Field Guide:  
Catheter-Associated Urinary Tract Infections

Definition and Harm Impact

A urinary tract infection occurs when microorganisms enter the urinary tract and cause infection. The infection is considered catheter-associated if an indwelling catheter has been in place for greater than two days from the date that the infection is noted.\(^1\) It is estimated that 15–25 percent of hospitalized patients have a urinary catheter placed during their hospital stay.\(^2\) Catheter-associated urinary tract infections (CAUTIs) are one of the five most frequently occurring type of infection in acute care settings.\(^3\) The most important risk factor for developing a CAUTI is *prolonged* use of the urinary catheter. Therefore, urinary catheters should only be used for appropriate indications and removed as soon as no longer needed. According the Centers for Disease Control and Prevention (CDC) in 2015, CAUTIs have been associated with increased:\(^4\)

- Morbidity and mortality.
- Healthcare costs.
- Length of stay.

Measurement

The Hospital Innovation Improvement Innovation Network (HIIN) goal is a 20 percent reduction in the CAUTI standardized infection ratio (SIR) compared to the National Healthcare and Safety Network (NHSN) calendar year 2015 baseline SIRs. For the purposes of HIIN reporting for CAUTI, there are four outcomes measures: CAUTI SIR All Units (intensive care units [ICUs] + Other, excluding neonatal ICU [NICU]), CAUTI SIR ICUs only (ICUs only, excluding NICUs), CAUTI Rate (ICUs + Other, excluding NICU), and CAUTI Rate (ICUs only, excluding NICU). The SIR is defined as the total number of observed infections divided by the total number of predicted infections, always excluding the NICU. The rates are defined as the total number of observed healthcare-associated inpatient CAUTIs over the total number of indwelling urinary catheter days for each surveilled location, per 1,000 catheter days.
Known Improvement Strategies

Hospitals working on improvement in CAUTI rates are encouraged to follow the 2009 CDC Healthcare Infection Control Practices Advisory Committee (HICPAC) guidelines to prevent CAUTIs, with the addition of antibiotic stewardship elements. The guidelines emphasize the proper use, insertion, and maintenance of urinary catheters, and can be implemented and tracked by using the “Bladder Bundle,” including:

- **Catheter Insertion**
  - Insert catheters only for appropriate indications
    - Other methods to drain the urine are sometimes used
    - External catheters in men
    - Intermittent urethral catheterization
  - Leave catheters in place only as long as needed
  - Ensure that only properly trained person insert and maintain catheters
  - Insert catheters using aseptic technique and sterile equipment

- **Catheter Care**
  - Following aseptic insertion, maintain a closed drainage system
  - Practice hand hygiene and standard (or appropriate isolation) precautions according to CDC HICPAC guidelines
  - Maintain unobstructed urine flow
  - Keep the bag lower than the bladder to prevent urine from back flowing to the bladder
  - Empty the bag regularly. The drainage spout should not touch anything while emptying the bag.

- **Quality Improvement Programs**
  - System of alerts or reminders to remove unnecessary catheters
  - Stop orders for urinary catheters
  - Protocols for nurse-directed removal of unnecessary catheters
  - Guidelines/algorithms for appropriate perioperative catheter management
  - Protocols for judicious testing, antibiotic use, and stewardship

Engaging Patients and Families

Educate patients and family members about the reasons for an indwelling catheter, as well as indications for removal. Empower patients and family members to talk with their healthcare provider frequently regarding the necessity of the catheter. Educate patients to wash their hands before and after touching the catheter and provide access to hand hygiene. Include education about the ideal location of the urine bag below the level of the bladder and not to tug, pull, twist, or kink the catheter tubing.
Resources and Guides for Hospitals

- CDC—Urinary Tract Infection (CAUTI and Non-CAUTI) and Other Urinary System Infection Events: http://www.cdc.gov/nhsn/PDFs/pscManual/7pscCAUTIcurrent.pdf
- Catheterout.org—Comprehensive resource and toolkit for all CAUTI prevention strategies, including patient and family engagement: https://catheterout.org/sites/webservices.itcs.umich.edu.drupal.Bladder%20Bundle/?q=the-toolkit