SMLE Internal Medicine Summary

Medicine & Allied (CMH Lahore Medical And Dental College)

SMLE INTERNAL MEDICINE SUMMARY

Diseases in table according to the system
Notes taken from Dr. Amer Zahrallayali 2022 Course

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Rheumatology

	Hints	Diagnosis	Treatment	Extra

Rheumatoid arthritis	- Morning stiffness >1 hour
	- Increase with rest, decrease with movement
	- Most common in wrist
	- Doesn't involve DIP, Spine (except C1/C2), Hip
		- **Initial/Next**: RF
		- **Diagnostic**: anti-CPP
		- **X-ray**: osteopenia → sclerosis → pannus
			- Newly diagnosed → **methotrexate + steroid**
			- Newly diagnosed + very mild (negative RF, low ESR/CRP) → **hydroxychloroquine**
			- Not improved on methotrexate + poor prognostic features → **add anti-TNF (infliximab)**
			- Not improved on methotrexate + no poor prognostic features → **add hydroxychloroquine and sulfasalazine**
			- Didn't improve in all medications → give methotrexate and **rituximab**
			- Patient taking methotrexate + hydroxychloroquine + no improvement + no poor prognostic features → **add biologic (infliximab)**
			- If pregnant:
			  ○ Low activity (only joint symptoms) → **hydroxychloroquine + steroid**
			  ○ High activity (deformity subcutaneous nodule, extra-articular) → **hydroxychloroquine + sulfasalazine + steroid** OR **anti-TNF + steroid**
				Poor prognostic features:
				- Joint erosion
				- >20 small joints involved
				- Poor functional status
				- Smoker
				- Late presentation
				- High RF, high ESR and CRP, high anti-CCP
				- Subcutaneous nodules
				Felty's syndrome:
				- RA
				- Splenomegaly
				- Low neutrophils

Adult-onset still's disease	- Arthritis + Fever - Rash (salmon patch) - HIGH ferritin	-	- **NSAIDs** - No improvement or severe (multi-joint) → **steroid** - Refractory → **methotrexate**	

Osteoarthritis	- Morning stiffness <30 minutes
	- Decrease with rest, increase with movement
	- Doesn't involve MCP, wrist, ankle, elbow
		- All labs normal
		- X-ray (late findings): joint space narrowing → subchondral sclerosis → osteophytes
			- Lifestyle modification
			- Topical diclofenac
			- If no improvement:
			  ○ Patient with CKD, hypertension, PUD, CHF → oral paracetamol or tramadol
			  ○ Healthy → short course NASAIDs (ibuprofen or celecoxib)
			- If no improvement with oral medication → intra-articular injection steroids
			- If no improvement → codeine	

Gout	- Diuretics (furosemide, thiazide) - Diabetes - CKD - CHF - Pyrazinamide - High turnover disease (psoriatic arthritis, RA)	- **Initial/Next**: joint aspiration (needle shaped, negative birefringent, yellow) - **Specific sign on ultrasound**: double contour sign	- **First attack:** o Medically free → indomethacin + misoprostol OR colchicine o CKD, CVD, HF, PUD → Colchicine - **After 2 weeks, start prevention** → colchicine for 6 months + urate lowering agents (only if indicated)	**Indications of urate lowering agent** (allopurinol OR febuxostat OR IV pegloticase if refractory tophi) - Tophi - 2 or more attacks/year - Erosion on x-ray - GFR <60
Pseudo-gout	- Hyperglycemia - Hypercalcemia - Hypomagnesemia - Hypothyroidism - Hemochromatosis	- **Initial/Next**: joint aspiration (rhomboid shaped, positive birefringent, blue) - **X-ray**: chondrocalcinosis	- **NSAIDs + colchicine** - Treat underlying cause	
Septic arthritis	- Joint fluid analysis >50,000 cell count (**PMN >75%)**	- If gonorrhea, they have to de cervical + urethra + pharyngeal PCR for chlamydia	- Gonococcal gonorrhea (gram -ve) → **ceftriaxone 2 weeks + 1 dose of doxycycline or azithromycin** - Staph → **oxacillin** or **cloxacillin**, if resistant **vancomycin** - Strep → **penicillin** OR **ceftriaxone** OR **ampicillin**	
Ankylosing spondylitis	- Male > female - <40 years old - Back pain - Anterior uveitis, aortic regurgitation, apical lung fibrosis, IgA nephropathy	- **Diagnostic**: MRI hip and spine	- **NSAIDs** o If no improvement + spine affected → **infliximab** o If no improvement + peripheral (knee, ankle) affected → **sulfasalazine**	

Reactive arthritis	- Post infection (2-4 weeks of GI/GU infection) - 20-40 years	- GU infection (chlamydia) - GI infection (shigella, clostridium difficile, salmonella, campylobacter jejuni)	- **NSAIDs** - No improvement or another attack → **stop NSAIDs + give steroids** - No improvement (recurrent or severe symptoms) → **stop steroids + give sulfasalazine OR methotrexate** - **Antibiotics** (doxycycline or azithromycin) given if only active infection, with **NSAIDs**	
IBD arthritis	- More common with Crohn's than UC	-	- If spine affected → **anti-TNF** - If peripheral (knee) affected → **IBD medications**	
Psoriatic arthritis	- Upper limb involvement - Sausage digit (dactylitis) - Nail pitting - Silver erythematous scaly plaque - 45-54 years old	- **X-ray**: pencil in cup	- **NSAIDs** - If mild → **add sulfasalazine** - If severe → **add anti-TNF**	
Diffused systemic sclerosis	- Tight skin in trunk - Involvement of heart (MI or restrictive cardiomyopathy leading to right heart failure), lung (ILD), kidney (sclerodermic renal crisis)	- **Initial/Next**: ANA - **Diagnostic**: anti-SCL 70 (topoisomerase I)	- No steroids - **If pulmonary fibrosis** → IV cyclophosphamide OR mycophenolate mofetil - **Renal crisis** → ACE inhibitor (even if pregnant or high creatinine)	**Sclerodermic renal crisis:** - Sudden hypertension - Increase creatinine - Microangiopathic hemolytic anemia
Limited systemic sclerosis	- Tight skin in face, hand - Calcinosis - Raynaud phenomena - Esophageal dysmotility - Sclerodactyly - Telangiectasia	- **Initial/Next**: ANA - **Diagnostic**: anti-centromere	- **Raynaud** → CCB (nifedipine) → didn't improve → topical nitrate → didn't improve → Viagra → didn't improve → aspirin → didn't improve → SSRI	

Dermatomyositis	- Painless, proximal muscle weakness
	- Purple rash:
	  o Eye: Heliotrope rash
	  o Hand: Gottron's papules
	  o Upper back: shawl sign
	  o Neck: V-sign
	  o Hip: holster sign
	- Organ involvement (cardiomyopathy, ILD, pulmonary hypertension)
		- High creatinine kinase
		- **Initial/Next**: ANA
		- **Specific**: anti-jo, anti-m1
		- **Diagnostic**: muscle biopsy
			- Mild disease (no organ involvement) → **steroid**
			- Severe disease → **azathioprine** OR **methotrexate** OR **rituximab** OR **IVIG** (if refractory)
			- Life threatening (low O_2, hypoxia, respiratory failure) → **cyclophosphamide**
				- Must do both upper and lower GI endoscopy and in female pelvic ultrasound to rule out GI/Gyne malignancy

Polymyositis	- No rash only weakness			

SLE	- Malar rash
	- Alopecia
	- Nonpainful oral ulcer
	- Seizure, psychosis
	- Episcleritis, sicca
	- Pericarditis
	- Liebman-sac endocarditis
	- Pulmonary hypertension
	- Pleurisy
	- Pleural effusion
	- Raynaud phenomena
	- Ascites
	- Mesenteric vasculitis
		- **Initial/Next:** ANA (>1:60)
		- **Specific:**
		  o Anti-smith (diagnostic)
		  o Anti-dsDNA (disease activity)
			- Mild (only joint or skin symptoms) → **hydroxychloroquine + PO steroid**
			  o If in the question only give hydroxychloroquine → give **steroid**
			  o If no improvement → add **methotrexate** or **azathioprine**
			- Moderate/non-life threatening (pleurisy, pericarditis, pleura effusion, platelet 20-50) → **hydroxychloroquine + IV steroid**
			  o If no improvement → add **methotrexate** or **azathioprine** or **mycophenolate mofetil**
			- Severe/life threatening (affects brain, spine, kidney, or pulmonary hemorrhage) → **IV cyclophosphamide + IV steroid**
			  o Give maintenance → **hydroxychloroquine + mycophenolate mofetil**
				- No live vaccine (MMR, zoster)
				- Only killed vaccine (pneumococcal, influenza)
				- Neonatal lupus (bradycardia + complete heart block) from anti-Ro
				- If SLE + RA → hydroxychloroquine + methotrexate
				- Anti-La is least autoantibody

Pregnancy and SLE	- **Stop** (methotrexate, cyclophosphamide, mycophenolate mofetil) → 3 months before conception
	- **Safe in pregnancy**: hydroxychloroquine, steroid, azathioprine, cyclosporine, tacrolimus
	- Start with **hydroxychloroquine + low dose steroid**
	- Presented with attack:
	  o Life threatening → **IV steroid + mycophenolate mofetil** (save the mother even if contraindicated) OR **rituximab**
	  o Non-life threatening → **IV steroid + hydroxychloroquine** → no improvement → **increase dose of steroid** OR give **cyclosporine**		

Lupus nephritis	- First step to diagnose is renal biopsy (guides the management):
	  o I (minimal mesangial) + II (mesangioproliferative) → **no treatment**
	  o III (focal proliferative) + IV (diffuse proliferative) → **IV steroid + IV cyclophosphamide** OR **IV mycophenolate mofetil**
	  o V (membranous) → IV **steroid + IV cyclophosphamide** OR **IV mycophenolate mofetil <u>AND</u> add ACE inhibitor** (for proteinuria)
	  o VI (sclerosis) → **dialysis**		

Drug-induced lupus	- Infliximab - Sulfasalazine - Hydralazine - Procainamide - Quinin + Methyl dopa	- **Initial/Next:** ANA - **Specific:** anti-histone	- Stop medication
Antiphospholipid syndrome	- SLE + multiple miscarriages + DVT - Livedo reticularis - Liebman-sac endocarditis - Fetal loss (x1 >10 wks OR x3 <10 wks)	- Lupus anticoagulant - Anticardiolipin - Low platelets - Long PTT	- Low molecular weight heparin (**enoxaparin**) + low dose **aspirin** - If only antibodies positive with no symptoms or miscarriage → only low dose **aspirin** given

Sjogren syndrome	- Dry eyes and mouth	- **Initial/Next:** ANA
		- **Specific:** anti-Ro (SSA), anti-La (SSB)
		- Rose-Bengal stain and Schirmer test
		- **Diagnostic**: parotid or salivary gland biopsy
			- Ocular symptoms → **tear drops** or **drops of cyclosporin** (if severe)
			- Oral symptoms → **PO pilocarpine**
			- Extra-glandular (arthritis, lung fibrosis, renal tubular acidosis type 1):
			  o Mild (arthritis) → **NSAIDs**
			  o Severe → **steroid**

Takayasu arteritis	- Young, Asian female - No radial pulse	- **Diagnostic**: CT angiography of aorta and aortic arch	- IV steroid
Giant cell arteritis	- Unilateral headache - Jaw claudication - Decrease eye vision - Tender scalp - Associated with polymyalgia rheumatica	- **Best to diagnose**: CT angiography of temporal artery - **Gold standard**: temporal biopsy	- Give high dose prednisone without delay
Polyarteritis nodosa	- Male >50 years - Abdominal pain - History of HBV - No effect on lungs - Livedo reticularis + mononeuritis multiplex	- **Diagnostic**: CT angiography (microaneurysms in mesentery)	- IV steroid
Wegner (Granulomatous polyangiitis)	- Recurrent sinusitis - URTI - Saddle nose - Hemoptysis - Renal involvement (RBC casts)	- C-ANCA	- IV steroid + IV cyclophosphamide - If no improvement → plasma exchange (plasmapheresis)
Shurg-straus (Eosinophilic granulomatous polyangiitis)	- Noncontrolled asthma - Recurrent rash + eosinophils >10%	- P-ANCA	- Steroid - If cardiac manifestation → IV steroid + IV cyclophosphamide
Familial Mediterranean fever	- Episodic fever + Pain in joint + Peritonitis pain + Pleuritis - Lebanon or Turkey	- High ESR, CRP, WBC - High levels of IL-1 - Have pyrin gene	- **Colchicine** - If only arthritis → **aspirin and steroid**

Nephrology

	Hints	Diagnosis	Treatment		Extra
Indication of urgent dialysis	- Refractory acidosis to $NaHCO_3$ - Refractory hyperkalemia and hypercalcemia - Intoxication by (salicylate, methanol, ethylene glycol, isopropyl alcohol) - Refractory volume overload to diuretics - **Uremia**: ○ Uremic pericarditis, Uremic encephalopathy, Refractory bleeding to desmopressin, Refractory uremic neuropathy - If ESRD and on dialysis came with hyperkalemia → start hemodialysis				
Hyperkalemia	- K >6.5 - Tall, tented T wave in V3-V4	- **Next step**: ECG	**Tall T wave in ECG**	- **Initial**: cardiac stabilizer (IV Ca gluconate) - **Next**: cell shifter (IV insulin with IV dextrose, albuterol nebulizer, $NaHCO_3$ only if low pH) - **Last**: clearance (Ca resonium OR furosemide)	- **If refractory** (tried for 3 times) → hemodialysis - Treatment of hypokalemia is potassium replacement (KCl)
			No ECG finding	- Start cell shifters (IV insulin + IV glucose) - $NaHCO_3$ only if low pH	

Hyponatremia	- Na <135
	- Stupor
	- Coma
	- Anorexia
	- Lethargy
	- Hyporeflexia
	- Weakness
	- Orthostatic hypotension
	- Seizure
	- Headache
	- Stomach cramp
		- Serum osmolarity
		- Assess volume status
			Hypovolemia	- Urine Na:
				  ○ >30 → renal loss (diuretics)
				  ○ <30 → extra-renal (vomiting, diarrhea, NGT, dehydration)
				- **Give isotonic saline**
					- In SIADH rule out hypothyroidism and adrenal insufficiency to make the diagnosis
					- Hyponatremia + CNS symptoms → **IV hypertonic saline** with rate of correction <u>Na level 4-6 in first 4 hours</u>, <u><12 in first 24 hours</u>

			Euvolemia	- Urine osmolarity:
				  ○ <100 (diluted urine) → psychogenic polydipsia
				  ○ >100 (dark urine) → SIADH
				- **Restrict water**	

			Hypervolemia	- Urine Na:
				  ○ >30 → renal loss (CKD or nephrotic syndrome)
				  ○ <30 → extra-renal (CHF, cirrhosis, secondary hyperaldosteronism)
				- **Give diuretics**	

	- **Osmotic demyelination syndrome** → paraplegia, diplopia, dysarthria from rapid correction → diagnosed by MRI - **Over correction + no signs of osmotic demyelination syndrome (central pontine myelinosis)** → stop normal saline + give D5W				

<table>
<tr><td>Uncomplicated cystitis</td><td>- Dysuria without fever
- Female
- Nonpregnant
- Medically free</td><td rowspan="4">- Urine analysis
- Urine culture:
○ Klebsiella
○ E. coli
○ Enterobacter
○ Proteus
○ Pseudomonas
○ Serratia
○ Staphylococcus saprophyticus (honeymoon cystitis</td><td>- 3-5 days of:
○ Nitrofurantoin OR Trimethoprim → first line
○ Amoxicillin OR Ciprofloxacin OR Augmentin → second line
- Trimethoprim not given in G6PD</td></tr>
<tr><td>Complicated cystitis</td><td>- Dysuria without fever
- Male
- Pregnant
- Renal transplant
- Renal stones
- Anomalies
- DM</td><td>- 5-7 days:
○ Amoxicillin OR Ciprofloxacin → first line
○ Nitrofurantoin OR Trimethoprim → second line
- Pregnant:
○ Trimethoprim in second trimester OR Nitrofurantoin (stops last 30 days before delivery) OR Beta lactam (Amoxicillin OR cephalexin)
○ Not given in pregnancy (Metronidazole, Ciprofloxacin, Aminoglycoside, Tetracyclines)</td></tr>
<tr><td>Uncomplicated pyelonephritis</td><td>- Fever + flank pain + dysuria
- Normal kidney function
- Normal US</td><td>- 10 days:
○ Ciprofloxacin
○ If pregnant → IV ceftriaxone or IV meropenem</td></tr>
<tr><td>Complicated pyelonephritis</td><td>- Fever + flank pain + dysuria
- High creatinine
- Low blood pressure
- Perinephric abscess on US</td><td>- 14 days:
○ IV meropenem OR IV ceftriaxone with IV aminoglycosides (gentamycin) OR IV ciprofloxacin
○ If pregnant → IV meropenem</td></tr>
<tr><td>Acute tubular necrosis causes</td><td colspan="2">- Severe prolonged ischemia from hypotension or hypovolemia
- Contrast induced nephropathy (prevented by giving pre and post isotonic IV fluid)
- Gout
- Toxins (aminoglycosides, vancomycin, acyclovir, methotrexate)
- Pigments: rhabdomyolysis, hyperbilirubinemia
- Cast: granular/muddy brown</td></tr>
</table>

Acute interstitial nephritis causes	- Allergy to drug (B-lactam or sulfa drugs) - Autoimmune (SLE, Sjogren) - Infections (TB, pyelonephritis) - Infiltration (lymphoma, leukemia)	
CKD (Waxy cast)	- **Statins** for cardiovascular complication protection - **ACE inhibitor** to decrease albumin level - CKD + hypertension → **decrease Na** - CKD + oliguria → **decrease K** - CKD + volume overload → **diuretics** (lasixs) - CKD + uremic pericarditis or uremic encephalopathy or uremic neuropathy → **dialysis** - CKD + metabolic acidosis → **PO NaCHO3** - CKD + hyperkalemia → management of hyperkalemia above - CKD + anemia of chronic disease → **erythropoietin injections** (target Hb level until 10, treat IDA before giving erythropoietin) - CKD + secondary hyperparathyroidism → **calcitriol** + **phosphate binder**	
Nephrotic syndrome	- **Proteinuria >3.5 gram (+4)**, Hypoalbuminemia, Hyperlipidemia, Edema - **Cast**: fat/oval	
	Systemic causes	- Diabetic nephropathy - Autoimmune + proteinuria + high Ca + rash → amyloidosis
	Minimal change GN	- Pediatrics, Leukemia, or lymphoma - Pudding (podocyte effacement) - Management: **Prednisone**
	Membranous GN	- Malaria, HBV - Solid malignancy (lung, breast, colon) - SLE - Medications (gold, NSAIDs) - Management: **ACE inhibitor + prednisone + treat the cause**
	Focal segmental glomerulosclerosis	- Sickle cell disease - Heroin, anabolic steroids - HIV, chronic pyelonephritis - Management: **ACE inhibitor + prednisone + treat the cause**

<table>
<tr><td rowspan="5">Nephritic syndrome</td><td colspan="3">- RBC casts or dysmorphic RBCs
- Proteinuria <3.5 grams, Hematuria (dark urine or Coca-Cola), Hypertension, Azotemia (high BUN and creatinine)</td></tr>
<tr><td rowspan="2">Systemic causes</td><td>Normal C3/C4</td><td>- Hemolytic uremic syndrome
- Henoch-Schoenlein purpura
- Good pasture syndrome</td></tr>
<tr><td>Low C3/C4</td><td>- SLE
- Endocarditis
- Cryoglobunemia</td></tr>
<tr><td>IgA nephropathy</td><td colspan="2">- Young + history of URTI <u>within days</u>
- Normal C3/C4
- Treatment: Steroid + ACE inhibitor</td></tr>
<tr><td>Post infectious GN</td><td colspan="2">- Young + history of URTI or skin infection <u>within weeks</u>
- Low C3/C4</td></tr>
<tr><td rowspan="4">Rapidly progressive GN</td><td colspan="3">- Crescent shaped
- Comes with Wegner and good pasture syndromes</td></tr>
<tr><td colspan="2">Good pasture</td><td>Wegner (granulomatous polyangiitis)</td></tr>
<tr><td colspan="2">- IgG linear deposits to basement membrane (anti-basement membrane antibodies)
- Hemoptysis + hematuria + high creatinine</td><td>- C-ANCA
- Hemoptysis + hematuria + high creatinine + sinusitis</td></tr>
<tr><td colspan="3">- Management: cyclophosphamide + steroid +/- plasmapheresis</td></tr>
<tr><td rowspan="3">Renal tubular acidosis</td><td colspan="3">- Hyperchloremic metabolic acidosis (non-anion gap)
- Hypokalemia</td></tr>
<tr><td>Type I (distal)</td><td>Type II (proximal)</td><td>Type IV (distal)</td></tr>
<tr><td>- Decrease secretion of H ions
- Stones formation
- Causes:
○ Autoimmune (SLE, Sjogren, RA)
○ Drugs (lithium)
○ Hyperglycemia</td><td>- Bicarbonate wasting
- Causes:
○ Multiple myeloma
○ Gold, mercury
○ Acetazolamide
○ Fanconi syndrome (low bicarbonate, low Na, low K, low glucose)</td><td>- High K (unique)
- Hormonal effect by aldosterone (from principal cells in distal)
- Causes:
○ Diabetic nephropathy
○ CKD
○ Obstructive uropathy</td></tr>
</table>

<table>
<tr><th colspan="6">Steps in ABG</th></tr>
<tr><td></td><td colspan="2">Metabolic acidosis</td><td>Metabolic alkalosis</td><td>Respiratory acidosis</td><td>Respiratory alkalosis</td></tr>
<tr><td rowspan="2">Step 1: arrows → compare pH with $PaCO_2$</td><td colspan="2">Same way</td><td></td><td colspan="2">Opposite ways</td></tr>
<tr><td colspan="2">↓pH ↓$PaCO_2$</td><td>↑pH ↑$PaCO_2$</td><td>↓pH ↑$PaCO_2$</td><td>↑pH ↓$PaCO_2$</td></tr>
<tr><td>Step 2: compensation (±2)</td><td colspan="2">$\frac{HCO_3}{PaCO_2} = \frac{\downarrow \mathbf{1}}{\downarrow \mathbf{1}}$</td><td>$\frac{HCO_3}{PaCO_2} = \frac{\uparrow \mathbf{2}}{\uparrow \mathbf{1}}$</td><td>$\frac{PaCO_2}{HCO_3} = \frac{\uparrow \mathbf{10}}{\uparrow \mathbf{1}}$</td><td>$\frac{PaCO_2}{HCO_3} = \frac{\downarrow \mathbf{5}}{\downarrow \mathbf{1}}$</td></tr>
<tr><td>Step 3: Anion gap</td><td colspan="2">Anion gap = Na – (HCO_3 + Cl)
- High >12 → high anion gap metabolic acidosis
- Normal (8-12) → non-anion gap metabolic acidosis</td><td colspan="3" rowspan="2"></td></tr>
<tr><td>Step 4: delta delta (if high anion gap metabolic acidosis)</td><td colspan="2">1. Delta anion gap = (step 3) – 12
2. Delta HCO_3 = 24 – patient HCO_3
3. Delta delta = delta anion gap – delta HCO_3:
>0 | 0 | <0
High anion gap metabolic acidosis + metabolic alkalosis | Pure | High anion gap metabolic acidosis + non anion gap metabolic acidosis</td></tr>
<tr><td>Examples</td><td>Anion gap</td><td>- Methanol
- Uremia
- DKA
- Paraldehyde
- Isoniazid
- Ethanol
- Lactic acidosis
- Renal failure, rhabdomyolysis
- <u>Salicylates</u></td><td>- Conn’s syndrome
- Cushing syndrome
- Vomiting
- Loop + thiazide diuretics</td><td>- CNS depression
- Airway obstruction
- Pulmonary edema
- Pneumonia
- Hemo or pneumothorax
- Neuromuscular disease</td><td>- Anxiety
- Mechanical ventilation
- Progesterone (pregnancy)
- <u>Salicylates</u>
- Sepsis</td></tr>
<tr><td></td><td>Non anion gap</td><td>- Renal tubular acidosis
- Diarrhea
- Acetazolamide
- Spironolactone
- Fistula
- Addison’s disease</td><td></td><td></td><td></td></tr>
</table>

Cardiology

	Hints	Diagnosis	Treatment		Extra

Heart failure	- **Left side**: pulmonary edema (bilateral basal crackles) = cough, wheeze
	- **Right side**: ascites, lower limb edema, hepatomegaly, Kussmaul sign, distended jugular veins
	- **Both**: fatigue, exercise intolerance
		- **Sensitive**: BNP >100
		- **Chest X-ray**: first cephalization then Kerly B line then pleural effusion
		- **Diagnostic**: Echo
			Acute	- **Lasix**, **morphine** (if chest pain or anxiety), **nitrates**, **O_2** (if sat <92%), **C-PAP**
				- If BP <90/60 → **add dobutamine**
				- if BP >160/100 → **add IV nitroglycerine**
					- **Acute presentation**:
					  ○ Orthopnea + PND
					  ○ Bilateral basal crackles
					  ○ S3
					  ○ Edema
					  ○ High BNP
					- Antidiabetic that decreases mortality in CHF → **SGLT-2**

			Chronic	- **ACE inhibitor** (+/- PO Lasix as reliever) → no improvement → **BB** → no improvement → **spironolactone** → no improvement → **digoxin** - In preserved ejection fraction → BB +/- Lasix - Preventive measure if ejection fraction <35% → intracardiac defibrillator	
Dilated cardiomyopathy	- Familial - Infection (post URTI) - Myocarditis (SOB, HF, chest pain, ECG normal) - Lateral displaced apex	- **Chest x-ray**: cardiomegaly + pulmonary edema - **ECG**: A. fib) - **Echo**: decreased ejection fraction - **Diagnostic**: endomyocardial biopsy → myocarditis	- Same management of chronic HF - Peripartum or postpartum → **bromocriptine** - **Definitive** → transplant		
Restrictive cardiomyopathy	- Diseases with -osis (amyloidosis, sarcoidosis, hemochromatosis, systemic sclerosis) - Kussmal sign	- **Chest x-ray**: pulmonary edema - **ECG**: low voltage - **Diagnostic**: endomyocardial biopsy	- Treat underlying cause - Control HR → **beta blocker** - Definitive → **transplant**		

Hypertrophic obstructive cardiomyopathy	- Autosomal dominant
	- Young + exercise + family history of sudden death
	- Syncope, angina, arrythmia, dyspnea
		- **Chest x-ray**: cardiomegaly
		- **ECG**: left ventricular hypertrophy
		- Normal Echo
			- **Beta blocker** → no improvement → **calcium channel blocker** → no improvement → **surgical myomectomy**
			- **Insert intracardiac defibrillator if**:
			  ○ Has syncope
			  ○ Family history of sudden cardiac death
			  ○ Ventricular tachycardia or V. fib
			- **Avoid** → digoxin and nitrate	

Aortic regurgitation	- Early diastolic murmur
	- Lt upper sternal boarder
	- Wide pulse pressure
	- Increase with expiration and leaning forward
	- Increase with hand grip and squatting
		- **Diagnosis**: echo	- Mild or moderate: **ACE inhibitor + CCB + nitrate**
			- **Surgery** (replacement):
			  ○ Ejection fraction <50
			  ○ Severe symptoms (HF)	

Mitral stenosis	- Mid-diastolic murmur
	- At apex
	- Low pitched
	- Loud S1
	- Opening snap
	- Decrease with hand grip
	- Increase with squatting
			- **Asymptomatic**:
			  ○ Avoid exercise
			  ○ Antibiotics prophylaxis if RHD
			  ○ Anticoagulation + BB + Diuretics
			- **Balloon valvoplasty**:
			  ○ Symptomatic (HF)
			  ○ Mitral valve area <1.5 (severe mitral stenosis)
			- **Pregnancy** → percutaneous mitral balloon commissurotomy
				- Worst outcome in pregnancy

Aortic stenosis	- Ejection systolic murmur (crescendo-decrescendo)
	- Rt upper sternal boarder
	- Radiate to carotid
	- Slow rising pulse
	- Decrease with hand grip
	- Increase with squatting
			- **Surgery (replacement):**
			  ○ Symptomatic (HF)
			  ○ Asymptomatic + echo <50 + severe (valve area <1, or pressure gradient >40)
			- Severe + echo >50 → **observe + stress test**
			- Old not fit for replacement → **transcatheter aortic valve implantation**	

<table>
<tr><td>Mitral regurgitation</td><td colspan="2">- High pitched holo-systolic murmur
- Radiate to axilla
- Increase with hand grip and squatting</td><td></td><td colspan="2">- Medical: normal BP + acute (ischemia or IE)
- Surgery (repair):
○ Low BP + acute
○ Symptomatic chronic
○ Asymptomatic + ejection fraction <60</td></tr>
<tr><td rowspan="3">A. fib</td><td>Unstable (BP <90)</td><td colspan="3">- Urgent synchronized cardioversion</td><td rowspan="3">- ECG A. fib (no P wave, irregular)
- Atrial flutter (Saw tooth): rate control → no improvement → radiofrequency ablation
- CHADS2 score:
○ CHF
○ Hypertension
○ Age >75
○ DM
○ Stroke or TIA</td></tr>
<tr><td rowspan="2">Stable</td><td>Duration of symptoms <48 hours</td><td colspan="2">- Rhythm control ONLY by:
○ Non-urgent electrical synchronized cardioversion
○ Pharmacological cardioversion: IV heparin the amiodarone</td></tr>
<tr><td>Duration of symptoms >48 hours</td><td colspan="2">- Rate control:
○ Decompensated CHF → amiodarone
○ Chronic CHF → metoprolol OR digoxin
○ Bronchial asthma → diltiazem or verapamil (CCB)
- Anticoagulant:
○ Warfarin if positive transesophageal echo
○ Empirical warfarin for ≥3 weeks if refused transesophageal echo
- Rhythm control (ONLY if young or first time or CHF):
○ Synchronized electrical cardioversion
○ Pharmacological cardioversion: Sotalol OR Flecainide OR Amiodarone
- Stroke prevention:
○ CHADS2 score:
▪ 0 → aspirin
▪ ≥1 → anticoagulation</td></tr>
<tr><td>Supraventricular tachycardia</td><td colspan="2">- Female, stress, caffeine, smoking, sepsis
- Skip beat, regular, high heart rate</td><td>- ECG:
○ Narrow complex
○ No P wave
○ Regular</td><td colspan="2">- Unstable (BP <90) → synchronized cardioversion
- Stable → carotid massage + Valsalva → no improvement → adenosine → no improvement → metoprolol OR verapamil/diltiazem OR synchronized cardioversion
- If bronchial asthma → CCB, cardioversion (NO BB or adenosine)
- If CHF → adenosine, BB (if not decompensated), cardioversion (NO CCB)</td></tr>
</table>

<table>
<tr><td>Premature ventricular contraction</td><td colspan="2">- ECG: one QRS is wide the rest are normal</td><td>- Symptomatic → beta blocker
- Asymptomatic → Holter monitor for 48-72 hours</td></tr>
<tr><td>Ventricular tachycardia</td><td colspan="3">- Monomorphic → DC shoch (non-synchronized)
- Polymorphic (torsade de point) → stop offending drugs (antibiotics, antidepressants, antipsychotics) + IV Mg sulfate (No shock)</td></tr>
<tr><td rowspan="3">AV block</td><td>First degree (no drop beat)</td><td colspan="2">- No drop beat + constant prolonged interval
- Symptomatic → pacemaker
- Asymptomatic → reassurance</td><td rowspan="3">- If patient had vasovagal attack:
○ ECG normal → do head tilt test
○ ECG abnormal → do Holter monitor → if negative → CT brain
- Bundle branch block on ECG (look at V1):
○ QRS going down → LBBB → think acute anterior wall MI
○ QRS going up or rabbit ears → RBBB → problem in lung like PE</td></tr>
<tr><td rowspan="2">Second degree (drop beat)</td><td>Mobits I</td><td>- Drop beat + nonconstant prolonged interval
- Treatment like first degree</td></tr>
<tr><td>Mobits II</td><td>- Drop beat + constant prolonged interval
- Treatment: pacemaker</td></tr>
<tr><td>Pericarditis</td><td colspan="2">- Pleuritic chest pain relieved by leaning forward
- Pericardial rub
- Pericardial effusion
- Kussmal sign</td><td>- ECG: diffuse ST segment elevation with PR depression
- Diagnostic: Cardiac MRI</td><td>- Idiopathic (URTI) → colchicine + NSAID → no improvement → steroid
- SLE/RA → steroid + hydroxychloroquine/methotrexate
- TB → steroid + antiTB
- Post MI:
- <1 week (post MI pericarditis) → aspirin
- >2 weeks + fever + high ESR = Dressler syndrome → NSAIDs</td></tr>
</table>

Infective endocarditis	- Fever + murmur
	- Shortness of breath
	- Osler's node (painful nodule)
	- Janeway lesions (erythema in palm and soles)
	- Splenomegaly
	- **Duke criteria**:
	  ○ Positive blood culture (2 separate occasions)
	  ○ Positive blood culture in first 12 hours
	  ○ Positive echo vegetations
	  ○ Positive new regurgitation
		- Most common organism in all infective endocarditis: **staph aureus**
		- Tricuspid + IV drug abuser → **staph aureus**
		- Native valve (VSD, ASD, rheumatic heart disease) + tooth extraction → **strep viridans**
		- Prosthetic valve (look at time of surgery):
		  ○ **<60 days** → staph epidermidis or staph aureus if patient unstable with severe symptoms
		  ○ **>60 days** → strep viridans
			- **Right sided IE** (tricuspid regurgitation):
			  ○ **MRSA** → vancomycin, **MSSA** → oxacillin
			- **Native valve** → ceftriaxone + gentamicin 2 weeks
			- **Prosthetic valve**:
			  ○ <60 days → vancomycin + gentamycin + rifampin
			  ○ >60 days → ceftriaxone + gentamycin
			- **Surgery** → CHF, persistent fever >72 hours, rupture aneurysm, recurrent septic emboli, fungal infection
			- **Prophylaxis** (give **amoxicillin** 1 hour before any surgery above diaphragm)
			  ○ Cyanotic heart disease
			  ○ Prior IE
			  ○ Prosthetic valve
			  ○ Cyanotic heart disease repair
			  ○ Heart transplant

Rheumatic fever	- Jones criteria (2 major or 1 major + 2 minors):
	  ○ **Major**:
	  ▪ Migratory arthritis (pain)
	  ▪ Carditis (murmur)
	  ▪ Subcutaneous nodules
	  ▪ Erythema marginatum
	  ▪ Sydenham chorea
	  ○ **Minor:**
	  ▪ High CRP, ESR
	  ▪ Fever
	  ▪ Arthralgia
	  ▪ ECG prolonged PR interval
	  ▪ Leukocytosis
		- High ASO titer
		- +ve throat culture (group A strep)
			- **Primary prevention** → penicillin for 10 days for acute pharyngitis
			- **Secondary prevention** → penicillin injection every 4 weeks to prevent re-infection and re-attack:
			  ○ Rheumatic fever + **no heart disease** → for 5 years OR until 21 years old (which ever longer)
			  ○ Rheumatic fever + **heart disease** → for 10 years OR until 40 years old (which ever longer)
			- **Arthritis** → Aspirin
			- **Carditis** → cortisone
			- **Chorea** → haloperidol

Unstable angina	- Chest pain (central + radiating to jaw and neck)	- **ECG**: ST depression, T wave inversion
		- **Cardiac enzymes**: normal
			- Aspirin + Plavix/clopidogrel
			- ACE inhibitor (given post MI)
			- BB
			- Heparin
			- High intensity statin
			- Nitrate
			- O2 therapy only if hypoxia
			- Low risk → CT angio in 48-72 hours
			- High risk → CT angio urgent → vessel anatomy:
			  ○ <3 vessels → PCI
			  ○ ≥ 3 vessels OR DM + 2 vessels → CABG
				- **If stable angina** (normal ECG and cardiac enzyme) → do stress ECG test
				  ○ Treatment: **BB + nitrate + ACE inhibitor** (**only if diabetic**) → no improvement → **BB + CCB** → no improvement → **PCI**
				- **Leads**:
				  ○ V1-V2 = septal
				  ○ V3-V4 = anterior
				  ○ V5-V6, I, aVL = lateral
				  ○ II, III, AVF = inferior
				  ○ II, III, AVF + V2-3 (ST depression) = posterior
				- **CK-mB used for re-infarction**
				- **Cardiac enzyme order**: CK-mB (3 days) → troponin (5 days) → AST (7 days) → LDH
				- Repeat troponin when negative **after 2-3 hours**
				- **Goal levels**:
				  ○ LDL <70
				  ○ BP <130/80
				  ○ Aspirin for life
				- If inferior wall MI → **NO nitrate**

Non-STEMI		- **ECG**: ST depression, T wave inversion - **Cardiac enzymes**: high (troponin, CK, CK-mB)		

STEMI		- **ECG**: ST elevation
		- **Cardiac enzymes**: high (troponin, CK, CK-mB)
			- Aspirin + Plavix/clopidogrel
			- ACE inhibitor (given post MI)
			- BB
			- Heparin
			- High intensity statin
			- Nitrate
			- O2 therapy only if hypoxia
			- **PCI within 90 minutes** → No → alteplase → repeat ECG → no improvement (still ST elevation) → repeat thrombolytics → improved (low ST by 50% + no pain) → send to PCI center
			- PCI within 90 minutes → Yes → CT angio urgent → vessel anatomy:
			  ○ <3 vessels → PCI
			  ○ ≥ 3 vessels OR DM + 2 vessels → CABG	

Hypertension	- 140-179 systolic
	- Pregnant: 140-159 systolic
		- Ambulatory blood pressure monitoring	- **Medications used (in order): ACE inhibitor, BB, CCB, Diuretic**
			- If patient is black → start with **CCB or thiazide**
			- **Patient with comorbidity** (**regardless of ethnicity**): start with ACE inhibitor → didn't improve → add CCB (ECEPT in HF)
			  o ACE inhibitor + developed cough → change to ARB
			  o ACE inhibitor + developed angioedema → change to CCB
			- If GFR <40 → ACE inhibitor + loop diuretic
			- **Patient healthy**:
			  o >60 years old: CCB or thiazide (first line) → didn't improve → add ACE inhibitor
			  o <60 years old: ACE inhibitor → didn't improve → add CCB → didn't improve → add thiazide
			- **In pregnancy:**
			  o Methyl dopa
			  o Labetalol
			  o Nifedipine

Emergency hypertension	- >180/>110
	- Pregnant: >160/110
		- >180/>110 alone → hypertension urgency
		- >180/>110 + end organ damage → hypertension emergency
			- **Hypertension urgency**: Labetalol or Captopril or Hydralazine
			- **Hypertension emergency**:
			  o Stroke (**treat ONLY when BP >220/110**) and papilledema → Nicardipine (CCB) OR Labetalol (BB)
			  o AKI → Hydralazine OR Nicardipine
			  o MI → Nitroprusside OR Nitroglycerin AND BB
			  o HF → Nitroglycerin AND Loop diuretic
			- **In pregnancy:**
			  o Hydralazine
			  o Labetalol
			  o Nifedipine

<table>
<tr><th colspan="2">Amiodarone toxicity
(Class 3 broad spectrum antiarrhythmic)</th><th>Digoxin toxicity
(Toxic level >2)</th><th colspan="2">Cytochrome P450</th></tr>
<tr><th>Side effect</th><th>Action to detect</th><td rowspan="10">- Causes of toxicity (increase digoxin binding):
○ Hypokalemia
○ Hypomagnesemia
- Benign finding in ECG → slopping ST depression (a digoxin effect not an adverse effect)
- Side effects:
○ Hyperkalemia
○ Paroxysmal atrial tachycardia (most common)
○ Nausea and vomiting
○ Dizziness, Confusion
○ Arrythmia: Bradycardia, AV block, Ventricular tachycardia
○ Visual disturbance (xanthopsia = yellow vision)
○ Gynecomastia</td><th>Inhibitors</th><th>Inducers</th></tr>
<tr><td>Prolonged QT interval (leading to torsade de pointes)</td><td>ECG at baseline + every 3-6 months</td><td rowspan="9">- Decrease P450 → effect: increase drug level → action done: decrease dose of inhibitor
○ Sodium valproate
○ Isoniazid (antiTB)
○ Fluconazole (antifungal)
○ Amiodarone
○ Acute alcohol drinking
○ Erythromycin
○ Ciprofloxacin (UTI)
○ Metronidazole (C. diff)
- Most antibiotics are inhibitors</td><td rowspan="9">- Increase P450 → effect: decrease drug level → action done: increase dose of inhibitor
○ Carbamazepine
○ Rifampicin (antiTB)
▪ Lowers everything except:
• Clopidogrel (increase)
• Thiazide (no effect)
• Nifedipine (change, it is contraindicated)
○ Chronic alcohol
○ Phenytoin
- All antiepileptics are inducers except valproic acid</td></tr>
<tr><td>Photosensitivity</td><td>Routine use of sunscreen</td></tr>
<tr><td>Blue-man syndrome</td><td>Routine skin exam</td></tr>
<tr><td>Peripheral neuropathy</td><td>-</td></tr>
<tr><td>Corneal deposits</td><td>Ophthalmic exam</td></tr>
<tr><td>Hypothyroidism + hyperthyroidism</td><td>Thyroid function test: Prior to use, every 4 months until 1 year after stopping the drug</td></tr>
<tr><td>Pulmonary fibrosis</td><td>PFT</td></tr>
<tr><td>Liver fibrosis</td><td>LFT every 3-5 months</td></tr>
<tr><td colspan="2">- Amiodarone induced hypothyroidism → stop the drug + give thyroxine
- Amiodarone induced hyperthyroidism (low radioiodine uptake on thyroid scan):
○ Type 1 → stop amiodarone only
○ Type 2 → stop amiodarone + give steroids</td><td>- Treatment when:
○ Asymptomatic + acute ingestion (for suicide) + level ≥10
○ Asymptomatic + chronic ingestion (for treatment) + level >6
○ Symptomatic regardless of digoxin level
- Antidote:
○ Digibind or Digifab
○ If not available → hemodialysis</td></tr>
</table>

Pulmonology

<table>
<tr><th colspan="6">Pulmonary hypertension</th></tr>
<tr><td>Symptoms</td><td colspan="5">- Risk factors + chronic dyspnea → developed right sided heart failure
- Right ventricular heave + tricuspid regurgitation + prominent P2</td></tr>
<tr><td rowspan="2">Risk factors (Groups)</td><td>Group 1
(Primary pulmonary artery hypertension)</td><td>Group 2
(Cardiac)</td><td>Group 3
(Lung)</td><td>Group 4</td><td>Group 5
(Miscellaneous)</td></tr>
<tr><td>- Familial
- Idiopathic
- Connective tissue disease (RA, SLE, Sjogren, Systemic sclerosis, Dermatomyositis)
- HIV
- Portal hypertension (Schistosomiasis)</td><td>- Left sided heart failure (most common cause of right sided heart failure)</td><td>- Chronic hypoxia:
○ COPD
○ Interstitial lung disease
○ Neuromuscular disease</td><td>- Chronic thromboembolism → recurrent PE → chronic thromboembolism pulmonary hypertension</td><td>- Sarcoidosis
- Sickle cell disease
- Graves’ disease</td></tr>
<tr><td>Diagnosis</td><td>- Gold standard: right side heart catheterization
- Connective tissue disease → Echo</td><td colspan="2">Echo</td><td>- Specific test: V/Q scan
- Echo</td><td>- Echo</td></tr>
<tr><td rowspan="2">Treatment</td><td colspan="5">- Supportive:
○ Keep O2 saturation >90%
○ Diuretics for symptoms of right sided heart failure
○ Digoxin if there is A. fib</td></tr>
<tr><td>- Vasodilation:
○ CCB (nifedipine)
○ Phosphodiesterase inhibitors (sildenafil/Viagra)</td><td>- ACE inhibitor
- BB
- Spironolactone</td><td>- Treat the cause</td><td>- Pulmonary endarterectomy</td><td>- Treat the cause</td></tr>
</table>

	Hints	Diagnosis	Treatment	Extra

Pulmonary embolism	- Risk factors of PE + sudden SoB + pleuritic chest pain + low BP or bradycardia → massive PE	- ECG: sinus tachycardia + ST depression in S1Q3T3 (specific sign)
		- High well's score (>2) → CT angio
		- Low well's score (<2) → D-dimer (if high do CT angio)
		- CKD → V/Q scan
		- Pregnant → ultrasound of leg (if negative V/Q scan)
		- **Gold standard** → pulmonary angiography
			- **If unstable** → thrombolytics then surgical thrombectomy
			  ○ If there is contraindication to thrombolytic → go surgery
			- **Stable**:
			  ○ **LMWH for 3 days until INR 2-3 then warfarin** OR **novel oral anticoagulant** (rivaroxaban, apixaban)
			  ○ **Provoked** → duration 3-6 months
			  ○ **Unprovoked** → duration 3 months for first attack, for life for second attack
			- CKD → unfractionated heparin
			- Pregnant → LMWH
				Thromboprophylaxis
				- **Low risk + medical admission** → ambulation
				- **Low risk + surgical admission** → mechanical prophylaxis (decompressive devices)
				- **High risk + medical admission + CKD** → unfractionated heparin (**if medically free** → LMWH)
				- **High risk + major surgery or trauma** → LMWH + mechanical prophylaxis
				- **Orthopedic surgery** → fondaparinux or LMWH

Solitary lung nodule	- <3 cm round - Single - Normal lung parenchyma	- **First check previous CT scan** - If <8 mm + no malignant features → follow up with CT 6-12 months - If malignant features regardless of size → PET scan ○ **Malignant features**: Spiculated, Upper lobe, Female, Age >60, Smoking - If >8mm → PET scan - If PET scan positive → biopsy - If PET scan negative → follow up with CT scan every 6-12 months		
Asthma	- Nocturnal cough or wheeze - Dry, white sputum	- Depends on peak flow (PEF)	- **Acute exacerbation**: oxygen if low SaO2 → SABA + SAMA → no improvement → steroids → no improvement → Mg sulfate → no improvement → intubate - **Chronic**: SABA (intermittent) → inhaled corticosteroid (mild persistent) → LABA (moderate persistent) → LTRA or LAMA (severe persistent) - **Refractory** → oral steroids - **Exercise induced** → SABA 1 hour before exercise	

COPD	- Chronic productive cough	- Depends on FEV1	- **Acute exacerbation**: SAMA + SABA → steroids PO → antibiotics → Oxygen (88-92%) - First **venturi** or **low flow oxygen nasal cannula** - **Bipap** if: no improvement, RR >25, pH 7.25-7.35, $PaCO_2$ >45 - **Mechanical intubation** if: no improvement on Bipap, confused, low BP, RR >30, PaO2 <55-60, pH <7.25 - **Chronic:** LAMA + SABA as needed → no improvement → add LABA → no improvement → ad inhaled corticosteroids	**Indications of long term O_2:** - PaO_2 <55 - PaO_2 <60 + cor pulmonale - SaO_2 <89 + cor pulmonale - SaO_2 <89 at rest in 2 or more occasions **Indication of Bipap at home:** - PaCO2 >53
TB	- Fever - Night sweats - Weight loss - Cough dry or productive - Pleuritic chest pain - +/- hemoptysis	- **Active**: AFB smear - **Latent**: Interferon gamma release assay or PPD test	- **Airborne isolation** until resolution sputum negative - **2 months** of rifampicin, isoniazid, pyrazinamide, ethambutol - **4 months** of rifampicin, isoniazid - **Latent**: o **First line**: rifampicin for 4 months o **Second line**: isoniazid + vitamin B 6, general population for 6 months, and healthcare workers for 9 months - **Stop all medications when**: AST/ALT 5x UNL + asymptomatic OR AST/ALT 3x UNL + jaundice, abdominal pain (symptomatic)	
Lung abscess	- Alcoholic found unconscious - Acute stroke, Post seizure - Foreign body ingestion - Fever + purulent foul-smelling sputum - +/- hemoptysis - +/- clubbing	- **X-ray**: air-fluid level	- **Clindamycin** OR **Augmentin**	

Typical pneumonia	- Productive cough - Fever - Consolidation on x-ray	- Must do sputum culture and gram stain - Specific test for strep pneumoniae → **urinary antigen**	- If diagnosed with strep pneumoniae → **amoxicillin** - Smoker or COPD + Hemophilus influenzae → **cefuroxime** - CURB-65 (0-1) + healthy → **azithromycin** for 5 days - CURB-65 (0-1) + comorbidity → **levofloxacin** OR **cefuroxime + azithromycin** for 5 days - CURB-65 (2) → **levofloxacin** OR **ceftriaxone + azithromycin** - CURB-65 (3 or more) → **levofloxacin** + **vancomycin** + **cefepime/meropenem/tazocin** for 7-10 days	**CURB-65:** - Confusion - Urea >6.5 - RR >30 - BP <90 - Age 65
Atypical pneumonia	- Dry cough - Bilateral chest x-ray infiltration - Healthy, male, crowded area, low hemoglobin, rash (erythema multiforme) → **Mycoplasma pneumoniae** - Old, water source or AC, abdominal pain, diarrhea, high LFT, low hemoglobin, low Na → **Legionella pneumophila**	- Must do sputum culture and gram stain - Mycoplasma: IgM cold agglutination test - Legionella: urinary antigen on buffered charcoal yeast extract agar	- **Azithromycin** OR **doxycycline**	
Hospital acquired pneumonia	- Hospitalized - After 2-3 days developed fever, productive cough, pneumonia on x-ray	- E. coli - Pseudomonas - Klebsiella - MRSA	- **Vancomycin** + **cefepime** - **Vancomycin** + **piperacillin-tazobactam** - **Vancomycin** + **meropenem**	

Ventilation acquired pneumonia	- ICU + mechanical ventilation - After 3-4 days developed fever, change color of secretion, increase tube secretion - Bilateral + severe	- Pseudomonas	- Same as above **with or without** **levofloxacin**
ARDS	- Unstable patient + bilateral infiltration - Critical low O_2 - Pneumonia - Aspiration - Near drowning - Pancreatitis - Shock - Sepsis	- Diagnosis of exclusion	- High flow O_2 - Prone positioning - Fluid balance - PEEP (positive end respiratory pressure) - Pulmonary vasodilator (inhaled NO) - ECMO (extracorporeal membrane oxygenation if refractory
Interstitial lung disease	- Older age - Chronic shortness of breath - Progressive - Dry cough - Finger clubbing - Bilateral fine crackles	- **First PFT** (low TLC, RV, FVC, DLCO) - **Next Chest x-ray** - **Diagnostic**: high resolution CT (ground glass appearance)	-
Sarcoidosis	- Female (30 – 50) - Red eye - ILD symptoms - Raised erythematous painful nodules (erythema nodosum) - Lupus pernio (facial rash) - Hypercalcemia	- **X-ray**: hilar LAP - **Labs**: ACE level (80% specific) - **Diagnostic**: high resolution CT - **Gold standard**: endobronchial US (LN biopsy)	- **Steroids**

<table>
<tr><td>Bronchiectasis</td><td>- Male + Fever + Foul smelling productive cough
- Dyspnea
- Clubbing
- +/- hemoptysis
- Diffuse rhonchi
- Mid-inspiratory crackles
- History of smoking, TB, or cystic fibrosis</td><td>- Chest x-ray: tram track appearance
- Diagnostic: high resolution CT (cystic ground glass appearance + honeycomb appearance)</td><td>- Acute:
○ Levofloxacin + inhaler SABA + SAMA
○ O2 if less than 92%
- Chronic:
○ Inhaler SABA + LAMA
○ Chest rehabilitation + postural drainage (chest physiotherapy)
○ Prophylactic antibiotic (azithromycin)</td><td>Causes:
- Cystic fibrosis
- Primary ciliary dysfunction → Kartagener
- TB
- Malignancy
- Repetitive pneumonia
- Alpha 1 anti-trypsin</td></tr>
<tr><td>Lung cancer</td><td colspan="4">- Smoker + dyspnea + cough + occasional hemoptysis + finger clubbing + weight loss + No fever, best modality for diagnosis:
○ Peripheral: CT guided biopsy ○ Central: Video assisted thoracoscopy, endoscopic bronchial ultrasound
- Miosis + ptosis + anhidrosis → Horner’s syndrome → Pancoast’s tumor (apical tumor)
- Facial plethora (redness) + SOB + dilated chest veins in chest → superior vena cava obstruction (oncological emergency)
○ Diagnosis: CT venogram ○ Treatment: steroids + radiation</td></tr>
<tr><td></td><td colspan="2">Small cell lung cancer</td><td colspan="2">Non-small cell lung cancer</td></tr>
<tr><td></td><td colspan="2">- Neuroendocrine tumor (high grade), 15%
- Smokers, Central lesion, Blue cells, Fast growing
- Responsive to chemo, but recurring disease
- Paraneoplastic syndrome:
○ Lung mass + hyponatremia → SIADH
○ Lung mass + puffy face, plethora, central obesity, striae (Cushing features)→ Ectopic ACTH
○ Lung mass + weakness in arms and shoulders that improves with repetition + no diplopia → Lambert Eaton syndrome (the opposite of myasthenia gravis) affects presynaptic Ca channel in neuromuscular junction</td><td>Squamous</td><td>- 30%
- Smoker, Cavitary lesion, Central lesion
- Hemoptysis and clubbing more than small cell
- Lung mass + increase Ca → high PTH related peptide</td></tr>
<tr><td></td><td colspan="2"></td><td>Adenocarcinoma</td><td>- Most common (40%)
- Smoker and non-smoker. Peripheral lesion, Clubbing
- Case: Women +/- Asian + never smoked + peripheral lung mass on chest x-ray
- Hypertrophic pulmonary osteoarthropathy</td></tr>
<tr><td></td><td colspan="2"></td><td>Treatment</td><td>- Stage I and II → surgery then radiation then chemotherapy (adjuvant)
- Stage III → combination (concurrent chemo + radiation) then target therapy
- Stage IV → chemotherapy</td></tr>
</table>

Hepatology

	Hints	Diagnosis	Treatment	Extra

Acute pancreatitis	- Abdominal pain radiating to the back (band like)
	- Nausea and vomiting
	- Jaundice
	- Decreased bowel sound
	- Signs of retroperitoneal hemorrhage (Cullen, Grey-Turner)
		- Lipase/amylase >3 times upper normal limit
		- Lipase >10,000 → **rules out alcohol**
		- ALT >3x upper normal limit → **rules in gallstones**
		- **US:**
		  ○ Wide CBD
		  ○ CBD stone
		- CT done in ER if:
		  ○ **Acute severe** (AKI, Respiratory failure, Shock, GI bleeding)
		  ○ **Persistent severe** (not improving after 48 hours with treatment)
			- **NPO**
			- **Aggressive hydration** with ringer lactate (goal: reduce CRP, Hct, BUN in 12-24 hours)
			- **Feeding**:
			  ○ Early enteral feeding prompted after 24 hours (NGT)
			  ○ Low fat low residue within 72 hours if no nausea or vomiting (oral)
			- **IV opioids** (pethidine or morphine)
			- **Gallstones** → ERCP within 24 hours → next → elective cholecystectomy
			- **Infected necrosis** (febrile) → Imipenem **+** debridement
			- **Sterile necrosis** (nonfebrile) → if symptomatic → **debridement**
				- **Causes:**
				  ○ Stone (most common)
				  ○ Alcohol
				  ○ Calcium
				  ○ Neoplasia
				  ○ Autoimmune
				  ○ Infection (mumps, mycoplasma, TB, CMV, HIV)
				  ○ Injury
				  ○ ERCP (**prevented by giving per rectum indomethacin**)
				  ○ Triglyceride
				  ○ Drugs (furosemide, aspirin, statin, sulfa drugs, azathioprine, ACE inhibitors)
				  ○ Steroids or scorpion sting
				- **Determine severity:**
				  ○ ER: prolactin
				  ○ 48 hours: CRP

Chronic pancreatitis		- Initial high amylase and lipase then normalizes
		- +ve fecal fat stool + decrease stool elastase (steatorrhea)
		- CT → calcification
		- **Diagnostic**: MRCP
		- **Endoscopic US:**
		  ○ Biopsy from a mass
		  ○ Dilated duct with stricture
			- **Pancreatic enzyme replacement**
			- **Pain control**:
			  ○ If not improving on opiate → celiac nerve plexus block
				- **Causes:**
				  ○ Alcohol (most common)
				  ○ Idiopathic
				  ○ Autoimmune
				  ○ Associated with cystic fibrosis

Autoimmune pancreatitis	- Young, female - Other autoimmune disease	- ANA, **IgG** - CT: fibrosis (sausage pancreas)	- **Steroids**	

Chronic liver disease	- White nails, palmar erythema, Duputern's contracture, clubbing, asterixis
	- Hepatic fetor, enlarged parotids
	- Gynecomastia, spider angioma
	- Testicular atrophy
	- Cuput medusa, splenomegaly, variceal bleeding, ascites, jaundice
		- **CBC:**
		  ○ Anemia of chronic disease
		  ○ Macrocytic anemia (folate deficiency)
		  ○ Low platelet, Neutropenia
		- **LFT:**
		  ○ <u>Synthesis:</u>
		  ▪ Bilirubin (high)
		  ▪ PT/PTT (high) → PT has greatest prognostic value
		  ▪ Albumin (low)
		  ○ <u>Enzymes:</u>
		  ▪ ALT/AST → hepatocellular
		  ▪ ALP/GGT → biliary
		- All results -ve → **Liver biopsy** by percutaneous or transjugular (when there is ascites or coagulopathy)
			- **Lactulose** → for constipation (prevent hepatic encephalopathy)
			- **BB** → for varices (prevent GI bleeding)
				- **Child Pugh score:**
				  ○ Ascites
				  ○ Hepatic encephalopathy
				  ○ Bilirubin
				  ○ INR
				  ○ A → 5-6
				  ○ B → 7-9
				  ○ C → 10-15 (survival <45%)
				- **Poor prognostic factors:**
				  ○ Ascites
				  ○ High PT
				  ○ Hypoglycemia
				  ○ Hyponatremia <130

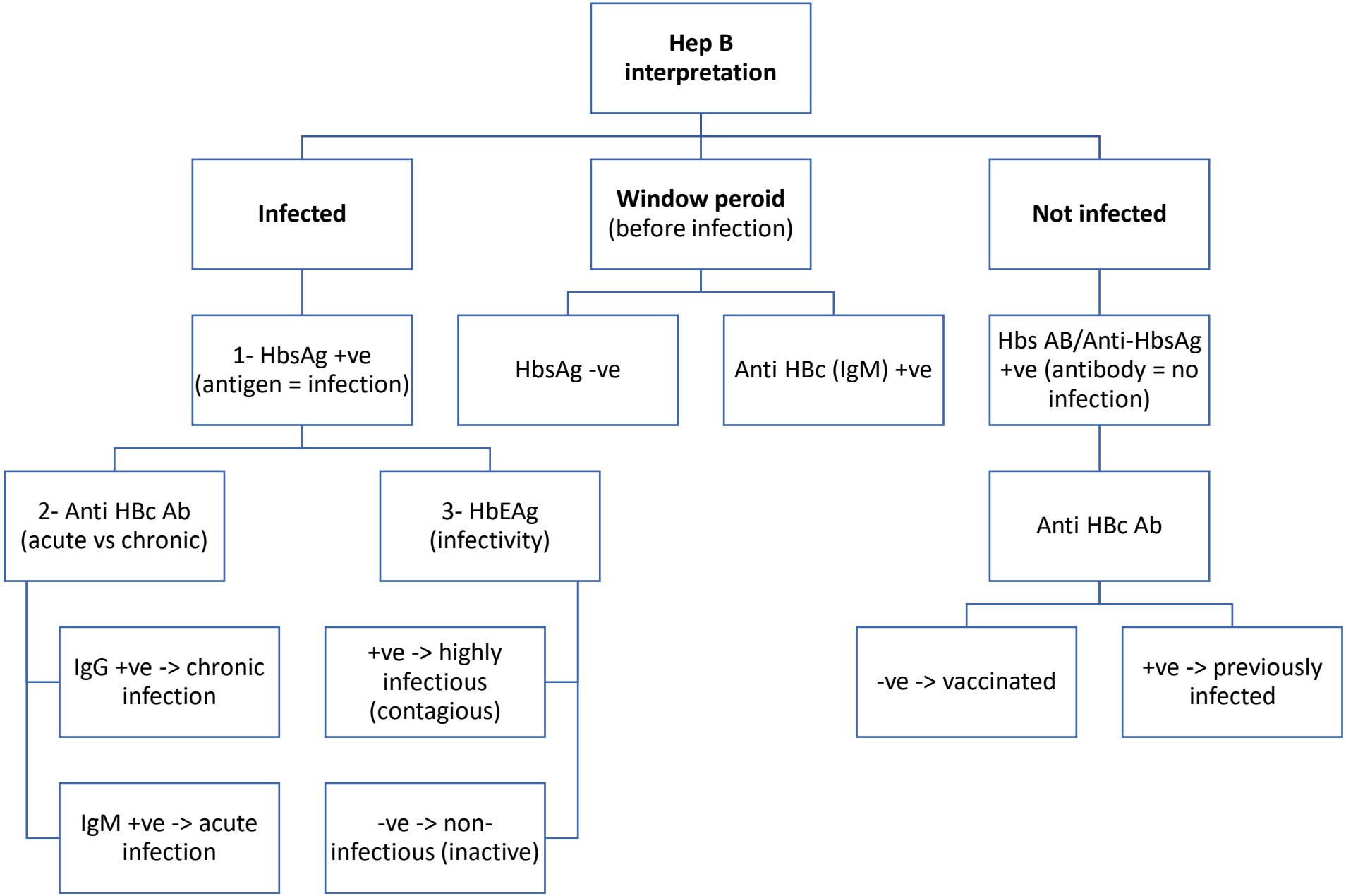
Ascites	- **Paracentesis >1.1 (portal hypertension):**
	  ○ **Perisinusoidal**: Schistosoma, Portal vein thrombosis
	  ○ **Sinusoidal**: Cirrhosis (ascitic protein <2.5), HCC
	  ○ **Post sinusoidal**: Right CHF (ascitic protein >2.5), Budd Chiari syndrome
	- **Paracentesis <1.1 (non-portal hypertension):**
	  ○ Nephrotic syndrome
	  ○ Malignancy
	  ○ TB
	  ○ Pancreatitis
			- **General:**
			  ○ Reduce Na intake
			  ○ Spironolactone → no improvement → add furosemide
			- **Symptomatic (tense ascites)** → albumin + paracentesis
			- **Refractory** (AKI from diuretics OR no improvement on medication):
			  ○ **Large volume paracentesis + albumin** OR **TIPS**
			- **Other conditions:**
			  ○ Ascites + hyponatremia → free water restriction
			  ○ CLD dehydrated + ascites → give 0.45 NS	

Spontaneous bacterial peritonitis	- Ascites + cell count of peritoneal fluid (PMN >250) - **Organism**: E. coli, Klebsiella, Streptococcus pneumoniae - History of current upper GI bleeding or previous SBP	- Cefotaxime OR ceftriaxone (for 5 days) + IV albumin - Prophylactic antibiotic (fluroquinolone)	
Hepatic encephalopathy	- CLD + disorientation, insomnia, asterixis, confusion	- Treat the cause - Lactulose enema in ER - Oral lactulose (prevention)	- **Precipitating factors:** ○ Bleeding ○ Constipation ○ Infections, SBP ○ Medication (sedative) ○ Non-adherence to meds ○ Dehydration, Low Na or K ○ TIPS in refractory ascites
Gastroesophageal varices	- All patients with CLD should do EGD to **look for varices**: ○ Not present → no need BB ○ Present → propranolol or nadolol - **Upper GI bleeding present** → give BB and do endoscopic variceal ligation		
Hepato-renal syndrome	- Diagnosis of exclusion - **Criteria**: ○ Cirrhosis + ascites + high creatinine (AKI) ○ No improvement on creatinine after discontinuation of diuretics ○ No signs of shock ○ No nephrotoxic medication, No intrinsic kidney disease	- Not ill → octreotide + midodrine - Critically ill → vasopressor + albumin - Consider renal and liver transplant	
Budd Chiari syndrome (hepatic vein thrombosis)	- Female + OCP or DVT - Jaundice + abdominal pain + ascites (CLD)	- Anticoagulation	
Autoimmune hepatitis	- Female - Abdominal pain, ascites, jaundice (CLD) - Other autoimmune disease	- ANA, **ASMA** - Anti-LKM, Anti-SLA - Anti-actin - Anti-LC - **Diagnosis**: biopsy (bridging fibrosis)	- Steroids +/- azathioprine

<table>
<tr><td>Ischemic hepatitis</td><td colspan="2">- ICU + low BP + septic shock + sudden high AST and ALT</td><td colspan="2">- Correct blood pressure</td></tr>
<tr><td>Alcohol hepatitis</td><td colspan="2">- AST>ALT 2:1 + agitated, delirium, hyperthermia, high HR = delirium termens</td><td colspan="2">- ICU + benzodiazepine</td></tr>
<tr><td rowspan="6">Infectious hepatitis</td><td colspan="4">- ALT>AST 2:1 → infectious hepatitis</td></tr>
<tr><td></td><td>Hepatitis A</td><td>Hepatitis B</td><td>Hepatitis C</td><td>Hepatitis E</td></tr>
<tr><td>NA</td><td>RNA</td><td>DNA</td><td>RNA</td><td>RNA</td></tr>
<tr><td>IP</td><td><2 weeks</td><td>8 – 12 weeks</td><td>8 – 12 weeks</td><td><2 weeks</td></tr>
<tr><td>Spread</td><td>fecal oral</td><td>- Needle stick injury:
o 30% if not vaccinated
o 5-10% if vaccinated
- IV drug abuser, sexual, transfusion
- Breast milk if cracked nipple or bleeding and baby not vaccinated
- If exposed → hepatitis B Ig</td><td>- Needle stick injury 2-7%
- Body fluids except for saliva (only if contaminated by blood)
- Breast feeding recommended (no transmission)
- If exposed → monitor LFT and antiHCV (no treatment)</td><td>fecal oral</td></tr>
<tr><td>Dx</td><td>IgM hepatitis A</td><td>Hep B interpretation (see diagram below) + HBV DNA viral load (>20K)</td><td>- Acute: Anti-hepatitis C IgM (ELISA) → HCV RNA viral load → HCV genotype (6 genotype)
- Chronic: Anti-HCV IgG</td><td>IgM hepatitis E</td></tr>
<tr><td>Mx</td><td>Supportive</td><td>- Tenofovir OR entecavir (nucleotide inhibitor)
- PEG interferon alpha (non-nucleotide inhibitor)</td><td>- Sofosbuvir OR ribavirin
- PEG interferon alpha</td><td>supportive</td></tr>
<tr><td>Extra</td><td>- Non-contagious
- Has vaccine</td><td>- HCC > chronicity
- Has vaccine
- Co-infection with hepatitis D</td><td>- No vaccine
- CLD > HCC
- Genotype 3 → most common in HCC
- Genotype 4 → most common in KSA
- Recovery or resolution → -ve HCV RNA viral load + anti-HCV IgM (-ve)</td><td>- Non-contagious
- South Asia
- In pregnant → fulminant hepatitis</td></tr>
</table>

Non-alcoholic fatty liver disease	- Obese, DM II - Rapid weight loss	- **Diagnostic**: biopsy	- Vitamin E + metformin (diabetic or non-diabetic) - Weight reduction if obese	
Hemochromatosis	- Male + jaundice, abdominal pain (CLD) + **hyperpigmentation** + **hypogonadism** + arthritis (pseudogout) + DM + cardiomyopathy	- **Transferrin saturation** (high) → specific - Iron level (high) - Hct (high) - **Biopsy**: pearl stain +ve - **Genetics**: autosomal recessive (HFEC282Y)	- Venesection + iron chelating (deferoxamine) - No improvement → transplant	
Wilson disease	- Female + jaundice, abdominal pain (CLD) + **abnormal movement** + **psychiatric disease** + **family history of liver disease** + tremor	- Copper (high) - **Ceruloplasmin** (low) - Urine copper (high) - **Pathognomic**: Kayser Fleischer ring (grey ring cornea) - **MRI brain** (if abnormal movement): panda sign - **CSF**: copper - **Genetics**: autosomal recessive (ATP7B gene)	- Penicillamine + zinc - No improvement → transplant	
Primary biliary cholangitis	- Female, 40 years old - Osteoporosis, pruritis, high cholesterol (xanthelasma) + SLE/Sjogren/RA	- **AMA** - **Diagnostic**: MRCP + biopsy - **Diagnostic and therapeutic**: ERCP	- Ursodeoxycholic acid - Cholestyramine (for pruritis)	
Primary sclerosing cholangitis	- Male +/- pruritis - Associated with UC	- ANCA or ASCA - MRCP (beading stricture) → if negative → biopsy - ERCP after MRCP	- Ursodeoxycholic acid - Treat IBD flare up	- Do colonoscopy for UC

<table>
<tr><td>Hepatocellular cancer</td><td colspan="2">- Screening: ultrasound every 6 months
- Diagnostic: CT triphasic in <u>CLD</u>
- Diagnostic: biopsy in <u>non-CLD</u></td><td colspan="2">- Single liver lesion <2-3 cm → surgery
- Multiple liver lesions → tyrosine inhibitor (-nib)
- Single liver lesion >4 cm → radiofrequency ablation or transplant</td></tr>
<tr><td>Variceal bleeding</td><td rowspan="2">- Hematemesis or coffee ground vomitus
- Melena (dark stool)</td><td rowspan="2">- Resuscitation:
○ Transfusion:
▪ If <7 + no CAD → transfusion
▪ If 8 + CAD → transfusion until Hb level 10
▪ In variceal bleeding don’t exceed Hb 10 or above
○ Unstable (no endoscopy)
▪ ICU
▪ Interventional Radiology (embolization)
▪ Surgery
○ Stable → urgent endoscopy within 12-24 hours</td><td>- Pharmacological:
○ Octreotide for 2-3 days OR Telipressin
○ Ceftriaxone OR cefotaxime for 5 days (to prevent SBP)
○ BB after discharge
- Endoscopy:
○ Esophageal band ligation OR esophageal sclerotherapy → didn’t improve → balloon → didn’t improve → TIPS</td><td rowspan="2">- Only tachycardia → 10% blood loss
- Orthostatic hypotension → 20% blood loss
- Hypotension → 30% blood loos</td></tr>
<tr><td>Non-variceal bleeding</td><td>- Pharmacological:
○ PPI IV then infusion for at least 72 hours then give oral
○ If low risk → PPI for 24 hours
- Endoscopy:
○ Erythromycin before endoscopy
○ Epinephrine injection + cautery
○ Ulcer found → biopsy</td></tr>
<tr><td>Obscure GI bleeding</td><td colspan="3">- No source of bleeding on endoscopy
- Bleeding → endoscopy → negative source → push enteroscopy (large endoscopy tube) → negative → capsule enteroscopy → negative → admit and wait until active bleeding → <u>CT angio</u>
- Causes:
○ Dielufoy lesion (direct spurting of blood)
○ Angiodysplasia
○ Gastric antral vascular ectasia (watermelon stomach) → systemic sclerosis</td></tr>
</table>



Gastroenterology

<table>
<tr><th></th><th>Hints</th><th>Diagnosis</th><th colspan="2">Treatment</th></tr>
<tr><td rowspan="2">Squamous esophageal cancer</td><td rowspan="3">- Dysphagia to solid then liquid + weight loss
- +/- nausea and vomiting or hematemesis</td><td rowspan="2">- Upper 2/3
- Risk factors: Smoking + alcohol
- Esophageal web/ring (anatomical problem) + female + IDA → Plummer Vinson disease</td><td colspan="2">Endoscopy + biopsy</td></tr>
<tr><td>Without dysplasia</td><td>- Endoscopy screening every 3-5 years</td></tr>
<tr><td rowspan="3">Adenocarcinoma esophageal cancer</td><td rowspan="3">- Lower 1/3
- Most common type
- Barret’s esophagus (columnar metaplasia) from GERD
- Obesity → most common cause</td><td>Low grad dysplasia</td><td>- Endoscopy screening every 6-12 months</td></tr>
<tr><td>High grade dysplasia</td><td>- Endoscopic ablation or resection
- If not treated → adenocarcinoma</td></tr>
<tr><td>Infectious esophagitis</td><td>- Odynophagia > dysphagia
- Immunocompromised</td><td colspan="3">- Candida (white spots) → Fluconazole
- CMV → Ganciclovir
- HSV → Acyclovir</td></tr>
<tr><td>Pill esophagitis</td><td>- Odynophagia > dysphagia</td><td colspan="3">- Causes: NSAIDs, KCl, Bisphosphonate, Doxycycline
- Treatment: stop the drug</td></tr>
<tr><td>Eosinophilic esophagitis</td><td>- Young or middle age
- Male, Dysphagia
- History of atopy</td><td>- Endoscopy and biopsy → eosinophils</td><td colspan="2">- Modify diet → didn’t improve → swallow inhaled steroid → didn’t improve → dilation</td></tr>
<tr><td>GERD</td><td colspan="2">- GI: Heart burn, regurgitation, metallic taste, dysphagia
- Extra-GI: Cough, wheeze, atypical chest pain
- Alarming features: Vomiting, anemia, weight loss, dysphagia</td><td colspan="2">- <50 years old + no alarming features:
○ 8 weeks PPI trial + lifestyle modification → didn’t improve → endoscopy → normal → esophageal 24-hour pH monitor (diagnostic) → normal → functional heartburn
- <50 years old + alarming feature OR >50 years old:
○ Endoscopy → PPI → didn’t improve → surgery</td></tr>
<tr><td>PUD (H. pylori)</td><td>- Epigastric pain that radiates to the back</td><td>- If taking antibiotic and PPI → stop for 2-4 weeks
- Urea breath test, stool antigen, endoscopy + rapid urea test
- Gold standard: biopsy (gram negative, comma shaped motile)</td><td colspan="2">- Triple therapy for 10-14 days:
○ Clarithromycin + Amoxicillin + PPI (BID)
- After 4 weeks → test for eradication by:
○ Urea breath test (specific and accurate)
○ Endoscopy (diagnostic)
○ Stool antigen</td></tr>
</table>

<table>
<tr><th rowspan="3">Inflammatory bowel disease</th><th colspan="3">Extracolonic Feature</th></tr>
<tr><th colspan="2">Related to disease activity</th><th>Not related to disease activity</th></tr>
<tr><td colspan="2">- Peripheral arthritis
- Erythema nodosum (raised in lower limb and painful)
- Perianal skin tags (more in Crohn's), Cholelithiasis
- Orofacial lesion (oral ulcers), Episcleritis</td><td>- Pyoderma gangrenosum (ulcer deep in lower limb) → treated with steroids</td></tr>
<tr><td>Ulcerative colitis</td><td>- Mostly in female
- Pancolitis + Proctitis
- Left sided colon (most common)
- Grossly bloody diarrhea
- Lower abdominal pain (before defecation)
- Tenesmus
- Nocturnal diarrhea</td><td>- P-ANCA
- Colonoscopy and biopsy:
○ Continuous inflammation involving the rectum
○ Erosion
○ Crypt abscess
○ Pseudopolyps
○ Diffuse ulceration
- Barium: lead pipe appearance</td><td rowspan="2">- Screening 8-10 years from diagnosis (has risk of colon cancer)
- Mild disease → 5-ASA (sulfasalazine or mesalamine)
○ UC:
▪ <u>Left colon</u> → oral + enema
▪ <u>Proctitis</u> → enema or suppository
○ CD:
▪ <u>Colonic</u> → oral
▪ <u>Extra-colonic</u> → no 5-ASA, give steroids
▪ <u>Fistulizing or perianal disease</u> → add antibiotics (ciprofloxacin + metronidazole)
- Moderate disease → add Budesonide PO or enema
- Moderate severe disease:
○ Stop budesonide
○ Add prednisone + azathioprine (OR methotrexate in CD)
▪ Order thiopurine methyltransferase before starting azathioprine
- Severe disease:
○ Rule out infection (C. difficule) by toxin assay
○ Give IV steroids (methylprednisone or hydrocortisone) for 3 days → didn't improve → add direct agent (Infliximab or adalimumab)
- Surgery:
○ Toxic megacolon – UC (abdominal pain, colon >6 cm):
▪ <u>No shock</u> → IV steroid + antibiotic → didn't improve → surgery
▪ <u>Shock</u> → surgery
○ Perianal disease or fistulizing – CD → first line is infliximab</td></tr>
<tr><td>Crohn's disease</td><td>- Smoking
- Mouth to anus sparing the rectum
- Ilium (most common)
- B12 deficiency
- Abdominal pain
- Fever
- Mucus, nongrossly bloody, diarrhea</td><td>- ASCA
- Colonoscopy and biopsy:
○ Transmural inflammation, Skip lesions by extending ileocolonoscopy
○ Non-caseating granuloma (pathognomic)
○ Cobble stone, Aphthous ulcer
- MR enterography for small bowel assessment</td></tr>
</table>

Irritable bowel syndrome	- Young + female
	- Stress
	- Abdominal pain
	- Diarrhea or constipation
	- Pain improves with defecation
	- Features of early depression
	- -ve fecal calprotectin, normal osmotic gap
			- **Diet**: Low-FODMAP diet
			- **Diarrhea predominant:**
			  ○ Rule out celiac
			  ○ Loperamide or cholestyramine → didn't improve → antispasmodics → didn't improve TCA or SSRI
			  ○ Give rifaximin (antibiotics)
			- **Constipation predominant** → give laxative

Celiac disease	- Anxiety
	- Depression,
	- Chronic abdominal pain
	- Diarrhea
	- Bloating
	- IDA
	- Dermatitis herpetiformis
	- Fatty stool (steatorrhea)
	- Symptoms present after eating bread, wheat, pastry
		- **Isolated high AST**
		- **Antibodies:**
		  ○ IgA tissue transglutaminase + IgA level → specific
		  ○ IgA antigliadin
		  ○ IgA antiendomysial
		- **Definitive**: duodenal biopsy → lymphocyte infiltration + atrophic villi
		- **Genetic**: HLA-DR2/DQ8
			- **Approach in diagnosis:**
			  ○ Symptomatic and on same diet + IgA tissue transglutaminase + IgA level → **biopsy**
			  ○ Asymptomatic and on same diet + IgA tissue transglutaminase + IgA level → **NO biopsy**
			  ○ Symptomatic + stopped gluten → HLA DR2/DQ8 → if positive → do **biopsy**
			  ○ If diagnosed and symptomatic → check food diary → if compliant → do **endoscopy and biopsy**
			- **Management:**
			  ○ Gluten free diet (wheat, rye, barely)
			  ○ Can eat rice, potato, lentil

Clostridium difficile diarrhea	- Antibiotics use (Ceftriaxone, clindamycin, ciprofloxacin, ampicillin) - Watery diarrhea +/- blood or mucus - Lower abdominal pain - Fever - Very high WBC	- **Sensitive**: stool PCR for C. diff - **Specific**: stool toxin assay - **Colonoscopy**: ○ Pseudomembranous colitis + bowel thickening	- **Initial (first) episode** → vancomycin oral for 10 days - **Second or subsequent** → fidaxomicin oral for 10 days - **Severe** → vancomycin oral + metronidazole IV - **Prevention** → washing with water and soap - **Toxic megacolon** → surgery

Endocrine

	Hints	Diagnosis	Treatment	Extra

Diabetes type 1	- HLA +ve
	- AntiGAD
	- Anti-islet cell
	- Anti-insulin antibody
	- Young <20 years + thin + autoimmune disease
		- **Prediabetes:**
		  ○ HbA1C → 5.7-6.4 (normal <5.7)
		  ○ Impaired fasting glucose → 100-125 mg/dL
		  ○ Post OGTT >2 (140-190)
		- **Diabetes:**
		  ○ HbA1C → >6.5 (2 readings)
		  ○ Fasting glucose → >126 (2 reading)
		  ○ Random glucose (>200) + symptoms (no need to repeat)
		  ○ Oral glucose tolerance test after 2 hours (best for pregnancy) → >200
			- **Bolus insulin with meals** → rapid acting (Lispro)
			- **Basal insulin at nigh** → long acting (Lantos or Glargine)
				- **Post prandial high blood sugar** and fasting is normal → **increase the bolus** and keep basal same
				- Post prandial normal blood sugar + **high fasting blood sugar** → keep rapid same + **increase basal**

Diabetes type 2	- >40 years old
	- Obesity
	- Family history +ve
			- Obese with high BMI + diabetic → **bariatric surgery** (gastric bypass) if can't lower the weight
			- Patient admitted for any cause other than diabetes → give **insulin sliding scale**
			- Best insulin regimen in pregnant → **NPH BID**
			- **All give metformin + lifestyle modification**
			- If >40 years old → **give Statin**
			- If HbA1c >9 → **give basal insulin** (long acting)
			- **If not improved on metformin and diet modification:**
			  ○ <u>If CVD</u> (stroke or IHD) → 1st option: GLP-1 (-tide), 2nd option: SGLT-2 (-glifozin)
			  ○ <u>If HF or CKD</u> → 1st option: SGLT-2, 2nd option: GLP-1
			  ○ <u>Medically free + obese</u> → 1st option: GLP-1 (-tide), 2nd option: SGLT-2 (-glifozin)
			  ○ <u>Medically free + risk of hypoglycemia</u> → DDP-4 (-gliptin)
			  ○ <u>Medically free completely</u> → SU (gli-)	

Diabetic ketoacidosis	- Increase in glucose >200 - Ketones in serum - Low pH, low HCO_3, high anion gap	- Hyponatremia from vomiting - Hyperkalemia - Hypophosphatemia - High WBC, High amylase	- Insulin + Hydration + potassium (only if 3.5 – 4.5) - With-hold insulin and give potassium if <3 - If anion gap high despite insulin → give IV dextrose + NS and lower insulin	

Hyperosmolar hyperglycemic state	- Dehydration - Hypotension - Altered mental status	- >600 glucose - No ketones - High serum osmolarity (>320)	- Same as DKA with more aggressive fluid - Monitor by serum osmolarity and symptoms
Hyperthyroidism	- Sweating - Tremor - Weight loss - A. Fib - Warm skin - Heat intolerance - Ophthalmoplegia - High reflex - Diarrhea	- High FT4 + low TSH - Thyroid stimulating antibody → **grave's disease** - Post viral, tender, high ESR → **thyroiditis** - Normal FT4 + low TSH → **subclinical hyperthyroidism** - Delirium, fever, high HR, high BP → **thyroid storm** - **Malignant features <u>do FNA</u>:** o >20 mm o <20 mm + hypoechoic or solid or microcalcification or LN or taller than wider - **<20 mm + benign <u>do TSH level:</u>** o Normal/high → FNA o Low → thyroid uptake scan	- **Grave's disease** (diffuse homogenous uptake): o Beta blocker + Methimazole or Propylthiouracil o If not improved on medication or high risk for CAD → radioactive iodine o Obstructive goiter or Severe ophthalmoplegia → surgery o **In pregnancy**: PTU (1st trimester), methimazole (2nd and 3rd trimesters) - **Thyroiditis** (no uptake) → beta blocker - **Subclinical hyperthyroidism** → treat when TSH <0.1 - **Toxic multinodular goiter** → beta blocker then radioactive iodine o Surgery (near total or total thyroidectomy) if obstructive - **Thyroid storm**: o Beta blocker IV + iodide IV o Methimazole or PTU
Hypothyroidism	- Weakness - Fatigue - Depression - Weight gain - Cold intolerance - Constipation - Menorrhagia - Hyperlipidemia - Diastolic hypertension - Delayed tendon reflex	- Low FT4 + high TSH - AntiTPO antibody + antithyroglobulin → **Hashimoto thyroiditis** - Normal FT4 + high TSH → **subclinical hypothyroidism** - Low BP, hypothermia, change mental status, low Na, hypoglycemia → **Myxedema coma**	- **Hashimoto thyroiditis**: o L-thyroxine o Check TSH every 6 weeks o If pregnant → 30% in thyroxine - **Subclinical hypothyroidism** → treat when: o TSH >10 o AntiTPO +ve o Pregnant - **Myxedema coma**: o Warm blanket + IV fluid + IV hydrocortisone o IV T4 and T3 (T3 shouldn't be given in bradycardia)

Osteoporosis	- Steroid use - Smoking - Female, hormones - Old age - Crohn's disease - Celiac disease - Primary biliary cholangitis - Heparin	- Normal Ca, PO_4, vitamin D - Dexa scan >-2.5 → **osteoporosis** - Dexa scan -1 to <-2.5 → **osteopenia** → do FRAX test - Osteopenia + fragility fracture → **osteoporosis**	- **Bisphosphonate**

Hypercalcemia (Hyperparathyroid)	- Dizziness
	- Polyurea
	- Constipation
	- Renal stones
	- Nausea and vomiting
	- Pancreatitis
	- PUD
	- ECG with narrow QRS complex
		- High PTH + high Ca + low PO_4 → **primary hyperparathyroidism**
		- High PTH + low Ca + high PO_4 → **secondary hyperparathyroidism**
		- High PTH + high Ca + high PO_4 → **tertiary hyperparathyroidism**
			- Management of hypercalcemia → **<u>aggressive hydration with NS</u>** → failed, options:
			  ○ IV zoledronic acid (bisphosphonate)
			  ○ Denosumab
			  ○ Calcitonin
			  ○ Steroids
			  ○ IV Lasix
			  ○ Dialysis (last resort)

Prolactinoma	- Female - Galactorrhea - Amenorrhea - Decrease libido - Infertility	- **Next step**: pregnancy test + TSH (rule out pregnancy and hypothyroidism) - **Confirmatory**: Fasting prolactin level - Pituitary MRI	- **>1 cm (macroadenoma)**: **cabergoline** → failed → transsphenoidal surgery - **<1 cm (microadenoma)**: **follow up MRI** → developed symptoms (headache only) → cabergoline → failed → transsphenoidal surgery - **Symptomatic** (diplopia, signs of optic chiasm compression): **Transsphenoidal surgery**
Acromegaly	- Change in voice and shoes size - Increase in length and jaw - Carpal tunnel - Headache - Sleep apnea, DM, HF - Acanthosis nigricans	- **Nest step**: Insulin like growth factor (screening) - **Confirmatory**: oral glucose tolerance test, after 2 hours check **growth hormone level** (high) - Pituitary MRI	- **Surgery** - If can't do surgery → **octreotide**

PCOS	- Young female
	- Obese
	- Acne
	- Oligo or amenorrhea
	- Hirsutism
	- Alopecia
	- Acanthosis nigricans
		- **Rotterdam 2 of 3:**
		  ○ Androgen excess (hirsutism/acne)
		  ○ Ovary (ovulatory dysfunction) by labs or clinical:
		  ▪ High LH:FSH
		  ▪ Increase free testosterone
		  ▪ Increase estradiol
		  ○ Ultrasound evidence of polycystic ovaries
			- **Metformin all**
			- Childbearing → **clomiphene** (fertility drugs) or IVF
			- Non-childbearing → **OCP**
			- Acne → **topical or isotretinoin** (if non-childbearing)
			- Hirsutism → **OCP or spironolactone**

Insulinoma	- **Whipple triad**:
	  ○ Symptoms of hypoglycemia (sweating, dizziness, palpitation)
	  ○ Glucose <3 (<54) in non-diabetic, <3.5 in diabetic
	  ○ Improves with glucose
		- **Labs**: high C-peptide + high insulin
		- **CT pancreases**
			- **Surgery**

Carcinoid syndrome	- Abdominal pain, Diarrhea - Facial flush, Wheeze - Tricuspid regurgitation	- **Urine 5HIAA**	- **Octreotide**

Adrenal incidentaloma	- Patient did CT abdomen and found adrenal mass	- **>4 cm** → surgery
		- **<4 cm**:
		  ○ **Functional**: order labs for Cushing's, Conn's, pheochromocytoma → +ve → surgery
		  ○ **Non-function**: CT adrenal → Benign (do follow up), Malignant (do surgery after ruling out pheochromocytoma by 24 hours urine metanephrines)	

Primary hyperaldosteronism	- Young <40 years
	- Hypokalemia
	- **High BP refractory to medication**
	- Metabolic alkalosis
	- PE normal
		- **Screening**: Aldosterone:renin ratio (>20:1)
		- **Confirmatory**: Saline suppression test
		- **Location**: CT adrenal (size and location)
			- **Unilateral adrenal adenoma:**
			  ○ >4 cm → surgery
			  ○ <4 cm → spironolactone
			- **Bilateral adrenal hyperplasia (Conn's syndrome):**
			  ○ Spironolactone

Hypercortisolism	- Acne
	- Moon face
	- Plethora
	- Truncal obesity
	- Fat pad
	- Striae
	- Hyperpigmentation
	- Hypokalemia
	- Hypertension
	- Metabolic alkalosis
	- Hyperglycemia
	- Lymphopenia
		- **Screening** (high cortisol)**:**
		  o 24-hour urine free cortisol
		  o Low dose overnight dexamethasone (not used in liver disease)
		  o 11 pm salivary cortisol (best for pregnant)
		- **Confirmatory**: ACTH level
		- **High dose dexamethasone suppression test** for secondary hypercortisolism
			Primary	- **Cushing's syndrome** → high cortisol + low ACTH
				- **Next**: CT adrenal
				- **Treatment**: surgery + PO hydrocortisone and fludrocortisone for life

			Secondary	- **Cushing disease** → high cortisol + high ACTH + suppressed (ACTH became low) - **Next:** MRI pituitary - **Treatment:** mitotane OR cabergoline OR metyrapone OR ketoconazole → didn't improve → transsphenoidal surgery
				- **Ectopic** → high cortisol + high ACTH + not suppressed (ACTH still high) - **Next**: CT chest, abdomen, and pelvis (rule out malignancy - **Treatment**: treat the cancer

Adrenal insufficiency	- Abdominal pain
	- Nausea and vomiting
	- Hyperkalemia
	- Metabolic acidosis
	- Hyperpigmentation (buccal mucosa and palmar crease)
	- Orthostatic hypotension
	- Dizziness
	- Hypoglycemia
	- Hyponatremia
		- **Screening**: morning serum cortisol
		- **Confirmation**: ACTH injection (cosyntropin test)
			Primary	- Screening (low), confirmation (low)
				- **Next**: CT adrenal for etiology
				  o Autoimmune = **Addison disease**
				  o Adrenal hemorrhage
				  o TB, metastatic deposit
				  o Hemochromatosis, sarcoidosis
				  o Rifampin, Septic shock
				- **Treatment**:
				  o Acute (adrenal crisis): 0.9 NS + IV hydrocortisone
				  o Chronic: PO hydrocortisone 3 times per day + fludrocortisone for life

			Secondary	- Screening (low), confirmation (high) - **Next step**: MRI pituitary - **Treatment**: PO hydrocortisone for life

<table>
<tr><td>Pheochromocytoma</td><td>- Headache
- Pallor
- Diaphoresis
- Episodic high BP
- Paroxysmal palpitation</td><td>- Screening: 24-hour urine metanephrine OR venylmandilic acid (VMA)
- Confirmation: serum free metanephrine
- Location: CT adrenal (size and location)</td><td>- 1- IV hydration
- 2- Alpha blocker (phenoxybenzamine)
- 3- After 2 weeks add BB
- 4- Surgery</td></tr>
<tr><td rowspan="3">Diabetes insipidus</td><td colspan="2">Polyurea + normal Na + urine osmolarity <100</td><td>Polyurea + hypernatremia</td></tr>
<tr><td colspan="2">- Initial → water deprivation test and check urine osmolarity:
o High >800 (concentrated) → primary polydipsia
o Low <800 (diluted) → ADH problem
- Confirmatory → desmopressin test:
o Improved urine osmolarity >50% → central diabetes insipidus
o Didn’t improve (<50%) → nephrogenic diabetes insipidus</td><td>- Next: MRI brain
- +ve → central diabetes insipidus (treatment: Desmopressin)
- -ve → Nephrogenic diabetes insipidus (treatment: amiloride)</td></tr>
<tr><td colspan="3">- Note: if polyurea + hyponatremia + urine osmolarity <100 = primary polydipsia</td></tr>
</table>

<table>
<tr><th colspan="4">Screening for</th></tr>
<tr><td>Osteoporosis (Dexa scan)</td><td colspan="3">- >65 years old
- <65 + high risk (steroid or hormonal replacement therapy)</td></tr>
<tr><td>Hypertension</td><td colspan="3">- >18 years old</td></tr>
<tr><td>Lipid</td><td colspan="3">- Men → 35 and above - Women → 45 and above</td></tr>
<tr><td>DM II</td><td colspan="3">- PCOS
- Normal BP → at 45 years old
- High BP → any age</td></tr>
<tr><td rowspan="5">Colon cancer (Colonoscopy)</td><td></td><td>Start</td><td>Repeat</td></tr>
<tr><td>General population</td><td>- 50 years old and above</td><td>- Every 10 years</td></tr>
<tr><td>IBD (UC)</td><td>- 10 years from diagnosis</td><td>- Annual</td></tr>
<tr><td>Polyp
(Familial polyposis)</td><td>- 10 yeas old (pediatric)
- At age 20 years old start upper GI scope with colonoscopy</td><td>- Annual</td></tr>
<tr><td>Non-polyps
(HNPCC /Lynch syndrome)</td><td>- 20 years old
- At age 40 years old start upper GI scope with colonoscopy</td><td>- Every 5 years</td></tr>
<tr><td>Lung cancer (Low dose CT chest)</td><td colspan="3">- From 55 to 80 if active smoker (20 pack per year)
- Ex-smoker and quit 15 years ago
- All patients (smoker) and >65 years old → do abdominal ultrasound (for abdominal aortic aneurysm)</td></tr>
<tr><td>Brest cancer</td><td colspan="3">- >40 years old (Saudi) or >45 (American)</td></tr>
</table>

Infectious Disease

Organism/Disease	Diagnosis		Treatment

Streptococcus pyogenes	**Cellulitis**	- Dermal lymphatics (deeper)
		- Ill-defined boarders, Acute onset
		- More systemic symptoms
		- Tender
			- **Purulent (pus):**
			  ○ Septic shock (low BP) → vancomycin
			  ▪ **S/E**: Red man syndrome (itching + redness) → slow infusion rate + antihistamine
			  ○ Non-septic → clindamycin
			- **Non-purulent** → clindamycin OR dicloxacillin

	Erysipelas	- Dermal and subdermal (superficial) - Well-demarcated, Indolent - Less systemic symptoms	- **Mild** → amoxicillin - **Septic shock** → IV ceftriaxone
Genital ulcer	**Syphilis**	- Painless genital ulcer - Painless inguinal lymph nodes - Maculopapular rash in palms and soles	- Penicillin G
	STD (Chlamydia trachomatis)	- Painless genital ulcer - Painful inguinal lymph nodes	- Doxycycline
	Chancroid (Hemophilus ducry)	- Painful genital ulcer - Unilateral inguinal lymph node involvement	- Doxycycline
	HSV-2	- Painful genital ulcer - Bilateral inguinal lymph node involvement	- Acyclovir
Syphilis (Treponema Pallidum)	**Primary**	- Painless genital ulcer (chancre) - **Diagnostic test**: Dark field microscopy	- Penicillin G
	Secondary	- Healed ulcer with scar - Maculopapular rash in palms and soles - Diagnostic test: FTA-AB, VDRL +ve, PEP +ve	- Penicillin G (even in pregnancy)
	Tertiary	- Neurosyphilis (personality changes, Argyle Robertson pupil) - Foot drop - Aortitis - **Diagnostic test**: FTA-AB	- Penicillin G IM weekly over 3 weeks - Neurosyphilis: IV penicillin G for 10-14 days
	- Fever + chills + tachycardia + syphilis started on penicillin → Jarish-Herxidemer reaction		

<table>
<tr><td rowspan="3">Maculopapular rash</td><td>Rubella
(German measles)</td><td>- Post auricular lymphadenopathy
- Rash: face then trunk
- Droplet transmission</td><td rowspan="3">- Supportive</td></tr>
<tr><td>Rubeola
(Measles)</td><td>- Cough + coryza + conjunctivitis
- Kolpik spots in buccal mucosa
- Rash: face then trunk
- Droplet transmission</td></tr>
<tr><td>Roseola (HHS-6)</td><td>- Trunk rash</td></tr>
<tr><td>Brucella meltiness</td><td colspan="2">- Raw milk ingestion then develops
o Back pain
o Fever
o Hepatomegaly
- Sensitive test: serum agglutination test (>1:640)
- Gold standard: blood culture
o If blood culture negative and there is high suspicion → do bone marrow culture</td><td>- Non-localized (fever, back pain, high titer, low WBC, raw mild ingestion):
o Doxycycline + rifampicin OR streptomycin OR gentamicin for 6 weeks
- Localized (lower back pain):
o Pregnant: rifampicin + trimethoprim sulfamoxazole for 4 weeks
o Joint/osteomyelitis: doxycycline + rifampicin + gentamycin for 3 months
o CNS: doxycycline + rifampicin + ceftriaxone until CSF normalized (up to 6 months)
o Endocarditis: doxycycline + rifampicin + gentamycin + trimethoprim sulfamoxazole for 6 weeks – 6 months</td></tr>
<tr><td>Dengue fever</td><td colspan="2">- Came from Jeddah, Jizan
- Febrile illness: fever, severe headache, myalgia, periorbital pain, petechial rash
- Critical phase: acute hemorrhagic phase (low BP, pleural effusion, GI bleeding)
- Recovery phase (dangerous): seizure, bradycardia, low platelet
- Testing:
o Duration of illness <3 days → do PCR or ELISA
▪ If negative → IgM detection
o Duration of illness >3 days → do IgM detection</td><td>- Supportive (paracetamol + IV fluids)
- Avoid NSAIDs or aspirin (they cause low platelet)</td></tr>
</table>

<table>
<tr>
<td rowspan="2">HIV</td>
<td>
- Traveling + (IV drug abuse OR sexual contact with multiple partners)
- After 3-6 weeks post exposure:
  ○ Mononucleosis like symptoms:
    ▪ Sore throat, fever, lymphadenopathy, rash, fatigue, myalgia, jaundice = acute retroviral infection
- Transmission:
  ○ Body fluids except for saliva (only if contaminated by blood)
  ○ 0.2-0.3% through needle stick injury
  ○ Breast milk (contraindicated to breast feed)
- Tests:
  ○ Screening: ELISA (HIV AB 1 and 2)
  ○ Confirmatory: Western blot
  ○ Measure:
    ▪ Viral load by PCR → determines treatment (anti-retroviral)
    ▪ CD4 count (<500) → determine the needs of prophylactic against opportunistic infection
</td>
<td>
- Prophylaxis:
  ○ Adult or healthcare worker with needle stick injury:
    ▪ 2 hours – 72 hours of exposure (window to give post-exposure medication) → 2 nucleoside reverse transcriptase inhibitor + integrase inhibitor for at least 4 weeks
  ○ Pregnant with HIV not on medication and she is in labor:
    ▪ Mother and child → zidovudine (NRTI) OR nevirapine
- Treatment: 2 nucleoside reverse transcriptase inhibitor + integrase inhibitor
</td>
</tr>
<tr>
<td colspan="2">
1- HIV patient + multiple ring enhancement on brain CT + fever + confusion + meningitis + CD <100 → toxoplasma:
  ○ Diagnosis: CSF toxoplasma IgG
  ○ Treatment: pyrimethamine + sulfadiazine
2- HIV patient + single ring enhancement in brain + CD <50 → HIV lymphoma
3- HIV patient + temporal area lesion + seizure + confused → HSV encephalitis
4- HIV patient + hypoxia + SOB + dry cough + fever + bilateral infiltration + high LDH + CD <200 → pneumocystis Jiroveci pneumonia:
  ○ Diagnosis: broncho-alveolar lavage
  ○ Treatment: trimethoprim + sulfamoxazole
5- HIV + pneumonia + patch + any CD → streptococcus pneumonia
6- HIV + Cavitary lesion + any CD → TB
7- HIV + eye symptoms + CD <50 → CMV retinitis
8- HIV + meningitis + CD <50 → CMV encephalitis
9- HIV + eye symptoms + CD <100 → toxoplasmosis
10- HIV + meningitis + CD <100 → toxoplasma OR cryptococcus:
  ○ Diagnosis: +ve Indian ink
  ○ Treatment: amphotericin + flucytosine OR only liposomal amphotericin
11- HIV + raised purple skin or buccal mucosa + CD <400 → Kaposi sarcoma (HHV-8)
12- HIV + diarrhea + CD <100 → cryptosporidium
13- HIV + diarrhea + any CD → giardia
14- HIV + odynophagia + white patch esophagus + CD <200 → candida esophagitis
15- HIV + odynophagia + ulcer in esophagus → HSV or CMV
</td>
</tr>
</table>

Malaria	- **#1 cause of FUO in returned travels**
	- **Fever of unknown origin**: Fever >38.3 for 21 days (3 weeks) + 1 week of inpatient investigation
	- **Sub-Saharan Africa** or **Sudan** or **Jizan** (Southern Saudi) + fever + abdominal pain + jaundice + splenomegaly
	- **Features of severe malaria:**
	  ○ **Labs:**
	  ▪ Parasitemia >5% (CDC) OR >2% (WHO)
	  ▪ Severe anemia
	  ▪ Lactic acidosis
	  ▪ Hypoglycemia
	  ○ **Clinical:**
	  ▪ Cerebral malaria (seizures, confusion)
	  ▪ Respiratory distress (ARDS)
	  ▪ Renal failure (high creatinine, decrease urine output)
	  ▪ DIC
	- **Species:** anopheles (**peak**: late night or pre-dawn)
	- Most common **type** in Saudi → p. vivax then p. falciparum
	- Most common malaria that causes **chronic disease** → p. malaria
	- Most common malaria causes **fatal** or **severe disease** → p. falciparum
	- **Hypnozytes** in liver → p. vivax + p. ovale
	- **Diagnosis:**
	  ○ **Screening**: Rapid diagnostic test in blood banks
	  ○ **Confirmation**: blood smear + light microscopy (Geimsa stain, thin-thick film)
	  ▪ If smear negative → repeat smear (thin-thick) every 12 hours for total of 3 sets CDC OR repeat smear (thin-thick) every 8 hours for 2 days (WHO)
		- **Prophylaxis (travelling):**
		  ○ <u>Chloroquine sensitive area</u> → give chloroquine once weekly (2 weeks before + throughout + 4 weeks after)
		  ○ <u>Chloroquine resistant area (KSA):</u>
		  ▪ **First line**: atovaquone (malarone) daily (2 days before + throughout + 5 days after)
		  ▪ **Second line**: doxycycline (2 days before + throughout + 28 days after)
		  ▪ **Pregnant** → mefloquine once weekly (2 weeks before + throughout + 4 weeks after)
		- **Treatment:**
		  ○ <u>Non-complicated (no severe features):</u>
		  ▪ **P. falciparum** → PO artesunate + sulfadoxine/pyrimethamine + primaquine one dose
		  ▪ **Non-P. falciparum** → PO chloroquine + primaquine one dose
		  ○ <u>Severe (Regardless of malaria type):</u>
		  ▪ IV artesunate
		  ○ <u>Pregnant (Regardless of malaria type)</u>:
		  ▪ **Non-complicated:**
		  • 1st trimester → clindamycin + quinine
		  • 2nd + 3rd trimester → artesunate + sulfa
		  ▪ **Severe:**
		  • IV artesunate + clindamycin

Vaginitis				
	Normal	**Trichomonas (STD)**	**Candida**	**Bacterial vaginosis (Gardnella vaginalis)**
Symptoms	X	Itching	Itching dysuria	Itching
Discharge	Clear	Frothy green Musty green grey	Thick white Cheese	Foul fishy
Clinical findings	X	Cervical petechiae (strawberry cervix)	Erythema	X
Vaginal pH	3.8 – 4.2	>4.5	=<4.5	>4.5
KOH (whiff test)	Negative	Positive	Negative	Positive
NaCl (wet mount)	Lactobacilli	Motile flagellated protozoa	X	Clue cells (coccobacilli) >=20%
KOH (wet mount)	X	X	Pseudo-hyphae	X
Treatment	-	Metronidazole + treat the partner	Topical clotrimazole or miconazole or fluconazole	Metronidazole + no treatment for partner

Hematology and Oncology

	Diagnosis	Treatment

Sickle cell disease	- Pain → **vaso-occlusive crisis**
	- Pain + very low BP + low Hb + splenomegaly → **spleen sequestration**
	- Low WBC, low Hb, low reticulocytes, low platelets → **Aplastic crisis**
	- Jaundice, low Hb, high reticulocyte → **hemolytic crisis**
	- Low O_2, SOB, chest x-ray with high interstitial markings, fever → **Acute chest syndrome**
		- **General:**
		  ○ Adequate hydration
		  ○ Adequate analgesia
		- **Urgent <u>blood transfusion</u>**:
		  ○ Hb <6
		  ○ Reticulocytes ≤4%
		  ○ Major surgery (keep Hb at least above 10)
		  ○ Pregnant going for CS
		- **Urgent <u>blood exchange</u>:**
		  ○ Microinfarction (stroke)
		  ○ Acute chest syndrome
		  ○ Spleen sequestration
		  ○ Priapism
		- **Hydroxyurea (prevention):**
		  ○ Severe acute chest syndrome
		  ○ Frequent painful crises ≥3/year

Von Willebrand deficiency	- Petechiae, epistaxis, gum bleeding, ecchymosis, menorrhagia, GI bleeding - Normal platelet count - High bleeding time - Slight increase in PTT	- **Desmopressin** - If bleeding → **Cryoprecipitate**
Immune thrombocytopenic purpura	- Young + post URTI - Petechiae or purpura - Low platelet - High bleeding time	- >30 years old + asymptomatic → **observe** - >30 years old + bleeding → **IVIG and platelet** - <30 years old → **steroids** → no improvement → **splenectomy or rituximab**
Thrombotic thrombocytopenic purpura	- Pregnant - Confusion (CNS) + petechiae and low platelet (thrombocytopenia) + low Hb and peripheral blood smear shows schistocytes (MAHA) + high creatinine (AKI)	- **Plasma exchange** - **FFP** if no plasma exchange

Hemophilia A	- Male - Hematoma - Hemarthrosis	- **Factor 8 replacement** or **cryoprecipitate**

Febrile neutropenia	- Single fever ≥38.3 OR persistent fever ≥38 over 3 hours
	- Neutropenia (absolute neutrophil count <0.5)
		- Isolate patient to **+ve pressure room**
		- Do septic work up (blood culture, sputum culture, urine culture and examination, chest x-ray)
		- **Main treatment**: Cefepime or tazocin or imipenem – covers gram negative (E. coli, pseudomonas, klebsiella)
		  ○ **Porta cath** or **IV line** or **pneumonia** (MRSA) → add vancomycin
		  ○ **No improvement in 5-7 days** of antibiotics → add antifungal (-fungin)
		- Ceftazidime → covers pseudomonas only

Polycythemia vera	- High RBC, Hb >16.5, high HCT >49% - Headache, dizziness, blurred vision, tinnitus, plethora, splenomegaly, bleeding, thrombosis (Budd Chiari syndrome), pruritis - EPO level low → then do mutation test (JAK 2 mutation)	- **Phlebotomy** (helps reduce HCT to <45%) + **aspirin**
Acute myeloid leukemia	- Young - Fatigue, Bleeding Recurrent infection - Anemia, low platelet, **Low WBC** - No palpable lymphadenopathy - No splenomegaly - Acute promyelocytic leukemia → M3 - Translocation 15:17 (PML-RAR) - **Auer rod**, myeloperoxidase +ve on cytochemistry	- Trans-retinoic acid
Chronic myeloid leukemia	- Old, Fatigue - **High WBC**, high basophils - Splenomegaly - Palpable lymphadenopathy - Translocation 9:22 (Philadelphia chromosome)	- Tyrosine kinase inhibitors (-nib)

Chronic lymphocytic leukemia	- Lymphadenopathy, Large spleen - High WBC - **Peripheral smear**: smudge cell, CD5 +ve - Associated with autoimmune hemolytic anemia (warm IgG) and ITP	- **Asymptomatic** (even if there is lymphadenopathy or splenomegaly) → watchful waiting - **Symptomatic** (anemia or thrombocytopenia) → fludarabine, cyclophosphamide, rituximab
Hodgkin lymphoma	- **Non-tender lymphadenopathy** - Night sweats, fever, weight loss >10% (**B-symptoms**) - Lymphocytosis + very high LDH - **Diagnosis**: First **lymph node excisional biopsy** → then **PET-CT for staging** (Ann Arbor)	- Bimodal age (young and very old) - With **EBV** or **HIV** - **Pathognomic**: Reed Sternberg cell	- Adriamycin - Bleomycin - Vincristine - Dacarbazine

Non-Hodgkin lymphoma		- Autoimmune (SLE, RA, autoimmune hemolytic anemia warm IgG type)
		- Burkitt's lymphoma
		- Infections (EBV, H. pylori)
		- Decrease immunity (HIV, post-transplant)
			- R-CHOP:
			  ○ Rituximab
			  ○ Cyclophosphamide
			  ○ Adriamycin
			  ○ Oncovin
			  ○ Prednisone
			- If H. pylori lymphoma (MALToma) → H. pylori eradication (antibiotics)

Multiple myeloma	- Elderly and smoker, Back pain, Repeated infections - Hypercalcemia and anemia (due to bone infiltration) - High creatinine (acute tubular necrosis) - **Diagnosis**: urine protein electrophoresis or serum protein electrophoresis		- Autologous stem cell transplant

		Stage I	**Stage II**	**Stage III**	**Stage IV**
Solid tumors	**Colon**	- Subserosa → surgery	- Serosa → surgery + chemo	- Lymph node → surgery + chemo	- Chemo + target therapy (palliative)
	Prostate	- Radiation	- Radiation + hormonal therapy (GHRH)	- Same as stage II but longer	- Radiation + GHRH + chemo
	Breast	- Surgery + radiotherapy	- Surgery + radiotherapy + chemo	- Neoadjuvant chemo + surgery + radiotherapy	- ER/PR → hormonal - HER2 → trastuzumab - Triple negative → chemotherapy

		Anemia			
		Iron studies			Peripheral smear
		Ferritin	TIBC	Transferrin saturation	
Anemia of chronic disease		High	Low	High	Microcytic hypochromic or normocytic normochromic
Iron deficiency anemia		Low	High	Low	Microcytic hypochromic
		Labs			-
Sideroblastic anemia		-			Microcytic hypochromic Basophilic stippling
Thalassemia		**Bata major** → HbF >90% **Beta minor** → HbF 2-3%, HbA2 3-10%			Microcytic hypochromic
Sickle cell disease		HbA 0% HbS present HbA2 <3.5% HbF 1-8%			Normocytic normochromic
Myelofibrosis		-			Normocytic normochromic Tear drop Dry tap
Aplastic anemia		Parvovirus B19			Normocytic normochromic
Megaloblastic anemia	**B12**	**High** methylmalonic acid High homocysteine			Macrocytic hyperchromic
	Folate	**Normal** methylmalonic acid High homocysteine			
Hemolytic anemia	**Autoimmune hemolytic anemia**	Direct Coombs test **+ve** **Cold (IgM):** mycoplasma, CMV, HIV **Warm (IgG):** CLL, NHL, SLE			Spherocytes
	Hereditary spherocytosis	Direct Coombs test -**ve**			
	G6PD	Enzyme activity assay			Bite cells Heinze body
	MAHA	Direct Coombs test -**ve**			Hamlet cell or Schistocytes

Transfusion			
	Indication	**Reaction**	
Plasma pheresis (Therapeutic apheresis)	- Good pasture syndrome - TTP	**Allergic reaction**	- Mild urticaria (**rash**) - Within minutes - **In mild** → Stop transfusion + antihistamine (diphenhydramine) then gradually start again - **In severe** (**SOB**, **low BP**, rash) → stop transfusion + epinephrine +/- steroid
Platelet	• Low platelet leads to ICH: - < 50,000 + active bleeding - < 20,000 + infection - < 10,000 + asymptomatic - **Contraindications**: HELLP, HUS, TTP, heparin induced thrombocytopenia)	**Acute hemolytic reaction**	- NO rash - **Fever + symptoms (chest pain, SOB, pain at site of cannula, bleeding from cannula)** - Within hours - From ABO incompatibility - **Management**: stop transfusion + ICU + dopamine + IV fluid
Cryoprecipitate	• Contains Von Willebrand + factor 8: - Bleeding in Von Willebrand deficiency - Factor 8 deficiency - DIC (low fibrinogen)	**Febrile nonhemolytic reaction**	- NO rash - **Fever (+/- chills) + no symptoms** - Most common reaction - Due to donor WBC - **Management**: acetaminophen
Irradiated	• No WBC: - Hematological malignancy - Stem cell transplant	**Transfusion related acute lung injury**	- NO rash + **NO fever** + SOB + high RR + chest x-ray non cardiogenic edema (ARDS) - Within 6 hours - **Management**: treat as ARDS (supportive) in ICU
FFP	- Active bleeding due to warfarin - DIC with bleeding - Liver disease (cirrhosis) - INR >2 before going to procedure (helps reduce quickly)		
IVIG	- Post exposure (pregnant exposed to measles <72 hours) - Autoimmune disease (Idiopathic thrombocytopenic purpura) - Guillain barre syndrome - Myasthenia gravis		

Neurology

	Hints	Diagnosis	Treatment	Extra
Brain abscess	- Fever + progressive headache at night (+/- frontal) - Increase ICP (vomiting, confusion, seizure, blurred vision) - Focal neurological deficit (weakness) - Risk factors (chronic sinusitis, dental infection, chronic mastoiditis, otitis media, IV drug abuser, fracture)	- **CT brain with contrast** → ring enhancement - **Best modality**: MRI brain with contrast - **Definitive** (gold standard): brain biopsy	- Metronidazole + ceftriaxone	- Headache at morning and frontal = brain tumor

Bacterial meningitis	- **Presentation:**
	  ○ **2 out of 4** (fever, headache, neck stiffness, change in mental status)
	  ○ Knee flexion → **Kernig's sign**
	  ○ Passive neck flexion → **Brudzinski sign**
	  ○ Atypical presentation in elderly (confusion)
	- **Special presentation:**
	  ○ Fever + headache + **petechial rash** + low BP + hyperkalemia → meningococcemia
	  ▪ Causes adrenal hemorrhage (**water house syndrome**)
	- **Complications:**
	  ○ Seizure (acute)
	  ○ Hearing loss (most common late complication)
	  ○ Stroke
		- **18 – 50 years**:
		  ○ Strep. pneumoniae (most common)
		  ○ N. meningitidis
		- **>50 years**:
		  ○ Strep. Pneumoniae (most common)
		  ○ N. meningitides
		  ○ Listeria monocytogenes (**elderly**, **alcoholics**, **immunocompromised** in early age)
		- **Blood culture** → then **CT brain**, **Only if**:
		  ○ Immunocompromised
		  ○ Change mental status
		  ○ >60 years old
		  ○ Seizure
		  ○ Space occupying lesion
		  ○ Focal neurological deficit
		- **LP** if no space occupying lesion (tumor, abscess):
		  ○ **Bacterial** → high protein, low glucose, high PMN
		  ○ **TB** → high protein, low glucose lymphocyte
			- **Start empirical antibiotics with dexamethasone:**
			  ○ **18 – 50 years** → ceftriaxone + vancomycin
			  ○ **>50 years** → ceftriaxone + vancomycin + ampicillin
			  ○ If listeria suspected → **no dexamethasone**
			- **Droplet isolation** for N. meningitidis and discontinue after 24 hours of starting treatment
			- **After culture result, if:**
			  ○ N. meningitidis → ceftriaxone 7 days
			  ○ Streptococcus → vancomycin 10 days
			  ○ Listeria → ampicillin
			- **Prophylaxis for N. meningitidis:**
			  ○ **Ciprofloxacin** once PO OR **rifampin** 2 days OR **ceftriaxone** once IM
			  ○ In pregnant **IM ceftriaxone**
			- **Immunization (A, C, Y, W – 135 + B):**
			  ○ SCD
			  ○ Asplenic patients
			  ○ Hajj	

Viral encephalitis	- Fever + change in mental status and personality	- **Herpes simplex** (most common):
		  ○ All ages → HSV-1
		  ○ Elderly → varicella zoster virus (vesicular rash)
		- LP + PCR for HSV-1
		- **Best modality for diagnosis**: MRI with contrast (temporal area enhancement)
			- IV acyclovir	- Most common **viral meningitis** → enterovirus
				  ○ **LP**: low protein, high glucose, high lymphocyte
				  ○ **Treatment**: supportive

Tension headache	- **Bilateral** pressure, band-like pain (mild – moderate intensity)
	- Increase with activity, stress, sleep deprivation, dehydration
	- Associated with photophobia and phonophobia
		- **Acute attack (episodes)** → NSAIDs or Acetaminophen
		  ○ Both at risk of medication overuse headache
		  ▪ Occurs with use of simple analgesia for ≥15 day/month OR combination for ≥10 days/month
		  ▪ Avoided by gradual wean off medication
		- **Chronic attack** → tricyclic antidepressant (amitriptyline)		

Cluster headache	- **Unilateral** headache starts at night, sudden, severe, several times per day (>8 times per day) - Male + **tearing** + **red eye** + rhinorrhea + miosis + ptosis + lid edema	- **Acute attack** → high flow O_2 100% OR hyperbaric O_2 chamber + sumatriptan (adjuvant) - **Prophylaxis**: CBB (verapamil)		- **Trigeminal neuralgia** → shock-like pain in face when eating or shaving ○ **Treatment:** carbamazepine

Migraine	- Unilateral headache **pulsating**, painful (moderate – severe)
	- **Without aura** (last 4 – 72 hours, nausea and vomiting)
	- **With aura** (last for minutes and comes before the headache, visual spots, numbness, speech disturbance, photophobia or phonophobia)
	- Aggravated by activity
	- +ve family history
		- **Acute** → sumatriptan (5-HT1 agonist) + NSAIDs
		  ○ Never give nitrates with sumatriptan
		  ○ Contraindication to sumatriptan (CAD or prior stroke) → give one of the following:
		  ○ Metoclopramide
		  ○ Valproic acid
		  ○ Magnesium IV
		  ○ Steroids
		  ○ Ergotamine
		- **Prophylaxis** → first line: BB, second line: CCB or amitriptyline or valproic acid or topiramate		

<table>
<tr><td>Secondary headache</td><td colspan="4">1- Severe headache in occiput suddenly happening after lifting an object → intracranial hemorrhage (ruptured aneurysm)
2- Worst headache of their life + meningismus (neck stiffness) without fever + risk factors (hypertension, smoking, cocaine, pregnancy, use of OCP), CT brain normal OR enhanced ventricles, LP shows yellow CSF + RBC (xanthochromia) → subarachnoid hemorrhage
3- Severe headache + proptosis (III nerve palsy) + risk factor (female, history of OCP use, DVT, PE, thrombophilia) → cavernous sinus thrombosis
○ Diagnosis: CT brain with arteria and venous contrast (CTV + CTA) + MRI (MRA/MRV)
○ Treatment: anticoagulation like PE/DVT
4- Severe headache, young, female, obese, OCP, tetracycline, Roaccutane, diplopia with lateral gaze (6th nerve/abducent palsy), papilledema → idiopathic intracranial hypertension (pseudotumor cerebri)
○ Diagnosis: CTA/CTV to exclude venous thrombosis → then LP: elevated opening pressure (>250mm or 25 cmH_2O)
○ Treatment: therapeutic LP + acetazolamide</td></tr>
<tr><td>Ischemic stroke</td><td>- Anterior cerebral artery → contralateral hemiplegia in leg + urinary incontinence
- Middle cerebral artery → contralateral hemiplegia in arm + aphasia + homonymous hemianopia
- Posterior cerebral artery → macular sparing homonymous hemianopia
- Basilar artery → paraplegia + palsies (CN) + pinpoint pupils
- Cerebellar artery → ipsilateral, intension tremor, nystagmus, ataxia, diplopia, truncal ataxia (vermes affected)</td><td>- Came within 3 – 4.5 hours → CT brain → no contraindication → start treatment + stroke work up:
○ Lipid profile
○ Carotid ultrasound
○ ECHO
○ Holter monitor
○ Fasting blood sugar and HbA1C</td><td>- Acute (within 3 – 4.5 hours) → thrombolytics (alteplase)
○ If contraindicated to thrombolytic → arterial thrombectomy
- Chronic:
○ Embolic cause:
▪ High risk (A. fib) → anticoagulant + aspirin
▪ Low risk → aspirin
○ Atherosclerotic cause → aspirin</td><td>- Stroke and blood pressure:
○ <180 → thrombolytics
○ 180-210 → antihypertensive or wait
○ >220 → treat hypertension (by ACE inhibitor) until become 180
- Lacunar stroke → stroke in basal ganglia resulting in pure weakness OR numbness OR aphasia
○ Treatment: aspirin</td></tr>
</table>

Gillian-Barre syndrome	- UPRTI (viral), LRTI (mycoplasma), surgery, bloody diarrhea (campylobacter Jejuni) >2 weeks
	- Back pain + **bilateral distal** (lower limb) weakness (symmetrical) + **ascending** + numbness
	- Hyporeflexia or areflexia
		- Nerve conduction study
		- **Biochemical** → Anti-GM1 OR anti-GD1
		- **LP** → increase in protein only (albuminocytologic dissociation)
			- **Acute**:
			  ○ Plasma exchange if going to ICU
			  ○ IVIG if going to ward
			- **No chronic** treatment **except** in chronic inflammatory demyelination polyneuropathy (>8 weeks) → give IVIG	

Myasthenia gravis	- **Bilateral proximal** (upper limb) weakness + **descending**
	- Symptoms **worse with repetition**
	- Associated with other autoimmune disease
	- Normal tendon reflex
	- Thymoma
	• **Lambert Eaton syndrome**: weakness in arms and shoulders **improves with repetition** + small cell lung cancer
		- **Clinical**:
		  ○ Edrophonium test → improved symptoms
		  ○ Simson test → develop fatigue and ptosis
		- **Biochemical** → Anti Ach receptor antibody
		- **Electromyogram** → decrease response of neuromuscle with repetition
		- **Imaging (CT chest)** → to rule out thymoma
			- **Acute** (myasthenic crisis = weakness + respiratory distress) → IVIG or plasmapheresis
			- **Prevention of relapse**:
			  ○ Thymoma → Thymectomy
			  ○ No thymoma → cholinergic drug (**pyridostigmine**)
			  ▪ If no improvement → **steroid** → if no improvement → **azathioprine**	

Multiple sclerosis	- **Young + female**
	- Sudden right arm numbness + left leg weakness for 1 week
	- **Right painful eyesight** or **diplopia**
	- Sudden urinary retention
	- Post URTI
	- Optic neuritis, UMN (hyperreflexia, clonus, Babinski), spastic
		- **Gold standard** → MRI brain and spine (periventricular plaques)
		- **LP** → high protein CSF (pathognomic: IgG oligobands)
		- **If presenting with flare** → urine analysis to rule out UTI
			- **Acute** → IV methyl prednisone
			- **Chronic**, options:
			  ○ Interferon B
			  ○ Natalizumab IV
			  ○ Fonglomoid PO (do baseline ECG, can cause arrythmia)
				- **Intraocular ophthalmoplegia** (lesion in MLF)
				  ○ Ipsilateral eye can't adduct
				  ○ Contralateral eye nystagmus
				  ○ Occurs in MS and stroke

Amyotrophic lateral sclerosis (ALS)	- Progressive skeletal muscle weakness starts from hands and legs (**fasciculations**) + normal sensory	- Clinical - LP	- Rilozole (increase survival)	

<table>
<tr><td>Partial seizure</td><td>- Tongue biting, up rolling of eye
○ Without post ictal (simple partial)
○ With post ictal (partial complex) → vague, can't remember what happened</td><td>- First line options:
○ Carbamazepine or topiramate → obese
○ Levetiracetam or lamotrigine → safe in pregnancy
- Second line: phenytoin</td><td rowspan="2">- Start treatment:
○ 2 or more seizure unprovoked
○ Seizure + structural brain disease (CNS tumor)
- Stop treatment when seizure free for 2 years
- Steven Johnson syndrome:
○ Extensive erythema + red eye from <u>lamotrigine</u> use</td></tr>
<tr><td>Generalized seizure</td><td>- Limb movement:
○ Tonic clonic (opens and closes hand)
○ Myoclonic (random movement)
- Absence (only staring)
- All have post ictal</td><td>- First line options:
○ Valproic acid (S/E: weight gain, increase LFT)
○ Topiramate (kidney stone)
○ Levetiracetam (safe in pregnancy)
- Second line: phenytoin</td></tr>
<tr><td>Status epilepticus</td><td>- Continued seizure for 5 minutes
- >2 seizure without returning to baseline (without resolution)</td><td colspan="2">- Benzodiazepine twice (lorazepam better or diazepam) → no improvement → phenytoin or phenobarbital as bolus then effusion (monitor by ECG) → no improvement → anesthesia (midazolam or propofol)
- If elderly and has seizure → give thiamine and dextrose</td></tr>
<tr><td>Parkinson's disease</td><td>- Bradykinesia, Shuffling gait
- Resting tremor
- Cog wheel rigidity</td><td colspan="2">- Treatment only if functional impairment → Levodopa + carbidopa</td></tr>
<tr><td>Dementia</td><td colspan="3">1- Difficulty remembering + disorientation + behavioral changes (mood changes) + gradual onset → Alzheimer disease:
○ Best investigation: MRI brain.
○ Treatment: <u>Mild or moderate</u> → cholinesterase inhibitors (donepezil or rivastigmine), <u>Severe</u> → add memantine
2- Elderly + rigidity + tremor + hallucination + early dementia + behavioral problems → Lewy body dementia
3- Rigidity + tremor + dementia + low BP → multisystem atrophy (shy dragger syndrome)
4- Young + aggressive behavior + dementia + loss of empathy → frontotemporal dementia
5- Elderly + dementia + urinary incontinence + abnormal gait → normal pressure hydrocephalus
○ First step is CT or MRI brain (dilated ventricles) → therapeutic LP → no improvement → ventriculoperitoneal shunt
6- Dementia + stepladder wise → vascular dementia (MRI brain for diagnosis)</td></tr>
</table>

	Toxicology Scenario	Medication	Antidote
	Young, vomiting, **suicidal attempt**, labs: high anion gap metabolic acidosis + normal osmolar gap + **high AST, ALT**, creatinine	**Acetaminophen toxicity** → take acetaminophen level (king college criteria for transplant, focus on low pH	- N-acetylcysteine (**side effect**: anaphylaxis) - Hemodialysis (severe cases like AKI or no antidote)
	History of depression + low BP + seizures + **ECG prolonged QT interval**	**Tricyclic antidepressant** (amitriptyline) → contraindicated in BPH (causes urinary retention)	- Urine alkalization by $NaHCO_3$ + IV fluid resuscitation (for low BP)
	Farmer, **increase salivation**, SOB, diarrhea, vomiting, tearing, miosis	**Organophosphate toxicity** (pesticides)	- Respiratory failure → intubation - No respiratory failure → atropine
	IHD, **stroke**, abdominal pain, vomiting, high RR, ringing in ears (**tinnitus**), ABG: (**high anion gap metabolic acidosis with normal osmolar gap and respiratory alkalosis**)	**Salicylate (Aspirin) toxicity**	- Alkalinization by $NaHCO_3$ - Maintain respiratory alkalosis - Consider hemodialysis if no improvement
ER	Change mental status, low RR (depression), **miosis**	**Morphine (opiate) toxicity**	IV naloxone
ER	Change mental status, low RR (depression), **ataxia**	**Benzodiazepine toxicity**	Flumazenil
ER	Change mental status, high anion gap metabolic acidosis, high osmolar gap	**Alcohol** or **ethylene glycol** or **isopropanol**	Ethanol or **fomepizole** or hemodialysis (severe)
ER	Change mental status, high anion gap metabolic acidosis, high osmolar gap + **blindness**	**Methanol** (formic acid causes blindness by affecting the optic nerve)	Same as up Blindness is irreversible (permanent damage)
ER	Change mental status, **seizure**, **pink spots on skin**, almond odor, ABG normal, **pulse oximeter normal**	**Cyanide (hydroxocobalamin) toxicity**	Sodium thiosulfate
ER	Change mental status, **headache**, vomiting, **cherry red skin**, ABG normal, **pulse oximeter low**	**Carbon monoxide toxicity**	Hyperbaric oxygen (100% oxygen)
ER	Change mental status, **chocolate brown blood**, ABG normal, **pulse oximeter low**	**Methemoglobinemia**	Methylene blue
ER	Bradycardia, **hyperkalemia**, **delirium**, **xanthopsia** (yellow vision), AV block, nausea, and vomiting	**Digoxin**	Digibind
ER	Bradycardia, low BP, heart failure, **hyperglycemia**, AV block	**CCB toxicity**	Calcium gluconate + pacing
ER	Bradycardia, low BP, heart failure, **hypoglycemia**, AV block	**BB toxicity**	Glucagon + pacing