On the CUSP: Stop CAUTI Implementation Guide

A Practical Resource for Improving Safety in Your Unit

Prepared for:

Agency for Healthcare Research and Quality (AHRQ)

U. S. Department of Health and Human Services (HHS)

Contract Number: 290-06-00022I-8

Contract Title:

National Implementation of the Comprehensive Unit-based Safety Program (CUSP) to Reduce Catheter-associated Urinary Tract Infection (CAUTI)

Contractor:

Health Research & Educational Trust, Chicago, IL

Prepared by:

Health Research & Educational Trust

Michigan Health & Hospital Association Keystone Center for Patient Safety & Quality

Johns Hopkins Medicine Armstrong Institute for Patient Safety and Quality

Ann Arbor VA Medical Center and the University of Michigan Patient Safety Enhancement Program

St. John Hospital and Medical Center

Updates:

November 2012 – Updated Section III narrative on insertion, appendices added.

October 2013 – Resources and guidelines for ED Improvement Intervention participants added.

February 2014 – Resources and guidelines for ED Improvement Intervention updated.

February 2014

Table of Contents

I. Project Overview

The Purpose of This Manual

This manual will help your team implement *On the CUSP: Stop CAUTI* in your patient care units that have committed to reducing catheter-associated urinary tract infections (CAUTI) and improving safety culture. This manual describes the collaborative model, presents teamwork and project management tools, delineates roles and responsibilities of unit-level project leaders, and defines measures of success for the program. To assist states and unit teams with the implementation of this project, this manual provides brief overviews of the concepts and processes to be applied as well as more detailed recommendations on how to implement the *On the CUSP: Stop CAUTI* project.

This manual is intended to serve as a resource for your team in implementing *On the CUSP: Stop CAUTI*. It is supplemented by templates, tools, and educational conference calls and webinars, many of which are available in the appendices as well as on the national project web site, www.onthecuspstophai.org. Additionally, state-level support is available for unit teams from State Hospital Associations (SHAs).

Although this manual provides step-by-step guidance on completing project implementation activities, it is important to acknowledge that these are guidelines to which you should apply your own local experience and expertise.

Because numerous studies have shown that the majority of indwelling urinary catheters are placed in emergency departments, *On the CUSP: Stop CAUTI* faculty have developed a separate intervention tailored to emergency departments, the Emergency Department Improvement Intervention. The ED Improvement Intervention will require of participating EDs educational and data entry activities that will supplement and align with the requirements of other types of hospital units participating in *On the CUSP: Stop CAUTI*. Participating EDs are strongly encouraged to take advantage of all activities of the national program, including Content Calls and learning sessions. Resources for participating EDs are available on the national project website at http://www.onthecuspstophai.org/on-the-cuspstop-cauti/emergency-department-improvement-intervention/.

Problem

Health care-associated infections (HAIs) are one of the most common complications of hospital care. Nearly two million patients develop HAIs annually, which contribute to approximately 99,000 deaths and $28 billion to $33 billion in health care costs.[1] Given the importance of HAIs in reducing costs and improving patient safety, Health and Human Services Secretary Kathleen Sebelius, joined by leaders of major hospitals, employers, health plans, physicians, nurses, and patient advocates, on April 12, 2011 announced the launch of the Partnership for Patients initiative. This new national partnership is intended to save 60,000 lives by stopping millions of preventable injuries and complications in patient care over the next three years. Reducing CAUTI is part of the national HAI initiative, which aims to save up to

$35 billion in health care costs, including up to $10 billion for Medicare. CAUTIs are the most common type of HAI in U.S. hospitals and account for 35 percent of all such infections.[2] The estimated total U.S. cost per year for CAUTI is $565 million, and the estimated number of deaths per year is 8,205.[1]

Six hundred thousand patients develop hospital-acquired UTIs each year, and CAUTIs comprise around 75 percent of these cases.[3, 4] Research suggests CAUTIs are preventable and that perhaps as many as 50 to 70 percent of these episodes are preventable.[5, 6]

Patients with indwelling urinary catheters are at greater risk for developing UTIs with risk of bacteriuria increasing with each day of use:

- Per day: ~5 percent
- 1 week: ~25 percent
- 1 month: ~100 percent

The leading risk factors of CAUTI include prolonged catheterization, female gender, and catheter insertion outside of the operating room.[7]

About 15 to 25 percent of patients will have a urinary catheter placed during their hospitalization. Many of these catheters are placed either in the intensive care unit, emergency department, or the operating room. Up to 50 percent of patients from non-intensive medical and surgical units may not have a valid indication for urinary catheter placement thus contributing to the high rate of CAUTI.[7] Approximately one-third of physicians in a 2000 study by Saint et al. were not aware that their patients even had an indwelling urinary catheter.[2]

Due to the magnitude of this problem and because these infections are often preventable, the Centers for Medicare & Medicaid Services (CMS) has included CAUTI on their list of hospital-acquired conditions for which it will no longer reimburse. In a 2007 study, cases with CAUTI resulted in $1,300 to $1,600 in additional cost per patient.[8]

In addition to cost and risk of infection, an even more immediately compelling reason to reduce the use of indwelling catheters is patient discomfort.[9] A report of Veteran's Health Administration patients found that nearly 50 percent of patients found indwelling catheters to be uncomfortable and painful. In addition, indwelling urinary catheters restrict patients' ability to ambulate.[10]

Goals

Recently, there have been demonstrations of a successful approach to reducing the use of indwelling urinary catheters.[11] The Michigan *Keystone: Hospital-Associated Infection* project is a statewide initiative that began in 2007 that is reducing the use of urinary catheters. Over the course of the first two years, the participating units successfully achieved and sustained a reduction of approximately 25 percent in the use of urinary catheters.[12] Based on these efforts and the success in Michigan, the Agency for Healthcare Research and Quality (AHRQ) has funded the Health Research & Educational Trust, the Michigan Health & Hospital Association (MHA) Keystone Center for Patient Safety & Quality, St. John Hospital and

Medical Center, the University of Michigan's Patient Safety Enhancement Program, and the Johns Hopkins Medicine Armstrong Institute for Patient Safety and Quality (Armstrong Institute) to lead the *On the CUSP: Stop CAUTI* project to reduce catheter-associated urinary tract infections (CAUTI) and to improve unit safety culture. This national project focuses on clinical interventions for indwelling catheters with regard to appropriate insertion and appropriate care and removal. In addition to the clinical interventions, the project focuses on improving unit safety culture using the Comprehensive Unit-based Safety Program (CUSP) developed by the Armstrong Institute.

The national goals of *On the CUSP: Stop CAUTI* are twofold:

1. Reduce mean CAUTI rates in participating clinical units by 25 percent
2. Improve safety culture, as evidenced by improved teamwork and communication, by disseminating the CUSP methodology

The unit-level objectives of the project include:

1. Promote the appropriate use of indwelling catheters
2. Improve the culture of safety, teamwork, and communication
3. Improve proper placement technique and care of the catheter

Solution

To achieve CAUTI reduction, improve unit safety culture, and sustain these improvements, a strategy to address both technical and adaptive problems is necessary. A technical problem is a problem that is readily identified with known solutions. CAUTI and its prevention interventions are the technical component. An adaptive problem is less easily identified, and the solutions are not always apparent. A focus on adaptive components addresses the unit team's values, attitudes, and beliefs, qualities often collectively referred to as *culture*. Addressing either technical or adaptive challenges—but not both—may not result in the success you are trying to achieve.

To meet the goals of this national and local initiative, all of the following pieces of the *On the CUSP: Stop CAUTI* project need to be implemented:

- Adaptive and Technical Interventions
- Education and Coaching Support
- Measures of Success
- Project Infrastructure

The combination of these activities and the project infrastructure makes the implementation and spread of this work possible across states, hospitals, and units. Each activity is introduced in this section of the manual.

Adaptive and Technical Interventions

The On the CUSP: Stop CAUTI project includes the following adaptive and technical interventions to reduce CAUTI:

ADAPTIVE
1. 4 E's Model
2. The Comprehensive Unit-based Safety Program (CUSP)

TECHNICAL
3. Appropriate Catheter Use Intervention
4. Proper Catheter Insertion and Maintenance Intervention
5. Prompt Catheter Removal Intervention

Over the course of this project, your team will be provided with the information to implement each of these interventions. A summary of each intervention follows below with greater detail for each intervention provided in sections five and six.

1. The 4 E's Model

The Armstrong Institute developed the 4 E's model to help implement patient safety interventions. This model includes four key elements: Engage, Educate, Execute, and Evaluate.[13]

Step 1: Engage. Unit teams help staff understand the impact of preventable harm caused by CAUTI by sharing stories about patients who develop these infections, and by estimating the number of patients who are harmed given the unit's current infection rates.

Step 2: Educate. Unit teams ensure staff and senior leaders understand what they need to do to prevent infections.

Step 3: Execute. Execution is based on the principles of safe system design: simplify the system, create redundancy, and learn from mistakes.

Step 4: Evaluate. Using standardized NHSN definitions for CAUTI, teams will regularly collect and submit CAUTI rates along with the prevalence and appropriateness of urinary catheter use.

This model will be used in conjunction with the CUSP model to help unit teams create change and improve patient safety in their units.

2. The Comprehensive Unit-based Safety Program (CUSP)

CUSP is a model designed to improve patient safety on a clinical unit by providing a common platform for understanding the science of safety, then integrating key habits and steps into the daily routines of a

unit or clinical area. CUSP draws on the wisdom of frontline providers who have practical knowledge regarding safety risks to their patients and provides a mechanism to help analyze and reduce the risk of those hazards. The CUSP model has five components: science of safety, identifying defects, executive adoption of the unit, learning from defects, and implementing teamwork and communication tools. In addition to these five components, CUSP emphasizes the importance of a diverse team, focuses on the input of direct care providers, discusses the importance of a common goal, identifies issues that the team can successfully solve, and integrates these elements as part of the team's routine work. Similarities to important components and teachings found in CUSP can be found in the literature on other change leadership models listed in the comparison table below.

Table 1: Culture Change Model Comparison Table

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	Describe appropriate indications/processes to improve appropriate care, insertion, and removal when catheter is no longer indicated
Team Development	ENGAGE, Senior Leader Partnership with the CUSP Team	Create a Guiding Coalition	Model the Way	
Developing Alignment	ENGAGE, "What hill do we climb?"	Develop a Shared Vision	Inspire a Shared Vision	
Sharing Approach		Communicate the Vision		
Empowerment	EXECUTE, Direct Care Provider involvement, Teamwork and Communication Tools	Empower Others to Act	Enable Others to Act	Assess for catheter presence and indication. Remove when no longer needed. Do not place catheter unless it is an appropriate indication.
Implementing Change	ENGAGE, EXECUTE, EVALUATE, Learning from Defects	Generate Short Term Wins	Challenge the Process	Improve utilization practices, evaluate improvement in compliance with indications and in symptomatic CAUTI
Spread	ENGAGE, EXECUTE EVALUATE, Learning from Defects	Consolidate Gains and Produce More Change		
Sustainability	Part of the Daily Work	Anchor New Approaches in Culture		

The components of CUSP provide strategies, information, and tools that can be adapted to use elsewhere in your organization.

CUSP is associated with improvements in patient safety, clinical outcomes, and safety culture.[12, 14, 15, 16] In the context of CUSP, culture has been diagnostic of unit strengths and weaknesses, responsive to interventions, and relevant to the unit frontline providers. Moreover, in the work with the Michigan *Keystone: ICU* program, linking culture through CUSP with focused clinical interventions (for example, to reduce central line-associated bloodstream infections (CLABSI) led to sustained reductions in infection rates. [12, 14, 15, 16]

3. Appropriate Catheter Use Intervention

Nursing workload has been cited as a significant issue in reducing infections because urinary catheters can ease nursing workflows, and there may be a perceived incentive for catheter placement. The Appropriate Catheter Use Intervention includes education for staff on appropriate indications and ways to avoid urinary catheter placement.

4. Proper Catheter Insertion and Maintenance Intervention

If appropriate indications for a urinary catheter exist, clinicians can reduce the risk of infection by following evidence-based recommendations for proper catheter insertion and maintenance. Key elements of the Proper Catheter Insertion and Maintenance Intervention include ensuring that only properly trained clinicians have responsibility for catheter insertion and maintenance, use of aseptic technique for insertion, and maintenance of a sterile, continuously closed drainage system.

5. Prompt Catheter Removal Intervention

More than 14 studies have evaluated the effectiveness of urinary catheter reminders and stop-orders, including written, computerized, and nurse-initiated stop-orders in reducing infections. The evidence indicates that reminders and stop-orders result in significant reduction in catheter use and significant reduction in infection, and there is no evidence of harm, such as a need for re-insertion.[11] This Prompt Catheter Removal Intervention implements a process to evaluate urinary catheter utilization and compliance with appropriate indications, and promotes sustained improvements through daily evaluation of catheter appropriateness and prompt removal when a catheter is no longer needed.

St. John Hospital and Medical Center in Michigan used a process to evaluate the need for indwelling urinary catheters and reduced unnecessary urinary catheter use by 45 percent. This work was expanded to participating units from approximately 70 Michigan hospitals enrolled in the *MHA Keystone: Hospital-Associated Infection* prevention project, which has shown and sustained a 25 percent reduction of all catheter use (unpublished data) over a period of 18 months.

Education and Coaching Support

A key component to implementing this work is the efficient and effective dissemination of information to frontline staff and providers charged with changing processes to improve patient safety, care delivery, teamwork, and culture. The *On the CUSP: Stop CAUTI* project delivers educational content in a variety of formats, including conference call series, manuals and toolkits, and an in-person meeting. The project begins with an initiation call that prepares teams to participate in the project. Next are a series of content calls that discuss in further detail several components of the intervention. Call-in informational sessions on data collection and submission occur prior to the collection of baseline data. All calls include a question and answer component for interaction with the speakers. During the intervention period of the project, teams will participate in coaching calls. Coaching calls are completely interactive and structured according to the teams' needs. Participating emergency departments will also take part in ED Quarterly Office Hours, which focus exclusively on the needs of the ED setting. Toolkits, audio recordings and slides from calls, and other resources are available on the *On the CUSP: Stop HAI* website for download.

Throughout the project, coaching and support are offered to the units at both a national and state level. The State Lead is available on coaching calls and serves as the key contact and call facilitator. State Leads are also available to answer ad hoc questions units may have regarding the project. The National Project Team (NPT) provides periodic support.

Additional resources are provided by the NPT and State Leads to help teams implement the intervention. Below is an abridged list of educational resources available to *On the CUSP: Stop CAUTI* teams via the project web site.

Table 2: Selected Resources Available on Project Website

Resource Title	Resource Description
Onboarding Call Series	These 60 to 75-minute calls provide information regarding each main element of the program. Below is an example, and all call slides and recordings are available online.
Onboarding Call #1: Building a Team and a Process to Reduce CAUTI Risk	This 75-minute call discusses how to identify key members of an effective CAUTI reduction team. It provides information on appropriate indications for catheter insertion and how to implement a process to evaluate urinary catheter need.
Toolkits and Resources	These guides provide information to help you implement the *On the CUSP: Stop CAUTI* intervention in your unit. Below is an example, but all toolkits and project implementation resources are available online.
Cohort 5 Data Collection Calendar	This tool itemizes data collection and data entry that must be completed throughout the project life cycle.

Measures of Success

Complete and meaningful data justify the allocation of resources that are necessary to implement this work and demonstrate improvement over time. In addition, the collection and reporting of data are effective means of providing feedback to the teams and support improvement and sustainability. However, in most quality improvement projects up to 60 percent of data is missing.[17] Missing data significantly damage the capacity to determine whether a given intervention has been successful. Yet, if the data burden of a project is too great, then teams struggle to collect and report it. For this reason, this project has a narrow set of measures that are collected and reported on a schedule that attempts to provide relevant feedback while reducing the data collection burden. The timing of the data collection is closely linked to the timing of interventions allowing for real-time improvement. Three types of measurements will be collected from participating acute care units:

1. Culture Measures
   a. Hospital Survey on Patient Safety Culture (HSOPS) at baseline and again near the end of the project
   b. Readiness Assessment
   c. Team Checkup Tool (TCT)
2. Outcome Measures
   a. CAUTI rates
   b. Catheter prevalence
3. Process Measures
   a. Cather prevalence
   b. Catheter appropriateness

Participating emergency departments will collect and submit two measurements:

1. Number of admissions from the ED, including observation patients
2. Number of admissions from the ED, including observation patients with an indwelling catheter that was newly placed in the ED

The data definitions and collection processes are explained in more detail in [section IV](#) of this manual.

Project Infrastructure

National Project Team
The National Project Team to implement this patient safety improvement effort consists of 10 organizations that each contribute unique knowledge and experience to support the improvement effort and to build program capacity at the national, state, hospital, and hospital unit levels. The following is a brief description of each individual organization's role within this project:

- The Health Research & Educational Trust (HRET) administers the project and provides oversight of the national implementation effort. This includes budget and project management, state recruitment, and support for implementation. HRET assists with coordination of meetings, educational conference calls, and web site maintenance. Beyond the initial project period, HRET is also responsible for helping states sustain and spread their success by disseminating the lessons learned in this national effort.

- The Michigan Health & Hospital Association Keystone Center for Patient Safety & Quality (MHA Keystone) contributes to the development and coordination of the project's education and coaching. MHA Keystone is responsible for data collection and reporting, as well as supporting content and coaching calls. They address clinical interventions, data use, submission, and reporting issues and provide project implementation advice.

- The Johns Hopkins Medicine Armstrong Institute for Patient Safety and Quality (Armstrong Institute) reviews the CUSP content adapted by HRET for this project and provides related tools. Armstrong Institute faculty support national CUSP calls and consult with HRET and MHA on emerging content specific to CUSP. The Armstrong Institute also serves as faculty for the initial CUSP educational sessions.

- The University of Michigan is a national leader in CAUTI prevention research. University of Michigan faculty serve on the NPT as CAUTI prevention content experts.

- St. John Hospital and Medical Center demonstrated the effectiveness of the CAUTI prevention techniques used by the *On the CUSP: Stop CAUTI* through their early implementation of CAUTI reduction interventions. A member of the St. John faculty serves on the NPT as a CAUTI prevention content expert.

- The Centers for Disease Control and Prevention (CDC) provide technical assistance to state health departments to assist in the creation of sustainable state infrastructures for HAI prevention as part of a larger HAI Action Plan. CDC definitions are used as the standard in *On the CUSP: Stop CAUTI*.

- The American College of Emergency Physicians (ACEP) provides guidance to Emergency Departments enrolled in the ED Improvement Intervention of *On the CUSP: Stop CAUTI*.

- The Association for Professionals in Infection Control (APIC) provides guidelines for infection control that are used in *On the CUSP: Stop CAUTI*.

- The Emergency Nurses Association (ENA) provides extended faculty support to help facilitate learning and training of units.

- The Society for Hospital Medicine (SHM) has created a mentoring program to link health workers in hospitals for professional growth and learning. *On the CUSP: Stop CAUTI* will work with this program to help facilitate learning.

- The Society for Healthcare Epidemiology of America (SHEA) provides extended faculty support to help facilitate learning and training of units.

State Collaborative

State hospital associations (SHA) play a key role in the implementation of the *On the CUSP: Stop CAUTI* intervention. SHAs act as liaisons between the NPT and hospitals within their respective states. The State Lead at each SHA serves as a local content advisor and coach to teams.

Depending on your state, your SHA may coordinate with your state health departments, quality improvement organizations, or other quality and patient safety organizations. While the roles of these groups vary among individual states, their partnership aids in the implementation of the program as they help to recruit hospitals, market the importance and practicality of the program, and maintain program data.

Not all states are able to support more than one or two cohorts of hospital units in the project. At the same time, no hospital that wishes to participate in the program from anywhere in the country will be barred from participating. Under some circumstances, the role of State Lead—often referred to as a project lead—is fulfilled by a representative of a neighboring state hospital association or a Hospital Engagement Network lead.

Hospital Teams

Embodying the front line role, individual hospital unit teams collect program data and implement the CUSP guidelines to ensure a complete implementation of the *On the CUSP: Stop CAUTI* program. Each step equips the frontline providers of all hospital units with the tools, metrics, and framework to tackle the challenge of quality improvement and CAUTI prevention. Through applying the *On the CUSP: Stop CAUTI* tools, metrics, and framework on the front lines, hospital unit teams play an important role in the project's success. Units participating in the project include medical-surgical units, intensive care units, labor and delivery, emergency department, pediatrics, radiology, and any other unit with high UTI rates.

Graphic 1: Project Infrastructure
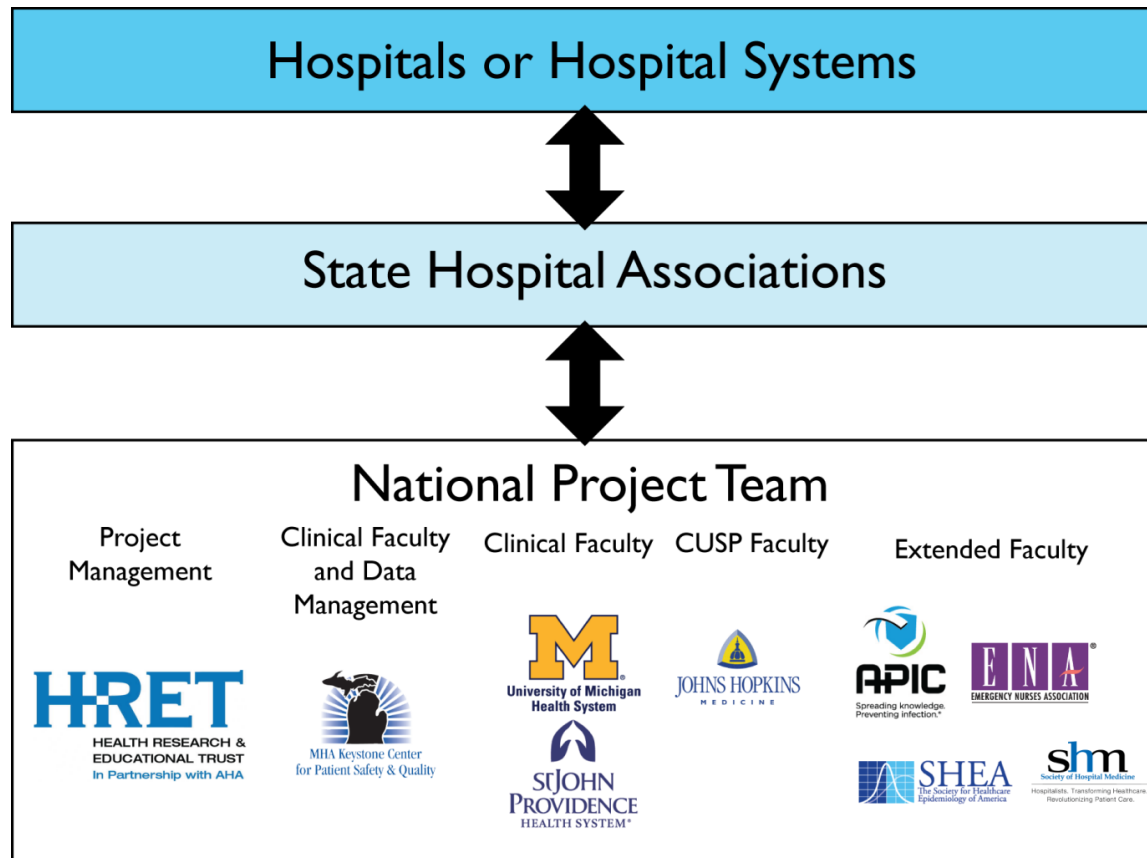
AHRQ funds this and other HAI initiatives. AHRQ's mission is to improve the quality, safety, efficiency, and effectiveness of health care for all Americans. The research sponsored, conducted, and disseminated by AHRQ provides information that helps people make better decisions about health care. For more information about AHRQ, visit www.ahrq.gov.

II. Frameworks for Change and Improvement

The 4 E's Model

The Armstrong Institute developed the 4 E's model to help implement patient safety interventions.[13] This model includes four stages that answer the following questions:

1. **Engage**: How will this make the world a better place?
2. **Educate**: How will we accomplish this?
3. **Execute**: What do we need to do?
4. **Evaluate**: How will we know we made a difference?

Engage: How does this make the world a better place?

The first E focuses on *engagement.* This is the step where you help your entire organization to understand the significance of reducing CAUTI. Project leaders talk to senior leaders, team leaders, and bedside staff about the prevalence of catheter use, the risk to patients, and the health care costs associated with CAUTI. To engage your colleagues, first make the problem real by telling the story of a patient who developed a CAUTI in your clinical area or hospital. Identify a patient in your clinical area who has suffered needless harm from a catheter, and share the patient's story with your colleagues. Work with risk management at your hospital to share this story openly with your colleagues and leadership. Know facts about CAUTI that will engage your unit:

- Millions of urinary catheters are placed each year in the United States, and urinary catheters are frequently used in the hospital setting. However, up to half of urinary catheter device days in the hospital setting may not have a valid indication for use.[18, 19]
- Urinary catheter use has been associated with urinary tract infections and trauma.
- Approximately 600,000 patients develop hospital-acquired urinary tract infections per year. Around seventy-five percent of these episodes are CAUTIs.[1, 2, 3, 4]
- Hospital-acquired bacteriuria or candiduria occurs in 25 percent of those patients who have urinary catheters in place for one week. The risk per day of bacteriuria is about 5 percent, and 3 percent of those with bacteriuria develop a bloodstream infection.[1, 2]
- The longer the urinary catheter is used, the higher risk of infection.
- If the urinary catheter is not present, CAUTI does not occur.
- The cost of a hospital-acquired CAUTI averages between $500 and $1,000. Catheter-related bacteremia increases the cost of care by at least $2,800 per patient.[1, 2]

After sharing the story of a patient who developed CAUTI, post the number of people who developed a CAUTI each month and the total number of CAUTIs for the previous year in your clinical area. To keep staff engaged, post a trend line so that nurses, physicians, and other staff can see at a glance your CAUTI rate and how it changes over time. Use formal and informal opportunities to talk about the intervention

and about unit specific infection rates. Make a point of recognizing providers who follow guidelines for the appropriate use of urinary catheters. Invite your hospital infection control professional or epidemiologist to become an active part of your clinical area's improvement team and draw on his or her expertise to help with your specific challenges. The goal should be that no patient suffers harm from a preventable complication while in your clinical area.

Educate: How will we accomplish this?

The second E, *educate*, is key to accomplishing your goal. Make sure your team understands how they can reduce CAUTI and the use of inappropriate urinary catheters. There are several practices to prevent CAUTI that should be included in any health care worker education. Importantly, clinicians should realize that CAUTI represents more than one-third of all health care-associated infections, and CAUTIs are associated with increased patient morbidity. There are four key approaches to preventing CAUTI. First, insert the indwelling urinary catheter only when needed (based on an appropriate indication). Second, when an indwelling catheter is indicated, ensure that proper insertion technique is used during catheter placement. Third, ensure proper care and maintenance of the urinary catheter system once it is in place. Fourth, promptly remove the catheter when it is no longer needed.

The general steps for education in the project are:

1. Educate staff on the CUSP model beginning with the *Science of Safety* video.
2. Educate staff about the appropriate indications using definitions by the Healthcare Infection Control Practices Advisory Committee (HICPAC) for use and proper care of urinary catheters. There are examples of presentations and educational materials provided in this manual in section III,Table 6: CAUTI Prevention Policies and Educational Materials.
3. Educate staff who are collecting outcome data on the definition of CAUTI.
4. Participate in national and state conference and coaching calls.
5. Share the number of people infected per month and your quarterly infection rates with the unit, medical staff and the executive sponsor. If your team has low rates, it may be better to share the number of inappropriate catheters.
6. Learn from at least one defect per quarter, preferably one or more a month.

Section V includes detailed guidance for implementing the educational components of this project.

Execute: What do we need to do?

The third E focuses on how you will *execute* the program. Even well-conceived, successful programs can fail if they are poorly implemented. Taking time to carefully plan the execution can help reduce this risk.

Successfully implemented projects share some key characteristics. They are usually well structured, provide adequate support for participants, clearly outline roles and goals that are then clearly explained to stakeholders, and are adaptable to the unique needs of participants. At a unit level, take time to

understand the importance of each step of the *On the CUSP: Stop CAUTI* intervention, and gain support to ensure a successful implementation.

To summarize, the general steps of executing this project are:

- Assemble a team, engage staff, and partner with a senior executive.
- Understand the CAUTI interventions. Listen to the onboarding calls and content calls and read through the materials provided by the NPT.
- Understand Safety Culture and how to apply CUSP to daily routine. Materials are available in this manual and on the *On the CUSP: Stop HAI* web site.
- Understand the issues with inappropriate catheter use and risks.
- Understand measures, and establish processes to ensure data is collected. Participate in data calls, and work with your team to put processes in place.
- Use teamwork tools that are relevant to the unit. Tools are available online and in the appendices of this manual.

If implementation does not go as planned, treat it like any other defect, learn from it, and then improve your execution. <u>Section V</u> includes detailed guidance for executing this project.

Evaluate: How will we know we made a difference?

The fourth E focuses on the *evaluation* process. In this step, you reflect on data that has been collected in order to determine the success and where improvements should be made.

Data are collected on culture, process, and outcome measures. Reports are available in Care Counts so that states and units may have continuous access to their data in order to monitor progress over time. These reports can be generated at the unit level and at a higher aggregate level. These reports should be used to evaluate progress on improving urinary catheter utilization, compliance with indications, and CAUTI reduction by sharing them with the safety team, senior executive partner, and unit staff/providers.

In addition to evaluating progress on CAUTI, your unit team will be asked to complete a "Team Checkup Tool" (TCT) on a quarterly basis. This tool asks about the activities the team has implemented in regard to CUSP and culture change, as well as the barriers the team has faced. The TCT is a mechanism for teams to identify what is impeding progress and an ongoing means to see whether improvements are being made. The information from the TCT for your unit should be summarized and reported to the team and the executive partner every quarter. This will provide a channel for the safety team to report issues to management in a way that allows honesty and openness, which in turn may help the executive provide the team with assistance and solutions.

Table 3: Measure Type: Care Counts Reports Available*

Measure Type	Reports Available
Culture	HSOPS Readiness Assessment Team Checkup Tool
Outcome	Symptomatic CAUTI rates: • Number of symptomatic CAUTIs/number of catheter days x 1,000 • Number of symptomatic CAUTIs/number of patient days x 10,000 Data Collection Status Prevalence Rate (catheter days/patient days)
Process	Percent of Patients with a Catheter (Prevalence Rate: number of patients with catheters/total number of patients x100) Data Submission Status Appropriate/Inappropriate Catheter Indication Rates

*Only acute care units participating in On the CUSP: Stop CAUTI will enter data to Care Counts. Participating Emergency Departments will use the HRET Comprehensive Data System (CDS). There are no plans to combine the two databases.

Comprehensive Unit-based Safety Program

Overview of the CUSP Model

The CUSP model is designed to equip frontline unit staff with a framework and tools to improve patient care and make your unit safer. For this project, CUSP will serve as a model that will help your unit staff to understand the risks of CAUTI associated with non-compliance with appropriate use and care of the catheter, and the role and shared responsibility of every unit staff member to help change your unit's work processes to reduce the risk of those infections for patients in your care. Culture is a major focus because it represents a set of shared attitudes, values, goals, practices, and behaviors that make one unit distinct from another unit. The CUSP framework is comprised of five components, each described in more detail in this section.

CUSP Components and Implementation Guidance

Assemble the Team

When you assemble your team, remember that culture is local. The *On the CUSP: Stop CAUTI* team is composed of engaged frontline providers who take ownership of patient safety. You should include providers of different types and levels of experience on your team. Partner with nursing, case management, infection prevention, and physicians. Recruiting the right personnel for a unit-based multidisciplinary team is crucial, because the team will:

> Assemble the Team through:
> - Understanding the importance of a CUSP team
> - Developing a strategy to build a multidisciplinary team
> - Identifying characteristic of successful teams and barriers to team performance

- Oversee the process to guide the implementation and management of the program
- Be the driving force for sustaining the program

As you develop your *On the CUSP: Stop CAUTI* team, you should ensure that the team possesses four key characteristics of successful teams. They include:

- An identified team leader
- Diverse opinion leaders or dissenters
- Members with a willingness to help spread the intervention
- A majority of members who provide direct care in the unit

These characteristics will help ensure that you have a successful team. Barriers to performance can occur when you do not have all four key characteristics, when there is miscommunication among team members, or when there are competing priorities for team members. Working to reduce these barriers contributes to team success.

What the team needs to do:

- Recruit a team lead, nurse manager, physician, and executive partner along with any other team members. Having a team leader who is a member of the patient care unit maximizes ownership of the project.

- The team leaders should meet with hospital risk management, quality improvement, and infection prevention departments to ensure that CUSP efforts are integrated into overall hospital quality improvement and patient safety efforts. Staff from these departments are knowledgable about existing data collection efforts and have expertise in areas that will be useful to the *On the CUSP: Stop CAUTI* team.

- List team member names and contact information on the [Background Quality Improvement Team Form](#) and post this list in a visible location for staff reference. Perhaps entertain the idea of an open invitation to join the team at a staff meeting or through another method of communication that will reach the entire staff that work with patients in your area, including members from pharmacy, nutrition, and occupational or physical therapy.

- Use the 4 E's to ensure team engagement. Team members need to know what is in it for them. Engage them in the process. Educate them about their roles. Work with your team to execute the processes. Then evaluate what you have done.

Engage the Senior Executive

Partnering a senior executive with your unit has two goals: to bridge the gap between senior management and frontline providers, and to allow for a system level perspective. The senior executive's role is one of advocacy. The senior executive should be encouraged to discuss the safety issues identified by the team and frontline care providers and to help remove barriers (e.g., lack of resources, political issues, lack of awareness) to implementing improvement efforts. In addition, the executive's role is also to stimulate further discussions about safety, help prioritize safety concerns, suggest solutions to safety concerns, and help set goals for the unit. Additionally, the executive should hold everyone, including providers and him or herself, accountable for undertaking efforts to reduce risks to patients.

> Engage the Senior Executive: This step invites a senior hospital executive to partner with your unit in order to:
> - Educate leaders about the clinical issues and safety hazards
> - Provide staff with resources to mitigate hazards and assist with removal of barriers
> - Improve frontline providers' attitudes about leadership
> - Help to hold staff accountable for reducing patient risks and open the lines of communication

The effect that the patient safety team and frontline providers can have on the executive is important. The executive can gain tremendous knowledge by observing and understanding the challenges the units face each day on the frontline. In addition, executives may not be aware that system defects exist in their hospital.[20] These valuable insights often alter the way the executives do their jobs, and they frequently report that their hour on the unit is time they look forward to the most each month.

One of the most effective approaches to bridging the gap between senior management and frontline providers is to conduct executive safety rounds, where the executive mingles with providers on the unit while discussing safety issues. Meeting with providers in a conference room format should be kept to a minimum. Meeting with providers on the unit is vastly preferable to meeting in a conference room, as presence on the unit helps to 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 frontline staff and imparts a stronger sense of commitment to the project.

<u>What the team needs to do:</u>

- The CUSP team leader or members of the safety team should meet with the senior executive assigned to their unit to share unit-specific information before the executive holds safety rounds. To prepare for this meeting, gather relevant information about the unit for the senior executive. This information packet should include:

    o Background information about the CAUTI project

    o Results from the safety culture baseline assessment if available

    o A list of safety issues that have been identified for that unit, such as those that may have been compiled from the staff safety assessment

    o Pertinent information about the unit that the senior executive may not know, especially information in regard to CAUTIs for that unit, and patient/physician demographics. If your senior executive does not have a clinical background, you may want to suggest that he or she visit the unit before the first staff meeting to get a better feel for the unit and how it works. He or she may also want to consider shadowing a provider to observe where system breakdowns are occurring within the unit. The [Shadowing Another Profession](#) activity will be helpful for this.

    o You may also want to provide your unit executive with a concise dashboard about the status of quality and safety culture on your unit. Some suggested sources of data in addition to the safety culture assessment results include sentinel events, incident reports, and liability claims. In the Michigan experience, a patient safety dashboard was used that included four items: how often patients are harmed (infections), how often they get the right care (appropriate care), how often are teams learning from defects and is culture improving.

    The unit champion or other member of the safety team should then work with your executive sponsor to schedule monthly executive safety rounds and post this schedule on a bulletin board that is accessible to unit providers. The unit team should invite all providers to attend these rounds. If possible, post a picture of the unit's senior executive partner and his or her contact information on the unit. This will help increase visibility of the executive and the program as well as help providers to feel comfortable addressing and contacting the executive.

- In preparation for executive safety rounds, the unit champion should brief providers regarding the purpose of partnering with a senior executive and ask them to be prepared to discuss their own safety concerns and suggestions for resolution during rounds. Make sure to repeat this preparatory step a few days before each safety round as a reminder to frontline providers and

to collect any safety concerns from providers who will not be physically present on the day of rounds.

- During executive safety rounds, the patient safety team, senior executive, and unit providers should review any safety issues identified, particularly those related to CAUTI, and list them on a tracking log. An example of this log, the Safety Issues Worksheet for Senior Executive Partnership, is found in the CUSP Toolkit. You may want to start with one or two safety issues that do not require extensive resources to implement and up to two issues that need additional resources (require funds to implement) and note these on the form. Documenting safety issues that will be addressed based on the executive safety rounds is useful in tracking the impact of the initiative. It may be helpful to transfer the safety issues that you are working on to the Status of Safety Issues form that is provided as Appendix A to this manual. Then, the executive partner and unit members can assign a contact person to champion all activities associated with each issue. As patient safety issues are resolved, they can be moved to the "Completed" section on the bottom half of the Status of Safety Issues form. Return this form to your unit champion so frontline providers on your unit can be kept informed about the progress of improvement interventions. Posting this form in a highly visible location where staff will see it regularly is a great way to increase staff awareness and encourage engagement.

- Part of patient safety rounds should include a discussion about the investigation of a safety defect identified using the Staff Safety Assessment. It may be best to wait until the second session with your senior executive before incorporating this tool in safety rounds. Waiting will provide an opportunity for your team and unit to undertake a trial run to see how the tool works so you are better able to explain the investigation process to your executive partner. This investigation process includes frontline staff and the executive using the Learning from Defects tool to identify what systems-based safety problems contributed to the defect. This process will include a plan of action to resolve system defects that is documented on the Learning from Defects tool. Again, this is an ideal time to use your CUSP tools to address a safety issue related to CAUTI.

Understand the Science of Safety

When a mistake occurs, we too often assume that the error was the result of inexperience, a lack of supervision, or simply bad luck. However, the fact is that care is often delivered within poor systems or in the absence of systems altogether. The Science of Safety provides a conceptual framework and a common safety vocabulary that allows frontline providers to recognize, raise, and address safety defects at the system level. The goal of

This step will help your unit staff to:

- Understand that safety is a system property

- Understand the basic principles of safe system design, including standardizing work, creating independent checks (checklists) for key processes, and learning from mistakes

- Recognize that the principles of safe design apply to technical as well as team work, and understand that teams make wise decisions when there is diverse and independent input

the Science of Safety training is to inform all frontline providers and executive partners about the magnitude of the patient safety problem, provide a foundation for investigating safety defects from a systems perspective, and highlight how each staff member's involvement can make a significant difference to make care safer, particularly in regard to reducing the risk of CAUTI. A system is a set of parts interacting to achieve a goal, and the Science of Safety training emphasizes how each part or cog in the health care system contributes to the provision of care and is vital to bringing about sustainable change in the clinical setting.

The Science of Safety training includes two companion pieces. First, have your staff view the 23-minute *Science of Safety* video, part of the CUSP Toolkit. Next, ask your staff to read the transcript of Sorrel King's speech at the 2002 Institute for Healthcare Improvement (IHI) Conference. Her speech retells the tragic death of her 18-month old daughter, Josie, from a series of errors. The *Science of Safety* video is available at http://www.ahrq.gov/professionals/education/curriculum-tools/cusptoolkit/videos/04a_scisafety/index.html as part of the CUSP Toolkit, and Sorrel King's speech is available on the Josie King Foundation web site at http://www.josieking.org/page.cfm?pageID=10.

> *TIP: As John Kotter recognizes, leading change requires a sense of urgency. The tragic death of Josie King brought this sense of urgency to Johns Hopkins. For another organization to relate and feel the same sense of urgency, they should focus on a safety event that occurred in their own organization. Revealing such an event may be difficult. Having a nurse manager or someone in a leadership capacity start a conversation about a safety event may help others to feel more comfortable and give permission for others to follow, thereby creating a safe environment in which to discuss psychological safety.*

What the team needs to do:

- The CUSP team leader or nurse manager should ensure that all staff members watch the *Science of Safety* video within the first month of CUSP implementation. This can be challenging, and there is no one right way to accomplish this goal. One popular approach is to schedule large group training sessions. However, a smaller group or individual training can be used as well. For an example of how to track the completion of staff member training, see the Science of Safety Training Attendance Sheet (Appendix B). You should share the video with your medical staff and house officers by screening the video at medical staff meetings and house staff educational sessions, which are already scheduled, rather than expecting physicians to attend a separate meeting.

Staff members should discuss safety events on their unit, what systems may have led to the events, how the principles of safe design could be applied to improve safety, and how teams can improve communication. Also, be sure to work with administration to ensure that new frontline providers, who join the unit later, watch the *Science*

> After watching the *Science of Safety* video, staff members should be encouraged to discuss the important concepts they have learned, and how they might apply it to the CAUTI project.

of Safety video. One strategy is to include these presentations in the standardized orientation programs for new staff, agency staff, and new house officers and medical staff.

- The National Project Team recommends that the [Staff Safety Assessment](#) form, introduced in the previous section, be handed out at the end of the Science of Safety training session. This is also a good time to instruct staff regarding how to report safety concerns on the unit in the future, identify the executive partnering with the unit, and describe how Executive Safety Rounds will be conducted.

Identify and Learn from Defects

Frontline providers are the eyes and ears of patient safety. They possess the expertise and knowledge needed to improve safety. After being exposed to the Science of Safety, frontline providers are more aware of system level defects and are prepared to identify clinical or operational issues or defects, which may have the potential to affect patient safety. The NPT has found that one of the strongest determinants of safety culture is whether physician and nurse managers listen to and act on staff concerns regarding patient safety. Therefore, it is important to follow through once staff identify defects.

There are many sources to identify safety defects. Once defects are identified and prioritized, frontline providers can learn from them and implement improvement efforts. The [Learning from Defects](#) form will help frontline providers investigate safety defects by examining one defect, identifying the factors that contributed to that defect, implementing and measuring changes to reduce the probability of the defect recurring, and summarizing what was learned from this investigation. The Learning from Defects (LFD) process seeks to answer four questions:

1) What happened?
2) Why did it happen?
3) What can you do to reduce risk?
4) How do you know risks were reduced?

The National Project Team asks that the safety team learn from at least one defect per quarter, preferably at least one per month. This defect can be a safety issue that is either related or unrelated to CAUTI. The process of learning from defects yields useful knowledge that can often be applied to various patient safety issues such as falls, medication errors, and handoffs in care. Because staff and physicians see CAUTIs all the time and view them as inevitable yet treatable, it is important to emphasize to staff that CAUTIs are painful for patients and often seed additional infection in the patient. Because of this, it is imperative that health care providers devote additional time

> Identify and Learn from Defects: This step asks your staff to think about how the next patient on your unit may be harmed, particularly in regard to inappropriate urinary catheter use as well as introducing a structured process to learn from medical and other errors by examining: what happened; why it happened; what you did to reduce risk; and how you measure whether risks were actually reduced.

and energy to education aimed at eliminating CAUTI. To encourage discussion and education on the topic, one may want to open a discussion about a recent CAUTI on the unit, or a general review of the

current CAUTI rates. The discussion and following education steps are vital to the CAUTI project as they play an important role in staff education as they invite staff members to share factors they have observed on the unit that may be contributing to CAUTIs. To be encouraged to begin this step, staff and providers may:

- Complete the [Staff Safety Assessment](#), which asks providers how the next patient will be harmed in their unit and what they think can be done to minimize patient harm or prevent this safety hazard from happening again

- Review other potential sources of information about defects, including your hospital's incident reporting system, risk management reports, liability claims, and morbidity and mortality conferences

Tap into frontline providers' tremendous knowledge about risks to patient safety. Incorporate the Learning from Defects process into activities undertaken with your senior executive. This includes completing the Case Summary Form ([Appendix C](#)) that is part of the Learning from Defects process and sharing the learning both inside and outside the unit. The senior leader may want to encourage this type of sharing by asking, "Did you share your lesson learned recently through the Defects tool, and if so, with whom?" Some additional examples include: a communication book that is read and signed by all frontline providers, a dedicated bulletin board, or updates at routine staff meetings. In the Michigan experience, some units produced newsletters to share what was learned on the participating unit with others in the hospital. While these are examples, any form of dissemination that works for your individual unit is encouraged. It is important to share the Learning from Defects case summaries throughout your health system as events tend to be common among units.

<u>What the team needs to do:</u>

The CUSP team leader, or his or her designee, should distribute the [Staff Safety Assessment](#) form to all clinical and nonclinical providers in the unit. One person should be assigned the task of handing out and collecting the safety assessment forms. To encourage staff to report safety concerns, establishing a collection box or envelope where completed forms can be dropped off anonymously may increase staff participation. All safety assessments should be:

- Grouped by common types of defects (such as communication, medication process, patient falls, supplies, etc.)

- Prioritized considering the following criteria: likelihood of harming the patient, severity of harm, how common it is, and likelihood that it can be defended against in daily work

- Shared with your senior executive partner. Note that one of the tasks of the senior executive is to help prioritize the unit's safety concerns. You have the option of saving this prioritizing process for your meeting with your executive partner. You can use informal methods (for example, group consensus) or formal quantitative methods to prioritize the greatest risks (for example, rating risk of harm). It is important to understand that identifying and learning from defects is not a one-time event, but rather a continuous process. As your team identifies safety

issues and implements interventions to make improvements, conduct new safety assessments to identify other defects. Take one defect identified on your unit such as a CAUTI, an incident report, sentinel event, liability claim, or defect identified from the Staff Safety Assessment, and complete the LFD tool. Each unit should complete at least one Learning from Defects tool and the accompanying Case Summary Form (Appendix C) per quarter.

While organizations have other modes of learning about risk, such as failure modes and effects analysis (FMEA) or root cause analysis (RCA), these processes can be burdensome and infrequent. The Learning from Defects process enriches FMEA and RCA by encouraging greater involvement of frontline staff, through a built-in process and accountability structure for implementing system changes as a result of input from staff, and a strong focus on the patient as the center of process changes. To manage and track safety activities, it may be easiest to transfer this information to the Status of Safety Issues Form (Appendix A).

Implement Teamwork and Communication

The National Project Team has developed a series of practical tools to help teams improve communication and teamwork and address areas that may present hazards to safety on your unit. Table 4, provided below, highlights specific tools and their purpose within the CUSP framework. Copies of each tool are available on the AHRQ website at www.ahrq.gov/cusptoolkit/. Some of these tools are mentioned in this guide, and others will be discussed during the course of calls.

> Implement Teamwork and Communication: This step helps your unit learn and use specific tools that will help to improve teamwork, work processes, and communication on your unit.

What the team needs to do:

Identify opportunities to improve teamwork and communication by reviewing the unit scores from the baseline safety culture assessment (the Hospital Survey on Patient Safety Culture, or HSOPS), and any barriers that the team identified while learning from a safety defect. Examples of this include poor teamwork climate, or nurses' fear to discuss catheter removal with physicians. Discuss with frontline providers how and where they want to improve communication, and select a tool that best addresses their concerns. Incorporate teamwork and communication tools into your team meetings and other project processes.

Tools

Table 4: CUSP Toolkit Resources

Name of Tool	Purpose	Link
Background Quality Improvement Team Form	Gather names, titles, and contact information for unit safety improvement teams.	http://www.ahrq.gov/cusptoolkit/8cusptools/bckgrndqiteam.doc
Shadowing Another Profession	Identify and improve communication, collaboration, and teamwork skills between different practice domains.	http://www.ahrq.gov/cusptoolkit/8cusptools/shadowing.doc
Safety Issues Worksheet for Senior Executive Partnership	Identify safety issues and recommendations for improvement identified by frontline staff in conversation with a senior executive.	http://www.ahrq.gov/cusptoolkit/8cusptools/safetysnrchklst.doc
Staff Safety Assessment	Inventory threats to patient safety identified by frontline care providers.	http://www.ahrq.gov/cusptoolkit/8cusptools/staffsafetyassess.doc
Learning from Defects	Set up a local process to learn from and respond to defects locally, within the unit.	http://www.ahrq.gov/cusptoolkit/8cusptools/learndefects.doc
Daily Goals Checklist	Improve team communication regarding patient's plan of care.	http://www.ahrq.gov/cusptoolkit/8cusptools/dailygoals.docx
Morning Briefing	Get everyone on the same page at the beginning of a day or shift, so that expectations are set and the day is more predictable	http://www.ahrq.gov/cusptoolkit/8cusptools/morningbriefing.doc

Table 5: Additional CUSP Implementation Tools

Name of Tool	Purpose	Appendix
Status of Safety Issues Form	Track previously identified safety issues and recommendations for improvement and status of improvement efforts.	A
Science of Safety Training Attendance Sheet	Verify participation in screenings of the *Science of Safety* educational video.	B
Case Summary Form	Analyze a case example of patient harm or a near-miss to identify system factors and opportunities for improvement.	C
Culture Debriefing Tool	Provide a structured process to make culture results actionable.	D

III. Interventions to Prevent CAUTI

There is clinical evidence that provides guidance in CAUTI prevention. In the acute care setting, prevention efforts must focus on three key steps to prevent CAUTI: appropriate urinary catheter use, proper catheter insertion and maintenance, and prompt catheter removal. Efforts in emergency departments will focus on appropriate use and proper catheter insertion.

Step 1. Appropriate Catheter Use Intervention

The key elements of the Appropriate Catheter Placement Intervention include:

1. Insert urinary catheters only for appropriate indications. The evidence-based HICPAC/CDC Guideline specifies appropriate indications for urinary catheter insertion and use.
2. Consider alternatives to indwelling urinary catheters, including the use of bladder scanners to identify and manage urinary retention, condom catheters and non-invasive methods of measuring urine output.

Step 2. Proper Catheter Insertion and Maintenance Intervention

The key elements of the Proper Insertion and Maintenance Intervention include:

1. Ensure that only properly trained people who know the correct technique of aseptic catheter insertion and maintenance are given these responsibilities.
2. Insert catheters using aseptic technique and sterile equipment.
3. Maintain a sterile, continuously closed drainage system.
4. Do not disconnect the catheter and urinary drainage system unless the catheter must be irrigated manually because of obstruction.

Step 3. Prompt Catheter Removal Intervention

Remove catheters as soon as possible. Patients should be monitored daily for catheter use and if an appropriate indication for catheter use is no longer present, the catheter should be promptly removed.

Step 1: Appropriate Catheter Use Intervention

Ensure the catheter is indicated based on the HICPAC/CDC Guideline

In 2009, HICPAC and CDC recommended a list of appropriate and inappropriate indications for urinary catheter placement based on a critical review of the available medical literature. Because of the absence of high-quality studies examining indications for urinary catheterization, the recommended indications for catheter use primarily represented consensus expert opinion. After careful review of these indications, facilities may choose to slightly modify the HICPAC urinary catheter use criteria based on

institutional considerations, including patient profiles and care practices. The data collection process allows for these modifications to be accounted for as appropriate indications.

Appropriate indications for urinary catheterization based on HICPAC guidelines include the following:

1. Acute urinary retention or obstruction—Urinary catheters are indicated for the management of acute urinary retention due to mechanical obstruction. Urethral or bladder outlet obstruction is commonly related to benign prostatic hypertrophy, severe edema with penile swelling, urethral stricture or urinary blood clots. Urinary catheters also are indicated for acute urinary retention related to a neurogenic bladder most often related to spinal cord injury or progressive neurological disease or to medications that reduce bladder muscle contractility or sensation.

2. Accurate measurement of urinary output in critically ill patients—Catheters are indicated when accurate measurement of urinary output is required in critically ill patients receiving care in the intensive care setting. ICU patients who are hemodynamically stable and cooperative often do not require urinary catheters and are appropriate candidates for alternate means of measuring urine output (see ***Consider alternatives to indwelling urinary catheters*** subsection below).

3. Perioperative use in selected surgeries—Urinary catheters are indicated perioperatively for selected surgerical procedures. Catheters should be used when a surgery is expected to be prolonged, when a patient will require large volume infusions during surgery, or when there is a need for intraoperative urinary output monitoring. Catheters also are indicated for urologic surgeries or other surgeries on contiguous structures of the genitourinary tract. Urinary catheters should not be used routinely for patients receiving epidural anesthesia or analgesia. Among these patients, the risk of acute urinary retention can be reduced by prompt discontinuation of the epidural medication and by the use of bladder scanners to monitor for acute urinary retention in the immediate post-operative period (see ***Consider alternatives to indwelling urinary catheters*** subsection below).

4. To assist healing of perineal and sacral wounds in incontinent patients—This is a relative indication for urinary catheter use when there is concern that urinary incontinence is leading to worsening skin integrity in areas where there already is skin breakdown. Urinary catheters should not be used as a substitute for the use of skin care, skin barriers, and other methods to manage incontinence and limit skin breakdown.

5. Hospice/comfort/palliative care—This is an acceptable indication for catheter use in end-of-life care, if it helps with patient comfort.

6. Required immobilization for trauma or surgery—Urinary catheters may be used when patients require requires prolonged immobilization following trauma or surgery. Examples include instability in the thoracic or lumbar spine, multiple traumatic injuries, such as pelvic fractures, and acute hip fracture when there is risk of displacement with movement.

7. <u>Chronic indwelling urinary catheter on admission</u>—Patients admitted from home or an extended care facility with a chronic indwelling catheter are considered to have an acceptable indication for catheter use. Note, this indication is not listed as one of the HICPAC urinary catheter indications.

Inappropriate indications for urinary catheterization include the following:

1. <u>Urine output monitoring outside the ICU</u>—Monitoring urine output in patients receiving care outside of the ICU setting is not an appropriate indication for urinary catheter insertion and use, including the for patients with congestive heart failure who are receiving diuretics. Some potential solutions are use of urinals for men and hats for women (to monitor output), and accurate daily weights. For patients with congestive heart failure, consider involving the patients themselves. Providing patients with educational materials on how to document their urine output and daily weight may assist in this process.

2. <u>Incontinence without a sacral or perineal pressure sore</u>—Urinary catheters should not be placed for management of urinary incontinence. Patients admitted from home or from extended care facilities with incontinence manage their incontinence without problems before admission. Mechanisms to keep the skin intact need to be in place. Some potential solutions for the management of incontinence include use of skin barrier creams for protection, use of a bedpan, or assisting the patient up to the commode regularly. Check for any wet bed linen, and change linens if they are wet when the patient is being turned in bed. In addition, external ("condom") catheters may be an alternative to manage urinary incontinence in cooperative male patients without urinary retention or obstruction.

3. <u>Prolonged post-operative use</u>—Urinary catheters should be promptly discontinued within 24 hours or less of surgery unless there is an appropriate indication for continued post-operative catheter use (e.g., structural repair of urethra or contiguous structures, prolonged effect of epidural anesthesia, etc.).

4. <u>Other inappropriate uses of urinary catheters:</u>

   a. <u>Patients who have been transferred from intensive care to a floor</u>—A urinary catheter should be discontinued promptly after the patient has been transferred from the ICU to a floor.

   b. <u>Morbid obesity or immobility</u>—Morbid obesity or immobility should not be a trigger for urinary catheter placement. Patients who are morbidly obese have functioned without a urinary catheter prior to admission. The combination of immobility and morbid obesity may lead to inappropriate urinary catheter use. However, this may lead to more immobility with the urinary catheter being a "one-point restraint." Some potential solutions include toilet training every two hours, use of a bedpan or urinal, or assisting the patient out of bed.

c. <u>Confusion or dementia</u>—Patients with confusion or dementia should not have a urinary catheter placed unless one of the seven indications for appropriate placement is present. External "condom" catheters are an alternative to urethral catheters for the management of incontinence in male patients who are cooperative (see ***Consider alternatives to indwelling urinary catheters*** subsection below).

d. <u>Patient request</u>—Patient request should not be a reason for placement of unnecessary urinary catheters. Explain to the patient the risk of infection, trauma, and immobility related to the use of the urinary catheter, and consider providing the patient with educational materials on the risks of CAUTI. The only exception would be for patients who are receiving end-of-life or palliative care (appropriate indication #5 described above). For example, if a patient is on diuretics and does not want to move out of bed multiple times, a catheter should not be used. Education is key! Explain to the patient the increased risks associated with use of a urinary catheter: urine infection, skin breakdown, and deep venous thrombosis due to immobility.

<u>What the team needs to do:</u>

Ensure that unit teams and care providers are properly educated in the seven appropriate indications for urinary catheters and the four inappropriate indications outlined above. Several educational tools are available in the appendices of this manual and at http://www.onthecuspstophai.org/on-the-cuspstop-cauti/toolkits-and-resources/on-the-cusp-stop-cauti-implementation-guide/, including two posters on urinary catheters, a brochure, fact sheet, and pocket card, which all outline the seven indications for catheter use. See [Table 6: CAUTI Prevention Policies and Educational Materials](#).

Consider alternatives to indwelling urinary catheters

Alternatives to an indwelling urinary catheter should be considered based on a patient's individual care needs. Why? In general, alternative devices and procedures provide a much lower risk of infectious complications, such as urinary tract infection. Additionally, these alternative methods can reduce or eliminate the non-infectious complications—such as discomfort and immobility—that are associated with indwelling urethral catheters.

Before placing an indwelling catheter, consider if these alternatives would be more appropriate:

1. <u>Bedside commode, urinal, or continence garments: to manage incontinence</u>. Additional planning and personnel resources may be required to ensure that patients are regularly prompted and assisted with voiding or assessed for incontinence.

2. <u>Bladder scanner: to assess and confirm urinary retention, before placing catheter to release urine</u>. Portable bladder ultrasound is a non-invasive portable tool for diagnosing and managing urinary outflow dysfunction. For example, portable bladder ultrasound are useful on medical, surgical or rehabilitation units to detect that a patient has insufficient urinary retention to justify

catheterization. Nurse-driven protocols and handheld bladder scanners have been shown to reduce the risk of CAUTI.[21]

3. <u>Straight catheter: for one-time, intermittent, or chronic voiding needs</u>. Intermittent catheterization is most often used in patients with neurogenic bladder or spinal cord injury, and lessens the risk of urinary tract infection. Intermittent catheterization is preferable to indwelling urethral or suprapubic catheters in patients with bladder emptying dysfunction. When the patient returns to the community, intermittent catheterization enhances patient privacy and dignity, and facilitates return to activities of daily living. It is important to perform intermittent catheterization at regular scheduled intervals to avoid over-distending the bladder. Among hospitalized patients, one-time or intermittent catheterization is often used in combination with a portable bladder ultrasound.

4. <u>External "condom" catheter: appropriate for cooperative men without urinary retention or obstruction</u>. External catheters are useful especially for management of incontinence in elderly male patients with dementia but remain underutilized.[22] In a randomized clinical trial among 75 male patients at a VA Medical Center, condom catheters reduce the cumulative risk of urinary tract infection or death and were better tolerated than indwelling urinary catheters.[23] When using condom catheters, it is important to choose an appropriate size to improve fit and adherence to limit the risk of urine leakage or penile trauma.

<u>What the team needs to do:</u>

Identify alternatives to indwelling urinary catheters that you plan to implement and the target populations. An example of a Bladder Scan Policy is available in <u>Appendix F</u> and at <u>http://www.onthecuspstophai.org/on-the-cuspstop-cauti/toolkits-and-resources/on-the-cusp-stop-cauti-implementation-guide/</u> and can help your facility put this important method of reducing catheter use into practice.

Step 2: Proper Catheter Insertion and Maintenance Intervention

Properly Trained Clinicians

Ensure that only properly trained people who know the correct technique of aseptic catheter insertion and maintenance are given responsibility for catheter placement.

Aseptic Insertion of Urinary Catheters

Supplies necessary for placing urethral catheters include the following:

- Water-absorbent underpad
- Sterile drape
- Sterile gloves
- Preparation swabs
- Forceps
- Antiseptic solution
- Catheter
- Tubing
- Collection bag
- Sterile water for balloon inflation
- Lubricating jelly

Most of these supplies can be purchased as prepackaged kits. Catheters vary widely by design, size, and construction material. The Foley catheter, a double-lumen, straight-tip catheter, is used most frequently.

Always place urethral catheters under sterile conditions, wearing sterile gloves. If using a catheterization kit, remove the kit from its outer packaging, and open the inner paper wrapping to form a sterile field. To avoid contaminating the gloves, with washed hands carefully retrieve the absorbent pad from the top of the kit, and place it beneath the patient's buttocks, with the plastic side down. Then put the gloves on, and cover the patient's abdomen and superior pubic region with the drape. Organize the contents of the tray on the sterile field, on a bedside table within reach. Techniques for catheterization of female and male patients vary. The *New England Journal of Medicine* has published two widely referenced articles with accompanying instructional videos on catheterization of females and males.[24, 25]

Appropriate Maintenance of Urinary Catheters

- If there are breaks in aseptic technique, disconnection of tubing, or leakage from the bag, replace the drainage system. Disinfect the catheter-tubing junction before connecting to the new drainage system. If the catheter becomes contaminated, replace the catheter.

- Make sure urinary flow is not obstructed. Ensure the catheter is not kinked. Drainage bags should always be placed below the level of the patient's bladder to facilitate drainage and to prevent stasis of fluid. Urine in drainage bags should be emptied at least once each shift using a container designated for that patient only. Care must be taken to keep the outlet valve from becoming contaminated. Use gloves and perform proper hand hygiene before and after handling the drainage device.

- Do not change urinary systems routinely. Consider changing the urinary system in the event of infection, obstruction, or a break or leak of the closed system.

- Do not disconnect the closed system. Avoid irrigation unless necessary (such as in the case of a catheter obstruction). The catheter tubing junction should be disinfected before irrigation. When sampling urine, disinfect the sampling port. Also check the site for possible disconnection of the catheter from the drainage bag.

- Frequently washing the meatus with povidone-iodine or soap is not associated with lower infection risk. In fact, frequent meatal cleaning may be associated with increased risk of CAUTI. Routine perineal hygiene during daily bathing is appropriate.

- Only nursing staff, family members, or patients themselves who know the correct technique of aseptic insertion and maintenance of the catheter should handle catheters. Health care workers and others who take care of catheters should be given periodic education and training, stressing the correct techniques and potential complications of urinary catheterization.

<u>What the team needs to do:</u>

Implement a urinary catheterization policy such as the one found in <u>Appendix E</u>, which spells out care and maintenance guidelines in detail. The purpose of the policy is to standardize urinary catheterization to facilitate urinary drainage when medically necessary.

Step 3: Prompt Catheter Removal Intervention

Nurses and physicians should be aware of the indications for urinary catheter use and should continually monitor patient ongoing need for a catheter. Physicians should promptly discontinue catheters that are no longer needed or indicated, and nurses evaluating catheters and finding no indication should contact the physician to promptly discontinue the catheter.

One prominent reason for inappropriate catheter use is a lack of awareness among clinicians of current catheter use. In a study published in 2000, 18 percent of medical students, 22 percent of interns, 28 percent of residents, and 35 percent of attending physicians were unaware that the patients for whom they were responsible had an indwelling catheter.[26]

Reminders and stop orders

Reminders that a urinary catheter is still in use and stop orders are low cost and high impact methods of reducing the duration of catheter use and help to change the default mind set of healthcare providers from "persistent use" to "timely removal." Reminders can be written, verbal, or electronic (e.g., computer order entry) and may include appropriate indications to continue catheter use and alternatives to indwelling catheters. Reminders are especially useful at the time of transition of care (e.g, admission from the Emergency Department, transfer from ICU to floor, transfer from floor to rehabilitation unit) when direct nurse-to-nurse communication can prompt removal of catheters that are no longer indicated. Automatic stop orders prompt removal of urinary catheters based upon a specified

time (e.g., within 24 hours of surgery) or clinical criteria. In a systematic review of 14 studies of urinary catheter reminder systems, daily reminders and automatic stop orders reduced the overall risk of CAUTI by 48 percent and the average duration of catheter use by 2.6 days and were not associated with an increased rate of catheter reinsertion compared to standard care.[5]

<u>What the team needs to do:</u>

Daily monitoring of patient catheters is key. The Urinary Catheter Decision-Making Algorithm (Appendix I), Urinary Catheter Pocket Card (Appendix K), and Urinary Catheter Brochure (Appendix M), all emphasize removal of catheters and can aid in reinforcing practices among teams.

Tools

A number of helpful tools to aid in implementing or expanding focused CAUTI prevention efforts can be found in the appendices and at http://www.onthecuspstophai.org/on-the-cuspstop-cauti/toolkits-and-resources/on-the-cusp-stop-cauti-implementation-guide/. These tools are listed below in Table 6: CAUTI Prevention Policies and Educational Materials and Table 7: CAUTI Prevention Presentations and Templates. Adaptation to the needs of your particular environment as needed is encouraged.

Table 6: CAUTI Prevention Policies and Educational Materials

Name of Tool	Purpose	Appendix
Urinary Catheterization Policy	Apply evidence-based practice to reduce CAUTI.	E
Bladder Scan Policy	Apply evidence-based practice to reduce CAUTI.	F
Urinary Catheter Poster (Option 1)	Educate caregivers in: • Risks of catheter use • Indications and non-indications	G
Urinary Catheter Poster (Option 2)	Educate caregivers in indications for catheter use.	H
Urinary Catheter Decision-Making Algorithm	Educate in catheter indications and need for monitoring.	I
Urinary Catheter Project Fact Sheet	Educate caregivers in: • The problem of CAUTI • Project goals • Indications • Catheter removal	J
Urinary Catheter Pocket Card	Educate caregivers in: • Catheter removal • Risks of catheter use • Indications and non-indications	K
Catheter Care Pocket Card	Educate caregivers in evidence-based practices in catheter maintenance.	L
Urinary Catheter Brochure	Educate caregivers in: • Catheter removal • Alternate solutions for incontinence • The problem of CAUTI • Catheter use algorithm • Indications and non-indications	M
Nurse-Driven Protocol for Catheter Removal	Empower nurses to evaluate and discontinue unnecessary urinary catheters.	N
Frequently Asked Questions	Refine evidence-based practice for appropriate indications, and care and removal of catheters.	O
Skin Care in the Incontinent Patient	Educate caregivers on how to prevent skin breakdown.	P
Helpful Hints	Consider approaches that will help you to be effective in educating and engaging nurses.	Q

Table 7: CAUTI Prevention Presentations and Templates

Name of Tool/Reference	Purpose	Appendix
Presentation to Manager	Educate nurse managers in: • Project goals • Project timeline • Indications • Non-indications	R
Presentation to Nursing Staff	Educate nurses in: • Project goals • Project implementation • Indications • Non-indications • Helpful tips	S
Presentation of Data	Present CAUTI data in a compelling way to encourage project sustainability.	T
Implementation of Urinary Catheter Initiative Letter	Encourage engagement in program implementation.	U
Completion of Staff Education Letter	Encourage engagement in program implementation.	V
Unit Rounds to Begin Letter	Encourage engagement in program implementation.	W
Unit Results Letter	Encourage engagement in program implementation.	X

Table 8: Tools for Emergency Departments*

Name of Tool/Reference	Purpose	Link
ED Improvement Intervention Fact Sheet	Help your ED team understand the goals, resources, and requirements of the ED Improvement Intervention.	https://s3.amazonaws.com/Toolkits_and_Resources/ED+Intervention+Fact+Sheet_01282014.doc
Informational Presentation on the ED Improvement Intervention	Find out about the scope, resources, and metrics of the ED Improvement Intervention.	https://s3.amazonaws.com/Toolkits_and_Resources/ED+Component+Informational+Slides+Updated.ppt

Name of Tool/Reference	Purpose	Link
Understanding the ED Improvement Intervention Framework	Learn about the background and conceptual framework of the ED Improvement Intervention as well as program contact info.	https://s3.amazonaws.com/Toolkits_and_Resources/Understanding+the+ED+Improvement+Intervention+Framework+2014.ppt
ED Nursing Education Presentation from Emergency Nurses Association	Learn the rationale for targeted improvement in emergency departments, appropriate indications for catheter placement, and communication necessary for appropriate decision-making.	https://s3.amazonaws.com/Toolkits_and_Resources/CAUTI+ED+nursing+education.ppt
ED Comprehensive Data System (CDS) Registration From	Gather contact information for members of your unit team participating in the ED Improvement Intervention.	https://s3.amazonaws.com/Toolkits_and_Resources/ED+CDS+registration+list.xlsx
CAUTI ED Quick Guide: Appropriate Urinary Catheter Use in the ED	Use this 17-page guide for participation in the ED Improvement Intervention. It includes a catheter checklist, program timeline, and tools for education and data collection.	https://s3.amazonaws.com/CAUTI_ED_Quick_Guide/Appropriate+Urinary+Catheter+Use+in+ED+Quick+Guide.pdf
ED Algorithm #1	Educate caregivers in the ED on appropriate indications for catheters.	https://s3.amazonaws.com/Toolkits_and_Resources/Emergency+Department+CAUTI+Prevention+Guidelines_Algorithm+1.doc
ED Algorithm #2	Educate caregivers in the ED on appropriate indications for catheters.	https://s3.amazonaws.com/Toolkits_and_Resources/Emergency+Department+CAUTI+Prevention+Guidelines_Algorithm+2.doc

*These and other resources focused exclusively on the needs of Emergency Departments can be found at http://www.onthecuspstophai.org/on-the-cuspstop-cauti/emergency-department-improvement-intervention/.

IV. Measurement

Culture, Process, and Outcome Measures

The collection and reporting of data is an effective means of providing feedback to teams and supports improvement and sustainability. There are two goals in data collection and measurement for the national project as a whole: changes in the culture of safety and reduction of CAUTI rates. The overall goal of measurement is to determine the efficacy of each intervention.

To measure culture of safety, *On the CUSP: Stop CAUTI* employs AHRQ's Hospital Survey on Patient Safety Culture (HSOPS) to track changes in patient safety culture over time and to evaluate the impact of patient safety interventions. The survey is anonymous, with no individual staff identifiers. The survey will be administered twice during the project, once at baseline and again approximately 15 months later. *On the CUSP: Stop CAUTI* also uses a Readiness Assessment to determine the team's exposure to other interventions and their readiness to collect data. This assessment is completed by the Team Leader one time for the unit at the beginning of the project. Participating emergency departments complete the ED Questionnaire in lieu of the Readiness Assessment. Finally, a Team Checkup Tool is completed once per quarter by the team leader with input from the team to report on progress that has been made in the implementation of CUSP principles and barriers the team is facing.

For participating acute care units, there will be three periods of data collection and evaluation, during which CAUTI rates (outcome) data will be collected. Optional process data is collected during these periods as well, if the team decides to do so. The CDC National Healthcare Safety Network (NHSN) definitions are used for outcome data (Appendix Z). The HICPAC guidelines for appropriate indications are used for process data (Appendix BB).

Participating emergency departments will collect two pieces of data on their own, ED-specific timeline, which corresponds with the data submission timeline for acute care units. EDs will collect and submit the number of ED admissions (including observation patients), as well as the number of ED admissions with a newly-placed indwelling catheter (including observation patients).

Table 9 provided below details the culture, process, and outcome measures to be collected during *On the CUSP: Stop CAUTI.*

Table 9: Culture, Outcome, and Process Measures

DATA COLLECTED	DATA SOURCE	MEASUREMENTS
CULTURE/Hospital Survey of Patient Safety Culture (ACUTE CARE UNITS ONLY): Track changes in patient safety culture over time and to evaluate the impact of patient safety interventions	MHA Care Counts Or commercial survey vendors (e.g. Press Ganey) in format specified by MHA	15 domains: 1. Communication Openness 2. Feedback and Communication About Error 3. Handoffs and Transitions 4. Teamwork Across Units 5. Teamwork Within Units 6. Management Support for Patient Safety 7. Non-Punitive Response to Error 8. Supervisor/Manager Expectations & Actions 9. Promoting Patient Safety Staffing 10. Organizational Learning & Continuous Improvement 11. Frequency of Events Reported 12. Number of Events Reported 13. Patient Safety Grade 14. Overall Perceptions of Patient Safety 15. Overall Summary
CULTURE/Readiness Assessment (ACUTE CARE UNITS ONLY): Determine the team's exposure to other interventions and their readiness to collect data	Web-based survey	5 domains: 1. Hospital Information 2. Description of Clinical Area 3. Safety Activities 4. Catheter Management Strategies 5. CAUTI Prevention Practices
ED Questionnaire (EMERGENCY DEPARTMENTS ONLY): Share information with the national project team on processes and culture in your emergency department.	Web-based survey	Survey Elements 1. Staff responsible for catheter insertion 2. Barriers to CAUTI reduction 3. Protocols for catheter removal 4. QI initiatives for CAUTI prevention
CULTURE/Team Checkup Tool(ACUTE CARE UNITS ONLY): Identify what has been implemented and identify any impediments to progress	MHA Care Counts	5 Elements 1. Measure Adaptive Implementation 2. Measure Technical Implementation 3. Monitor Progress 4. Behaviors Driving Performance 5. Barriers to Teamwork and Communication

Table 9: Culture, Outcome, and Process Measures (continued)

DATA COLLECTED	DATA SOURCE	MEASUREMENTS
OUTCOME (acute care) • Identify Number of Symptomatic CAUTIs attributable to your unit for the month • Number of urinary catheter days per month (number of patients with urinary catheter device is collected daily at the same time each day, and the total is summed for the month) • Number of patient days per month	NHSN MHA Care Counts	Symptomatic CAUTI rates: • Number of symptomatic CAUTIs divided by number of catheter days, multiplied by 1,000 • Number of symptomatic CAUTIs divided by number of patient days, multiplied by 10,000 • Data Collection Status • Prevalence Rate (catheter days divided by patient days)
EMERGENCY DEPARTMENT • Catheter prevalence • **For more details please visit the ED Webpage**	HRET Comprehensive Data System (CDS)	• Number of ED admissions (including observation patients) • Number of ED admissions with a newly-placed indwelling catheter (including observation patients)
PROCESS (acute care, optional) • Assess each patient on the unit for the presence of a urinary catheter • Record the reason for the catheter	MHA Care Counts	• Percent of Patients with a Catheter (Prevalence Rate: number of patients with catheters divided by total number of patients, multiplied by 100) • Data Submission Status • Appropriate/Inappropriate Catheter Indication Rates

Data Collection

Acute care teams should collect and enter data by teams into the web-based portal MHA Care Counts. The periods of data collection and the measures to be collected by acute care units are described below in Table 10. Participating emergency departments will collect and enter data into the HRET Comprehensive Data System (CDS), and measures to be collected and data collection periods are below in Table 11.

Baseline data collection: Baseline refers to the period of time before staff members are formally educated about appropriate indications for urinary catheter use, and before instituting daily processes to evaluate the need for urinary catheters and to discontinue catheters that are no longer needed. Baseline data collection includes collection of prevalence and appropriateness (process) data and CAUTI rates (outcome) data.

Implementation period: Implementation refers to the period of time when staff education about appropriate indications for urinary catheters has been completed and a process has been instituted to evaluate the need for urinary catheters. Implementation data collection includes collection of prevalence and appropriateness (process) data and CAUTI rates (outcome).

Sustainability period: Data collection on all elements listed above will continue on a less frequent basis.

Table 10: Acute Care Data Collection Schedule*

TOOL/DATA COLLECTED	DATA COLLECTION SCHEDULE
HSOPS	• **Baseline** • **Implementation**: 15 months post baseline
Readiness Assessment	• **Baseline**: One time per unit at start of project
Team Checkup Tool	• **Implementation**: One tool completed each quarter
CAUTI Outcome Data • Number of symptomatic CAUTIs attributable to your unit for that month • Number of urinary catheter days per month (the number of patients with urinary catheter devices is collected daily at the same time each day, and the total is summed for the month) • Number of patient days per month	• **Baseline:** Collect monthly for three months • **Implementation:** Collect monthly for two months and quarterly thereafter • **Sustainability:** Quarterly
Prevalence and Appropriateness Process Data • Assess each patient on the unit for the presence of a urinary catheter • Record the reason for the catheter	• **Baseline:** Monday through Friday for three weeks • **Implementation:** Monday through Friday for two weeks, one day per week for six weeks, then one week (Monday through Friday) per quarter thereafter • **Sustainability:** one week (Monday through Friday) per quarter

* For dates specific to your Cohort, please consult your cohort-specific project calendar, found at http://www.onthecuspstophai.org/on-the-cuspstop-cauti/toolkits-and-resources/cohort-timelines/.

The data collection timeline correlates closely with project interventions, so it is imperative that feedback to teams and unit staff be given in real time to evaluate progress and modify processes as necessary.

Table 11: Emergency Department Data Collection Schedule

TOOL/DATA COLLECTED	DATA COLLECTION SCHEDULE
ED Questionnaire	Quarterly
ED Catheter Prevalence Data Note: Each data collection period will be the last two weeks of the CAUTI inpatient project data collection schedule with the exception of sustainability. Sustainability data collection will be any 14 days the last moth of each of the subsequent 4 quarters following implementation. ED cohort specific timelines can be found here on the ED project website.	Baseline: Collect daily for 14 consecutive days (the last two weeks of acute care 3 month basline data collection period) Implementation: Collect daily for 14 consecutive days after unit education has taken place (the last 2 weeks of acute care 2 month implementation data collection period) Sustainability: Collect daily any 14 days the last month of the quarter (the same month's as the acute care sustainability data collection period)

Table 12: Data Collection Tools

Name of Tool/Reference	Purpose	Appendix
CAUTI Process Data Collection Tool	The form helps units to collect prevalence and appropriateness data.	Y
NHSN Definition for Symptomatic CAUTI	Implement a surveillance process, including use of an indwelling urinary catheter, a positive urine culture, and the presence of certain clinical signs and symptoms.	Z
ED CDS Data Collection Form, Cohort 6 *Cohort 7*	This series of worksheets helps participating emergency departments to collect numerator and denominator data. For more information please visit our national project website here.	AA
HICPAC Guidelines for Appropriate Indications	Continually assess patient need for urinary catheters.	BB
Team Checkup Tool Questions	Share TCT questions with your team to gather their input in completing and submitting this quarterly data.	CC

V. Implementing *On the CUSP: Stop CAUTI*

This section of the toolkit provides an overview of project implementation activities, ongoing education, data collection and evaluation, and project milestones. In this section the technical portion of the project (CAUTI reduction interventions) and the adaptive portion (CUSP) are integrated into a single project management resource. This resource should be used as a quick guide to implementing the program on your unit. You can use the planning worksheets for each stage to keep track of due dates and necessary resources specific to your unit.

Phase 1: Start-up

Table 13: Start-up Phase Worksheet

Implementation Step	Resources	Due Date
Participate in National Calls		
Download the Project Initiation Timeline		
Compile Project Manuals, Appendices, and Toolkits into one resource binder		
Select a Unit		
Gain Buy-in from CEO, Team, and Staff		
Registration		

Start-up

Participate in National Calls
Participate in the Orientation Webinar. The Orientation Webinar is an introductory 60 minute webinar that will provide an overview of the collaborative. Teams are encouraged to attend this call to get a better understanding of participation requirements. PowerPoint slides will be distributed to the State Leads prior to the call and may also be accessed on the national *On the CUSP: Stop CAUTI* web site. If teams are not able to attend this webinar, they may also access the recording, which will be available on the web site.

Download the Project Initiation Timeline
Download the project initiation timeline. Project Initiation timelines for participating acute care units are available for each cohort on the *On the CUSP: Stop HAI* website. Download the timeline specific to your cohort so that you are aware of important dates. Timelines for participating emergency departments are available on the *On the CUSP: Stop HAI* website at http://www.onthecuspstophai.org/on-the-cuspstop-cauti/emergency-department-improvement-intervention/#Data.

Compile Project Manuals, Appendices, and Toolkits into one resource binder

Download project manuals, appendices, and toolkits from the *On the CUSP: Stop HAI* web site, and compile them into one resource binder so that all important documents are in a centralized location.

Select a Unit

Select a unit with at least moderate urinary catheter use as your target unit for this intervention. Evaluate units that have the highest urinary catheter utilization or units with increased non-indicated catheter utilization using point prevalence. Conduct a point prevalence to identify the unit with the highest usage of indwelling catheters, or work with your infection preventionist to determine the unit with the highest CAUTI rate. **Point Prevalence** is calculated using the following formula:

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

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. Identify the unit to target first. In the example below, you 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

Gain Buy-in from CEO, Team, and Staff

Alert staff on your unit to the start of the project. Share the link to the webinar recording with them along with the information you receive from State Leads. Encourage them to join the initiative. Meet with your CEO and unit leaders to discuss the initiative and its benefits for your units.

Registration

Your State Lead will send you a list of documents to be completed during this time period. These include:

- Registration-Registration for acute care units is completed through an online form for Care Counts. The link to this form can be found on the website and will be sent to you by your State Lead.
- Registration for EDs is completed through the ED CDS Registration Information form, which can be found on the national program website.
- Data Use Explanation (DUE)-This form explains how we will use the data submitted by your hospitals. The DUE form, should your hospital choose to complete it, should be signed by your hospital's CEO's or authorized representative and returned to HRET.

- CEO Commitment Letter-The commitment to participate in the project is formed between your hospital and the state hospital association. It should be signed by your hospital's CEO's or authorized representative and returned to HRET.
- Unit Team Commitment Form-Each member of the participating teams should sign this form on page 3. A copy of the signed form should be given to the State Lead.

Phase 2: Planning

Table 14: Planning Phase Worksheet

Implementation Step	Resources	Due Date
Assemble Your Team		
Develop Processes for Project Implementation		
Participate in National Calls		
Attend Learning Session # 1- Kickoff Meeting		
Educate Staff		
Develop Educational Plan		
Lay Foundation for Data Collection		

Planning

Assemble Your Team

- Establish your multidisciplinary team, and obtain leadership support from nursing, physicians, and administration.

    Nursing: Identify a nurse leader to be the point person for your unit. Potential candidates include the nursing director, or a very effective nurse manager or charge nurse. This person will:
    - Explain the project to unit staff and the management team
    - Ensure that unit staff are educated about CAUTI and the appropriate indications for urinary catheter use
    - Facilitate use of teamwork tools to guide communications regarding the appropriateness of catheters and recommendations for removal of non-indicated urinary catheters
    - Support integration of CUSP into daily workflow and unit operations

Medical Staff: Identify a physician leader for the project on your unit. This could be a urologist, infectious disease specialist, hospitalist, quality/patient safety officer, or any physician with an interest in improving safety and quality. This physician will:

- o Explain the project to medical staff who have patients on the unit
- o Assist with education of medical staff about the rationale for implementing a CAUTI reduction project and the appropriate indications for urinary catheter use
- o Participate in the CUSP activities of the project
- o Encourage project support

Administration: Recruit a senior executive to be your unit sponsor and to demonstrate that this project is a priority for the hospital. Tips for recruiting and working with a senior executive are detailed in section V of this manual, which describes CUSP.

Develop Processes for Project Implementation

- Develop a process to evaluate the prevalence—and if your unit is an acute care unit, the appropriateness—of urinary catheters on your unit. The process should be one that best fits your unit. Consider making this a part of rounding process that already exists. Most importantly, the process for evaluating the appropriateness of catheters must be standardized and used consistently. Write this process up using the Hospital Unit Action Plan.

- Acute care units should determine who will contact the physician to request an order for discontinuance of inappropriate urinary catheters unless a nurse approved protocol for the removal of catheters exists.

  - o Teamwork tools such as those found in the CUSP Toolkit or TeamSTEPPS, may be helpful to facilitate communication about the appropriateness of catheters and the recommendation for catheter discontinuance.

  - o Consider revising current processes, policies and procedures to include automatic stop orders or removal protocols.

  - o The process may be enforced by integrating it into the patient's daily nursing assessment.

Most importantly, the process for evaluating the prevalence and appropriateness of catheters must be standardized and used consistently.

Education

Participate in National Calls
Participate in educational opportunities offered by the National Project Team. These opportunities include:
- National Onboarding Calls: This series of calls gives teams the background information necessary to participate in the project. They begin approximately two weeks after Learning Session #1 and continue biweekly.
- ED Quarterly Office Hours: These 60-minute, focused, interactive coaching calls are geared for emergency departments. They are facilitated by faculty from the Emergency Nurses Association, and expert faculty provide coaching to participating EDs.

Attend State Face-to-face Meeting
Attend the State Face-to-face Meeting. The Learning Session #1: Kickoff Meeting will occur in each state as the official program kickoff. This meeting provides an opportunity for your team to meet with the State Lead and other teams participating in the project. The meeting also provides an opportunity for dialogue and shared learning among participating emergency departments and inpatient units.

Educate Staff
Educate unit staff on the science of safety and on appropriate indications for urinary catheter use.

- Watch the *Science of Safety* video with your unit:

  - This should include a formal instructional session about CAUTI, and appropriate indications for catheter use.

  - You may also provide staff with printed educational material, lectures, posters, and pocket cards found in Appendices G, H, I, J, K, L, M, O, R, S, T, U, V, W, and X.

  - Emergency departments should educate staff with the tools and algorithms found on the ED Improvement Intervention web page.

- The most important education occurs during rounds where a project champion discusses the appropriate indications for urinary catheter use with the unit staff:

  - A champion (usually a nurse, alternatively an infection preventionist, or quality improvement health care worker who is knowledgable of indications for urinary catheter utilization) participates in a daily process to assess each patient for the presence and appropriateness of urinary catheters.

  - This may occur during daily rounding, in which nursing staff assess each patient for urinary catheter presence. The nurses should be educated in the indications for urinary catheter utilization. If a patient has a urinary catheter, review the reasons for use with the nurse caring for the patient.

o   If there are no valid indications for the urinary catheter, the nurse should contact the physician to discontinue the urinary catheter.

Develop an Educational Plan

Develop a plan for ongoing education of staff (including physicians) about the appropriate indications for urinary catheter use and the proper care and maintenance of catheters. A key factor of success is a manager who supports the initiative and holds staff accountable for removing all non-indicated urinary catheters. Template presentation language is available in Appendices R, S, and T.

Data

Lay Foundation for Data Collection

Lay the foundation for data collection. Project success depends on the ability of hospital teams to successfully collect and submit data. Determine who will collect and submit your unit's data for this project.

Acute Care Unit Data:
- Prevalence and Appropriateness (Process)
- CAUTI Rates by patient days and catheter days (Outcome)
- Team Check-up Tool
- Hospital Survey on Patient Safety Culture (HSOPS)
- CAUTI Readiness Assessment
- Submit data according to the timelines outlined in Table 10: Acute Care Unit Data Collection Schedule.

Emergency Department Data:
- ED Questionnaire
- Catheter prevalence
  - Number of ED admissions (including observation patients)
  - Number of ED admissions with a newly-placed indwelling catheter (including observation patients)
- Submit data according to the timelines outlined in Table 11: Emergency Department Data Collection Schedule.

Phase 3: Execution

Table 15: Execution Phase Worksheet

Implementation Step	Resources	Due Date
Utilize Teamwork and Communication Tools		
Learn from Defects		
On the CUSP: Stop CAUTI Team Meeting		
Attend Learning Session # 2- Midcollaborative Meeting		
Participate in National Calls		
Continuing Education		
Educate Other Units		
Baseline Data Collection		
Ongoing Data Collection		
Review Reports and Monitor Rates		
Use Data for Improvement		
Participate in State Coaching Calls		
State Site Visits		

Execution

Use Teamwork and Communication Tools
Use tools described in section five to improve teamwork and communication in your unit. Your *On the CUSP: Stop CAUTI* team can decide which tools are most appropriate for use in your unit.

Learn from Defects
- Investigate all infections.
- Regularly identify defects and walk through at least one defect each quarter with your team. Use this as an opportunity to learn from defects. This can occur at your CUSP team meeting or in another setting.

On the CUSP: Stop CAUTI Team Meeting
Meet at least once per month with your *On the CUSP: Stop CAUTI* team including your executive partner, team leader, nurse champion, and physician champion. Meet more frequently if your team finds it useful to do so. Use this time to assess changes that could be made to reduce harm and improve the culture of safety on your unit.

Education

Attend State Face-to-face Meeting
Attend the State Face-to-face Meeting. The Learning Session #2: Mid-collaborative meeting will occur in each state around the eighth month. This in-person meeting provides an opportunity for teams to assess progress, share data and discuss leadership and followership.

Participate in National Calls
Participate in educational opportunities offered by the National Project Team. These opportunities include:
- National Onboarding Calls: Participate in the Onboarding Call Series. This series of five calls gives teams the background information necessary to participate in the project. They begin approximately two weeks after Learning Session #1 and continue biweekly. Onboarding Call #2 is geared specifically for participating emergency departments.
- National Content Calls: Content calls are 60-minute conference calls led by national project faculty advisors. Teams should attend this call series following the conclusion of the Onboarding Call Series.
- ED Quarterly Office Hours: These 60-minute, focused, interactive coaching calls geared for emergency departments are facilitated by faculty from the Emergency Nurses Association.

Continuing Education
- Educate any new staff who join your unit using the *Science of Safety* video.
- Use Learning from Defects and the Team Checkup Tool to ascertain places where education is still needed. Revisit slides, call recordings, or other materials for subjects on which your team needs more training.
- Give feedback on results of program implementation.
- Champion the program, and lead by example.
- Educate unit staff about improvements the team is making by:
  - Posting a CAUTI calendar banner
  - Displaying reminders around the unit
  - Holding unit education sessions
  - Sharing and recognizing achievements
  - Sharing data with staff by regularly posting reports for staff

Educate Other Units
Engage others outside of your unit and increase awareness of your team's efforts by:
- Displaying CAUTI posters outside of your unit
- Posting reminders outside of your unit
- Creating an elevator speech to inform others you meet in passing
- Including monthly progress reports on bulletin boards or in newsletters
- Post updates on hospital Intranet

Data

Collect Baseline Data

Acute Care Units:
- For baseline data, collect three weeks (Monday through Friday) of urinary catheter prevalence. Evaluate the need for urinary catheters, and determine the reason for all urinary catheters used.
- Complete and submit an initial Hospital Survey on Patient Safety Culture (HSOPS)
- Complete and submit the CAUTI Readiness Assessment one time per unit

Emergency Departments:
- For baseline data, collect two weeks (seven-day calendar weeks) of urinary catheter prevalence.
  - Denominator: number of ED admissions, including observation patients
  - Numerator: number of ED admissions (including observation patients) with a newly-placed urinary catheter
- Complete and submit the ED Questionnaire

Ongoing Data Collection
Data collection is not just an exercise in collecting information, but it is a key part of the intervention. Collection of the process data in particular provides an opportunity to discuss and reinforce the daily assessment of whether catheters are needed, identification of appropriate indications, and removal of the catheters that are no longer indicated.

Acute Care Units:
- For implementation data collection, process data should be collected once a day for two weeks (Monday through Friday) and then one day a week for the following six weeks. Outcome data should be collected for two full months every day according to the data collection schedule in Table 10. The patient's bedside nurse should note the catheter's presence and evaluate the indication during the patient's daily nursing assessment.
- Submit data into Care Counts and/or NHSN.
- Complete the quarterly Team Checkup Tool.

Emergency Departments:
- For implementation data collection, collect two weeks (seven-day calendar weeks) of urinary catheter prevalence data.
- Submit data into the HRET Comprehensive Data System.

Review Reports, and Monitor Rates
Review reports at your *On the CUSP: Stop CAUTI* team meetings. Use these reports to monitor your rates and see where improvement is still needed. Prevalence reports are available on both Care Counts

and CDS. You may also calculate the prevalence rate by taking the sum of urinary catheters used over a time period and dividing that number by the total patient days during that period.

Use Data for Improvement

Use data to inform the unit of areas where improvement is still needed, and post rates in a highly visible place where staff can easily see them.

Coaching Support

Participate in Coaching Calls

The National Project Team, Extended Faculty members and your State Lead will provide coaching support through regular coaching calls. These calls occur monthly during this period.

Quarterly ED Office Hours

ED Quarterly Office Hours are 60-minute, focused, interactive calls geared towards emergency departments. The calls are facilitated by faculty from the Emergency Nurses Association, with expert faculty providing coaching to participating EDs teams

State Site Visits

The National Project Team and the Extended Faculty will visit hospitals in each state starting in the Execution phase of the collaborative. The hospitals will be chosen by the State Lead and the hospital(s) chosen will be contacted in advance of the visit.

Phase 4: Sustainability

Table 16: Sustainability Phase Worksheet

Implementation Step	Resources	Due Date
Use Teamwork and Communication Tools		
Learn from Defects		
On the CUSP: Stop CAUTI Team Meeting		
Attend Learning Session # 3: Final Meeting		
Participate in National Content Calls		
Continuing Education		
Educate Other Units		
Ongoing Data Collection		
Review Reports, and Monitor Rates		
Use Data for Improvement		
Participate in State Coaching Calls		
State Site Visits		

Use Teamwork and Communication Tools

Continue to use tools mentioned in section V to improve teamwork and communication in your unit. Your *On the CUSP: Stop CAUTI* team can decide which tools are most appropriate for use in your unit.

Learn from Defects
Continue to investigate all symptomatic infections and identify defects quarterly.

On the CUSP: Stop CAUTI Team Meeting
Meet at least once per month with your *On the CUSP: Stop CAUTI* team including your executive partner, team leader, nurse champion, and physician champion. Meet more frequently if your team finds it useful to do so. Use this time to assess changes that could be made to reduce harm and improve the culture of safety on your unit.

Education

Attend State Face-to-face Meeting

Attend the State Face-to-face Meeting. The Learning Session #3: Final meeting will occur in each state around the eighteenth month. This in-person meeting provides an opportunity for teams to celebrate their successes and discuss sustainability.

Participate in National Content Calls

Participate in educational opportunities offered by the National Project Team. These opportunities include the National Content Calls and ED Quarterly Office Hours.

Continuing Education

- Educate any new staff who join your unit using the *Science of Safety* video
- Use Learning from Defects and the Team Checkup Tool to ascertain places where education is still needed. Revisit slides, call recordings, or other materials for subjects on which your team needs more training.
- Give feedback on results of program implementation.
- Champion the program, and lead by example.
- Educate unit staff about improvements the team is making by:
  - Posting a CAUTI calendar banner
  - Displaying reminders around the unit
  - Holding unit education sessions
  - Sharing and recognizing achievements
  - Sharing data with staff by regularly posting reports

Educate Other Units

Engage others outside of your unit and increase awareness of your team's efforts by:

- Displaying CAUTI posters outside of your unit
- Posting reminders outside of your unit
- Creating an elevator speech to inform others you meet in passing
- Including monthly progress reports on bulletin boards or in newsletters
- Post updates on the hospital Intranet

Data

Ongoing Data Collection

Acute Care Units:
- For ongoing data collection, process data should be collected once a day for one week (Monday through Friday) quarterly. Outcome data should be collected for one full month every day each quarter. This is outlined further in the data collection schedule in Table 10. During this period, the patient's bedside nurse should continue to note the catheter's presence and evaluate the indication during the patient's daily nursing assessment.
- Continue to submit data into Care Counts and/or NHSN.
- Complete and submit final Hospital Survey on Patient Safety Culture (HSOPS).

Emergency Departments:
- For data collection in the sustainability period and beyond, prevalence data should be collected for 14-day periods on a quarterly basis.
- Continue to submit data into CDS.

Review Reports, and Monitor Rates
Continue to review reports at your *On the CUSP: Stop CAUTI* team meetings. Use these reports to monitor your rates and see where improvement is still needed.

Use Data for Improvement
- Post rates in a visible area where staff can see them.
- If there is no improvement from the baseline, then evaluate the unit for reeducation and re-implementation of the program.

Coaching Support

Participate in State Coaching Calls
Your State Lead will provide coaching support through regular coaching calls. The frequency of these calls is determined by your State Lead.

Quarterly ED Office Hours
Quarterly ED Office Hours will continue through 2015 for emergency departments to receive focused coaching.

State Site Visits
The National Project Team and the Extended Faculty will visit hospitals in each state starting in the Execution phase of the collaborative. The hospitals will be chosen by the State Lead and the hospital(s) chosen will be contacted in advance of the visit.

Project Milestones

Each phase of *On the CUSP: Stop CAUTI* has unique milestones for you to complete. The lists below summarize milestones for each stage. They are also illustrated in [Graphic 2](#).

Phase 1: Start-up

- Participate in Orientation call

Phase 2: Planning

- Attend Learning Session #1: Kickoff Meeting
- Complete Hospital Unit Action Plan
- Complete the CAUTI Readiness Assessment/ED Questionnaire
- Participate in Onboarding calls

Phase 3: Execution

- Complete baseline HSOPS (acute care units only)
- Attend Learning Session #2: Mid-collaborative Meeting
- Collect process and outcome data, as appropriate for your unit type (acute care or ED)
- Participate in Content Calls
- Participate in Coaching Calls
- Participate in ED Quarterly Office Hours (EDs only)
- Complete the Team Checkup Tool (acute care units only)
- If selected by State Lead, host a site visit

Phase 4: Sustainability

- Attend Learning Session #3: Final Meeting
- Collect quarterly process and outcome data (acute care units only)
- Collect quarterly prevalence data (EDs only)
- Complete final HSOPS (acute care units only)
- Participate in Coaching Calls
- Complete the Team Checkup Tool (acute care units only)
- If selected by State Lead, host a site visit

Timeline

Graphic 2: *On the CUSP: Stop CAUTI* Project Milestones
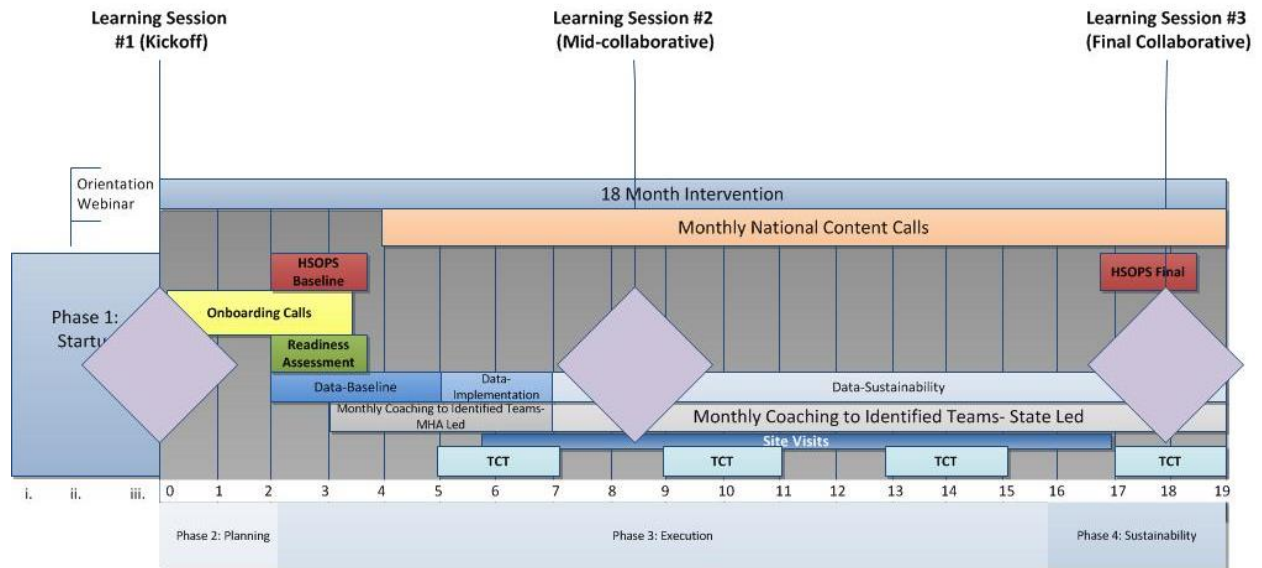
VI. Sustainability and Spread

Sustainability

Sustainability is marked by the ability to continue the components of *On the CUSP: Stop CAUTI* as part of routine workflows. This can be accomplished by building assessments into the daily work. Reinforce the importance of compliance with indications by presenting feedback data even after the period of required data collection has ended. Identify a facilitator who will take responsibility for reinforcing the process after the initial intervention is completed. This could be a nurse, a case manager, a discharge planner, or a team member of another discipline, but it should be someone who is committed to this role. Create a plan for continuation and integration. This could include education in orientation, annual competencies, or a strategy to address resurgent rates. It is important to understand that while the *On the CUSP: Stop CAUTI* program has a limited duration, it is based on the 4 E's, a cyclical, continuous process of improvement.

Successful sustainability will depend on having a trained champion to continue this effort on the unit; providing periodic feedback on performance to the unit's project team, nurses, medical staff and administration; and implementing CUSP principles on the unit, to emphasize patient safety, engage staff participation and encourage empowerment, and identify and learn from safety defects.

Spread Strategy

In the implementation stage, begin reaching out to teach other units about the initiative. Continue these activities over time to spread learning to other units. You may do this by displaying CAUTI posters outside of your unit, posting updates on the hospital intranet, or posting reminders outside of your unit. Simply put, spread within a hospital is about actively disseminating effective practices and knowledge about an intervention to all relevant care settings in the hospital.

To facilitate spread, consider volunteering to meet with interested units to share what you have learned or to communicate the success you've had in reducing CAUTI rates in your unit. Start with units with higher CAUTI rates. Share this manual and the other resources available on the project web site with the unit, and make yourself available to coach other unit teams in CAUTI prevention and in the CUSP model.

You may take a more proactive approach and offer to train team leaders to serve as mentors for other units. Teaching other units not only benefits the rest of your hospital, but it can also benefit you. Through teaching others, you can solidify your own knowledge of the subject plus learn from the unique challenges that other units face. It is also a way for your team to ensure equal protection for all patients in your hospital.

VII. Getting Help

Table 17: Project Contacts

STATE PROJECT LEAD
Names and contact information for State Leads can be found at http://www.onthecuspstophai.org/about-us/state-coordi-nators-contact-list/ State Lead Name and Title:_____ Phone:_____Email:_____

MHA KEYSTONE CENTER FACULTY

Name and Title	State Assignments	Email	Phone
Barbara Meyer Lucas, MD, MHSA Physician Consultant		blucas@mha.org	313-399-7445
Marie Masuga, RN, MSN, BSN Project Coordinator		mmasuga@mha.org	517-348-3910
Lucy Koivisto, BS, LVT Project Assistant		lkoivisto@mha.org	517-886-8404

THE NATIONAL PROGRAM OFFICE AT HRET

General Inquiries	onthecuspstophai@aha.org
Louella Hung, MPH Senior Program Manager (Operations)	lhung@aha.org
Kelly Faulkner Senior Program Manager (Data)	kfaulkner@aha.org

Table 18: Online Resources

Web Site	Focus	Available Resources
www.onthecuspstophai.org	The web site of the national, AHRQ-funded CUSP initiatives to eliminate HAIs, including *On the CUSP: Stop CAUTI*	**STOP CAUTI > TOOLKITS AND RESOURCES** • Sign-up and Registration • Timelines • CUSP Resources • Implementation Guide • Additional Resources **STOP CAUTI > CALENDAR** **STOP CAUTI > EMERGENCY DEPARTMENT IMPROVEMENT INTERVENTION** **STOP CAUTI > EDUCATIONAL SESSIONS** • Learning Session Recordings • Onboarding Call Information • Content Call Recordings and Slides
www.mhacarecounts.org	The secure, web-based data portal of *On the CUSP: Stop CAUTI*	Enter baseline and monthly CAUTI data, HSOPS data, and Team Checkup Tool data, and run reports to communicate progress to your team and senior leaders.
www.hretcds.org	The secure, web-based data portal of the ED Improvement Intervention	Enter project data and run reports to track and communicate progress. CDS QUICK GUIDE
www.cdc.gov/nhsn	Home of the National Healthcare Safety Network, the web-based surveillance system of the Centers for Disease Control and Prevention	**ABOUT NHSN** • Purposes of NHSN • Confidentiality • Use of Data NHSN MANUALS CONTACT NHSN
www.catheterout.org	A web site developed by a team of CAUTI experts that provides CAUTI prevention guidance along with supporting evidence.	Supporting Evidence Engaging Clinicians and Administrators

VIII. References

1. Klevens RM, Edwards J, Richards C, Horan T, Gaynes R, Pollock D, Cardo D. Estimating Health Care-Associated Infections and Deaths in U.S. Hospitals, 2002. *Public Health Reports* 2007; 122:160-166.

2. Saint S. Clinical and economic consequences of nosocomial catheter-related bacteriuria. *Am J Infect Control* 2000; Feb; 28(1):68–75.

3. Haley RW et al. Nosocomial Infections in US Hospitals, 1975-1976. Estimated Frequency by Selected Characteristics of Patients. *Am J Med.* 1981; 70:947-59.

4. Krieger JN, Kaiser DL, Wenzel RP. Urinary Tract Etiology of Bloodstream Infections in Hospitalized Patients. *J Infec Dis.* 1983; 148(1):57-62

5. Meddings J et al. Systematic Review and Meta-Analysis: Reminder Systems to Reduce Catheter-Associated Urinary Tract Infections and Urinary Catheter Use in Hospitalized Patients." *Clin Infec Dis 2010;* 51(1 September):550-560.

6. Umscheid CA et al. Estimating the Proportion of Healthcare-Associated Infections that are Reasonably Preventable and the Related Mortality and Costs. *Infect Control Hosp Epidemiol* 2011; 32(2):101-14.

7. Maki DG and Tambyah PA. Engineering Out the Risk for Infection with Urinary Catheters. *Emerg Infect Dis* 2001; Mar-Apr; 7(2):342-7.

8. Wald HL et al. Nonpayment for Harms Resulting From Medical Care Catheter-Associated Urinary Tract Infections. *JAMA* 2007; 298(23):2782-2784.

9. Saint S, Lipsky BA, Goold SD. Indwelling Urinary Catheters: A One-Point Restraint? *An Intern Med.* 2002; 137:125-7.

10. Saint S et al. Urinary Catheters: What Type Do Men and Their Nurses Prefer? *J Am Geriatric Soc* 1999; 47(12):1453-1457.

11. Fakih, MG et al. Effect of Nurse-Led Multidisciplinary Rounds on Reducing the Unnecessary Use of Urinary Catheterization in Hospitalized Patients. *Infec Control Hosp Epidemio* 2008; 29(9):815-819.

12. Pronovost PJ et al. Sustaining Reductions in Catheter-Related Bloodstream Infections in Michigan Intensive Care Units: An Observational Study. *BMJ* 2010; 340.

13. Pronovost PJ, Berenholtz SM, and Needham DM. Translating Evidence into Practice: A Model for Large Scale Knowledge Translation. *BMJ* 2008; 337:1714.

14. Pronovost PJ et al. An Intervention to Decrease Catheter-Related Blood Stream Infections in the ICU. *N Engl J Med* 2006; 355:2725-32.

15. Berenholtz SM et al. An Intervention to Reduce Ventilator- Associated Pneumonia in the ICU. *Infect Control Hosp Epidemiol.* 2011; 32(4):305-314.

16. Sexton JB et al. Assessing and Improving Safety Climate in a Large Cohort of ICUs. *Crit Care Med* 2011; 39(5):1-6.

17. Pronovost PJ et al. Improving Patient Safety in Intensive Care Units in Michigan. *J Crit Care* 2008; 23(2):207-221.

18. Saint S, Veenstra DL, Sullivan SD, Chenoweth C, Fendrick AM. The potential clinical and economic benefits of silver alloy urinary catheters in preventing urinary tract infection. *Arch Intern Med.* 2000; 160:2670-2675.

19. Jain P, Parada JP, David A, Smith LG. Overuse of the indwelling urinary tract catheter in hospitalized medical patients. Arch Intern Med 1995; 155:1425-9.

20. Vogelsmeier A, Scott-Cawiezell J. Influencing Leadership Perceptions of Patient Safety Through Just Culture Training. *J Nurs Care Qual.* 2010: 25(4):288-94.

21. Ontario Health Technology Assessment Series 2006; Vol.6, No.11:1-51. Available at: http://www.health.gov.on.ca/english/providers/program/mas/tech/reviews/pdf/rev_pbu_040106.pdf. Last accessed on October 9, 2012.

22. Saint S, Kowalski CP, Kaufman SR, et al. Preventing hospital-acquired urinary tract infection in the United States: a national study. *Clin Infect Dis* 2008; 46:243-50.

23. Saint S, Kaufman SR, Rogers MA, Baker PD, Ossenkop K, Lipsky BA. Condom versus indwelling urinary catheters: a randomized trial. *J Am Geriatr Soc.* 2006; 54:1055-61.

24. Ortega R, Ng L, Sekhar P, Song M. Female Urethral Catheterization. *New England Journal of Medicine* 2008; 358(14):e15-18.

25. Thomsen TW, Setnik GS. Male Urethral Catheterization. *New England Journal of Medicine* 2006; 354(21):e22-24.

26. Saint S, Weiss J, Amory JK, et al. Are physicians aware of which of their patients have indwelling catheters? *Am J Med* 2000 Oct 15; 109(6):476-80.