



COMMONWEALTH of VIRGINIA

DEPARTMENT OF BEHAVIORAL HEALTH AND DEVELOPMENTAL SERVICES

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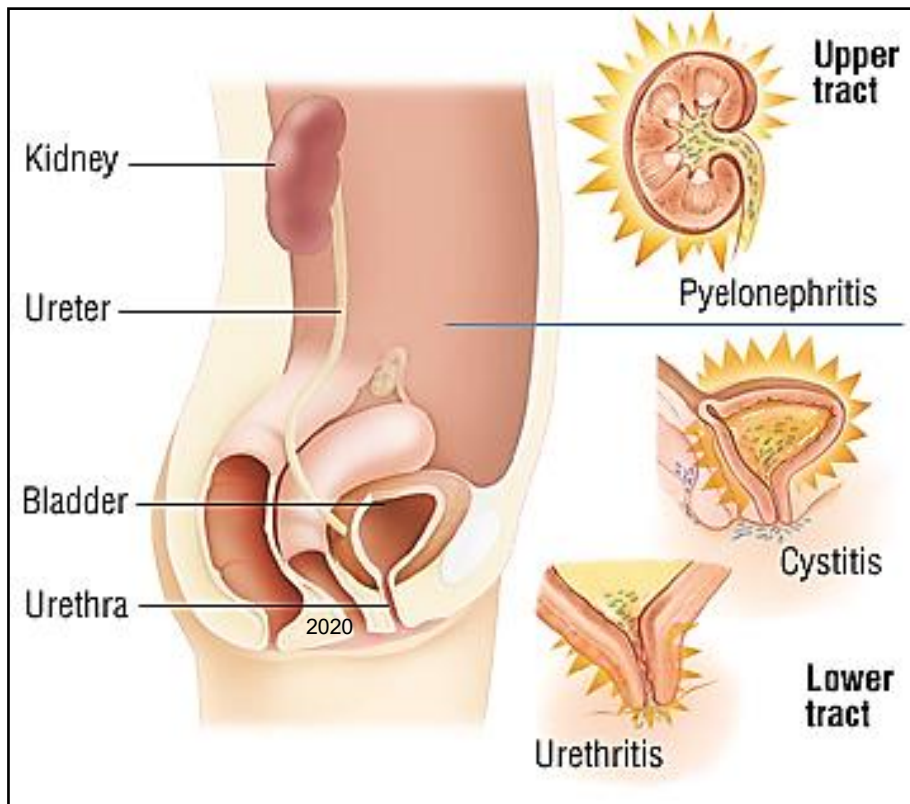
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Office of Integrated Health Health & Safety Alert/Information

Urinary Tract Infection (UTI) Health & Safety Alert

Introduction

Urinary tract infections (UTIs) are the most common type of infections (9) (14). UTIs occur when pathogens (disease producing microorganisms) enter the urinary tract, usually from the skin or rectum, and travel up the urethra to the bladder, producing an infection (9). Pathogens can produce infections in the urethra (urethritis), bladder (cystitis), ureters (ureteritis), and the kidneys (pyelonephritis), which are also categorized as UTIs (1) (5) (Figure 1) (12). Bladder infections are the most common type of lower UTI, while kidney infections are more serious, but less common (9).

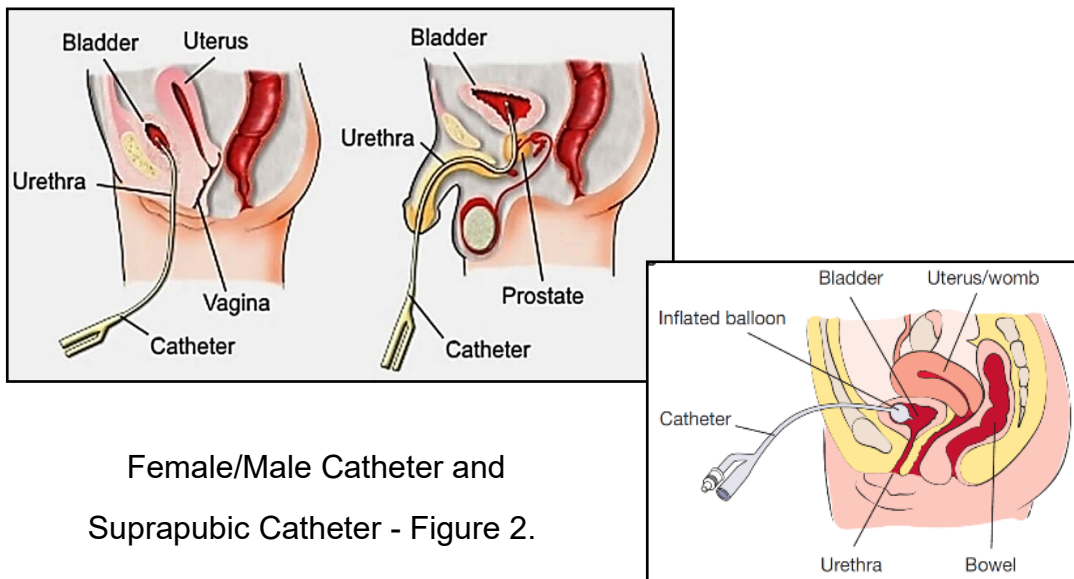


Diagnosis of a UTI is based on the confirmation of bacteria (pathogens) and white blood cells in the urinary tract, and physical symptoms of UTIs (see signs and symptoms on page 5) (3). Asymptomatic Bacteriuria (ASB) is when a person has an increase of bacteria in their urine without having any physical symptoms of UTI (10).

Types of UTIs

There are five types of UTIs:

- **Uncomplicated UTIs** occur in healthy individuals with no known physical, anatomical, or functional defects within their urinary tract (14).
- **Complicated UTIs** are associated with blockages or obstructions in the urinary tract. Blockages or obstructions can be caused by an enlarged prostate (in men), bladder tumors, urinary retention (due to a neurological disorder such as multiple sclerosis, epilepsy, and spinal problems), complete suppression of the immune response (immunosuppression), and or urinary bladder stones and pregnancy (9).
- **Recurrent UTIs** are described as at least 2 - 3 uncomplicated or complicated infections in a 6-month time period, or 3 UTIs within a year (4) (18).
- **Relapse UTIs** are infections which recur within the first two weeks of completing the initial antibiotic drug therapy for the first UTI (11) (14).
- **Catheter-Associated UTIs** (CAUTIs) happens when a person has an indwelling urinary or supra-pubic catheter and/or has recently been catheterized in the past 48 hours (Figure 2) (14).



Signs and Symptoms of UTIs

- Dysuria (painful or difficult urination).
- Fever.
- Frequent and urgent urination (may feel the need to urinate, even after emptying the bladder).
- Nocturia (excessive urination at night).
- Hematuria (the presence of blood in the urine).
- Malaise (feeling ill or weak).
- Lower abdominal pressure, pain or cramping, lower back pain or side pain.
- Urinary incontinence (sudden onset).
- Lack or loss of appetite.
- New or worsening mental confusion.
- Irritability and agitation.
- Chills.
- Nausea or vomiting (2) (4) (5).

Individuals with Intellectual and Developmental Disabilities (IDD) and UTIs

Individuals with any intellectual disability are at higher risk for UTIs than the general population. Individuals with profound or severe intellectual or developmental disability; those who are nonverbal; those with physical disabilities; and those who are incontinent, are at even higher risk for UTIs.

If an individual cannot communicate or describe the discomfort they may be experiencing, they are dependent on caregivers to recognize the signs and symptoms of a UTI (20) (23). Individuals with IDD may exhibit the following symptoms, in addition to the symptoms experienced by the general population:

- A higher-than-normal temperature 98.6> (often one of the first signs of UTI in a non-verbal individual).
- Grabbing, pulling, or holding their genitals or perianal area (more than usual or sudden onset).
- Nausea and or vomiting.
- Increased irritability and agitation related to toileting or urinating (squirring, wiggling, grimacing, whining, crying, stiffening legs, etc.)
- Refusal to eat or drink, and/or poor appetite.
- New onset of bowel or urinary incontinence.
- Numerous, repeated trips to the bathroom.
- Listlessness, tiredness (20) (23).

NOTE: It is very important for caregivers of individuals with IDD to get them to their PCP, urgent care, or emergency room immediately if they suspect a UTI or any other type of infection (20). Failure to do so increases their risk for sepsis. If their PCP is unavailable, take the individual to the hospital ER.

Risk Factors

- Urinary tract infections are more common in females than males. The female urethra is shorter and closer to the rectum, where more bacteria exists and can easily travel into the urinary tract (18) (5) (2).
- A history of a prior UTI puts an individual at a 20-30% higher risk of acquiring another (13) (18).
- If any female relative has a history of UTI's, it likewise increases an individual's risk (if the individual is female) (11) (9).
- Individuals with any type of incontinence, urinary retention, recurring hospitalizations, or congregate living are at higher risk for a UTI (7).
- A diagnoses of Type 2 diabetes, coupled with bladder nerve damage (neuropathy) puts an individual at five times higher risk of UTI (21). (This is due to the bladder not emptying completely.)
- Prolonged use of an indwelling urinary or suprapubic catheter; or a recent urinary catheterization procedure in the hospital or medical environment (18) (14).
- Young children who are being toilet trained are at increased risk, if not taught proper hygiene (wiping front to back) (9).
- Incomplete emptying of the bladder related to an enlarged prostate, narrows the urethra in men, causing an elevated risk of UTI (18) (7).
- Dehydration increased an individual's risk for UTI. (Staying well hydrated by drinking enough water and beverages (non-caffeinated) daily helps to flush waste from the body when urinating and can lower risk (17).

Causes of UTIs

- UTIs are caused when bacteria enter the urinary tract. This happens when feces from the rectum find their way into the urethra. It can occur when a female wipes her perianal area from the front instead of the back of the body (9) (5) (2) (Figure 3).

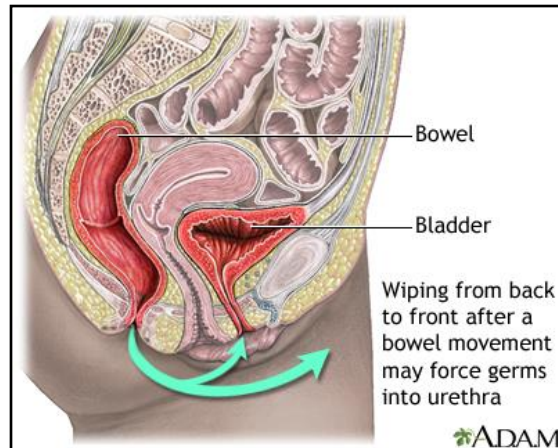


Figure 3.

- Escherichia coli (E. coli) is the most common bacteria found to cause UTIs in the community, accounting for greater than 80% of all diagnoses, but any bacteria can cause a UTI (2) (14) (16).
- Another cause of UTI can be small amounts of urine left sitting in the bladder (stagnant residual) after urinating. Urine residual happens when the bladder is not emptied completely during urination, creating an environment for bacterial growth (i.e., dark, warm, and moist). Sometimes this condition requires in-out (straight) catheterization, which creates another opportunity for bacteria to enter the urinary tract (14).

Identifying UTIs

Collection of a mid-stream clean catch urine specimen is the first step to diagnosis of a UTI.

- It is important not to contaminate the urine specimen with bacteria from outside of the body when collecting a urine specimen (24).
- The best time to collect urine is in the morning, when the urine has been in the bladder for several hours (24).

- A special urine collection kit obtained from the primary care physician's (PCP's) office should be used to collect the specimen. (The kit should have a sample cup with a lid and disinfecting wipes to be used to clean the perianal area before collection (24). Be sure to write the individuals last name and date of birth on the cup label with a permanent marker if you are assisting with the urine collection).
- Follow the specific step-by-step instructions in the kit for collecting a clean catch urine sample. Staff should wear gloves and remain with the individual to assist if needed, and to ensure a clean catch urine is obtained (24).
- Some individuals are not cognitively able to follow verbal direction to obtain a clean catch urine specimen. When this occurs, a specimen collection device or "toilet hat" can be inserted under the lid of the toilet to catch urine (if the individual is physically able to sit on the commode). Specimen collection devices are typically inexpensive and are made of plastic. The lab may be able to give you one to use, or the individual's PCP may write an order for one. If you think it will be needed, ask the physician for the device (15) (7) (Figure 4).



Figure 4.



- Non-ambulatory individuals who cannot sit upright on the commode can use a specialized ultra-absorbent gel collection insert in an incontinence brief for urine sample collection. The urine is then drawn out of the insert and tested. Adhesive (stick-on) urine collection bags may also be used. The drawback to both of these collection methods is the increased risk of contamination and inaccurate results (15).
- The "gold standard" method of urine specimen collection from an incontinent, non-ambulatory and/or non-compliant individual is a sterile in-out catheterization by a nurse. A needle aspiration of the bladder is another option if the individual is in an acute care facility (15) (7).

- After the urine is collected, it should be returned to the primary care physician's (PCP) office or lab immediately if possible. If it cannot be returned immediately following collection, it can be stored in the refrigerator in a plastic baggy until the next earliest opportunity for delivery (24). If a urine sample is left at room temperature it will affect the bacterial growth in the urine and will require another urine specimen to be collected (7).
- Complicated UTIs may involve more extensive testing to pinpoint the physical issue. This might include a pelvic examination, X-rays of the urinary tract, ultrasounds, computerized tomography (CT) scans, a scope of the urinary tract (cystoscopy), and or magnetic resonance imaging (MRI) to diagnose complications (4) (14).

Proper testing of the urine specimen is the second step in identify and treating UTIs.

- A urinalysis (UA) examines the color and clarity, content, and concentration of the urine (14) (Figure 5.).



Figure 5.

- Identifying bacterial growth and white blood cells in the specimen is initially confirmed by a dipstick test (urinalysis).
- To identify the specific bacteria causing the infection, a culture & sensitivity (C&S) test is required. This test identifies the specific bacteria causing the infection and enables the prescribing physician to determine which antibiotic will be most effective. A C&S takes approximately 3 to 5 days to complete (14).
- A C&S is recommended for recurring and relapsing UTI cases to ensure the right medication and length of treatment is implemented (4).

Treatment and Care of UTIs

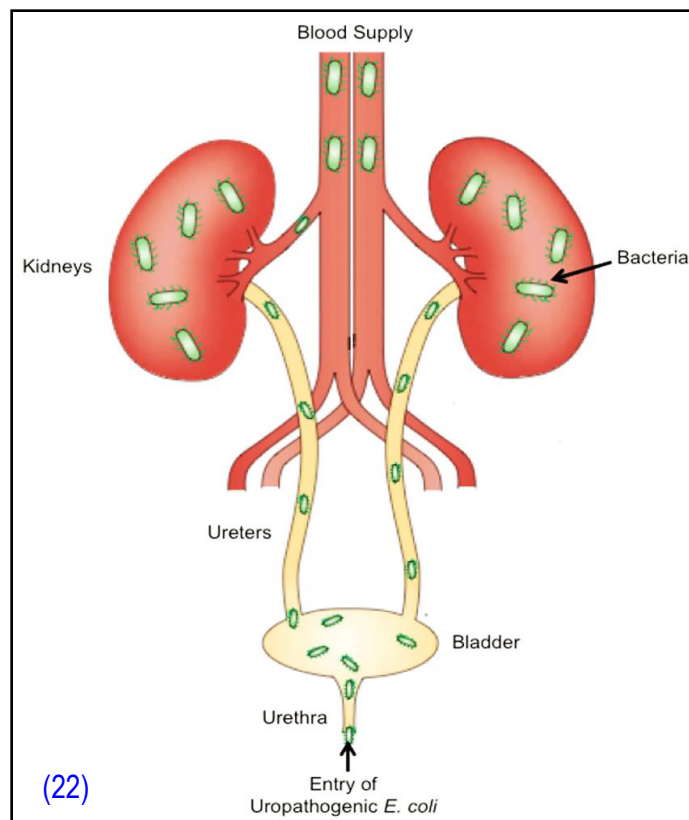
- UTIs with physical symptoms are treated with antibiotics. Other medications such as Ibuprofen (Advil, Motrin) and Pyridium (phenazopyridine) may be prescribed to treat symptoms of pain, burning and itching (6). Pyridium can cause symptomatic relief of pain, burning, urgency, frequency, and other discomfort, but causes the urine to become bright orange to gold in color and can stain bedsheets or clothing.
- The individual's PCP will start antibiotic treatment immediately based on the confirmation of infection. If physical symptoms continue after treatment has started, another antibiotic may be needed. The results of the C&S may indicate the need for another antibiotic, which may be more effective (4).
- Antibiotic treatment can range from between 3 – 10 days depending on the individual's infection and the physician's prescription (4). Antibiotic medications should be given as soon as the prescription is obtained from the pharmacy, unless directed otherwise. Antibiotic medications should be given exactly as prescribed, until all of the medication is gone (6). If the medicine is accidentally spilled, spit out or vomited up, the prescribing physician, or the individual's PCP should be contacted immediately, so other options can be explored. It is important not to miss **any** doses.
- Antibiotic treatment works by either killing the bacterial or keeping the bacteria from replicating. Antibiotic levels in the blood must be consistently maintained in order to accomplish this task. If a dose of antibiotic is missed, (for whatever reason), it should be taken as soon as it is remembered (6). If unsure, contact the pharmacy where the medication was obtained, or the prescribing physician for guidance.
- Within 24 – 48 hours of taking antibiotics, signs and symptoms of UTI (pain, burning, etc.) should begin to lessen. Symptoms of the UTI should be completely gone after finishing the medication. If any symptoms remain, it is very important to notify the diagnosing physician for reevaluation immediately (4).
- There is a high risk of sepsis with UTIs, and sepsis symptoms can progress rapidly (19). If symptoms worsen or new symptoms appear (fever, chills, fast breathing or panting (tachypnea), or fast heartbeat >100), at any point during their treatment, or after the individual has taken all of their medicine; **take the individual to the emergency room immediately or call 911.**
- Treatment of complicated UTIs may require surgical intervention, such as needle drainage and ultrasound shockwaves to clear obstructions like bladder stones (14).

- Antibiotic bladder irrigation is a treatment option available to individuals experiencing several recurrent UTIs (4).
- Individuals diagnosed with serious kidney infections may need to be hospitalized for IV antibiotic treatment and or surgical intervention (2).
- Currently there are no over-the-counter (OTC) treatments to treat UTIs or prevent recurrence. Numerous research studies have been conducted to review the effectiveness of using Chinese herbal remedies, cranberry juice, etc. but no study has produced any evidence of effectiveness (8) (4) (14).

UTI Complications

The bacteria associated with urinary tract infections can cause chronic kidney infections (pyelonephritis), permanent renal damage, pre-term births, and serious antibiotic-resistant complications such as *Clostridium difficile* (C. diff) in individuals (14).

A UTI will not clear up on its own; it must be treated with antibiotics. If no medical interventions are provided, a UTI can cause kidney failure, sepsis and/or death in all age groups (9) (2). Sepsis can occur if bacterial pathogens leave the urinary tract and travel to other parts of the body via the blood stream (Figure 6).



Urinary Tract Sepsis (Figure 6).

Lowering Risk

- Educating individual's and caregivers regarding proper perianal hygiene is most effective in reducing UTIs (13) (2).
- Staying well hydrated flushes bacteria from the body when urinating (13) (2).
- Drinking adequate amounts of non-caffeinated fluids assists the bladder muscles in remaining firm and healthy to enable better evacuation of urine from the body (13) (2).
- Performing proper catheter care hygiene on a regular basis as prescribed by a physician and maintaining scheduled replacement appointments has been shown to lowers the risk of CAUTI in individuals with indwelling urinary and or suprapubic catheters. Regular review of the individual's underlying health conditions requiring an indwelling catheter, with a possible treatment change to periodic catheterization, if possible, may be the best way to reduce risk of CAUTI (7).
- Pharmacy research is working on developing a vaccine, currently in clinical trials, which would target and reduce E.coli bacteria growth in the urinary tract (9) (18).

Caregiver Considerations

- The over prescribing of antibiotic treatment for UTIs over the past 50 years is in large part responsible for the development of antibiotic-resistant organisms such as *Clostridium difficile* (C. diff) and *Methicillin-resistant Staphylococcus aureus* (MRSA) (14).
- While an individual is being treated with antibiotics, it is important to be aware of other imbalances, which could produce secondary infections, such as yeast infections and persistent diarrhea. If the individual has experienced C. diff or MRSA in the past, (due to antibiotic treatment), be sure to inform the prescribing physician and the individual's PCP of this history (6).
- For individuals with diabetes, a diagnoses of UTI requires special caregiver considerations and observation. Caregivers should be aware of the increased risk of acute kidney infection UTI and septic shock. If signs and symptoms of UTI are suspected in an individual with diabetes they should be examined by their PCP immediately (21). If the individual's PCP is unavailable on the day, you call for an appointment, the individual should be examined in an urgent care center or an emergency room immediately.

Resources

The Office of Integrated Health at DBHDS: If you have any questions about the information contained in this Health & Safety Alert, or need additional resources or support, please email your questions to the Office of Integrated Health's nursing team at: communitynursing@dbhds.virginia.gov

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The Office of Women's Health at womenshealth.gov a division of the U.S.

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