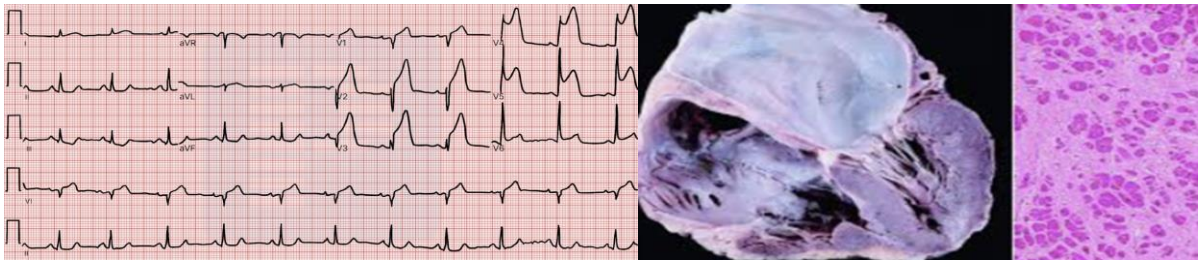
Cardiology

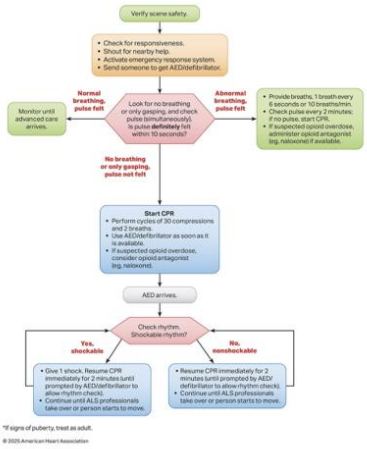


Topics color coded red are optional for FMG students

Crashing patient

Q. You are posted in CCU and handling a 50 year old man admitted with diagnosis of Anterior wall STEMI. He becomes suddenly unconcious and resident identifies him as suffering from pVT. Which of the following is the first step to be done in management of this case?

a. Check Carotid pulse for 6 seconds and asses breathing efforts
b. Verify scene safety
c. Immediately Place defibrillator leads and give DC shock
d. Give chest compressions



1. Check scene safety
2. Check responsiveness
3. Shout for help
4. .
5. .
6. Look for
7. Start @

Rate	
Depth of sternal depression	
Site of chest compression	
Rationale	Maintain Cerebral blood flow
Fulcrum of movement	Hip joint Shoulder joint Eblow joint Wrist joint

8. AED arrives

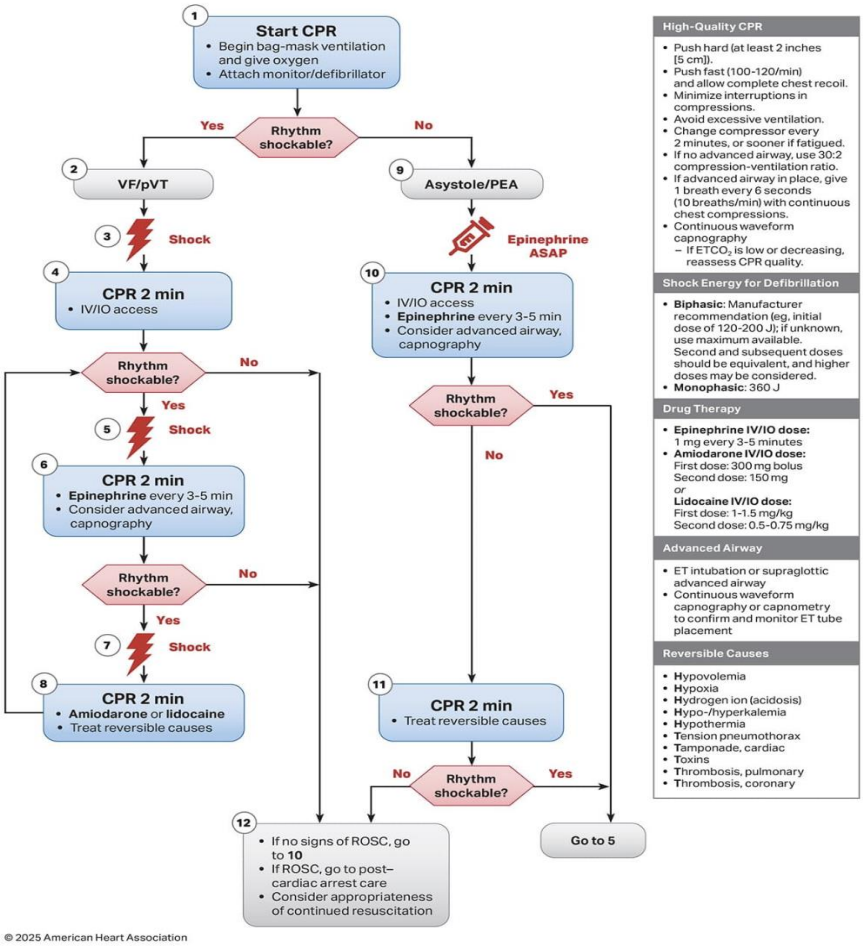
Left pad placement	
Right pad placement	

9. Check rhythm and if shockable give one shock and resume CPR, till AED gives next prompt for rhythm check . Continue till ALS team arrives

Extra mile

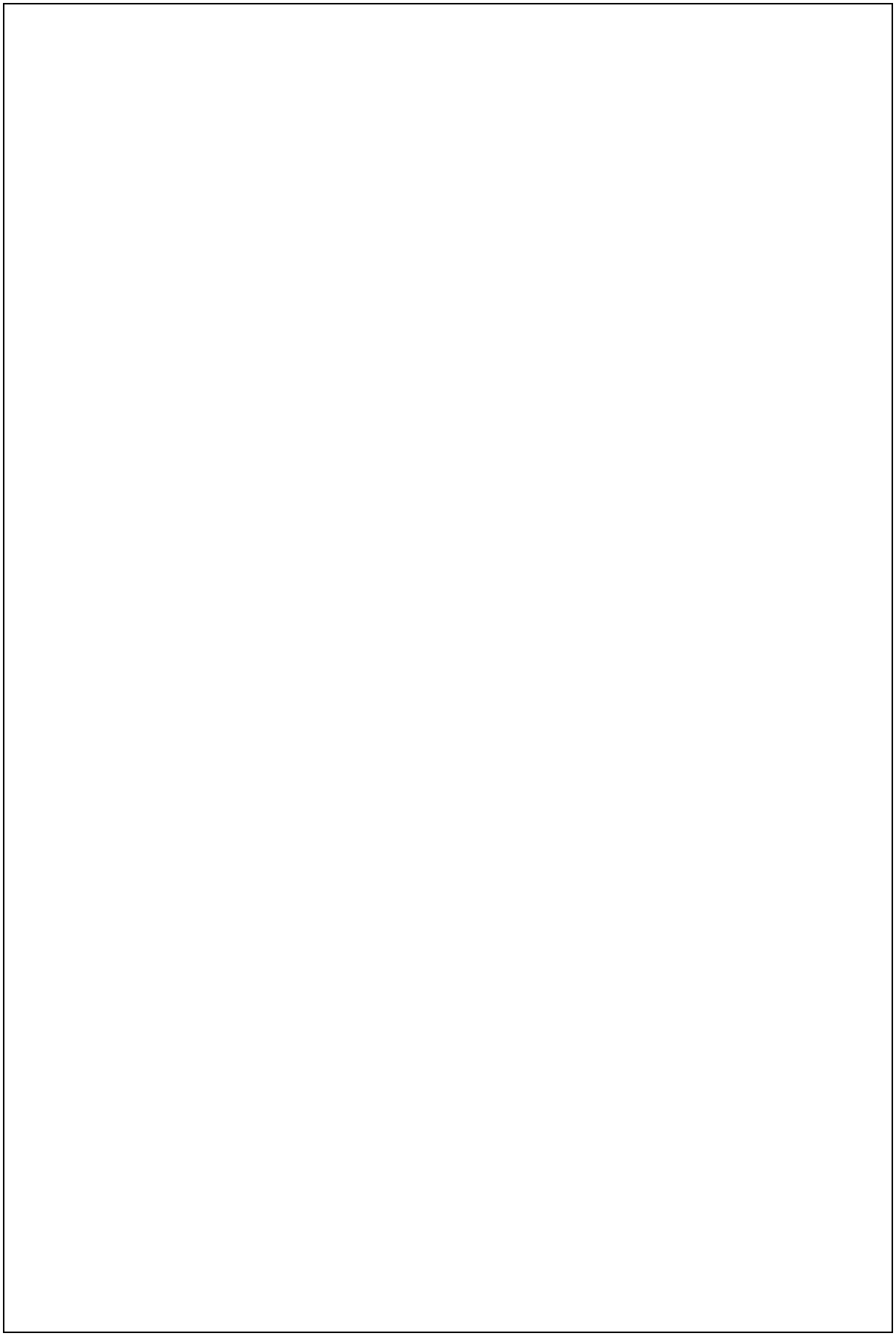
MC ribs fracture during CPR	
MC solid organ traumatised during CPR	

Adult Cardiac Arrest Algorithm (VF/pVT/Asystole/PEA)

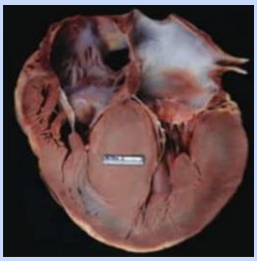


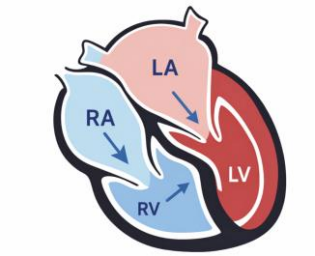
Rx for pVT and Ventricular fibrillation

Asystole management

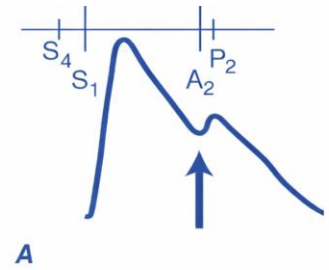


ABCD of Pulse

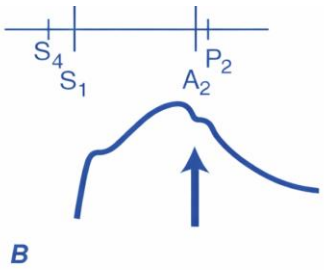
Alternans **Anacrotic**	
Bisferiens 	
Collapsing pulse with pistol shot sounds 	
Dicrotic pulse	

Pulsus paradoxus **SBP falls > 12 mm Hg on deep inspiration** 	**Mnemonic: MR-CAP** **Massive PE** **RV MI** **Cardiac tamponade** **Asthma (status asthmaticus)** **Pericarditis Constrictive**
Irregularly irregular pulse	

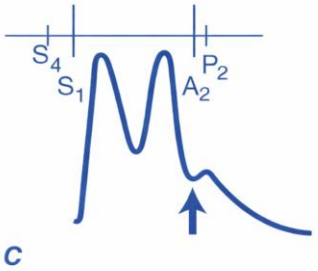
Line diagrams for types of pulses



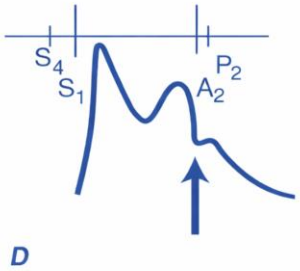
A



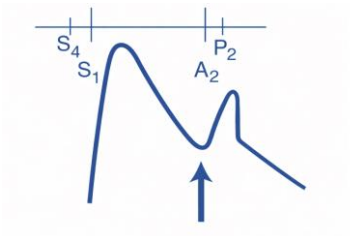
B



C

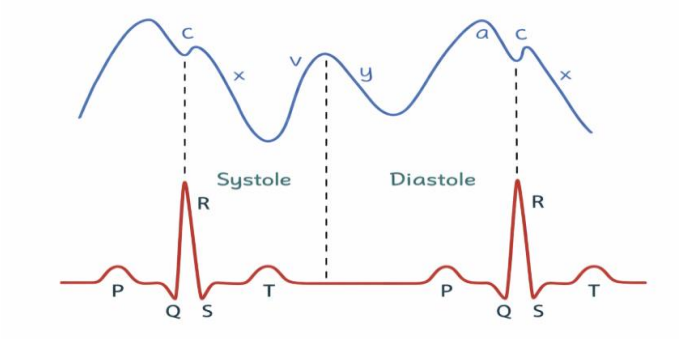


D



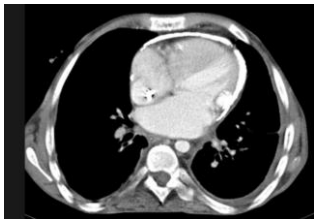
Abnormalities of JVP

Normal JVP value: _____ is evaluated in _____



Kussmual sign: Paradoxical rise of JVP on deep inspiration

Mnemonic: **Cops restrict right heart**

Large a waves	
Absent a waves	
Cannon a waves **Frog sign**	
Absent x descent	
Absent y descent	
Steep x and absent y descent	
Steep x and steep y descent	

Pericardial diseases

	Acute pericarditis	Pericardial effusion
ECG		
CXR		
Rx	**Dressler syndrome**	**TB** **Oat cell Cancer**

Cardiac tamponade vs Constrictive pericarditis

	Tamponade	Constrictive pericarditis
Pulse		
JVP character		
JVP waves		
BP		
ECG	**Low voltage ECG**	**Low voltage ECG**
CXR		
Rx	**Pericardiocentesis**	

Murmurs

Ejection systolic murmurs	Pansystolic murmurs
Mnemonic: PASS	**Mnemonic: MTR-Vada**

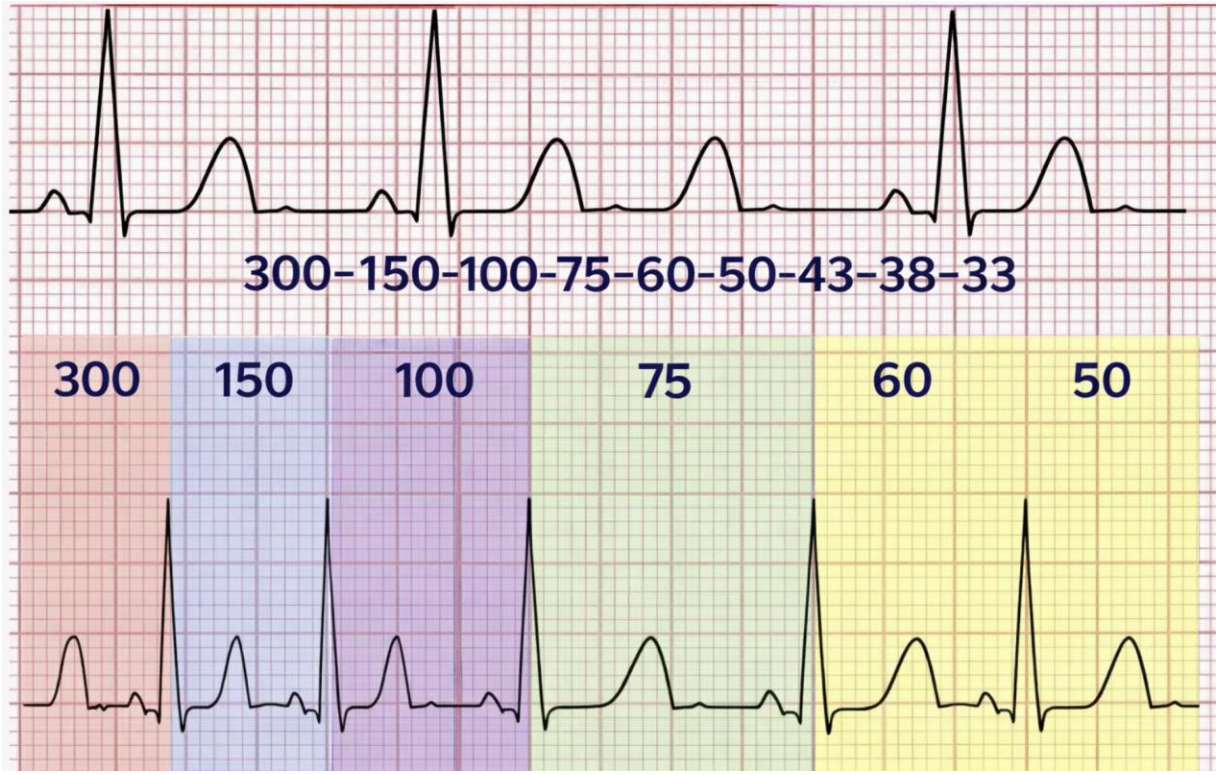
Early diastolic murmur	Mid diastolic murmur
GAP: Mnemonic	**CAM: Mnemonic**

Continuous murmur

Connaught place main Hum-Tum!

1. **Coarctation of Aorta**
2. **PDA**
3. **Mammary souffle**
4. **Venous hum**
5. **Peripheral pulmonic stenosis**

How to calculate heart rate under 5 seconds



Tachy and Brady Arrythmias

Atrial fibrillation

ECG criteria

Rate control

Rate control in patients with coexistent poorly controlled asthma

Rate control in patients with coexistent COPD

Rate control in patients with acute pulmonary edema

Recent onset atrial fibrillation with crashing BP

How to manage long standing atrial fibrillation

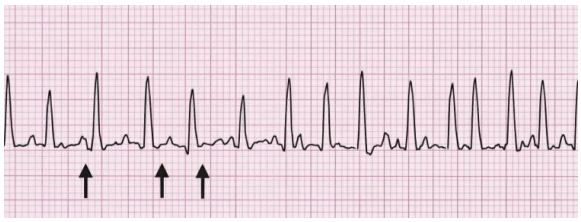
How to decide on Anticoagulation?

Drugs used for anticoagulation in Atrial fibrillation

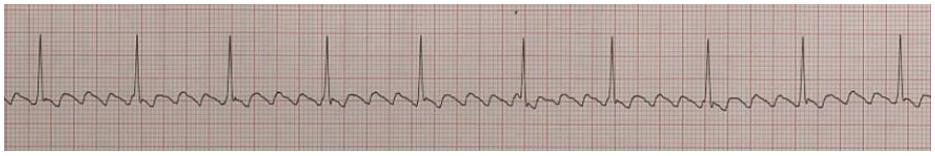
Rhythm control

Multifocal atrial tachycardia vs Atrial flutter

ECG findings of MAT



ECG findings of Atrial flutter



Rx for Atrial flutter	RX for MAT

Paroxysmal supraventricular tachycardia

Management of crashing patient or SBP < 90/60 mm Hg

Management of patient with SBP > 90/60 mm Hg

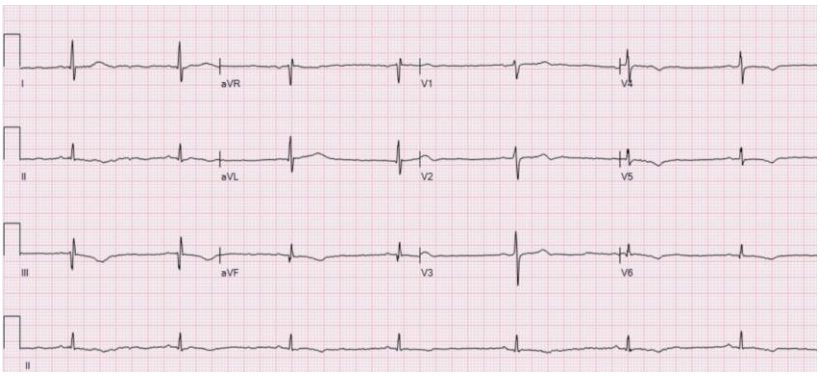
Home management: **Etripamil** is a short-acting intranasal calcium channel blocker used for paroxysmal supraventricular tachycardia

Best management for prevention of PSVT episodes

Ventricular tachycardia

- AV dissociation
- Cannon a waves in JVP
- Premature ventricular complexes
- Why PVC is bad?
- Capture beats
- Fusion beat

Management of symptomatic bradycardia



1. **IV Atropine 1 mg IV, max dose = 3 mg**
2. **Other drugs**
3. **Temporary pacing**

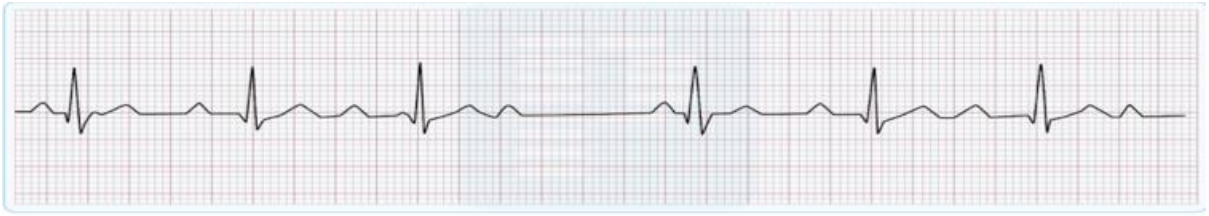
First degree heart block

Causes

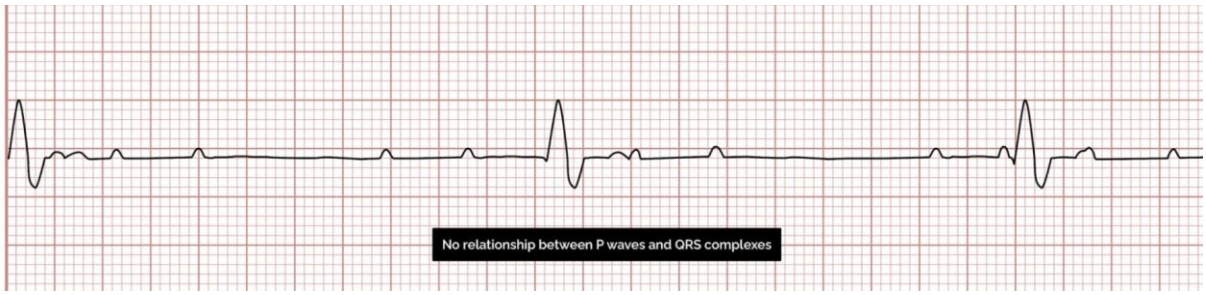
1. Physiological
2. Rheumatic fever
3. Sarcoidosis
4. Hemochromatosis
5. Endo-myocardial fibroelastosis

ECG findings

Mobitz I vs Mobitz II heart block



3rd degree heart block



Summary of ECG Special findings

P Wave	**P- Pulmonale: RAE** **P- Mitrale: LAE** **Pseudo-P- Pulmonale** **Absent P Wave**
Q waves	**Deep Q waves** **S1Q3T3 pattern**

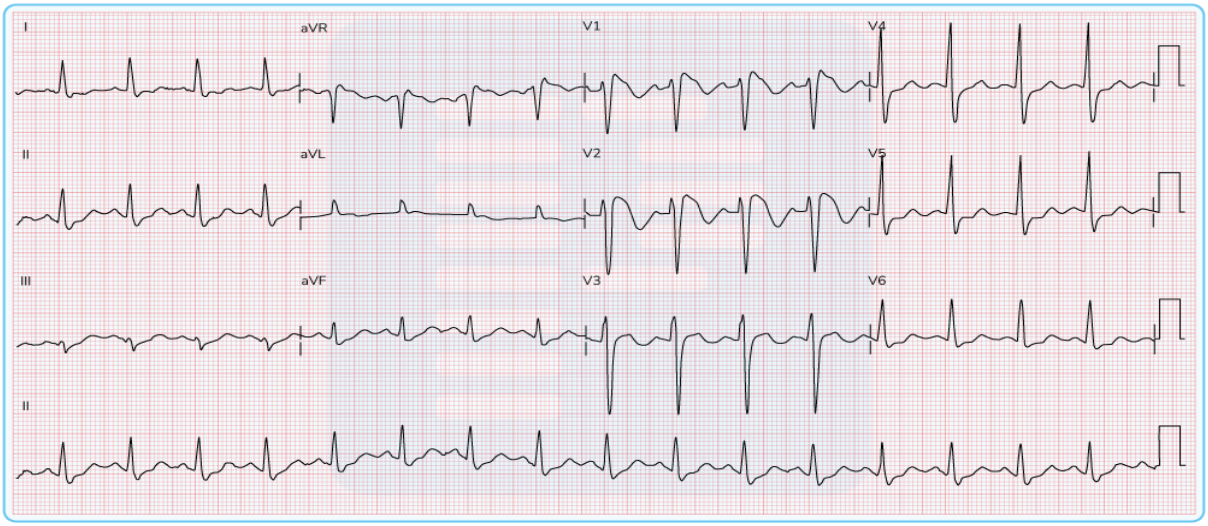
Short PR interval	**Prolonged PR interval**
Wolf Parkinson white syndrome	**PR interval remains normal in mobitz II heart block**

qRS Complex abnormalities	**Narrow qRS tachycardia** **Broad qRS tachycardia** **Delta waves** **J waves/ Osborn waves** **Epsilon waves**

ST elevation	ST depression

T wave inversion	Tall Tented T waves	Hyperacute T waves

Brugada Syndrome	ARVD
Pathophysiology	**Pathophysiology**
Agonal breathing and syncope	**Palpitations and recurrent syncope**
ECG	**ECG**
Rx	**Rx**



Infective endocarditis

Native valve-IE

- Hospital acquired:
- Community acquired:

Prosthetic valve endocarditis

< 2 months: CONS
2-12 months: CONS
> 12 months:

TAVR_ IE:

CIED-IE: CONS

Definite IE

1. *Pathologic criteria* (microorganisms or active endocarditis identified in a vegetation/ intracardiac abscess from cardiac tissue prosthetic material, arterial embolus)

2. *Clinical criteria* (2 major or 1 major + 3 minor or 5 minor)

Minor Criteria

A. **Predisposition:** Previous history of IE, injection drug use, prosthetic valve, previous valve repair, congenital heart disease (e.g. bicuspid AV), CIED, more than mild regurgitation or stenosis hypertrophic cardiomyopathy

B. **Fever.** T > 38.0^0C (100.4^0F)

C. **Vascular phenomenon**: arterial emboli, septic pulmonary infarcts, mycotic aneurysm , intracranial hemorrhage, conjunctival hemorrhage, Janeway lesions, cerebral / splenic abscess purulent purpura

D. **Immunologic phenomena**: Roth spots, positive Rheumatoid factor, Osler nodes, glomerulonephritis

E. **Microbiologic evidence**: positive blood cultures (not meeting above criteria)

Positive culture PCR, or other nucleic acid -based test for an organism consistent with IE from a non - endovascular site or single finding of a skin bacteria by PCR on a valve or wire without additional clinical or microbiological supporting evidence

A. **Imaging Criteria**: Abnormal metabolic activity on FDG-PET/T within 3 months of implantation of a prosthetic valve, ascending aortic graft, intracardiac device lead

B. **Physical exam criteria**: New valvular regurgitation on auscultation

Microbiological Criteria

1. **Positive blood culture**: Microorganisms that occasionally or rarely causes IE isolated from 3 or more separate blood culture sets (Non-Typical)

2. **Positive laboratory tests**

-Positive polymerase chain reaction (PCR for Coxiella burnetti, Bartonella spp., or Tropheryma whipplei from blood

-Single blood culture growing C. burnetti or phase I IgG Ab titer ≥ 1: 800

-Indirect immunofluorescence assays (IFA) for IgM Ab and IgG Ab to B. Henselae or B. Quintana with IgG Ab titer ≥1:800

Imaging Criteria

1. Echocardiography or cardiac CT showing vegetation, valvular/ leaflet perforation/ aneurysm, abscess, pseudoaneurysm or intracardiac fistula

2. FDG -PET /CT with abnormal metabolic activity involving a native or prosthetic valve, ascending aortic graft, intracardiac device leads or other prosthetic material

Surgical Criteria: Evidence of IE documented by direct inspection during heart surgery

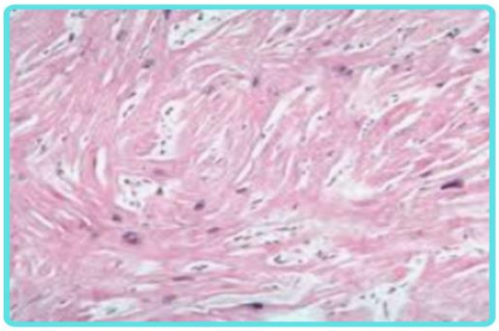
Must know Cardiac emergencies

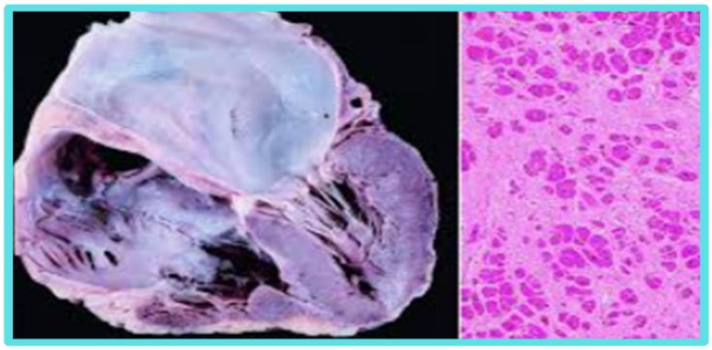
Acute pulmonary edema due to Hypertensive crisis	Cardiogenic shock	HFrEF

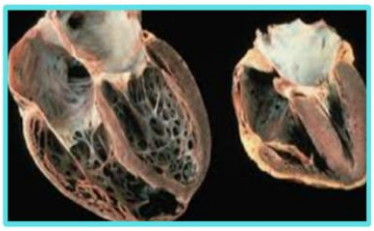
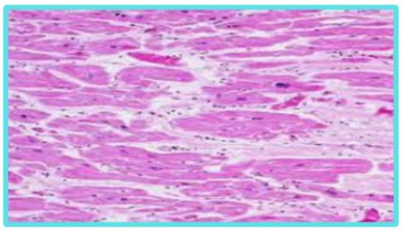
HFpEF

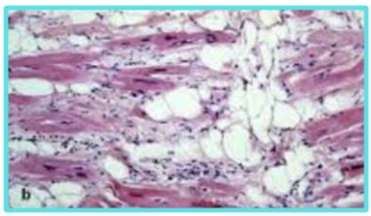
Hypertensive emergency leading to acute pulmonary edema	Note: beta blockers are contraindicated in Acute HF
Hypertensive emergency leading to hemorrhagic stroke **Target BP**	
Hypertensive urgency	
Posterior reversible encephalopathy syndrome	
Malignant hypertension	
Scleroderma crisis	
Nitroprusside acts within seconds and has onset within 2 minutes. It breaks down to produce NO (acts via cGMP) and Cyanide. Must be given in light protected infusion set. Antidote for toxicity: Sodium thiosulfate (preferred) and Hydroxocobalamin (binds cyanide)	

Cardiomyopathy (Histopathology)





Cardiomyopathy clinical details

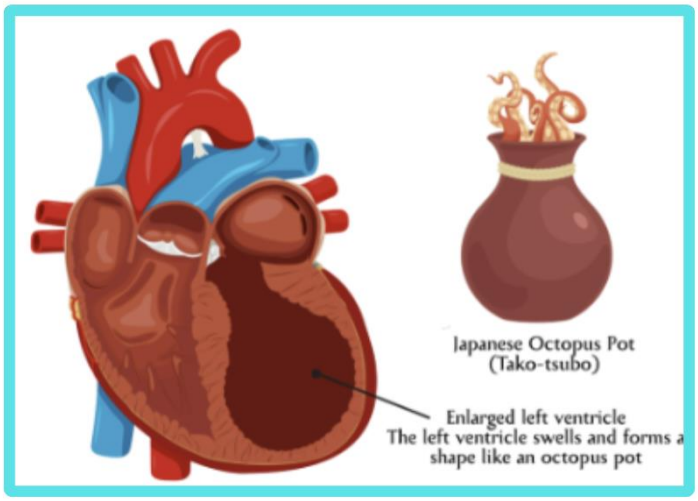
	Hypertrophic	Dilated
Histology	Banana shaped cavity Sub-valvular aortic stenosis Systolic anterior movement of anterior valve Predominant diastolic malfunction	
Pulse		
Murmur		
Treatment of choice		

Restrictive cardiomyopathy

Histology	
Pulse	
JVP finding	
IOC	Cardiac MRI vs endomyocardial Biopsy
Cardiac catheterization	

Takotsubo cardiomyopathy/ Broken heart syndrome

- Mimics MI presentation
- Elevated cardiac biomarkers with ST segment elevation
- Diagnosis made in cath lab
- Management :



Myocardial infarction

Earliest ECG finding
ECG finding that persists for whole life/ Old MI
First cardiac biomarker to rise in MI
Last to rise in MI
Cardiac biomarker of reinfarction > 72 hours
Treatment of Choice for STEMI
First medical contact to balloon time
Window period for thrombolysis
Door to needle time (cath lab facility is not available)
Rescue PCI (< 50% ST-segment resolution at 60–90 min after fibrinolysis)

Complications of myocardial infarction

Most common complication in few hours:

MC cause of death > 24 hours

Death 3-5 days

MC valvular lesion seen in MI

Dressler syndrome

Mnemonic

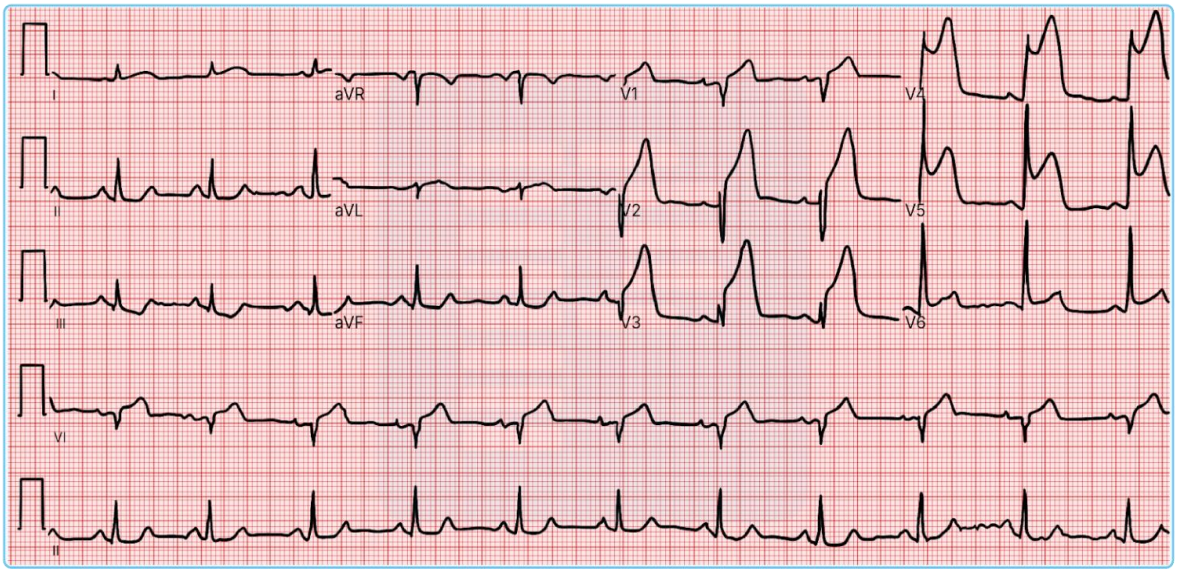
C: Cardiogenic shock

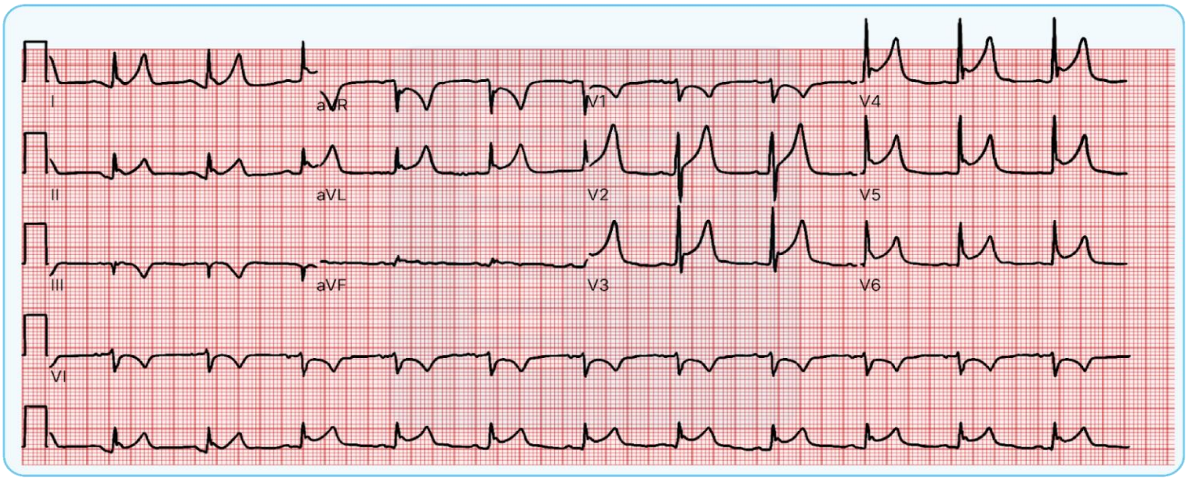
A: Arrhythmias

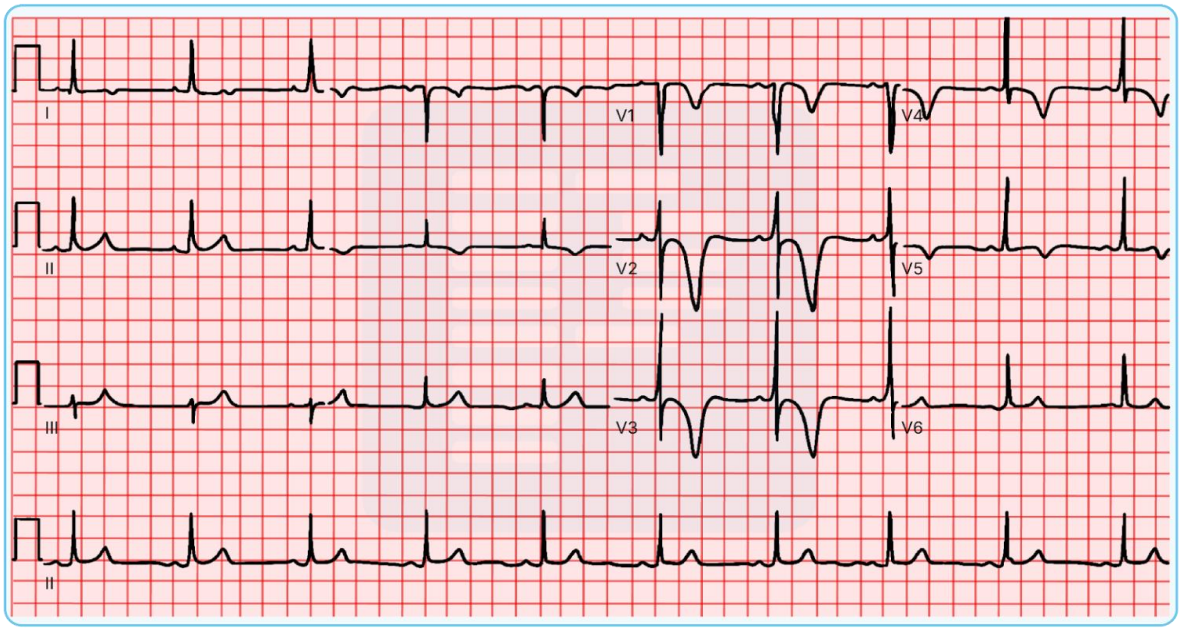
L: LV aneurysm

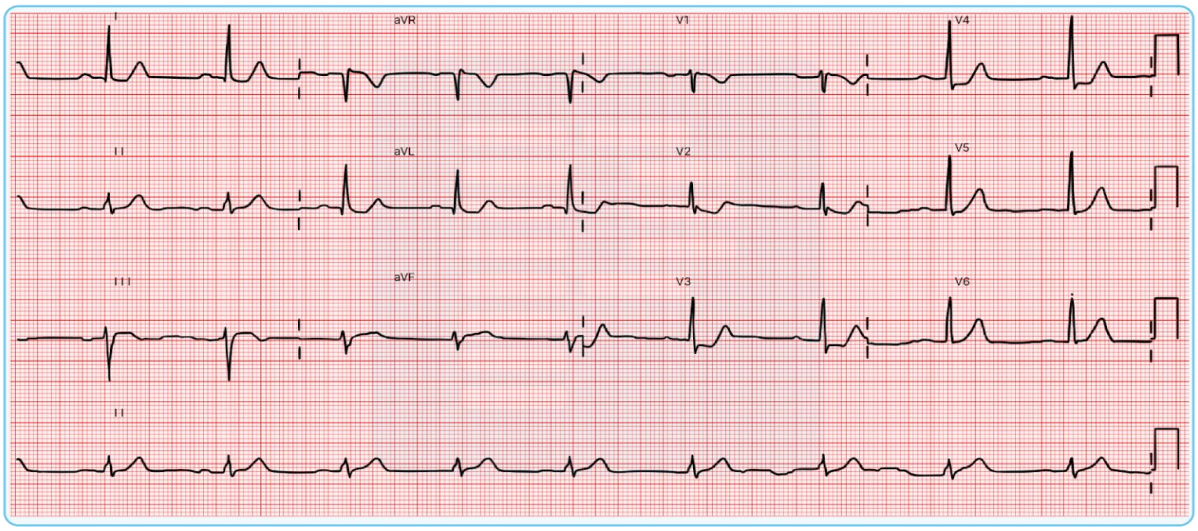
M: Mitral regurgitation (papillary muscle dysfunction /rupture

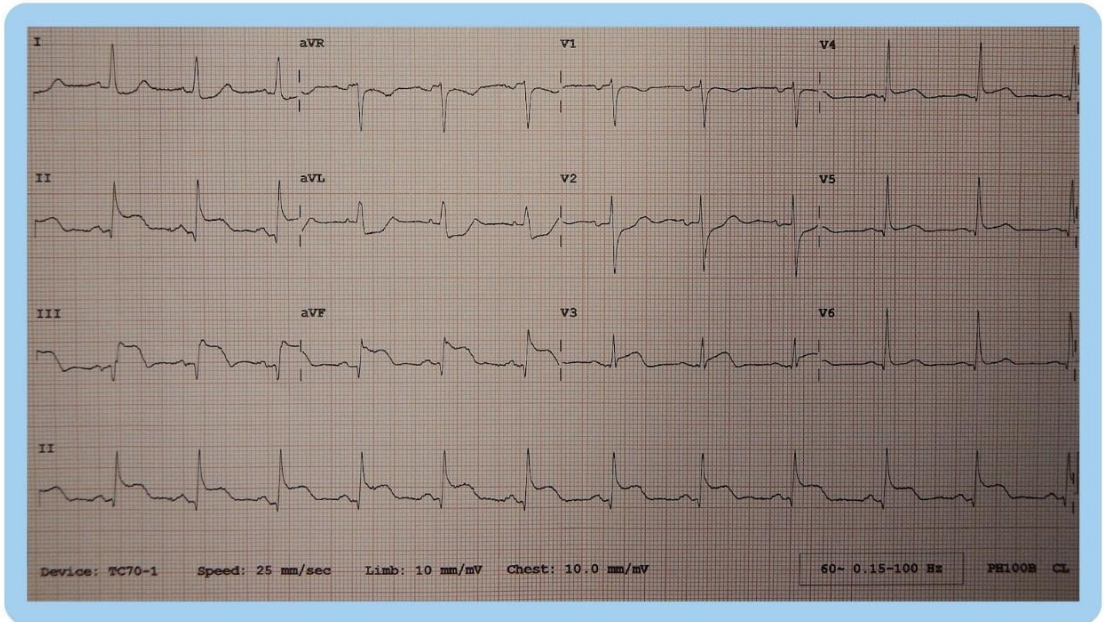
D: Dressler


I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
VI
II


I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
VI


I
II
III
II
V1
V2
V3
V4
V5
V6


aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
II


I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
II
Device: TC70-1
Speed: 25 mm/sec
Limb: 10 mm/mV
Chest: 10.0 mm/mV
60~ 0.15-100 Hz
PH100B CL

Additional Notes

Additional Notes

Additional Notes

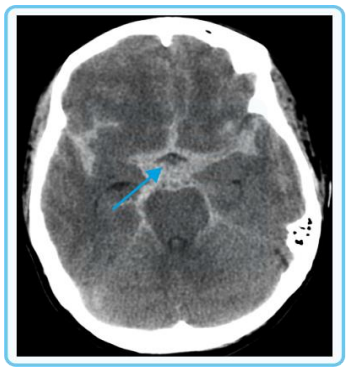
Additional Notes

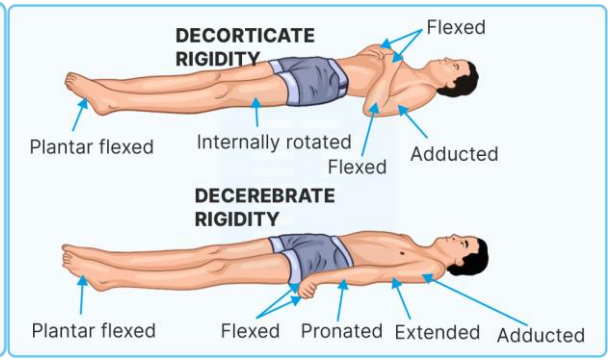
Additional Notes

Additional Notes

Additional Notes

Additional Notes





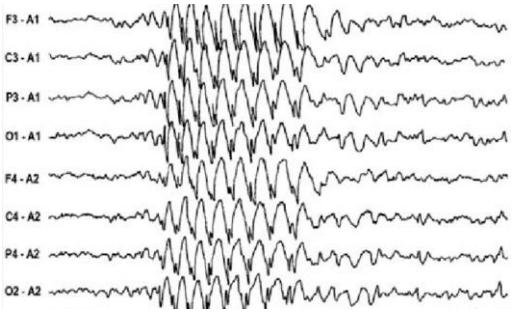
Seizures and epilepsy

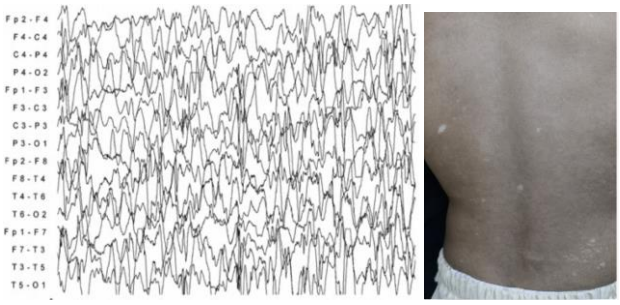
MCC of acquired epilepsy in India is

Normal EEG finding with eyes open:

Normal EEG findings with eyes closed:

EEG finding of < 3 Hz spike and slow wave pattern and multiple seizures types is seen in





Ethosuximide/ Valproate/ Lamotrigine

ACTH / Vigabatrin if associated with TS

Drug of choice for Seizures in patient >5 minutes in a patient with GTCS	1. iv Lorazepam and repeat _____ if necessary 2. Start Phenytoin or Valproate or Levetiracetam **If failure to respond to BZD 2 doses and 1st line AED** then diagnose as **Refractory SE** *T1 = time to treat and T2= risk of neuronal injury*
Focal seizures	Starts with Aura Jacksonian march or _____epilepsy with Todd paralysis Complex hallucinations and automatisms. MRI shows hippocampal sclerosis. Diagnosis:

GTCS	Ictal cry Usually treatment is given for 2 years and then tapering is done Lamotrigine can be used in both GTCS and focal seizures
Absence seizures	Sudden brief loss of consciousness without loss of postural control Vacant staring spells EEG finding of 3/sec spike and slow wave Carbamazepine and phenytoin worsen absence seizures

- MC type of epilepsy in children:

- MC type of seizures in children:

- MC type of seizures in neonates:

- Leading cause of subtle seizures: H.I.E

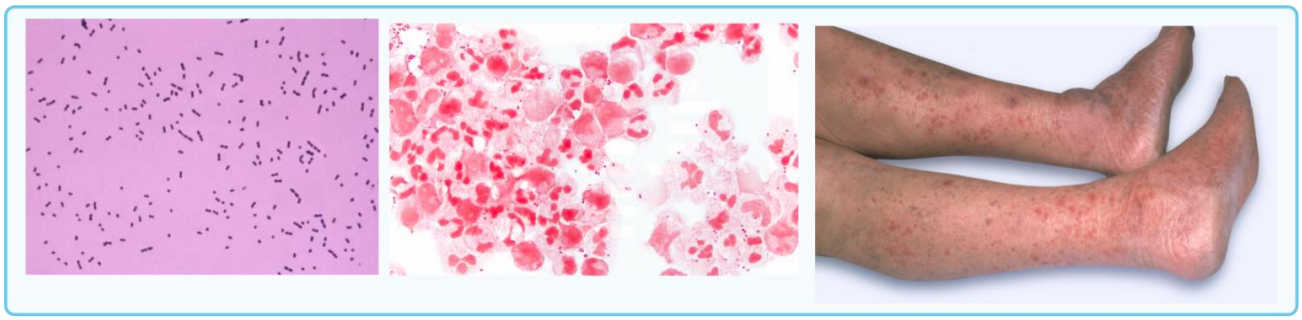
Febrile seizures

Best drug for intermittent prophylaxis:

Best drug for continuous prophylaxis: oral valproate. Don't use phenytoin

Best drug for management of acute episode at home:

Pyogenic Meningitis



MCC in neonate with bulging AF and vacant stare

Leading cause of pyogenic meningitis in adults/ > 3 months to < 55 years

Leading cause of pyogenic meningitis in adults with purpuric rash and distributive shock

Perform guarded LP and then start Empirical antibiotic treatment within _____minutes with _____

Add coverage for_____ in alcoholics/ heart transplant

Mass Chemoprophylaxis for N.meningitidis with

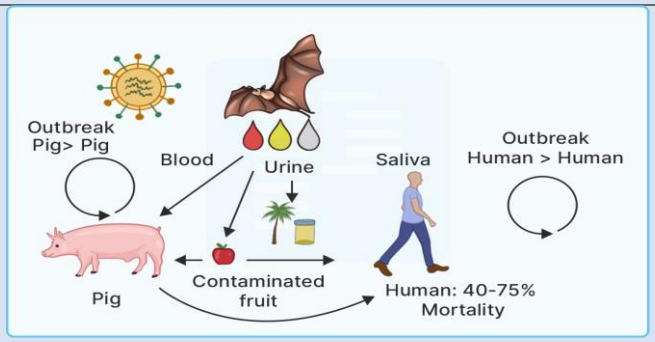
Recurrent meningitis in adults with meningococcus is due to C5-C9 deficiency

Whether neuroimaging or LP first in case of meningitis

Always do neuroimaging first if any one present

– Papilledema
– Immunocompromised state
– New-onset seizures
– Focal neurological deficit
– Altered sensorium / low GCS
– Neoplasm / known CNS lesion

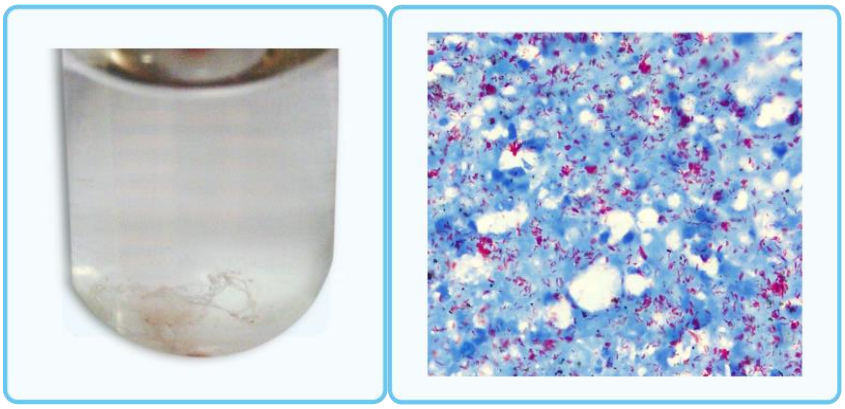
Viral encephalitis

Overall MCC	- **Shows predilection for _____ lobe** - **CSF shows RBC in CSF** - **EEG Shows PLED** - **Empirical Rx started with**
Leading cause in India	
Kerala outbreak	

Findings of CSF

Remarks	Cells	Sugar	Protein	Opening pressure	Color
Normal					
ABM					Turbid / Cloudy
TBM					Clear/ Straw
Viral meningitis					Clear

Q. 7-year-old child has been sick for 4 weeks with persistent fever, irritability, vomiting, and recent onset of headache and neck stiffness. For past one day mother says child is in altered sensorium and not recognising the mother. Lumbar puncture reveals: opening pressure raised, protein 180 mg/dL, glucose 35 mg/dL (blood glucose 100 mg/dL), and lymphocytic predominance (120 cells/mm³). What is the most likely diagnosis?

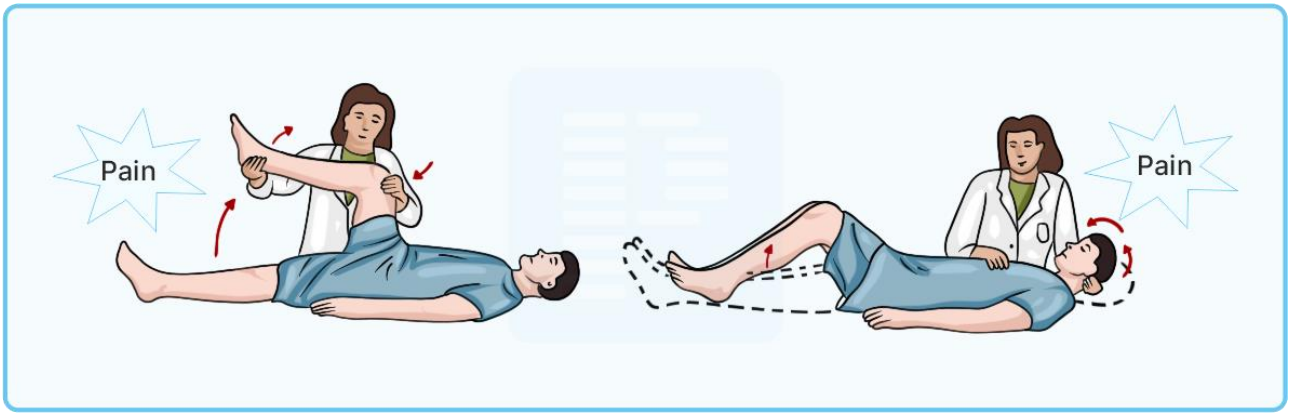


a. Viral meningitisb.

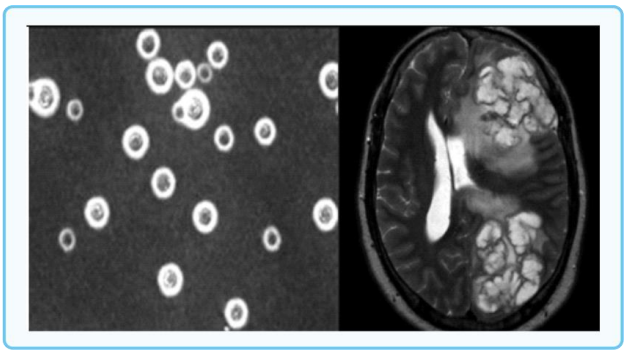
b. Pyogenic meningitis

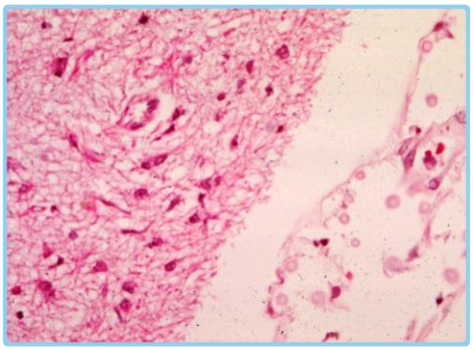
c. Tuberculous meningitis

d. Cryptococcal meningitis



Q. HIV positive truck driver comes with fever and headache for the past 3 days. He also has photophobia and cannot drive. On examination nuchal rigidity is noted. Fundus shows papilledema. CSF preparation and MRI head is shown. Diagnosis is?





Mode of entry of fungus into patient

Work up

1. MRI head

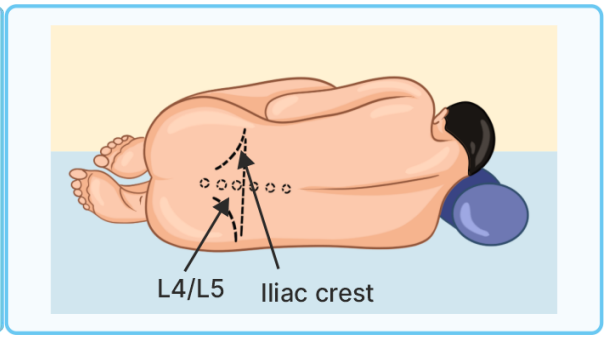
2. Guarded Lumbar puncture and CSF cytology

3. Urine or blood lateral flow assay for antigenic detection for cryptococcus

Treatment= Liposomal Amphotericin B +

Lumbar puncture

Preferred site

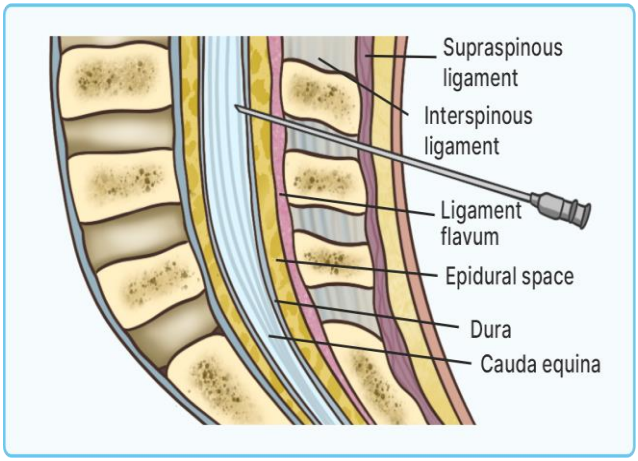


Contraindications to LP

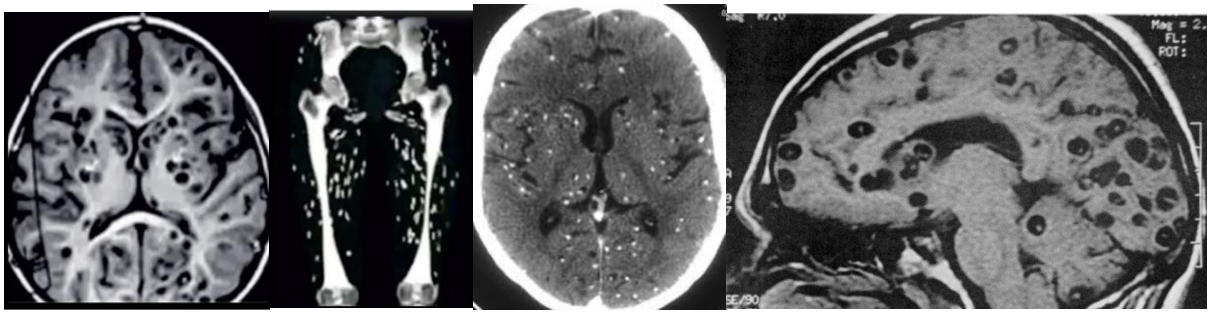
1. Raised ICP
2. Local site infection
3. Kyphoscoliosis

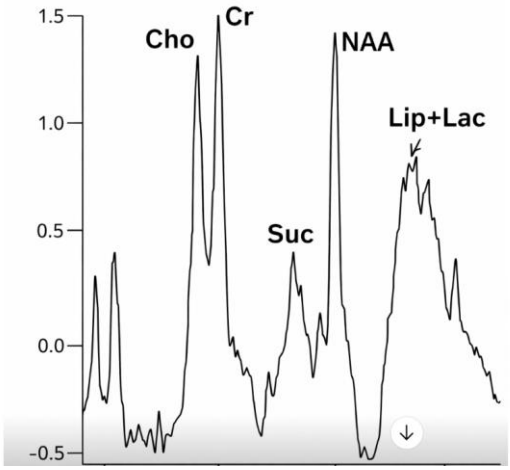
- Highest point of iliac crest joined to form _____ that cuts through L4 spinous process

- Most common complication of LP is headache. Best drug for management of PDPH _____



Neurocysticercosis (caused by ingestion of proglottids containing eggs of tenia solium)





Rx: **Calcified lesions**: Only Valproate X _____ years

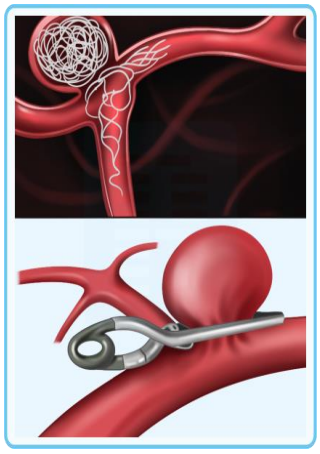
RX: **Hypointense lesions with/without scolex**

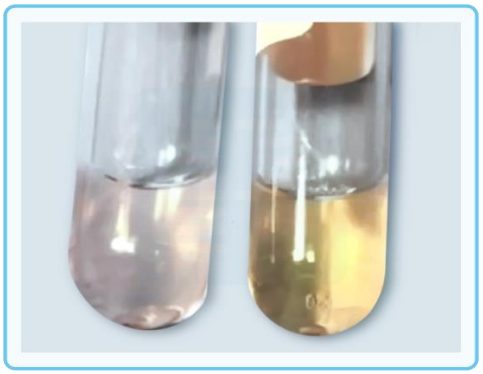
1.
2. Albendazole
3. Valproate

DIFFERENCE BETWEEN NEUROCYSTICERCOSIS AND CNS TUBERCULOMAS LESIONS

NEUROCYSTICERCOSIS	TUBERCULOMA
1. Lesions are <20 mm and may be single or multiple. 2. Meningitis feature is not there. 3. Present at grey-white matter junction. 4. Other involvements like eyes, muscles or subcutaneous tissues. 5. T2W shows hyper intensity with hypointense scolex in it. No midline shift and ring enhancement is there depending upon the staging. 6. MR spectroscopy shows multiple amino acid peaks.	1. Often multiple and >20 mm because of conglomeration. 2. Meningitis is usually associated. 3. More common in posterior fossa. 4. Spread is mostly secondary to infection somewhere else. 5. Hy pointensity seen in T2W and midline shift may be present. 6. MR Spectroscopy shows lipid peak.

Subarachnoid hemorrhage





Buzz Words

-Worst headache of my life

-Thunderclap headache (also seen in Pituitary apoplexy, CVT, Hydrocephalus acute, HTN crisis) : occurs without warning and reaches peak intensity in 1 minutes

-Sudden onset Headache with

-Next best investigation after CT head

-Next best investigation if CT head is normal

- Leading cause of SAH: Trauma > rupture of berry aneurysm

- **First investigation**

- Next best investigation after NCCT head

- What to do if CT head is normal

- Finding of guarded Lumbar puncture

- Treatment of choice

- DOC of choice

- 1st step in management

- MC location of Berry aneurysm

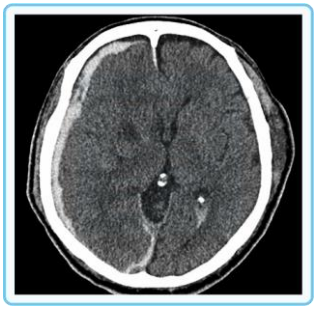
- MC location of Berry aneurysm prone to rupture

- MC cranial nerve involved in ruptured/ un-ruptured berry aneurysm

Leading cause of death in SAH

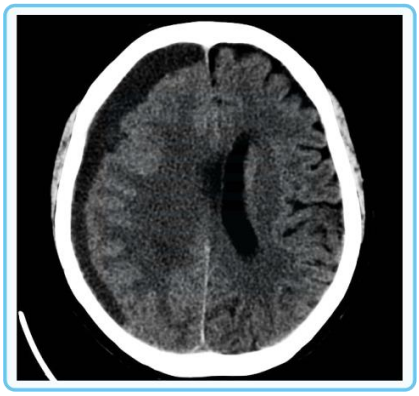
1. Delayed cerebral ischemia
2. Hydrocephalus
3. Bleeding
4. Rebleeding
5. Electrolyte imbalance

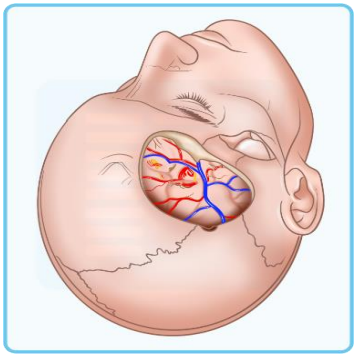
Q. Diabetic patient falls in washroom and head slams against the wall. Lucid interval was noted. From the next day onwards, her son notices she is becoming irritable and sleeps for most part of day. He also tells that she is having severe headache and has trouble speaking and recollecting events. NCCT was done on day 3 and is shown below?



cal evacuation if they do not enlarge. Stupor or coma, hemiparesis, and unilateral pupillary enlargement are signs of larger hematomas. The bleeding that causes larger subdural hematomas is primarily venous in origin, although arterial bleeding sites are sometimes found at operation, and a few large hematomas have a purely arterial origin. In an acutely deteriorating patient, an emergency craniotomy is required. In contrast to epidural hematomas, there is significant morbidity and mortality associated with acute subdural hematomas that require surgery.

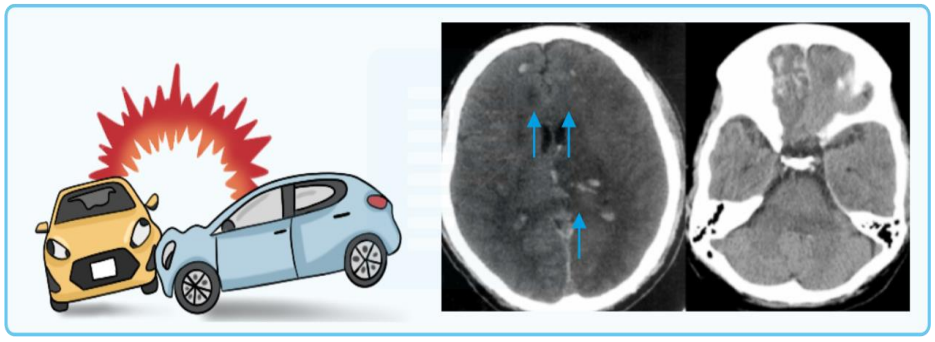
Q. Diabetic patient falls in washroom and head slams against the wall. Over the next 3 weeks she becomes forgetful and delirious. NCCT was done.





Clinical observation coupled with serial imaging is a reasonable approach to patients with few symptoms and small chronic subdural collections that do not cause mass effect. Treatment with surgical evacuation through burr holes is usually successful, if a cranial drain is used postoperatively. The fibrous membranes that grow from the dura and encapsulate the collection may require removal with a craniotomy to prevent recurrent fluid accumulation.

Q. Patient had a head on collision of car while driving under influence of alcohol. Day 3 of admission GCS score is 7/15 and relatives are arguing about lack of medical care. NCCT head is show below. Diagnosis is?

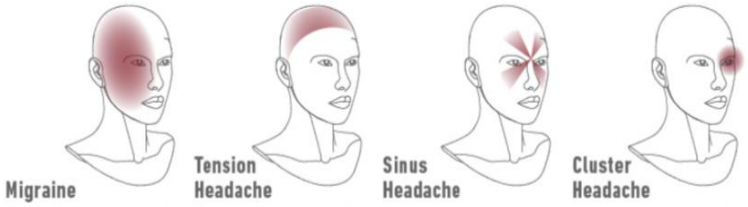


Q. Guy is struck on head with cricket ball. He becomes unconscious for few minutes. He wakes up and resumes playing and score a half century. After the match he tells the coach that he is having headache and wants to sleep in dressing room. After few hours he is non-responsive and is brought to ER.

Headache

MC type of headache: Tension type headache

Most common cause of secondary headache : Systemic infection



Migraine

-mediator:

-Aura: zig zag lines

-**POUND**

-Most efficacious triptan: Rizatriptan

-Triptans not given in patients with pregnancy and ASCVD. Use Lasmiditan

-Prevention of attacks with once-a-month injections

-Ona-botulinum A

-MIDAS score for disability with migraine

Cluster headache

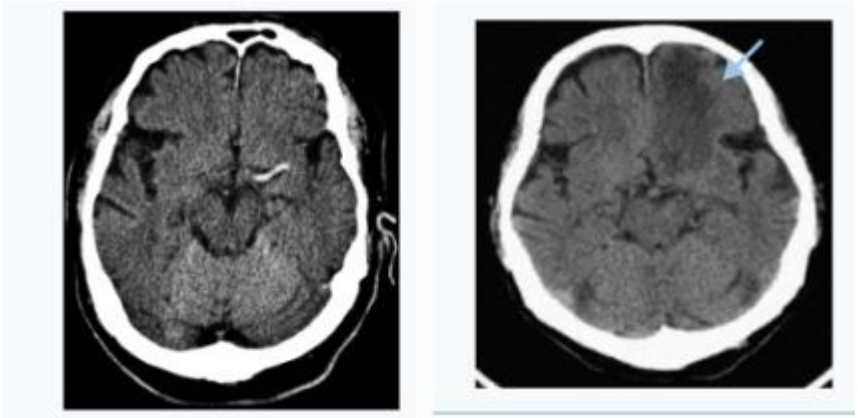
Male with retro-orbital pain and epiphora and nasal congestion (1-8 attacks per day with duration of 15-180 minutes)

RX: First line and DOC

Prevention:

Acute ischemic stroke

(ischemia occurs when brain blood flow decreases to less than 20 ml per min) 60-year-old man with DM and HTN develops sudden onset face deviation and arm weakness for last 3 hours. NCCT shows dense MCA sign.



Door to imaging time for stroke

Next investigation if NCCT head is normal

IOC for early detection of Acute ischemic stroke

Window period for management of AIS

Priorities of acute stroke consultation

Assess Airway and BP

2. Clearly establish the time patient was last seen normal

3. Calculate NIHSS Value (Value > ____ is eligible for EVT or thrombolysis with IVPA or Tenecteplase 0.25 mg per kg

4. If CT scan is normal, next best investigation is CTA

Thrombolysis	Mechanical thrombectomy
Window period < 4.5 hours 2026 update Extended window 4.5–9 hours from last known well in imaging-selected patients (CTP / MRI mismatch) 1. Wake up stroke 2. Salvageable tissue in 4.5 to 9 hours from last know well	Done for LVO involving 1. Proximal MCA and ICA 2. Basilar artery occlusion Can be done for which candidates 1. 0-6 hours: irrespective of thrombolysis eligibility Give IV Tenecteplase if eligible (do not delay MT) 2. 6-24 hours: based on CTP report

Contraindications for thrombolysis

INDICATION	CONTRAINDICATION
Clinical diagnosis of stroke **Onset of symptoms to time of drug administration ≤4.5H** **CT scan showing no hemorrhage or edema of >⅓ of the MCA territory** **Age ≥18 years**	**Sustained BP > 185/110 mmHg despite treatment** **Bleeding diathesis** **Recent head injury or intracerebral hemorrhage** **Major surgery in preceding 14 days** **Gastrointestinal bleeding in preceding 21 days** **Recent myocardial infarction**

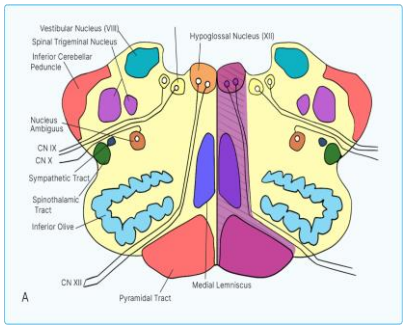
Thrombolysis is indicated in	Thrombolysis is contraindicated in

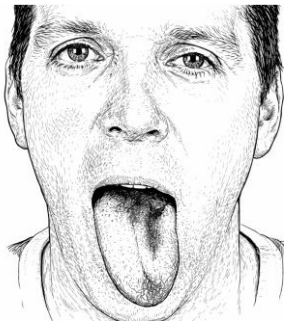
Reperfusion window for STEMI	
Reperfusion window for AIS (ideal)	
Golden period for MI	
Drugs approved for thrombolysis in AIS	**Tenecteplase and alteplase**

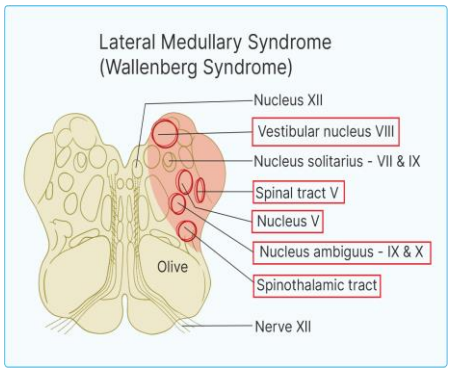
Hemorrhagic stroke

60-year-old man with Hypertension develops sudden onset face, arm and leg weakness while eating breakfast at the dining table. He is rushed to hospital where NCCT head is done. What is the site of lesion?

Stroke Syndromes







5

Lateral spinothalamic pathway

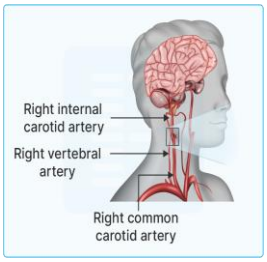
8

9

10

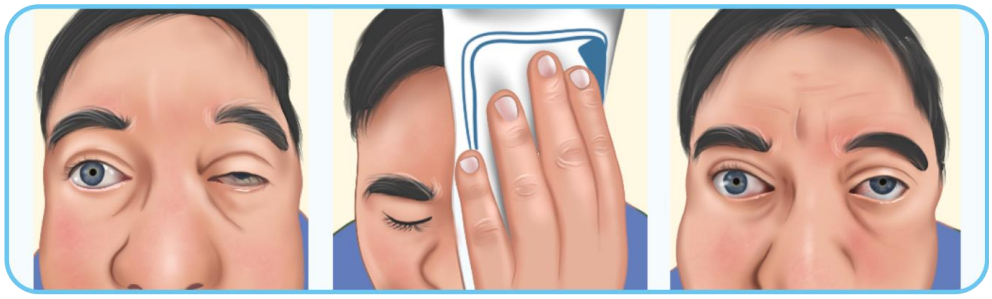
Sympathetic tract

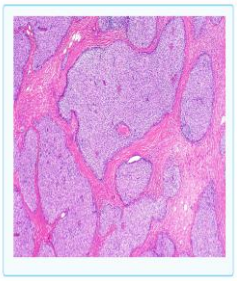
Transient ischemic attack



Parameter			Score
A	Age	≥60 years	1
B	Blood pressure	Systolic ≥140 mm Hg or diastolic ≥90 mm Hg	1
C	Clinical	Unilateral weakness Speech problem, no weakness Any other	2 1 0
D	Duration	≥60 min 10-59 min <10 min	2 1 0
D	Diabetes	Yes	1

M. Gravis





- Myoid cells of thymus act as source of autoantigen
- 65% cases associated with
- 10% cases associated with

- Decreased synaptic transmission at myoneural junction
- Shows waxing and waning course and does not show complete remission

- Anti Ach R antibody causes

1. Accelerated turnover of Ach R
2. Blockage of active site of AchR
3. Damage to post synaptic muscle membrane

1.Diplopia

2.Ptosis (asymmetrical) is most common ocular finding. Pupils are not affected

3.Diurnal variation of symptoms with weakness more in evening

4.Dysphagia and Dysarthria

6.Diaphragmatic weakness leading to dyspnea in M. Crisis

7.Muscle weakness with DTR normal

Work up

1. Screening

2. Most specific test(confirmation)

3. IOC

4 Imaging

5. Coexistent autoimmune disease

Common Errors

Q. Bilateral ptosis in a patient, which investigation must be done first: MRI head

Q. Antibiotic safe in patients with MG = Linezolid

Q: MG are resistant to depolarizing NM blocking agents like Sch

Generalized M. Gravis	**Ocular M. Gravis**
	Ocular muscles are more prone to depolarization block

48-year-old woman presents with progressive proximal lower limb weakness for 4 months. Weakness is worse in the morning and improves after walking for a few minutes. Examination reveals absent deep tendon reflexes that transiently improve after sustained muscle contraction. She also reports dry mouth. What is the most likely diagnosis?

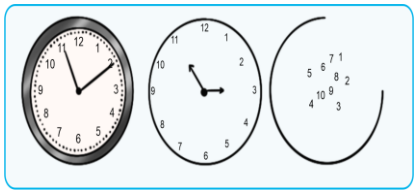
a. Myasthenia gravis

b. Lambert-Eaton myasthenic syndrome

c. Polymyositis

d. Guillain-Barré syndrome

Low frequency stimulation: Decrement
High frequency stimulation or post-exercise: Increment

Alzheimer disease	Parkinson disease	Huntington disease
Ach deficiency Nucleus of Meynert basalis Hirona bodies Tau protein 	Dopamine deficiency Substania nigra Lewy bodies Alpha synuclein defect	Dopamine excess and GABA is less Caudate nucleus mutant huntingtin protein Rich in polyglutamine (poly-Q) repeats Ubiquitin-positive Autosomal dominant, chromosome 4 defect, trinucleotide (CAG segment) repeats and anticipation

Guillain Barre syndrome

Bright FAME: Brighton criteria

Flaccid paralysis bilateral

Areflexia , ascending paralysis, Albuminocytological dissociation

Monophasic course

Electrophysiological studies for diagnosis: NCV

Pathophysiology

Demyelination of peripheral nerves and nerve roots from spinal cord due to type II hypersensitivity seen after infection with C.Jejuni, Zika virus, HEV

Work up

1.Electrodiagnostic testing: NCV

2.Lumbar puncture

Treatment

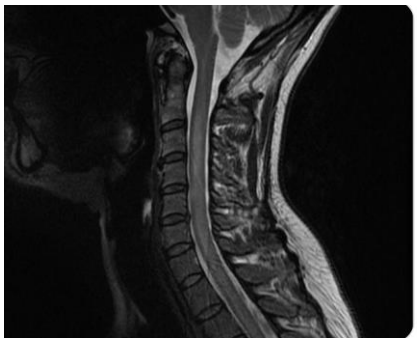
1.IVIG

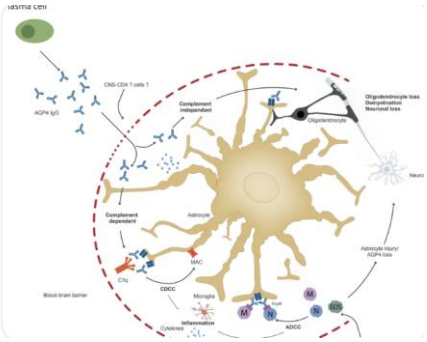
2.Plasmapheresis

3.Role of steroids

AIDP	
AMAN	
AMSAN	
MFS	

Neuromyelitis Optica / Devic disease





Pathophysiology

- IgG against _____ on astrocytes
- Severe necrotizing demyelination (optic nerve + long spinal cord segments)

Clinical features

A: Area postrema syndrome: intractable vomiting and hiccups

B: Brain stem syndrome

C: Cord involvement. Longitudinally extensive transverse myelitis

- Lesion > 3 vertebral segments
- Early bladder involvement

D: Diencephalic syndrome: unexplained weight loss and hypersomnolence

E: Eye involvement: optic neuritis bilateral

Work up

1. AQP4-IgG positivity
2. MRI spinal cord showing LETMS

Rx:

- Acute: IV steroids + Plasma exchange
- Maintenance: Rituximab

Additional Notes

Additional Notes

Additional Notes

Additional Notes

Additional Notes

Additional Notes

Additional Notes

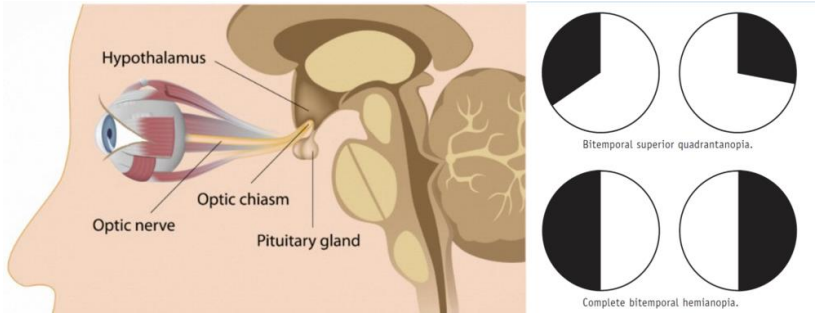
Additional Notes

Endocrinology

Pituitary gland

MC tumour of pituitary is

MC *functioning* tumour of pituitary

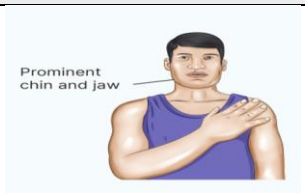
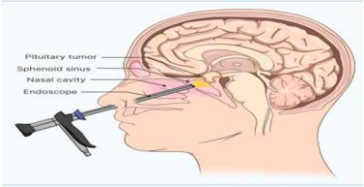


- Pituitary adenoma grows upward (suprasellar extension)

- Compresses the optic chiasm from below

- *Inferior fibers of optic chiasm that carry superior temporal field vision are compressed first*

- Leads to *superior* temporal quadrantanopia

	Prolactinoma	Acromegaly
Buzz word in clinical bytes		 - _____like hands - Prognathism - Galactorrhoea - Weight gain with IGT - Hypertension
Screening	Serum Prolactin levels	
IOC	MRI with contrast to evaluate Sellar mass	After 75 g oral glucose: GH remains >1 ng/mL
1st line intervention	**Patient desirous of pregnancy: Bromocriptine** **Patient completed family**	**Macroadenoma** **If high surgical risk or macroadenoma invading cavernous sinus** **Residual disease after surgery** 

Endocrine emergencies

Emergency	First line intervention	Drug of choice
DKA D K A		
HHS Adult with T2DM is excessively sleepy and drowsy, RBS is > 600 mg/dl, ketones 2+	Aggressive fluid resuscitation with normal saline	
Severe hypoglycaemia (unconscious)	Airway + IV access	
Thyroid storm	Beta blocker	
Myxoedema coma	Secure airway External rewarming IV hydrocortisone to prevent concomitant Addison disease being unmasked and worsen the patient	

Endocrine emergencies

Addisonian crisis	Rapid IV fluids (NS)	
Pheochromocytoma intra op HTN crisis		**Drug that be used both intra-op and post-operatively**
Hypercalcaemic crisis		IV Bisphosphonates Calcitonin nasal spray for rapid effect
Tetany		

Endocrine emergencies

Euglycemic DKA (SGLT2)	IV fluids	IV insulin (stop SGLT2 drug)

Gradual correction of hyponatremia is done to avoid risk of ODS. Max correction of 6-8 meq rise per day

-**SGLT2** inhibitor provide Cardio renal benefit and are used in

1. DM plus CHF

2. DM plus nephropathy

Side effects:

Common error

-For management of DM plus ASCVD start

Side effects=

1.

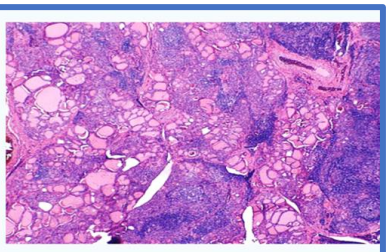
2. GI upset

3.

4. Vision loss due to sudden fall of HbA1c

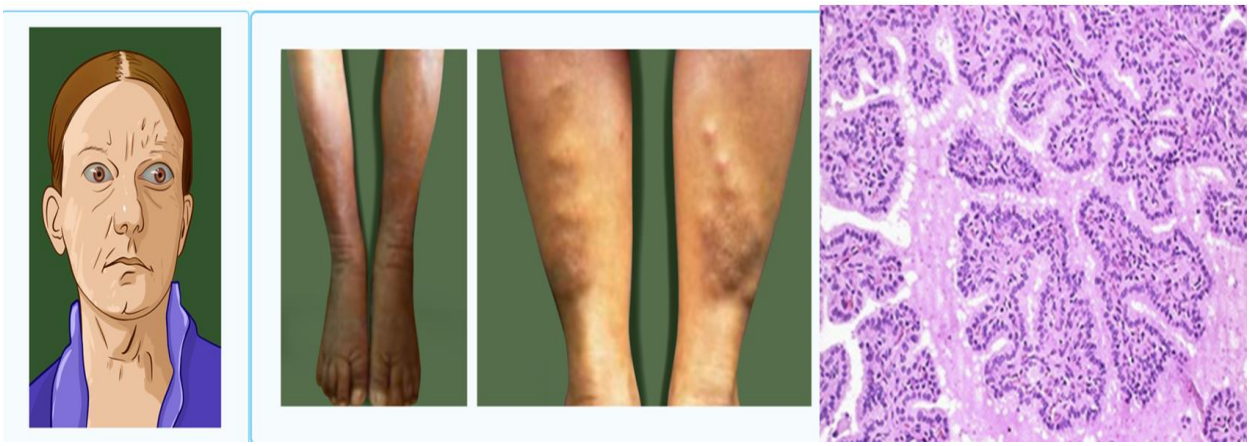
Tirzepatide has the maximum glucose lowering property. Dual agonist: GIP + GLP-1 receptors

Diagnostics / Investigation of choice for various endocrine conditions



Primary hypothyroidism	Secondary hypothyroidism
TSH T4 T3	TSH T4 T3

Hypothyroidism and Hyperthyroidism	
Suspected thyroid dysfunction (any)	
Primary hypothyroidism	
Central hypothyroidism	
Grave's disease	



Muscle involved in Grave disease

Most specific feature of Grave disease

Antibody responsible for grave disease

Drug of choice for management of grave disease

Drug of choice for management of grave disease in pregnancy T1

Disease of Adrenal glands	
Condition	**Investigation of choice**
ACTH independent Cushing syndrome	
Primary aldosteronism	
Pheochromocytoma	24-hour urinary
Adrenal insufficiency	ACTH stimulation test

Common errors

1. **Best for monitoring of diabetes mellitus**
    a. CGM
    b. HbA1c
    c. Glycated albumin
    d. RBS

2. **Not a classic symptom of Diabetes mellitus**
    a. Weight loss
    b. Polyuria
    c. Polydipsia
    d. Polyphagia

3. **Chromosome involved in pathogenesis of T1DM**
    a. 2
    b. 4
    c. 6
    d. 8

Diagnosis of Diabetes mellitus

mg/dl	**Normal**		**Diabetes mellitus**
Fasting			
75 gm Glucose			

Not used for Diagnosis of DM is

Glycosylated haemoglobin

Normal	
Pre-Diabetes	
Diabetes mellitus	

Best test for Long term control of DM:

Best test for short term control of DM:

Falsely high HbA1c:

Diagnosis of DM

Common errors in management of DKA

D **K** **A**

1st line management in case of shock / Thready pulse/ Crashing Pulse

1st line management in case of evidence of dehydration (Tachycardia, low BP)

1. Normal saline or Ringer lactate infusion
2. Check potassium values and hold insulin if potassium is less than 3.3 meq/L
3. Start regular insulin drip after 1 hour @ 0.05-0.1 unit / Kg/ hr

Cause of death in DKA

Unconscious unresponsive diabetic patient

pH				
pCO2				
HCO3				
Urine ketones				
RBS				
Any special investigation ordered				

Methods of Insulin administration

Long-acting weekly insulin:

Start insulin if

1. Asymptomatic t2DM with HbA1c> 10%

2. Symptomatic t2DM with weight loss and HbA1c > 9%

3.

Somogyi phenomenon (extra amount of bed time insulin)

Nocturnal

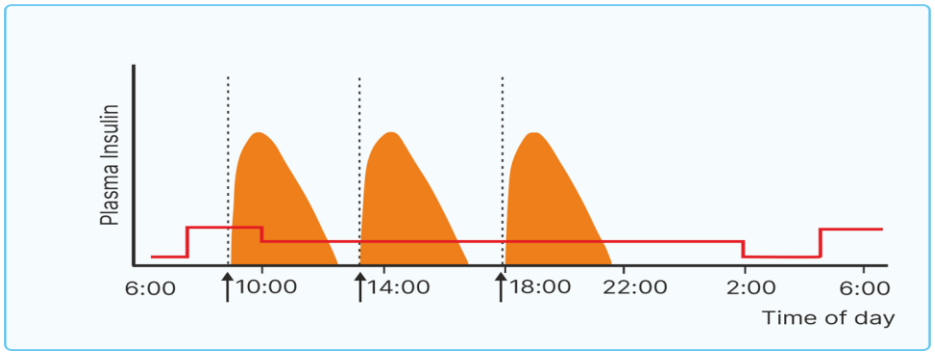
Pre breakfast

Dawn phenomenon (GH peak between 4 am to 7 am)

Nocturnal

Pre-breakfast

Basal Bolus regimen



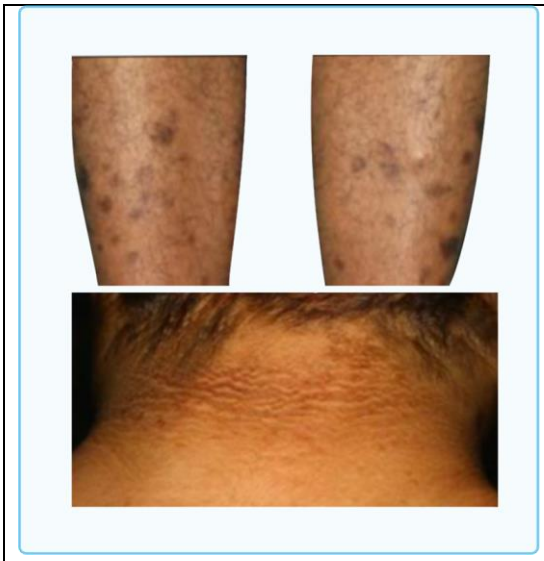
Skin involvement in DM

MC skin lesion in type 2 DM

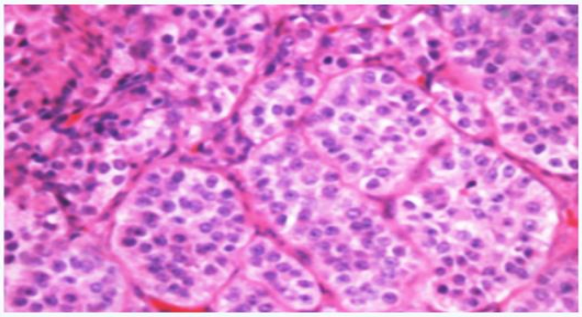
MC skin lesion in type 1 DM

MC skin lesion in glucagonoma

Causes of Acanthosis nigricans



Pheochromocytoma



Leading catecholamine produced by normal adrenal medulla

Leading catecholamine produced by pheochromocytoma

Leading catecholamine produced by pheochromocytoma in MEN-2 is

Extra adrenal pheochromocytoma is called

NF-1 is associated with Pheochromocytoma

Clinical Buzz words

It can mimic Anxiety neurosis/ Panic attacks

Screening test

IOC

Rx of benign pheochromocytoma

RX of malignant pheochromocytoma

Use MIBG containing iodine-125 and Chemotherapy

Cushing Syndrome

<table>
<tr>
<td>  </td>
<td>Clinical features

Lemon on sticks appearance
Dorsocervical fat pad
Purple striae
Thin skin with increasing bruising
Hypokalaemic alkalosis
Hirsutism and oligomenorrhea
Hyperpigmentation of knuckles and IP joints</td>
</tr>
<tr>
<td>Causes

S:

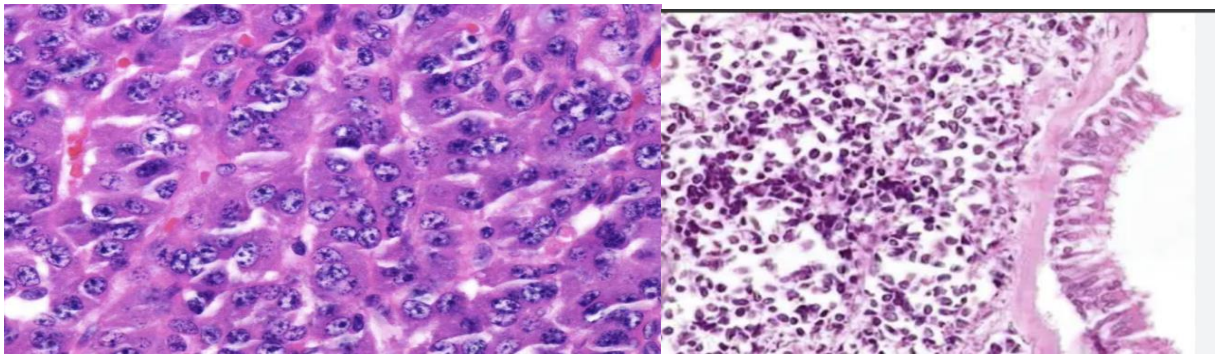
O:

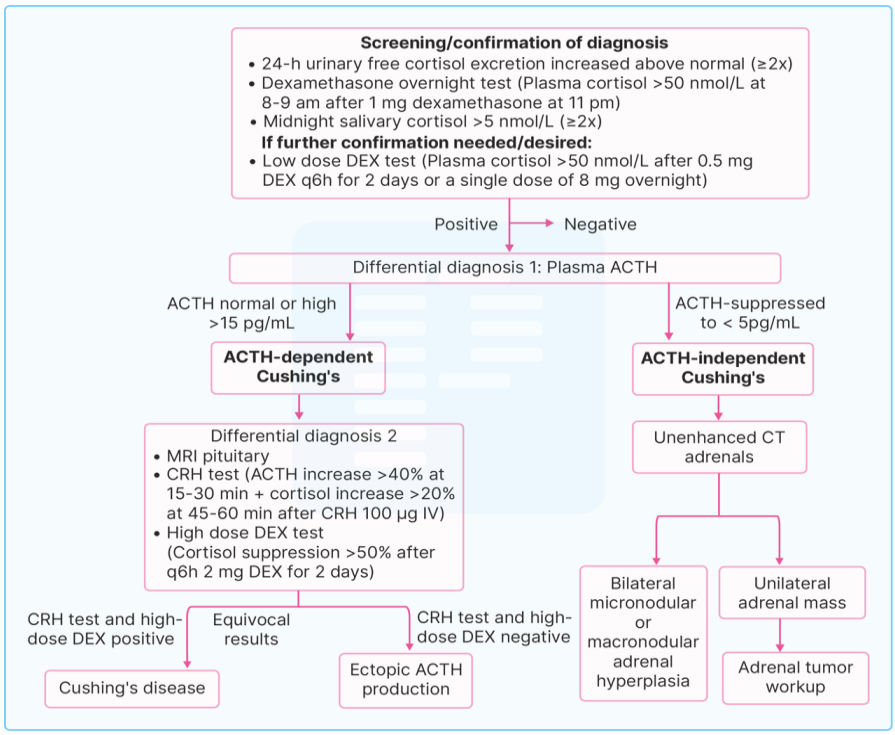
A:

P:</td>
<td>Screening test

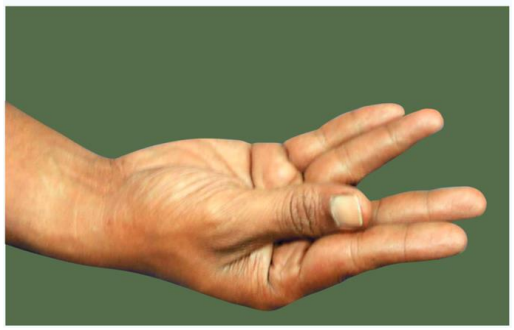
IOC

Endogenous vs ectopic source</td>
</tr>
</table>




Screening/confirmation of diagnosis
• 24-h urinary free cortisol excretion increased above normal (≥2x)
• Dexamethasone overnight test (Plasma cortisol >50 nmol/L at 8-9 am after 1 mg dexamethasone at 11 pm)
• Midnight salivary cortisol >5 nmol/L (≥2x)
If further confirmation needed/desired:
• Low dose DEX test (Plasma cortisol >50 nmol/L after 0.5 mg DEX q6h for 2 days or a single dose of 8 mg overnight)
Positive
Negative
Differential diagnosis 1: Plasma ACTH
ACTH normal or high >15 pg/mL
ACTH-suppressed to < 5pg/mL
ACTH-dependent Cushing's
ACTH-independent Cushing's
Differential diagnosis 2
• MRI pituitary
• CRH test (ACTH increase >40% at 15-30 min + cortisol increase >20% at 45-60 min after CRH 100 µg IV)
• High dose DEX test (Cortisol suppression >50% after q6h 2 mg DEX for 2 days)
Unenhanced CT adrenals
CRH test and high-dose DEX positive
Equivocal results
CRH test and high-dose DEX negative
Bilateral micronodular or macronodular adrenal hyperplasia
Unilateral adrenal mass
Cushing's disease
Ectopic ACTH production
Adrenal tumor workup

Disorders of Calcium Metabolism



DOC for tetany

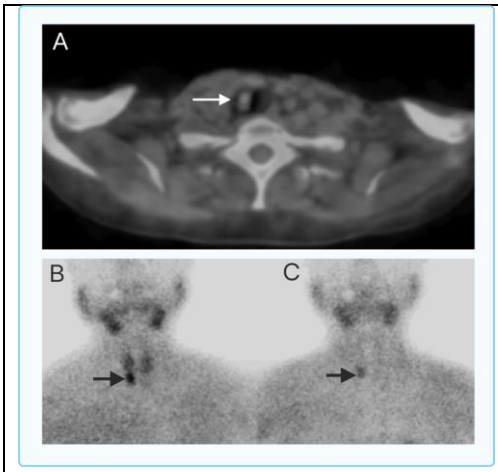
Leading cause of Hypocalcaemia

1. Inadvertent removal of parathyroid gland during total thyroidectomy
2.

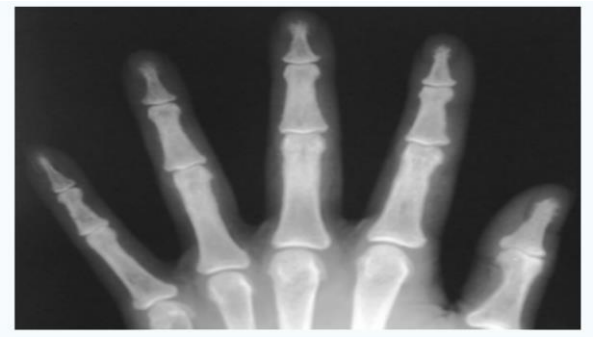
DOC for management of surgically induced hypoparathyroidism

	Primary Hyper PTH	**Secondary Hyper PTH**	**Hypoparathyroidism**	**PHP**
Calcium				
Phosphate				
SAP				

Primary hyperparathyroidism



Stones – bones – moans and psychic moans



Leading cause of hypercalcemia in hospitalized patients

Management of hypercalcaemic crisis

Additional Notes

Additional Notes

Additional Notes

Additional Notes

Additional Notes

Additional Notes

Additional Notes

Pulmonology

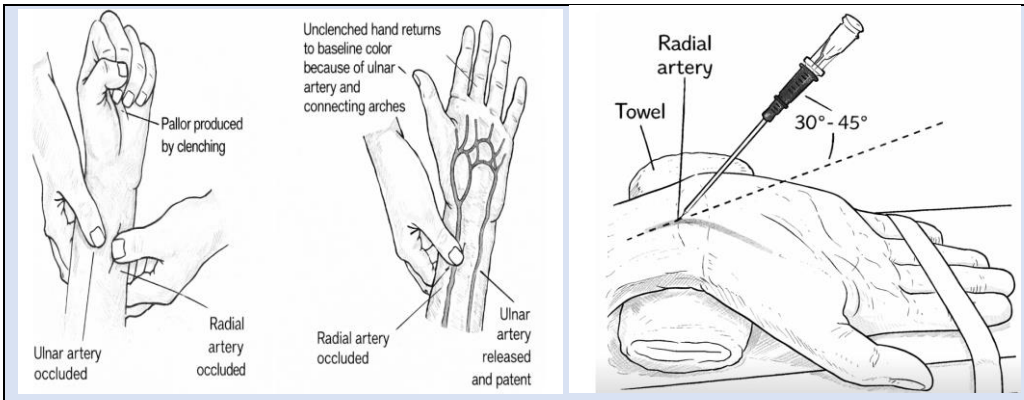
ABG analysis Hacks

pH	pCO2	HCO3	Interpretation

Extra mile

Aldosterone has inverse relation with potassium pH has inverse relation with Potassium

Modified Allen test is done for integrity of palmar arch before doing ABG



P02, pCO2 values are by default in mm Hg

How to interpret in 30 seconds

pH	**7.2**	**7.22**	**7.36**
pCO2	**60**	**58**	**50**
HCO3	**26**	**28**	**32**

Scenario 1:

Parameters	Values	Interpretation
pH	**7.25**	
PC02	**25**	
HCO3	**10**	

Expected PCO2= HCO3 plus 15 = 10 + 15 = 25 mm Hg

Optional for FMGE

Scenario 1.1

Parameters	Values	Interpretation
pH	**7.25**	
PC02	**30**	
HCO3	**10**	

Hypoventilation causing decreased CO2 washout

Expected PCO2= HCO3 plus 15 = 10 + 15 = 25 mm Hg and actual PCO2=

Scenario 1.2

Parameters	Values	Interpretation
pH	**7.1**	
PC02	**16**	
HCO3	**6**	
pO2	**90**	

Scenario 2: Acute exacerbation of chronic bronchitis

Parameters	Values	Interpretation
pH	**7.2**	
PC02	**60**	
HCO3	**28**	
pO2	**90**	

Management =

Scenario 3: COVID Moderate/ Severe case

Parameters	Values	Interpretation
pH	**7.5**	
PC02	**30**	
HCO3	**20**	

Scenario 4: Chronic Vomiting in case of CHPS neonate

Parameters	Values	Interpretation
pH	**7.5**	
PC02	**45**	
HCO3	**30**	

Optional for FMG

Scenario 5

CKD patient with multiple episodes of vomiting

Parameters	Values	Interpretation
pH	**7.4**	
PC02	**40**	
HCO3	**24**	
Na Chloride	**130** **80**	

Must know facts

Fluid of choice for metabolic alkalosis

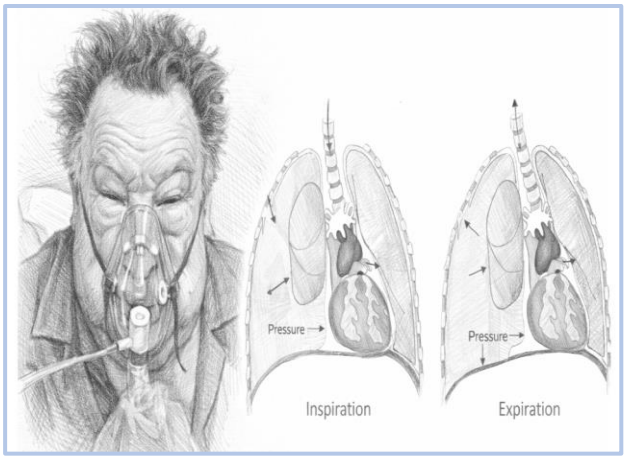
Side of Excess normal saline is

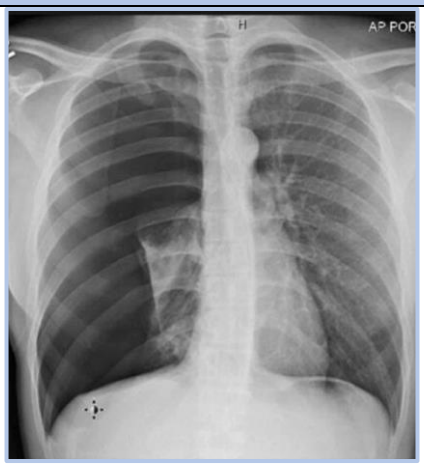
Fluid of choice for Metabolic acidosis

Best for management of Acute exacerbation of chronic bronchitis

Best for management of Respiratory alkalosis

Pneumothorax





When to say Tension Pneumothorax

Key words

- Hypotension

-Mediastinal shift/ Apex beat displaced away

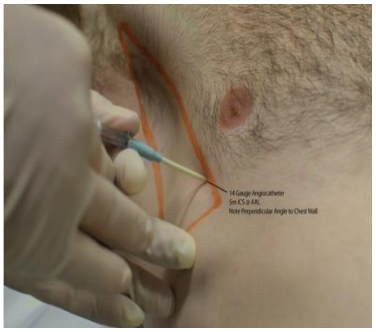
-Elevated JVP

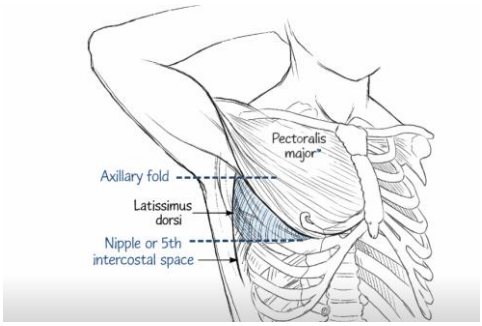
- Absent air entry

- Absent Breath sounds

- Hyper-resonant percussion note

First line intervention





Air collection chamber should exhibit intermittent bubbling

-Continuous bubbling in air collection chamber indicates

-Intermittent bubbling stops

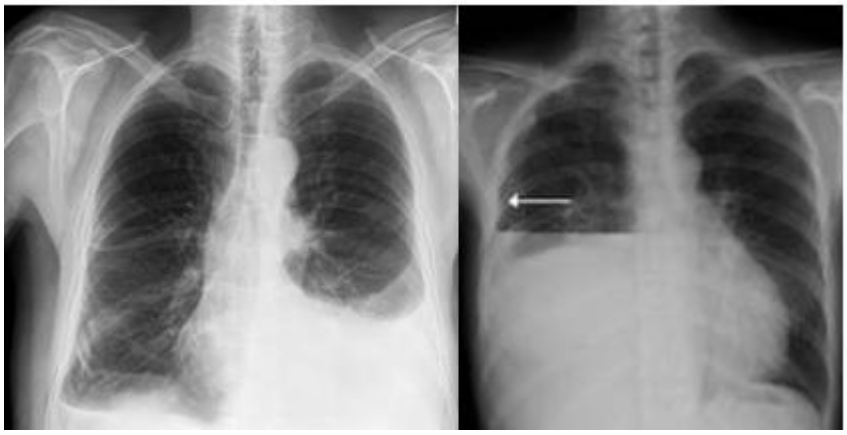
Hemothorax

When to inform surgeon

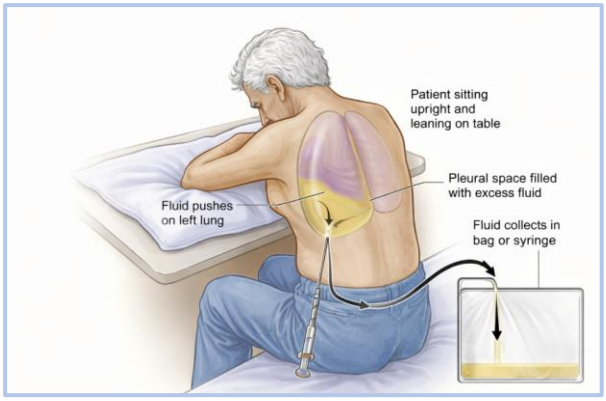
1. Drain amount > _____ per hour for _____ hours

2. Drain amount > _____single reading

Pleural effusion



Site for thoracocentesis



Maximum amount removed per sitting

Site from perspective of avoiding injury to Neurovascular bundle

Above the upper border of lower rib

Lights criteria

Transudative: CHAP: CHF, Hypoalbuminemia, Ascites and peritoneal dialysis

PF protein

PF LDH

PF Adenosine deaminase levels elevated are seen in

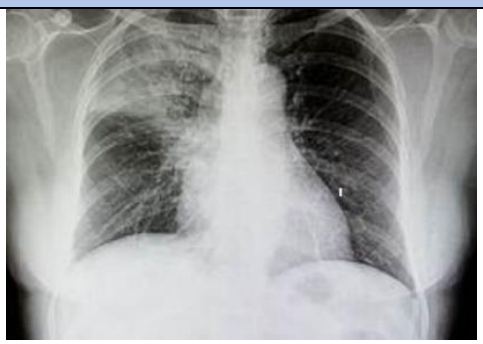
Right sided pleural effusion is seen in

Bloody pleural effusion is seen in

Low sugar with cholesterol crystals are seen in

Low sugar in Pleural fluid

Pneumonia



Most reliable auscultatory finding of lobar pneumonia

Organism that can cause both typical and atypical pneumonia

CAP

VAP

Leading cause in children with Cystic Fibrosis/ Mucoviscidosis (F508 mutation, del phenylalanine, Chromosome ___)

< 10 years

>10 years

CURB 65 Score or CRB-65 score

The CURB-65 criteria include five variables: confusion (C); urea >7 mmol/L (U); respiratory rate ≥30/min (R); blood pressure—systolic ≤90 mmHg or diastolic ≤60 mmHg (B); and an age of ≥65 years. Patients with a score of 0 (a 30-day mortality rate of 1.5%) can be treated as outpatients. With a score of 1 or 2, the patient should be hospitalized unless the score is entirely or in part attributable to an age of ≥65 years; in such cases, hospitalization may not be necessary. Among patients with scores of ≥3, mortality rates are 22% overall; these patients may require ICU admission. The PSI has greater efficacy than CURB-65 but is more difficult to calculate.

RX:

Outpatients

Inpatient / ICU

IV

Add coverage for S. Aureus

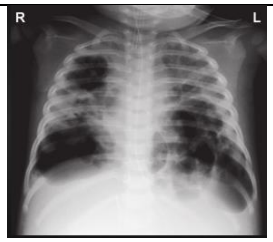
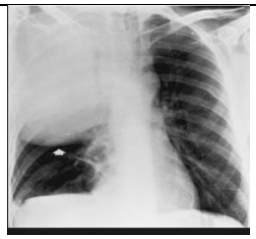
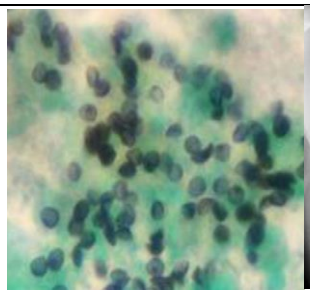
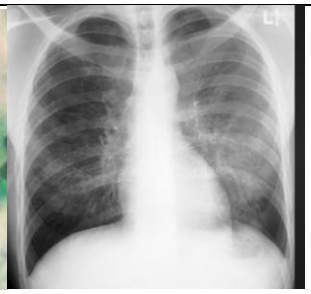
Add coverage for Pseudomonas Aeruginosa

	Pneumonia	Pleural effusion	Pneumothorax
Trachea position			
Percussion - note			*Hyper-resonant*
Air entry **Breath sounds**			

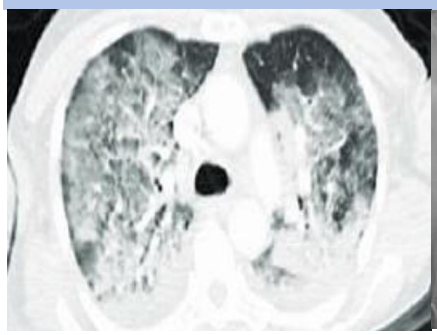
- MCC of pneumonia in AIDS patient is Pneumococcus
- MCC of Tension Pneumothorax is Baro trauma > penetrating trauma
- Best site for insertion of wide bore needle in

  -Tension pneumothorax in adults=

  -Tension pneumothorax in children=
- Legionella pneumophila is associated with SIADH
- Legionella can present as both typical and atypical pneumonia
- Atypical pneumonia with evidence of hemolysis, Low Hb and black urine is mycoplasma pneumoniae

Organism specific pointers in pneumonia	
Legionella pneumonia	Best test: urine legionella antigen Selective culture media DOC
S. Aureus Nosocomial pneumonia	
Klebsiella Pneumoniae Alcoholic with Red currant jelly sputum	
Anaerobic lung abscess	
P. Jiroveci	 

ARDS



- MCC

- MC direct cause

- MC indirect cause

Diagnostic criteria

1. pa02/ Fio2 ratio =

2. LA pressure is normal / Absence of LA hypertension

3. CXR shows Bilateral infiltrates

4. < 7 days of lung injury

RX:

Low volume ventilation = Low tidal volume and high PEEP

COPD

Modified medical research council grading of dyspnea

Grade

I	
II	
III	
IV	

GOLD grades of COPD

I	Mild	FEV1/ FVC < 0.7
II	Moderate	FEV1/ FVC < 0.7
III	Severe	FEV1/ FVC < 0.7
IV	Very severe	FEV1/ FVC < 0.7

FEV1/ FVC < 0.7 post bronchodilator

GOLD Groups

A	Low symptoms	0-1 hospitalization	Any BD
B	High symptoms	0-1 hospitalization	LAMA + LABA
E	Any symptoms	>2 exacerbations or >1 hospitalization	LABA + LAMA+ ICS Blood eosinophils > 300

-Clubbing is not seen in COPD

-Barrel chest is seen and patient sits in tripod position with hoover sign(paradoxical inward movement of chest during inspiration)

-Best to measure residual volume is body plethysmography

-Emphysema has reduced DLCO

- IV hydrocortisone is used in both COPD exacerbation and severe acute asthma. Don't use oral steroids as side effects exceed the benefit.

- NIV is treatment of choice of acute exacerbation of COPD causing Type 2 respiratory failure

- best mortality reducing intervention in COPD is LTOT using low flow oxygen. Target sp02 in COPD is 88-92%.

- NIV is contraindicated in unconscious patients with CV instability

Bronchial Asthma

-Post bronchodilator FEV1 increases by > 12% or > 200 ml air: Reversible bronchoconstriction

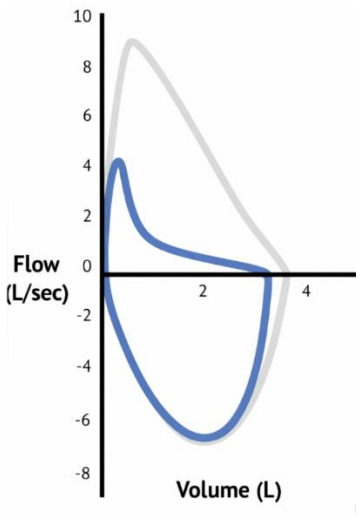
-DLCO is increased in asthma

-idiosyncratic asthma/ extrinsic asthma presents in adult age group and has normal IgE levels and coexists with nasal polyps

Extra mile

-Fe NO measures the amount of nitric oxide in exhaled breath

1. Non-invasive measurement of nitric oxide in exhaled breath
2. **It is a non-invasive biomarker of Type-2 (eosinophilic) airway inflammation, especially in asthma.**
3. Inducible nitric oxide synthase (iNOS) upregulated by IL-4/IL-13
4. Values > 50 ppb indicate Eosinophilic inflammation likely and steroid responsiveness



Management

Step 1-2	Low dose ICS-LABA as needed
Step 3	MART with low dose maintenance ICS-LABA
Step 4	MART with
Step 5	Add on -Refer for assessment of phenotype -Consider trial of high dose maintenance ICS-formoterol(risk of adrenal suppression) -Consider Biologicals Mepolizumab: Block IL-5 itself → ↓ eosinophil survival Benralizumab: Blocks IL-5 receptor → antibody-dependent cell-mediated cytotoxicity → near-complete eosinophil depletion

MART = single inhaler having ICS–Formoterol inhaler for BOTH maintenance + relief

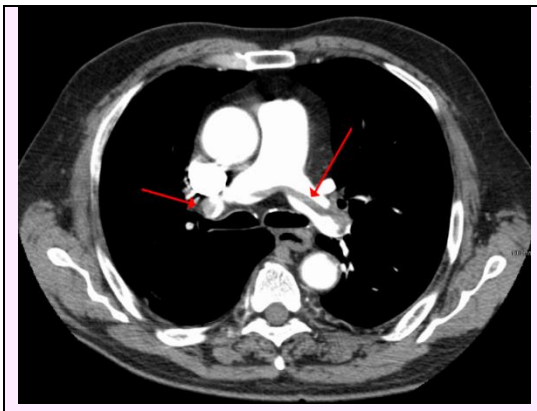
AIR= anti-inflammatory reliever

Case Scenario

Q. 25-year-old guy has bike accident and is hospitalized for polytrauma. On day 3 he develops sudden onset respiratory distress and spO2 is 80%. O/E Pulse is 100/min, BP = 90/60 mm hg and prominent neck veins. Diagnosis is

a. Pulmonary embolism

b. Fat embolism syndrome



First investigation/ Screening test

Non-invasive test to identify the cause

IOC

TOC of massive PE

TOC of PE/ Sub-massive PE

Parameters to be checked to identify in the question

1. **Homan sign**
2. **BP Value**
3. **Echo findings**

Common errors

Q.A 60-year-old man with colorectal cancer underwent a hemicolectomy. During surgery ETCO2 suddenly dropped from 35 mm Hg to 5 mm Hg with Hypotension. Which of the following best describes this presentation?

a. Myocardial muscle relaxation due to anaesthetic drugs

b. Overload of saline

c. Pulmonary embolism

d. Mesenteric artery bleeding

Q. 25-year-old guy has bike accident and is hospitalized for polytrauma. On day 3 he develops sudden onset respiratory distress and becomes unconscious and unresponsive. O/E Pulse is 100/min, BP= 110/70 and petechiae are noted in chest wall. Diagnosis is

a. Pulmonary embolism

b. Fat embolism syndrome

Major features	Minor features
Axillary or subconjunctival petechiae	Tachycardia > 110/minute
Hypoxemia PaO_2 < 60 mmHg; FIO_2 = 0.4	Pyrexia > 38.5
Pulmonary edema	Retinal fat or petechiae
Sudden drop in Hb level > 20%	Urinary fat globules or oligoanuria
Central nervous system depression disproportionate to hypoxemia	Sudden thrombocytopenia > 50% High ESR > 71 mm/hour

Additional Notes

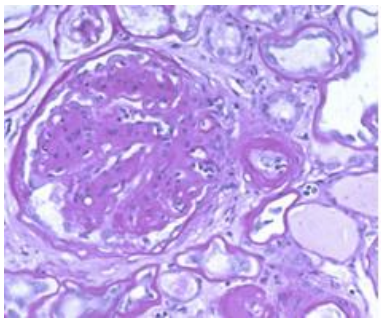
Additional Notes

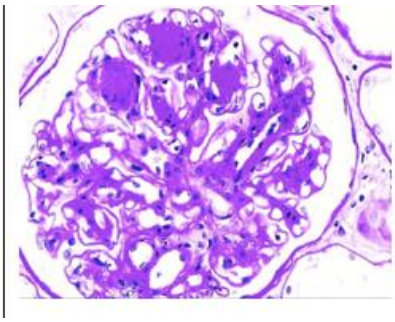
Additional Notes

Additional Notes

Nephrology and electrolytes

			Albuminuria categories Description and range		
CKD is classified based on: • Cause (C) • GFR (G) • Albuminuria (A)			A1 Normal to mildly increased <30 mg/g <3 mg/mmol	A2 Moderately increased 30–299 mg/g 3–29 mg/mol	A3 Severely increased ≥300 mg/g ≥30 mg/mmol
GFR categories (ml/min/1.73 m²)					
G1	Normal or high	≥90	Screen 1	Screen 1	Screen 1
G2	Mildly decreased	60–89	Screen 1	Treat t 2	Treaat 2
G3a	Mildly to moderately decreased	45–59	Treat 1	Treat t 2	Treaat 3
G3b	Moderately to severely decreased	30–44	Treat 2	Treat t 3	Treaat 3
G4	Severely decreased	15–29	Treat 3	Treat t 3	Treat 4+
G5	Kidney failure	<15	Treat 4+	Treat 4+	Treat 4+





Chronic Kidney disease

-Leading cause is _____

-CKD with normal size kidney/ slight enlargement is seen in

-Leading cause of death in CKD is _____

-Target BP in CKD patients should be < _____mm Hg

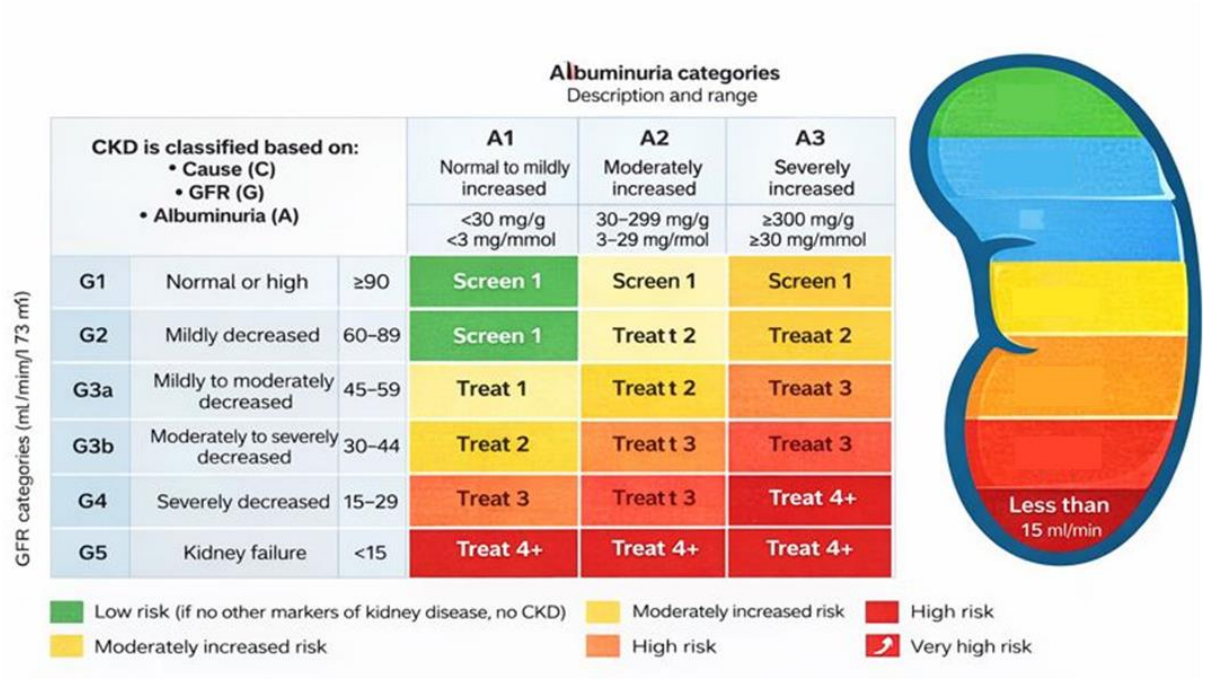
-Most life-threatening complication of CKD is _____

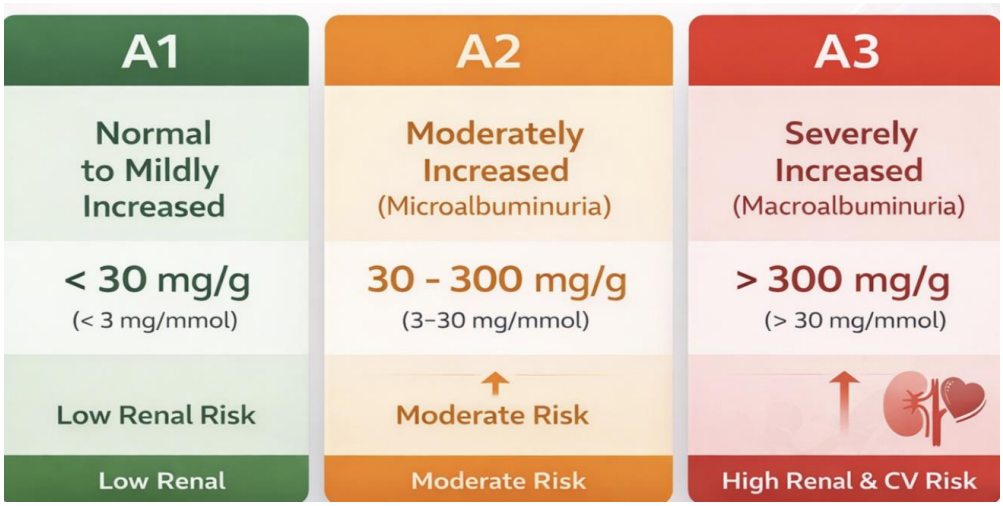
-Staging of CKD is based on _____ and _____

-Stage at which complications appears is grade _____

-Uraemia features develop in grade _____

-Troponin I is elevated in CKD so never rely on single value in CKD patient with chest pain. Instead perform Serial troponin I


Albuminuria categories
Description and range
CKD is classified based on:
• Cause (C)
• GFR (G)
• Albuminuria (A)
A1
Normal to mildly increased
<30 mg/g
<3 mg/mmol
A2
Moderately increased
30–299 mg/g
3–29 mg/rmol
A3
Severely increased
≥300 mg/g
≥30 mg/mmol
GFR categories (ml/mim/l 73 mí)
G1 Normal or high ≥90 Screen 1 Screen 1 Screen 1
G2 Mildly decreased 60–89 Screen 1 Treatt 2 Treaat 2
G3a Mildly to moderately decreased 45–59 Treat 1 Treatt 2 Treaat 3
G3b Moderately to severely decreased 30–44 Treat 2 Treatt 3 Treaat 3
G4 Severely decreased 15–29 Treat 3 Treatt 3 Treat 4+
G5 Kidney failure <15 Treat 4+ Treat 4+ Treat 4+
Less than
15 ml/min
Low risk (if no other markers of kidney disease, no CKD)
Moderately increased risk
Moderately increased risk
High risk
High risk
Very high risk


A1
Normal to Mildly Increased
< 30 mg/g
(< 3 mg/mmol)
Low Renal Risk
Low Renal
A2
Moderately Increased
(Microalbuminuria)
30 - 300 mg/g
(3–30 mg/mmol)
Moderate Risk
Moderate Risk
A3
Severely Increased
(Macroalbuminuria)
> 300 mg/g
(> 30 mg/mmol)
High Renal & CV Risk

Mild CKD: 60 -89

Moderate CKD: 30-59

Severe CKD: 15-29

Renal failure / ESRD < 15

Q. Best to differentiate between AKI and CKD?

a. Creatinine clearance and Urine albumin

b. Serum creatinine and BUN

c. Size of kidney and BUN

d. Urine output and Serum creatinine

G1	
G2	
G3A	
G3B	
G4	
G5	

Medical Management of CKD: ABCDE-PK

A

B

C

D

Start first with sevelamer to decrease phosphate and then start cinacalcet

On regularly taking vitamin D and calcium, low PTH levels develop **causing Adynamic bone disease**

E: First replete iron levels and then start Darbepoeitin

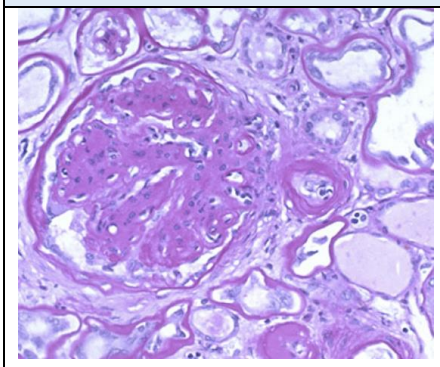
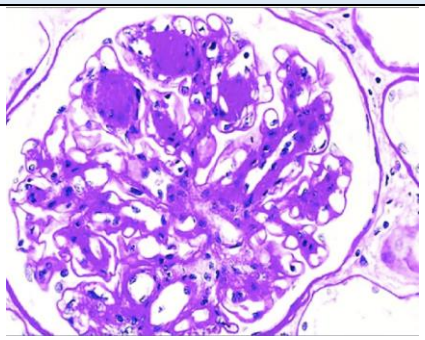
Causes of Anaemia in CKD

1. **Erythropoietin deficiency**
2. **Iron deficiency**
3. **Hyperparathyroidism**

P

K

Diabetic Nephropathy

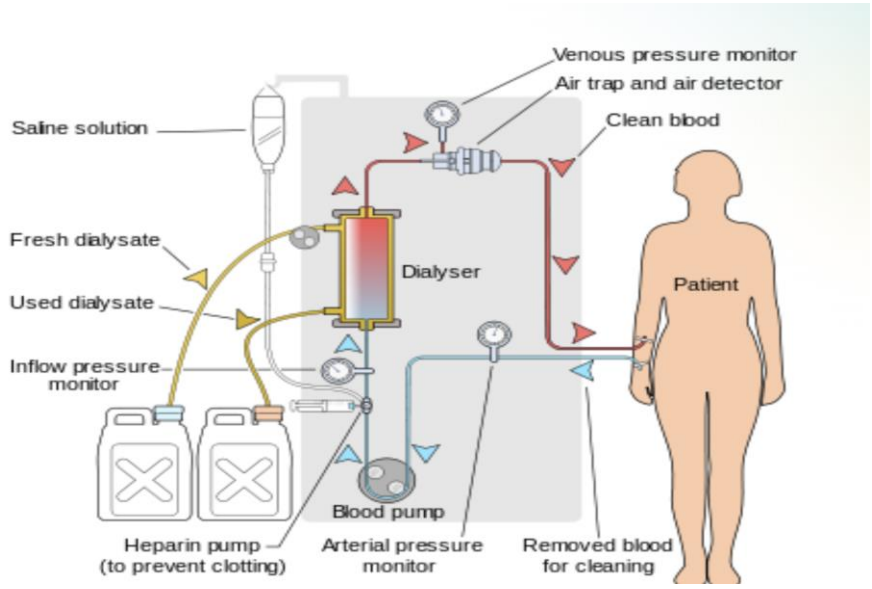
	

Earliest feature of diabetic nephropathy	
Screening test	
First line drug	
Additional drugs and interventions	

Renal replacement therapy

Preferred modality: Kidney transplantation

MC used modality: Hemo-dialysis



-MC complication of HD is _____(caused due to acetate used as buffer in dialysate due to its vasodilatory effects). Cooling the dialysate helps too in reducing this complication

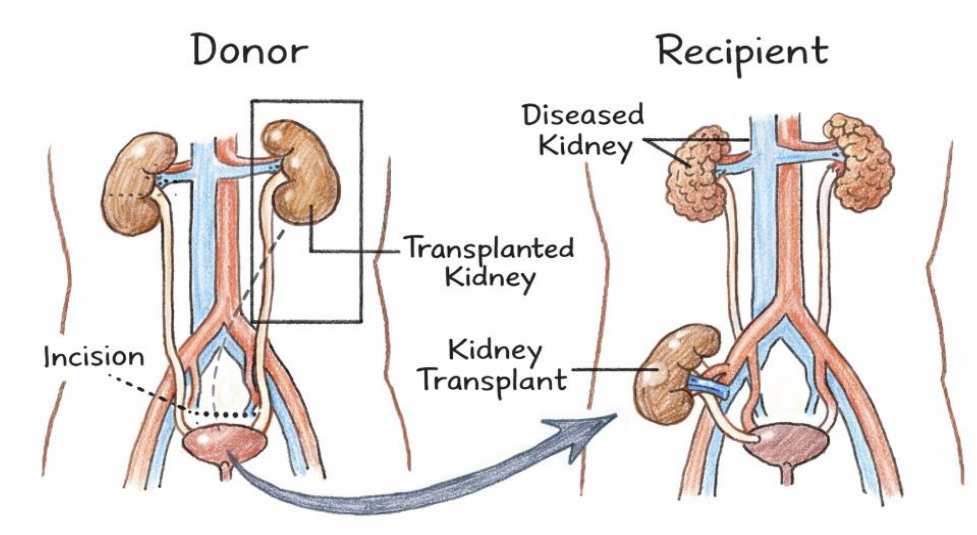
-MC complication of recurrent HD is increased _____

-AV fistula site in non-dominant hand between _____artery and _____vein and is called Cimino Brescia fistula

Q. **All of the following improve with dialysis except?**

a. Renal osteodystrophy
b. Metabolic acidosis
c. Hyperkalaemia
d. Pulmonary oedema

Kidney transplant



Life expectancy enhanced by approximately 15 years

Lesion with high recurrence tendency after kidney-transplantation:_____

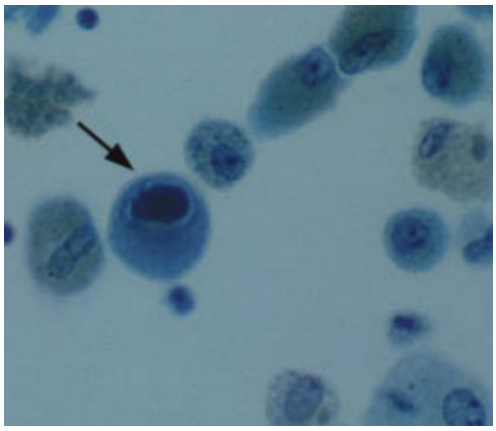
Lesion that does not recur after kidney transplantation: _____

Q. Which of the following is absolute indication for urgent haemodialysis

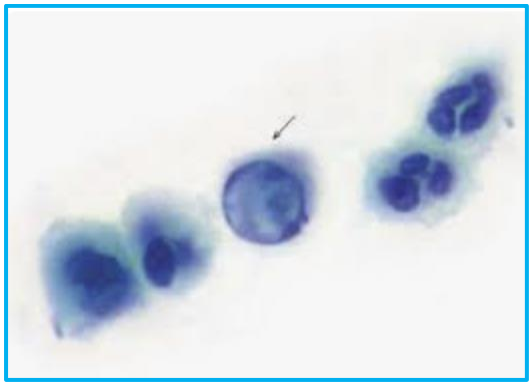
a. Uremic pericarditis
b. Uremic melena
c. Uremic encephalopathy
d. Uremic asterixis

Opportunistic infections after kidney transplantation

MC opportunistic infection leading to graft failure after 3 months of kidney transplantation with urine m/e finding shown is



MC opportunistic infection leading to graft failure after 8 months of kidney transplantation with urine m/e finding shown is

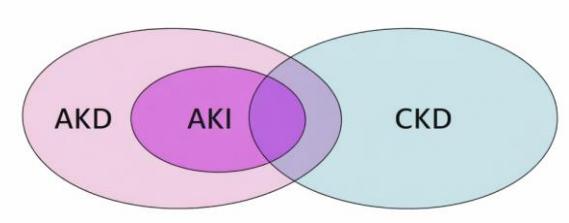


Graft rejection

Type	Hypersensitivity
Hyperacute	
Acute	
Chronic	

Acute kidney injury

KDIGO/ RIFLE / AKIN criteria



Functional criteria for AKI
Time frame Within 7 days / 48 hours
Increase in Scr by ≥50% within 7 days. OR Increase in Scr by ≥0.3 mg/dL within 2 days. Or Oliguria for ≥4 hours

	Serum creatinine	Urine output	Duration
Stage 1			
Stage 2			
Stage 3			

-Leading cause of ICU admission:

-Anuria is defined as urine output less than 100 ml per day

-MC type of acute kidney injury: Pre-renal AKI

- Preferred fluid for choice for patients of AKI – Normal saline

Indications for haemodialysis

A: Acidosis (pH <7.1)

E: Electrolytes: Refractory Hyperkalaemia (K > 6.5 mEq/L)

I: Intoxications

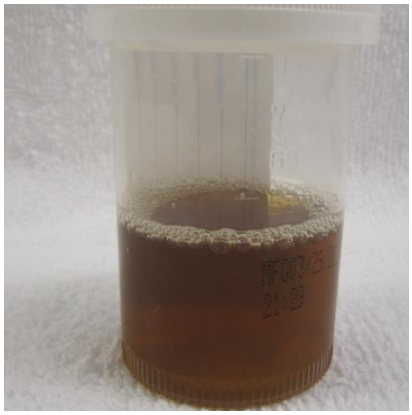
O: Overload with fluid refractory to diuresis

U: Uremic pericarditis, uremic encephalopathy

Q. 15-year-old child develops diarrhoea with severe dehydration and oliguria. On admission Serum creatinine is 4 mg/dl with urine osmolality of 700 mosm/kg and urine sodium of 12 meq/L. what is the most likely diagnosis?

a. Pre renal AKI
b. Post renal AKI
c. Renal AKI
d. ATN

Q. Electrician is admitted to ER with burn and passage of red color urine. Labs shows increased CK MM levels with serum creatinine of 4 mg/dl. Which of the following will not be seen in this case



a. Hypocalcaemia
b. Hypokalaemia
c. Hypophosphatemia
d. Hypomagnesemia

Q. Leading cause of renal failure in multiple myeloma

a. Hypocalcaemia
b. Hypercalcemia
c. Bence jones proteinuria
d. Urine beta 2 microglobulin

MCC of post renal AKI

Non oliguric Acute kidney injury is caused by

1. AIN
2. Contrast induced nephropathy
3. Aminoglycosides

Features of tumor lysis syndrome: PUKE Calcium

Renal failure after coronary angiography

Contrast induced nephropathy (iodinated contrast)	**Athero-embolic kidney disease**
Good prognosis KFT returns to normal within 7 days IV hydration N-acetylcysteine **(**	Livedo reticularis Rash Blue toes **Urine _____**

Renal failure after dysentery/ Diarrhoea

Normal sized kidney PS: Schistocytes	Unilateral or Bilateral enlarged kidneys

ECG changes in electrolyte abnormalities seen in kidney disease

Hyperkalaemia	Hypokalaemia

Renal tubular acidosis

Type 1

Causes: _____ and amphotericin B

Mnemonic: **Alpha can't acidify, Stones Fly and potassium says bye**

Defect in alpha intercalated cells	Inability to acidify urine and urine pH>
Impaired function of H-K ATP ase	
Low urinary citrate and alkaline urine	
Can't excrete H+	

Type 2

Causes: Fanconi syndrome, Wilson and multiple myeloma

-Impaired bicarbonate resorption from PCT

-Serum bicarbonate: <15 meq/L

- Salt loss occurs – increased distal sodium delivery- hyperaldosteronism and hypokalemia

Type 4

Cause:

High sugar damages the JG apparatus plus tubulointerstitial fibrosis damages principal cells in collecting duct which is the site of aldosterone resistance

ENac: Resistance to aldosterone

Hyperkalaemia with inability to acidify urine

Electrolytes

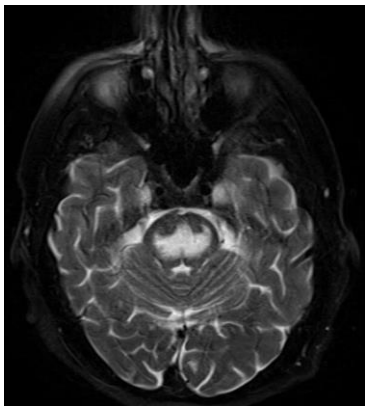
Hyponatremia

Fast correction of chronic hyponatremia leads to stroke like feature called ODS

Symptoms usually appear **2–6 days after correction**

Mild	Moderate	Severe
Confusion Dysarthria Dysphagia	Quadriparesis Spastic paralysis Pseudobulbar palsy	Locked-in syndrome Conscious but cannot move limbs

MRI findings of ODS shows trident sign



Q. 28-year-old male collapses at the finish line of a full marathon conducted in hot weather. He is confused and has a generalized tonic-clonic seizure in the emergency department. On examination: BP: 110/70 mmHg, HR: 96/min. History reveals he consumed excessive plain water during the race. Labs show

- **Serum sodium: 118 mEq/L**
- **Serum osmolality: low**
- **Urine osmolality: elevated**

What is the most appropriate immediate management?

a. Fluid restriction and slow correction with normal saline
b. 3% hypertonic saline bolus (100 mL over 10 minutes)
c. 3% hypertonic saline infusion with slow correction @6 meq per 24 hours
d. Demeclocycline therapy

Q. A 62-year-old chronic smoker presents with fatigue, headache, and progressively increasing confusion for 10 days. He has lost 6 kg over the last 3 months. Examination reveals decreased breath sounds over the right upper lung field and disoriented patient.

Investigations:

- **Serum sodium: 118 mEq/L**
- **Serum osmolality: Low**
- **Urine osmolality: High**
- **Urine sodium: Elevated**
- **Chest X-ray shows a right hilar mass**

What is the most appropriate management?

a. 3% hypertonic saline bolus (100 mL over 10 minutes)
b. 3% hypertonic saline slow correction not exceeding 6–8 mEq/L per 24 hours
c. Rapid correction with normal saline infusion
d. Demeclocycline therapy as immediate management

Q. 55-year-old patient of lung cancer admitted for work up developed seizures. Labs shows Na= 120 meq/L, serum potassium = 4.0 meq/L, Calcium 10 mg/dl. Weight = 60 kg. Calculate the total correction to be given to this case over the next 24 hours?

a. 180
b. 360
c. 600
d. 720

Lab status in SIADH

Serum sodium	**Low**
Serum osmolality	**Low**
Urine osmolality	**High**
Urine sodium	**>40 meq/L due to ANF liberation)**
Volume status	**Euvolemic**

Electrolyte imbalance	Possible leading Cause of death	Intervention
Hyponatremia		
Hypernatremia		
Hypokalaemia		
Hyperkalaemia		
Hypocalcaemia		
Hypercalcemia		
Hypermagnesemia	Asystole, bradycardia and Nm paralysis	
Hypomagnesemia	Ventricular arrythmias and tetany	

Additional Notes

Additional Notes

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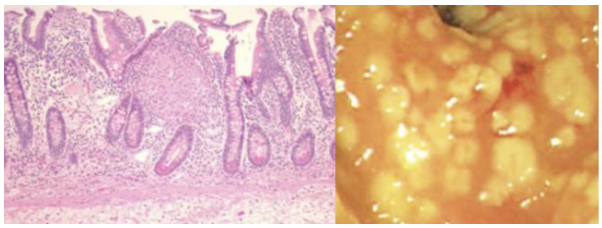
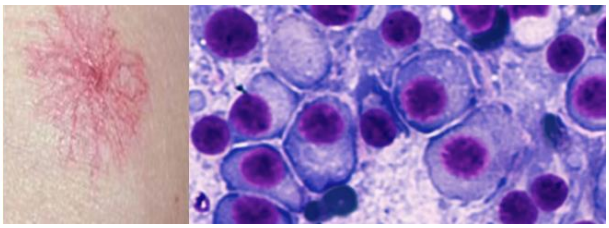



Cause:

Overgrowth of _____

that produce toxins A (enterotoxin) & B (cytotoxin)

Triggers

- Cephalosporins
- Clindamycin
- Fluoroquinolones
- Ampicillin / Amoxicillin

- Prolonged _____ use

Clinical features

1. Profuse watery diarrhea
2. Abdominal pain, fever
3. Leukocytosis
4. Recent antibiotic exposure (oral or IV), often in a hospitalized or elderly patient.

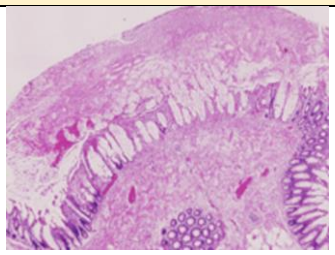
Screening

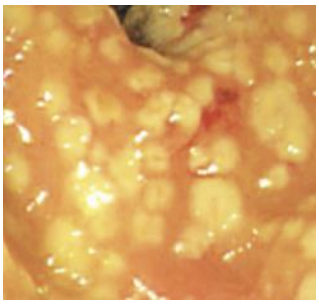
1. Stool _____ antigen
2. Stool EIA for toxin A and B

IOC

Stool

Colonoscopy: Yellow–white raised plaques (pseudo-membranes) with patchy distribution over erythematous mucosa in colon



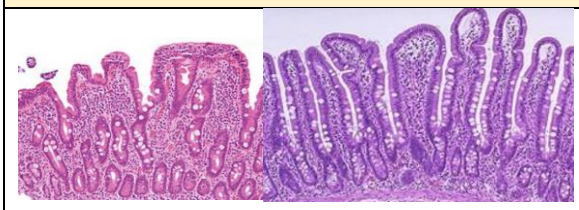


Rx:

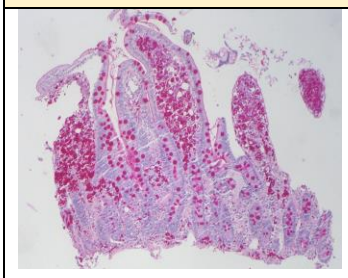
First episode: Fidaxomicin

Severe or relapsed PMC: Vancomycin

Multiple recurrences: Faecal microbiota transplant

 **IOC-** IgA anti-tTG antibody Anti endomysial antibody- **Highest specificity** *If IgA deficient* 1. IgG anti-tTG 2. Anti- Deamidated Gliadin Peptide	BROW is CI HLA DQ2 DQ8 Quinoa, Bajra, maize and rice with iron and Folic acid is given Follow up required for 1. T1 DM 2. DH 3. EATL

IOC for malabsorption: 72-hour fecal fat estimation: > 7g fat (Sudan III stain)

Whipple disease

Cause Chronic diarrhea, steatorrhea, weight loss Seronegative arthritis that precedes GI symptoms Fever Hyperpigmentation **IOC: Duodenal biopsy** -PAS-positive macrophages in lamina propria showing rod shaped bacilli -PCR on blood sample **Rx:** Ceftriaxone TMP SMX **Complications** -CNS cognitive decline -CVS: culture negative endocarditis (Aortic > mitral)

DISEASES OF ESPOPHAGUS

Achalasia cardia

Ba swallow

Shows smooth tapering defect

Bird beak

Sigmoid esophagus

Pathogenesis

Degeneration of inhibitory neurons (NO & VIP–producing) in the myenteric (Auerbach) plexus of the esophagus

Most common cause?

UGIE shows

IOC

High resolution manometry

Chicago classification

Type 1	Type 2	Type 3
Absent peristalsis Incomplete LES relaxation	-Absent peristalsis -Incomplete LES relaxation -Uniform pressurization of entire esophagus	Premature / spastic distal contractions

Type 2 Best response to pneumatic dilatation and

Type 3 worst prognosis

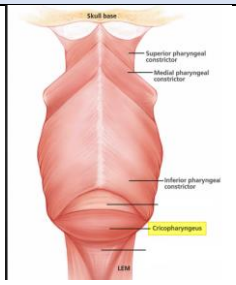
Surgery of choice

1. Heller's myotomy: Longitudinal division of LES muscle fibers to relieve obstruction
2. Partial fundoplication (Dor or Toupet): Added to prevent postoperative GERD

   Effective for all Chicago types, especially Type I & II

	Other procedures 3. PD 4. Botulinum toxin 5. CCB

Zenker diverticulum



Surgery

1. **Dohlman procedure (Endoscopic diverticulotomy)**
2. **Z POEM**

Carcinoma esophagus	
	
	**Simultaneous, non-peristaltic, premature contractions** of the esophagus with **normal LES relaxation**. **Jack hammer esophagus** Hypercontractile esophagus characterized by very high-amplitude, prolonged peristaltic contractions on HRM

Alcoholic develops multiple episodes of vomiting and retching followed by development of chest pain. CXR is shown First differential diagnosis

1. **Mallory Weiss**
2. **Boerhaave syndrome**
3. **Bleeding esophageal varices**

HEPATOLOGY

MC of acute viral hepatitis (adults)	
Virus with highest chances of progression to chronicity	
MC of chronic viral hepatitis	
MC viral of Fulminant viral hepatitis	
MCC of Fulminant hepatitis in pregnancy	
MCC of hepatocellular 167carcinoma	
DOC for Hepatitis B	
DOC for hepatitis C	
DOC for hepatitis D	
MCC of OLT	

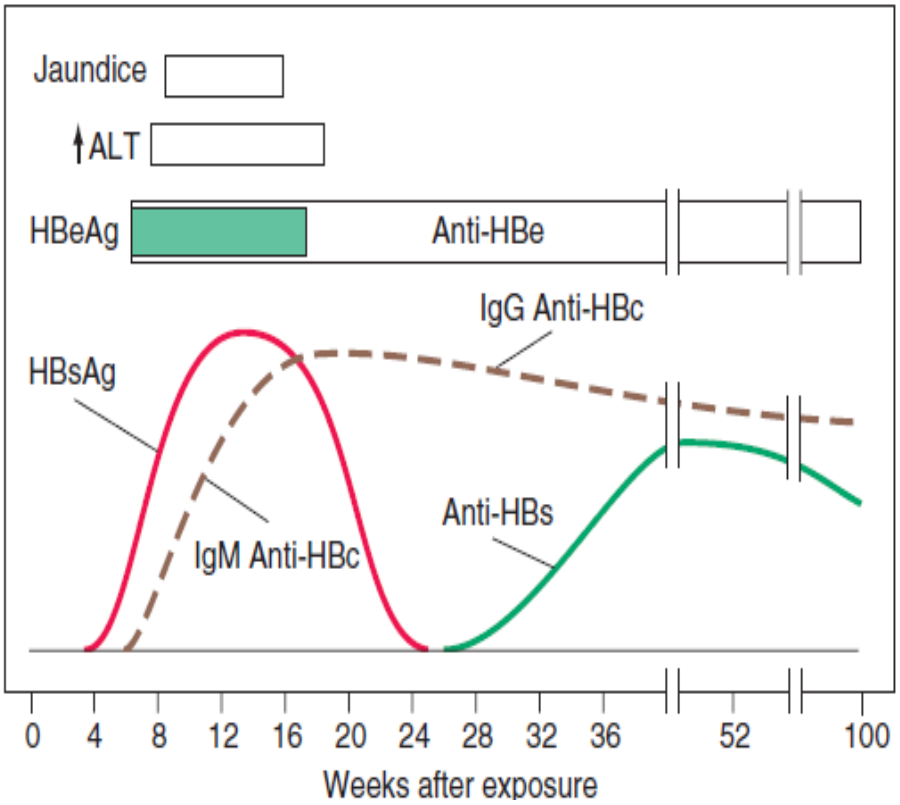
Hepatitis B

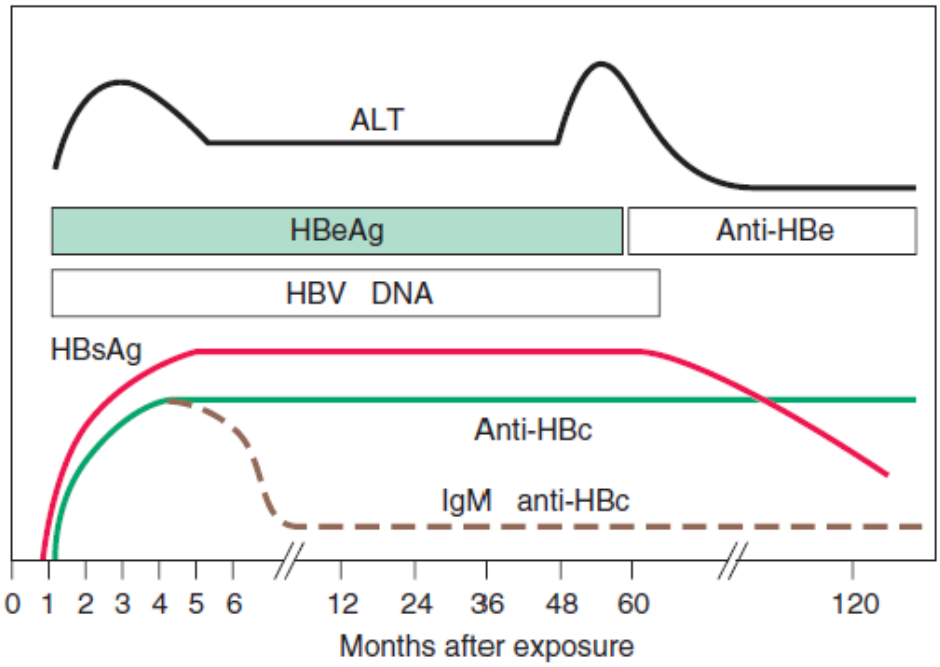
ss/ds DNA virus

Antigens

Antibodies

Serological interpretation





HBsAg	Anti HBs	Anti HBc	HBe Ag	

CIRRHOSIS

-MCC is NAFLD (>5% of hepatocytes showing steatosis)

-MCC of need for OLT IS NAFLD

-Non-invasive imaging for NAFLD is Fibro-scan

-Drugs approved for NAFLD

Resmetirom

MOA: Thyroid hormone receptor-β (THR-β) agonist : ↑ Hepatic fat metabolism and reduces liver fat

Semaglutide (GLP-1 receptor agonist)

Lanifibranor: Pan-PPAR agonist in phase III trials

Scores for severity of cirrhosis

*Child-Turcotte-Pugh Class obtained by adding score for each parameter (total points)
Class A = 5 to 6 points
Class B = 7 to 9 points
Class C = 10 to 15 points

MELD Score	MELD 3.0

Ascites

Serum albumin ascites gradient

SAAG > 1.1 g/dl		SAAG < 1.1 g/dl
Ascitic Fluid Protein < 2.5 g/dL	**Ascitic Fluid Protein > 2.5 g/dL**	
Alcoholic liver disease Portal vein thrombosis Late Budd–Chiari syndrome	CHF Early Budd–Chiari syndrome Sinusoidal obstruction syndrome (veno-occlusive disease)	

Site of ascitic tap in refractory ascites

1. 2cm below umbilicus
2. 2-3 cm above medial to ASIS

Spontaneous bacterial peritonitis

Q. A 54-year-old male with CLD and ascites presents with massive ascites. While in hospital he develops fever, abdominal pain and worsening ascites associated with shortness of breath. Which of the following is correct about clinical diagnosis of SBP?

a. PMN cells > 50 cells/cu.mm in ascitic fluid
b. PMN cells > 100 cells/cu.mm in ascitic fluid
c. PMN cells > 150 cells/cu.mm in ascitic fluid
d. PMN cells > 250 cells/cu.mm in ascitic fluid

DOC for management of SBP = cefotaxime

Prevention of SBP = norfloxacin

Hepatorenal syndrome	**Hepatopulmonary syndrome**
Occurs due to Severe splanchnic vasodilation causing effective arterial volume causing reflex renal vasoconstriction Presents as 1. Oliguria 2. AKI	Nitric oxide–mediated intrapulmonary vascular dilatation Presents as: 1. Platypnea **2.** Orthodeoxia
1. Terlipressin + albumin 2. Midodrine + octreotide + Albumin **3.** Definitive is OLT	

PORTAL HYPERTENSION

MC complication of CLD

Earliest and most reliable examination finding of portal hypertension

Portal hypertension definition is HVPG > _____ mm Hg

HVPG > _____ mm Hg increases risk of hematemesis due to esophageal varices

Source of bleeding in esophageal varices

Portal side = left gastric vein

Systemic vein = azygos vein

Best management for prevention of bleeding from esophageal varices

DOC for prevention of bleeding from esophageal varices

Management of acute variceal bleeding with BP < 90/60 mm Hg

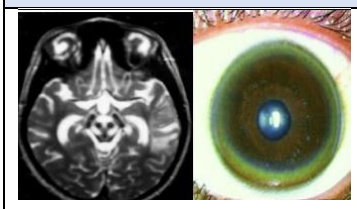
3. Wide bore cannula

4. Massive transfusion

5. Permissive hypotension

6. Octreotide / Somatostatin

7. Endoscopic variceal ligation

Wilson disease	
 Gene Chromosome Inheritance	**Defect** **C/F: Mnemonic- COPPER** **Chronic hepatitis** **Ocular features** **Psychiatric features** **PD like features** **EPS** **Renal tubular disorder** **Screening** **IOC** **1st line drug**

Additional Notes

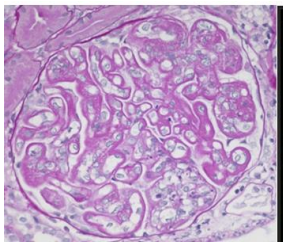
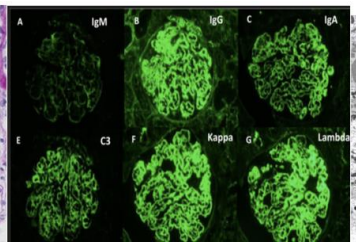
Additional Notes

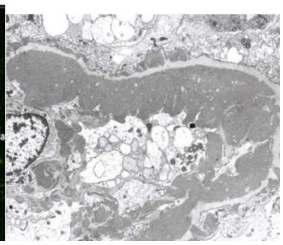
Additional Notes

Additional Notes

RHEUMATOLOGY

Systemic lupus erythematosus



- Type _____ HSR
- Must have criteria for diagnosis is _____
- MC body system involved is _____
- Type of arthritis seen is non erosive polyarticular involvement
- MC Type of anemia is _____
- MC type of anemia taken as diagnostic criteria is _____
- Leading cause of death after decade _____
- Leading cause of death in first decade of diagnosis is _____

Drug induced lupus erythematosus

- ✓ _____ male ratio
- ✓ Renal involvement and CNS involvement is rare
- ✓ Causative drugs are

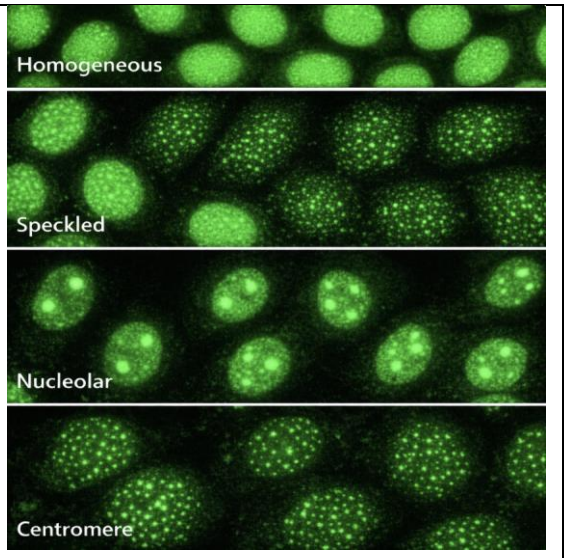
  H

  I

  P

  Methyldopa, minocycline and Quinidine

ANA Patterns

Homogenous **Uniform bright staining**	Anti ds DNA, Anti histone	
Specked **Granular dots in nucleus**	Anti-sm and anti RNP, SSA SSB	
Nucleolar	Anti Scl-70 for scleroderma	
Centromere **Polka dot nucleus**	Anti centromere CREST	

Q. Male female ratio of 1:1 in seen in which of the following?

a. Systemic lupus erythematosus
b. Discoid lupus erythematosus
c. Drug induced lupus nephritis
d. Lupus nephritis

Q. Young female presents with following lesion that worsen after hot drinks and going in sunlight

a. SLE
b. DLE
c. Scleroderma
d. Acne rosacea

Scleroderma

- Screening test for SSc is _____

_____ is the earliest and most common extra cutaneous manifestation of scleroderma

- High risk of B-cell NHL

-Leading cause of death in Scleroderma is _____

- DOC for scleroderma crisis is _____

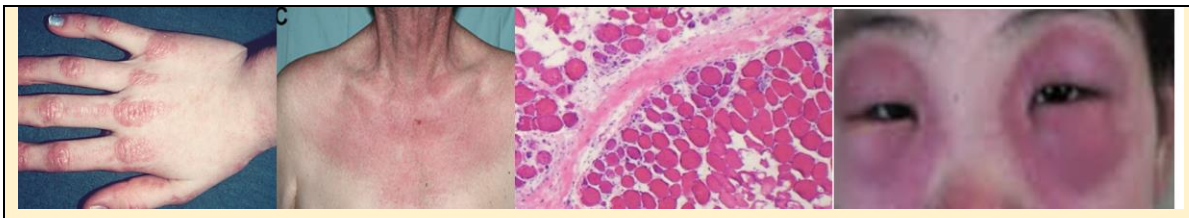
-Scleroderma renal crisis is associated with anti _____ ___antibody

CREST syndrome

Antibody of choice is Anti centromere antibody

Esophageal dysmotility more common than in SSc

Dermatomyositis



Most specific antibody seen is anti _____

Anti PM-Scl antibody is associated with PM with scleroderma overlap

Most specific antibody associated with malignancy seen in dermatomyositis is_____ also called anti 155/140

Anti MDA-5 associated with rapidly progressive ILD

Initial investigation to be done is CK levels

Increased risk of _____cancer in dermatomyositis

Clinical features

D – Difficulty climbing stairs (proximal muscle weakness)

E – Elevated CPK

R – Rash (heliotrope rash)

M – Malignancy association

O- Gottron papules

S- Shawl sign

Mixed connective tissue disorder

Required

- Anti-U1

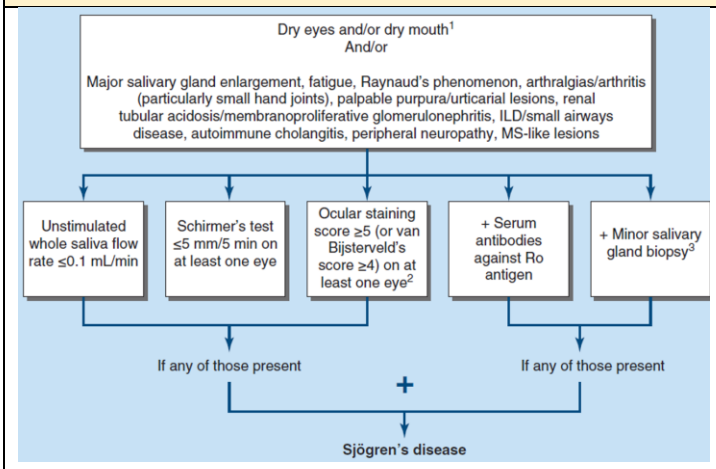
  _____antibody

Clinical overlap features from ≥2 diseases:

- **SLE-like:** arthritis, malar rash, serositis
- **Scleroderma-like:** Raynaud, sclerodactyly
- **Polymyositis-like:** proximal muscle weakness, ↑ CK

Sjogren syndrome

Mnemonic: USE_ROME



-HLA DR3 association

-Secondary sjogren is associated with Rheumatoid arthritis

-Extraglandular involvement seen is arthritis

Risk of lymphoma is ~5–15× higher than general population

Most common type: Extranodal marginal zone lymphoma (MALT) of salivary glands

Typically arises in parotid gland

Anti synthetase syndrome


antibodies against **aminoacyl-tRNA synthetases** (most commonly **anti-Jo-1**).

Classic core features

-Inflammatory myopathy (PM or DM phenotype)

-Interstitial lung disease (most important cause of morbidity)

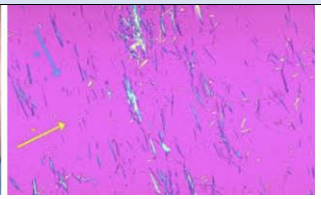
-Non-erosive arthritis

-Raynaud phenomenon

-Mechanic's hands (hyperkeratotic palms)

Arthritis

Gouty arthritis

Crystals of

Triggers

- HTN with Thiazides
- ATT
- Alcohol binge with non veg

C/F

-Fever with difficulty in ambulation

-Severe pain at base of big toe/ ankle / knee

IOC

DOC

Chronic gout

-Tophi


-Nephrolithiasis

Work up

Rx

Allopurinol is CI

Pseudo gout

MC joint involved

Polarized microscopy features

Rx:

Polarized microscopy cannot identify crystals of calcium oxalate

High dose salicylates don’t cause uric acid retention

Martel sign is seen in chronic gout and is called rat bite erosion

USG findings of MTP involvement is called double contour sign

Extra mile

Factors precipitating gout

Mnemonic: **CAN LEAP**

Cyclosporine

Alcohol binge and Aspirin low dose

Niacin

Lasix and Thiazides

Ethambutol

Alcohol

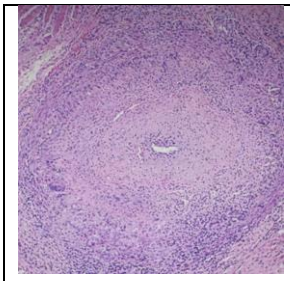
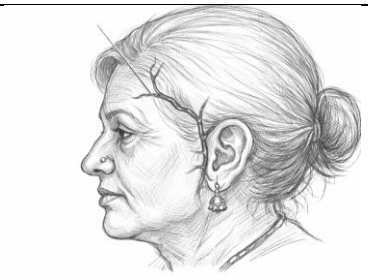
Pyrazinamide, purine rich diet

MCC of vasculitis in adults:

MCC of vasculitis in children

Giant cell arteritis

	
HPE features Skip lesions seen Granulomatous inflammation that involves the media and intima Multinucleated giant cells seen adjacent to the internal elastic lamina Fragmentation of internal elastic lamina	S – Scalp tenderness C – Claudication of jaw (jaw claudication) O – Old age (>50 years) P – Polymyalgia rheumatica association E – ESR elevated

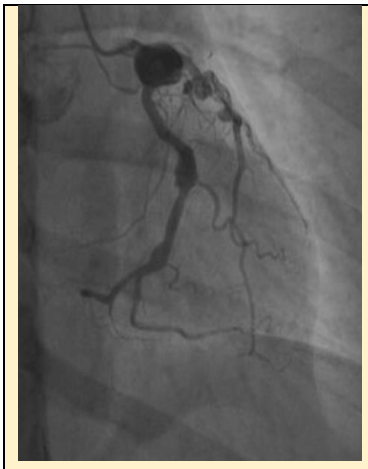
- ***Start steroids before biopsy***

- ***High-dose glucocorticoids are started as soon as GCA is suspected to prevent irreversible vision loss***

- **Major complication:**
  Irreversible blindness due to ischemic optic neuropathy

Kawasaki disease

Life-long aspirin if *large* coronary artery aneurysms are detected



Mnemonic:

Fever > 5 days plus

Conjunctivitis

Rash

Adenopathy

Strawberry tongue

Hand and feet skin desquamation

Henoch Scholein purpura

Palpable purpura

Abdominal pain and hematochezia (ileo-ileal intussusception)

Arthralgia

Renal involvement (may occur)

Work up:

C3 is normal and Ig A is elevated

Rx

Steroid given for renal and GI involvement with bleeding

Additional Notes

Additional Notes

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