ACS NSQIP BEST PRACTICES GUIDELINE:  
Prevention of Catheter-Associated Urinary Tract Infections

Stanley K. Frencher, MD, MPH and Nestor F. Esnaola, MD, MPH, MBA, FACS

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Abstract
Indwelling urinary catheters are a leading cause of nosocomial infection in medical and surgical patients in the United States. Risk assessment, adherence to key preventative strategies, and active surveillance can reduce rates of symptomatic catheter-associated urinary tract infections (CAUTIs). The purpose of this document is to review the current literature, consolidate recommendations from existing guidelines, and provide a concise, evidence-based, expert panel-rated list of interventions to help reduce CAUTI among surgical patients at your institution.

Background
Over 5% of Medicare patients in 2005 were diagnosed with postoperative urinary infections.\(^1\) Urinary tract infections represent 32-40% of all nosocomial infections, which occur in up to 1.7 million patients annually.\(^2\)\(^,\)\(^3\) As many as 80% of urinary infections are attributable to urinary catheterization.\(^1\) In a recent study of over 36,000 patients undergoing major surgery, 86% of these patients had perioperative urinary catheters.\(^4\) Of note, patients who had indwelling catheters for longer than 2 days postoperatively were twice as likely to develop a CAUTI.

An episode of CAUTI results in direct and indirect costs of $676 and $2,386, respectively.\(^5\) Due to the high frequency of catheter use in hospitalized patients, the cumulative economic impact of CAUTIs is significant. Patients who experience CAUTIs require an additional 1-3.8 hospital days. It is estimated that CAUTIs account for $340-450 million in additional health care costs every year.\(^6\)\(^-\)\(^8\) In response, the Centers for Medicare and Medicaid Services no longer provides reimbursement to providers of covered beneficiaries for the treatment of CAUTIs.\(^9\) In addition, a new measure scheduled for inclusion in the Surgical Care Improvement Project (SCIP Inf-9) will require providers to submit data on the proportion of the sample of surgical patients captured for whom a urinary catheter (if used) was removed on postoperative day 1 or 2.\(^9\)

Risk Factors for CAUTIs
Risk factors for developing CAUTIs have been identified (Table 1). While insertion of a urinary catheter is essential for developing a CAUTI, duration of catheterization is the most important risk factor (additional risk factors are shown in Table 1 below). As such, the best way to avoid CAUTIs is to avoid unnecessary catheterization and remove bladder catheters as soon as possible.\(^10\)
TABLE 1: RISK FACTORS FOR DEVELOPING A CAUTI

<table>
<thead>
<tr>
<th>Major Risk Factors</th>
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<tbody>
<tr>
<td>Increasing duration of catheterization</td>
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<tr>
<td>Female sex</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
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<tr>
<td>Faulty aseptic management of indwelling catheter</td>
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<tr>
<td>Bacterial colonization of drainage bag</td>
</tr>
<tr>
<td>Additional Risk Factors</td>
</tr>
<tr>
<td>Older age</td>
</tr>
<tr>
<td>Azotemia</td>
</tr>
<tr>
<td>Rapidly fatal underlying illness</td>
</tr>
<tr>
<td>Periurethral colonization with uropathogens</td>
</tr>
<tr>
<td>Catheter not connected to urine meter</td>
</tr>
</tbody>
</table>

Studies suggest that more than 50% of catheterizations in hospitalized patients may be unnecessary. The indications for indwelling bladder catheterization are limited, based predominately on expert or consensus opinion, and commonly include:

- Perioperative use for selected surgical procedures (with planned removal as soon as possible)
  - Patients undergoing urologic surgery (or other surgery on contiguous structures of the genitourinary tract)
  - Anticipated prolonged duration of surgery (catheters inserted for this reason should ideally be removed in the postanesthesia care unit)
  - Patients anticipated to receive large-volume infusions or diuretics during surgery
  - Operative patients with urinary incontinence

- Need for intraoperative monitoring of urinary output
- Short-term, frequent monitoring of urine output in critically ill patients
- Management of acute urinary retention/obstruction
- Facilitate healing of advanced pressure ulcers in incontinent patients when other interventions (e.g. condom catheters, wound dressings) are ineffective
- At patient request to improve comfort (e.g. terminally ill patients)

Indwelling catheters should NOT be used:
- As a substitute for nursing care of the patient or resident with incontinence
- As a means of obtaining urine for culture (or other diagnostic tests) when the patient can voluntarily void
- Routinely for patients receiving epidural anesthesia/analgesia

**Basic Strategies to Prevent CA-UTIs**

Certain measures during the insertion and maintenance of a urinary catheter can help prevent against associated infection (Table 2).

<table>
<thead>
<tr>
<th>TABLE 2: BASIC RECOMMENDATIONS FOR PREVENTION OF CAUTIs¹⁷, ²²-²⁴</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prior to Insertion of Urinary Catheter</strong></td>
</tr>
<tr>
<td>Use alternate bladder drainage methods (e.g. condom catheters, in-and-out catheterization) when appropriate ²⁵-³¹</td>
</tr>
<tr>
<td>Educate staff regarding proper insertion and maintenance of urinary catheters</td>
</tr>
<tr>
<td><strong>During Insertion of Urinary Catheter</strong></td>
</tr>
<tr>
<td>Ensure that only trained personnel insert urinary catheters ¹¹, ³²-³⁴</td>
</tr>
<tr>
<td>Practice hand hygiene immediately prior to insertion of catheter ³⁵, ³⁶</td>
</tr>
<tr>
<td>Use Standard Precautions (including use of gown and gloves, as appropriate) prior to any manipulation of the catheter/drainage system.</td>
</tr>
<tr>
<td><strong>After Insertion of Urinary Catheter</strong></td>
</tr>
<tr>
<td>Properly secure to prevent movement/urethral traction ³⁷</td>
</tr>
<tr>
<td>Maintain sterile, closed drainage system ³⁴, ³⁸-⁴¹</td>
</tr>
<tr>
<td>Position drainage bag below bladder and off floor ⁴²</td>
</tr>
<tr>
<td>Routine, daily meatal care (use of antiseptics is NOT necessary) ⁴³-⁴⁵</td>
</tr>
<tr>
<td>Practice hand hygiene and wear clean gloves prior to any manipulation of the catheter/drainage system ³⁵, ³⁶</td>
</tr>
<tr>
<td>Obtain urine sample aseptically from sampling port ²³, ³⁴</td>
</tr>
<tr>
<td>Avoid routine catheter irrigation. If obstruction is anticipated, closed continuous irrigation may be used. To relieve obstruction due to mucus or clots, an intermittent method may be used ⁴⁶-⁴⁸</td>
</tr>
</tbody>
</table>

Education of patients and caretakers via “fact sheets”(Appendix A) or nurse-directed education, competency based training, or skills labs may help reinforce appropriate provider adherence and self-protective behaviors consistent with many of the recommendation cited above (e.g. keeping the urinary drainage bag secure, unobstructed, and lower than the bladder). ⁴⁹
**Special Approaches to Prevent CAUTIs**

Additional, special strategies may be needed for use in locations/populations with unacceptably high rates of CAUTIs despite implementation of the basic strategies outlined above (Table 3).

<table>
<thead>
<tr>
<th>TABLE 3: SPECIAL APPROACHES FOR PREVENTION OF CAUTIs</th>
<th>17, 22-24</th>
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</thead>
<tbody>
<tr>
<td><strong>Before Insertion of Urinary Catheter</strong></td>
<td></td>
</tr>
<tr>
<td>Develop procedure-specific guidelines or criteria to restrict perioperative catheter insertion</td>
<td>50</td>
</tr>
<tr>
<td>Establish mechanism to ensure urinary retention medications resumed postoperatively (e.g. alpha blockers)</td>
<td>51</td>
</tr>
<tr>
<td>Develop protocol for management of postoperative urinary retention (e.g. nurse-directed use of bladder scanners, in-and-out catheterization, etc)</td>
<td>52</td>
</tr>
<tr>
<td><strong>During Insertion of Urinary Catheter</strong></td>
<td></td>
</tr>
<tr>
<td>Consider use of antimicrobial-coated catheters for selected, high-risk patients (e.g. patients undergoing certain urologic procedures or requiring prolonged [&gt;7-10 days] bladder catheterization)</td>
<td>53-58</td>
</tr>
<tr>
<td><strong>After Insertion of Urinary Catheter</strong></td>
<td></td>
</tr>
<tr>
<td>Implement unit-/institution-wide protocol to identify and remove unnecessary bladder catheters (see below)</td>
<td>10, 15, 69-63</td>
</tr>
</tbody>
</table>

Several of the basic and special approaches outlined above can be implemented unit- or institution-wide as a “bladder bundle” that uses the mnemonic ABCDE: 64, 65

- **A**dherence to generally recommended infection control principles (e.g. hand hygiene, aseptic insertion, proper maintenance).
- **B**ladder ultrasound may avoid indwelling catheterization
- **C**ondom and intermittent catheterization in appropriate patients
- **D**o not use the indwelling catheter unless you must
- **E**arly removal of the catheter using reminders or stop-orders

Identification and removal of unnecessary bladder catheters should be a priority. Unit- and institution-wide protocols to identify and remove unnecessary bladder catheters should be implemented, including:

- Procedure-specific guidelines for postoperative catheter removal | 50 |
- Institutional policies requiring daily reassessment of need for continued catheterization
- Daily, physician reminders (in chart, electronic, or nurse-generated) to alert providers that an indwelling catheter is still in place and that its continued use should be reassessed (Appendix B) | 10, 36, 59, 63, 66 |
- Automatic stop orders requiring renewal of the indwelling bladder catheter | 67 |
Daily wards rounds by nurses/physicians to review patients with bladder catheters and determine continuing necessity.  

**Approaches That Should NOT be Considered for the Prevention of CAUTIs**

| TABLE 4: APPROACHES NOT RECOMMENDED FOR PREVENTION OF CAUTIs | 
|---|---|
| **During Insertion of Urinary Catheter** | 
| Do not use silver-coated or antibiotic-impregnated catheters routinely | 
| **After Insertion of Urinary Catheter** | 
| Do not add antibiotics to drainage bag | 
| Do not use systemic antibiotic prophylaxis | 
| Do not change catheters or drainage bags routinely | 
| Do not screen for or treat asymptomatic bacteriuria in catheterized patients |

**Surveillance**

Standardized criteria should be used to identify patients with asymptomatic bacteriuria versus symptomatic UTIs (Appendix C). Use of uniform definitions by providers, infection control personnel, and data abstractors will ensure that the numerators used are reliable when discussing CAUTI rates.

Patients at high risk for developing CAUTIs should be identified and followed closely. Adherence to the basic prevention guidelines cited above should be tracked, and CAUTI rates should be closely monitored using a program such as the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) or other hospital-based, internal data collection program. Documenting indications for use and cases where basic prevention recommendations are not utilized is encouraged to guide and focus ongoing, quality-improvement efforts.

Because asymptomatic bacteriuria does not present an increased risk for CAUTIs unless other factors are present (and its treatment can lead to antibiotic-associated disease and resistance), routine screening for and treatment of bacteriuria in catheterized patients is NOT recommended. In lieu of participation in the ACS NSQIP, surveillance programs that monitor urine culture results through the microbiology lab can be used to identify patients with potential symptomatic urinary tract infections. Patients with positive urine cultures can then be assessed for the presence of an indwelling bladder catheter and possible CAUTI based on defined surveillance criteria. The purpose of these surveillance programs should be to monitor rates of possible CAUTI in order to help guide, implement and evaluate quality-improvement programs while providing critical performance feedback.

**Summary**
CAUTIs are a leading source of morbidity and increased length of stay and costs in hospitalized, postoperative patients. The best way to avoid CAUTIs is to avoid unnecessary catheterization and remove catheters as soon as possible. Adherence to generally accepted infection control principles, application of the basic and special recommendations contained in this document, and active surveillance can help guide quality improvement efforts and reduce CAUTI rates at your institution.
Appendix A. Catheter-Associated Urinary Tract Infections Patient Education Sheet

FAQs (frequently asked questions)

“What is a catheter-associated urinary tract infection?”

A urinary tract infection (also called “UTI”) is an infection in the urinary system, which includes the bladder (which stores the urine) and the kidneys (which filter the blood to make urine). Germs (such as bacteria or yeasts) do not normally live in these areas, but if germs are introduced, an infection can occur.

If you have a urinary catheter, germs can travel along the catheter and cause an infection in your bladder or your kidney; in that case, it is called a catheter-associated urinary tract infection (or “CA-UTI”).

“What is a urinary catheter?”

A urinary catheter is a thin tube placed in the bladder to drain urine. Urine drains through the tube into a bag that collects the urine. A urinary catheter may be used:

- If you are not able to urinate on your own
- To measure the amount of urine that you make, for example, during intensive care
- During and after some types of surgery
- During some tests of the kidneys and bladder

People with urinary catheters have a much higher chance of getting a urinary tract infection than people who don’t have a catheter.

How do I get a catheter-associated urinary tract infection (CA-UTI)?

If germs enter the urinary tract, they may cause an infection. Many of the germs that cause a catheter-associated urinary tract infection are common germs found in your intestines that do not usually cause an infection there. Germs can enter the urinary tract when the catheter is put in or while the catheter remains in the bladder.

What are the symptoms of a urinary tract infection?

Some of the common symptoms of a urinary tract infection are:

- Burning or pain in the lower abdomen (that is, below the stomach)
- Fever
- Blood in urine may be a sign of infection, but is also caused by other problems
- Burning during urination or an increase in the frequency of urination after the catheter is removed.

Sometimes people with catheter-associated urinary tract infections do not have these symptoms of infection.

Can catheter-associated urinary tract infections be treated?

Yes, most catheter-associated urinary tract infections can be treated with antibiotics and removal or change of the catheter. Your doctor will determine which antibiotic is best for you.

What are some of the things that hospitals are doing to prevent catheter-associated urinary tract infections?

To prevent urinary tract infections, doctors and nurses take the following actions.

Catheter Insertion

- Catheters are put in only when necessary and they are removed as soon as possible.
- Only properly trained persons insert catheters using sterile (“clean”) technique.
- The skin in the area where the catheter will be inserted is cleaned before inserting the catheter.
- Other methods of draining the urine are sometimes used, such as
  - External catheters in men (these look like condoms and are placed over the penis rather than into the penis)
  - Putting a temporary catheter in to drain the urine and removing it right away. This is called intermittent urethral catheterization.

Catheter Care

- Healthcare providers clean their hands by washing them with soap and water or using an alcohol-based hand rub before and after touching your catheter.
  
  If you do not see your providers clean their hands, please ask them to do so.

- Avoid disconnecting the catheter and drainage tube. This helps to prevent germs from getting inside the catheter tube.
- The catheter is secured to the leg to prevent pulling on the catheter.
- Avoid twisting or kinking the catheter.
- Keep the bag lower than the bladder to prevent urine from backflowing to the bladder.
- Empty the bag regularly. The drainage sac should not touch anything while emptying the bag.

What can I do to help prevent catheter-associated urinary tract infections if I have a catheter?

- Always clean your hands before and after doing catheter care.
- Always keep your urine bag below the level of your bladder.
- Do not tug or pull on the tubing.
- Do not twist or kink the catheter tubing.
- Ask your healthcare provider each day if you still need the catheter.

What do I need to do when I go home from the hospital?

- If you will be going home with a catheter, your doctor or nurse should explain everything you need to know about taking care of the catheter. Make sure you understand how to care for it before you leave the hospital.
- If you develop any of the symptoms of a urinary tract infection, such as burning or pain in the lower abdomen, fever, or an increase in the frequency of urination, contact your doctor or nurse immediately.
- Before you go home, make sure you know who to contact if you have questions or problems after you get home.

If you have questions, please ask your doctor or nurse.
Appendix B. Sample Urinary Catheter Provider Reminder

**URINARY CATHETER REMINDER**

**DATE:** ___/___/____

This patient has had an indwelling urethral catheter since ___/___/____

Please indicate below EITHER (1) that the catheter should be removed OR (2) that the catheter should be retained. If the catheter should be retained, please state ALL of the reasons that apply.

☐ Please **discontinue** indwelling urethral catheter; OR

☐ Please **continue** indwelling urethral catheter because patient requires indwelling catheterization for the following reasons (please check all that apply):

  ☐ Urinary retention
  ☐ Very close monitoring of urine output and patient unable to use urinal or bedpan
  ☐ Open wound in sacral or perineal area and patient has urinary incontinence
  ☐ Patient too ill or fatigued to use any other type or urinary collection strategy
  ☐ Patient had recent surgery
  ☐ Management of urinary incontinence on patient’s request
  ☐ Other—please specify
Appendix C. Clinical and Surveillance Definitions of Asymptomatic Bacteriuria and Urinary Tract Infections

**Clinical Definitions of Asymptomatic Bacteriuria**

Isolation on a specified quantitative count of bacteria in an appropriately collected urine specimen in a manner that minimizes contamination

*For Women*: 2 consecutive voided specimens with isolation of the same bacterial strain in quantitative counts ≥100,000 CFU/mL or a single catheterized urine specimen with 1 bacterial species isolated in a quantitative count >100 CFU/mL

*For Men*: a single clean-catch voided urine specimen with 1 bacterial species isolated quantitative counts ≥ 100,000 CFU/mL or a single catheterized urine specimen with 1 bacterial species isolated in a quantitative count >100 CFU/mL

*and* the absence of signs and symptoms that may suggest urinary tract infection, such as:

- Fever
- Urgency
- Frequency
- Dysuria
- Suprapubic tenderness
- Costovertebral angle pain/tenderness

**Centers for Disease Control and Prevention National Healthcare Safety Network Surveillance Criteria for Symptomatic Urinary Tract Infections**

Urinary tract infections (UTI) are defined using symptomatic urinary tract infection (SUTI) criteria or asymptomatic bacteremic UTI (ABUTI) criteria (Table 1 below). Report UTIs that are catheter-associated (i.e. patient had an indwelling urinary catheter at the time of or within 48 hours before onset of the event). There is no minimum period of time that the catheter must be in place in order for the UTI to be considered catheter-associated.

**NOTE**: SUTI 1b and 2b and other UTI (OUTI) *cannot* be catheter-associated.

**EXAMPLE**: Patient has a Foley catheter in place on an inpatient unit. It is discontinued, and 4 days later patient meets the criteria for a UTI. This is not reported as a CAUTI because the time since Foley discontinuation exceeds 48 hours.
### Table 1 - Urinary Tract Infection Criteria

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Symptomatic Urinary Tract Infection (SUTI)</th>
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<tbody>
<tr>
<td><strong>1a</strong></td>
<td>Patient had an indwelling urinary catheter in place at the time of specimen collection and at least 1 of the following signs or symptoms with no other recognized cause: fever (&gt;38°C), suprapubic tenderness, or costovertebral angle pain or tenderness and a positive urine culture of $\geq 10^5$ colony-forming units (CFU)/ml with no more than 2 species of microorganisms. (\text{---OR---}) Patient had indwelling urinary catheter removed within the 48 hours prior to specimen collection and at least 1 of the following signs or symptoms with no other recognized cause: fever (&gt;38°C), urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness and a positive urine culture of $\geq 10^5$ colony-forming units (CFU)/ml with no more than 2 species of microorganisms.</td>
</tr>
<tr>
<td><strong>1b</strong></td>
<td>Patient did not have an indwelling urinary catheter in place at the time of specimen collection nor within 48 hours prior to specimen collection and has at least 1 of the following signs or symptoms with no other recognized cause: fever (&gt;38°C) in a patient that is $\leq 65$ years of age, urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness and a positive urine culture of $\geq 10^5$ CFU/ml with no more than 2 species of microorganisms. (\text{---OR---})</td>
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</tbody>
</table>
| **2a**    | Patient had an indwelling urinary catheter in place at the time of specimen collection and at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C), suprapubic tenderness, or costovertebral angle pain or tenderness and a positive urinalysis demonstrated by at least 1 of the following findings:  
  a. positive dipstick for leukocyte esterase and/or nitrite  
  b. pyuria (urine specimen with $\geq 10$ white blood cells [WBC]/mm$^3$ or $\geq 3$ WBC/high power field of unspun urine)  
  c. microorganisms seen on Gram stain of unspun urine and a positive urine culture of $\geq 10^3$ and $<10^5$ CFU/ml with no more than 2 species of microorganisms. \(\text{---OR---}\) Patient had indwelling urinary catheter removed within the 48 hours prior to specimen collection and at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C), urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness and a positive urinalysis demonstrated by at least 1 of the following findings:  
  a. positive dipstick for leukocyte esterase and/or nitrite  
  b. pyuria (urine specimen with $\geq 10$ white blood cells [WBC]/mm$^3$ or $\geq 3$ WBC/high power field of unspun urine) |
Table 1 - Urinary Tract Infection Criteria

<table>
<thead>
<tr>
<th>Field of unspun urine</th>
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<tbody>
<tr>
<td>c. Microorganisms seen on Gram stain of unspun urine</td>
</tr>
<tr>
<td>2b Patient did not have an indwelling urinary catheter in place at the time of specimen collection and has at least 1 of the following signs or symptoms with no other recognized cause: fever (&gt;38°C) in a patient that is ≤65 years of age, urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness and a positive urinalysis demonstrated by at least 1 of the following findings:</td>
</tr>
<tr>
<td>a. Positive dipstick for leukocyte esterase and/or nitrite</td>
</tr>
<tr>
<td>b. Pyuria (urine specimen with ≥10 WBC/µL or ≥3 WBC/high power field of unspun urine)</td>
</tr>
<tr>
<td>c. Microorganisms seen on Gram stain of unspun urine and a positive urine culture of ≥10^5 CFU/ml with no more than 2 species of microorganisms.</td>
</tr>
<tr>
<td>3 Patient ≤1 year of age with or without an indwelling urinary catheter has at least 1 of the following signs or symptoms with no other recognized cause: fever (&gt;38°C core), hypothermia (&lt;36°C core), apnea, bradycardia, dysuria, lethargy, or vomiting and a positive urine culture of ≥10^5 CFU/ml with no more than 2 species of microorganisms.</td>
</tr>
<tr>
<td>4 Patient ≤1 year of age with or without an indwelling urinary catheter has at least 1 of the following signs or symptoms with no other recognized cause: fever (&gt;38°C core), hypothermia (&lt;36°C core), apnea, bradycardia, dysuria, lethargy, or vomiting and a positive urinalysis demonstrated by at least 1 of the following findings:</td>
</tr>
<tr>
<td>a. Positive dipstick for leukocyte esterase and/or nitrite</td>
</tr>
<tr>
<td>b. Pyuria (urine specimen with ≥10 WBC/µL or ≥3 WBC/high power field of unspun urine)</td>
</tr>
<tr>
<td>c. Microorganisms seen on Gram’s stain of unspun urine and a positive urine culture of between ≥10^2 and &lt;10^5 CFU/ml with no more than two species of microorganisms.</td>
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</table>

**Criterion**  
Asymptomatic Bacteremic Urinary Tract Infection (ABUTI)  
Patient with or without an indwelling urinary catheter has no signs or symptoms (i.e., no fever (>38°C) for patients ≤65 years of age*, and for any age patient no urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness, OR for a patient ≤1 year of age, no fever (>38°C core), hypothermia (<36°C core), apnea, bradycardia, dysuria, lethargy, or vomiting) and a positive urine culture of ≥10^5 CFU/ml with no more than 2 species of uropathogen microorganisms** and a positive blood culture with at least 1 matching uropathogen microorganism to the urine culture.

* Fever is not diagnostic for UTI in the elderly (>65 years of age) and therefore fever in this age group does not disqualify from meeting the criteria of an ABUTI.  
** Uropathogen microorganisms are: Gram-negative bacilli, Staphylococcus spp., yeasts, beta-hemolytic Streptococcus spp., Enterococcus spp., G. vaginalis, Aerococcus urinae, and Corynebacterium (urease positive).

**Comments**  
- Urinary catheter tips should not be cultured and are not acceptable for the diagnosis of a urinary tract infection.
- Urine cultures must be obtained using appropriate technique, such as clean catch collection or
**Table 1: Urinary Tract Infection Criteria**

Specimens from indwelling catheters should be aspirated through the disinfected sampling ports.

- In infants, urine cultures should be obtained by bladder catheterization or suprapubic aspiration; positive urine cultures from bag specimens are unreliable and should be confirmed by specimens aseptically obtained by catheterization or suprapubic aspiration.

- Urine specimens for culture should be processed as soon as possible, preferably within 1 to 2 hours. If urine specimens cannot be processed within 30 minutes of collection, they should be refrigerated, or inoculated into primary isolation medium before transport, or transported in an appropriate urine preservative. Refrigerated specimens should be cultured within 24 hours.

- Urine specimen labels should indicate whether or not the patient is symptomatic.

- Report secondary bloodstream infection = "Yes" for all cases of Asymptomatic Bacteremic Urinary Tract Infection (ABUTI).

- Report *Corynebacterium* (urease positive) as either *Corynebacterium species unspecified* (COS) or, as *C. urealyticum* (CORUR) if so specified.

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Other Urinary Tract Infection (OUTI) (kidney, ureter, bladder, urethra, or tissue surrounding the retroperineal or perinephric space)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Patient has microorganisms isolated from culture of fluid (other than urine) or tissue from affected site.</td>
</tr>
<tr>
<td>2</td>
<td>Patient has an abscess or other evidence of infection seen on direct examination, during a surgical operation, or during a histopathologic examination.</td>
</tr>
</tbody>
</table>
| 3         | Patient has at least 2 of the following signs or symptoms with no other recognized cause: fever (>38°C), localized pain, or localized tenderness at the involved site and at least 1 of the following:  
  a. purulent drainage from affected site  
  b. microorganisms cultured from blood that are compatible with suspected site of infection  
  c. radiographic evidence of infection (e.g., abnormal ultrasound, CT scan, magnetic resonance imaging [MRI], or radiolabel scan [gallium, technetium]). |
| 4         | Patient ≤ 1 year of age has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C core), hypothermia (<36°C core), apnea, bradycardia, lethargy, or vomiting and at least 1 of the following:  
  a. purulent drainage from affected site  
  b. microorganisms cultured from blood that are compatible with suspected site of infection  
  c. radiographic evidence of infection, (e.g., abnormal ultrasound, CT scan, magnetic resonance imaging [MRI], or radiolabel scan [gallium, technetium]). |

**Comment**

- Report infections following circumcision in newborns as SST-CIRC.
Expert Panel

Chair:
Sanjay Saint, MD, MPH
Hospitalist, Ann Arbor VA Medical Center
Professor of Internal Medicine
University of Michigan Medical School
Ann Arbor, MI

Committee Members:
Sue Bradley, MD
Professor, Department of Internal Medicine
University of Michigan Medical School
Ann Arbor, MI

Thomas M. Hooton, MD
Associate Dean and Professor, Department of Medicine
University of Miami, Miller School of Medicine
Miami, FL

Jennifer Meddings, MD, MSc
Assistant Professor, Department of Internal Medicine
University of Michigan Medical School
Ann Arbor, MI

Lindsay E. Nicolle, MD
Professor, Department of Internal Medicine
University of Manitoba, Health Sciences Center
Winnipeg, MG

Russ Olmsted, MPH
Epidemiologist, Infection Control Services
Saint Joseph Mercy Health System
Ann Arbor, MI

Anthony J. Schaeffer, MD
Professor and Chairman, Department of Urology
Northwestern University, Feinberg School of Medicine
Chicago, IL

Heidi Wald, MD, MSPH
Assistant Professor, Department of Medicine
University of Colorado at Denver and Health Sciences Center
Aurora, CO
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References:


