MICROBIOLOGY

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	Uncomplicated (simple) Cystitis	Complicated cystitis
Definition	• In healthy adult women (sexually active – Over 12 y/o) Non-Pregnant women or in cases without triad of complicated cytitis (fever, nausea and vomitting, flank pain)	• Females with co-morbid medical conditions, All male patients, with catheters or in cases of urosepsis/hospitalization.
Diagnosis (Dx)	• Only dipstick Urinalysis (to look for WBCs or RBCs). No culture or lab tests.	• Urinalysis, urine culture. Further lab tests are required.
Treatment (tt)	Trimethoprim / Sulfamethaxazole for 3-7 days	• fluoroquinolone (or other broad spectrum antibiotic) for 7-14 days (depending on severity) • May treat even longer (2-4 weeks) in males with UTI.

• Important notes:-

1- 90% of UTI cases are caused by E. coli. • Catheter's associated UTI is caused by others such as Proteus. • Majority of cases are bacterial infections, some are fungal, but no viral (except in immunodificient pts.)

2- two routes for infection :- 1- Hematogenous (un common) 2- Ascending route (most common)

3- Females are more prone for UTI due to many causes including:- small urethra, susceptibility of epithelium during sexual intercourse, and pregnancy.

4- Symptoms of lower UTI :- Dysuria, increased frequency and urgency, and Hematuria (although they may occur in Upper UTI but in more severe form)

• classical triad of Upper UTI :- fever, nausea/vomitting and Flank pain. • A patient with dysuria indicates urethritis (sexually transmitted disease)

5- Most common cause for cystitis, prostatitis and pyelonephritis is E. coli and s. sapprophiticus and others.

• The most common cause of UTI associated with renal stones is:- Proteus species.

6- Supra optic tenderness → indicates → Cystitis , Costovertebral angle → pyelonephritis.

Urethral discharge → urethritis. , Tender prostate of PRE → Prostatitis.

7- In cases of catheter's associated UTI → we have to remove the catheter then start tt with antibiotic.

PYELONEPHRITIS

Patho-physiology	• It is frequently secondary to urine backup into the ureters usually at the time of voiding. • Obstruction of urinary tract may be another common cause. • Almost always caused by E.coli, which may lead to gram-negative sepsis and septic shock.
Risk factors	• Like risk factors for any urinary tract infection, but most importantly is vesico-urerthal reflux (VUR) which is a major cause of upper UTI in children.
Clinical Manifestations	"Triad" including :- Chills, fever, vomitting, nausea, flank pain, leukocytosis and Bacteriuria. • The patient will come with pain at the costo vertebral angle (between 12th rib and vertebral column).
Diagnosis "Dx"	• CT scan with contrast, renal ultra sound, blood urea nitrogen and creatine in blood and urine to monitor kidney function.
Treatment "tt"	• Goal of treatment is to eradicate bacteria from urine. • mild cases → treat in outpatient basis for 14-21 days with follow up. • tt of Pyelonephritis → 2 weeks of Trimethoprim/sulfamethaxazole or fluoro-quinolone for 2 weeks, admission with IV antibiotic if unable to take oral drugs.
Complications	Perirenal/renal abcess (suspect in patients unresponsive/not improving with antibiotics.