

A Leader's Guide

Cather-associated Urinary Tract Infection

Catheter-associated urinary tract infections are among the most common types of health care-associated infections. Since October 2008, the Centers for Medicare & Medicaid Services no longer reimburse costs associated with hospital-acquired CAUTI.ⁱ While these infections are serious and costly, they also are preventable when using evidence-based guidelines. The most important risk factor for developing a CAUTI is prolonged use of a urinary catheter.ⁱⁱ Evaluating the necessity of a catheter, along with an effective removal policy, are among the top evidence-based practices to implement. Among UTIs acquired in the hospital, approximately 75 percent are associated with a urinary catheter.ⁱⁱⁱ Between 15-25 percent of hospitalized patients receive urinary catheters during their hospital stay.^{iv} According to the Centers for Disease Control and Prevention, the average cost of a CAUTI is \$1,000.^v From January to June 2018, Missouri hospitals experienced 292 CAUTI harm events, equating to \$292,000 in costs to Missouri hospitals.

The American Hospital Association's Health Research & Educational Trust created a [CAUTI Change Package](#) and a [Top Ten Checklist](#) to aid facilities in reducing CAUTIs. Five of the practices included in the checklist include the following.^{vi}

- Insert indwelling urinary catheters only for [clinically appropriate reasons](#). Use alternative methods if possible.
- Ensure proper [aseptic insertion and maintenance techniques](#) are followed.
- Optimize prompt removal of urinary catheters that are not clinically indicated. Conduct [daily reviews](#) for appropriateness.
- [Culture](#) the urine only when the patient is symptomatic.
- Perform [root cause analyses](#) on all CAUTIs, and communicate findings with staff.
- Involve staff in process improvement efforts.

In addition to implementing these practices into daily workflow, hospital leaders also should engage the patients and their caregivers in these efforts. Educate the patients, and encourage them to ask questions regarding their care. The following are ways patients can protect themselves.^{vii}

- Educate the patient about how they can minimize risk of infection – hand and personal hygiene and avoid catheter manipulation.

- Educate the patient about the practice around uses of urinary catheters in surgery and the need for quick removal post-op.
- Encourage patients and family to ask each day, “Will my catheter be removed today?”
- Discuss catheter removal goals during rounds and on white boards.

Achieving a reduction in CAUTIs will require new ways of looking at complex care issues. The inappropriate use of indwelling urinary catheters has the potential to cause not only CAUTIs, but also harm resulting from immobility (such as VTE, falls and pressure ulcers). Understanding CAUTI prevention as a system safety measure will allow your organization to engage multiple professionals and other staff.^{viii} To achieve CAUTI reduction and sustain these improvements, a strategy to address both unit culture and clinical practice is necessary. Culture consists of the unit team’s values, attitudes and beliefs, which all will have an impact on the unit’s ability to improve clinical practice.^{ix} The [Comprehensive Unit-based Safety Program \(CUSP\) Toolkit](#) can be used to improve unit culture and create a working environment favorable to improve clinical practice and reducing infections.

Below are resources to aid in your improvement efforts in reducing CAUTIs within your facility.

Additional Resources:

- [Appropriate perioperative criteria for urinary catheter use in common general and orthopedic surgeries](#)
- [The Ann Arbor Criteria for Appropriate Urinary Catheter Use in Hospitalized Medical Patients: Results Obtained by Using the RAND/UCLA Appropriateness Method](#)
- [ANA CAUTI Prevention Tool](#)
- [AHRQ CAUTI Prevention Toolkit Implementation Guide – Appendix M; Example of a Nurse-Driven Protocol for Catheter Removal](#)
- [Ready, set, implement! Guided by the principles of implementation science, a team of nurses develop an innovative nurse-driven Foley catheter protocol to prevent CAUTI](#)
- [Changing ICU culture to reduce catheter-associated urinary tract infections](#)

ⁱ <https://www.ahrq.gov/topics/catheter-associated-urinary-tract-infection-cauti.html>

ⁱⁱ https://www.cdc.gov/hai/ca_uti/uti.html

ⁱⁱⁱ https://www.cdc.gov/hai/ca_uti/uti.html

^{iv} https://www.cdc.gov/hai/ca_uti/uti.html

^v https://www.cdc.gov/HAI/pdfs/hai/Scott_CostPaper.pdf

^{vi} <http://www.hret-hiin.org/Resources/cauti/17/catheter-associated-urinary-tract-infection-cauti-top-ten-checklist.pdf>

^{vii} <http://www.hret-hiin.org/Resources/cauti/17/catheter-associated-urinary-tract-infection-cauti-change-package.pdf>

^{viii} <http://www.hret-hiin.org/Resources/cauti/17/catheter-associated-urinary-tract-infection-cauti-change-package.pdf>

^{ix} <https://www.ahrq.gov/sites/default/files/wysiwyg/professionals/quality-patient-safety/hais/cauti-tools/impl-guide/implementation-guide.pdf>

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Central Line-associated Bloodstream Infection

A central line-associated bloodstream infection is a serious infection that occurs when bacteria or viruses enter the bloodstream through a central line.ⁱ While these infections are serious, they also are preventable when using evidence-based guidelines. If proper steps are not taken to prevent CLABSIs, patients can experience an extended length of hospital stay, increased costs associated with treating the infection, and increased patient morbidity and mortality. According to the Centers for Disease Control and Prevention, an estimated 30,100 CLABSIs occur in intensive care units alone annually in the U.S., with as many as 250,000 occurring across all care settings.ⁱⁱ Of all the health care-associated infections, CLABSIs are the most costly; according to *CDC Vital Signs* in 2009, the average cost of a CLABSI was \$17,000.ⁱⁱⁱ In calendar year 2016, Missouri experienced 504 CLABSI harm events, equating to \$8.568 million in costs to Missouri hospitals. During the first and second quarters of 2018, Missouri experienced 256 CLABSI harm events, equating to \$4.325 million in costs to Missouri hospitals.

The American Hospital Association's Health Research & Educational Trust created a [Top Ten Checklist](#) to aid facilities in reducing CLABSIs. The following are five of the practices that are included in the Top Ten Checklist.^{iv}

- Implement the [central venous catheter insertion bundle](#).
- Implement an insertion checklist to promote compliance and monitoring.
- Implement a "Stop the Line" approach to the insertion bundle.
- Adopt the maintenance bundle with dressing changes.
- Incorporate a daily review of line necessity and maintenance bundle into daily workflow.

In addition to implementing these practices, hospital leaders also should engage the patients and their caregivers in these efforts. Educate the patients, and encourage them to ask questions regarding their care. The following are ways patients can protect themselves.^v

- Speak up about any concerns.
- Ask questions. Is the central line absolutely necessary? How long will the central line be in place?
- Pay attention to the bandaged areas and their symptoms. Encourage the patients to speak up if anything seems wrong.

- Promote hand hygiene with the patient and visitors.

Ultimately, the success of your effort relies on a belief that a zero harm rate is attainable, holding staff accountable for their work, strong leadership at all levels, having the infrastructure and resources to support your improvement efforts, an effective use of data, and having a supportive organizational culture.^{vi}

Below are resources to aid in improvement efforts to reduce CLABSIs within your facility.

Resources

- [Strategies to Prevent Central Line-associated Bloodstream Infections in Acute Care Hospitals: 2014 Update](#)
- [CVC Insertion Bundle](#)
- [AHRQ Core CUSP Toolkit for Reducing Central Line-associated Bloodstream Infections](#)
- [AHA HRET CLABSI Change Package](#)
- [AHA HRET Date of Last Central Line-associated Bloodstream Infection Checklist Poster](#)

ⁱ <https://www.cdc.gov/hai/bsi/clabsi-resources.html>

ⁱⁱ <http://www.hret-hiin.org/topics/central-line-associated-bloodstream-infection.shtml>

ⁱⁱⁱ http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6008a4.htm?s_cid=mm6008a4_w

^{iv} <http://www.hret-hiin.org/Resources/clabsi/17/date-of-last-central-line-associated-bloodstream-infection-clabsi-checklist-poster.pdf>

^v <https://www.cdc.gov/hai/bsi/clabsi-resources.html>

^{vi} <https://www.ahrq.gov/professionals/quality-patient-safety/cusp/clabsi-hpwpreport/clabsi-hpwp4.html>

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Clostridium difficile Infection

The prevention of *Clostridium difficile* transmission and infection is an urgent patient safety challenge. Although the Centers for Disease Control and Prevention estimates that more than 14,000 people die of CDI in the U.S. annually, the mortality rate may be much higher. According to data from the Agency for Healthcare Research and Quality, more than 9 percent of CDI-related hospitalizations end in death, which is a rate nearly five times higher than other health care-acquired conditions. CDIs result in additional health care expenditures of at least \$1 billion per year and remain at historically high levels. It is critical to prevent, identify and treat these deadly infections.^{i, ii}

CDI is the leading cause of antibiotic-associated diarrhea and is a highly problematic health care-associated infection in hospitals and other health care facilities. CDI also is increasingly noted as a community-acquired pathogen. CDI commonly develops after either exposure to antibiotics or exposure to and acquisition of *C. difficile*.

Leaders may implement the following evidence-based strategies to promote reduction of CDI.

- Establish understanding of performance improvement focus areas.
 - Complete case reviews and root-cause analysis exercises to identify gaps in care, additional training needs and system-level issues creating increased risk for CDI transmission.
 - Identify hospital-acquired versus community-acquired CDI. Collaborate with patients, post-acute and long-term care, and monitor lab and coding procedures to ensure appropriate capture.
 - Monitor Healthcare Effectiveness Data and Information Set (HEDIS) and/or National Healthcare Safety Network Antibiotic Use and Resistance Module performance measures on antibiotic utilization in pharyngitis, upper respiratory infections and acute bronchitis.
 - Evaluate the use of antimicrobials among patients with CDI, and provide feedback to medical staff and facility leadership.
- Fully implement an Antimicrobial Stewardship Program.
 - Engage team members from nursing, pharmacy, laboratory, physicians and environmental services staff, as well as the infection preventionist to ensure stakeholder representation.

- Identify *C. difficile*, and diagnose CDI early, rapidly and accurately.
- Educate prescribing clinicians regarding the appropriate selection, dose, timing and duration of antimicrobials.
- Determine if antimicrobials predisposing to CDI development are discontinued or therapy is de-escalated when CDI is suspected.
- Review laboratory testing, reporting and coding practices.
 - Utilize an Enzyme Immunoassay diagnostic test that detects both Glutamate dehydrogenase and *C. difficile* toxins; conduct confirmatory Polymerase Chain Reaction for indeterminate results.
 - Utilize a diagnostic test (e.g., a DNA amplification test) that will enhance the sensitivity and specificity of diagnosing CDI.
 - Implement a lab-based alert system to immediately notify the team and the provider of newly identified cases. Ensure that the system includes notification of the designated provider on holidays and weekends.
 - Establish criteria for when testing for CDI should be performed on patients with clinically significant diarrhea (i.e., three or more loose stools per day for at least 1-2 days).
 - Adopt the “if the stool ain’t loose, the test is of no use” rule.
 - Utilize a “diarrhea decision tree.”
- Focus on prevention of CDI by reducing transmission of *C. difficile*.
 - Continue contact precautions (e.g., gloves, gowns, private room) for the duration of a CDI patient hospitalization unless the diarrhea has resolved and the patient has been transferred to another room, recognizing that CDI-infected patients continue to shed organisms for a number of days following cessation of diarrhea.
 - Implement Chlorhexidine Gluconate bathing in select or all patients.
 - Instruct patients and families about the importance of hand hygiene and personal hygiene. Provide patients with a hand sanitizer, and emphasize that it should be used after toileting and prior to eating.
 - Select a cleaning solution that is effective against *C. difficile* spores, and establish appropriate cleaning protocols for its use.
 - To ensure effective equipment cleaning and disinfection, develop procedures to assign detailed responsibilities to specific staff and ensure adequate oversight (e.g., who cleans what and how; who audits cleaning).
 - Directly observe room cleaning and provide coaching, including improvement recommendations and/or positive feedback.
 - Use ATP Bioluminescence to measure organic debris as a surrogate marker for biological contamination and to assess cleaning effectiveness.ⁱⁱⁱ

Resources

- [C. difficile Infection Change Package: Preventing Clostridium difficile transmission and infection](#), American Hospital Association, Health Research and Educational Trust

- [NHSN Multi-Drug Resistant Organism and *Clostridium difficile* \(MDRO/CDI\) Module: LabID Event Reporting and Infection Surveillance presentation by CDC](#)
- [Clinical Practice Guidelines for *Clostridium difficile* Infection in Adults and Children: 2017 Update by the Infectious Diseases Society of America and Society for Healthcare Epidemiology of America](#)

ⁱ Cohen, S. H., Gerding, D. N., Johnson, S., et al. (2010). Clinical practice guidelines for *Clostridium difficile* infection in adults: 2010 update by the Society for Healthcare Epidemiology of America (SHEA) and the Infectious Diseases Society of America (IDSA). *Infection Control & Hospital Epidemiology*, 31(5), 431-455.

ⁱⁱ Piacenti, F. J. & Leuthner, K. D. (2013). Antimicrobial stewardship and clostridium difficile-associated diarrhea. *Journal of Pharmacy Practice*, 26(5), 506-513.

ⁱⁱⁱ http://www.hqinstitute.org/sites/main/files/file-attachments/cdi_2014_changepackage_final.pdf