Adult urinary tract disorders

Objectives:

- Introduction to common urologic disorder.
- To know the presentation and clinical manifestation of the following:
  - Urinary tract infection
  - Urolithiasis
  - BPH
  - Voiding dysfunction
- Overview of the manifestation of these common investigation and treatment of these disorders.

Resources:

- Davidson.
- 436 Doctor's slides.
- Surgical recall.
- 435 teamwork.

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Notes , Important , Extra , Davidson's

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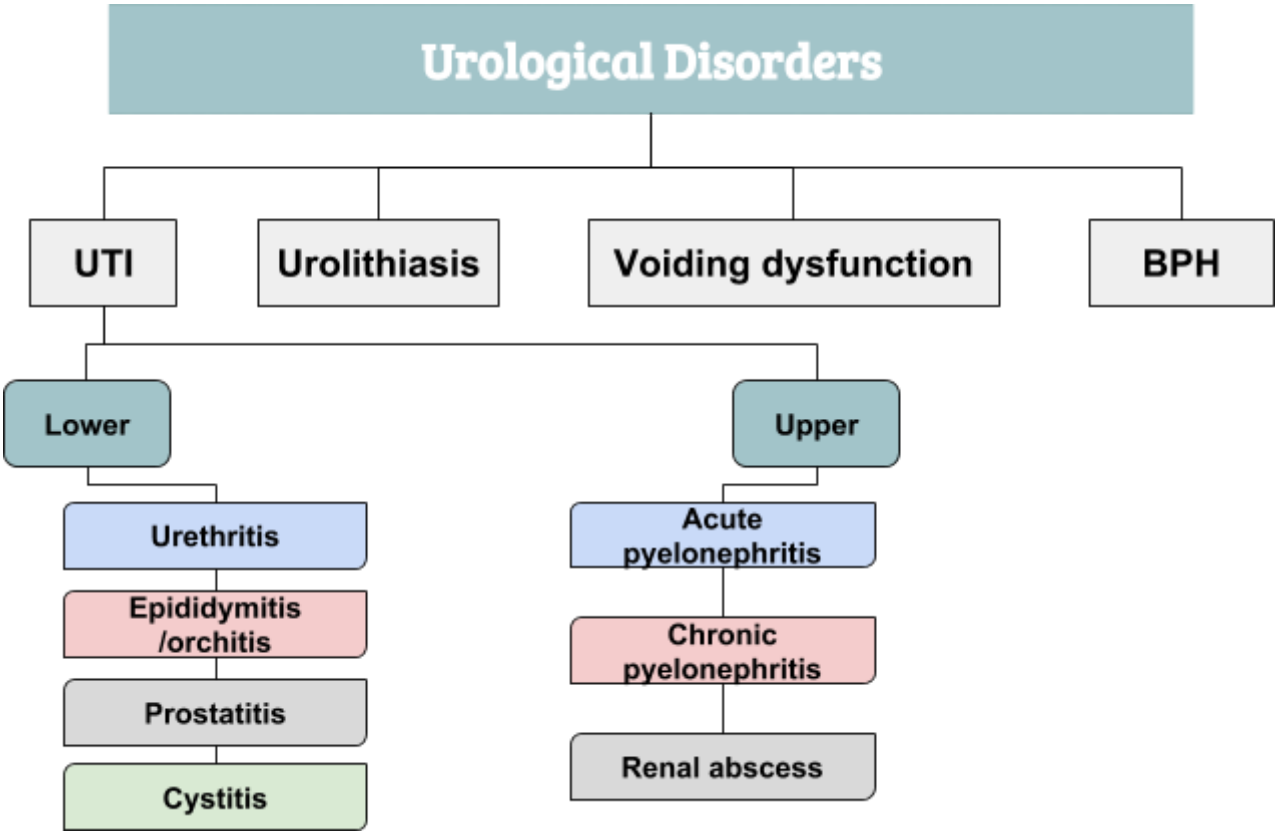
Feedback



Upper urinary tract infection Symptoms	Lower urinary tract infection Symptoms
Systemic manifestation (more serious problems): - Fever - Chills or shivering - Vomiting - Nausea - Abdominal ache - Flank pain	**-Dysuria** **-Storage (irritative) symptoms:** - Frequency - Urgency - Nocturia - Incontinence **-Voiding (obstructive) symptoms:** - Hesitancy - Weak stream, interrupted stream. - Dribbling - Urine retention - Reduced flow - Sensation of incomplete emptying

Urethritis[1]

Signs and symptoms:

- Urethral discharge.
- Usually related to unprotected sexual intercourse.
- **Dysuria and frequency** (LUTI irritative symptoms).
- Burning on urination (Yellowish discharge with burning sensation).
- Could be asymptomatic.

Gonococcal vs. Nongonococcal :

- Neisseria Gonorrhoeae and Chlamydia Trachomatis are the most common organisms.
- 40-60% are asymptomatic carriers.
- The most common non specific urethritis is due to chlamydia.
- The main feature to differentiate between the two is the INCUBATION PERIOD.

	Gonorrhea	Chlamydia
Organism	Neisseria gonorrhoeae	Chlamydia trachomatis
Organism type	Gram -ve diplococci	**Intracellular facultative** organism
IP (incubation period)	**3-10 days (Short incubation period)**	**1-5 weeks**
Urethral discharge	Usually profuse, purulent (Whitish)	Usually scant
Asymptomatic carriers	40% - 60%	
Diagnostic test	Ligand chain reaction, Gram stain culture	Polymerase/ligand chain reaction, culture immunoassay
Treatment	Ceftriaxone +(Azithromycin or Doxycycline; for possible chlamydial coinfection)	Doxycycline or Azithromycin + (ceftriaxone; for possible gonorrheal coinfection)

Diagnosis:

- **Urethral swab and culture**[2]
- **Serum marker & antigen:** Chlamydia-specific ribosomal RNA[3]

[1] An infection-induced inflammation of the urethra. usually caused by a STD, and normally categorized into either **gonococcal urethritis (GU)** or **nongonococcal urethritis (NGU),** it's usually in the age of being sexually active
[2] To know the most proper antibiotics against the organism.
[3] Usually done in chronic forms of the disease

EPIDIDYMITIS[4]

Etiology:

- **Young** patients due to sexual transmitted infection: **N.gonorrhea, C.trochomatis**
- **Elderly** due to: **E.coli.**

Epididymitis can be classified as follows:

Acute	Characterized by: Pain & swelling of the epididymis **<6** weeks, after infection has subsided, the epididymis alone may remain thickened and irregular, so that chronic epididymitis may be diagnosed.
Chronic	Characterized by: Long-standing pain in the epididymis and testicle, usually **no** swelling.
Epididymo\orchitis	When the inflammation extends up to the testicles.

Diagnosis: Epididymitis VS testicular torsion

	Epididymitis	Torsion[5]
History	**Older** patient Gradual onset (along 2 weeks) **With** urinary symptoms like burning sensation – hematuria e.g patient may say doctor I had blood in urine for 2 weeks now.	Usually **in teenagers**, who just reached adolescence[6] Sudden onset of testicular pain and swelling There may be a history of minor trauma, but usually **without** urinary symptoms
Physical Examination	Inflammatory sign: • Redness • warmth • swelling of the scrotum • Testis attached to the skin • Sometimes local abscess • Elevation of the scrotum **relief** the pain • Painful ejaculation (not specific)	• High riding testis • Red & swollen hemiscrotum (usually too Tender to palpate) • Bean-shape, • Transverse (horizontal) line[7] • Loss of cremasteric reflex • Severe tenderness • Elevation of the scrotum **causes more** pain
U/S duppler	**Hyperemia** [8] (Due to the inflammation)	**No** blood flow, if the blood supply is not restored within 12 hours, the testis infarcts and must be then excised.
Testicular Scan **Radionuclide image**	**Photogenic** (black) (Due to increased radiotracer uptake)	**Photopenia** (white area) (no radiotracer uptake)
Urine Culture	**Younger:** N. gonorrhoeae or C.trachomatis **Older:** E.coli (gram -ve rods)	No causing agent

[4] An inflammation of the epididymis, a significant cause of morbidity and is the fifth most common urologic diagnosis in 18-50 year-old males. Untreated urethritis progresses to prostatitis, untreated prostatitis progresses to epididymitis (**anatomical**)
[5] Twisting of the spermatic cord leading to decreased blood flow to the testicle resulting in ischemia, infarction and potentially, tissue necrosis. PICTURE
[6] Rapid growth during puberty may cause this condition.that's why it's common in adolescent male.
[7] Normally it lies vertically.
[8] An excess of blood in the vessels supplying an organ or other part of the body.

Treatment of acute Epididymo-orchitis:

Secondary to bacteriuria	Secondary to sexually transmitted urethritis
1. Do urine culture & sensitivity studies. 2. Promptly administer broad-spectrum antimicrobial agent For 2 weeks.eg: tobramycin, trimethoprim-Sulfamethoxazole, Quinolone antibiotic. 3. Prescribe bed rest & perform scrotal evaluation. 4. Strongly consider hospitalization. 5. Evaluate for underlying urinary tract disease. • The treatment should be antibiotics for about TWO weeks with Nonsteroidal antiinflammatory drug, to calm down the inflammation and control the pain.	1. Do gram stain of urethral smear. **2. Administer ceftriaxone IM then tetracycline or doxycycline for at least 10 days.** 3. Prescribe bed rest & perform scrotal evaluation. 4. Examine & treat sexual partners.

Recall (EXTRA) :

What is it Epididymitis?
Infection of the epididymis
What are the signs/symptoms?
Swollen, tender testicle; dysuria; scrotal ache/pain; fever; chills; scrotal mass.
What is the cause?
Bacteria from the urethra.
What are the common bugs in the following types of patients:
- **Elderly patients/children?** Escherichia coli
- **Young men?** STD bacteria: Gonorrhea, chlamydia

What is the major differential diagnosis?
Testicular torsion.
What is the workup?
U/A, urine culture, swab i STD suspected, U/S with Doppler or nuclear study to rule out torsion.
What is the treatment?
Antibiotics.

PROSTATITIS

A syndrome that presents with inflammation ± infection of the prostate gland.

Signs and symptoms:

- Patients will come with lower urinary tract symptoms.
- Dysuria, frequency
- Dysfunctional voiding
- Perineal pain
- **Painful ejaculation**

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
Category III is subcategorized into A and B: Non bacterial prostatitis	**Category III** chronic pelvic pain syndrome (CPPS)	Chronic genitourinary pain in the absence of uropathogenic bacteria localized to the prostate gland with standard methodology
	Category IIIA • inflammatory CPPS (Chronic pelvic pain syndrome) With WBC.	**S**ignificant number of white blood cells in expressed prostatic secretion, post prostatic massage urine sediment (VB3), or semen.
	Category IIIB: Prostatodynia[9] • **Non**-inflammatory CPPS (Chronic pelvic pain syndrome) With NO WBC .	**In**significant number of white blood cells in expressed prostatic secretion, post prostatic massage urine sediment (VB3), or semen
N/A	**Category IV asymptomatic** inflammatory prostatitis (AIP)	**White blood cells (and/or bacteria) in expressed prostatic secretion**, post prostatic massage urine sediment (VB3), semen or histologic specimen of prostate gland

- **The difference between category IIIA and IIIB is the white blood cells in the prostatic screening test.**

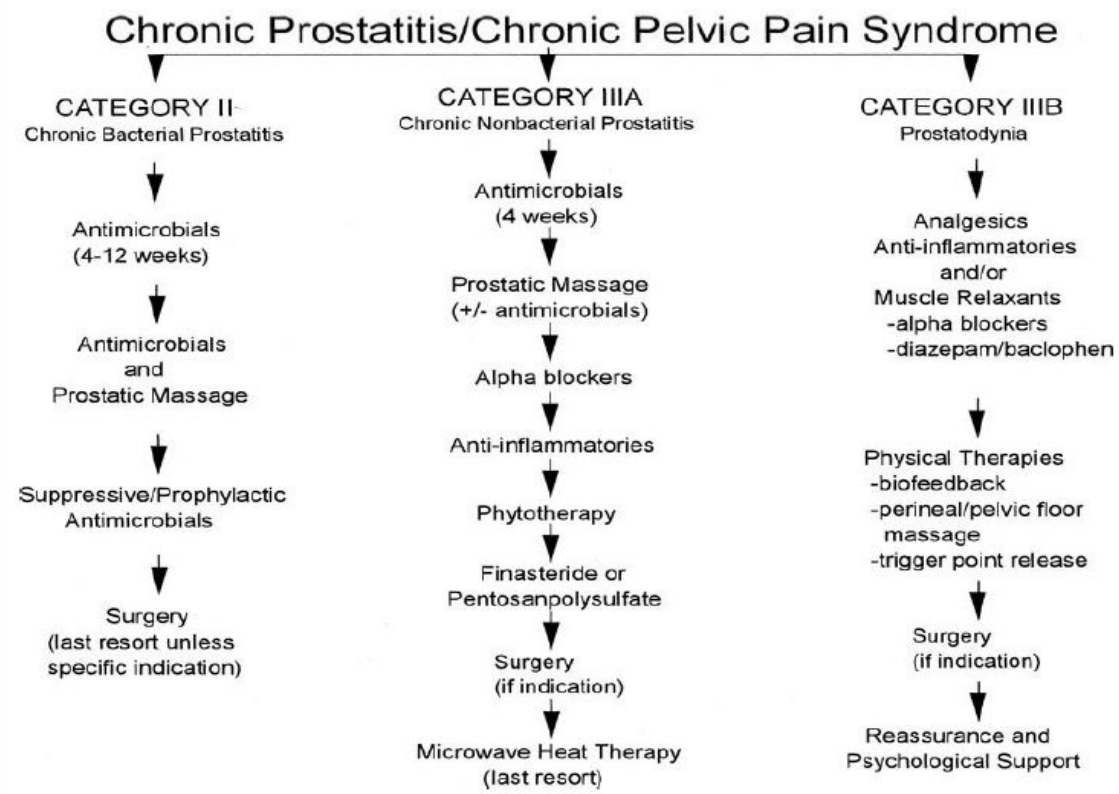
Acute Bacterial Prostatitis:

- Rare.
- Acute pain.
- Storage and voiding urinary symptoms
- Fever, chills, malaise, N/V
- Perineal and suprapubic pain
- Tender swollen hot prostate.

[9] A type of inflammation of the prostate **not** due to bacterial infection and in which there are no objective findings.

Treatment:

- Antibiotics
- Urinary drainage (if they are voiding don't drain the urine, treat the cause and the urine will pass).



CYSTITIS[10] Helpful Video 8:21

Signs and symptoms:

- Dysuria, frequency, urgency, voiding of small urine volumes, in addition it causes sensory urge incontinence (so treatment of both the infection and the bladder spasm is required).
- Suprapubic/lower abdominal pain
- ± Hematuria
- No fever (even if it's severe)

Diagnosis:

- Dipstick [11]
- Urinalysis (you will see WBCs and RBCs)
- Urine culture; (to confirm the diagnosis), the Gold standard.

Treatment:

The treatment is usually :

- For a **Healthy woman** with a **simple cystitis**: **3 days** of wide spectrum antibiotic (Ciprofloxacin,levofloxacin).
- For a **Male gender/ Older patients/ Diabetic/ Pregnancy/ Complicated cystitis**: **7 days** of antibiotic (TMP-SMX or Fluoroquinolones).

Table 14–10. TREATMENT REGIMENS FOR ACUTE CYSTITIS

Circumstances	Route	Drug	Dosage (mg)	Frequency per Dose	Duration (days)
Women					
Healthy	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	
Symptoms for >7 days, recent urinary tract infection, age >65 yr, diabetes, diaphragm use		TMP–SMX or Fluoroquinolone	160–800 As above	Every 12 hr As above	7
Pregnancy	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	
Men					
Healthy and <50 years old	Oral	TMP-SMX or Fluoroquinolone	160–800 As above	Every 12 hr As above	7

[10] Ascending infection from the urethra to the bladder
[11] When nitrate is (+), it indicates an infection

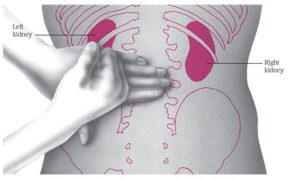
PYELONEPHRITIS[12] Helpful Video 5:17

Inflammation of the kidney and renal pelvis.

Signs and symptoms: (Upper UTI symptoms.)

- Chills
- Fever
- Costovertebral angle tenderness (flank pain)
- GI: Abdominal pain, N/V, and diarrhea
- Gram -ve sepsis - mild flank pain
- Dysuria, frequency

Costovertebral angle tenderness

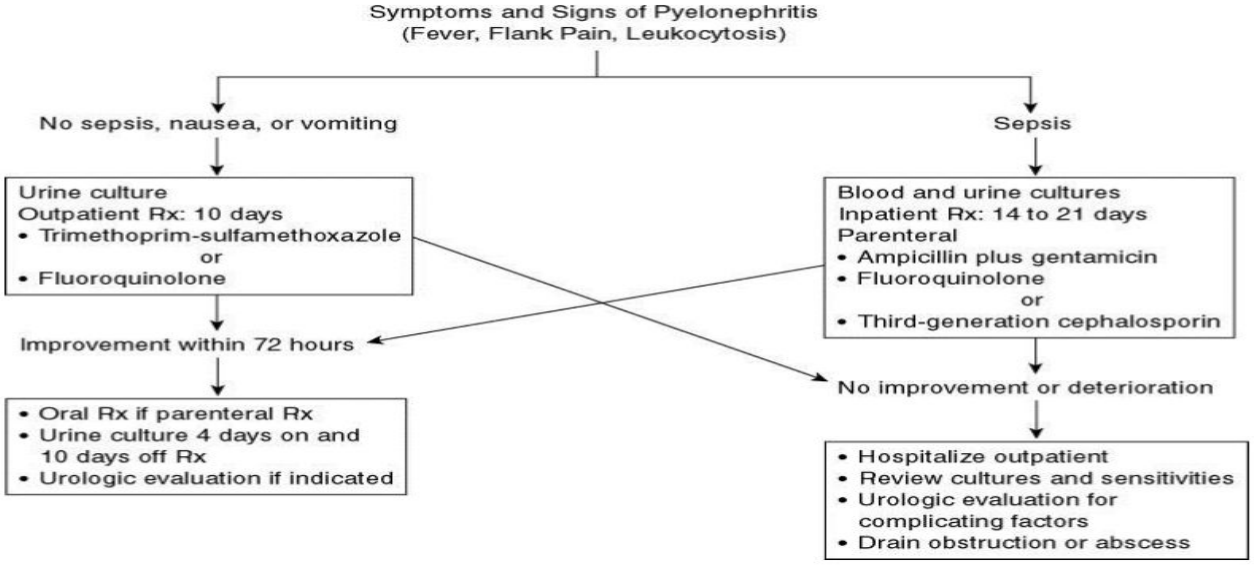


Investigations:

- **Urine C&S** (culture & sensitivity): +VE (80%) (You diagnose by gram stain)
  - **Enterobacteriaceae (E. coli) , Enterococcus**
- **Urinalysis:** ↑WBCs, RBCs, Bacteria
- **Blood test for renal function:** (±) ↑serum Creatinine
- **CBC:** Leukocytosis.
- Urine dipstick microscopy
- **Imaging:**
  - IVP (Intravenous Pyelogram) (we don't do that anymore).
  - **U/S** (to rule out abscess in the kidney and to check out if there is any hydronephrosis).
  - **CT** (If you think that this pyelonephritis is caused by a stone).

Treatment:

- **If there is no sepsis, no vomiting, you send a culture , and then start the patient on oral antibiotic (Trimethoprim-Sulfamethoxazole or Ciprofloxacin) as an outpatient for 10 days.**
- **If the patient is in sepsis : we give him parenteral antibiotic (Ampicillin + Gentamicin or 3rd generation cephalosporins) for about 14-21 days, after they improve we switch them to oral.**



[12] Inflammation of the kidney and renal pelvis.

UROLITHIASIS[13] Helpful Video 7:24

- Formation of urinary calculi (stones)
- Common disease in Saudi Arabia
- Were found in Egyptian mummies 4800 BC
- Prevalence of 2% to 3%
- **Lifetime risk:** Male 20% , Female: 5-10%
- Recurrence rate 50% at 10 years

Risk factors:

Intrinsic Factors	Extrinsic Factors Mainly dehydration states.
• Genetics • Age: 20s-40s, younger age group • Sex: M>F	• Geography (mountainous, desert, tropics) • Climate (July - October) • Decrease in water Intake (the single most important one)[14] • Diet (purines, oxalates, Na) • Occupation (sedentary occupations)

How do stones form?

Supersaturated urine ⇒ Crystal growth[15] ⇒ Aggregation of crystals ⇒ Stone formation.

Most people have Crystals in their urine, so why don't everyone gets stones?

1. Because of the stone inhibitors.
2. If you get the supersaturation in a certain promoter, you have to exceed a certain point (Formation product) point , you also need to have dehydration.

- Anatomic abnormalities.[16]
- Imbalance between Inhibitors/promoters: either by decrease in inhibitors or by increase in promoters levels
    1. **Inhibitors**: Citrate **(the most potent one)** (Found in orange and lemon), Mg, pyrophosphate, and urinary proteins (nephrocalcin).
    2. **Promoters**: Oxalate, Sodium , Phosphate ,Cystine, Uric acid, red meat (which contains animals proteins)[17], hypercalciuria.

[13] The process of forming stones in the kidney, bladder, and/or urethra (urinary tract).
[14] Dehydration increases solutes concentration in the body, thereby increasing the risk of developing crystals.
[15] When the concentration of a solute reaches a certain level, it precipitates forming crystals.
[16] Presence of certain abnormalities of the urinary tract like hydronephrosis or obstruction may lead to stasis of the urine. Then, supersaturation of minerals may lead to formation of stones.
[17] Increases uric acid production through purine degradation

Common stone types:

- Calcium stones are the most common 75% , followed by uric acid stones.
- Cystine stones in adults 1-2% while in children it is 10%. Why? Because it is genetic (Autosomal recessive disorder in which they have a defect in the reabsorption of cystine).
- Struvite stones are also called infection stones.

type	Calcium 75%		Struvite [18] (ammonium magnesium phosphate)	cystine	Uric acid[19]
	oxalate	phosphate			
Cause	Hypocitraturia	-	urease +ve bacteria[20]	hereditary[21]	Myeloproliferative disorders, Excessive blood purine[22]
pH changes that increases their risks	↓ in pH,	↑ in pH	↑ in pH	↓ in pH	↓ in pH
On X-ray	radiopaque[23]			faint radiopaque	radiolucent

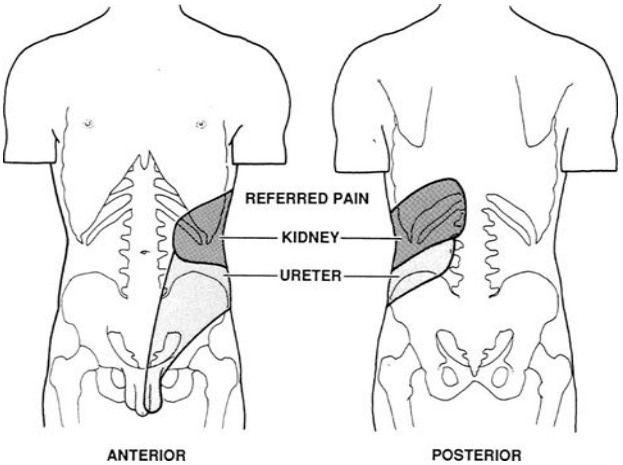
Signs and symptoms: (are similar to pyelonephritis that's why we do CT to rule out)

- Renal or ureteric colic (Not all renal stones will give you a pain) A staghorn stone mostly doesn't give you pain unless they cause obstruction. Small stones cause severe pain because they go everywhere in the tract leading to obstruction.
- Frequency, dysuria
- Hematuria
- GI symptoms: N/V, ileus[24], or diarrhea.
- Restless:
  - ↑HR, ↑BP
  - Fever (If UTI)
  - Tender costovertebral angle.

Staghorn stones

Differential diagnosis:

- Gastroenteritis
- Acute appendicitis
- Colitis
- Salpingitis

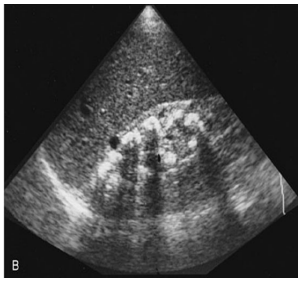


[18] Usually it's the most common cause for staghorn stones
[19] Associated with red meat and gout (not usually)
[20] Proteus,klebsiella, and staphylococcus saprophyticus (seen in newly sexually active women)
[21] Autosomal **recessive** disease; defect in PCT reabsorption of Cystine, Ornithine, Lysine, Arginine (COLA), which increases their urine concentration. All of these compounds are water soluble except cystine, that is why cystine causes stones formation.
[22] Particularly with gout
[23] Radiopaque objects block radiation rather than allow it to pass through like bones, metal and calcium stones which appears white on x-ray
[24] ileus can occur when the normal movement of your intestines are interrupted.

Investigation:

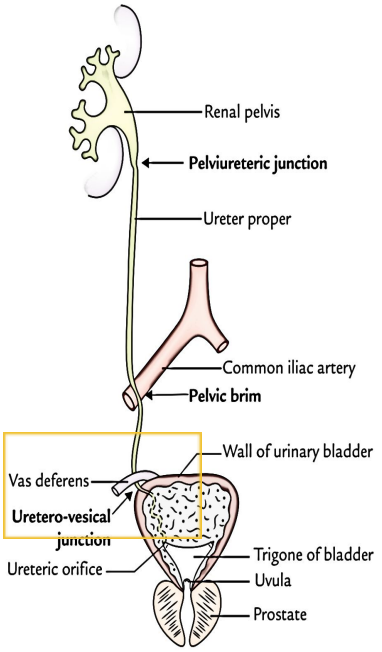
- **Urinalysis**
  - RBCs (bleeding) ,WBCs (Inflammation), Bacteria, Crystals (seeing crystals in urine doesn't mean you have a stone, and not seeing crystals in urine doesn't mean that you don't have stones!), (So crystals in the urine is not specific)
- **Imaging:**
  - Plain Abdominal Films (KUB) (Kidney Ureter Bladder)
    A kind of plain X-ray which only show the Radiopaque stones.
    - What is the most common Radiopaque stone? Calcium and calcium oxalate.
    - What is the most common Radiolucent stone? Uric acid stones and Xanthine stones.
    - What are xanthine stones? They are the precursors of uric acid stones.
  - Intravenous Pyelogram (IVP) (rarely used now)
  - Ultrasonography (U/S) (used for pregnant)
  - Computed Tomography With no contrast (CT) **(The gold standard)>Mentioned by the doctor last year.**

You will get a question in the exam (Describe what do you see), so first you describe the study (KUB or US… , Coronal or cross sectional) and then you describe what you see in the study.

KUB	US	IVP (rarely used)	CT
 Plain abdominal film shows only radiopaque stones, (radiopaque shadow overlying the right kidney)	 U/S shows hyperechoic stones + acoustic shadow.	 shows radiolucent (uric acid stone) & radiopaque stones (calcium stones).	 • We call this an axial or cross sectional cut of a non enhanced abdominal CT scan. • shows both radiopaque and radiolucent stones. (So it's the first step)

The most likely places for ureteral stones to lodge are at the site of constrictions:

- At ureteropelvic junction (UPJ)
- At pelvic inlet (site of crossing of common iliac artery)
- At Ureterovesical junction (UVJ) the site of entrance to bladder (the narrowest area).



Treatment:

1. Conservative (Always start with conservative):

- Hydration
- Analgesia, (intramuscular diclofenac, a NSAID, is the most effective analgesic)
- Antiemetics
- Stones (<5 mm) >90% undergo spontaneous passage, we usually ask them to drink plenty of water and give them alpha blocker to dilate the ureter, **(this is called medical expulsive therapy).**

2. Indications for admission:

- Renal Impairment
- Refractory Pain
- Pyelonephritis[25]; patient has 3 mm stones with fever and chills> pyelonephritis.
- Intractable N/V (Nausea/Vomiting)

3- Extracorporeal Shock Wave lithotripsy (SWL)[26] : a device assisted by X-Ray, it delivers shock pulses which causes Bubbles and fractures to the stones, the stone **has to be RADIOPAQUE** or if the shock wave machine has an ultrasound that can locate the radiolucent stones but not all of them have it.

- The **IDEAL STONE** for a shock wave would be a proximal ureteric **8 to 10 mm RADIOPAQUE** stone**.**
- If the stone is larger than 1.5 cm then shock wave is not a good option, because when you break these stones you will get smaller stones which can obstruct the ureter.

4- Ureteroscopy[27] laser. (for Distal ureteric stone or RADIOLUCENT stones).

5- Percutaneous nephrolithotripsy (PNL)[28] (Used with larger stones more than 2 cm or staghorn stones).

6- Open surgery. (rare and not really an option).

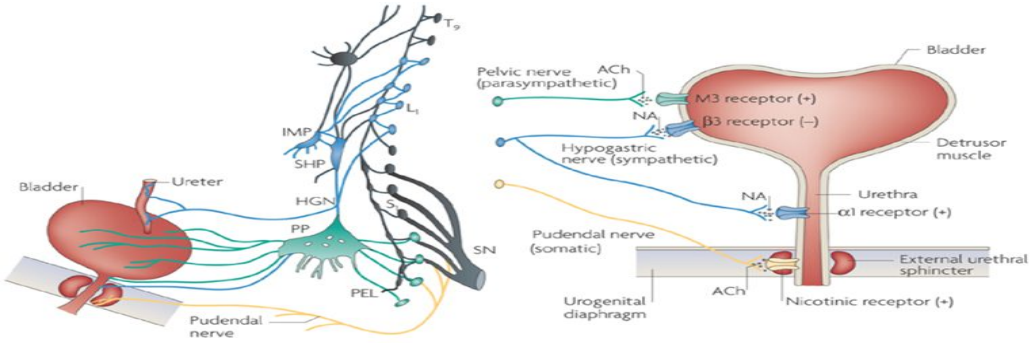
[25] Stones may act as a nidus, so if the patient shows signs of infection consider antibiotic therapy
[26] least invasive, for small stones
[27] enter from the urethra and goes up and us laser to destroy the stone
[28] enter from the flank, for Staghorn stones

VOIDING DYSFUNCTION Helpful Video 7:15

- The bladder **emptying** is controlled by:
  Muscarinic receptors and **beta receptors.**
- The bladder neck **(sphincter)** is controlled by: **alpha receptors.**

Overactive Bladder: (Mostly with women)

- Overactive bladder can be due to the hypersensitivity of the receptors that control the detrusor muscle that control the bladder sphincter.
- The **treatment of bladder overactivity** is usually **anticholinergic medication** to relax the bladder.
- It is **IMPORTANT** to measure the **Post-Void Residual urine**[29] before you start the medication, because if the patient has a high Post-Void Residual urine then you shouldn't start them on any medication that relax the bladder, because that will increase it even more and then the urine will reflux on the kidney which lead to renal insufficiency.



Failure to store	Failure to empty
Bladder Problems: • **Overactivity**: common in **women** or b/c of spinal cord injury, stroke > loss of control by causing damage to micturition inhibitory center. • Hypersensitivity	**Bladder Problems :** • Neurologic • Myogenic • Idiopathic
Outlet Problem: • **Stress Incontinence:** Patients with weak pelvic floor muscles or weak sphincter muscles of bladder neck may lose some urine control (dribbling) following an increase in intra-abdominal pressure (sneezing, coughing, or running)[30] • Sphincter Deficiency	**Outlet Problem:** • BPH: Benign Prostatic Hyperplasia • Urethral Stricture • Sphincter Dyssynergia[31].
Combination of both	**Combination of both**

[29] The post-void residual (PVR) urine test measures the amount of urine left in the bladder after urination.
[30] Multiparous women commonly lose some of the tone over pelvic floor muscles with each pregnancy. Thus, they are more prone to suffer from stress incontinence.
[31] **Dyssynergia** is any disturbance of muscular coordination, resulting in uncoordinated and abrupt movements.

Recall (EXTRA) :

What are the common types of incontinence[32]?

- Stress incontinence
- overflow incontinence,
- urge incontinence

Define the following terms:

- **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
- **Overflow incontinence**: Failure of the bladder to empty properly; may be caused by bladder outlet obstruction (BPH or stricture) or detrusor hypotonicity
- **Urge incontinence**: Loss of urine secondary to detrusor instability in patients with stroke,dementia, Parkinson's disease, etc.
- **Mixed incontinence:** Stress and urge incontinence combined
- **Enuresis:** Bedwetting in children

How is the diagnosis made?

History (including meds), physical examination (including pelvic/rectal examination), urinalysis, postvoid residual (PR), urodynamics, cystoscopy/ vesico cystourethrogram (VCUG) may be necessary

What is the "Marshall test"?

Woman with urinary stress incontinence placed in the lithotomy position with a full bladder leaks urine when asked to cough

What is the treatment of the following disorders:

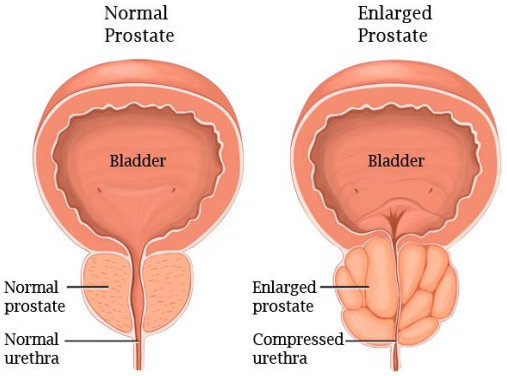
- **Stress incontinence?** Bladder neck suspension
- **Urge incontinence?** Pharmacotherapy (anticholinergics, α-agonists)
- **Overflow incontinence?** Self-catheterization, surgical relief of obstruction, α-blockers

[32] Loss of bladder control.

Benign prostatic hyperplasia Helpful Video 4:46

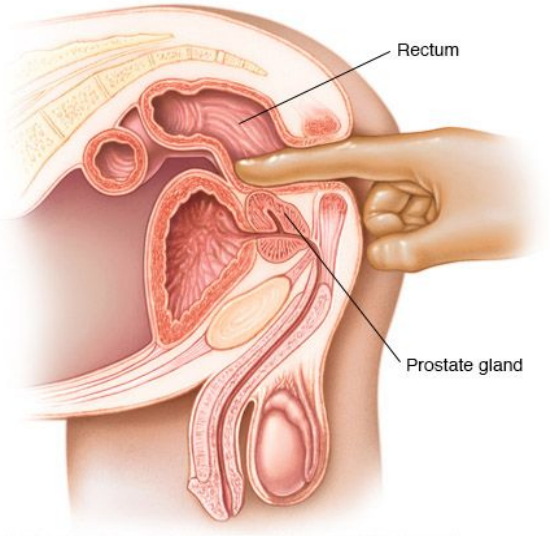
Clinical features:

- **Lower urinary tract symptoms**[33] (Irritative **and**/or Obstructive)
- Poor bladder emptying
- Urinary retention
- Urinary tract infection (UTI)
- Hematuria
- Renal insufficiency Rarely.



Physical examinations:

- DRE[34] (Digital rectal Examination) (you check if the patient is having fissures, hemorrhoids, size of the prostate , consistency and the size of any NODULES)
  If it's hard to palpate the nodules, it most likely Cancer.
- Focused neurological exam:
  - Anal tone
  - Prostate cancer
  - Rectal cancer
  - Neurological problems some neurological disorders may cause bladder dysfunction (There is micturition center in the pons).
- Abdomen: Distended bladder



Investigations:

- Urinalysis, Culture
  - UTI
  - Hematuria:
    Are of two types : Gross and microscopic, What defines the microscopic hematuria?
    It is defined as **THREE or more red blood cells** per high power microscopic field of at least TWO of THREE collected urine samples.
- Serum Creatinine (if have suspicion of poor bladder emptying or hydronephrosis).
- Serum Prostate-Specific Antigen (PSA)[35](Released due to destruction of prostatic cells).
- Flow rate (we measure : the **time** , **maximum flow rate** and the **volume**):
  The maximum flow rate should be more than 15, less than 10 is obstructive. It is higher in **FEMALES (20-25)** and **MALE** would be **LOWER**.
- US → (kidney for Hydronephrosis), (bladder for Post Void Residual) and (prostate we check for size).

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[33] Prostate adenocarcinoma most commonly originates from the posterior aspect at the periphery. Therefore, it usually doesn't cause urinary symptoms until late in the course.

[34] Examination reveals: little, rubbery, symmetrical and smooth prostatic enlargement, with a median groove between the two lateral 'lobes"

[35] Normal range (0-4 ng/mL); BPH (4-10 ng/mL); prostatic cancer (more than 10 ng/mL)

Management:

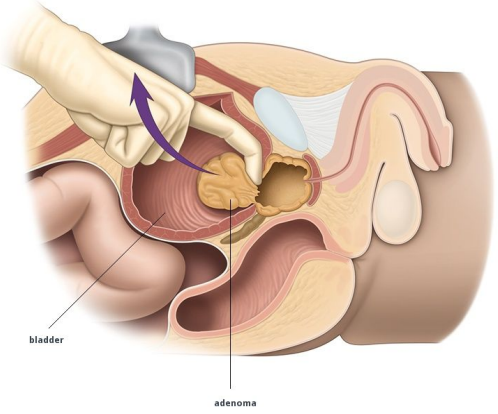
- **Medical therapy (Always start with medical therapy):**
  - Selective α_{1A}-Adrenergic Blockers:[36] (To open the Bladder neck)
    - Tamsulosin
    - Alfuzosin
    - Terazosin

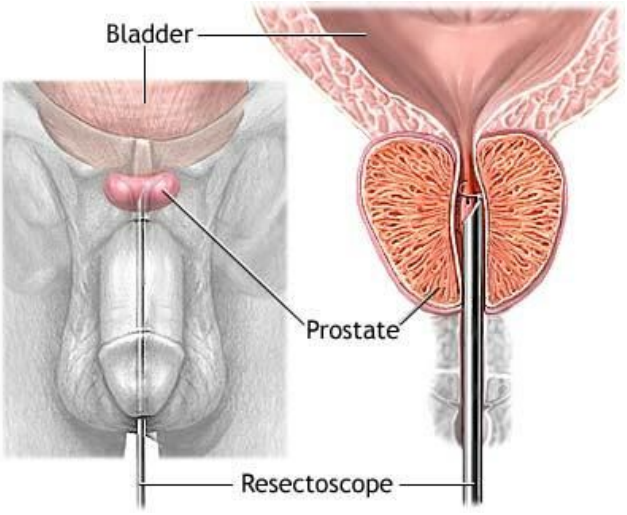
    (The problem with these drugs is that they cause **Postural Hypotension)**.
  - 5α reductase inhibitor[37] (Androgen suppression):
    - Finasteride

    (This drug inhibit the formation of the active form of Testosterone) and this would decrease the vasculogensis of the prostate which lead to a decrease in the size of the prostate and also decrease the PSA.

- **Surgical Rx[38]:** by prostatectomy (removal of the whole or a part of prostate)
  - **Endoscopic** (e.g. Transurethral resection of the prostate (TURP)[39], laser ablation, prostatic stent); we go in with a scope through the urethra, and we resect a lope from the prostate which lead to the formation of a cavity.زي تقوير الكوسه
  - **Open prostatectomy**. Reserved for very large prostate more than 100 grams.

  After prostatectomy, the bladder must be allowed to drain freely via a urethral catheter while the prostatic bed heals and bleeding stops.





Complication:

BPH may lead to obstruction → stasis → UTIs, bladder stones, tumor, or obstructive uraemia.

- **obstructive uraemia** which is characterized by:
  - Azotemia and decreased GFR
  - Oliguria
  - Nausea and vomiting
  - Weight loss
  - Muscles cramps

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[36] relax smooth muscles of bladder neck and prostate capsule
[37] blocks the conversion of testosterone to dihydrotestosterone → shrinks prostate 60% in 6 months
[38] If medical therapy failed
[39] Picture

Summary

Urinary Tract infections	
Lower	**Urethritis:** • Gonococcal (Neisseria gonorrhoeae), (IP: 3- 10 Days), Whitish discharge. • Non Gonococcal (Chlamydia trachomatis) (IP: 1-5 weeks). **Epididymitis:** young : STI (gonorrhea and chlamydia), elderly : E.coli Acute: Pain & swelling of the epididymis <6 weeks Chronic : Long-standing pain in the epididymis and testicle, usually no swelling present cremasteric reflex, treat according to the causative agent **PROSTATITIS:** painful ejaculation , perineal pain , dysuria and frequency treatment :Antibiotics ,Urinary drainage **CYSTITIS:**dysuria , frequency and urgency +- hematuria , suprapubic/lower abdominal pain Diagnosis is done with dipstick , **urine culture** and urinalysis Treat with: broad spectrum antibiotics if healthy women for 3 days If Male gender/ Older patients/ Diabetic/ Pregnancy/ Complicated cystitis : **7 days of antibiotic**
Upper	**PYELONEPHRITIS:** fever,chills, flank pain dysuria and frequency Treatment : sepsis ? no : outpatient for 10 days with trim-sulfa or ciprofloxacin , if yes :i.v (ampicillin , gentamicin , 3rd generation cephalosporins for **14 to 21 days**.l

Renal Colic	• Formation of urinary calculi (stones). **Risk factors:** Decrease in water Intake (the most Important). **Types:** • Calcium, struvite (staghorn): **RADIOPAQUE.** • Uric acid, Xanthine : **RADIOLUCENT.** **Investigations**: the gold standard imaging method (CT without contrast).

Benign prostatic hyperplasia	**Lower urinary tract symptoms:** frequency , urgency hematuria ,UTI , urinary retention , poor emptying, dripping Digital rectal exam: look for nodules Abdomen: Distended bladder : which pushes the prostate and make it seem larger Check for : serum creatinine , serum PSA, flow rate and U/S for kidney , bladder and prostate **Management** Medical (always start with medical treatment) : alpha 1 blockers (relax the sphincter): Tamsulosin ,Alfuzosin , Terazosin .Finasteride Surgical Endoscopic (e.g. Transurethral resection of the prostate (TURP) , laser ablation, prostatic stent Open prostatectomy : reserved for very large prostate

Questions

1) 14 years old male complaining of sudden onset of severe unilateral scrotal pain followed by scrotal swelling. The pain last for less than 6 hours with fever and vomiting, no voiding difficulties or painful urination. Physical examination revealed a swollen, tender, high-riding testis and absence of cremasteric reflex. What is the most likely diagnosis ?

a- Epididymitis
b- Torsion of testicular
c- Hydrocele
d- Testis tumor

2) What is the confirmatory diagnostic test in cystitis?

a- Urine culture
b- Urinalysis
c- Dipstick
d- Ultrasound

3) which one of the following is one of the most common organisms that cause pyelonephritis?

a- Proteus
b- Klebsiella
c- Pseudomonas
d- E.coli

4) <u>All of the following</u> are considered true regarding urolithiasis <u>except</u> :

a- Decrease in water Intake contribute to developing urolithiasis
b- Increase in physical activity will cause recurrent urolithiasis
c- Affects males more than females
d- CT is the gold standard diagnostic test

5) 50 years old male presented to the emergency complaining of difficulty to urinate, painful urination, low back pain, fever, painful ejaculation and urethral discharge. Physical examination revealed tender, nodular and hot gland on digital rectal examination, suprapubic abdominal tenderness and enlarged tender bladder. What is the most likely diagnosis?

a- Benign prostatic hyperplasia
b- Prostatic cancer
c- Prostatitis
d- Cystitis

6) What is the best treatment for large stones (>2 cm) or staghorn stones?
a- Shock Wave lithotripsy
b- Ureteroscopy laser
c- Percutaneous nephrolithotripsy
d- Open surgery

7) 26 years old male came to your clinic complaining of urethral discharge. He had no fever and no other symptoms. He told you that he had unprotected sexual intercourse 3 weeks ago. What is the most likely organism?
A- N.gonorrhea
b- Chlamydia
c- E.coli
d- proteus

8) Which one of the following diagnostic approaches of urolithiasis is not/rarely used nowadays?
a- Plain Abdominal Films
b- Intravenous Pyelogram
c- Ultrasonography
d- Computed Tomography

Answers:

1: B 2: A 3: D 4: B 5: C 6: C 7: B 8: B