



# **URINARY TRACT INFECTIONS AND ASYMPTOMATIC BACTERIURIA**

EDUCATIONAL MODULE FOR NURSING  
ASSISTANTS IN LONG-TERM CARE FACILITIES

## Pre-Test

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1. Is the following statement true or false?  
Asymptomatic bacteriuria is defined as bacteria in the urine without symptoms of UTI.  
***True or False?***
  
2. Which of the following are risk factors for the development of asymptomatic bacteriuria in long-term care (LTC) residents?
  - a. Increased age
  - b. Increased number of diagnoses
  - c. Decreased ability to perform activities of daily living
  - d. Indwelling urinary catheter
  - e. All the above

## Pre-Test

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3. Recognizing changes in resident condition is an essential component of care for a resident with a possible urinary tract infection. Which of the following symptoms or conditions is not important to recognize in a resident who may have a UTI?
- Pain with urination or urinary urgency/frequency
  - New onset or worsening of:
    - Sudden, severe confusion
    - Shaking chills
    - Urinary incontinence
  - Tenderness in the lower abdominal and flank areas
  - Blood in the urine
  - None of the above (all symptoms and conditions listed are important to recognize)

# Learning Objectives

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- Define these terms:
  - Urinary tract infection (UTI)
  - Asymptomatic bacteriuria
- Describe risk factors for UTI and asymptomatic bacteriuria among LTCF residents
- Describe the physical and non-physical resident changes that should be recognized and communicated

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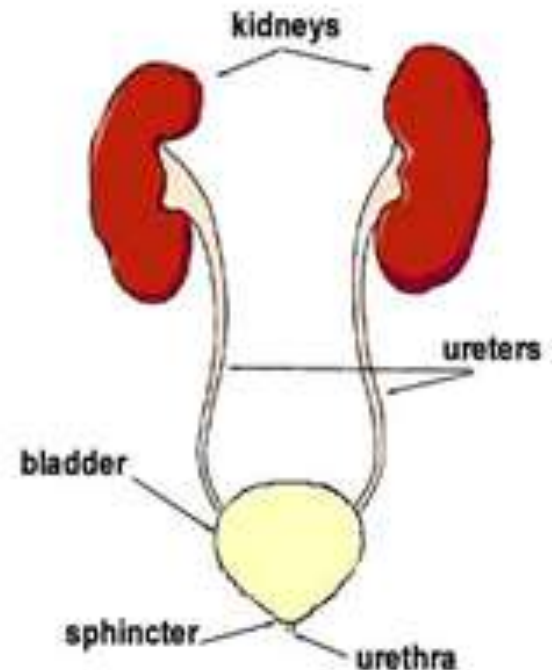
# Urinary Tract Infection (UTI)

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## Definition:

- A UTI is an infection in the bladder, kidney, or ureters (tubes that connect the kidneys to the bladder) that is characterized by bacteria in the urine (bacteriuria) and clinical symptoms (such as painful urination, fever, etc.).
- The presence of bacteria in the urine is determined by a urine culture.

Front View of Urinary Tract



# LTCF Resident Risk Factors for Developing a UTI

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- A number of factors place LTCF residents at greater risk for infection, including individual and facility characteristics

While many risk factors cannot be changed, you can still take several actions to reduce residents' risk of developing a UTI

# UTI Risk Factors

Risk Factor	Description	Action Steps for Nursing
<b>Increased Age</b>	Older people have weaker immune systems and are less able to fight infections	Increased responsibility for staff to adhere to Standard Precautions, especially hand hygiene
<b>Chronic Disease</b>	Diabetes, heart disease, and kidney disease lower a person's ability to fight infections	Increased responsibility for staff to adhere to Standard Precautions, especially hand hygiene
	People with Alzheimer's, Parkinson's, or cerebrovascular diseases may have a complication called neurogenic bladder (nerves and muscles controlling the bladder are affected)	Avoid unnecessary catheterization; when catheters are needed, follow protocols for appropriate catheter care
<b>Functional Impairment</b>	Incomplete bladder emptying caused by decreased mobility or other functional impairment	Provide regular opportunities for resident to empty bladder, assist as needed

## UTI Risk Factors, continued

Risk Factor	Description	Action Steps for Nursing
<b>Invasive devices</b>	Invasive devices such as urinary catheters allow bacteria and viruses to enter the body	Avoid unnecessary catheterization
	Twisted urinary catheter tubing prevents urine flow into collection bag	Ensure tubing is secured properly, without kinks or twists, with collection bag below bladder. Notify nurse of tubing problems.  Follow protocols for appropriate catheter care
<b>Other factors that promote bacterial growth in urine</b>	Dehydration and poor fluid intake	Offer fluids frequently (unless on fluid restriction)
	Prostatic hypertrophy (enlarged prostate) in men (sometimes referred to as “BPH”)  Decreased estrogen in women	Care givers should be aware of these increased risks among elderly residents



# Recognition of a Resident's Change in Condition: Physical and Non-Physical Changes

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Physical Changes	Non-Physical Changes
Walking	Demeanor
Urination and bowel patterns	Appetite
Skin	Sleeping
Level of weakness	Speech
Falls	Confusion or agitation
Vital signs	Resident complaints of pain

Communicate resident changes to the resident's nurse as soon as possible.

# Treating UTI

The Society for Healthcare Epidemiology in America (SHEA) has guidelines to help providers decide when antibiotics should be started to treat UTI in residents of LTCF

**Minimum Criteria for Initiation of Antibiotics in Long-Term Care Residents**

**Suspected Urinary Tract Infection**

**NO indwelling catheter:**

- Acute dysuria

*or*

- Fever ( $>37.9^{\circ}\text{C}$  [ $100^{\circ}\text{F}$ ] or a  $1.5^{\circ}\text{C}$  [ $2.4^{\circ}\text{F}$ ] increase above baseline temperature)

*and at least one of the following:*

**New or worsening:**

- Urgency
- Frequency
- Suprapubic pain
- Gross hematuria
- Costovertebral angle tenderness
- Urinary incontinence

**WITH indwelling catheter (Foley or suprapubic):**

- *At least one of the following:*
  - Fever ( $>37.9^{\circ}\text{C}$  [ $100^{\circ}\text{F}$ ] or a  $1.5^{\circ}\text{C}$  [ $2.4^{\circ}\text{F}$ ] increase above baseline temperature)
  - New costovertebral tenderness
  - Rigors
  - New onset of delirium

# Clinical Symptoms of UTI

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## For residents **WITHOUT** indwelling urinary catheters:

- Acute dysuria (painful urination)  
or
- Fever  $>100^{\circ}\text{F}$  ( $>37.9^{\circ}\text{C}$ ) or  $2.4^{\circ}\text{F}$  ( $1.5^{\circ}\text{C}$ ) increase above baseline *and* at least one of the following:

### *New or worsening:*

- Suprapubic pain (pain over the bladder)
- Urinary frequency or urgency
- Urinary incontinence
- Gross hematuria (blood in the urine)
- Costovertebral angle (CVA) tenderness (flank pain)

# Clinical Symptoms of UTI, continued

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## For residents WITH indwelling urinary catheters:

- Fever >100°F (>37.9°C) or 2.4°F (1.5°C) increase above baseline
- New costovertebral angle (CVA) tenderness (flank pain)
- Rigors (shaking chills) with or without identified cause
- Delirium (new onset)
- Altered mental status
- Malaise
- Lethargy with no other identified cause
- Acute hematuria
- Pelvic discomfort

### *If recent catheter removal:*

- Dysuria
- Urgent or frequent urination
- Suprapubic pain or tenderness

# Laboratory Testing for UTI

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Most UTIs result from bacteria present close to the urinary opening, where they can gain entry to the bladder. The most common organisms found in urine are:

- *Escherichia coli* (*E. coli*)
- *Klebsiella pneumoniae*
- *Proteus mirabilis*

When should a urinalysis (UA) or urine culture (UC) be performed?

- Symptoms of UTI should be present before nurses request a urinalysis or culture

Bacteria in the urine without signs and symptoms of infection is not a UTI and does not require an antibiotic prescription

# Laboratory Testing for UTI, continued

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Accurate lab results are only possible if the urine specimen is collected using appropriate techniques that prevent contamination of the specimen. These include:

- Clean catch collection , based on facility protocol (assist resident as needed)
  - Wipe from the urinary opening toward the anus with towelettes
  - Mid-stream urine
- Bladder catheterization (from sterile port of indwelling catheter)
  - If catheter has been in place for more than 14 days, specimen will likely show the presence of bacteria growing inside the catheter; results will be more meaningful if specimen is collected from newly placed catheter, if catheter is still needed
    - Discuss with resident's nurse

## Laboratory Testing for UTI, continued

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- Collect a urine specimen before giving antibiotics. A urine culture may be falsely negative if the specimen is collected after antibiotics have been started.
  - Talk to the nurse to make sure steps are completed in the right order
- UA or UC should only be performed on residents with signs or symptoms of a UTI in order to:
  - Confirm the presence and type of bacteria
  - Determine which antibiotics will kill the bacteria

# Preventing UTI in LTCF Residents

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- Use Standard Precautions when caring for all residents
  - Wear gloves when there is potential for having contact with blood, body fluids, secretions or excretions (including contact with urine, feces and genital mucous membranes)
  - Wear gowns when there is potential for clothing to become contaminated by splashing or contact with blood, body fluids, secretions or excretions, regardless of the resident's multidrug resistant organism (MDRO) status.
  - Always clean your hands
    - Before touching a resident; putting on gloves; performing a clean/aseptic procedure; and
    - After blood, body fluid exposure; removing gloves; touching a resident or his or her surroundings



# Preventing UTI in LTCF Residents

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- Increase hydration in residents at high risk for UTI
  - Check with the resident's nurse to make sure he or she is not on a fluid restriction
- Prevent fecal soiling
  - Offer regular opportunities for toileting
  - Regularly check for soiling in incontinent residents
- Encourage frequent bladder emptying by offering assistance with/providing toileting opportunities
- Ensure proper perineal and catheter care is provided
  - Wipe front to back to prevent contamination of urethra with fecal bacteria

# Asymptomatic Bacteriuria

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- Asymptomatic bacteriuria (ASB) means there are bacteria in the urine without symptoms of UTI.
- ASB is very common and considered a harmless condition among LTCF residents.
- Routine testing for bacteriuria among LTCF residents is not recommended

# Prevalence of Asymptomatic Bacteriuria

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- Many LTCF residents without indwelling urinary catheters have bacteria in their urine (bacteriuria)
- Nearly 100% of LTCF residents with an indwelling urinary catheter have bacteria in their urine
- 98% of LTCF residents with bacteriuria do not have clinical symptoms

# Prevalence of Asymptomatic Bacteriuria, cont.

Table 2. Prevalence of Asymptomatic Bacteriuria

Group	Prevalence
Pre-menopausal women	1 – 5%
Post-menopausal women	2.8 – 8.6%
Pregnant women	1.9 – 9.5%
Elderly females in LTCF	25 – 50%
Elderly males in LTCF	15 – 40%
Short-term catheter	9 – 23%
Chronic indwelling catheter	100%

# Risk Factors for Asymptomatic Bacteriuria among LTCF Residents

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- Indwelling catheter
- Increased:
  - Age
  - Number of diagnoses
  - Number of medications
- Decreased:
  - Ability to perform independent activities of daily living (ADLs)
  - Mental status
  - Independent mobility
  - Overall health status (self-rated)

# UTI and Asymptomatic Bacteriuria FAQs

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## **Do nonspecific behavioral and mental status changes mean a resident has a UTI?**

- There are many myths about what symptoms indicate a UTI
- The following symptoms should be evaluated but current guidelines do not link these symptoms to a UTI that needs antibiotic treatment:
  - Chronic incontinence (during sleep or when awake, when coughing or sneezing)
  - Anorexia (loss of appetite)
  - Difficulty falling asleep or staying asleep
  - Fatigue
  - Malaise (a generalized feeling of discomfort, illness, or lack of well-being)
  - Weakness
  - Mental status change
  - Fall

# UTI and Asymptomatic Bacteriuria FAQs, continued

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## **Does the presence of pyuria (pus in the urine) mean a resident has a symptomatic UTI?**

- No, the presence of pyuria alone does not mean that the person has a symptomatic UTI.
- Pyuria is considered an immune response to the presence of bacteria in the urine.
- Pyuria without symptoms should not be treated with antibiotics.
  - Treatment decisions must be made by a provider

# UTI and Asymptomatic Bacteriuria FAQs, continued

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## **Does foul-smelling urine mean a resident has a UTI?**

- A resident's urine can smell foul for several reasons, including dehydration, diet, medication, or the presence of specific bacteria.
- Foul-smelling urine without clinical symptoms of a UTI does not indicate the presence of a UTI and does not require antibiotics.
  - Treatment decisions must be made by a provider



# UTI and Asymptomatic Bacteriuria FAQs, continued

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## **Are antibiotics needed to treat a UTI?**

- Symptomatic UTI should be treated with antibiotics.
- Residents with asymptomatic bacteriuria generally should not be treated with antibiotics.
  - Treatment decisions must be made by a provider

# UTI and Asymptomatic Bacteriuria FAQs, continued

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## **Does it matter if asymptomatic bacteriuria is treated with antibiotics?**

- Yes! Antibiotics should only be given for bacterial infections
  - Treatment decisions must be made by a provider
- Inappropriate antibiotic use can lead to antibiotic resistance
- Infections caused by antibiotic-resistant bacteria can be:
  - More severe
  - Require more powerful and toxic antibiotics
  - Can lead to secondary infections, longer hospital stays, and increased healthcare costs

# UTI and Asymptomatic Bacteriuria FAQs, continued

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## Does it matter if asymptomatic bacteriuria is treated with antibiotics?

- Antibiotics can cause bad reactions and side effects, including:
  - Allergic reactions, rashes, harmful drug interactions
  - Disruption of normal flora
    - *Clostridium difficile* diarrhea
    - Yeast infections
  - Increased future infections with resistant bacteria
- Due to the potential of adverse drug reactions or development of antibiotic-resistant super-infections, inappropriate antibiotic prescribing can result in increased mortality

Not only do residents not benefit from having asymptomatic bacteriuria treated with antibiotics, doing so may actually cause harm.

# UTI and Asymptomatic Bacteriuria FAQs, continued

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## **Should prophylactic antibiotics be given to prevent a UTI in residents with asymptomatic bacteriuria?**

- Antibiotics should not be given to prevent a UTI in LTCF residents, unless it's prior to a surgical urinary tract procedure or if the resident is pregnant.
  - Treatment decisions must be made by a provider

## **Do cranberry juice and other cranberry products prevent UTI?**

- There are no clear data to indicate that cranberry juice prevents UTI, but if not otherwise restricted, there is no reason not to give cranberry juice to residents. Check with the resident's nurse to make sure it's ok to provide cranberry juice to a resident.

# Glossary, Part 1

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**Antibiotic resistance** - The ability of bacteria to change so that they develop the ability to survive when exposed to antibiotics that are intended to kill them.

**Asymptomatic bacteriuria** - Presence of bacteria in urine without signs or symptoms of UTI

**Bacteremia** - Bacteria in the blood

**Bacteria** - Bacteria are single-celled life forms. Bacteria are present in soil, water, and all living organisms. Many disease-causing organisms are bacteria; however, not all bacteria cause disease. Some bacteria are necessary for essential functions like digestion.

**Colonization** - Bacteria are present without causing disease

## Glossary, Part 2

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**Costovertebral angle (CVA) tenderness** - Pain near the ribs and thoracic vertebrae (sometimes called ‘flank pain’)

**Cystitis** – Infection of the urinary tract that is limited to the bladder, usually involving only the mucosal surface. This is the infection that most people think of when they say “UTI.” A more common term would be “bladder infection”.

**Delirium** – Sudden, severe confusion. An altered state of consciousness, consisting of confusion, distractibility, and disorientation.

**Dysuria** – Difficulty or pain with urination

**Hematuria** - Blood in the urine

## Glossary, Part 3

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**Infection** - The presence and multiplication of microorganisms (germs) that are causing symptoms (fever, redness, wound drainage). Infection generally implies that the person has signs or symptoms of a disease.

**Pyelonephritis** - Infection of the kidney usually resulting from travel of the infection from the bladder to the ureter (the tube connecting the bladder and kidney) and then to the kidney. This infection is commonly referred to as a kidney infection.

**Pyuria** - Presence of white blood cells or pus in the urine

**Rigors** - Shaking chills

**Suprapubic pain** – Pain in the lower abdominal region

## Glossary, Part 4

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**Urinary incontinence** - Involuntary excretion of urine from one's body. It is often temporary, and almost always results from an underlying medical condition.

**Urinary tract infection (UTI)** - An infection of the urinary tract (bladder, kidney, ureters, urethra (the tube that releases urine from the body)) that is characterized by bacteriuria and symptoms.

**Urosepsis** - Sepsis occurs when bacteria enter the blood stream and lead to a widespread infection – urosepsis means the infection has stemmed from an infection of the urinary tract.

**Virus** - A submicroscopic (very small) particle that can reproduce only if it's inside the cell of a living organism. Viruses cannot be killed by antibiotics.



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420-555 | Nov 2023

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