

Urologic Disorders

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Objectives:

1. Introduce to common urologic disorder
2. To know the presentation and clinical manifestation of the following:
A. UTI B. Urolithiasis C. BPH
3. Overview of the manifestation of these common investigation and treatment of these disorders

Color Index:

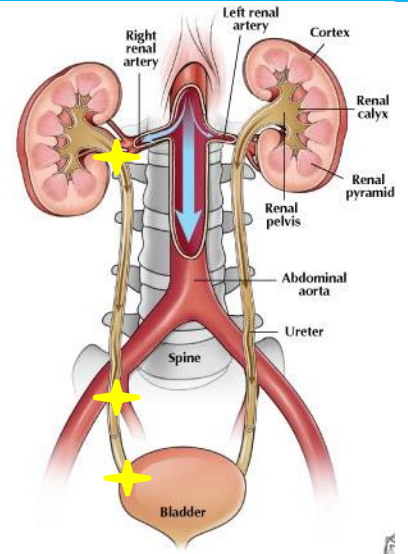
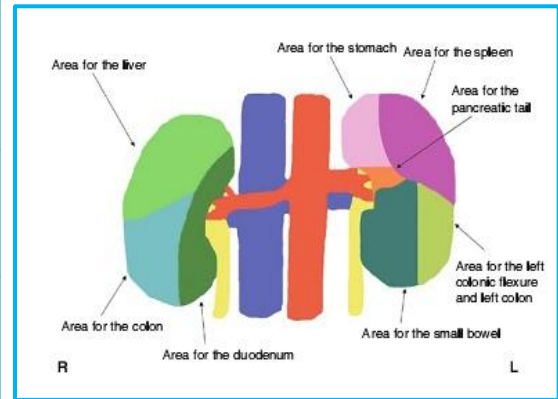
-Doctor's Notes -Surgery Recall -Doctor's Slides -Important -Extra

Anatomy

1- Anatomy of the kidney

Position	The two kidneys lie retroperitoneally on the posterior abdominal wall * The right kidney is located lower than the left due to the lobe of the liver which lies on the right kidney	
Relation	right	Anteriorly covered by the liver, the second part of the duodenum and the ascending colon.
	Left	Anteriorly covered by the spleen, stomach, tail of pancreas, left colon and small bowel overlie
Vessels	arterial	Renal artery → from abdominal aorta
	Venous	Renal vein → to IVC

Relations of the right and left kidneys with other organs



2- Anatomy of the urinary tract :

- Stones tend to impact at the three points where the ureter narrows: namely, the pelviureteric junction, the pelvic brim and the ureteric orifice.
- The section of ureter that lies within the bladder wall functions as a flap valve to prevent reflux.

2- anatomical differences :

Female



- 1- short urethra (cystitis is common)
- 2- more susceptible to UTI
- 3- Anatomy :
 - the ureter crossed by the uterine vessels, where it is vulnerable to damage during hysterectomy.
 - The uterus is located above the bladder causing a pressure in case of pregnancy
 - The vagina is located right in the posterior aspect of the bladder.
 - We should consider fistula formation between these two structures in some complicated cases (e.g emergency C-section)

Male



- 1- longer urethral (urethritis is common)
- 2- More susceptible to obstructive diseases
- 3- anatomy :
 - the ureter is it is crossed by the vas deferens
 - The rectum is located in the posterior wall of the bladder
 - We should consider fistula formation between these two structures in some complicated cases

Urologic Disorders:

- Urinary tract infections
- Urolithiasis
- Benign Prostatic Hyperplasia and voiding dysfunction

Lower urinary tract

- Urethritis
- Epididymitis/orchitis
- Prostatitis
- cystitis

Upper urinary tract

- Acute Pyelonephritis
- Chronic Pyelonephritis
- Renal Abscess

Note :

If the patient is a women and she experienced dyspareunia* and vaginal pain → you may think of cervicitis

*difficult or painful sexual intercourse

Note :

asymptomatic bacteriuria is quite common in females however we only treat it if the patient is pregnant to avoid complications.
- Bacteriuria : when the urine bacteria is more than 10^5 ☺

Routes of UTI:

- 1- Ascending infection; 95%.
- 2- Haematogenous spread.
- 3- Adjacent invasion, imagine you have colon with diverticulum and diverticulum would rupture in bladder so u will have UTI
- 4- Lymphatics; rare.

The most common cause of UTI in general is E.coli and other gram -ve bacilli , if it occurred in young prior to puberty it is most likely caused by s.saprophyticus

Note UTI:

Haematogenous spread: e.g. tooth abscess > pyelonephritis
In the past, they used to see more hematogenous spread like in TB> secondary TB in kidney.
-Adjacent invasion: e.g. Diverticulum ruptured in bladder >UTI.

URETHRITIS: Common in men; in young men usually the cause is STDs.

- urethral discharge
 - LUTS in the form of dysuria
 - Burning on urination
 - Asymptomatic; 25% especially in women.
- Frequency (abnormally frequent urination)
- Urgency (strong overwhelming need to urinate)

Note:

URETHRITIS:

- mostly affect men; because women have a short urethra (about 4cm in length). the patient may or may not present with:
 - urethral discharge
 - burning on urination
 - Asymptomatic (in female)

Gonococcal Vs. Non-gonococcal

Diagnosis of the organism is established by :

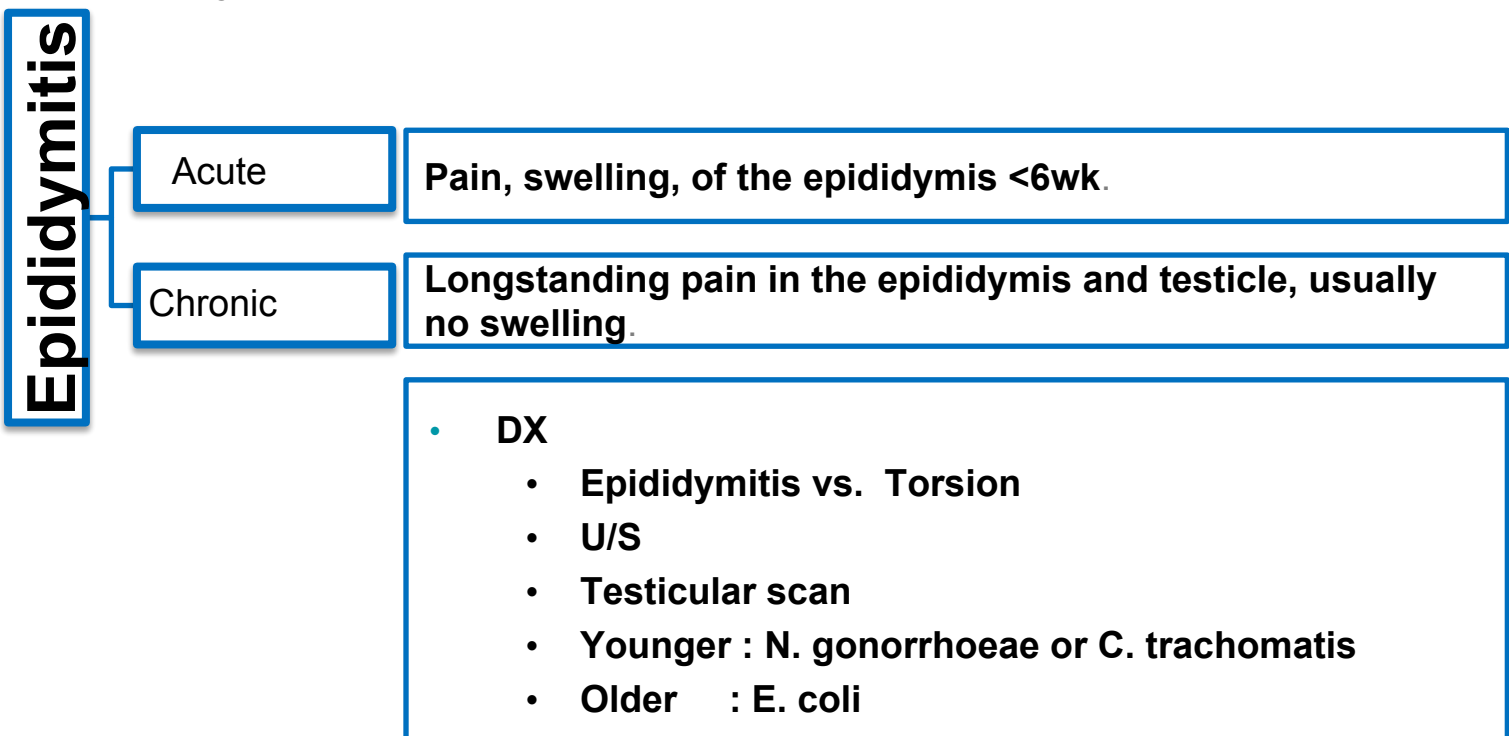
- o Incubation period: Gonococcal: 3-10 days vs. Non-gonococcal: 1-5 wks.
- o Urethral swab; send it to be cultured to identify the proper antibiotics which are affecting the organism.
- o Serum marker & antigen: Chlamydia-specific ribosomal RNA (usually done in chronic forms of disease)

	Gonorrhea	Chlamydia
Organism	<i>Neisseria gonorrhoeae</i>	<i>Chlamydia trachomatis</i>
Organism Type	Gram (-) diplococci	Intracellular facultative organism
Incubation Period *	3-10 days	1-5 weeks
Urethral Discharge	Usually profuse, purulent	Usually Scant
Asymptomatic Carrier	40%-60%	40%-60%
Diagnostic Test	Ligand chain reaction, Gram stain Culture	Polymerase/ligand chain reaction, Culture, Immunoassay, Chlamydia-specific ribosomal RNA
Treatment	Ceftriaxone + Azithromycin or Doxycycline	Doxycycline or Azithromycin

Note :

In men ascending infection goes from the urethra. if does not get treated it starts going up all the way to testis or it may go to the > bladder > kidney. It may go to the Vas deferens and the testes and may cause Epididymitis.

Epididymitis



❑ What is the difference between epididymitis and testicular torsion ?!

	Epididymitis	Torsion
History	Older patient - Longer history Gradual onset With urinary symptoms like burning sensation - hematuria e.g the patient may say I had blood in my urine 2 weeks ago.	Usually young boys, just reached adolescence Acute pain - sudden in onset Usually without urinary symptoms (organ threatening condition)
Physical Examination	Inflammatory sign (redness-warmth and swelling of the scrotum). Cremasteric reflex is Present. Elevation of scrotum relieves the pain in epididymitis.	High riding testis, (testis is kidney shaped, bean-shape, Horizontal lie). Cremasteric reflex is Absent . Elevation of scrotum increases the pain in torsion.
UltraSound (Doppler to detect flow)	Hyperemia "infection increases blood flow"	No blood flow
Testicular Scan	Increased radiotracer uptake; Hyper-scan photogenic (black)	Photopenia (white area)
Urine for Culture	Younger: N. gonorrhoeae or C. trachomatis Older: E. coli (gram -ve rods)	There is no urinary symptoms
Symptoms :	Swollen, tender testicle; dysuria; scrotal ache/pain; fever; chills; scrotal mass.	Symptoms: Pain in the scrotum, suprapubic pain.
Extra notes	It needs oral antibiotics and Supportive therapy	OR directly. Otherwise, testis and spermatogenesis will be lost.

Note :
if a young boy (9 Y/O) come to you in the ER with acute testicular pain, so he has torsion. you have to take him to OR, otherwise the patient would lose the testis if it last longer than 8 hrs. it is like ovarian torsion but the female will present with acute abdomen. ☺

Note :
you can differentiate between Epididymitis & Torsion by: U/S: if you have time*. Sometimes the patient present after 7-8 hrs. then you don't have time you just take him to the OR.
- Epididymitis of a young child is usually due to uropathogen most commonly is E.coli.
- young male who is sexually active makes you think about STD.

Note :
In testicular torsion :
✓ <6 hours from the onset will bring about the best results. (> 90% salvage rate)
✓ after 24hrs. (<10% salvage rate)

❑ Treatment of Epididymitis

Table 17–3. TREATMENT OF ACUTE EPIDIDYMO-ORCHITIS

Epididymo-Orchitis Secondary to Bacteriuria

1. Do urine culture and sensitivity studies
2. Promptly administer broad-spectrum antimicrobial agent (e.g., tobramycin, trimethoprim-sulfamethoxazole, quinolone antibiotic)
3. Prescribe bed rest and perform scrotal evaluation
4. Strongly consider hospitalization
5. Evaluate for underlying urinary tract disease

Epididymo-Orchitis Secondary to Sexually Transmitted Urethritis

1. Do Gram stain of urethral smear
2. Administer ceftriaxone, 250 mg IM once; then tetracycline, 500 mg PO qid for at least 10 days, or doxycycline, 100 mg PO bid for at least 10 days
3. Prescribe bed rest and perform scrotal evaluation
4. Examine and treat sexual partners

Adapted from Berger RE: Urethritis and epididymitis. Semin Urol 1983;1:143.

Note :

REMEMBER: Cremasteric reflex !!
Stimulation of the femoral branch of the (genitofemoral nerve) would cause a reflex conducted by genital branch of the same nerve resulting in an elevation of the testis at the same stimulated side.

Interpretation :

+ve in normal cases who are older than 30 months

+ve in case of epididymitis

-ve in cases where the patient age is less than 30 months

-ve testicular torsion

Note :

. Torsion (twist) of the spermatic cord, resulting in venous outflow obstruction, and subsequent arterial occlusion S infarction of the testicle

- ✓ classic history: Acute onset of scrotal pain usually after vigorous activity or minor trauma.
- ✓ signs: Very tender, swollen, elevated testicle; no illumination; absence of cremasteric reflex.
- ✓ Differential diagnosis: Testicular trauma, inguinal hernia, epididymitis, appendage torsion.

❑ Prostatitis : Dysfunctional voiding= abnormal voiding

Syndrome that presents with inflammation± infection of the prostate gland

Dysuria, frequency

Perineal pain

Painful ejaculation

Prostate: produces about 80% of the semen

Table 15–1. CLASSIFICATION SYSTEM FOR THE PROSTATITIS SYNDROMES

Traditional	National Institutes of Health	Description
Acute bacterial prostatitis	Category I	Acute infection of the prostate gland
Chronic bacterial prostatitis	Category II	Chronic infection of the prostate gland
N/A	Category III chronic pelvic pain syndrome (CPPS)	Chronic genitourinary pain in the absence of uropathogenic bacteria localized to the prostate gland with standard methodology
Nonbacterial prostatitis	Category IIIA (inflammatory CPPS)	Significant number of white blood cells in expressed prostatic secretions, postprostatic massage urine sediment (VB3), or semen
Prostatodynia	Category IIIB (noninflammatory CPPS)	Insignificant number of white blood cells in expressed prostatic secretions, postprostatic massage urine sediment (VB3), or semen
N/A	Category IV asymptomatic inflammatory prostatitis (AIP)	White blood cells (and/or bacteria) in expressed prostatic secretions, postprostatic massage urine sediment (VB3), semen, or histologic specimens of prostate gland

N/A, not applicable.

common to see in urology. (acute or chronic) Acute is serious, rarely seen. every year we admit 2-3 patients because of fever, chills and urosepsis.
Admit > give antibiotics.
Sometimes they may develop prostatic abscess that requires to be drained.

He may get hypotension 90/40 (urosepsis – septic shock)
It's a rare clinical emergency condition that maybe life threatening BUT chronic prostatitis is more common.

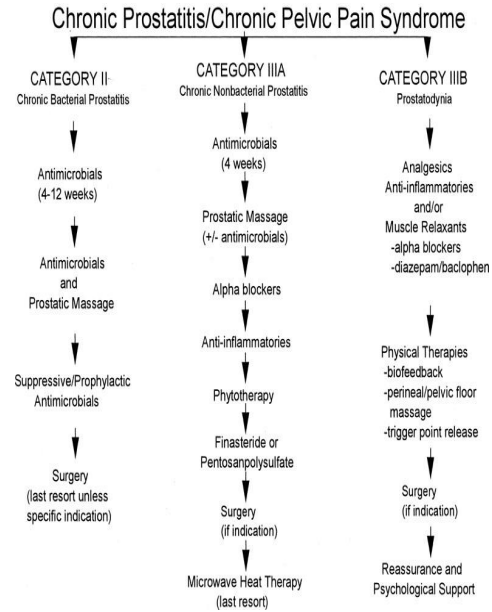
The dr said DOSAGE memorizing is NOT required..

☐ **Acute Bacterial Prostatitis :** ☐ **chronic Prostatitis :**

- ✓ Rare
- ✓ Acute pain
- ✓ Irritative and obstructive voiding symptoms
- ✓ Fever, chills, malaise, N/V
- ✓ Perineal and suprapubic pain
- ✓ Tender swollen hot prostate
- ✓ Rx: antibiotics and urinary drainage

← In our lever we have to know that there is: bacterial prostatitis and non-bacterial prostatitis.

just to know that there → are **different categories** of chronic prostatitis and some of them we **cannot** isolate an organism from.



☐ **Cystitis** *More common in women, B/C their short urethra..*

dysuria, frequency, urgency, voiding of small urine volumes

± Hematuria

Suprapubic /lower abdominal pain

No fever even if it's severe

☐ **Diagnosis of cystitis:**

Dipstick: When nitrate is (+), it indicates an infection

Urinalysis

If WBC>5 , It is cystitis and we treat it as so

Urine culture; is the gold standard. It takes 2 days. Start treatment before waiting for results b/c we know what are the commonest organisms.

Note :

- ✓ Notice that there is **NO FLANK** pain !!
- ✓ Cystitis it is common in women **specially after marriage** they basically get it like flu and common cold , it is usually just an infection but for men there is a cause and we should figure out what is it . It could be STD , BPH, PROSTATITIS ORCHITIS , or as a result of anal sex .

❑ Treatment of cystitis:

is just for 3 days, to avoid any effect on normal bowel Flora.



In men the treatment is usually for a week.




Table 14-10. TREATMENT REGIMENS FOR ACUTE CYSTITIS

Circumstances	Route	Drug	Dosage (mg)	Frequency per Dose	Duration (days)
Women	Oral	Ciprofloxacin	500	Every 12 hr	3
		Enoxacin	400	Every 12 hr	
		Levofloxacin	500	Every day	
		Lomefloxacin	400	Every day	
		TMP-SMX	160-800	Every 12 hr	
		TMP	100	Every 12 hr	
		Microcrystalline nitrofurantoin	100	Four times a day	
		Norfloxacin	400	Every 12 hr	
		TMP-SMX	160-800	Every 12 hr	
		Fluoroquinolone	As above	As above	
Symptoms for >7 days; recent urinary tract infection, age >65 yr, diabetes, diaphragm use	Oral	Amoxicillin	250	Every 8 hr	7
		Cephalexin	500	Four times a day	
		Microcrystalline nitrofurantoin	100	Four times a day	
		TMP-SMX	160-800	Every 12 hr	
Pregnancy	Oral	Amoxicillin	250	Every 8 hr	7
		Cephalexin	500	Four times a day	
Men	Oral	TMP-SMX	160-800	Every 12 hr	7
		Fluoroquinolone	As above	As above	

TMP, trimethoprim; TMP-SMX, trimethoprim-sulfamethoxazole.
 Modified from Stamm WE, Hooton TM: Management of urinary tract infections in adults. N Engl J Med 1993; 329: 1328-1334. Copyright 1993 Massachusetts Medical Society. All rights reserved.

- Note :
- ✓ trimethoprim / sulfamethoxazole → make sure that the patient does not have an allergy
 - ✓ Fluoroquinolone (ciprofloxacin , levofloxacin) are contraindicated in pregnancy
 - ✓ Lactobacilli (vaginal flora) which has two functions: reject the fungi and maintain the acidity
 - ✓ the best antibiotic is nitrofurantoin because 90 is excreted in urine ,so it does not affect the normal flora
 - ✓ We like to give abx which are concentrated in the urine, so they kill the organism

❑ Pyelonephritis

Pyelonephritis: Inflammation of the kidney and renal pelvis

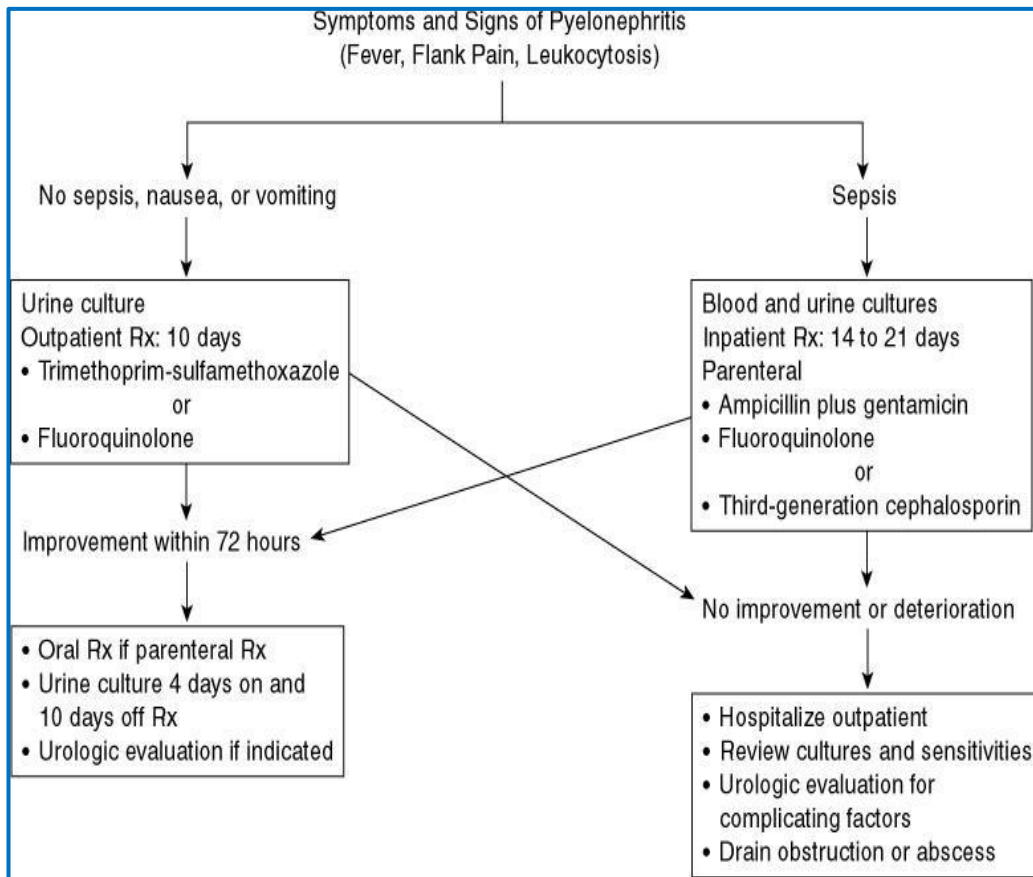
- Symptoms :**
- ✓ Chills
 - ✓ Fever
 - ✓ Costovertebral angle tenderness (flank Pain)
 - ✓ GI:abdominal pain, N/V,and diarrhea
 - ✓ Gr-ve sepsis
 - ✓ Dysuria, frequency

- Investigation**
- ✓ Urine C&S :+VE(80%)
 - ✓ Enterobacteriaceae (E. coli), Enterococcus "Most common"
 - ✓ Urinalysis:↑ WBCs, RBCs,Bacteria
 - ✓ Blood test for renal function
 - (±) ↑serum Creatinine
 - ✓ CBC : Leukocytosis
 - ✓ Urine dipstick, microscopy:
 - To get rapid results

- Imaging**
- To rule out any obstructions :
- ✓ IVP
 - ✓ U/S
 - ✓ CT

- Notes**
- ✓ It can come with severe urosepsis, in elderly or immunocompromised patient it may cause death in 10-20% of patients.
 - ✓ In history you may find two weeks history of Dysuria, frequency that tells you this patient has some form of UTI.
 - ✓ Basically the diagnosis is clinical, investigation is to rule out the possibility of complicated Pyelonephritis.

Pyelonephritis: Management;



Note :

The patient looks ill and have an excruciating flank pain. When will the patient get fever? If the bacteria has ascended and reached the kidney (pyelonephritis) Some women will ignore their feeling of dysuria and they come to the ER with urosepsis.

If the pt is vomiting ⇒ admit (IV abx)

Note :

- ✓ The best initial imaging is US
- ✓ The most sensitive imaging CT
- ✓ If we provide the patient the proper management and treatment for 3 days and yet the symptoms persist , we may order a CT scan to rule out perinephric abscess.
- ✓ perinephric abscess: has a less UTI symptoms and the symptoms usually started gradually so the patient may say that its been going on for a while .

Summary of UTI form Recall

URINARY TRACT INFECTION (UTI):

Etiology: Ascending infection, instrumentation, coitus in female.

Three common organism: E. coli (90%) – Proteus - Klebsiella, Pseudomonas.

Predisposing factors: Stones, obstruction, reflux, diabetes mellitus, pregnancy, indwelling catheter/stent.

Symptoms:

- Lower UTI— **frequency, urgency, dysuria, nocturia.**
- Upper UTI— **back/ flank pain, fever, chills.**

Diagnosis made by: Symptoms, urinalysis (>10 WBCs/HPF, >10⁵ CFU)

When should workup be performed?

- After first infection in male patients (unless Foley is in place).
- After first pyelonephritis in prepubescent female patients.

Treatment:

- Lower: 1 to 4 days of oral antibiotics.
- Upper: 3 to 7 days of IV antibiotics.

URINARY TRACT INFECTION: (U.T.I.)

CYSTITIS:
 FREQUENCY
 URGENCY
 SUPRAPUBIC PAIN
 BURNING UPON URINATION
 HEMATURIA
 FEVER
 NAUSEA
 VOMITING

PYELONEPHRITIS
 FLANK PAIN
 DYSURIA
 PAIN AT COSTOVERTEBRAL ANGLE
 SAME SIGS AS CYSTITIS

NURSING GOALS:
 *SYMPTOMATIC RELIEF
 *TEACHING & PREVENTION
 *SHOWERS BETTER THAN BATHS
 *PERINEAL CLEANSING "FRONT TO BACK"
 *VOIDING & INTERCOURSE
 *ANTI-MICROBIAL THERAPY
 *WHITE TOILET PAPER
 *NO PERFUMES, ETC. TO PERINEAL AREA

DX → DIPSTICK FOR LEUKOCYTE ESTERASE AND NITRATES UA/C/S
TX → ANTI-MICROBIALS
 ↑ FLUID INTAKE
 PREVENTION

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❑ Urolithiasis:

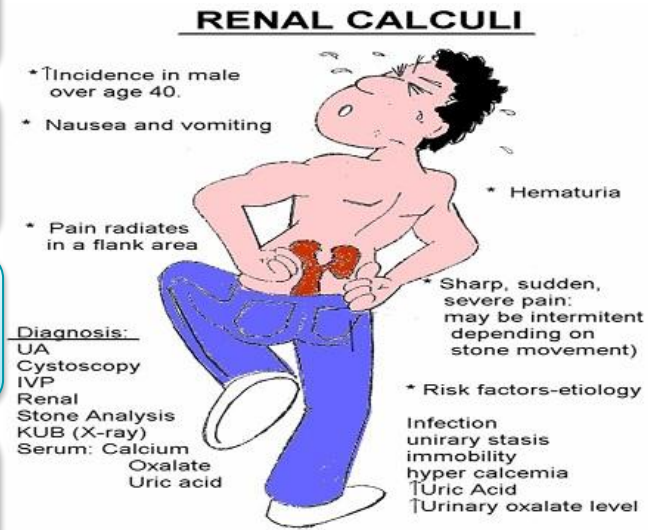
Egyptian mummies 4800 BC
Prevalence of 2% to 3%

Lifetime risk: Male : 20%, female 5-10%
Recurrence rate 50% at 10 years

Intrinsic risk Factors *Genetics , Age (20s-40s) , Sex*
M>F

Extrinsic Factors Geography (mountainous, desert, tropics) ,Climate (July - October),Water Intake,Diet (purines , oxalates, Na) ,Occupation (sedentary occupations)

Other risk factors as:
IBD, Hypercalcemia, Renal tubular acidosis and small bowel bypass



Most people have crystals in their urine, so why not everyone gets stones?

Anatomic abnormalities (such as Big renal pelvis with narrow the ending, -the narrowing ureter and Malrotated kidneys)

Modifiers of crystal formation: Inhibitors/promoters

Inhibitors	Promoters
Mg, Urinary proteins(nephrocalcin), Citrate	oxalate, red meat

How do stones form:

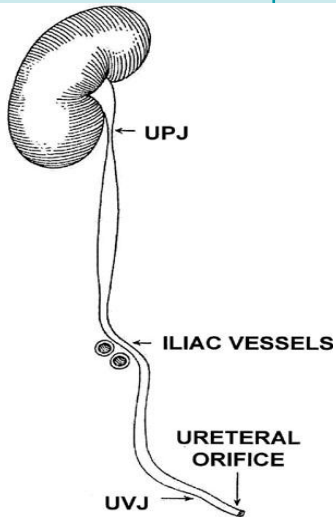
A *solute* dissolves in a *solvent* to form a *solution* but when the concentration of solute in solution reaches a certain Level (supersaturation level),the compound precipitates out to form crystals. This may progress to clump together (*aggregation*) to form calculi. There are substances inhibiting nucleation But in a certain concentration of solute nucleation will occur despite their presence.

There are multiple factors facilitating the formation of certain stones like urine Ph , infections , Ca⁺⁺ saturation ...etc.

supersaturated → Crystal Growth
Aggregation of crystals + renal anomaly → stone

☐ Kidney stones:

Calcium oxalate	Calcium phosphate	Strutive	Uric acid	Cystine
<p>The most common (75%)</p> <p>Acidic urine</p> <p>Associated with hyperparathyroidism</p> <p>Urine analysis hypercalciuria</p>	<p>Around 10% Alkalotic urine</p> <p>Associated with any disease or drug cases</p> <p>hypercalcemia</p> <p>Urine analysis hypercalciuria</p> <p>Associated with renal tubular acidosis</p>	<p>Associated with infections (proteus mirabilis and klebsiella)</p> <p>Alkalotic urine</p>	<p>Common in Saudi Arabia</p> <p>Acidic urine</p> <p>Uric acid is found in animal proteins.</p> <p>Radiolucent</p> <p>The commonest radiolucent stone</p> <p>uric acid stones are as the same consistency as tissue. (Radiolucency).</p>	<p>Number 1 cause of renal stones in children.</p> <p>Cystine is an amino acid. Remember them by COLA:</p> <p>cystine, oxalate, lysine and arginine; the proximal tubules are unable to reabsorb these amino acids. All of them are water soluble except Cystine, that's why it forms stones ☐.</p> <p>Cystinuria is an autosomal recessive</p> <p>Associated with malodorous urine</p>

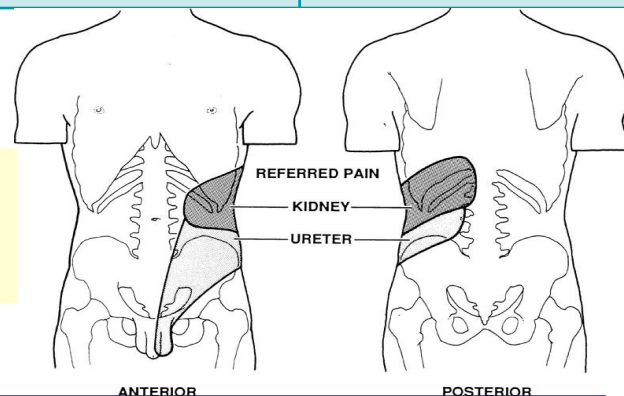


← Renal stones tend to be trapped at these locations ☺
the narrowest area in ureter is UVJ. its about 2 ML

☐ Urolithiasis: signs and symptoms

- ✓ Flank pain
- ✓ Renal or ureteric colic
- ✓ Frequency, dysuria
- ✓ Hematuria
- ✓ GI symptoms: N/V, ileus, or diarrhea

The pain is cyclic ☺



-What are the indications for intervention?

Urinary tract obstruction Persistent in action Impaired renal function

-What are the contraindications of outpatient treatment?

Pregnancy, diabetes, obstruction, severe dehydration, severe pain, urosepsis/ fever, pyelonephritis, previous urologic surgery, only one functioning kidney

Urolithiasis

differential diagnosis The patient presents with Restless in the form of

- | | |
|---|--|
| <ul style="list-style-type: none"> ✓ Gastroenteritis ✓ acute appendicitis ✓ colitis ✓ salpingitis | <ul style="list-style-type: none"> ✓ ↑HR, ✓ ↑ BP ✓ fever (If UTI) ✓ Tender CVA |
|---|--|

Investigations

Urinalysis :

- ✓ RBCs
- ✓ WBCs
- ✓ Bacteria
- ✓ Crystals

Imaging

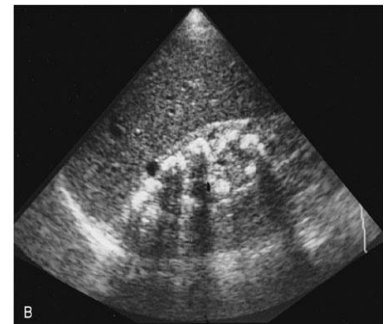
- ✓ Plain Abdominal Films (KUB) : shows only radiopaque stones.
- ✓ Intravenous Urography (IVP): shows radiolucent (uric acid stone) **Unseen radiopaque stones (calcium stones).**
- ✓ Ultrasonography (U/S) shows hyperechoic stones + acoustic shadow.
- ✓ Computed Tomography (CT) **The gold standard; most sensitive and specific & shows the radiolucent stones. So it's the first step.**



KUB



CT



U/S

Management

Conservative:

- ✓ Hydration
- ✓ Analgesia
- ✓ Antiemetics
- ✓ Stones (<5 mm) >90% undergo spontaneous passage.

Opioids
NSAIDs
Acetaminophen in pregnancy

Indications for admission

- ✓ Renal Impairment(ex. Born with 1 kidney)
- ✓ Refractory Pain
- ✓ Pyelonephritis; patient has 3 mm stones with fever and chills>
- ✓ pyelonephritis.
- ✓ Intractable N/V; can't take

Other management options :

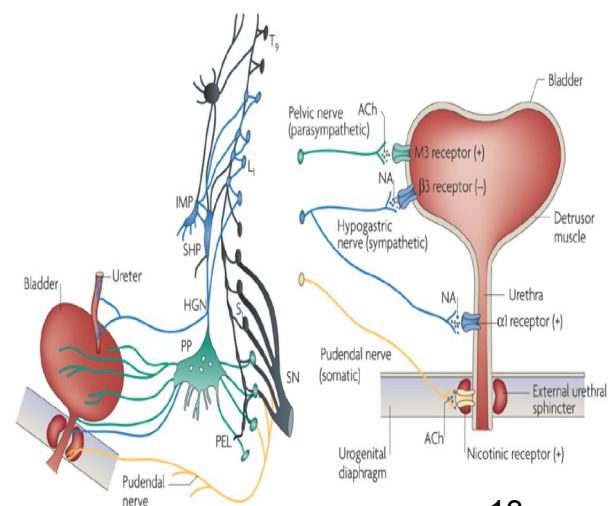
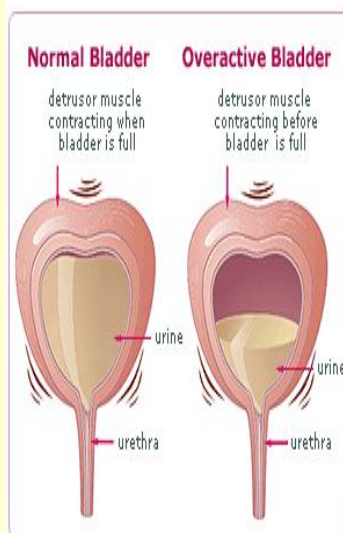
Shock Wave lithotripsy	Ureteroscopy:	Percutaneous Nephrolithotripsy (PNL):	Open surgery:
<ul style="list-style-type: none"> ✓ SWL): Good for kidney stones and small stones; ✓ potential injury to ovary. 	<ul style="list-style-type: none"> ✓ Breaks up large stones by laser. 	<ul style="list-style-type: none"> ✓ For huge stones 	<ul style="list-style-type: none"> ✓ Not used anymore.

❑ Voiding dysfunction:

	Failure to Store	Failure to Empty
Bladder Problems	<ul style="list-style-type: none"> • Overactivity: common in women or b/c of spinal cord injury, stroke > loss of control by causing damage to micturition inhibitory center. • Hypersensitivity 	<ul style="list-style-type: none"> • Neurologic • Myogenic • Idiopathic
Outlet Problem	<ul style="list-style-type: none"> • Stress Incontinence: With pregnancies and deliveries, the pelvic wall muscles is gone , the support is gone so with a little increase in abdominal pressure > leakage • Sphincter Deficiency 	<ul style="list-style-type: none"> • Benign Prostatic Hyperplasia • Urethral Stricture <ul style="list-style-type: none"> • Sphincter Dyssynergia
	Combination	Combination

you have to know how to take history of a female with Over Activity or incontinence. Incontinence types:

- ✓ Stress Incontinence
- ✓ Urge Incontinence
- ✓ Overflow Incontinence
- ✓ Functional Incontinence
- ✓ Mixed Urinary Incontinence
- ✓ Woman had a caesarian section complain of uncontrolled urination, so most likely they injured her bladder in the operation and she got physiovaginal fistula, usually this happens as a complication of CS of prolonged labor.



Additional : from surgical recall

INCONTINENCE:

- **Stress incontinence:** Loss of urine associated with coughing, lifting, exercise, etc.; seen most often in women, secondary to relaxation of pelvic floor following multiple deliveries. (Treatment: Bladder neck suspension.)
- **Overflow incontinence:** Failure of the bladder to empty properly; may be caused by bladder outlet obstruction (BPH or stricture) or detrusor hypotonicity. (Treatment: Self -catheterization, surgical relief of obstruction, α -blockers)
- **Urge incontinence:** Loss of urine secondary to detrusor instability in patients with stroke, dementia, Parkinson's disease, etc. (Treatment: Pharmacotherapy (anticholinergics, α -agonists).
- **Mixed incontinence:** Stress and urge incontinence combined.
- **Enuresis Bedwetting:** in children.

Diagnosis made by: History (including meds), physical examination (including pelvic/rectal examination), urinalysis, postvoid residual (PR), urodynamics, cystoscopy/

vesico cystourethrogram (VCUG) may be necessary.

"Marshall test": Woman with urinary stress incontinence placed in the lithotomy position with a full bladder leaks urine when asked to cough.



Physiology of micturition



Urge Urinary Incontinence



Stress Urinary Incontinence

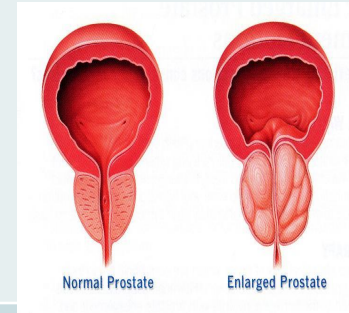


Overflow Urinary Incontinence

Benign Prostatic Hyperplasia(BPH)

Remember its location is in the median lobe"periurethral"

Clinical features	-LUTS -poor bladder emptying -urinary retention	-UTI -Hematuria -Renal insufficiency
Physical Examination	<p>DRE (Digital rectal Examination) If it's hard to palpable the nodules, it means Cancer. Focused neurologic exam</p> <ul style="list-style-type: none"> - prostate Ca - Rectal Ca - Anal tone - Neurologic problems <p>Abdomen: Distended bladder</p>	
Investigations	<p>Urinalysis, Culture</p> <ol style="list-style-type: none"> UTI Hematuria <ol style="list-style-type: none"> Serum Creatinine Serum Prostate-Specific Antigen; it is elevated in prostatic cancer. Flow rate U/S (kidney, bladder and prostate). 	



Management

Treatment options depend on the symptoms.

Medical therapy		Surgical	
		Indications; Urinary retention,Hydronephrosis, UTIs and Severe symptoms	
<p>α-Adrenergic Blockers; selective α1 blocker that :</p> <ol style="list-style-type: none"> Relax sphincter Relax prostate capsule 	<p>Androgen Suppression; 5α reductase inhibitor > shrinks prostate 60% in 6 months</p>	<p>Endoscopic (e.g. TURP, laser ablation, prostatic stent</p>	<p>Open prostatectomy.</p>
<ol style="list-style-type: none"> Tamsulosin Alfuzosin Terazosin 	<ol style="list-style-type: none"> Finasteride 	<p>Cut adenoma that blocks the passage.</p>	

DON'T forget our FUNWISE mnemonic:

-WISE refers to obstructive symptoms:

Weak urinary stream

Intermittent flow

Straining to urinate

incomplete Emptying

-FUN refers to irritative symptoms:

Frequency

Urgency

Nocturia

Thank you

**“ THERES
NO ELEVATOR
TO SUCCESS.
YOU HAVE
TO TAKE
THE STAIRS. ”**

Author Unknown