

## **What is a UTI?**

A urinary tract infection (UTI) is an infection caused by bacteria in any part of the urinary system, including the kidneys, ureters, bladder, and urethra. Women are more prone due to their shorter urethra.

## **Common Pathogens and Causes:**

The most common causative agent is *Escherichia coli* (E. coli), followed by *Klebsiella pneumoniae*, *Proteus mirabilis*, *Enterococcus faecalis*, and *Staphylococcus saprophyticus*. Risk factors include poor hygiene, catheter use, immune suppression, use of unclean baby diapers, and lifestyle factors.

## **Classification of UTIs:**

UTIs can be:

- Uncomplicated: Occur in healthy individuals with normal urinary tracts.
- Complicated: Associated with underlying conditions like pregnancy, catheters, kidney stones, or diabetes.

Types:

- Cystitis (bladder infection): causes dysuria, urgency, frequency.
- Pyelonephritis (kidney infection): causes flank pain, fever.
- Asymptomatic bacteriuria: bacteria present without symptoms.

UTIs in Pregnancy:

Very common during pregnancy, especially in the second trimester. Can be asymptomatic or symptomatic. Untreated UTIs can lead to pyelonephritis, premature labor, or kidney complications. 30% of asymptomatic bacteriuria may develop into symptomatic UTI.

### **Clinical Manifestations in Pregnancy:**

- Asymptomatic bacteriuria: no symptoms, detected through routine urine tests.
- Cystitis: burning sensation, frequent urination, suprapubic pain.
- Pyelonephritis: high fever, nausea, vomiting, flank pain, and risk of sepsis or kidney failure.

#### **Risk Factors:**

- Premenopausal: frequent sexual activity, spermicide use, new partners.
- Postmenopausal: reduced estrogen, vaginal dryness, loss of protective lactobacilli.
- Pregnancy: hormonal changes, bladder compression, residual urine.
- Others: Catheter use, incontinence, diabetes, poor hygiene. Pathogenesis:

Bacteria like uropathogenic *E. coli* attach to the urothelium using fimbriae, form biofilms, and evade the immune system. Infections often start from gut flora colonizing the urethra and bladder, especially with catheters.

### **Antibiotic Resistance:**

- Resistance is growing due to overuse and misuse of antibiotics.
- *E. coli*: rising resistance to trimethoprim-sulfamethoxazole (SXT) and ciprofloxacin.
- *K. pneumoniae*: naturally resistant to ampicillin and nitrofurantoin.
- *Proteus mirabilis*: high resistance to common antibiotics.
- ESBLs (e.g., TEM, SHV, CTX-M) break down penicillins and cephalosporins, making treatment difficult.

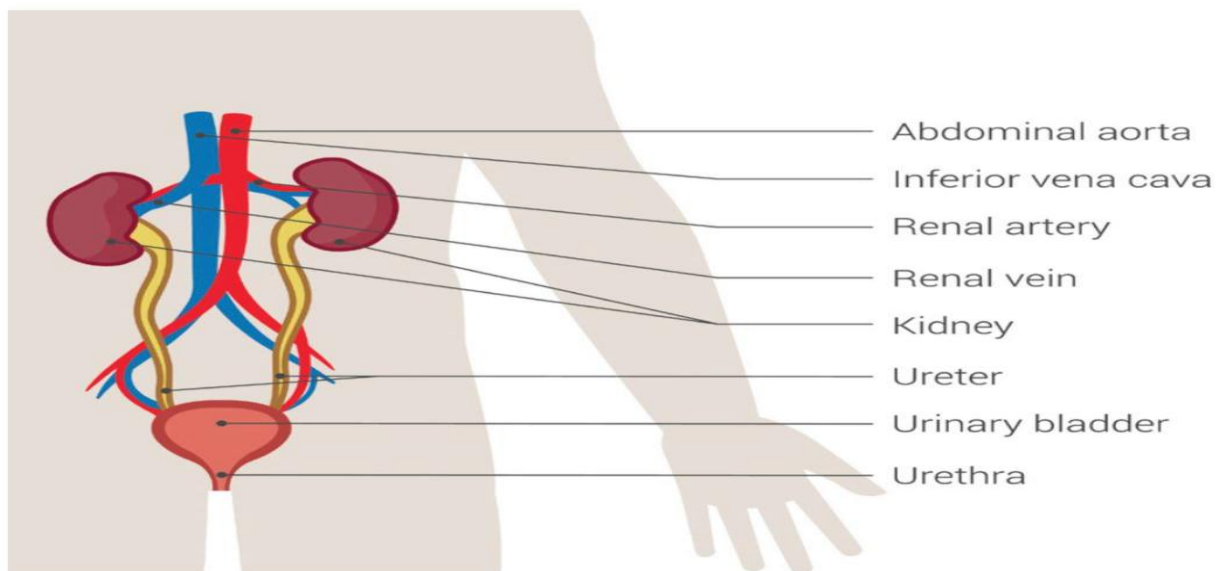
## Treatment Options:

- Common antibiotics: Nitrofurantoin, SXT, Ciprofloxacin, Ampicillin.
- Nitrofurantoin: effective for uncomplicated UTIs.
- Ciprofloxacin: used for complicated or hospital-acquired UTIs.
- New therapies: Combination drugs like ceftazidime-avibactam target resistant bacteria.

Treatment must be based on culture and sensitivity, especially in pregnancy (Why?).

## What is AFAB & AMAB ?

A UTI is a bacterial infection that usually involves the bladder and urethra (the tube that urine travels through to exit the body). Sometimes the bacteria can travel higher and infect the kidneys (pyelonephritis). Kidney infections can cause a more severe illness than a bladder infection. People AFAB are more likely than people assigned male at birth (AMAB) to get a UTI because their urethra is shorter, and bacteria can reach the bladder more easily.



The anatomy of people assigned female at birth (AFAB) includes a short urethra, making it easy for bacteria to infect the bladder.

# Common Bacterial Diseases of the Urinary Tract

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## 1. Cystitis (Bladder Infection)

Caused mainly by *Escherichia coli*. Symptoms include burning during urination, frequent urge to urinate, and lower abdominal pain. Common in women and often occurs after sexual activity or poor hygiene.

## 2. Pyelonephritis (Kidney Infection)

A serious infection that affects the kidneys. Often results from untreated cystitis. Caused by *E. coli*, *Proteus mirabilis*, or *Klebsiella*. Symptoms include fever, chills, flank pain, nausea, and vomiting.

## 3. Urethritis

Inflammation of the urethra, can be caused by *E. coli*, *Chlamydia trachomatis*, or *Mycoplasma genitalium*. Symptoms include painful urination and discharge. Often associated with sexually transmitted infections.

## 4. Prostatitis

Infection or inflammation of the prostate gland in males. Caused by *E. coli* and other Gram-negative bacteria. Symptoms include pelvic pain, painful urination, and difficulty urinating. Can be acute or chronic.

## 5. Asymptomatic Bacteriuria

Presence of bacteria in the urine without symptoms. Most often caused by *E. coli*. Common in pregnant women and elderly. Can lead to complications if untreated in high-risk patients.

## 6. Catheter-Associated Urinary Tract Infection (CAUTI)

Occurs in people using urinary catheters. Common bacteria include *E. coli*, *Pseudomonas aeruginosa*, and *Enterococcus*. Risk increases with prolonged catheter use and poor hygiene practices.

## **7. Urosepsis**

A severe infection that starts in the urinary tract and spreads to the bloodstream. Life-threatening. Caused by E. coli and Klebsiella species. Requires urgent medical treatment with antibiotics and hospitalization.