

Landmark Urology and Complementary Medicine

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Female Recurrent Urinary Tract Infections

Urinary tract infections (abbreviated 'UTI') account for over 7 million visits to health care providers annually and cost the US health care system 1 billion dollars annually.¹ Nearly fifty percent of women will develop a urinary tract infection during their lifetime. Eighty percent of these women will subsequently develop another UTI within the ensuing 18 months. Women with recurrent UTIs typically experience two to three infections per year. Although it not always possible to prevent recurrent UTIs, the following information can help women devise a program to manage recurrent urinary tract infections.

Definition:

The *urinary tract* consists of the kidneys, ureters (tubes that carry urine from the kidneys), bladder, and urethra (tube that carries urine from the bladder to the outside). Normally urine is sterile (free of infection). *Urinary tract infections* occur when small microscopic organisms called bacteria invade the urinary tract. A urinary tract infection is called *pyelonephritis* when it occurs in the kidney, *cystitis* when it occurs in the bladder, and *urethritis* when it occurs in the urethra.

Finally, UTIs are subdivided into complicated and uncomplicated varieties. Urinary tract infections are classified as complicated when there is a history of hematuria (blood in the urine), neurogenic bladder (e.g., spinal cord injury), recent urinary tract surgery or catheterization, unusual types of bacteria (e.g. Klebsiella, Pseudomonas, or Proteus species), diabetes, compromised immune system (e.g., chronic steroid use, AIDS), UTIs that fail to respond to initial treatment, and renal failure. Other types of urinary tract infections are considered uncomplicated.²

Etiology:

Over 80% of UTIs are caused by bacteria called *e.coli*. The bacteria originally come from the bowel and then make their way into the vagina. Bacteria such as lactobacteria are normally present in vagina and help maintain a healthy environment and prevent yeast overgrowth. It's not unusual for bacteria to get massaged into the urethra and bladder during intercourse, but a protective lining inside the urinary tract prevents the bacteria from sticking to the surface until they get flushed out during urination. On the other hand, the protective barrier doesn't work as well in women with recurrent UTIs; therefore, bacteria stick more easily.

In addition, certain types of bacterial are more virulent; they secrete chemicals that help them evade the immune system and sport special hair-like projections called 'pili' that help them cling to the urinary tract lining.

Although rare, other factors that predispose women to recurrent urinary tract infections include infected kidney stones and a pocket of pus located beneath the urethra

called a urethral diverticulum. These two conditions occur in women with *persistent* UTIs; that is, infections initially respond to antibiotic therapy and then reoccur once the medication is stopped. Special tests can help diagnose these conditions and surgery can correct the problem.

Risk Factors:

Risk factors for developing recurrent urinary tract infections vary with age.³ Risk factors in **premenopausal women** include history of a UTI as a child, mother with a history of UTIs, and sexual activity. Women that are more active sexually, especially if they have had more than one new partner within the past year, are more likely to develop a UTI. The type of birth control used is also relevant. The use of a diaphragm and condoms that contain spermicidal jelly increase the risk of developing recurrent UTIs.

Risk factors in **postmenopausal women** include lack of vaginal estrogen, history of UTI in premenopause, and non-secretor blood type (genetically inherited).

Risk factors in **elderly women** include catheterization, urinary incontinence, cystocele (dropped bladder), retention of urine, injudicious use of antibiotics, and impaired function (e.g., stroke, Alzheimers).

Diagnosis:

Symptomatic UTIs cause *symptoms* such as frequent urination, burning urination, sensation of incomplete bladder emptying, pain or pressure in the lower abdomen and *signs* such as foul smelling, cloudy, or bloody urine. If untreated, bladder infections can migrate to the kidneys and cause pyelonephritis, which is a more serious type of infection.

A sample of urine is sent to a laboratory and cultured to accurately identify the type of bacteria and to help determine which antibiotic will most effectively eradicate the infection. Occasionally it is necessary to collect a catheterized specimen, especially if the voided specimen is contaminated with skin cells. In the meantime, patients are often started on a trial of antibiotics, especially if they are experiencing symptoms, until the culture results are available, which are usually within 48 hours. Occasionally it is necessary to switch the antibiotics if the culture results show that the bacteria is resistant to the initial antibiotic.

If infections persist or fail to respond to normal measures, additional workup may be necessary. Tests that may be ordered include an ultrasound or x-ray of the kidneys and bladder and cystoscopy. Cystoscopy is a simple procedure that is performed in the office. Numbing jelly is first instilled into the urethra. Next a special instrument called a cystoscope is gently inserted into the urethra and into the bladder. Sterile fluid is used to fill the bladder and a small instrument with a light and special lens at the end is used to examine the bladder. Live pictures of the procedure are displayed on a television monitor.

Treatment:

Symptomatic bacterial infections are treated with antibiotics. If the infection is treated promptly, a three-day course of antibiotics is as effective as a seven to ten-day course of medication. Furthermore, a shorter course of therapy costs less and causes fewer side effects such a diarrhea or vaginal yeast infection compared to a longer course of treatment. Options for treating uncomplicated urinary tract infections include one or more of the following:

Self-directed therapy: According to scientific studies, women can accurately diagnose a UTI based on symptoms alone. Researchers reported that 84% of urine cultures showed an infection and 11% of specimens showed pus cells or bacteria when women experienced UTI symptoms.⁴

If women can identify when they have a UTI and the infection responds to a three-day course of antibiotics, then self-directed therapy is a viable option for treating subsequent infections. The routine is as follows: At the first onset of UTI symptoms, women take an antibiotic and continue therapy for three days. The choice of antibiotics varies, but may be either Macrochantin 50 mg four times daily, Macrobid 100 mg twice daily, Septra DS one tablet twice daily, or a fluoroquinolone such as Cipro 500mg (one half or one pill) twice daily, Cipro XR 1000mg once daily, or Levaquin 500mg (one half or one pill) once daily. Yearly office visits are required before another twelve-month prescription for antibiotics will be written.

If symptoms persist despite antibiotic therapy, it may be caused by a 'break through' infection. Three quarters of subsequent infections are caused by a different strain of bacteria. Although most of these bacteria will respond to the chosen antibiotic, bacteria can develop resistance, especially if antibiotics are used frequently. If an antibiotic other than a fluoroquinolone has been routinely used for self-directed therapy, additional treatment with a three-day course of a fluorquinolone will usually eradicate the break through infection. If symptoms persist though, or frequent break through infections occur, a repeat office visit is recommended. In this situation, antibiotics should be stopped for at least 24 hours before coming in for visit to allow sufficient time for antibiotics to be cleared from the system, especially if once-a-day antibiotics have been used, since residual antibiotics will interfere with the urine culture results. A mid stream or catheterized urine culture will help sort out whether lingering symptoms are due to inflammation versus a resistant bacterial organism.

Antibiotic after sex:

If UTIs occur after sexual intercourse, taking a single antibiotic after sex can prevent recurrent urinary tract infections.⁵ Alternatively, self-directed therapy may require fewer antibiotics in the long run, depending upon the level of sexual activity and number of yearly infections.

Continuous antibiotic suppression:

If infections occur more than 4 times yearly, taking one quarter of the normal dose of antibiotics either nightly or every other day can prevent infections by 95% as long as the antibiotics are continued.⁶ However, once the antibiotics are stopped, UTIs will usually reoccur.

When not to treat a UTI:

Approximately 3.5% of the general population has bacteria in their urine without symptoms. The incidence of asymptomatic bacteriuria increases with age and affects 15-20% of women aged 65-70 and 20-50% for women older than 80 years. Furthermore, it's not unusual for female children and patients with diabetes or spinal cord injuries to have asymptomatic bacteriuria. Antibiotic treatment is not only unnecessary in this situation,

it can actually make matters worse. Treating asymptomatic bacteriuria with antibiotics increases the risk of developing a serious kidney infection.⁷

Prevention:

Scientific research has shown that the use of spermicides adversely affects the vaginal ecosystem and increases the risk of recurrent UTIs. Consumption of eight ounces of unsweetened cranberry juice daily or taking a cranberry extract pill three times daily can also decrease the incidence of recurrent UTIs.

Unproven, but common sense measures that may decrease the incidence of recurrent UTIs include drinking at least 64 ounces of water daily, wiping after urination from front to back, urinating after sexual intercourse, and avoiding chemical douches.

Urinary irritants such as caffeine and consumption of hot and spicy foods won't cause a UTI but they can provoke symptoms that mimic 'cystitis'. Keeping a diary of food and beverage consumption during symptomatic episodes can help identify triggers. Stress is another common cause of bladder symptoms. Stress activates the adrenal glands to release adrenaline – the 'fight-or-flight' hormone- that in turn stimulates the nerves that cause the bladder to become overactive.

Taking a probiotic such as acidophilus twice daily with food whenever antibiotics are taken and for several weeks thereafter can help prevent antibiotic-related side effects such as abdominal bloating, diarrhea, and vaginal yeast infection. Probiotics should be refrigerated after the bottle is opened.

¹ Nickel, JC. Practical Management of Recurrent Urinary Tract Infections in Premenopausal Women. *Reviews in Urology*. 2005; 7 (1): 11-17

² Krieger, JN. Urinary Tract Infections: What's New? *J Urol*. 2002; 168: 2351-2358

³ Krieger, JN. Urinary Tract Infections: What's New? *J Urol*. 2002; 168: 2351-2358

⁴ Gupta, K, et al. Patient-initiated treatment of uncomplicated recurrent urinary tract infections in young women. *Ann Intern Med*. 2001; 135: 9-16

⁵ Stapleton, AE et al. Postcoital antimicrobial prophylaxis for recurrent urinary tract infections : A randomized, double-blind, placebo-controlled trial. *JAMA*. 1990; 264: 703-706

⁶ Krieger, JN. Urinary Tract Infections: What's New? *J Urol*. 2002; 168: 2351-2358

⁷ Krieger, JN. Urinary Tract Infections: What's New? *J Urol*. 2002; 168: 2351-2358