
Urinary Tract Infection

Introduction

Urinary tract infections are a common cause of morbidity and can lead to significant mortality. Careful diagnosis and treatment result in successful resolution of infections in most instances.

Definitions

Urinary tract infection is an inflammatory response of the urothelium to bacterial invasion that is usually associated with bacteriuria and pyuria.

Aetiopathogenesis

To cause UTI, the pathogen has to reach the urinary tract. Retrograde spread via the urethra is the most common mode. Haematogenous spread is another route, as in cases of tuberculosis or a renal abscess. Other possible modes may be lymphatic or contiguous spread from adjoining organs.

The susceptibility factors are different in both sexes and their relative role varies in different age groups. In children, faulty toilet training (e.g., infrequent voiding, incomplete voiding) and presence of congenital anomalies like vesicoureteric reflux, posterior urethral valves, congenital hydronephrosis, etc., are important factors.

A short urethra and proximity to the vaginal introitus and anus make the fair sex more susceptible to UTI. Sexual intercourse, trauma of childbirth, urethral instrumentation, etc., may further help the entry of these organisms into the urinary tract. Postmenopausal vaginal atrophy with a bacterial colonization and ineffective urethral seal due to a lax perineum or a prolapse of genitalia increase the risk of infection in elderly females.

In males, bacterial seeding in stagnant urine proximal to an obstruction is more common. A predisposing factor like a urethral stricture, neurogenic bladder or urolithiasis in adults and prostatic hypertrophy in the elderly should always be excluded.

Manifestations of UTI

Both systemic as well as local reactions occur to the invading pathogen. The systemic reactions occur more often following upper tract infections (i.e., kidney and ureter) and manifest as fever with rigors, malaise and anorexia. The local reactions manifest itself as pain and tenderness at the infected site along with frequency, dysuria and hematuria of variable degree. Urinary infections usually remain nonsuppurative (uncomplicated), though septicemia and suppuration (pus formation) may complicate them, especially if associated with obstruction.

Classification of UTI

Non- specific infections

Infection Types	Upper Tract	Lower Tract
(1) Acute Infections		
(a) Non-supportive	Acute Pyelonephritis Lobar Nephronia Papillary Necrosis	Acute Cystitis Acute Prostatitis Acute Urethritis Acute Epididymitis
(b)	Pyonephrosis Emphysematous Pyelonephritis	Prostatic abscess Periurethral abscess
(2) Chronic Infections	Chronic Pyelonephritis Xanthogranulomatous Pyelonephritis (XGPN)	Chronic Cystitis Chronic Prostatitis

Specific infections

These infections involve both upper and lower tracts simultaneously and are clinically present in both acute and chronic forms. Specific infections can be classified into

- (a) Nonparasitic infections – (i) Genitourinary tuberculosis (ii) Fungal infections
- (b) Parasitic infections – (i) Filariasis, (ii) Hydatid disease and (iii) Bilharziasis.

Bacteria

The cause of infection in uncomplicated outpatients is typically as follows:

- 85% of all UTI = E Coli (but only certain serotypes)
- 10 % = Klebsiella, Proteus, Pseudomonas, Enterobacter
- < 5% = Staph aureus, enterococcus, chlamydia, fungus, TB, other

If the UTI is acquired in the hospital, the causal organism is less likely to be E. Coli, and more likely to be another gram negative bacterium or Staph

How do I know if I have a urinary Tract Infection?

Symptoms you may experience could include:

- difficulty in urination
- burning or pain during urination
- Passing small amounts frequently
- A constant urge to empty bladder
- Cloudy or bloody urine

- 📌 Foul smelling urine
- 📌 Discomfort low in the abdomen

NOTE: Some of these symptoms may indicate other Problems. It is important to have your symptoms evaluated!

To diagnose a urinary tract infection, a clean urine sample is tested for the presence of white blood cells and other components. An increase in the number of white cells indicates a probable infection. The white cells multiply to fight off the infection.

A sample may also be placed in a culture medium to allow any bacteria to grow for 24 or more hours, so that it may be identified. Escherichia coli, an intestinal organism, is a frequently found bacteria due to the nearness of the urinary opening to the rectum.

If I should get a urinary Tract Infection, How would it be treated?

Often, if you notice the symptoms early, you may be able to clear the infection from your system by simply making sure that you drink plenty of non-alcoholic, non-caffeinated fluids (at least two additional quarts, and possibly more), and getting adequate rest.

If these simple measures do not suffice, you may need an antibiotic medication. There are a number of drugs which target the urinary system, many of which kill a wide variety of bacteria.

You should begin to feel better after at least twenty-four hours. You will need to continue to drink additional fluids throughout the course of your treatment to flush your bladder, as well as to help prevent some of the possible side effects of the medications.

In some cases, you may be given a special medication for urinary tract pain. If this is the case, your urine may be discolored. (At least one of the antibiotic drugs can change your urine's color, also.)

Once I've been treated, can I get a bladder Infection again?

Urinary tract infections can recur. If the reoccurrence is very soon after the original infection, it is often because the individual did not complete the treatment as it was suggested. It is important that you finish all of the medication, so that all of the infecting organisms are killed. Between 48 and 72 hours after completing the medication, return to the clinic to have another sample tested, so that you are sure the infection has been completely healed.

Another reason for recurrence of the same infection might be that the organism is resistant to that particular drug, in which case a different drug must be ordered for you.

Some women have frequent bladder infections. When possible, the cause of these infections is located so that appropriate preventive measures can be taken, especially in the case of structural defects or other pathology. For some women, no cause is identifiable. These women may need prophylactic antibiotics.

How can I prevent a Bladder Infection?

- Empty your bladder frequently, so that bacteria can't multiply.
- Always wipe from front to rear.
- Empty your bladder before and after intercourse.
- Wash your genital area before intercourse.
- Wear cotton underwear — it breathes, allowing air to circulate.
- Drink two to three quarts of liquid daily, to dilute your urine, and flush any bacteria out.
- Eat plenty of foods, including juices, that are rich in vitamins, and which acidify the urine, making it more difficult for bacteria to grow. (Yes, this includes cranberry juice.)

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