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## (1D) Surveillance of Urinary Tract Infections in the Long-Term Care Setting

**Introduction:** One-quarter of the older adult population in the United States will reside in a long-term care (LTC) facility at some point in their lives. According to the Nursing Home Compendium (2009), published by Center for Medicaid and Medicare Services (CMS), 3.2 million residents received care in a certified nursing home in 2008. Urinary tract infection (UTI) is the second most frequent infection in LTC facilities and the most common cause of hospitalization for bacterial infection. Previous reports have indicated that the prevalence of UTIs among LTC residents ranges from 0.6% to 21.8% and its incidence to be between 0.3 and 0.8 cases per 1,000 resident days. In residents with indwelling urinary catheters, the risk is time dependent; increasing at a rate of approximately 5% each day of use, reaching 100% prevalence at 30 days. The reported prevalence of asymptomatic bacteriuria is higher than that of symptomatic UTI. In elderly residents of LTC facilities, the prevalence of asymptomatic bacteriuria has been estimated at 25%-50% for women and 15% to 40% for men.

UTI treatment represents 30% to 50% of antimicrobial use in LTC facilities, with as much as 25% to 75% of that use considered inappropriate. Several well-designed randomized controlled trials have shown no benefit to treating asymptomatic bacteriuria in this population. According to the Infectious Disease Society of America's (IDSA) Guidelines (2005), screening for and treatment of asymptomatic bacteriuria in elderly institutionalized residents of long-term care facilities is not recommended (A-I recommendation). The overuse use of antimicrobials in nursing home residents has been associated with the development of multi-drug resistant organisms, drug-related adverse effects, and increased costs. Therefore, it is essential to identify residents for whom potential benefits of antimicrobial therapy outweigh the risks.

**Purpose:** To improve the surveillance and identification of symptomatic urinary tract infections in order to prevent the inappropriate use of antimicrobials for asymptomatic bladder colonization (bacteriuria); which can lead to the development of drug resistant infections and increase the risk of *Clostridium difficile* infections.

**Scope of Practice:** Nursing staff (RNs, LPNs, Aides, etc.), Infection Preventionist, Ancillary staff (Dietary, Physical Therapy, etc.), and Physicians (including Physician Extenders)

**Related Policy/Guidelines:** Indwelling Urinary Catheter Policy, Antibiotic Formulary Protocol; UTI Prevention Recommendations, (also, reference your internal policies here)

**Surveillance:** Identifying symptomatic UTIs in LTC residents is challenging because of communication barriers, chronic genitourinary symptoms, and comorbidities. Clinicians frequently must determine whether changes in clinical status of nursing home residents are due to a treatable urinary tract infection or to another cause. Given the complexity of the diagnosis of UTIs in LTC facilities, the

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increase of drug resistance, and the inappropriate use of antimicrobials, **the use of a facility-adapted protocol to guide surveillance, diagnosis, and antimicrobial selection for UTIs is advisable.**

Therefore, the Center for Disease Control and Prevention's National Healthcare Safety Network's (NHSN) urinary tract infection surveillance guidelines will be utilized for standardizing the identification of symptomatic urinary tract infections. See **ADDENDUM A** for the Urinary Tract Infection Assessment form, which facilitates the identification of UTIs.

### **Policy and Procedure:**

#### **I. NHSN Definitions:**

**A. Urinary tract infections (UTI)** are defined using NHSN's UTI surveillance criteria. NHSN provides three (3) separate case definitions, which can be seen in **TABLE 1:**

1. Symptomatic Urinary Tract Infection (SUTI) criteria
2. Asymptomatic Bacteremic UTI (ABUTI) criteria
3. Catheter-associated symptomatic UTI (CA-SUTI) criteria

**NOTE:** If a resident is transferred from an acute care facility and develops signs/symptoms of a UTI on the first 3 days of admission to the LTCF, it would be considered present at the time of transfer and not attributed to the LTCF (your facility HAI if develops on Day 4 or greater). It should be reported back to the transferring facility.

**B. Indwelling catheter** is a drainage tube that is inserted into the urinary bladder through the urethra, is left in place, and is connected to a closed collection system; also called a Foley catheter. CA-SUTIs are captured if the resident had an indwelling urinary catheter at the time of or within 2 days before onset of the event. **NOTE:** The catheter must be in place for at least 2 calendar days (date of insertion = D1), in order for the UTI to be considered catheter-associated. Catheter days among residents with indwelling urethral catheters will be captured daily as a separate denominator.

**C. Permanent catheters** placed through the skin in the suprapubic region are a type of indwelling catheter but may have a different risk for symptomatic UTI compared to temporary indwelling urethral catheters. Therefore, UTIs in residents with suprapubic catheters will be captured as symptomatic UTI (SUTI), not CA-SUTI. Suprapubic catheters, as well as straight in-and-out catheters, will not contribute to catheter day counts (denominator data).

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**TABLE 1**

Criterion	<b>Symptomatic Urinary Tract Infection (SUTI)</b> <i>For residents without an indwelling catheter:</i>
1a	Acute dysuria or acute pain, swelling, or tenderness of the testes, epididymis, or prostate  <b><u>AND</u></b>  A positive urine culture with $\geq 10^5$ cfu/ml (100,000 colonies) of no more than 2 species of microorganisms <b>OR</b> a specimen collected by in-and-out catheterization with $\geq 10^2$ cfu/ml (100 colonies) of any number of organisms
2a	Fever [Single temperature $\geq 37.8^\circ\text{C}$ ( $>100^\circ\text{F}$ ), or $>37.2^\circ\text{C}$ ( $>99^\circ\text{F}$ ) on repeated occasions, or an increase of $>1.1^\circ\text{C}$ ( $>2^\circ\text{F}$ ) over baseline] <b>OR</b> Leukocytosis ( $>14,000$ cells/mm <sup>3</sup> ) or Left shift ( $>6\%$ or 1,500 bands/mm <sup>3</sup> )  <b><u>AND</u></b>  At least <b>one</b> of the following: Acute costovertebral angle pain or tenderness, suprapubic pain, or gross hematuria, new or marked increase in incontinence, urgency, or frequency  <b><u>AND</u></b>  A positive urine culture with $\geq 10^5$ cfu/ml (100,000 colonies) of no more than 2 species of microorganisms <b>OR</b> a specimen collected by in-and-out catheterization with $\geq 10^2$ cfu/ml (100 colonies) of any number of organisms
3a	<b>Two or more</b> of the following: Costovertebral angle pain or tenderness, new or marked increase in incontinence, urgency, frequency, suprapubic pain, or new gross hematuria  <b><u>AND</u></b>  A positive urine culture with $\geq 10^5$ cfu/ml (100,000 colonies) of no more than 2 species of microorganisms <b>OR</b> a specimen collected by in-and-out catheterization with $\geq 10^2$ cfu/ml (100 colonies) of any number of organisms

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Criterion	<b>Symptomatic Urinary Tract Infection (SUTI) – CA-SUTI</b> <i>For residents with an indwelling catheter (or removed within 2 days):</i>
1b	<p>Any <b>one</b> of the following:</p> <ul style="list-style-type: none"> <li>a. Fever, rigors OR new onset hypotension, with no alternate site of infection</li> <li>b. Either acute change in mental status or acute functional decline with no alternate diagnosis <i>and</i> leukocytosis</li> <li>c. New onset suprapubic pain or costovertebral angle pain or tenderness</li> <li>d. Purulent discharge from around the catheter or acute pain, swelling, or tenderness of the testes, epididymis, or prostate</li> </ul> <p><b><u>AND</u></b></p> <p>Urine specimen <math>\geq 10^5</math> cfu/ml (100,000 colonies) of any organism(s) collected following placement of a new catheter (if current catheter has been in place <math>\geq 14</math> days)</p>
Criterion	<b>Asymptomatic Bacteremic Urinary Tract Infection (ABUTI)</b>
1	<p>Resident with or without an indwelling urinary catheter has no signs or symptoms (i.e., no urgency, frequency, acute dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness). <i>If no catheter is in place, fever alone would not exclude ABUTI if other criteria are met.</i></p> <p><b><u>AND</u></b></p> <p>A positive urine culture with <math>\geq 10^5</math> cfu/ml (100,000 colonies) of no more than 2 species of microorganisms, <b>or</b> a specimen collected by in-and-out catheterization with <math>\geq 10^2</math> cfu/ml (100 colonies) of any number of organisms</p> <p><b><u>AND</u></b></p> <p>A positive blood culture with at least 1 matching uropathogen microorganism to the urine culture.</p> <p><b>**Uropathogen microorganisms are: Gram-negative bacilli, <i>Staphylococcus</i> spp., yeasts, beta-hemolytic <i>Streptococcus</i> spp., <i>Enterococcus</i> spp., <i>G. vaginalis</i>, <i>Aerococcus urinae</i>, and <i>Corynebacterium</i> (urease positive).</b></p>

**II. Data Analyses:**

- A. SUTI Numerator:** Number of symptomatic urinary tract infections identified in the month of surveillance. Only SUTIs which are NOT catheter associated will be included in the SUTI incidence rate.
- B. SUTI Denominator:** Resident days in the month of surveillance. Do not include resident beds being held open, only those beds in which a resident currently resides. Note: only include resident days on the units/wings numerator surveillance is being conducted.
- C. SUTI incidence rate** per 1000 resident days is calculated by dividing the number of SUTIs by the number of resident days and multiplying by 1,000.

$$\frac{\text{Number of SUTIs in surveillance period}}{\text{Number of Resident Days in surveillance period}} \times 1,000$$

- D. CA-SUTI Numerator:** Number of symptomatic urinary tract infections among residents with an indwelling urinary catheter in place that are identified in the surveillance time period. Only SUTIs which develop at the time an indwelling catheter is in place (must have been in place at least 2 days prior to symptom onset) or <2 calendar days from catheter removal will contribute to the CA-SUTI rate.
- E. CA-SUTI Denominator:** Indwelling urinary catheter days in the month of surveillance. Urinary catheter days are the sum of the number of residents with an indwelling catheter for each day and are collected daily at the same time each day. Note: only include daily catheter counts for those residents who have a catheter in place on the units/wings numerator surveillance is being conducted.
- F. CA-SUTI incidence rate** per 1000 urinary catheter days is calculated by dividing the number of CA-SUTIs by the number of urinary catheter days and multiplying by 1,000.

$$\frac{\text{Number of CA-SUTIs in surveillance period}}{\text{Number of catheter days in surveillance period}} \times 1,000$$

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**G. Urinary Catheter Utilization Ratio** can be used to trend use of/utilization of indwelling catheters among the facility population over time. It is calculated by dividing the number of urinary catheter days by the number of resident days. Multiply by 100 to obtain percent (%).

$$\frac{\text{Number of urinary catheter days in surveillance period}}{\text{Number of resident days in surveillance period}} \times 100$$

**H. ABUTI Numerator:** Number of asymptomatic bacteremic urinary tract infections identified in surveillance period. Note: if UTI meets the criteria for SUTI or CA-SUTI and a positive blood culture (bacteremia) is present with the same identified pathogen, then these are **not** captured as ABUTI, but SUTI/CA-SUTI with secondary blood stream infection. Only asymptomatic cases (no urinary symptoms) are included in this definition.

**I. ABUTI Denominator:** Resident days in the month of surveillance. Do not include resident beds being held open, only those beds in which a resident currently resides. Note: only include resident days on the units/wings numerator surveillance is being conducted.

**J. ABUTI incidence rate** per 1000 resident days is calculated by dividing the number of ABUTIs by the number of resident days and multiplying by 1,000.

$$\frac{\text{Number of ABUTIs in surveillance period}}{\text{Number of Resident Days in surveillance period}} \times 1,000$$

**URINARY TRACT INFECTION ASSESSMENT FORM**

Resident Name: \_\_\_\_\_

Date of Symptom Onset: \_\_\_\_\_

Date Culture was Collected: \_\_\_\_\_

*How was the urine specimen collected (check one):*

- In & Out Catheter*       *Voided/Clean Catch*       *Existing Anchored Foley Catheter*

Signs and symptoms (**please assess for all of the following and check all that apply**):

- Fever: single temperature  $\geq 37.8^{\circ}\text{C}$  ( $>100^{\circ}\text{F}$ ), or  $>37.2^{\circ}\text{C}$  ( $>99^{\circ}\text{F}$ ) on repeated occasions, or an increase of  $>1.1^{\circ}\text{C}$  ( $>2^{\circ}\text{F}$ ) over baseline
- Rigors
- New onset hypotension
- New onset confusion/functional decline
- Acute pain, swelling, or tenderness of the testes, epididymis or prostate
- Acute dysuria
- Purulent drainage at catheter insertion site
- None

New and/or marked increase in (check all that apply):

- Urgency                       Frequency                       Incontinence
- Costovertebral angle pain or tenderness                       Suprapubic tenderness
- Visible (gross) hematuria                       None

Comments:

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*Please complete this form for all residents who have a suspected urinary tract infection. Once form is complete, please return to the Infection Control Nurse.*

DATE: \_\_\_\_\_ COMPLETED BY: \_\_\_\_\_

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