Infective Endocarditis: is the colonisation of the heart valves with microbiologic organism, leading to the formation of friable, infected vegetation ↳ frequently valve injury.

- Acute → High virulence
- Sub-Acute → low virulence

→ high chance of emboli formation

[I.E. organism]

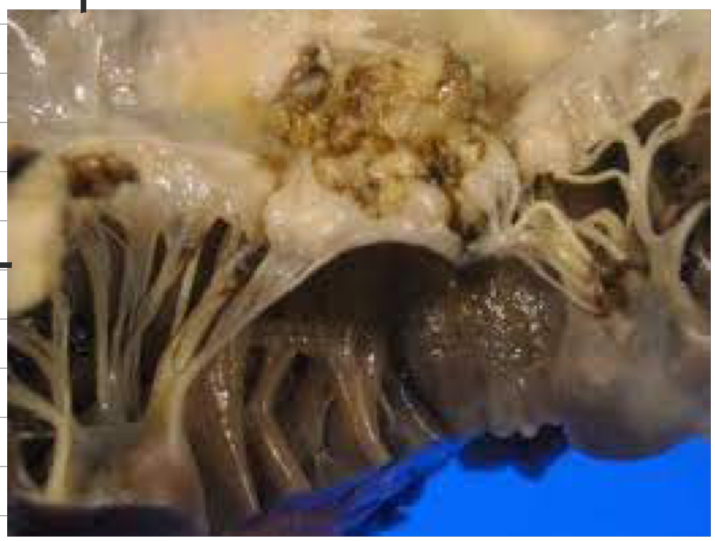
- **Native**
  - Community Acquired
    - Staph aureus (infants)
    - Streptococci (overall)
  - Nosocomial → S. aureus
- **Prosthatic valve**
  - <1 year → S. epidermidis (= coagulase neg.)
  - >1 year → Streptococci
- **I/v Drug Users**
  - Right side Heart → Straph aureus (overall)
  - Left side → entero-coccus

Q. M/C organism causing Endocarditis → S. aureus

Q Acute infective endocarditis ī Abscess formation: → S. aureus

Q infective endocarditis in Austrian Syndrome is: Streptococcus Pneumoniae.

- Austrian Syndrome or Osler's triad Represents an association of:
  - Pneumonia
  - meningitis
  - infective endocarditis



Q. m/c lesion predisposing to IE is?

↳ Mitral value Prolapse ī MR

Q. Cardiac lesions at highest risk of occurence of IE?

↳ High pressure areas cardiac lesions.

↓

AS, AR, MR, VSD, TOF, PDA, coarctation of Aorta.

- Low risk lesions : MVP ± out MR
  ASD

Q. Bacterial colonies → Basophilic stippling.

↳ are present in fibrinous exudate appear dark purple.

Q. Diagnostic criteria

↳ 2 major criteria
↳ 1 major + 3 minor
↳ or all 5 minor criteria.

DUKE CRITERIA BE-FEVEER

MAJOR

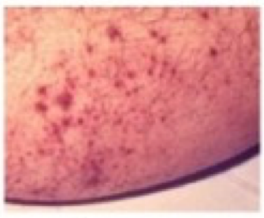
- B-BLOOD CULTURE +VE >2 TIMES 12 HOUR APART
- E- ENDOCARDIAL INVOLVEMENT FROM ECHO

MINOR CRITERIA

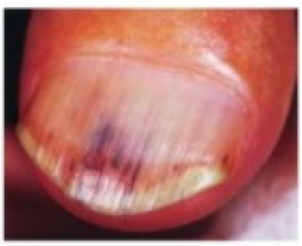
- F- FEVER (m/c feature)
- E- ECHO FINDING NOT MAJOR
- V- VASCULAR PHENOMINA
- EE- EVIDENCE FROM MICROBIAL /IMMUNOLOGICAL- 2 EVIDENCE
- R- RISK FCTOR FOR IE VALVE DISEASE /CONGEITAL DRUG ABUSER

Endocarditis: Physical Presentation

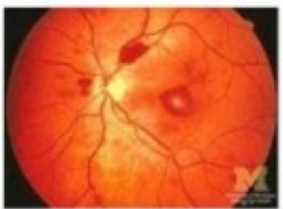
- *Petechiae:*



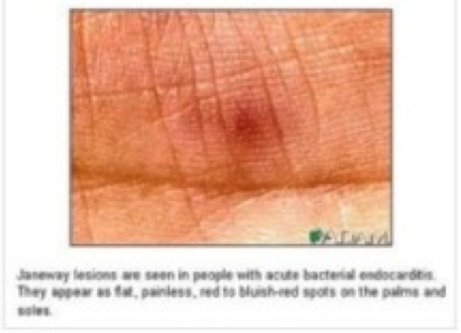
- *Splinter hemorrhages:*



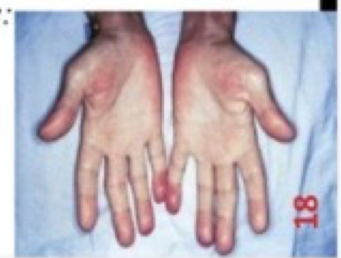
- *Roth spots:*



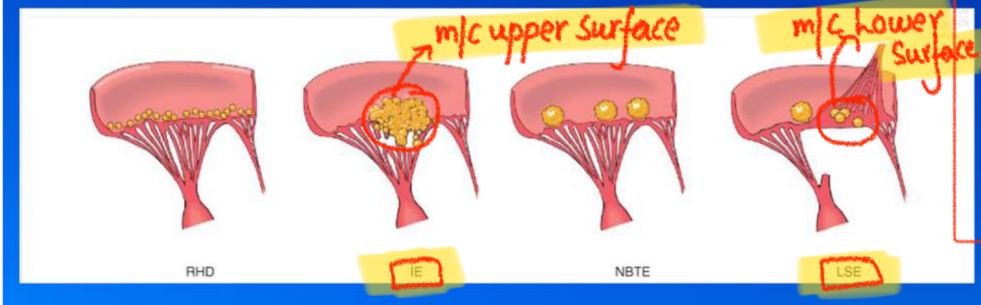
- *Janeway lesions:* — Non-Tender



- *Osler nodes:* (Tender)



Types of vegetations



RHD	IE	NBTE	LSE
Small,Firm, Friable	Large, bluky, irregular	Small friable	Medium sized flat verrucous
Along the lines of closure	Valve cusps and mural endocardium	Along the lines of closure	Both surface of valves involved

Max. embali

a/w Hypercoagulable condition

Duke Criteria – IE

Duke Stage for – Ca. Rectum

Duke Score for – Chronic Stable angina

Indication for Surgical Management

- failure of medical Rx
- Myocardial or valve ring Abscess
- Aortic Valve endocarditis developing Heartblock
- Prosthetic valve endocarditis
- Presence of Large vegetation ↑ possible embolism.
- Fungal endocarditis
  ↳ Life long Amphoteresin B treatment.

Treatment

S. aureus	Naficillin +gentamycin and rifampicin X 8 weeks *rifampicin kills staphylococcus adherent to foreign material MRSA= add vancomycin
HACEK	Ceftriaxone X 4 weeks
Enterococci	Penicillin G + gentamycin X 4 weeks
Penicillin sensitive S. bovis	Penicillin G + ceftriaxone X 2 weeks
Penicillin resistant S. bovis	Same as above for 4 weeks

Liddle Syndrome : Autosomal Dominant

Mutation : SCNN1B and SCNN1G gene.

- Gain of function mutation : ENaC
  - epithelial Sodium channel in collecting duct
- Consequence : ↑↑absorption of Sodium into blood
  - Hypertension
    - Aldosterone Suppressed
  - K^+ loss in urine
    - Hypokalemic Alkalosis

- Also known as : Pseudo - Hyperaldosteronism.
  - Hypertension
  - Hypokalemic alkalosis
  - low aldosterone levels

Rx: Amiloride
(ENac Blocker)

Inherited tubular disorder

- Polyuria
- failure to thrive
- Hypokalemic Alkalosis

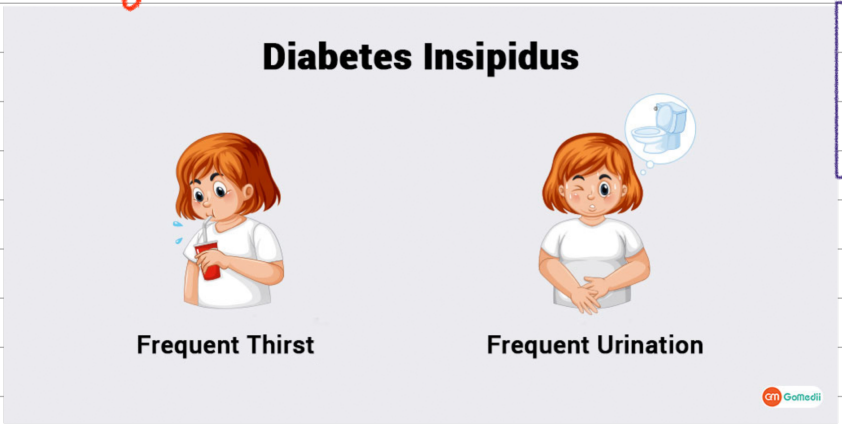
Bartter Syndrome	Gitelman Syndrome	Liddle Syndrome.
• Normal BP	• Normal BP	↑↑ BP
• Hypercalciuria	• Hypomagnesemia	

Diabetes Insipidus:

- Central Diabetic insipidus (CDI)
- Nephrogenic Diabetic insipidus (NDI)

Central: Anti-diuretic Hormone ↓, Receptors are normal

Nephrogenic: ADH ↑, but Receptors malfunction



C/F: Polydipsia
- Polyurea

Check for:
1. Urine Osmolality: diluted
2. Plasma osm.: Concentrated
3. Na^+ Conc.: Na → Here water is lost (H_2O) ↓ ∴ ↑ Hypernatremia
4. water deprivation test ↓
   - in a normal person, after Urine deprivation test → urine Conc. ↑↑
   - But in diabetes insipidus even after UDT → Urine is diluted

→ Diabetes insipidus

Rx: CDI → Desmopressin

NDI → Thiazide

Causes of Central Diabetes insipidus

Pearl #PM1534 • Medicine

- Neoplasms:
  - **Pituitary adenomas** (most common)
  - Meningioma
  - Metastasis from lung and breast cancers
- Infiltrative:
  - Sarcoidosis
  - Langerhans cell histiocytosis
- Genetic:
  - Wolfram syndrome
  - Hand-Schuller-Christian disease
- Infections:
  - Chronic meningitis
  - Viral encephalitis
  - Toxoplasmosis
- Inflammatory:
  - Granulomatosis with polyangiitis
  - Lupus erythematosus
  - Scleroderma
- Vascular:
  - Sheehan's syndrome
  - Aneurysm (internal carotid)
- Head injury (closed and penetrating) including pituitary surgery
- Snakebite
- Lymphocytic hypophysitis

Defibrillator

refers to asynchronous discharge of electric current to the myocardium and is indicated for pulseless ventricular dysrhythmia.

Indication: Ventricular fibrillation (VF)
Pulseless VT

Types of Defibrillators:
- External defibrilator
- Internal defibrillator
- Automated external defibrilator
- Internal cardiovertor "
- Wearable cardiovertor defibrilator

Automated External Defib.

Steps:
- Patient unconcious
- Call for Help
- Scene Safety
- Assess for pulse & respiration
- If absent
- Start CPR
- Assess for shockable rhythm
- pulseless VT/VF defibrillation

Pre-checks: Ensure:
- Patient is not on ICD
- Metallic objects / transdermal patches removed
- Power source off

ECG changes in Hyperkalemia and Hypokalemia

K^+ – Relexes
Ca^{2+} – Contracts

T wave amplitude ∝ K^+ values.

Hyperkalemia:
1. Tall Tented Twave
2. ST Segment ↑
3. P wave ↓/⊖, PR prolonged
4. qRS: Broad
5. Sine wave pattern

DOC

Rx:
- inj. calcium Gluconate / calcium chloride
- Insulin Drip (sends k^+ inside the cell) → ↓k^+ 0.5–1 meq/hr) → helps in redistribution of k^+
- Salbutamol nebulization. (most effective drug)
- Furosemide: Kaliuria → helps in excretion of k^+
- Hemodialysis: Most effective Rx.

Q. Death in Hyperkalemia is due to: Diastolic Arrest ($k^+ > 8$)

P wave absent in:
- Hyperkalemia
- Sick Sinus Syndrome
- Atrial fib.

Hypokalemia: Death due to diaphram paralysis

1. T wave ↓/⊖/inverted
2. ST ↓
3. P wave ↑ amplitude
   (Pseudo-P-pulmonale → P wave >2.5mm in absence of pul. artery HTN.
4. Prominent U wave
5. Prolonged QT,
   Prolonged PR
   ↓
   Seen in both $K^+ \uparrow$, $K^+ \downarrow$

Rx: • KCl + i/vF
• Peripheral line rate of administration
↓
20-40 meq/hr

Q. T wave invertion/↓/⊖
↓
Hypokalemia
NSTEMI
Unstable Angina

Prolactinoma → m/c functional tumors

• Serum prolactin level >200 mcg/L ≡ , >200 ng/ml
• m/c pituitary adenoma
(α subunit of FSH secreting tumor > Prolactinoma, though clinically irrelevant)

• Prolactinoma <1cm (majority) called microadeno-ma.
• 1-4cm called macroadenoma
• >4cm called giant prolactinoma.

Clinically Relevant tumors:
↓
Prolactinoma > GH secreting adenoma > ACTH adenoma

Fasting prolactin level corresponds to the size of the tumor.

Epidemiology:
• Women of Reproductive age group
• Rare in children
• Microadenoma F:M, 20:1
• Macroadenoma F:M, 1:1
• Giant prolactinoma M:F, 9:1

• <25 ng/ml – Normal
• 25-200 ng/ml
↓
micro → Drug induced / Prolactinoma / Stark effect
• >200 ng/ml
↓
macro → typically seen in prolactinomas.

Q. Drugs which are responsible for prolactin levels >200 ng/ml
- Typical anti-psychotic
- Resperidone

C/F presentation

Females

- m/c ↓ galactorrhea / amenorrhea syndrome in reproductive age.
- Secondary amenorrhea
- Hypogonadism / Luteolysis features

Males

Loss of Libido, erectile dysfunction, gynecomastia.
Overlooke most of the time, Hence male mostly present late ↓ mass effects

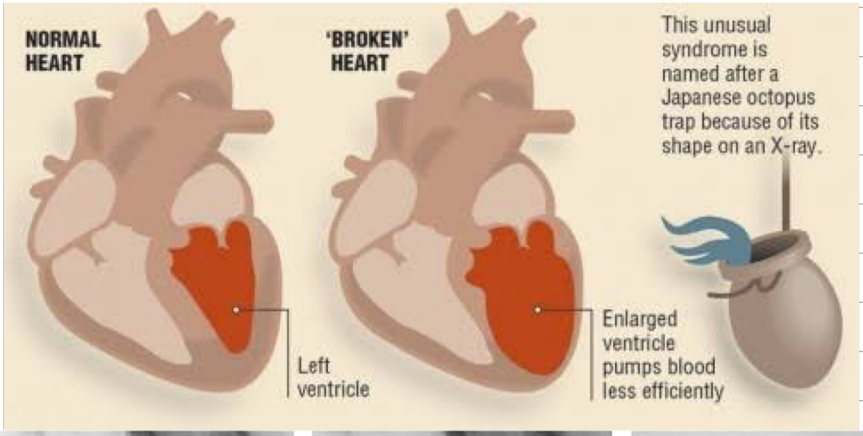
osteopenia / osteoporosis of spine, insulin resistance are common to both male & females

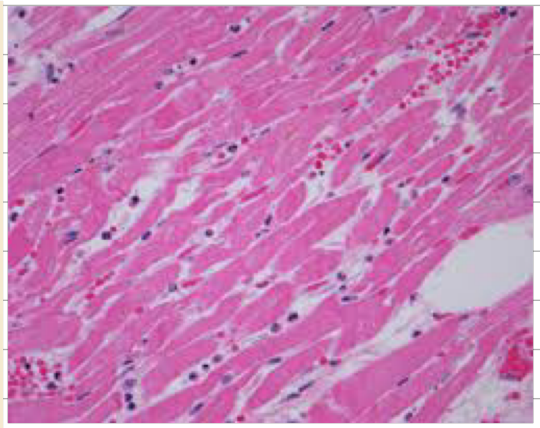
Takotsubo Cardiomyopathy

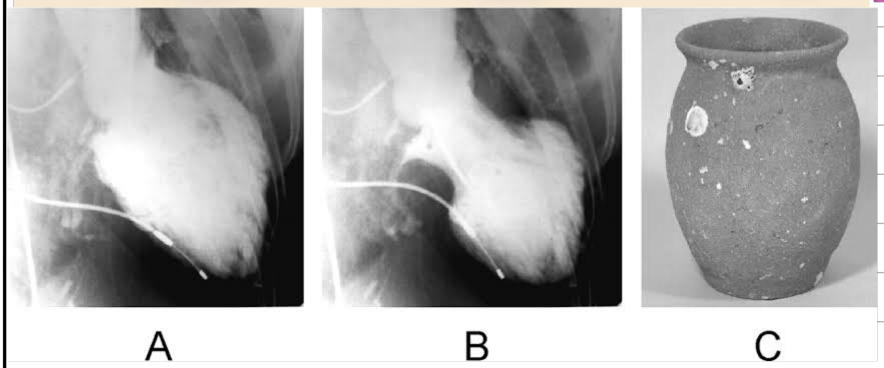
↓

- Type of Dilated cardiomyopathy.
- aka: Broken Heart Syndrome.

- Due to sudden intense emotional stress, there is release of large amounts of catecholamines. These catecholamines cause the Selective ballooning and hypertrophy of the left ventricles.







A B C

Myasthenia Gravis

"Muscle" "weakness" "Grave"

→ • Autoimmune Disease affecting skeletal muscle, extraocular m/s.

Controls
- Eyelids → Ptosis
- movement of the eye → Diplopia

Patient wakeup (feeling fine)

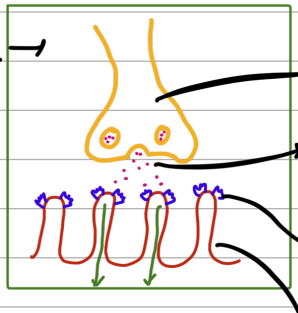
↓

But End of the day (feeling weak)

Sometimes from Repetitive movement (e.g. chopping vegetables)

• MG preferentially affects → young women in 20-30s
→ older man in 60-70s

Normally →



- Motor neuron Releases
- Acetylcholine (which binds to)
- Nicotinic Ach receptors (on)
- Muscle cell membrane → * Muscle contraction

In MG:

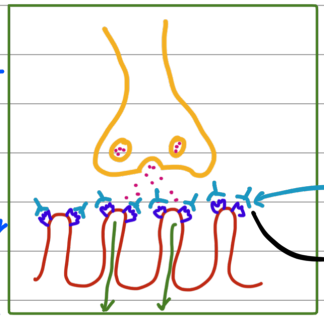
↓

Type II Hyper-sensitivity

↓

- Cytotoxic injury
- Mediated by Autoantibodies

Against (specific for our own cells or proteins)



- B-cell inappropriately make antibodies
  - also targets Classical complement pathway → Leading to inflammation and muscle cell destruction
- antibodies Binds to nicotinic Ach receptors.

∴ Ach is unable to Bind I Nicotinic receptors

↓

∴ m/s don't respond to contract signals.

• Myasthenic Crisis : • Life threatening
• e.g. ↓ function of Breathing m/s.

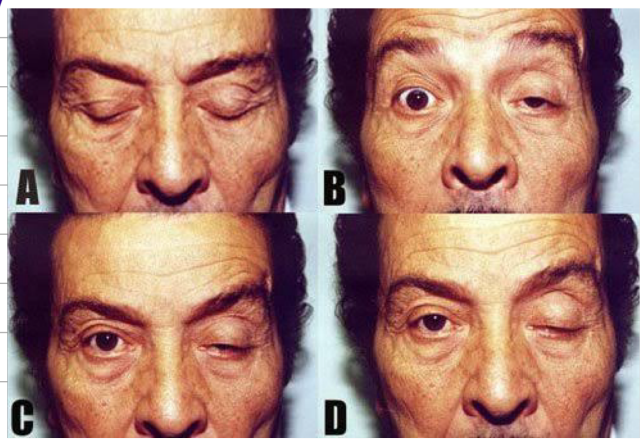
Rx: * Acetylcholinestrase inhibitors (Neostigmine or Pyridostigmine)

↓

- Stops Breakdown of Ach.
- ↑ Concentration of Ach.

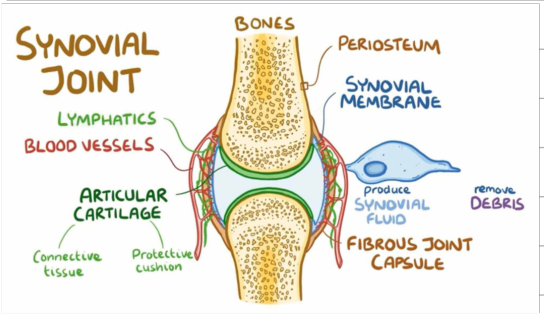
* Immunosuppressive drugs (Prednisone)
↳ ↓ production of autoantibodies.

* Surgical removal of Thymus
↳ ↓ muscle weakness



Rheumatoid Arthritis → is a chronic inflammatory disorder which primarily affects joints but can also involve other organ system: Skin, Lungs

- Musculoskel-etal illness
- Joints
- inflammation



- Inflammatory arthritis
- B/L symmetrical
- Polyarthritis
- Small joint >> Large joint
- Peripheral >> Axial
- Upper limb >> Lower Limb

→ Chronic inflammatory multisystemic peripheral polyarthritis

- X-ray - Erosive, • CRP- >50 mg/dl
- Risk of RA ↑ >40 years of age.
- F>M, F:M - 3:1

Factors:

1. Genetic and environment susceptibility:
   - HLA DR4
   - HLA DR1 - Slightly ↑ Risk
   - HLA DR3, HLA DR5, HLA-DR27 alleles are protective.
   - Smoking is the strongest environmental risk factor and smoking is also ↑ Risk for ILD in RA.

2. Auto-antibodies

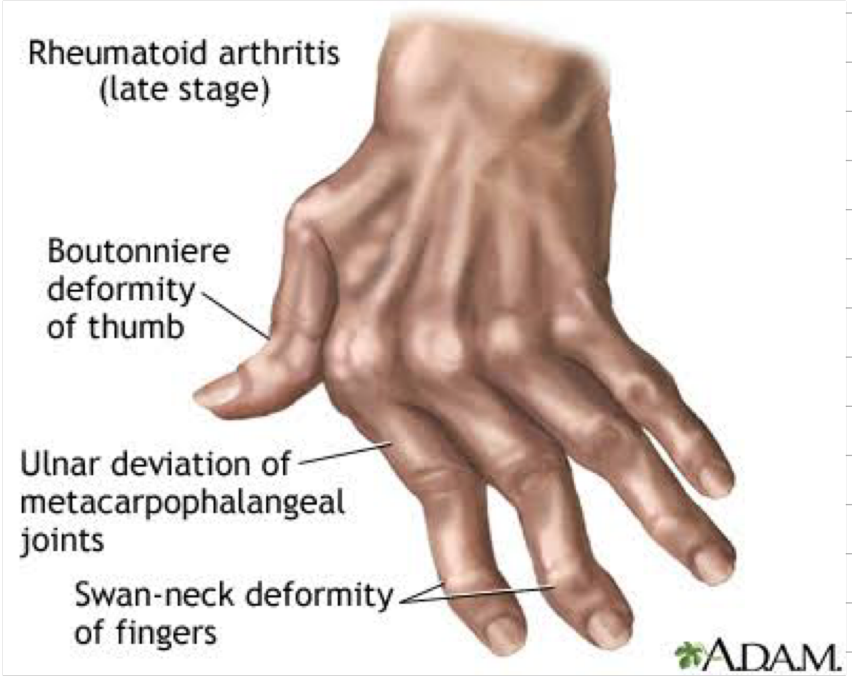


Table I: 2010 ACR/EULAR Classification Criteria for RA	
Joint Involvement	**Score**
1 large joint	0
1-10 large joints	1
1-3 small joints	2
4-10 small joints	3
> 10 joints	5
Serology	
Negative RF and negative ACPA	0
Low-positive RF and low-positive ACPA	2
High-positive RF or high-positive ACPA	3
Acute-phase reactants	
Normal CRP and normal ESR	0
Abnormal CRP or abnormal ESR	1
Duration of symptoms	
< 6 weeks	0
> 6 weeks	1

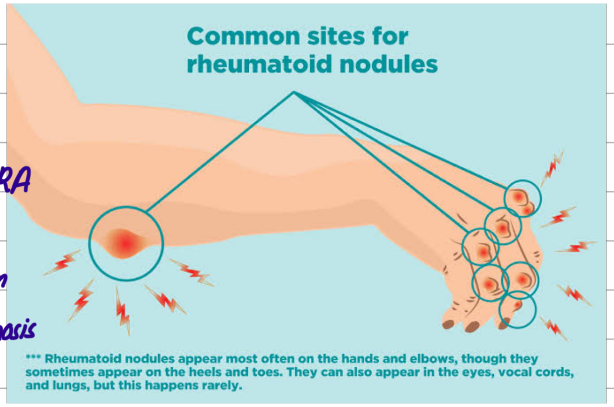
A patient with score of > 6 is classified as having rheumatoid arthritis (RA).
ACR is the American College of Rheumatology
EULAR is the European League Against Rheumatism
ACPA is anti-citrulliated protein antibody
CRP is C-reactive protein
ESR is erythrocyte sedimentation rate

Classification of RA :

- VERA - very early RA - with in 1st 3 months
- Early established RA - within 1 year
- Late established RA - 1-2 year
- Chronic stabilized RA - After 24 months

• Extra Articular Manifestation of RA

1. Cutaneous manifestation : Rheumatoid nodule
   - m/c extra articular manifestation of RA
   - occurs m/c in elbow or friction sites
   - Painless nodul and late manifestation
   - a/w ↑ disease activity and poor prognosis



2. Ocular System :
   - Most common ⟶ Dry eye.
   - most characteristic manifestation is scleritis.
   - Uveitis is not seen in RA.

3. CVS and vascular manifestations :
   - m/c/c of death in RA is MI.
   - m/c CVS manifestation is Pericarditis ↓out effusion.
   - m/c valvular lesion : Mitral regurgitation.

4. GIT : Long standing RA :
   - Petechiae
   - Purpura
   - Splinter Hemorrhages

   } Small vessel vasculitis

5. CNS involvement :
   - Entrapment neuropathy
     m/c Carpal Tunnel Syndrome

6. Renal :
   - m/c renal manifestation : NSAID induced AKI
   - Longstanding RA produces ⟶ 2° Amyloidosis

7. Skeletal ⟶ osteoporosis
8. Endocrine ⟶ Hypoandrogenism
9. Hematological ⟶ Anemia of chronic disease

DOC ⟶ DMARDS (Disease Modified Anti-Rheumatoid Drugs but take 6-8 weeks to achieve target therapeutic level)

- Methotrexate 2.5 mg weekly twice alone (upto 20mg wkly dose)
- Remaining 5 days folic acid
- Monitor CBC, LFT

or

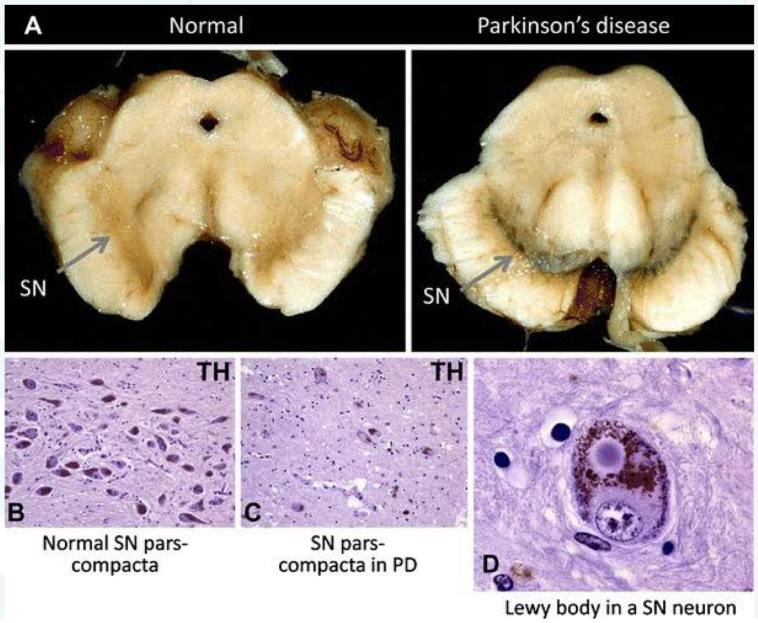
Methotrexate + Sulfasalazine + Hydroxychloroquine.

Parkinson's disease

- is a neurogenerative disease. → affects movement.
- Pathogenesis: • Gain of function mutation in LRRK gene.
  • Mutation involving the over expression of α-synuclein.
- Gross appearance: Pale substantia Nigra.
- On microscopy: Lewy bodies seen, composed of α-synuclein.

Medical treatment of Parkinson's disease

Increase dopaminergic action	Anti cholinergics
Dopamine precursor	**Anti muscarinic**
Levodopa	Benzhexol (trihexyphenidyl)
Dopa decarboxylase inhibitor	Benztropine
Carbedopa	Procyclidine
Benserazide	**H1 antagonist**
Dopamine agonist-Ergot derivatives	Promethazine
Bromocriptine	Orphenadrine
Cabergoline	Diphenhydramine
Pergolide	
Lisuride	
Dopamine agonist-Non ergot derivatives	
Ropinirole	
Pramipexole	
Rotigotine	
Apomorphine	
Dopamine facilitator	
Amantadine	
MAO-B inhibitor	
Selegiline	
Rasagiline	
COMT inhibitor	
Tolcapone	
Entacapone	



Normal SN pars-compacta | SN pars-compacta in PD | Lewy body in a SN neuron

Four cardinal features of Parkinson disease

- Bradykinesia
- Tremors (Resting)
- Rigidity
- Gait and Balance issues

Must have **Bradykinesia**

Any **one** of below

1. Tremors
2. Rigidity
3. Gait and Balance issues

Wilson's Disease Gene Defect: ATP 7B on chr. 13.
This gene codes for P-type adenosine triphosphatase.

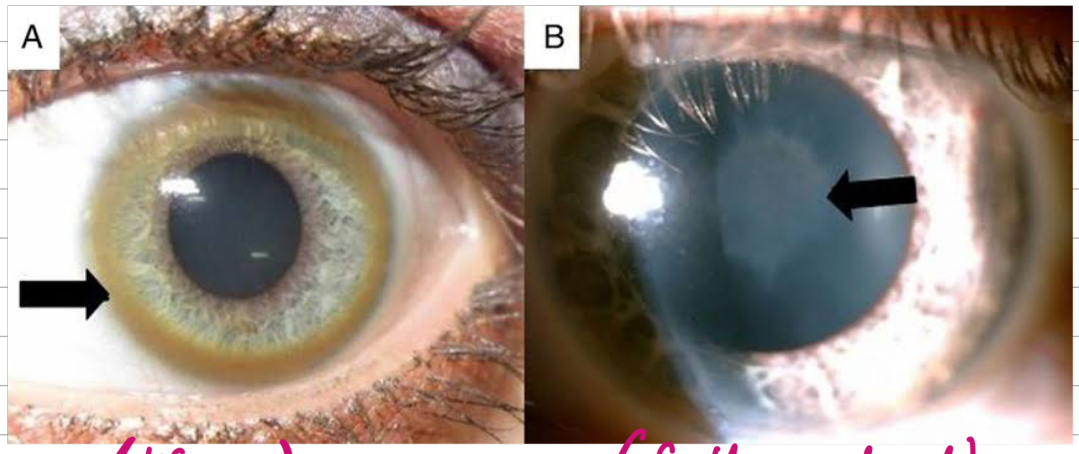
- Impaired excretion of Cu^{2+} in the bile leading to accumulation of Cu^{2+} in Liver.
- ↑ levels of unbound / free Cu^{2+} in the blood (toxic)

Clinical features: - Chronic Liver Disease, cirrhosis of liver (in >1-2 yrs old)
- Kayser-Fleischer ring in cornea.
- Sunflower cataract.
- Neurological → 1. Basal ganglia # → Abnormal movements, tremors, seizures.
2. Psychiatric Manifestation.

Ix: Screening → • Urine Cu^{2+} (↑)
• S. ceruloplasmin (↓)
Confirmatory → • Liver biopsy: • Mallory-Hyalin bodies (not very specific)
• Macrovesicular steatosis

Rx: • Cu^{2+} chelating agents → • D-penicillamine: DOC in children
• Trientene.
• Zinc
• CLD / cirrhosis: Liver transplantation.

* Chronic use of D-penicillamine leads to deficiency of Vit B6.



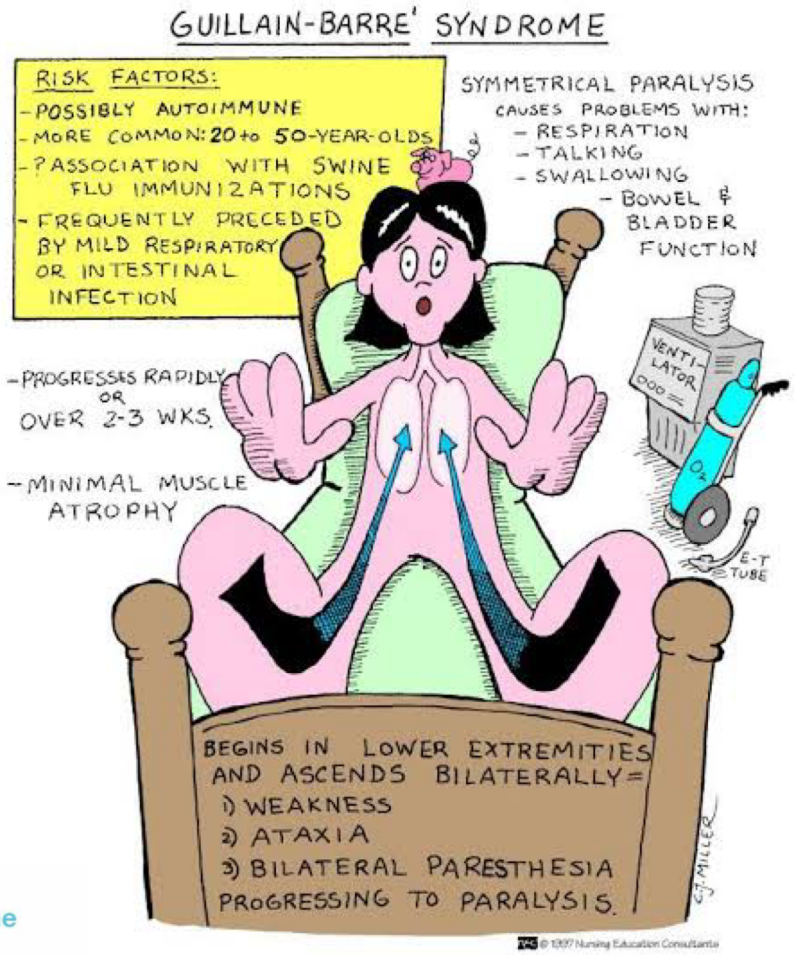
(KF ring) (Sunflower cataract)

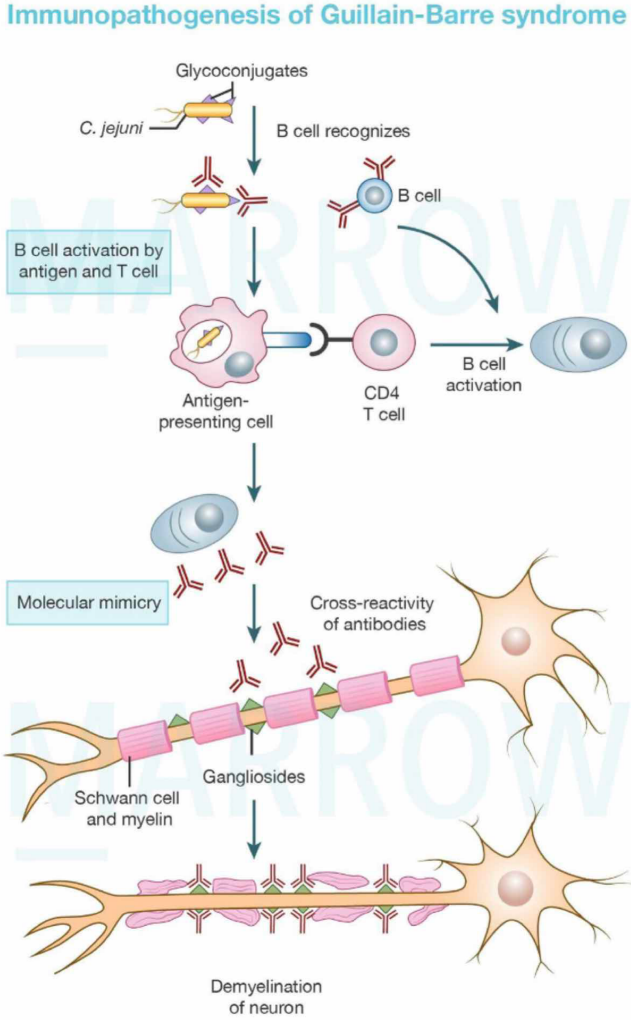
Guillain-Barre Syndrome

In Guillain-Barré syndrome, the body's immune system attacks part of the peripheral nervous system. The syndrome can affect the nerves that control muscle movement as well as those that transmit pain, temperature and touch sensations. This can r-esult in muscle weakness and loss of sensation in the legs and/or arms. It is a rare condition, and while it is more common in adults and in males, people of all ages can be affected.

- Acute presentation, b/L polyradiculo-neropathy
- Autoimmune cause.

- The most common subtype is acute inflammatory Demyelinating Polyradiculo-nephropathy.



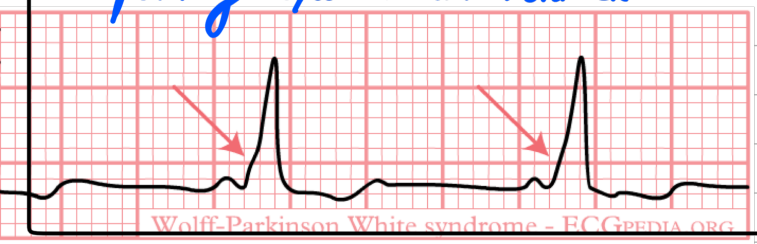


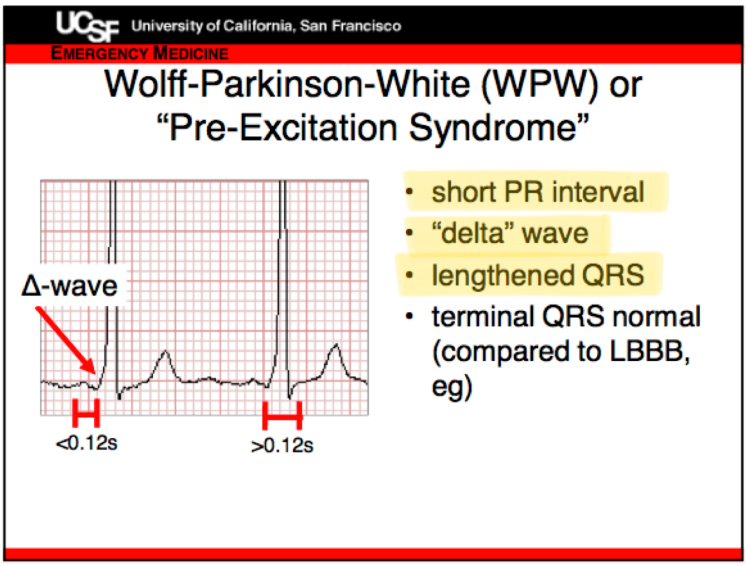
Types	Antibodies
Acute inflammatory demyelinating polyradiculo-Neuropathy (m/c) (AIDP)	Anti-GM1 antibodies
Acute motor axonal neurop. (AMAN)	Anti-Gd1a antibodies
Acute motor sensory axonal neuropathy (AMSAN)	• Poor prognosis • axonal variant —
Miller Fisher Syndrome	• ophthalmoplegia, Areflaxia, Ataxia, Demyelinating — Anti Gq1b antibodies

WPW Syndrome :

Wolff-parkinson White syndrome / "Pre-excitation syndrom"

→ Characterized by presence of an accessory pathway b/w atria and ventricles.





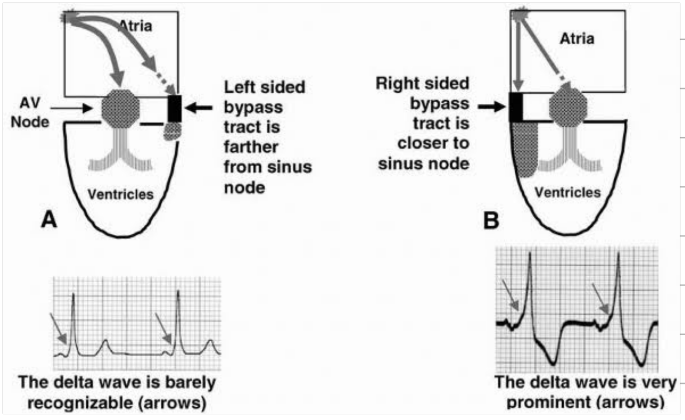
Management of WPW Syndrome :

Concealed WPW

- AVRT → Adenosine → Electrophysiologist
- A-fib → Synchronised DC Cardioversion

Manifest WPW (Catheter ablation (if an incidental finding on ECG))

- AVRT → Adenosine → Sinus rhythm → δ wave → Electrophysiologist
- A-fib → Synchronised DC Cardioversion → Sinus rhythm → δ waves → Electrophysiologist



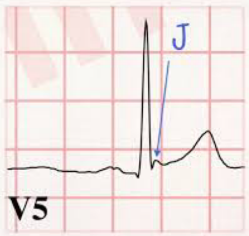
	Left sided WPW	Right sided WPW
Conduction	L → R	R → L
VI Lead	Positive Tall R waves ↑ δ wave	Negative R waves ↓ δ wave
	Left side free wall WPW m/c	

OSBORN WAVE (j wave)

Etiology

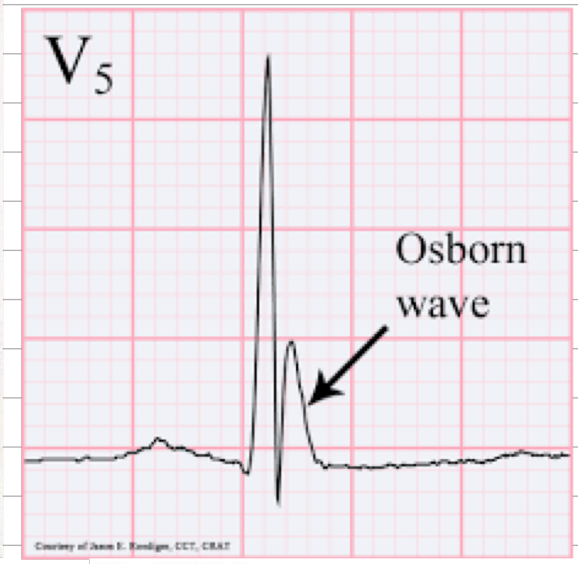
knowledge.of.ecg
Knowledge Of ECG

- Hypothermia (below 32°C/90°F)
- Normal variant
- Hypercalcemia
- Neurological insult
- Medications
- Ventricular fibrillation



Clinical

- Most prominent in the precordial leads
- Size of wave correlates with degree of hypothermia
- Usually resolves with warming
- No prognostic value



Proxysmal Supraventricular Tachycardia (PSVT)

Diagnosis:
- ECG: Normal when patient is asymptomatic
- HOLTER advised: device records ECG for 24 hrs

Findings:
- Narrow QRS complex (HR > 150 – 200)
- ST segment ↓ (ST segment depression)
- R-R interval ↓
- Hidden Pwave

Management

- Rx

Acute	Primary episodes (PSVT)
• SBP <90: DC shock • SBP>90 ○ **Carotid sinus massage** ○ (Carotid sinus nerve-ix) Efferent close down re entry circuit current ○ Given with thumb ○ **Site**: perpendicular to angle of jaw, burst of 10 seconds ,given at one side intermittently If given continuously, will cause desensitization of receptors	• Oral verapamil (Prevention) • Catheter ablation

Supraventricular tachycardias with narrow QRS complex:

- Narrow QRS with regular RR interval

Tachycardia	ECG features
Sinus tachycardia	Normal P wave, normal ECG features except for the rate
Focal atrial tachycardia	A single type of abnormal p wave morphology is seen
Junctional tachycardia	No p waves. Heart rate is 100- 200/ min
AV nodal reentry tachycardia	No p waves. Pseudo R' waves may be seen. Heart rate is 150-250/ min
Atrioventricular reentry tachycardia	P wave always follows QRS. RP interval< PR interval
Atrial flutter	Sawtooth shaped flutter waves are seen

- Narrow QRS with irregular RR interval

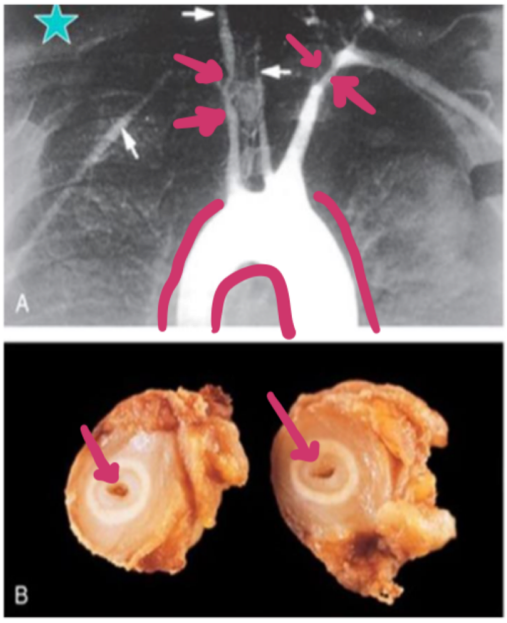
Tachycardia	ECG features
Atrial fibrillation	No distinct p waves seen
Multifocal atrial tachycardia	More than 3 different abnormal p wave morphologies are seen
Atrial flutter/tachycardia with variable block	ECG features of heart block are seen.

Supraventricular tachycardias with wide QRS complex:

- Antidromic AVRT (atrioventricular reentry tachycardia)
- Supraventricular tachycardias with bundle branch block

TAKAYASU ARTERITIS

AORTIC ARCH Sx



Blood flow ↓ ⇒ PULSELESS DISEASE

UL

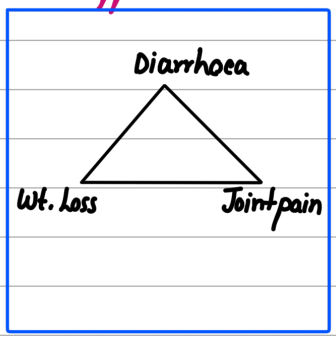
PYQ Q M/c : subclavian vessel

UL weak
LL normal

Whipple disease

- Infectious disease.
- Causative Agent → Tropheryma whippelii

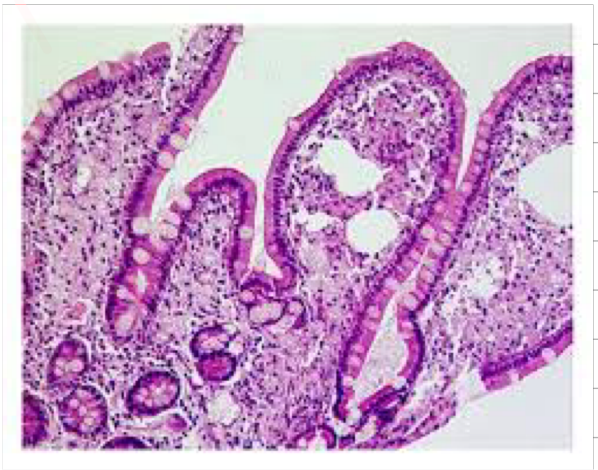
- Multisystem involvement.
- Intestine
- Dementia
- CNS (Late involvement)
- Joints (early involvement)
- LN
- Cardiac

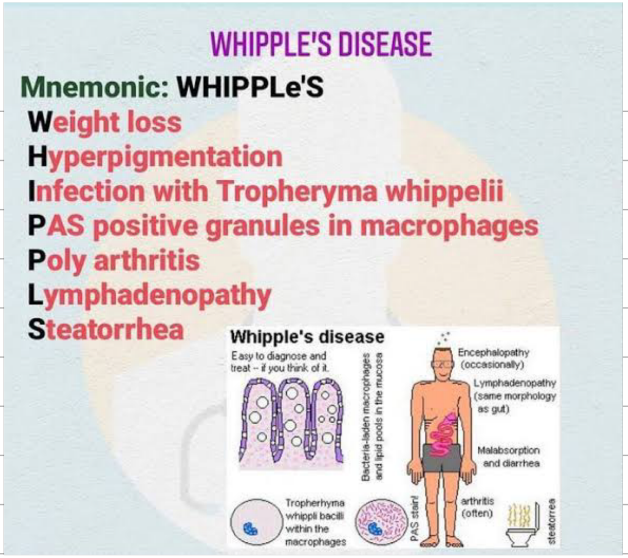


Pathogenesis : Trophyrema Whippeli infection → Macrophage infiltration in Lamina propria
↓
• Rod shaped Bacilli inside Macrophages
↓
Diarrhea ← Lacteal compression Obstruction of Lymphatic Drainage
(Defect in lymphatic transport)

Diagnosis → IOC: upper GI endoscopy
↓ Biopsy
Gram positive organisms inside macrophages

Rx: DOC → Induction therapy for 14 days ↓ Ceftriaxone or meropenam.
• For long term therapy to prevent relapse : Co-trimoxazole due to good CNS penetration.

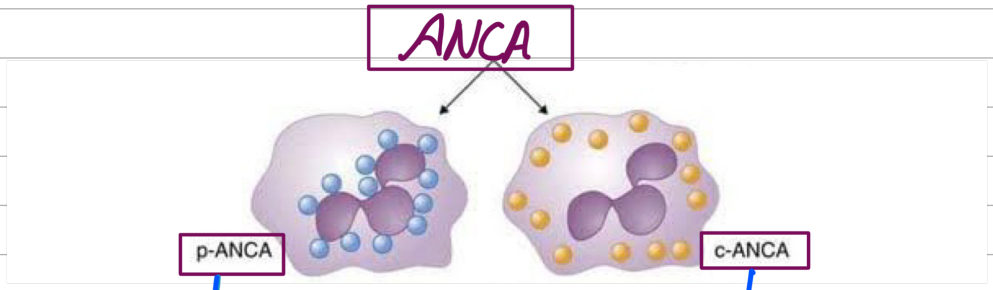




ANCA : Antineutrophilic cytoplasmic antibody

↓

pANCA
cANCA
→ Both of them are antibodies against the granules of neutrophils

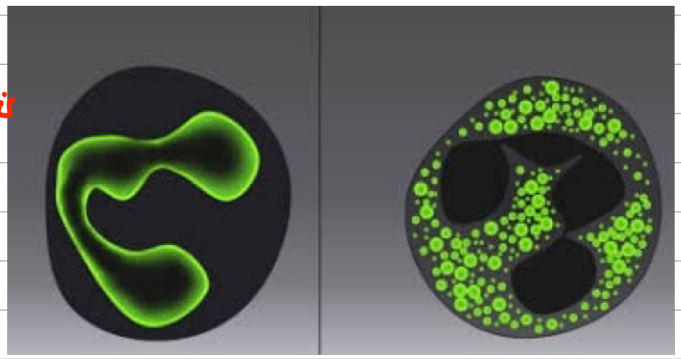


Location: Perinuclear (around the nucleus)

Randomly distributed in cytoplasm

Seen in:

- Microscopic polyangiitis
- Churg strauss syndrome



- Wegner's granulomatosis

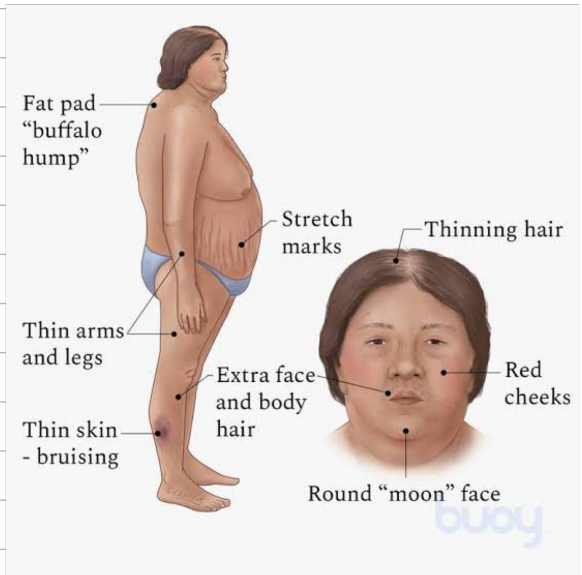
Child Pugh Score

Clinical and Lab Criteria	Points*		
	1	2	3
Encephalopathy	None	Mild to moderate (grade 1 or 2)	Severe (grade 3 or 4)
Ascites	None	Mild to moderate (diuretic responsive)	Severe (diuretic refractory)
Bilirubin (mg/dL)	< 2	2-3	>3
Albumin (g/dL)	> 3.5	2.8-3.5	<2.8
Prothrombin time			
Seconds prolonged	<4	4-6	>6
International normalized ratio	<1.7	1.7-2.3	>2.3

Child-Turcotte-Pugh Class obtained by adding score for each parameter (total points)
Class A = 5 to 6 points (least severe liver disease)
Class B = 7 to 9 points (moderately severe liver disease)
Class C = 10 to 15 points (most severe liver disease)

Cushing Syndrome : aka Hypercortisolism

Causes :
- Iatrogenic steroids
- Exogenous - m/c/c
  - ↑ Cortisol ↓ ACTH by feedback.
- Carcinoid Tumor : ↑ Ectopic ACTH → ↑ Cortisol
- Oat cell CA lung
- Pituitary Adenoma
  - Aka cushing disease
  - Endogenous cause
  - ACTH ↑ → Cortisol ↑
- Adrenal adenoma involving Zona Fasciculata
  - Cortisol ↑ → ACTH ↓



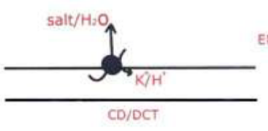
- Earliest manifestation of Cushing's syndrome is loss of diurnal variation of cortisol production

- Cortisol ↑ → Activates Sex steroid receptors
  - Causes Hirsutism, weight gain, oligomenorrhea, infertility
  - PCOD >> Cushing Syndrome
- ACTH Dependent Cushing Syndrome: Pituitary Tumor and ectopic Tumors producing ACTH
- ACTH independent Cushing Syndrome: Adrenal adenoma
- High dose dexamethasone suppression Test is used to differentiate between these causes.

HYPERPIGMENTATION
- Seen in
  - C – Cushing Disease: ACTH↑
  - A – 1° Addison Disease: ACTH↑
  - N – Nelson syndrome: ACTH↑

C/F :
- Moon faces
- Centripetal obesity
- Violet / Purple striae, thin skin, Purpura
- Buffalo hump
- Weight gain / Lemon on sticks
- ↑ peripheral resistance → HTN

- Secondary DM
  - FBS > 126 mg%
  - 2hr > 200 mg%
  - Caused by
    - → Insulin resistance → sugar ↑
    - → Cortisol ↑ → sugar ↑
  - Treatment
    - → Metformin
- Cortisol ↑ → Activates ENaC
  - causes salt & water retention
  - Hypokalemic alkalosis



Workup – Screening test

- 24 hr urinary cortisol ↑↑
- Spot salivary cortisol ↑

– Overnight dexamethasone suppression test

– Low dose dexamethasone suppression → IOC

High dose dexamethasone suppression test is used for etiological diagnosis. It Helps to Pinpoint the cause of disease and not disease per se.

Investigations

- MRI Head [pituitary adenoma]
- HRCT Chest [lung cancer]
- CT Abdomen [Adrenal causes]
- ACTH levels ↑/↓
  - Can be Suppressed in pituitary adenoma
    → Also referred as ACTH dependent cause
  - Not suppressed in ectopic causes

Treatment

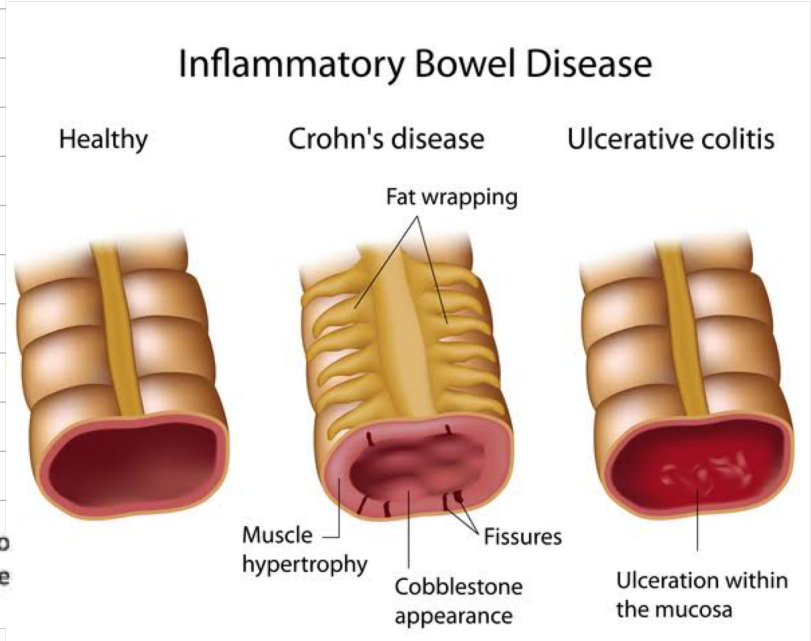
- Iatrogenic steroids
  - Taper steroids
  - Start alternate immunosuppressive drugs like Azathioprine
- Oat cell lung cancer
  - Chemotherapy with Cisplatin + Irinotecan
- Pituitary adenoma/Cushing disease
  - Trans-sphenoidal Surgery
- Adrenal adenoma
  - Medical Adrenalectomy done using
    → Oral Ketoconazole (preferred)
    → Aminoglutethimide (IV)
    → Mitotane IV

Chron's disease

- Overall, CD is m/c than UC.
- IBD is overall m/c in males > females

- m/c site: Terminal ileum
- Sparing: Rectum
- Earliest presentation: Apthous Ulcers → they progress to cause deep serpiginous ulcers
- Serpiginous Ulcers in esophagus: CMV

Transmural involvement and Submucosal fibrosis leads to Irregular appearance of mucosa called as cobble stone pattern. Occasional sparing is called skip lesions.

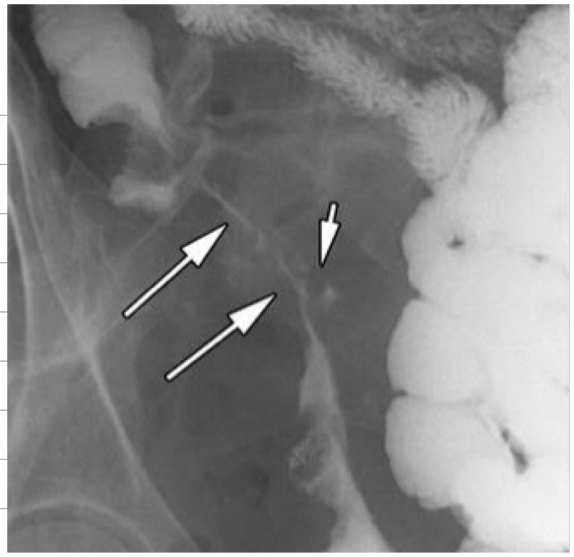


Ix:

- ASCA – Anti Saccharomyces Cerevisiae Antibody
- Imaging – Capsule endoscopy / Upper GI endoscopy/ Colonoscopy + Biopsy (Granulomas are seen)
- CT Enterography
- Ba meal follow through (Enteroclysis)
  - "String Sign of Kantor" due to stricture formation

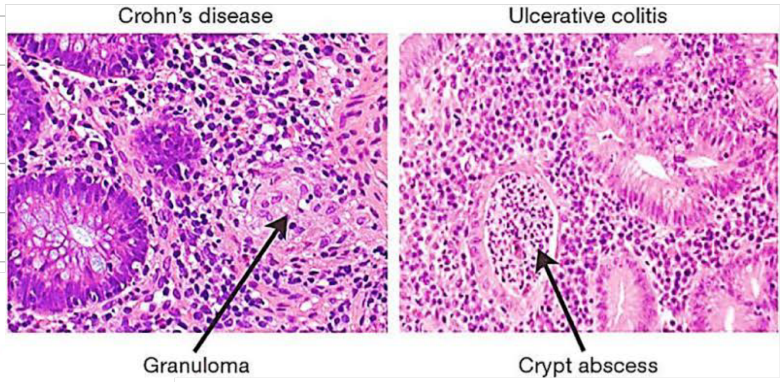
Rx

- DOC for CD: Steroids, Mesalamine
- Bile acid diarrhea: Cholestyramine/ Colestipol
- Sulphalazine Bacteria → 5 ASA (Amino Salicylic Acid)
  - (Local anti-inflammatory action to heal apthous ulcers)
  - Works in large bowel but not in the small bowel due to lack of bacteria
- Azathioprine



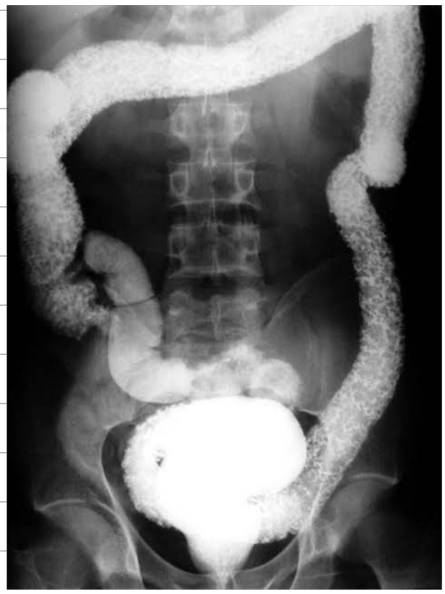
Ulcerative Colitis

- "Pseudopolyps" Partial Thickness involvement
- + Pan Colitis
- m/c site : Rectum



Clinical features

- Painless bloody diarrhoea
- Anemia
- Protein Losing enteropathy (Albumin ↓ : Puffy eyes)
- Toxic megacolon (colon loop dilation> 6cm) – [UC > CD]
- Malignancy incidence in UC is equal to that in Crohn's disease



Work-up

- p- ANCA
  - Also in
    - → Primary Sclerosing Cholangitis
    - → Microscopy Poly Angitis
- IOC : Colonoscopy – Proctitis + Biopsy (Granulomas) are not seen.
- CT Enterography
- Ba. enema – (Earliest features is Granular appearance due to pseudopolyps)
  - Later – loss of Haustrations leading to PIPE STEM COLON appearance.
- TOXIC MEGACOLON PIPE STEM COLON on Barium enema
- Fecal Calprotectin levels help to differentiate IBD vs IBS (No Blood in stool)

Rx:→

- DOC of UC – Sulphasalazine
- DOC of UC exacerbation – Budosonide enema
- Infliximab infusions in case of disease progression.

Indication for Sx in UC

1. Toxic megacolon
2. Rectal mucosa friable – Bleeds on touch

- Surgery of choice: Proctocolectomy + ileal pouch Anal Anastomosis (IPAA)

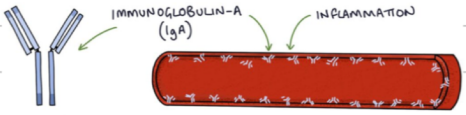
Henoch Schonlein Purpura

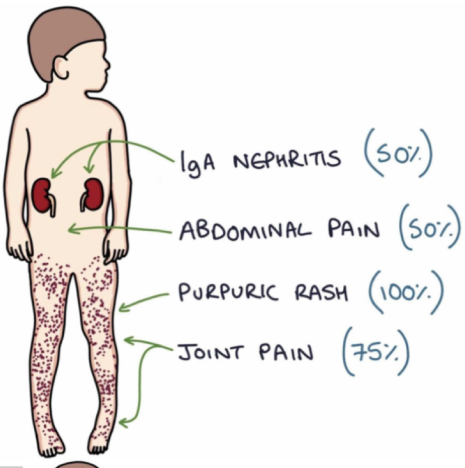
Henoch-Schonlein Purpura (HSP) is an ***IgA vasculitis*** that presents with a ***purpuric rash*** affecting the lower limbs and buttocks in children. Inflammation occurs in the affected organs due to ***IgA deposits*** in the ***blood vessels***.

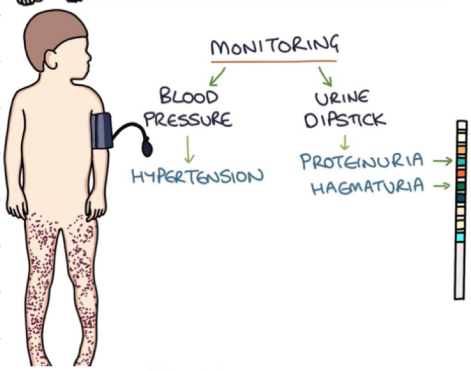
It affects the ***skin***, ***kidneys*** and ***gastro-intestinal tract***. The condition is often triggered by an upper airway infection or gastroenteritis. It is most common in children under the age of 10 years.

The four classic features are:

- ***Purpura*** (100%),
- ***Joint pain*** (75%),
- ***Abdominal pain*** (50%)
- ***Renal involvement*** (50%)







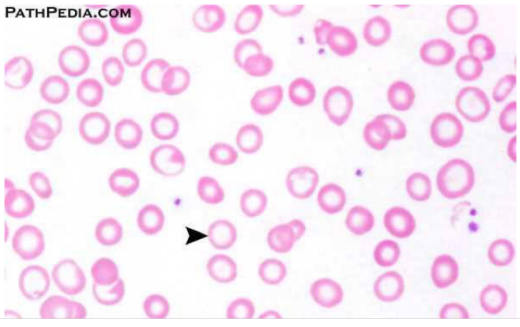
Iron Deficiency Anemia

Genetic form of IDA: Can be due to
- DMT1 mutation
- Iron Resitant Iron Deficiency anemia CIRIDA) → Matriptase 2 defect.

- Both presents around 2 year of age.
- Present in adults: • Atransferrinemia
  • Aceruloplasminemia

DMT1 mutation :-No defect in absorption (Heme Carrier protein is functional)
- Iron utlisation in bone marrow affected → Anemia.
- S. fe ↑
- S. ferritin ↑
- S. Transferrin ↑
- Liver Stores ↑
- Percentage saturation of Transferrin (PSAT)
- TIBC (Normal to low, yet anemia present)

Iron Resistant iron Deficiency anemia (IRIDA) → matriptase 2 defect → Non clevage of Hepcidin → Hepsidin production ↑↑ → iron not taken up → S. iron ↓
- S. Ferritin normal to high,
- Liver stores ↑
- PSAT ↓
- TIBC normal to low.



Calculate the iron Deficit:
2.3 × Body weight of the patient × (Target Hb − Patient's Hb) + 1000 (for iron stores)

Diabetic Ketoacedosis

- Complication more common in type 1DM > type 2 DM.
- Basic Trigger is Insulinopenia (due to which Sugar cannot enter muscle)
  - ↓
  - Intracellular Starvation
  - ↓
  - Since cell cannot utilize glucose due to insulin deficiency.
  - ↓
  - Counter regulatory hormones (GH, Cortisol, Glucagon, Catecholamines)
  - ↓
  - They increase blood sugar level oxidation of fat → FFA will generate ketones (Acidosis)
  - ↓
  - Acidic pH will damage BBB
  - ↓
  - Metabolic Encephalopathy
- ↑↑ Sugar levels in blood → osmotic dieresis → dehydration.
- Mortality Rate depend upon the age group of the patient → 40 years = 20% Mortality
  → <40 years = 5% Mortality

Clinical features

- Nausea and severe vomiting
  - ketonemia which trigger vomiting center- CTZ
- Abdominal pain
- Osmolality increase= 310-320mosm
  - Stupor
  - Coma
- Polyuria
  - Due to osmotic dieresis
  - ↑ Thirst
- Encephalopathy

Examination

- Fruity odor breath
- Tachycardia
- Orthostatic hypotension
- Dry Oral Mucosa
- Urine Output initially increases
  - ↓
  - As dehydration occur Urine Output ↓
  - ↓
  - kidney function deranged)
- RR increases (Kussmual breathing-- acidotic hyperventilation-- washout of Co2)

$$2H^+ + HCO_3^- \rightarrow H_2CO_3 \rightarrow H_2O + CO_2$$
(↑) (↑) (↑)

- H_2Co_3 reduced less than 15meq (as they are consumed more)
  - ↓
  - More Co_2 formed - trigger Respiratory center
  - ↓
  - Leading to washout of Co_2- Leading to more proton consumption
  - ↓
  - Proton is responsible for damaging BBB, Encephalopathy etc.
  - ↓
  - Kussmual Breathing is a compensatory Mechanism (Fruity breath)
  - ↓
  - Fruity breath is due to acetone (Ketone bodies are -acetone, acetoacetate, and beta hydroxybutyrate)

Treatment

- Grading of severity of disease

Ph	β Hydroxy	Grade
7.25 - 7.30	3-4	Mild (alert)
7.00 – 7.25	4 – 8	Moderate (drowsy)
< 7	8	Severe (Stupor)

- First line of management
  - Fluid Resuscitation
    - → NS 0.9% (fluid of choice)
    - → 5L of NS is given (in next 8 hours) 1L/hour in first 2 hours
    - → Decrease after 2 hours
    - → 400 ml NS/hour
    - → On treatment in DKA → fluids given → sugar will be diluted →sodium level rises → when $Na^+ > 150$ meq → 0.45% N/2 is Given
    - → $\text{Glucose} \propto \frac{1}{\text{Sodium}}$
  - Insulin administration
    - → Regular Insulin (can be administer by any route I/M, I/V, S/C) is given
    - → Bolus is given initially 0.1 U/Kg to Prime Insulin receptor
    - → Infusion later on (0.1 U/kg/hr.)
    - ↓
    - Blood Sugar level falls 10% initially in first Hour
    - ↓
    - Subsequently 50 mg% decreases/hour
    - → Fast correction can lead to Death-- most common cause of fast correction (in Pediatrics) in treating DKA is Cerebral Edema.
    - → When Blood sugar level falls to 250 mg%, change the fluid to 5% Dextrose.
  - Maintenance of Potassium Levels
    - → On treatment as acidosis resolves hypokalemia occurs
    - → Lead to Torsade's de pointes, muscle paralysis → Respiratory Paralysis
    - → Monitor K+ levels
    - → Give KCL to the patient, add to IV fluids (10-30 mEq/hr. infusion)
  - Acidosis
    - → Give Soda Bicarbonate Only if pH < 7.0 (in severe DKA only)
    - ↓
    - If excess of HCO3 given to person - HCO3 will trigger Metabolic alkalosis (Tetany, Laryngospasm)
    - ↓
    - K+ influx into cell- hypokalemia - can lead to arrythmia.
  - Infection control
  - Switch over to subcutaneous insulin

- RL is not given because it is rich in potassium and in DKA potassium is already raised--IF raised further will lead to diastole arrest.

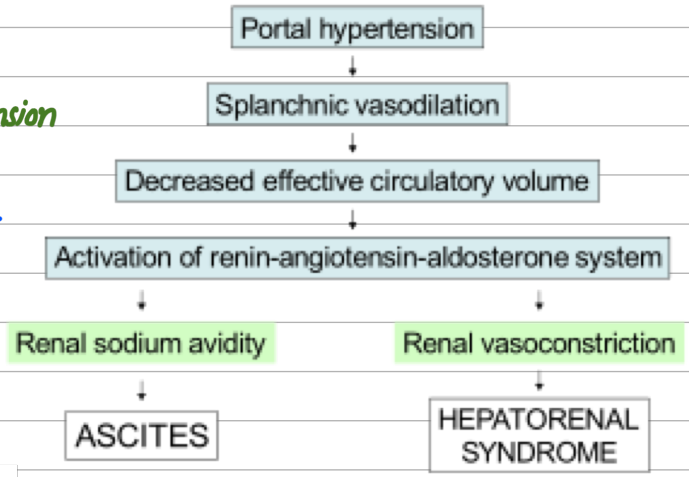
CLASSIFICATION OF AIRFLOW LIMITATION SEVERITY IN COPD (BASED ON POST-BRONCHODILATOR FEV_1)

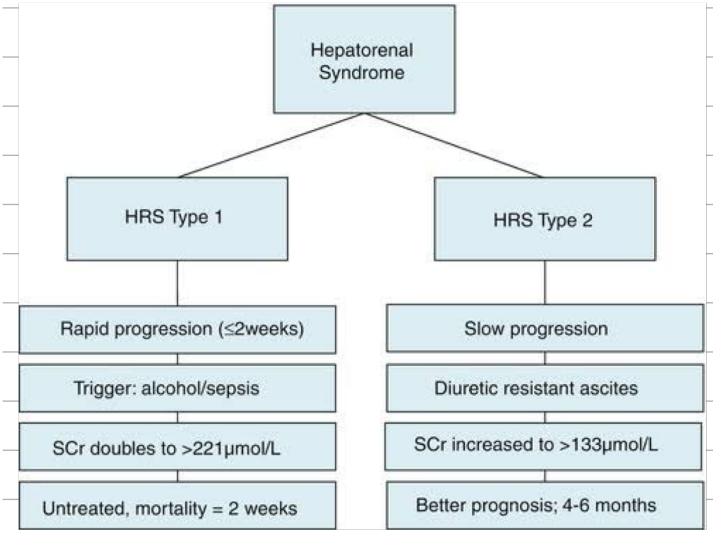
In patients with FEV1/FVC < 0.70:

GOLD 1:	Mild	$FEV_1 \geq 80\%$ predicted
GOLD 2:	Moderate	$50\% \leq FEV_1 < 80\%$ predicted
GOLD 3:	Severe	$30\% \leq FEV_1 < 50\%$ predicted
GOLD 4:	Very Severe	$FEV_1 < 30\%$ predicted

Hepatorenal Syndrome

A patient with Cirrhosis, portal hypertension and ascites develop Acute kidney injury (structurally normal kidney), and kidney injury not related to any intrinsic kidney disease gives provisional diagnosis of Hepato renal Syndrome.

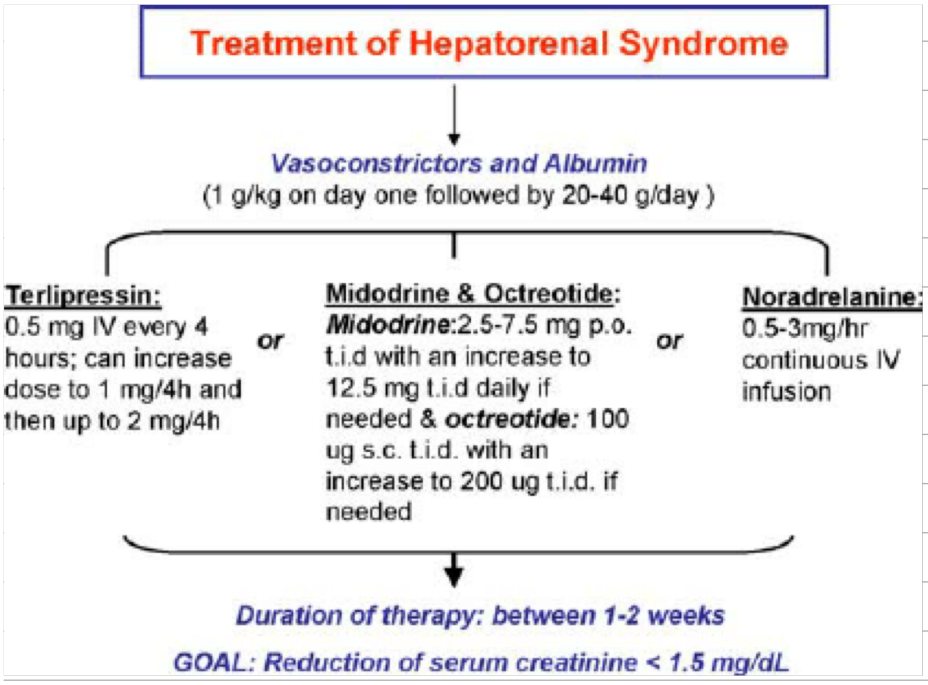




Prevention of HRS

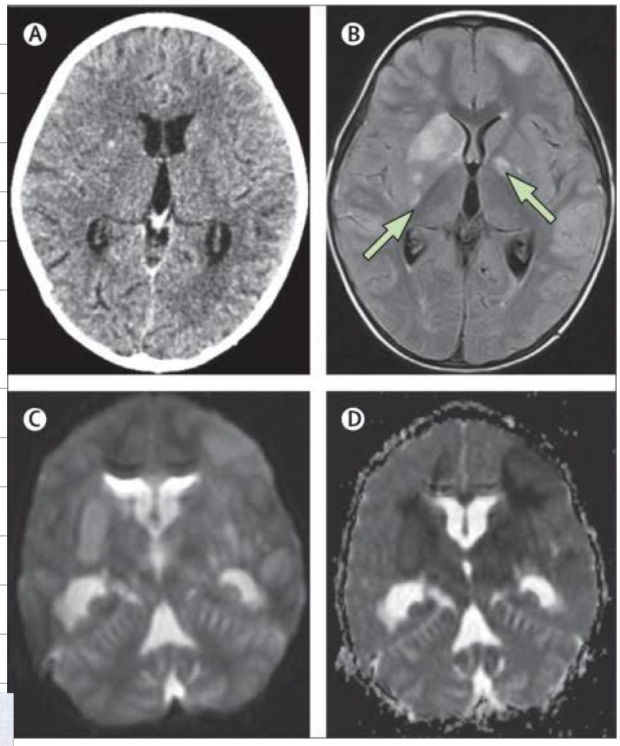
- Volume Expansion: Patients with SBP should be volume expanded with albumin.
- Prophylaxis against bacterial infections, especially Spontaneous bacterial peritonitis (SBP)

Rx: The definite treatment includes transplant.



TUBERCULOUS MENINGITS (TBM)

- Most common form of CNS tuberculosis
- If untreated, high frequency of **Neurologic sequelae** and **Mortality**
- TBM complicates **0.3%** of untreated TB infections in children.
- Common between **6 mns and 4 yr of age**
- Clinical progression of TBM may be **rapid or gradual**
  - Rupture of 1 or more Subependymal tubercle
- **Rapid** progression more often in **infants and young children**
- Occasionally, TBM occurs many years after the infection



PATHOLOGY

Primary infection
↓
Lymphohematogenous dissemination
↓
Metastatic caseous lesion in the cerebral cortex or meninges
↓
Discharges few tubercle bacilli into the subarachnoid space
↓
Forms gelatinous exudate
↓
Infiltrates the corticomeningeal blood vessels
↓
Inflammation, obstruction & infarction of cerebral cortex
↓ ↓
Brainstem (commonest site) | Interferes CSF flow
↓ ↓
Dysfunction of CN III, VI, and VII | Hydrocephalus

Thick exudates at the basal cisters : Characteristic feature.

It occurs in 3 phases :

1. Prodromal phase – Lasts for 1-4 week, characterized by fever, irritability and vomiting.
2. Meningitis – The child will have high grade fever, signs of meningeal irritation, headache and photophobia.
3. Coma.

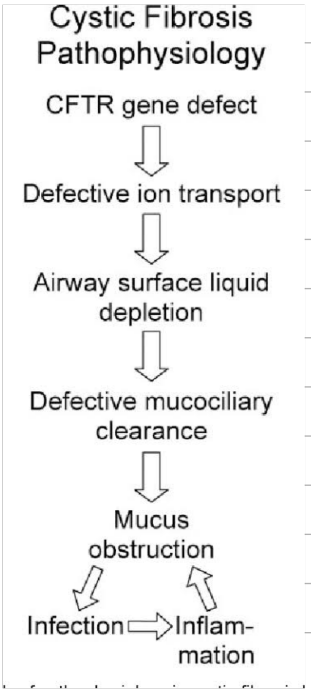
CSF findings in meningitis

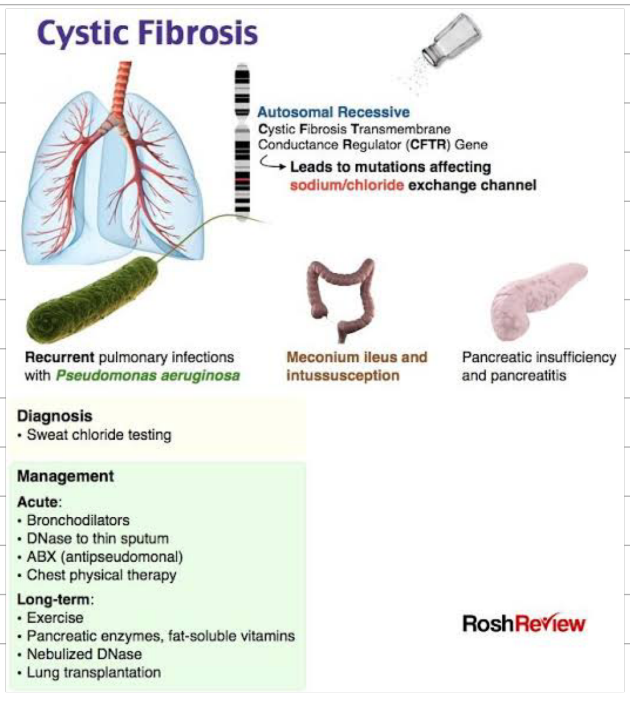
	Glucose (mg/dL)	Protein (mg/dL)	WBC (per µL)
Normal	40-85	15-45	<5 60-70% lymphocytes, ≤30% monocytes / macrophages
Bacterial	<40	>100	>1000 ↑ ↑ PMNs (≥80%)
Viral	Normal	20-80	25-500 Predominantly lymphocytes
Tuberculous	<50 in 75% cases	100-200	25-100 Predominantly lymphocytes
Fungal	↓ to normal	150-300	40-600 Lymphocytes or PMNs, depending on specific organism
Parasitic	Normal	50-200	150-2000 ↑ ↑ Eosinophils (≥50%)

Cystic Fibrosis → multi-system AR disorder (GIT, RS, Genito-urinary, Sweat glands are affected)

↓ mutation in

- one of the most common life limiting genetic disorder.
- CFTR gene (CF transmembrane regulator) → located on chr. 7q
- m/c mutation : ΔF 508 → deletion of Phenylalanine at 508th position. (>1500 mutation)





Wells score

Criteria	Points
Clinical signs/symptoms of DVT	3
PE is most likely diagnosis	3
Tachycardia (>100 bpm)	1.5
Immobilization/surgery in previous 4 weeks	1.5
Prior DVT/PE	1.5
Hemoptysis	1
Active malignancy (trt w/in 6 month)	1

Low Risk	**Intermediate risk**	**High risk**
< 2 points	2-6 points	>6 points

PE unlikely	**PE Likely**
0-4 points	>4 points