



COMMENTARY

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## Infection of the Urinary Tract: Management and Pathogenesis

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### Description

An illness that impacts the urinary tract in any way is known as a urinary tract infection (UTI). Depending on which part of the urinary system it affects, it is referred to as a kidney infection or a bladder infection. Lower urinary tract infections can cause discomfort when urinating, frequent urination, and the sensation to urinate even when one's bladder is empty.

In addition to the signs of a lower UTI, kidney infections frequently present with fever and flank pain. Very rarely, the urine may look bloody. Symptoms may be hazy or non-specific in the very young and the very old. *Escherichia coli* are the most frequent cause of illness, while other bacteria or fungi can also play a role. Female anatomy, sexual activity, diabetes, obesity, and family history are all risk factors. UTIs are not considered to be sexually transmitted infections, despite the fact that sexual activity is a risk factor (STIs). If a kidney infection does develop, it frequently follows a bladder infection but can also be brought on by a blood-borne illness. In young, healthy women, a diagnosis can be made only on the basis of symptoms. Because bacteria may be present without an illness, diagnosis can be challenging in patients with hazy symptoms. A urine culture may be helpful in complex instances or if treatment fails.

### Treatment

Antibiotics are the foundation of the therapy. Sometimes, in the early stages of a bladder infection, phenazopyridine is also recommended in addition to medicines to relieve the burning and itchiness that might occasionally accompany the condition. However, it is not frequently advised due to safety issues with its use, notably a higher risk of methemoglobinemia.

Fever can be treated using paracetamol. For treating current infections, there isn't enough solid data to support the usage of cranberry products. Both simple and complex UTIs, such as acute pyelonephritis, can be successfully treated with fosfomycin. On the basis of only the symptoms, uncomplicated illnesses can be identified and treated. The first line of defence usually involves oral antibiotics like trimethoprim/sulfamethoxazole, nitrofurantoin, or fosfomycin. A fluoroquinolone, cephalosporin, and amoxicillin/clavulanic acid are other options. The bacteria that cause urinary infections have, however, been developing an increased resistance to fluoroquinolone antibiotics. Because fluoroquinolones carry a higher risk of significant adverse effects such as tendinitis, tendon rupture, and exacerbation of myasthenia gravis, the Food and Drug Administration (FDA) advises against using them when other options are available, including by adding a Boxed Warning.

Complex UTIs are more challenging to treat and typically call for rigorous examination, therapy, and follow-up. It could be necessary to locate the underlying issue and deal with it. Antibiotic resistance is raising concerns about the future of treating difficult and recurrent UTI. The usual rule is that antibiotics shouldn't be given to those who have germs in their urine but no symptoms. The elderly, individuals who have had spinal cord injuries, and people using urine catheters are all included in this. It is advised that women use antibiotics for seven days during pregnancy as an exception. Pyelonephritis, which raises the risk of low birth weight and premature birth if untreated, can develop in up to 30% of moms. Others suggest treating diabetes patients as well as treating them before to surgeries on the urinary system that are likely to result in bleeding.

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## **Pathogenesis**

Usually, the urethra is the route *via* which the germs that cause urinary tract infections enter the bladder. Yet, the lymphatic system or blood might potentially become infected. According to theory, the bacteria are typically passed from the intestine to the urethra, with females being more susceptible because of their anatomical makeup. *E. coli* is able to enter the bladder and then stick to the bladder wall to create a biofilm that helps to stop the body's immunological response. The most frequent bacteria to cause urinary tract infections

are *Escherichia coli*, which is followed by Klebsiella and Proteus species. Stone disease is commonly connected to Klebsiella and Proteus spp. Gram positive bacteria like Enterococcus and Staphylococcus are more widespread. It has been reported all around the world that urinary bacteria are becoming more resistant to quinolone antibiotics, which may be due to their overuse and improper handling.