
# A Model for Sustaining and Spreading Safety Interventions

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## Background and Acknowledgments

Healthcare-associated infections (HAIs) are a major concern for public health, patient safety, and quality of care, and they contribute to increased morbidity, mortality, cost, and length of stay. The Association for Professionals in Infection Control and Epidemiology (APIC) worked collaboratively with the Health Research & Educational Trust (HRET) to develop this resource guide on how to sustain and spread infection-prevention change initiatives, using lessons from the central-line associated bloodstream infection (CLABSI) and the catheter-associated urinary tract infection (CAUTI) projects of the *On the CUSP: Stop HAI* initiatives implemented in the acute care setting across the United States and Puerto Rico. Part of the National Action Plan to Prevent Healthcare Associated Infections, these HAI prevention projects were funded by the Agency for Healthcare Research and Quality from 2008 through 2015.[1]

APIC has been a key partner with other members of the national project team that oversaw these HAI prevention initiatives. Other *On the CUSP: Stop CAUTI* partners were: the University of Michigan, the Michigan Health & Hospital Association's Keystone Center for Patient Safety & Quality, St. John Hospital and Medical Center, the Johns Hopkins Medicine Armstrong Institute for Patient Safety and Quality, the Emergency Nurses Association, the Society for Critical Care Medicine, the Society for Healthcare Epidemiology of America, the Society of Hospital Medicine, and the Centers for Disease Control and Prevention.

HRET would also like to acknowledge Dr. Shelley Jeffcott, Improvement Advisor, Healthcare Improvement Scotland. Dr. Jeffcott is the principal author of the guide *The Spread and Sustainability of Quality Improvement in Healthcare*, first published in 2014 and developed for the NHS Scotland Quality Improvement Hub. The NHS Scotland guide is organized around 10 sustainability factors. This guide is similarly organized and it contains some of the same themes; the content has been changed, however, to conform with the patient safety model used in these HAI elimination national collaboratives, the Comprehensive Unit-based Safety Program (CUSP), and the experience of the more than 2,000 hospitals that have participated in the CLABSI and CAUTI prevention projects from 2008 through 2015.

### Origins of the *On the CUSP: Stop HAI* Initiatives

This guide is based on the CUSP patient safety model developed in 2001–2002 by Peter Pronovost, M.D., Ph.D., FAAC, and his team at Johns Hopkins Medicine. The CUSP model combined evidence-based clinical practice with proven patient safety practices that promoted a culture of safety in which clinicians were held accountable for patient outcomes. Clinicians investigated every infection to learn how it could have been prevented. Administrators, physicians, and nurses worked as an interdisciplinary team and embraced each infection as a problem to be solved. Senior administrators, and physicians and nurse champions, strongly promoted CUSP.

Dr. Pronovost partnered with the Michigan Health and Hospital Association (MHA) in 2003 to implement CUSP in more than 100 intensive care units (ICUs) with funding from AHRQ. Within 18 months, CLABSIs were reduced by 66 percent.[2,3]

From 2008 to 2012 with continued AHRQ support, HRET partnered with Dr. Pronovost and his team, MHA, and 44 State and regional hospital associations to implement CUSP to prevent CLABSIs. More than 1,000 hospitals and 1,800 CUSP teams across 44 States, the District of Columbia, and Puerto Rico, reduced CLABSIs by 41 percent in ICUs and non-ICUs.[4]

From November 2001 through August 2015, again with AHRQ funding, HRET partnered with the national partners cited above and State and regional hospital associations to implement the *On the CUSP: Stop CAUTI* project in 40 States, the District of Columbia, and Puerto Rico. Sanjay Saint, M.D., and his team at the University of Michigan, as well as Mohamad Fakih, M.D., MPH, at St. John Hospital and Medical Center in Detroit served as principal faculty. In all, 1,266 hospitals participated in the CAUTI prevention effort and achieved an overall 12.5 percent relative reduction in CAUTIs nationwide.[5]

# How To Use This Guide

## Audience

This guide is intended for health care leadership, quality and patient safety specialists, unit team leaders, safety innovation champions, and others involved in performance improvement and patient safety.

## How To Use This Document

Planning for sustainability should happen early in the process of implementing any improvement project. This how-to guide is organized into short sections on each of the key factors or drivers behind successful sustainment of effective safety practices. These main drivers are based on the lessons of the hospital units that participated in the *On the CUSP: Stop HAI* initiatives. See Additional Reading for more information about the research and practice related to the adoption, sustainment, and spread of safety innovations.

## Please Note

The use of the word “staff” applies to all levels of the organization and other professionals involved in CAUTI rate reduction, (e.g., physicians who may not be employees of the organization).

## Why Sustainability Matters

Sustainability in health care occurs when a new safety innovation loses its separate identity as a project and becomes embedded into daily work flow, *and* the improvements in patient outcomes attributed to the new safety practices are maintained or improved after the initial implementation project ends. Sustainability is also evident when hospital staff and providers share their expertise and provide ongoing support to others in carrying out the change package, which is now no longer described as change, but rather as "this is how we do things here."

Too often, well-meaning staff and clinical teams undertake patient safety projects, achieve improvements, and then fail to maintain those improvements over time. Key factors contributing to the failure of HAI reduction efforts over time include not educating new staff in the technical and adaptive aspects of the change package, failing to require continuing competency checks, not incorporating the change package into daily work flow, and ceasing to routinely monitor progress toward achieving or maintaining safety goals. For an informative graphic on what to avoid, read the Institute for Healthcare Improvement's "Seven Spreadly Sins."[6]

Ten themes or drivers characterize the hospitals that were successful in sustaining and spreading CLABSI and CAUTI prevention in their organizations.

### 1. Leadership Commits to Bold Improvement Goals

The most important driver to sustaining and spreading new safety practices is public, active commitment of organizational leadership to achieving a bold improvement goal. This effect is enhanced by establishing a specific timeframe for goal achievement, continued communication about each safety goal's importance, and regular assessment of how well each goal is being met or sustained. Using the example of CAUTI prevention, leaders did this by—

- Including "zero CAUTIs" in the organization's strategic plan
- Consulting expert opinion on effective interventions to address the safety concern
- Piloting an evidence-based change package in one unit first to create reliable process and strong staff buy-in before spreading to other units
- Engaging staff and providers by linking actual patient stories to individual HAI events
- Providing adequate resources for the change initiative by—
    - Assigning a senior leader to adopt the unit
    - Providing protected time for teams to implement the change initiative
    - Removing barriers to investigating all CAUTIs
    - Holding practitioners and staff accountable
    - Contributing other resources that will help ensure success
- Monitoring HAI rates or events and other harms
- Communicating each units' progress toward achieving or maintaining CAUTI prevention goals regularly to all staff and the hospital board

## 2. The Organization Has a Culture of Safety

*On the CUSP: Stop HAI* hospital units that successfully lowered their infection rates and other patient harms attributed their success as much to a strong safety culture as to effective technical and clinical interventions. A strong safety culture is manifested in the following ways:

- All levels of the organization demonstrate a commitment to safety in how they orient their staff and publicly monitor avoidable healthcare-associated conditions such as HAIs.
- The organization understands the high-risk nature of its work and promotes safety mindfulness in staff and clinical teams at all levels.
- The organization directs adequate resources to: patient safety education for staff, providers, and patients and family members; dedicated safety personnel; materials, equipment, and technology to support safety; regular practice competency checks; and other proven means to promote safe care.
- Individuals are encouraged to report errors or near misses and staff are assured they can do so without fear of negative consequences.

### The Comprehensive Unit-based Safety Model or CUSP

The cultural or socioadaptive aspects of care delivery, as well as evidence-based clinical and technical practices are a central component of the CUSP model. The five core elements of the CUSP model are—

1. Learn about CUSP.
2. Assemble the team.
3. Engage a senior executive to "adopt" the unit.
4. Understand the science of safety to illustrate the high-risk nature of healthcare (Managers may want to share a video such as the Sue Sheridan video on patient safety, which is part of the TeamSTEPPS® training tools).
5. Identify and learn from defects.

### Potential or Actual Harm or "Defects"

A defect is any clinical event or situation that a staff member or provider would not want to happen again. It includes any incident that someone believes caused patient harm or put a patient at risk of harm. Examples related to CAUTI prevention include—

- Failure to comply with any element of the catheter insertion, maintenance and removal bundle
- Inaccurate patient information regarding catheter presence or indication shared by a team member during patient rounds
- Failure to use available catheter alternatives when appropriate

**Learn From Defects Process**

Hospital CUSP teams find the Learn From Defects process useful when investigating each infection. Sometimes called a mini-root cause analysis, the process involves convening the appropriate team members to explore the following questions and documenting the answers to help ensure resolution and support future learning:

- What happened?
- Why did it happen?
- What will we do to reduce the risk of recurrence?
- How will we know the risk is reduced?

**Staff Safety Assessment**

Another very useful way for units to learn about potential harms or defects, and to maintain staff safety mindfulness is through the CUSP tool called the Staff Safety Assessment. It asks two important questions:

- How might the next patient in the unit be harmed?
- What can be done to minimize harm or prevent safety hazards?

Staff may answer these questions at monthly staff meetings, or can submit their answers at any time on cards inserted into a box at the nursing station. Managers may also allow answers to be submitted anonymously.

The CUSP Toolkit has additional defect investigation tools in the module, "Identify Defects Through Sensemaking."

**Alignment With Other Quality Improvement Tools**

CUSP aligns well with these other quality improvement tools:

- TeamSTEPPS®
- Six Sigma
- Institute for Healthcare Improvement Model for Improvement
- Plan-Do-Study-Act
- Root Cause Analysis
- Failure Mode Effect Analysis

The combination of CUSP and the TeamSTEPPS communication and teamwork tools has been used by hospital units to create a sustainable set of behaviors to facilitate HAI prevention and other patient safety practices.

**Learn More About CUSP, TeamSTEPPS, and the PDSA Model**

- To learn more about the CUSP model, visit the CUSP Toolkit on the AHRQ Web site at www.ahrq.gov/cusptoolkit. The toolkit has modules pertaining to the different steps and includes other safety content. It also includes slide presentations with facilitator notes, exercises, and short video vignettes demonstrating CUSP used with various healthcare-associated conditions.
- To learn more about TeamSTEPPS visit the AHRQ Web site at teamstepps.ahrq.gov/abouttoolsmaterials.htm.
- To learn more about the Plan-Do-Study-Act model, visit the Institute for Healthcare Improvement Web site at www.ihi.org/resources/pages/tools/plandostudyactworksheet.aspx.

**Safety Culture Surveys**

Safety culture surveys help health care organizations assess the culture in their institutions. In addition to raising staff awareness about the importance of culture and its key elements, survey results uncover staff perceptions of safety, identify areas of strength, and point to opportunities for improvement. A popular safety culture survey is AHRQ's Hospital Survey on Patient Safety Culture; information about this survey can be accessed at www.ahrq.gov/professionals/quality-patient-safety/patientsafetyculture/hospital.

## 3. Program Champions Motivate Individuals To Continue To Improve

Each successful change initiative has administrative, physician, and nurse champions who help nurture change from the pilot stage through sustainment. Effective champions are able to explain the importance of the change initiative, motivate others to embrace it, and, when necessary, overcome the skepticism and resistance of project naysayers. The role of the champion goes beyond cheering on the change initiative. Champions need to be an active part of the change initiative, by, for example, attending project meetings and being available to consult with project teams. Champions should counsel their professional counterparts privately when lapses in safety practice are observed or reported by team leaders or department managers.

Individuals selected to be champions should be respected, knowledgeable, and willing to engage with their professional counterparts—for example, physician to physician, nurse to nurse, and pharmacist to pharmacist. Organizations should plan for the loss of a champion with a succession plan that is in place by the pilot phase and continues through sustainment.

Once the change package is embedded into daily work flow, champions continue to play a role in educating new staff and spreading the safety innovations to staff in units that have not yet adopted the new practices.

## 4. Interdisciplinary Teams Create and Sustain Effective Safety Practices

Hospital units attempting to implement and sustain a change initiative need engaged interdisciplinary teams. Multidisciplinary teams are appropriate when care processes are complex and involve members of different professions involved in different actions related to catheter ordering; insertion, maintenance, and removal; or the use of catheter alternatives. To effectively and efficiently implement an HAI prevention bundle, deploying a diverse team of individuals with different skills, experience, knowledge and viewpoints will enhance the likelihood of successful implementation and sustainment.

A unit with only one or two individuals undertaking a change initiative is likely to fail in implementing the program, much less in sustaining or spreading it. The ideal team composition for most HAI prevention efforts involves physicians, nurses, pharmacists, infection preventionists, hospital epidemiologists, unit nurse managers, housekeeping staff, and a senior-level executive. Once the safety innovation becomes a part of daily work flow, the team focused on sustaining the gains achieved will continue to involve unit staff and providers.

Units need to be on guard for the loss of a team leader, which can stall or reverse progress in HAI prevention. An effective strategy is for units to have a team co-leader as well as a succession plan in the event of staff turnover.

## 5. Staff Learn Both Technical and Adaptive Interventions

HAI prevention and other safety change initiatives begin with evidence-based guidelines. These guidelines are most often bundled into a series of steps that involve multiple individuals implementing different aspects of the change package. Hospitals that are successful at eliminating HAIs and other adverse healthcare-associated conditions understand that the socioadaptive or cultural interventions are as important as the technical and clinical ones. Hospitals successful at eliminating or greatly reducing the incidence of CLABSIs and CAUTIs provide protected time for staff to learn, test, and incorporate into daily work flow both the technical/clinical interventions and the socioadaptive work of CUSP.

### Translating Evidence Into Practice

A useful, generic model for addressing any safety concerns is to first translate the evidence into practice. Calling upon both internal and external expertise, staff should follow four steps to transform the evidence into actions to improve patient care:

1. Know the evidence-based practices and translate them into checklists or other tools
2. Identify local barriers to implementation and develop strategies to overcome resistance
3. Measure performance to ensure adherence to evidence-based practices
4. Continue to ensure that all patients get the evidence-based practice[7]

Staff should work with nursing leadership and the continuing education team to establish and sustain periodic processes for staff training and retraining in appropriate and inappropriate indications for urinary catheters, use of a nurse-driven protocol for catheter removal, as well as aseptic insertion technique and proper catheter maintenance.

**CAUTI Prevention Example**

Primarily technical actions include:

- Educate staff about the impact of CAUTIs
- Educate staff about the appropriate indications for an indwelling catheter
- Perform daily catheter rounds to assess appropriateness and prompt removal
- Monitor catheter insertion practices
- Monitor catheter maintenance practices
- Have catheter alternatives available
- Use other supports, such as catheter kits, electronic medical record prompts, and bladder scanners

Primarily adaptive actions include:

- Educate staff on the CUSP model and the science of safety
- Assemble a multidisciplinary team
- Engage a senior executive to adopt the unit, and promote the change initiative and provide necessary resources
- Engage a physician and a nurse champion
- Identify and learn from defects
- Implement teamwork and communication tools

## 6. Frontline Staff Are Empowered To Raise Safety Concerns

Leaders and managers empower staff, patients, and family members when they listen and respond to safety concerns and when they consider suggestions for improving current practices. Empowering leaders and managers encourages staff to voice safety issues and to act quickly to address them. When leaders and managers ignore staff safety concerns or move too slowly to address them, the result is often disengaged and demoralized staff and an environment in which patient harm is more likely to occur.

## 7. Key Outcomes Are Continuously Monitored and Communicated

An increasingly common practice is for nursing units to post performance indicator boards that display unit safety aims and progress toward meeting or maintaining them. Data are usually posted monthly. Patient names can be associated with each harm event to remind staff that there is a real person is behind each data point and run chart, assuming that appropriate privacy concerns are addressed.

Many units will post a "days since the last_____ (harm event, e.g., CLABSI)." Staff and providers are motivated to sustain their safety efforts when they see the number of days climb higher and higher. Conversely, an engaged staff will feel let down when the "days since" number drops to zero, which may lead to renewed motivation to increase the number. This way of looking at safety encourages staff to learn what happened and why, and how to take action to prevent a recurrence.

## 8. Success Is Communicated and Rewarded

Effective leaders and managers should always acknowledge unit teams that achieve safety goals or significant progress toward them. Recognition of individual team members at hospitalwide meetings and in newsletters motivates staff to sustain the safety work. Spread is facilitated when other units become inspired to adopt safety practices recognized and rewarded elsewhere in the organization.

Celebrating success need not be elaborate and small gestures can go a long way to motivate staff and providers. Unit pizza parties, staff beverage gift cards, and celebratory banners are some examples of how to reward good work.

## 9. Change Is Incorporated Into Daily Work Flow

Spread and sustainability of HAI prevention initiatives are fostered when the new units are able to make local adaptations based on their patient mix, the consensus of the multidisciplinary teams, and small tests of change. Active involvement of frontline workers and other end-users in safety interventions has multiple benefits. Frontline staff members' perception of the value of the intervention is increased when they are involved in the change initiative's design, testing, revision, and implementation. In addition, frontline staff can help minimize potential increases in workload.[8]

For example, teams can consider what rounding processes are already established that could accommodate review of patients for presence of urinary catheters and ongoing appropriateness of those catheters. What already established processes could be expanded to accommodate collection and reporting of data on catheter prevalence and appropriateness and CAUTI rates? And when a CAUTI does occur, what existing infrastructures will support the "Learning From Defects" process of examining the event for its root causes? Importantly, ideas that help both staff and patients are more likely to be implemented, sustained, and spread quickly.[9]

Multiple supports to help foolproof and hardwire safety changes are important for patient safety. Examples include checklists, pocket cards, prepackaged kits, electronic medical record alerts, nurse-driven catheter removal protocols, daily interdisciplinary rounds, and daily goals forms. Sample protocols, pocket cards, other educational materials, and a nurse-driven protocol for

catheter removal are available as appendixes to the "Toolkit for Reducing Catheter-Associated Urinary Tract Infections in Hospital Units: Implementation Guide."

### 10. The Facility Is a Learning Organization

The organizational change theorist, Peter Senge, counseled organizations in the 1990s to be learning organizations in order to survive. His advice is no less true today: "An organization's ability to learn may make the difference between its thriving and perishing in the years ahead."[10] Aside from an organization's overall survival, each patient who is spared an HAI or other harm makes the investment in safety more than worthwhile.

Safe patient care is based on continuous learning, from learning from defects, and keeping abreast of the most recent guidelines from professional associations and government agencies to the latest safety science from national patient safety and quality improvement organizations. Equally important, organizations need to listen and learn from their staff at the bedside, from their patients, and from their patients' family members. The combined wisdom of HAI prevention and safety experts, staff, and patients and their families will help organizations be true learning organizations.

## Tool

**Appendix A. Action Plan Tool for Project Sustainability**

This worksheet will help teams identify what's working and what's not working, outline future goals for CAUTI prevention, and develop an action plan to reach ongoing CAUTI prevention goals.

## References


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# Additional Reading

## Sustainability and Spread

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The Institute for Healthcare Improvement has the following resources about sustainability and spread; available at www.IHI.org:

- Getting Started Kit: Rapid Response Teams. 5 Million Lives Campaign. Cambridge, MA: Institute for Healthcare Improvement; 2008.
- Massoud MR, Nielsen GA, Nolan K, et al. A Framework for Spread: From Local Improvements to System-Wide Change. IHI Innovation Series white paper. Cambridge, MA: Institute for Healthcare Improvement; 2006.
- Botwinick L, Bisognano M, Haraden C. Leadership Guide to Patient Safety. IHI Innovation Series white paper. Cambridge, Massachusetts: Institute for Healthcare Improvement; 2006.
- Seven Spreadly Sins. Graphic. Institute for Healthcare Improvement. May 2015.

## CUSP Toolkit

The CUSP Toolkit (www.ahrq.gov/cusptoolkit) contains the following 10 modules: Learn about CUSP, Assemble the Team, Engage the Senior Executive, Understand the Science of Safety, Identify Defects Through Sensemaking, Implement Teamwork and Communication, Apply CUSP, The Role of the Nurse Manager, Spread, and Patient and Family Engagement.

Readers may also wish to visit the Web site of the Armstrong Institute for Patient Safety and Quality at Johns Hopkins Medicine at: www.hopkinsmedicine.org.

## Applying CUSP Principles to HAI Prevention

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