

Prevention of Catheter-Associated Urinary Tract Infections in the Hospital



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KEYWORDS

- Catheter-associated urinary tract infection • Hospital-acquired infection
- Asymptomatic bacteriuria • Urinary tract infection • Urinary catheter
- Quality improvement

HOSPITAL MEDICINE CLINICS CHECKLIST

1. Catheter-associated urinary tract infection (CA-UTI) is a urinary tract infection (UTI) in a patient with a catheter present (see [Table 1](#) for information regarding timing of catheter duration) or within 48 hours of catheter removal.
2. Asymptomatic bacteriuria should only be treated in certain circumstances; including pregnancy and urologic procedures with mucosal bleeding.
3. Prolonged catheterization is a risk factor for developing a CA-UTI.
4. *Escherichia coli*, *Pseudomonas*, *Klebsiella*, and *Candida albicans* remain the most common organisms associated with CA-UTI; however, susceptibility patterns continue to trend toward increasing resistance.
5. Patients with CA-UTI are at increased risk for the development of bacteremia and coinfections with multidrug-resistant organisms.
6. CA-UTI has been associated with worse patient outcomes and increased cost of care.
7. The decision to place a urinary catheter should be supported by institutional-based criteria, and require an order to be placed by a clinician before placement.

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8. In 2008, Medicare stopped reimbursement for costs associated with CA-UTIs that develop during hospitalization.
9. CA-UTI is a focus of reporting by the Centers for Medicare and Medicaid Services.
10. The Keystone Bladder Bundle is a best-practice initiative in the prevention of CA-UTI that has shown 30% reduction in urinary catheter use after implementation.

DEFINITION

What are the definition and diagnostic criteria of catheter-associated urinary tract infection?

The guideline-based definition of catheter-associated urinary tract infection (CA-UTI) differs between the Infectious Diseases Society of America (IDSA) and Centers for Disease Control and Prevention (CDC).^{1,2} It is important that the initial clinical evaluation for CA-UTI begins with evaluation of the patient for signs or symptoms compatible with a urinary infection, and should then include the use of laboratory data to confirm the diagnosis. There are multiple areas in which the 2 guidelines slightly differ, including signs and symptoms compatible with infection, yield of urine culture, and timing of catheter duration (**Table 1**). The decision of the IDSA guideline to use 10³ or more colony-forming units (cfu) per milliliter was cited as a balance between the sensitivity of diagnosing a CA-UTI and the rates of bacterial growth in the microbiology laboratory.² This difference is likely a minor consideration clinically, as low-level colony counts have been shown to quickly progress to much higher levels.³

It is important to distinguish CA-UTI from asymptomatic bacteriuria (ASB). ASB is defined as bacteriuria without signs or symptoms related to infection of the urinary tract.² Asymptomatic catheter-associated bacteriuria and funguria are unlikely to cause adverse events (more serious infections), and therefore should not be treated except in specific circumstances such as pregnancy and urologic procedures with mucosal bleeding.⁴

What is the significance of CA-UTI?

CA-UTI has been associated with an increased risk of death, even after controlling for confounders such as severity of illness and comorbid conditions.⁵ Approximately 4% of patients with CA-UTI will develop bacteremia associated with their infection, which has a strong correlation with mortality. Mortality associated with bacteremia secondary to nosocomial UTI is approximately 30%.⁶

In addition to the increased mortality risk, length of hospital stay increases by an average of 2 to 3 days per infection. In this setting the cost attributed to treatment of CA-UTI alone is an additional \$676 and increases to \$2836 for treatment of CA-UTI-related bacteremia.⁶ In total, the cost associated with care of CA-UTI annually is estimated to total more than \$350 million.⁷

In 2008, Medicare stopped paying for costs associated with CA-UTIs that develop while a patient is hospitalized.⁸ This policy change led to increased awareness and focus on how to recognize, treat, and prevent CA-UTI.⁸ In 2012, the Centers for Medicare and Medicaid Services (CMS) added CA-UTI reporting to the Inpatient Prospective Payment System for acute care hospitals.

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