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Urinary Tract Infection

By Robert S. Hollabaugh, Jr. MD

Urinary tract infections (UTIs) commonly affect both women and men. In general, the term UTI includes bladder and kidney infections; however, your doctor may specify between infections located only in the bladder (**cystitis**), the prostate (**prostatitis**), and more severe infections in the kidneys (**pyelonephritis**). Bacteria are the cause of most infections. They enter the bladder by traveling up the urethra (where urine passes) from the outside world. In most cases, your primary care doctor can treat the infection with antibiotics without additional investigation. When the infection persists or recurs often, you may require a more extensive evaluation by a urologist.

If the infections are difficult to clear or recur, your urologist will often check additional lab tests to see if there is an underlying cause. The simplest tests involve a urinalysis with a bacterial culture of the urine. This confirms the actual type of bacteria and tests which antibiotics will be effective for your infection. Additional evaluation by x-rays, which may include a **kidney ultrasound**, IVP (**intravenous pyelogram**) or **CT scan**, gives information about the anatomy of your urinary tract. Kidney stones, blocked kidneys, and bladder malformations are common things that doctors look for with these tests. Sometimes **cystoscopy**, where a small scope is inserted into your bladder through the opening of the urethra, is performed. It is a very simple and quick procedure that can give a lot of information about your bladder.

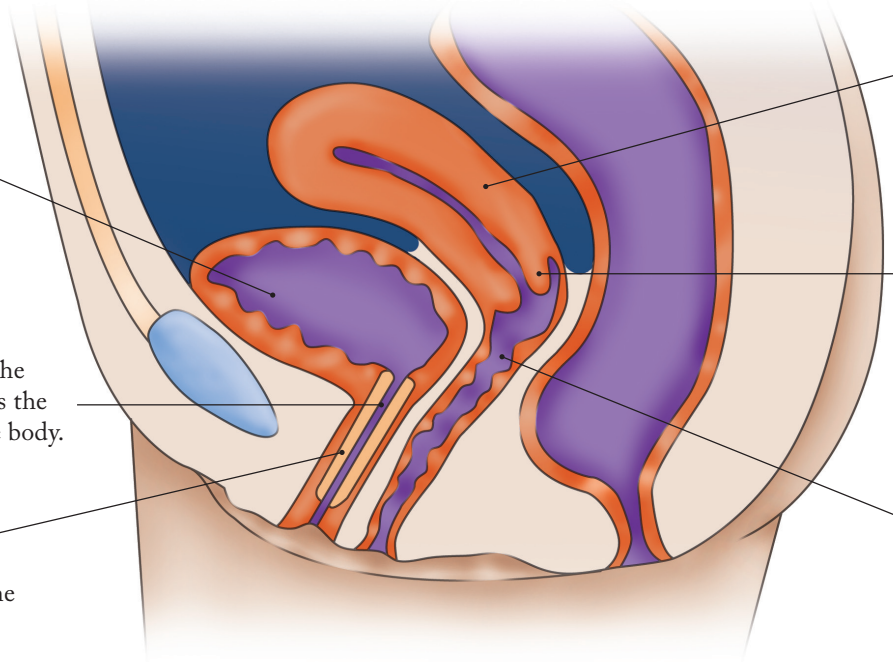
Urinary tract infections are **more common in females**. The length of the urethra is much shorter, and this offers an easier route for bacteria to get into the bladder. Many natural mechanisms guard against these infections. Your body's immune system, the natural "flushing action" of emptying your bladder and urine acidity levels can usually stop infections before they start.

A variety of **symptoms** may accompany a UTI:

- burning when urinating
- frequent or urgent urination
- waking up often to urinate
- bloody urine
- inability to control urination
- bladder or kidney pain
- fever or rigors

Most UTIs in adults are isolated events, and if they resolve with standard antibiotics then no further evaluation may be recommended. For simple infections, a one or two day course of antibiotics may do. More complicated infections may require 7 – 14 days. In some situations, chronic infections may develop that can call for low dose antibiotics for 30 to 90 days duration. Many factors in your medical history may guide your doctor in your treatment. After the infection has been treated, it is not uncommon to still have persistent symptoms related to the swelling caused by infection. These may last for up to six weeks and may require medicines to calm the bladder or sooth the burning. It is very important to **complete all the antibiotics your doctor prescribes** and to contact the office if your symptoms worsen or are accompanied by high fever. A follow-up visit may be scheduled to recheck the urine for infection. Together with your doctor,

FEMALE ANATOMY



most urinary tract infections resolve quickly without becoming more serious events.

Urinary tract infections in infants and children are more concerning, and need more immediate attention. Many congenital anomalies of the urinary tract exist that are associated with UTI's. In kids, it is important to rule out these potential anatomical problems early because the developing kidney may be at risk. Even a single UTI in a child may warrant a full evaluation by a urologist.

UTI's and Post-Menopausal Women

Estrogen has a variety of effects on the vaginal tissues. When present, estrogen helps to maintain the appropriate acidity of the vaginal environment; when deficient, the vagina becomes alkaline, permitting bacteria to multiply more easily. When bacteria multiply in a vicinity so close to the opening of the bladder, urinary infections can result. A lack of estrogen also causes deterioration of the vaginal lining and opening to the bladder which allows easier adhesion by bacteria. This also increases the risk bladder infection. Vaginal estrogen creams can be useful in treating this problem. Estrogen deficiency is one of the most common factors related to recurrent urinary tract infections in post menopausal females.

Blood in the Urine

Blood in the urine (**Hematuria**), either plainly visible or microscopic, is never normal. It is, however, fairly common. All cases of bloody urination need to be evaluated. In many cases, something as simple as a urinary tract infection can be the cause. If a doctor is able to reliably explain the cause of the blood, then no further testing may be required. In cases of a UTI, most doctors will treat the infection and then recheck a urinalysis 3-6 weeks later to make sure that the blood has resolved. (If you re-check the urine too soon, traces of blood with still be there.) The infection in the bladder makes the blood vessels in the lining of the bladder irritated. When irritated, these vessels bleed easily causing hematuria. The most common causes of hematuria are UTI and kidney stones. However, there are other more ominous causes that need to be ruled out: Bladder cancer, Kidney cancer, and Kidney blockages to name a few. Your doctor can help make sure what tests are needed to properly evaluate your situation.

The Truth About Cranberries

You may have heard that cranberry juice will help prevent bladder infections. This is true to some extent. First of all, drinking lots of any fluid will have a cleansing action on the bladder. By drinking more fluid, your body produces more urine. The more urine you make, the more frequently you will urinate. Emptying your bladder more frequently will flush out bacteria and help clear urinary infection.

While drinking lots of cranberry juice will cause increased urination, it also has some unique factors that may further help in managing UTIs. Because of its chemical composition, cranberry juice can acidify the urine. Acidic urine (low urinary pH) inhibits bacterial multiplication. More importantly, cranberry juice has chemicals in it that alter the ability of bacteria to stick to the lining of the urinary tract. If bacteria have less ability to adhere, then they flush out easier. Overall, these factors of increased urinary acidification and inhibition of bacterial adherence make cranberry juice a useful, if not limited, tool in the prevention of UTIs. Remember, it is the chemistry of actual cranberries, not just the flavor, that is helpful. Don't be fooled by drinking cranberry flavored drinks; most of them have little, if any, real cranberry in them.

Risk Factors

A variety of factors can influence how bacteria get into the bladder to cause UTIs. Some risk factors include:

- poor hygiene. After using the bathroom, females need to wipe the vaginal area from front to back to avoid introducing bacteria to the urethra. Going from back to front can relocate bacteria from the rectum to the urethra.
- sexual activity. The mechanics of sex can force naturally occurring vaginal bacteria into the urethra. This is perhaps the most common cause of adult UTI's. Likewise, anything put into the vaginal area regularly can accomplish the same result, not just sexual activity. Similar effect may be seem with vaginal hygiene products, horseback riding, straddle-type seats, as well as clothing items associated with vaginal pressure like thong underwear or leotards.
- retained urine in the bladder. If your bladder is not emptying completely, the remaining urine is stagnant and becomes infected more easily.
- blockages in the urinary tract. Any blockage, such as from an enlarged prostate or kidney stone, can result in poor emptying and lead to infections.
- medical illnesses. Diabetes in particular can impair the immune system and predispose to a variety of infections.

Diagnostics

URINE CULTURE

The best way to fully assess for the presence of infection requires growing any bacteria found in the urine and testing antibiotics against it. Some symptoms that suggest infection may NOT be infection, and a urine culture helps to clarify this. For women, a catheter may be necessary to get a sample of urine that is not contaminated with bacteria from the vagina. If you are collecting a urine specimen in the doctors office, make sure to use good technique. Women need to spread the labia with one hand, wipe off the opening, let the urine stream start, and then catch a sample mid-stream. Men need to make sure to completely retract the foreskin, clean the meatus, let the stream start, and then catch a sample mid-stream. Incorrect collection will lead to incorrect diagnosis and treatment.

X-RAY IMAGING

In some instances abnormalities of the urinary system can lead to recurrent infections or symptoms of infection. Poor drainage from birth defects of the urinary system, obstruction from stone or cancer, or stones themselves can be the source of recurrent UTI. A CT scan or IVP can aid in detecting these problems and potentially resolve the issue following treatment.

CYSTOSCOPY

By using a lighted scope to examine the lower urinary tract (bladder and urethra), your doctor can look for abnormalities that can lead to

recurrent infections. These include stones, tumors, narrowing of the urethra or areas of the urethra with poor drainage (urethral diverticulum). The procedure is usually short, has limited discomfort, and can be done in the office.

Did You Know?

- urine is sterile? It is normal for urine to have an odor, but the odor is usually from urinary chemicals not bacteria. Bacteria in the urine are always abnormal.
- UTIs during pregnancy can be very dangerous? Therefore, your OB-GYN will routinely check a urinalysis. If you regularly have UTIs, make sure to tell your OB-GYN.
- in men, a UTI may falsely elevate your PSA? Therefore, a PSA should not be checked during an episode of UTI.
- a UTI in a child always needs to be further evaluated? Childhood UTIs raise the concern for abnormalities of the urinary tract. If not treated properly, these abnormalities may affect normal kidney development.
- treating a UTI with antibiotics may cause a vaginal yeast infection? It is natural for both bacteria and yeast to live in the vaginal area. They establish a healthy balance. When you take antibiotics, the antibiotic indiscriminately kills bacteria throughout the body. Some of the bacteria in the vagina are killed, the balance is disrupted, and the yeast take over. This is not a sign of anything bad, and seems to be more common in some women than others. If this is a common problem for you, tell your doctor.
- Not all antibiotics can effectively treat a UTI. Sometimes, a particular antibiotic cannot concentrate in the body tissue where infection exists. In other cases, the bacteria responsible are resistant to certain types of antibiotic.

BACTERIA

Infections and Chronic Catheters

Some circumstances deserve special attention. In cases where the b ladder cannot empty on its own, doctors may recommend a catheter be placed as a long term solution. Even though the catheter is changed monthly, bacteria will colonize the inside of the bladder. In any other circumstance, bacteria in the bladder would be considered a problem. With a catheter longterm, we know that bacteria will colonize the bladder, usually without problem. If a culture is checked it will always indicate "infection." These circumstances are not "infections" however, just "colonizations." The bladder becomes tolerant of the colonization and no treatment is usually necessary. If the bacteria invades the bladder wall, "infection" may develop and require treatment. Such circumstances usually will have associated bleeding or fever. In the absence of that, however, "colonization" need not be treated in patients with chronic catheters.

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