoing basis.

Remove barriers to investigating all CAUTIs

Require that leaders in quality improvement, patient safety or infection prevention create and execute a process to investigate each CAUTI. The project team should use the Learn from Defects process to investigate all CAUTIs and share results throughout the organization. This process involves gathering detailed input from the front line and other clinicians on root causes of safety hazards or threats and using a framework for addressing those root causes to prevent future harm. The Learn from Defects tool can be found in the Identify Defects through Sensemaking module of the CUSP Toolkit at www.ahrq.gov/cusptoolkit.

Step 3: Celebrate Success, and Support Sustainability and Spread

Acknowledge the work of the CAUTI teams

To celebrate success in CAUTI reduction, health care organizations should acknowledge the work of the CAUTI team in staff newsletters, the organization's intranet or press releases. To spread learning to other units, encourage project leaders and champions to reach out to other areas of the organization. The team can do this by displaying posters of CAUTI reduction run charts or reminders of the indications for catheter placement outside of the pilot unit(s). The CAUTI prevention team also can post project updates on the hospital intranet or bulletin boards or in employee newsletters. The team also should create an "elevator speech" to inform others they meet in passing to communicate enthusiasm for the CAUTI prevention project and its value.

Promote sustainability

Sustainability of a quality or safety improvement project is marked by long term continuation of gains in both outcome and process data and by a continued ability to adapt key components of the original intervention to the constantly shifting context of the unit environment. Sustainability occurs if infections remain low while facing staff turnover, facility and equipment changes and time.

This long-term continuation of improvement is the result of embedding improvement principles in day-to-day work and encouraging attitudes and behaviors in staff that are conducive to quality improvement. Using tools in the CUSP model has been a significant factor in hospitals' ability to sustain improvements successfully.

Encourage spread to new units

To support widespread adoption of successful approaches, hospitals and care systems should provide opportunities for teams to share success stories with management and other teams. Health care organizations can celebrate process-oriented successes—reductions in catheter prevalence and utilization—as well as reduced CAUTI rates, especially early in the project.

Project unit leaders and champions should consider meeting with interested units to share lessons learned or to communicate success in reducing CAUTI rates. Health care organizations can start with units that have higher CAUTI rates. Hospital and care system leaders can share this guide and other available resources, and encourage pilot unit leaders and champions to coach other unit teams in CAUTI prevention and in the CUSP model. Trained team leaders serve as mentors for other units. Teaching other units not only benefits the rest of the hospital but also benefits members of the pilot unit teams. By teaching others, leaders solidify their knowledge of the subject and learn from the unique challenges that other units experience.

Key Lessons for Success in Reducing CAUTI

Identified by CAUTI reduction teams, several key success factors help reduce CAUTI rates.

Table 1. Key Lessons for Success

	Demonstrate senior leadership commitment	Be clear in internal and external messages that CAUTI reduction is a priority for the organization, and when operational changes are made based on input from the front line, ensure that this is communicated to the unit teams.
	Assemble a diverse and engaged multidisciplinary team on each implementation unit	All culture is local, and the best collective decisions are made when there is diverse and independent input. Make sure that front-line nurses, nurse managers and physicians all are at the table.
	Empower front-line staff	Ensure that all unit staff understands the Science of Safety (the complex systems in which care is delivered and how to improve these systems to make care safer). Encourage the front line to train other team members to encourage ownership.
	Ensure processes for data collection and reporting are established	Work with each unit team to build a system for collecting outcome data that will work best for the unit, and integrate data collection into existing unit workflows.
	Provide dedicated resources to the project	Allow teams to set aside designated staff time to collect and share data, and encourage cross-departmental collaboration, such as IT initiatives.
	Engage staff with patient stories	Work with the risk management team and talk with front-line staff to reveal stories of actual CAUTI cases to make the challenge real for the project team at all levels.
	Communicate successes—large and small—both early in the project and long term	Front-line staff will gain courage to speak up when granular, process-oriented gains are celebrated as successes. Widely communicating sustained rates of zero CAUTIs can set long-term goals that will help drive sustainability.

Source: American Hospital Association, 2013. Images by the Noun Project.

Conclusion

Creating and enhancing a culture of safety reduces medical errors and increases patient safety. Through the CUSP model, hospitals and care systems in the *On the CUSP: Stop CAUTI* project have reduced CAUTI rates and improved patient safety and quality. As a CAUTI reduction team at St. Joseph Mercy Hospital in Michigan observed, "CAUTI reduction is both a sprint and a marathon." By establishing a strong culture of safety and implementing technical methods, CAUTI rates can be reduced.

Coupled with the CUSP cultural interventions, unit teams can sustain long term the gains in processes and outcomes achieved by integrating these practices into their daily work: appropriate catheter placement, proactive approaches to prompt catheter removal, and ongoing data monitoring. Through coaching and support, even units that have had low CAUTI rates benefit from involvement with the program. In addition, the CUSP model is applicable to all patient safety concerns, and successful units are using the model to address other safety issues.

Case Example: **St. Joseph Mercy Hospital, Ann Arbor, Michigan**

Background: St. Joseph Mercy Hospital (SJMH) of Ann Arbor, Michigan, is a 537-bed teaching hospital and a member of a five-hospital system serving seven counties in southeastern Michigan. SJMH formed an HAI team in 2005 as part of a Michigan Health & Hospital Association Keystone Center for Patient Safety & Quality HAI project. SJMH implemented the CUSP model together with a hand hygiene program and began planning for CAUTI reduction pilot projects in 2007.

Intervention: SJMH implemented the CUSP model and educated staff on CAUTI prevention practices and the science of safety. The project team provided a standardized script for handoffs of catheterized patients and applied the Learn from Defects tool to practices of placement, maintenance and discontinuation of urinary catheters. The SJMH team implemented MHA Keystone protocols on two pilot units and educated nurse managers, bedside nurses, physicians, and leadership teams on appropriate indications for catheter placement. The project implemented a paper-based process of physician reminders and provided coaching on catheter use during rounds.

Clinician education addressed catheter placement and focused on reducing manipulation of the catheter; securing the catheter as needed; maintaining a sterile, closed system; and standardizing processes for specimen collection. The project provided standardized equipment kits for urinary catheter placement and assessed clinician competency for catheter placement during orientation. In November 2011, SJMH built alerts for patients with urinary catheters into their electronic medical record system to remind clinicians to check for catheter indications and remove the catheter if necessary.

Results: In the four years since the CAUTI project was first implemented in 2009, SJMH has seen a gradual decrease in utilization of urinary catheters, with an overall reduction of approximately 6 percent. Since early 2011, SJMH has seen an increase in the percentage of catheters that are removed within two days post-operation, from 79 percent to approximately 97 percent.

Lessons: SJMH has learned that CAUTI reduction is both a sprint and a marathon. The project team built momentum early in the project with quick wins and immediate results that were motivated by a strong sense of urgency to eliminate infections. In the years that followed, the team strived to maintain and build on these early gains by setting continuous goals for improvement. The SJMH team also emphasizes the need to engage all players, from front-line nurses to physicians to other quality improvement teams in the organization.

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Case Example: **Ozarks Medical Center, West Plains, Missouri**

Background: Ozarks Medical Center (OMC) is a 114-bed community hospital in southern Missouri with 21 outlying clinics. OMC chose a 12-bed intensive care unit to begin implementation and educated staff.

Intervention: The project began with a two-hour CUSP kick-off workshop, where unit staff viewed a video about Josie King, a child who died as the result of medical errors; a brief presentation outlining CUSP; and the Science of Safety video by Peter Pronovost, MD, of Johns Hopkins. Front-line unit leaders presented workshop didactic content, attendance for the Science of Safety video was documented and staff completed the CUSP Staff Safety Assessment tool. One of the safety hazards identified through this exercise was selected to be examined with the Learn from Defects process.

The project was spread quickly to other units, including a second-floor surgical inpatient unit. The project team on this unit consisted of two unit leads, a unit nurse manager, infection control and quality improvement staff, which put Learn from Defects at the center of their implementation process.

Results: At baseline, CAUTI rates in the second-floor surgical inpatient unit fluctuated widely between zero and 11.9 CAUTIs per 1,000 patient days. After CUSP implementation, the rate dropped to zero and stayed there for all of 2011 and into early 2012. The ICU where OMC's implementation began has maintained a rate of zero CAUTIs for more than two years.

Lessons: Front-line staff taught other staff about the CUSP model and CAUTI prevention practices early in the implementation process, to cement learning and encourage ownership of the project. OMC's CUSP teams were not afraid to celebrate small successes. They recognized that every time a nurse inquired about the need for a urinary catheter, and every time an unnecessary catheter was removed, it meant a win for the CAUTI project. OMC openly acknowledged these successes as models for the entire project, particularly early in the project.

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Case Example: **Saint Clare's Health System, Denville, New Jersey**

Background: Saint Clare's Health System is a four-facility system that runs three acute-care hospitals and is based in New Jersey. Saint Clare's is a member of Catholic Health Initiatives. Prior to 2009, the infection control department was responsible for CAUTI reduction.

Intervention: Saint Clare's Health System developed educational and communication tools for employees and physicians, as well as patients and families, providing materials in both English and Spanish. The project team improved the standing orders for indwelling urinary catheters and worked with IT to capture appropriate documentation. Saint Clare's also has emphasized continuous education and annual competency requirements for nurses and nursing assistants.

Results: Since project implementation in 2009, the overall number of CAUTIs in Saint Clare's Health System has declined steadily with 55 CAUTIs in 2008 dropping to 29 in 2009, for a rate of 2.2 infections per 1,000 catheter days. In 2010, there were half as many CAUTIs, with 14 infections total, for a rate of 0.96 per 1,000 catheter days. In 2011, there were six CAUTIs, and the rate was 0.40 per 1,000 catheter days. Eighty percent of patient care units were able to maintain zero CAUTI rates for six months, and 60 percent had rates of zero for 12 months or more. Two intensive care units in the system maintained rates of zero for more than 24 months. These gains have saved St. Clare's Health System an estimated $192,000 or more in avoidable costs.

Lessons: The team at Saint Clare's has identified major factors in their success, including the accountability of multidisciplinary teams with designated team leaders and strong leadership support. The Saint Clare's team engaged physicians, staff and patients and shared project outcomes on an ongoing basis, improving unit processes as needed. Development of a standing order for indwelling catheter use and review of all CAUTI cases by infection prevention professionals were also factors in Saint Clare's success. Most importantly, Saint Clare's has recognized successes at all unit levels to keep momentum strong.

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Appendix A: Additional CAUTI Reduction Resources for Specific Hospital Staff

Resource	Hospital Staff			
	Physician Champions	Infection Prevention Professionals	Nurse Leaders	Data Collectors
HICPAC Guidelines for Prevention of CAUTIs: *http://www.cdc.gov/hicpac/cauti/001_cauti.html* Aid physicians and team members in continually assessing patients' need for urinary catheters.	X	X	X	X
Urinary Catheterization Policy: *https://s3.amazonaws.com/CAUTI_Manuals_and_Toolkits/CAUTI+Implementation+Guide/Appendix+E-Urinary+Catheterization+Policy.doc* This template policy will provide decision support and formalize a process for ordering and placing urinary catheters.	X	X	X	
Bladder Scan Policy: *https://s3.amazonaws.com/CAUTI_Manuals_and_Toolkits/CAUTI+Implementation+Guide/Appendix+F-Bladder+Scan+Policy.doc* This policy supports an important alternative to catheter placement.	X	X	X	
Urinary Catheter Decision Making Algorithm: *https://s3.amazonaws.com/CAUTI_Manuals_and_Toolkits/CAUTI+Implementation+Guide/Appendix+I-Urinary+Catheter+Decision+Making+Algorithm.doc* This decision aid helps to educate caregivers in catheter indications and the need for monitoring.	X			
Learn From Defects Tool: *http://www.ahrq.gov/professionals/education/curriculum-tools/cusptoolkit/toolkit/learndefects.doc* Collect valuable input from the front line on potential threats to safety and on steps to mitigate them.	X	X	X	
Nurse-Driven Protocol for Catheter Removal: *https://s3.amazonaws.com/CAUTI_Manuals_and_Toolkits/CAUTI+Implementation+Guide/Appendix+O-Nurse-Driven+Protocol+for+Catheter+Removal.doc* This template policy and educational tool provides valuable support in empowering the front line.		X	X	
***On the CUSP: Stop CAUTI* Frequently Asked Questions:** *https://s3.amazonaws.com/CAUTI_Manuals_and_Toolkits/CAUTI+Implementation+Guide/Appendix+P-Frequently+Asked+Questions.doc* This document of 14 questions and answers provides clarity on indications for catheter placement and proper care and removal.		X	X	
Helpful Hints When Educating Nursing Staff: *https://s3.amazonaws.com/CAUTI_Manuals_and_Toolkits/CAUTI+Implementation+Guide/Appendix+R-Helpful+Hints.doc* Use this eight-point checklist for guidance in educating nursing staff.		X	X	

Presentation to Nurse Manager and Case Manager (or Unit Champion): *https://s3.amazonaws.com/CAUTI_Manuals_and_Toolkits/CAUTI+Implementation+Guide/Appendix+S-Presentation+to+Manager.doc*		X		
Presentation of Data: *https://s3.amazonaws.com/CAUTI_Manuals_and_Toolkits/CAUTI+Implementation+Guide/Appendix+U-Presentation+of+Data.doc* Use these presentations to educate nurse managers on CAUTI project goals, timeline and progress.		X		X
Implementation of Urinary Catheter Initiative Sample Letter for Nurse Manager/Case Manager: *https://s3.amazonaws.com/CAUTI_Manuals_and_Toolkits/CAUTI+Implementation+Guide/Appendix+V-Implementation+of+Urinary+Catheter+Initiative+Letter.doc*		X		
Completion of Staff Education Sample Letter: *https://s3.amazonaws.com/CAUTI_Manuals_and_Toolkits/CAUTI+Implementation+Guide/Appendix+W-Completion+of+Staff+Education.doc*		X		
Unit Rounds to Begin Sample Letter: *https://s3.amazonaws.com/CAUTI_Manuals_and_Toolkits/CAUTI+Implementation+Guide/Appendix+X-Unit+Rounds+to+Begin+Letter.doc*		X		
Unit Results Sample Letter: *https://s3.amazonaws.com/CAUTI_Manuals_and_Toolkits/CAUTI+Implementation+Guide/Appendix+Y-Unit+Results+Letter.doc*		X		
Shadowing Another Professional Tool: *http://www.ahrq.gov/professionals/education/curriculum-tools/cusptoolkit/toolkit/shadowing.doc* This easy-to-use tool provides a framework and guide for observing interactions and processes on the unit. Review this tool before your shadowing experience to help you recognize teamwork and communication issues among practice domains that are important to patient care.			X	
CAUTI Process Data Collection Tool: *https://s3.amazonaws.com/CAUTI_Manuals_and_Toolkits/CAUTI+Implementation+Guide/Appendix+Z-CAUTI+Process+Data+Collection+Tool.xls* This easy-to-use form guides the process of collecting catheter prevalence and appropriateness data.				X
NHSN Protocol Corrections, Clarification and Additions: *http://www.cdc.gov/nhsn/pdfs/pscmanual/7psccauticurrent.pdf* This resource aids in implementation of a surveillance process, including use of indwelling urinary catheters, positive urine cultures, and the presence of certain clinical signs and symptoms.				X

Appendix B: Selecting a Pilot Unit or Units for CAUTI Project Implementation

Infection prevention professionals and patient safety teams should work together to select a small number of hospital units with at least moderate urinary catheter use to serve as the pilot unit(s) for this intervention. Evaluate units that have the highest urinary catheter utilization or units with increased non-indicated catheter utilization. Work with the infection prevention professional to determine the unit with the highest CAUTI rate. He or she may conduct a point prevalence to identify the unit with the highest usage of indwelling catheters. Point prevalence is calculated using the following formula:

$$\text{Point prevalence} = \frac{\text{(Number of urinary catheters)}}{\text{(Number of patients at one point in time)}} \times 100$$

Example: During a nursing shift change, count all urinary catheters in use, and then count the number of patients on the unit. Using the formula above, use these counts to calculate point prevalence for multiple units and identify the unit with highest prevalence to target first. In the example below, one can see that the team should start with unit B, because unit B has the highest prevalence.

	Number of Urinary Catheters	Number of Patients	Prevalence
Unit A	6	32	19
Unit B	10	29	34
Unit C	4	30	13

Appendix C: Culture Change Model Comparison

The CUSP model integrates well with routine procedures such as daily rounds and debriefs. CUSP also provides streamlined tools for making ongoing risk assessment part of the mindset of front-line staff. This table details how three existing change models are interchangeable and applicable to the CAUTI effort.

Culture Change Model Comparison

Objective	CUSP	Kotter: Leading Change	Kouzes and Posner: Leadership Challenge	As Applied to CAUTI
Developing Engagement	ENGAGE, EDUCATE, Science of Safety, the Josie King Story	Create a Sense of Urgency	Encourage the Heart	Communicate number of CAUTIs in unit, potential or real patient harm that could occur, financial cost of CAUTI
Team Development	ENGAGE, Senior Leader Partnership with the CUSP Team	Create a Guiding Coalition	Model the Way	Establish unit team with direct care providers, nurses, nurse manager or charge nurse, infection control professional and a physician
Developing Alignment	ENGAGE, "What hill do we climb?"	Develop a Shared Vision	Inspire a Shared Vision	Identify with the team: What would it look like if catheter utilization was low and CAUTIs were prevented?
Sharing Approach		Communicate the Vision		Educate others in daily rounding assessing for catheter presence and indication
Empowerment	EXECUTE, Direct Care Provider Involvement, Teamwork and Communication Tools	Empower Others to Act	Enable Others to Act	Work with care team to establish protocols to remove catheter when no longer needed and not to place catheter unless it is indicated
Implementing Change	ENGAGE, EXECUTE, EVALUATE, Learn from Defects (see appendix A for more information)	Generate Short Term Wins	Challenge the Process	Improve utilization practices, evaluate improvement in compliance with indications and in symptomatic CAUTI
Spread	ENGAGE, EXECUTE, EVALUATE, Learn from Defects	Consolidate Gains and Produce More Change		Work with ICP and senior executive to spread to other units in the organization
Sustainability	Part of the Daily Work	Anchor New Approaches in Culture		Make daily rounding and catheter utilization assessment part of routine patient care

Source: American Hospital Association, 2013.

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