



# FACT SHEET

## Ending Healthcare-Associated Infections

The mission of AHRQ is to improve the quality, safety, efficiency, and effectiveness of health care by:

- Using evidence to improve health care.
- Improving health care outcomes through research.
- Transforming research into practice.

Healthcare-associated infections (HAIs) are the most common complication of hospital care, resulting in 1.7 million infections and 99,000 deaths each year. The added financial burden attributable to HAIs is estimated to be between \$28 billion to \$33 billion each year. To address this growing problem, the Agency for Healthcare Research and Quality (AHRQ) has funded numerous projects that target HAI prevention.

This fact sheet provides an overview of many projects that AHRQ has supported since 2001 that have led to the successful reduction of central line-associated blood stream infections (CLABSIs) in hospital intensive care units (ICUs). Often referred to as a central venous catheter, a central line is a tube placed in a large vein in a patient's neck, chest, or groin to administer medication or fluids or to collect blood samples. According to the Centers for Disease Control and Prevention (CDC), each year, an estimated 250,000 cases of CLABSI occur in U.S. hospitals, and an estimated 30,000 to 62,000 infected patients die.

### Acronyms

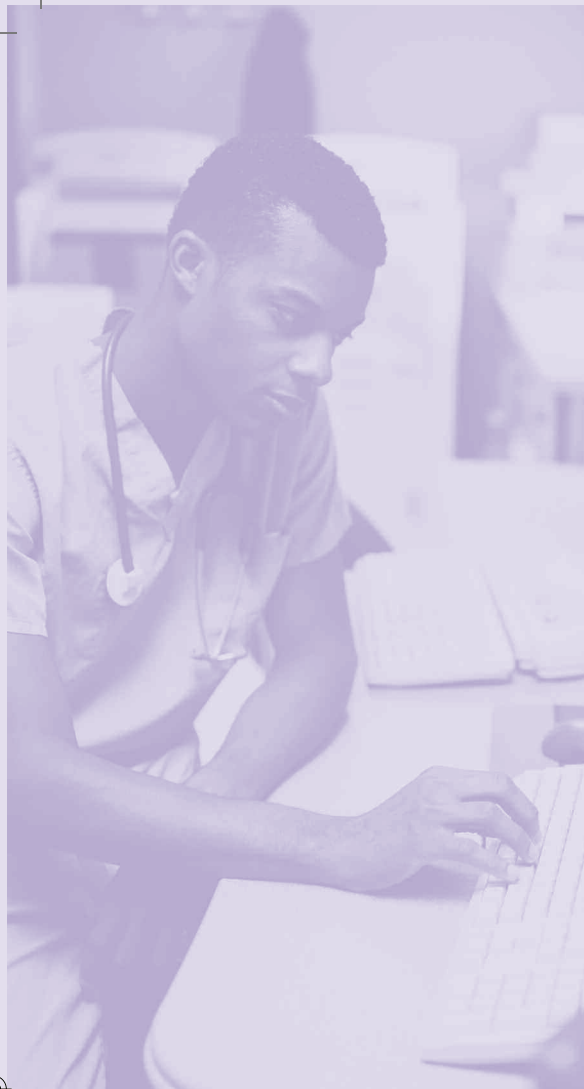
AHRQ	—Agency for Healthcare Research and Quality
BSI	—bloodstream infection
CAUTI	—catheter-associated urinary tract infection
CDC	—Centers for Disease Control and Prevention
CLABSI	—central line-associated blood stream infection
CUSP	—Comprehensive Unit-based Safety Program
HAI	—healthcare-associated infection
ICU	—intensive care unit

The AHRQ-funded projects involve the implementation of a Comprehensive Unit-based Safety Program (CUSP), which is based on an Intensive Care Unit Safety Reporting System developed by the Johns Hopkins University Quality and Safety Research Group, Baltimore, MD.

In October 2009, AHRQ announced that the CUSP will expand to all 50 States and additional hospitals in States already participating in the program, extend to other settings in addition to ICUs, and broaden the focus to address other types of infections, such as catheter-associated urinary tract infections (CAUTIs).



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Information on the infection reduction program and brief descriptions of AHRQ's projects that use the CUSP is below.

### **Background on the Comprehensive Unit-based Safety Program**

The CUSP integrates communication, teamwork, and leadership to create and support a “harm-free” patient care culture. It provides a structured strategic framework for safety improvement, yet it is flexible enough to tap into staff wisdom and encourage them to fix hazards that they perceive pose the greatest risks. CUSP is implemented at the unit level and provides a scalable program that can be implemented throughout an organization. The program draws from frontline providers who have the most knowledge about safety hazards and the means to lessen the severity of those hazards, and provides a mechanism to help defend against hazards.

CUSP is comprised of five steps, and the program is a continuous process designed to incorporate an ongoing evidence-based patient safety infrastructure into an existing unit. Each step of CUSP builds on previous work to equip frontline providers with the tools, metrics, and framework to tackle the challenge of quality improvement. The steps are briefly described below.

Step 1 – Staff are educated on the science of safety.

Step 2 — Staff complete an assessment of patient safety culture.

Step 3 – A senior hospital executive partners with the unit to improve communications and educate leadership.

Step 4 — Staff learn from unit defects.

Step 5 – Staff use tools, including checklists, to improve teamwork, communication, and other systems of work.

### **AHRQ Projects Using the Comprehensive Unit-based Safety Program**

#### **The Keystone Project**

As a result of applying the CUSP in more than 100 ICUs in Michigan and using the program's simple five-step checklist that was designed to prevent certain hospital infections, this project reduced the rate of blood stream infections from intravenous lines by two-thirds within 3 months. Known as the “Keystone Project,” the initiative also helped the average ICU decrease its infection rate from 4 percent to 0. Over 18 months, the program saved more than 1,500 lives and nearly \$200 million.

The project, a partnership between the Johns Hopkins University School of Medicine and the Michigan Health & Hospital Association Keystone Center and its member hospitals, resulted in a large and sustained reduction in rates of catheter-related blood stream infections (BSIs). The study targeted clinicians' use of five evidence-based procedures recommended by the CDC: hand hygiene, using full-barrier precautions during the insertion of central venous catheters, cleaning the skin with chlorhexidine, avoiding the femoral site when possible, and removing unnecessary catheters. Findings of the study were published in the December 28, 2006, issue of the *New England Journal of Medicine*.

## CUSP Expands to 100 Hospital ICUs

This project continues the Keystone Project's work by helping States apply and beta test the CUSP as a strategy for reducing CLABSIs in 100 hospital ICUs from 10 States over a 3-year period. Specifically, new partners or existing statewide cooperatives of stakeholders, including State hospital associations, quality improvement organizations, public health agencies, and health care purchasers, will work to help reduce these infections in ICUs. Participating hospitals will implement a checklist to ensure compliance with safety practices, educate staff on evidence-based practices to reduce BSIs, educate staff on team training, provide feedback on infection rates to hospitals and hospital units, and implement monthly team meetings to assess progress. Thus far, State hospital associations and patient safety groups from more than two dozen States have been selected to participate in the project. Participation is based on capability and the availability of infrastructure to implement the safety protocols being tested in the project in addition to providing broad geographic representation.

## CUSP Expanding on a National Scale

In fiscal year 2009, AHRQ awarded \$8 million to expand the project above and implement CUSPs nationally.

- Since the initial implementation of the CUSP-CLABSI initiative in 10 States, additional hospitals in those States have expressed interest in participating in the program. This project will increase the number of participating hospitals. Total funding: \$1,000,000

- As a result of additional funding from AHRQ and a private foundation, participation of Keystone Project's CUSP-CLABSI initiative is now open to all 50 States, Puerto Rico, and the District of Columbia. Total funding: \$3,000,000
- The project also has expanded the CUSP-CLABSI initiative beyond the ICU to general medical and surgical hospital units in 10 States. Total funding: \$2,000,000
- The success of the CUSP in reducing CLABSIs has increased pressure to apply the program to other HAIs, including CAUTIs. For a demonstration of the CUSP concept as applied to CAUTIs, investigators will adapt CUSP materials to CAUTI and then use them in 10 hospitals in each of 10 States, for a total of 100 hospitals. Total funding: \$1,000,000
- CUSP also is being used to examine the comparative effectiveness of standard recommended practices with antibiotic catheter locks and antiseptic catheter locks for preventing BSIs in hemodialysis patients. Secondary evaluations will include screening assessments for changes in antimicrobial resistance and evaluating the development of toxicities related to the use of catheter locks. Total funding: \$1,000,000

## For More Information

For more information, visit the following pages on AHRQ's Web site:

- For HAI tools and resources: <http://www.ahrq.gov/qual/hais.htm>
- For a comprehensive overview of AHRQ's HAI projects: <http://www.ahrq.gov/qual/haiflyer.htm>
- For AHRQ's most recently funded HAI projects: <http://www.ahrq.gov/qualhaify09.htm>

The checklist, below, which a care team can use when inserting a central line has reduced healthcare-associated infections in intensive care units. The CUSP stresses the need to have tools that improve teamwork, communication, and other systems of work in the unit.


















	<i>The Johns Hopkins Hospital</i> INTERDISCIPLINARY CLINICAL PRACTICE MANUAL	Policy Number	IFC035
	Subject ADULT VASCULAR ACCESS DEVICE (VAD) POLICY: APPENDIX C CENTRAL LINE CHECKLIST	Effective Date	5/1/07
		Page	1 of 1
		Supersedes	12/05

**Central Line Insertion Care Team Checklist**

Pt Name \_\_\_\_\_ Hx # \_\_\_\_\_ Unit \_\_\_\_\_ Date/Time \_\_\_\_\_

A minimum of 5 supervised successful procedures in both the chest and femoral sites is required (10 total). If a physician successfully performs the 5 supervised lines in one site, they are independent for that site only. A total of 3 supervised re-wires is required prior to performing a rewire independently. **Supervisor Role:** 2<sup>nd</sup> year resident and above (approved for line placement). **Assistant Role:** RN, ClinTech, MD, NP, PA (responsible for completing checklist).

If there is a deviation in any of the critical steps, **immediately notify the operator and stop the procedure until corrected**. If a correction is required, make a check mark in the "Yes with reminder" column and note what correction was made in the comment space, if applicable. Uncorrected deviations and complications of line placement are to be reported in PSN. Contact the Attending if any item on the checklist is not adhered to or with any concerns. PLEASE RETURN COMPLETED FORM TO THE DESIGNATED PERSON IN YOUR AREA.

Critical Steps	Yes ✓	Yes with reminder	Procedure Deviation: Complete PSN report	Comments:
<b>Before the procedure, did the operator:</b>				
Obtain informed consent				
Obtain supervision if needed (see roles above)				N/A <input type="checkbox"/>
Perform a time-out/ briefing				
Confirm hand washing/sanitizing immediately prior				
Operator(s): cap, mask, sterile gown/gloves, eye protection				
Supervisor: cap, mask, sterile gown/gloves, eye protection				N/A <input type="checkbox"/>
Assistant: cap, mask, isolation gown and gloves, eye protection (if at risk for entering sterile field, use sterile gown and gloves)				
Properly position to prevent air embolism For Chest/EJ: Trendelenburg (HOB < 0 degrees) For Femoral: supine				
Sterilize procedure site (chlorhexidine)				
Allow site to dry				
Use sterile technique to drape from head to toe				
Utilize local anesthetic and/or sedation				N/A <input type="checkbox"/>
<b>During the procedure, did the operator:</b>				
Maintain a sterile field				
Monitor that lumens were not cut				N/A <input type="checkbox"/>
Clamp any ports not used during insertion (to avoid air embolism, clamp all but distal port)				N/A <input type="checkbox"/>
Obtain qualified second operator after 3 unsuccessful sticks (except if emergent)				N/A <input type="checkbox"/>
Aspirate blood from each lumen ( <b>to avoid air embolism and ensure intravascular placement</b> )				
Transduce CVP or estimate CVP by fluid column ( <b>to avoid arterial placement</b> ).				N/A for fluoroscopy procedures <input type="checkbox"/>
<b>After the procedure, did the operator:</b>				
Clean blood from site using antiseptic agent (chlorhexidine), apply sterile dressing				
Verify placement by x-ray (tip in SVC/RA junction)				N/A for fluoroscopy procedures <input type="checkbox"/>

Operator \_\_\_\_\_ Supervisor \_\_\_\_\_ Assistant \_\_\_\_\_

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