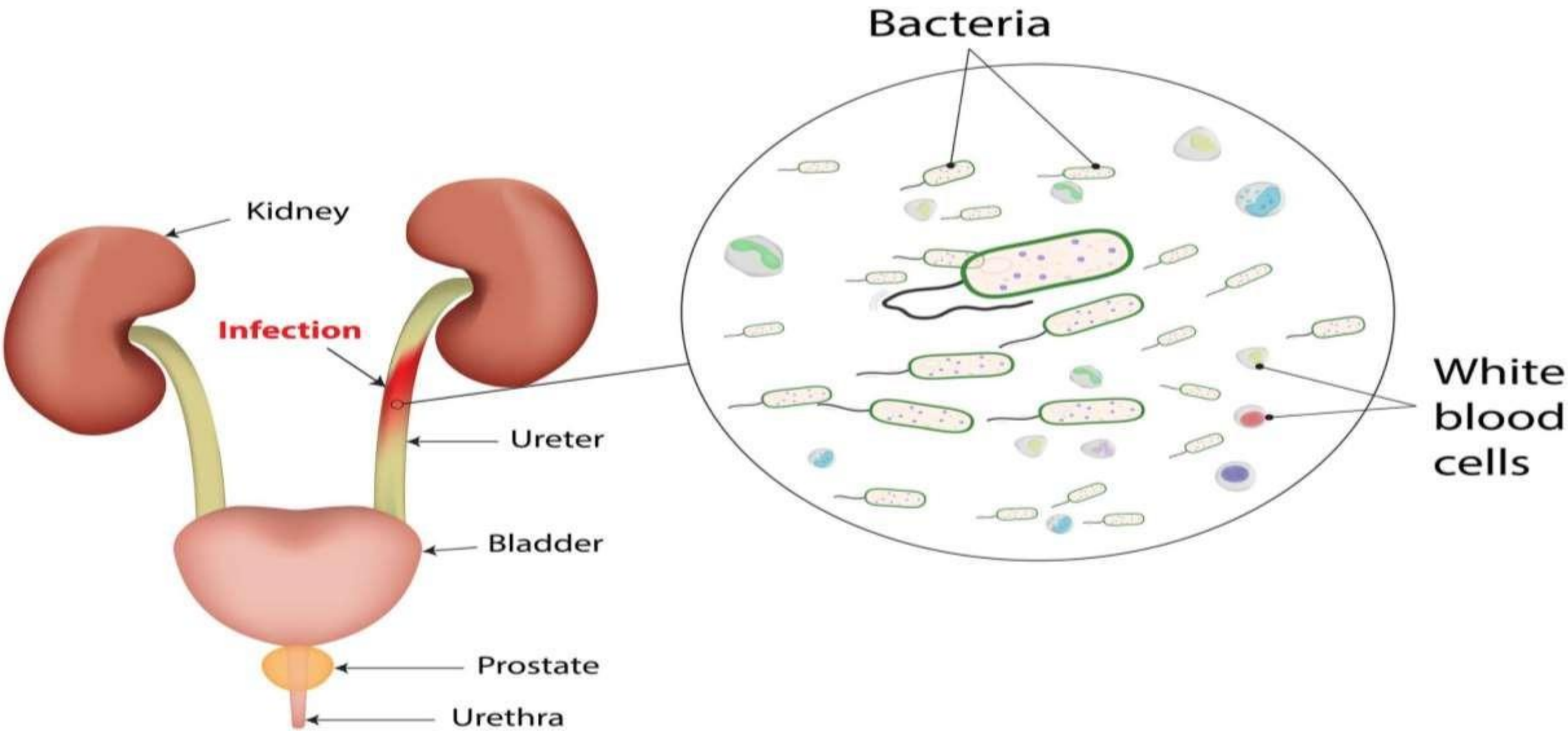
URINARY TRACT INFECTION (UTI)



Introduction

- Urinary tract infection (UTI) is a term that is applied to a variety of clinical conditions ranging from the asymptomatic presence of bacteria in the urine to severe infection of the kidney with resultant sepsis. UTI is one of the more common medical problems.

Definition of UTI

- UTI is an inflammatory response of the urothelium to bacterial invasion that is usually associated with bacteriuria and pyuria.

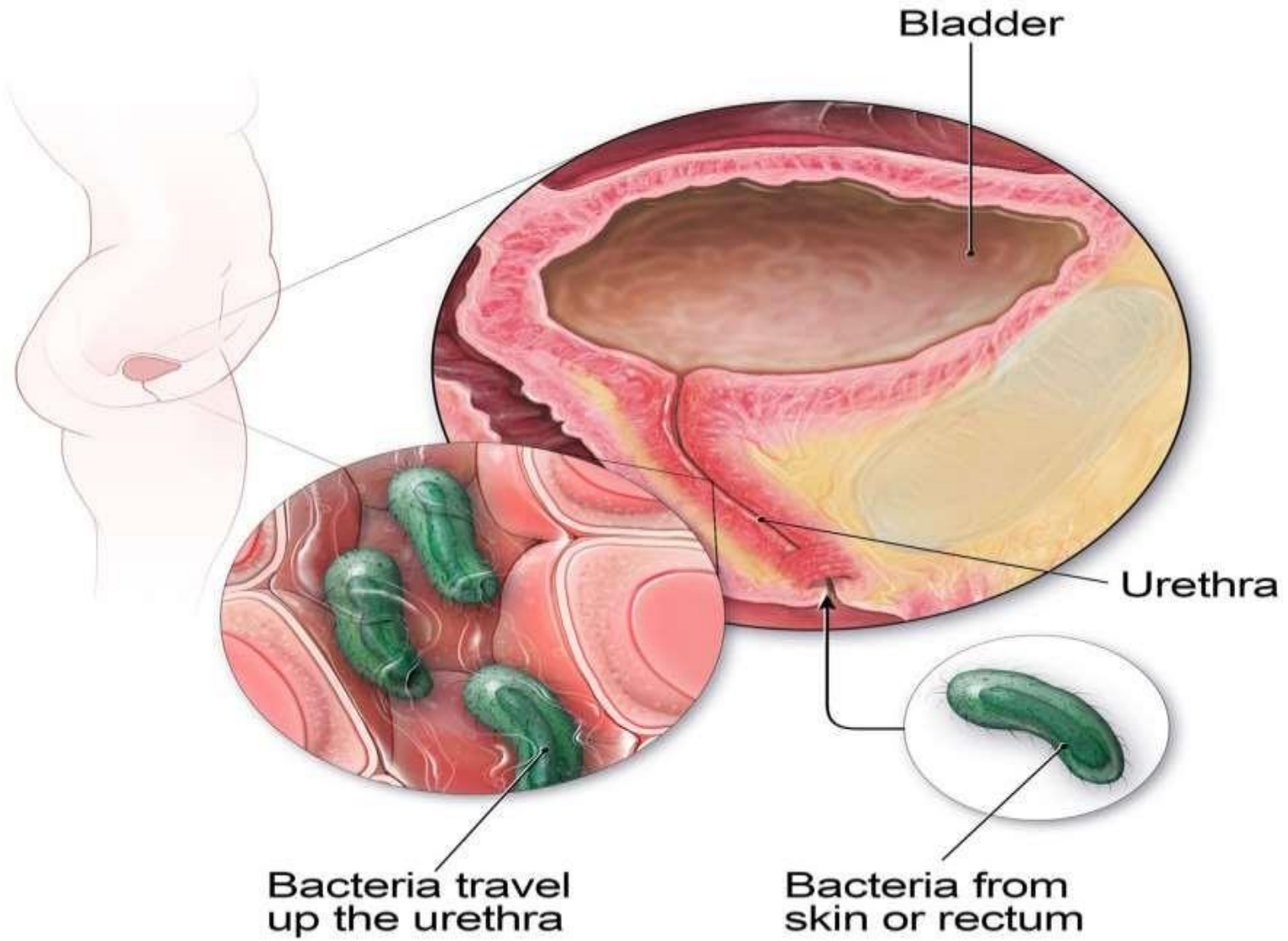
- Smith

Causative pathogens

- Most UTIs are caused by a single bacterial species. At least 80% of the uncomplicated cystitis and pyelonephritis are due to E. coli, with most of pathogenic strains belonging to the O serogroups (Orskov et al, 1982). Other less common uropathogens include Klebsiella, Proteus,and Enterobacter spp. and enterococci
- In hospitalacquired UTIs, a wider variety of causative organisms is
- found, including Pseudomonas and Staphylococcus spp. (Wagenlehner and Naber, 2000); UTIs caused by S.aureus often result from hematogenous dissemination.
- Group B beta-hemolytic streptococci can cause UTIs inpregnant women (Wood and Dillon, 1981).

Common microorganism causing UTI

- Escherichia coli
- Enterococcus
- Klebsiella
- Enterobacter
- Proteus
- Pseudomonas
- Staphylococcus
- Serratia
- Candida albicans



Predisposing factor to UTI

1. **Factor increasing urinary stasis:**

- Intrinsic obstruction due to stone on tumor in urinary tract.
- Extrinsic obstruction due to tumor and fibrosis.
- Urinary retention including neurogenic bladder.
- Renal impairment.

2. **Foreign bodies:**

- Urinary tract calculi
- Catheter
- Urinary tract instrumentation

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3. **Anatomic factor:**

- Congenital defect in genital tract leading to obstruction
- Fistula
- Shorter female urethra
- Obesity

4. **Factor compromising immune response:**

- Ageing
- HIV
- Diabetes mellitus

5. **Functional disorder:**

- Constipation
- Voiding dysfunction due to detrusor sphincter dyssynergia

6. **Other:**

- Pregnancy
- Multiple sex partner
- Poor personal hygiene
- Hypo estrogenic state
- Use of spermicidal agent and contraceptive diaphragm (women)

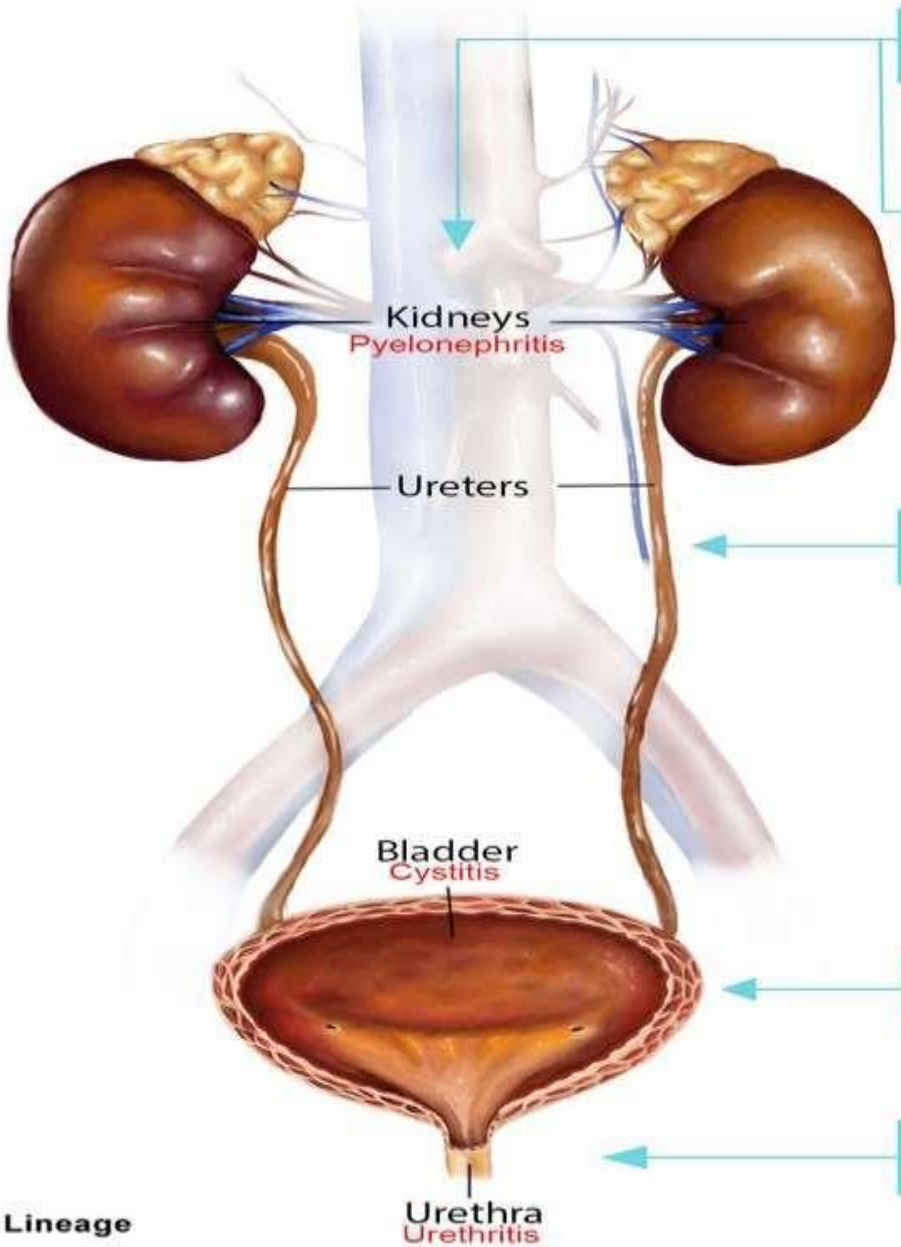
Pathogenesis

Bacterial entry:

Understanding of the mode of bacterial entry, host susceptibility factors, and bacterial pathogenic factors is essential to tailoring appropriate treatment for the diverse clinical manifestations of UTI.

There are 4 possible modes of bacterial entry into the genitourinary tract. It is generally accepted that periurethral bacteria ascending into the urinary tract causes most UTI. Most cases of pyelonephritis are caused by the ascent of bacteria from the bladder, through the ureter and into the renal parenchyma

Pathogenesis of Urinary Tract Infections



Acute kidney injury
- Continuous inflammatory response results in interstitial edema, interstitial nephritis, and ultimately acute kidney injury (AKI)

Pyelonephritis
- Bacterial ascension or hematogenous spread infects the renal parenchyma and results in pyelonephritis

Ascension
- Sufficient bacterial colonization can lead to bacterial ascension through the ureters

Uroepithelium penetration
- Bacterial fimbriae allows for attachment and penetration of bladder epithelial cells

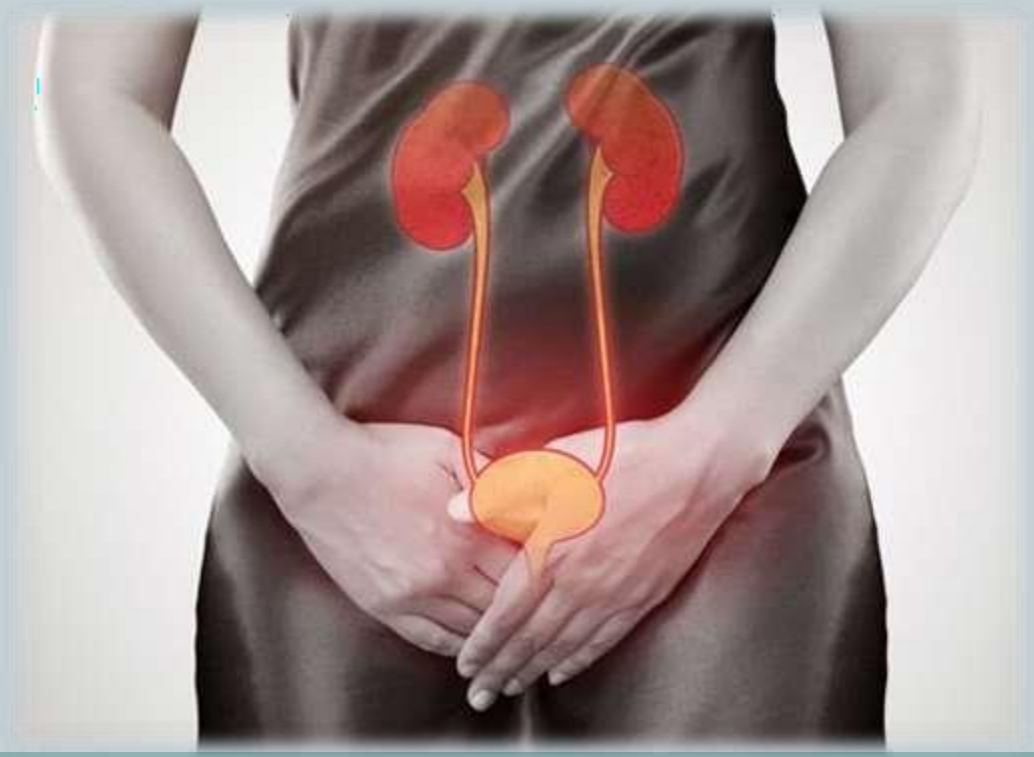
Colonization
- Bacterial colonization in the periurethra allows for ascension via the urethra

Clinical manifestation

- LUTS are experienced in patient who have UTI of the upper urinary tracts as well as those confined to lower tract. These symptoms are related either bladder storage or emptying. These symptom are decide in to two parts:

1. EMPTYING SYMPTOMS

1. STORAGE SYMPTOMS



Emptying symptoms

Weak urinary stream

Hesitancy: difficulty starting the urine stream resulting in a delay between initiation of urination by relaxation of the urethral sphincter and when urine stream actually begins.

Intermittency: interruption of the urinary stream while voiding.

Post void dribbling: Urine loss after completion of voiding.

Urinary retention or incomplete emptying: inability to empty urine from the bladder which can be caused atonic bladder or obstruction of the urethra. Can be cute or chronic.

Dysuria: difficulty voiding

Pain on urination

Storage symptoms

- **Urinary frequency:** an abnormally frequent (usually >8 times in a 24 hr. period)
- **Urgency:** a sudden strong or intense desire to void immediately, usually accompanied by frequency.
- **Incontinence:** involuntary or unwanted loss or leakage of urine.
- **Nocturnal:** waking up 2 or more times at night because of the need or urge to void.
- **Nocturnal enuresis:** complaint of loss of urine during sleep. In children it is called bedwetting.

Investigation

- History and physical examination
- Urinalysis obtain a midstream voided “ clean- catch” urine specimen.
- Urine for culture and severity (if indicated)
- Imaging studies of urinary tract (e.g IVP, cystoscopy)

Treatment

Uncomplicated UTI:

- Antibiotic: trimethoprim – sulfamethoxazole, nitrofurantion
- Adequate fluid intake
- Urinary analgesic: phenazopyridine or combination agent
- Counseling about risk of recurrence and reduction risk factors.

Recurrent UTI

- Repeat urinalysis and consider urine culture and sensitivity testing.
- Antibiotic: 3-5 day treatment regimen of TMP-SMX, nitrofurantion
- Sensitivity guided antibiotic
- Urinary analgesic such as phenazopyridine or combination agent.
- Cranberry or lingoberry juice (200-750 ml or equivalent tablets daily)
- Adequate fluid intake.
- Imaging study of urinary tract in selected cases.

Antimicrobial agents for genitourinary pathogens

Diagnosis	Pathogens	Choice of antibiotic	Duration of therapy
Complicated UTI	E.Coli Enterococai Pseudomonas Staphylococci	1st: Fluroquinole 2nd : Amniopenicilin 3rd : third generation cephalosporin Aminoglycosides	3-5 days after afebrile

PROPHYLACTIC ANTIBIOTIC REGIMEN

Sr.no	Tablet	Dose
1.	Nitrofurantoin	50-100 mg daily
2.	Nitrofurantoin macrocrystals	100 mg daily
3.	TMP-SMX	10/200 mg daily
4.	Cephalexin	250mg daily
5.	Ciprofloxacin	250mg daily
6.	Trimethoprim	100mg daily

Nursing diagnosis

1. Impaired urinary elimination related to effect of urinary tract infection as evidenced by pain and burning on urination, flank, Suprapubic, or lower back pain; urgency, frequency, nocturia, or hematuria.
2. Acute pain related to infection on LUTS/ UUTS as evidenced infection on the lining of the interstial tissue of the urinary tract.
3. Ineffective therapeutic regimen management related to lack of knowledge regarding treatment regimen and prevention of recurrent infection as evidenced by verbalization of desire to manage treatment of illness and prevent recurrence.

Prevention of UTI

Maintain Hygiene

- Wash hands before using toilets
- Wipe front and back after urinating or defecating
- Clean urethral meatus first while bathing
- Use washcloths to clean the perineum
- Use liquid soap instead of bar soap to prevent colonisation

Urinate before & after intercourse

Wear comfortable & clean clothing

Wear under wear made out of breathable fabric like cotton

Consume healthy diet

Stay Hydrated

Avoid Caffeine

Caffeine irritates the bladder.


THANK YOU....