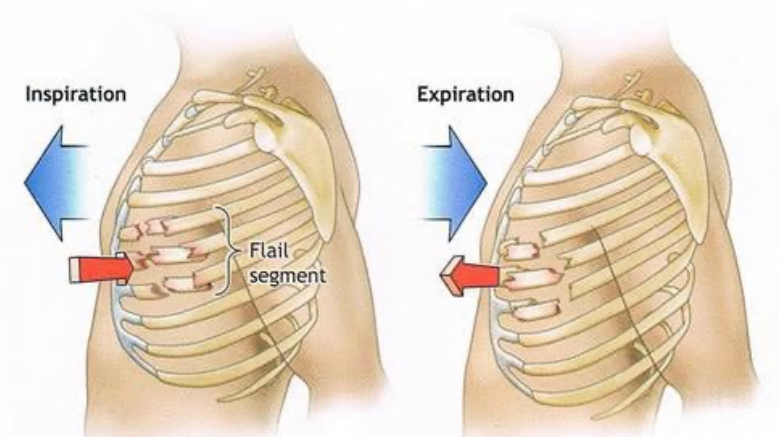
BLOCK I NOTES

BY FATIMA HAIDER
KGMC



Flail Chest

Digitalis
(Foxglove)

Yellow Oleander

White Oleander

Cerebra Odollam

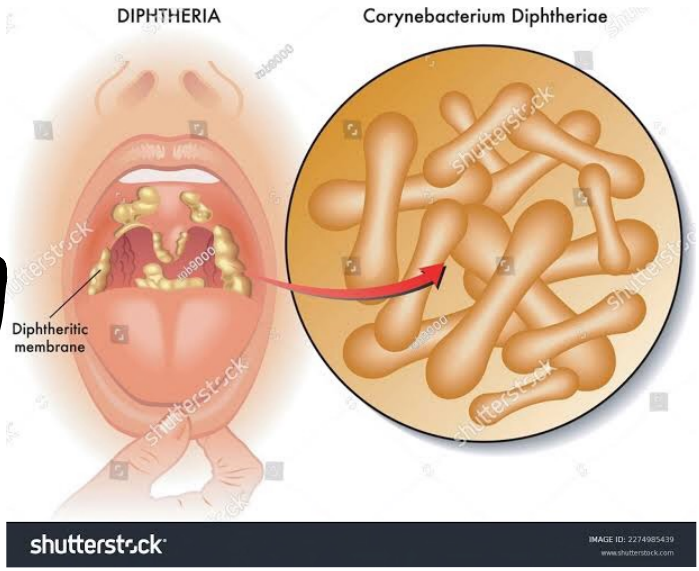
Aconite

Root is most toxic

- Active principle: **Aconitine**
- MOA: Blocks voltage sensitive Na^+ channels
- Side effect
  - **Paraesthesia** over fingers, mouth and face
  - **Hippus** - Alternate dilatation & constriction of pupil
  - Cardiac arrhythmias: Both bradyarrhythmia & tachyarrhythmias
  - If bradyarrhythmia, Atropine to be given
  - If tachyarrhythmias, Give Amiodarone / or Flecainide for VF
  - Hyperkalemia is seen

Important Information

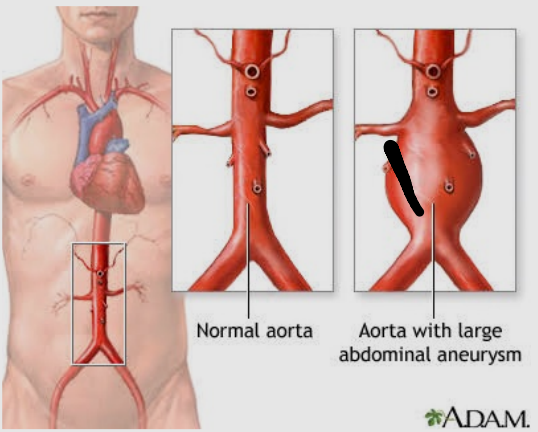
Emphysema Aquosum: Conscious person drowned
Edema Aquosum: Unconscious person drowned
Hydrostatic lung: Postmortem drowning



Diphtheria

Pseudomembrane

Abdominal aortic aneurysm



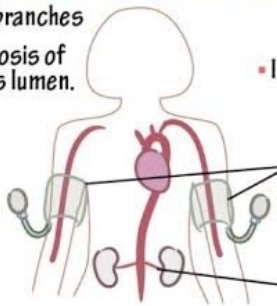
Takayasu arteritis

(aka, Pulseless disease)

Granulomatous Disease

✓ Aorta and its large branches

- Thickening and fibrosis of vessel wall narrows lumen.

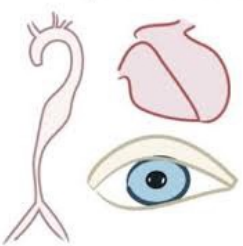


- Ischemia produces:
  - "Pulseless disease" Weak/absent pulse.
  - Different pressures in upper extremities.
  - Claudication in limbs, chest pain.
  - Poss. hypertension (renal art. stenosis)

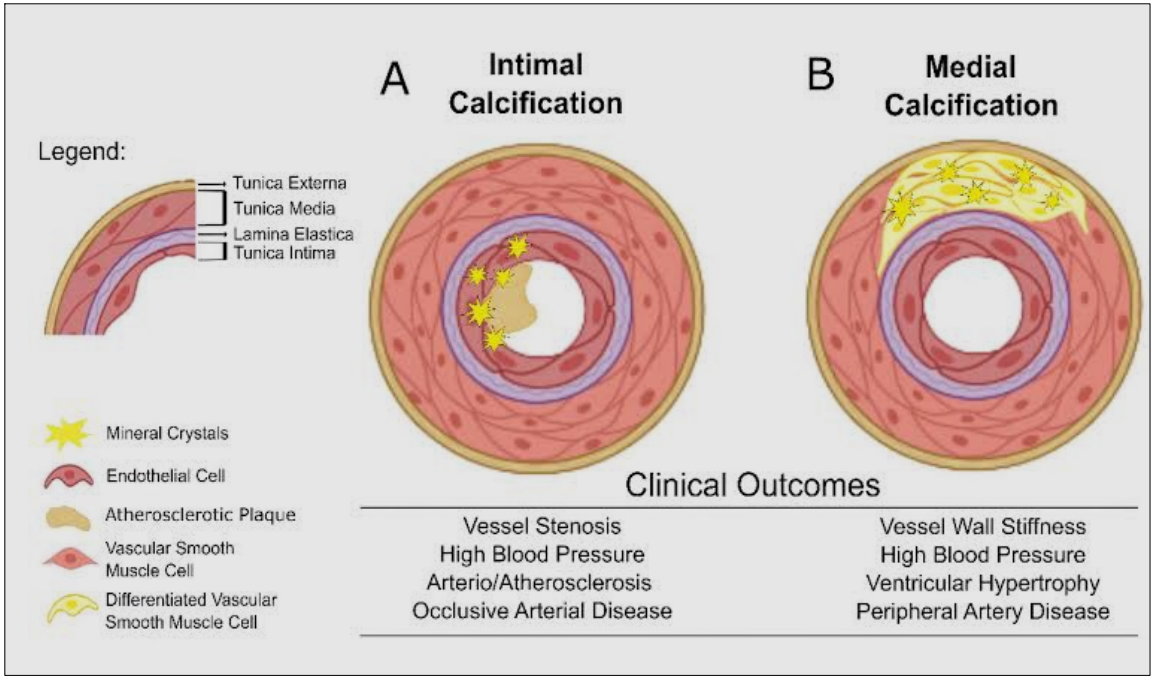
- Nonspecific symtpoms assoc. with inflammation:
  - Weakness, fatigue, fever, weight loss, arthralgia.

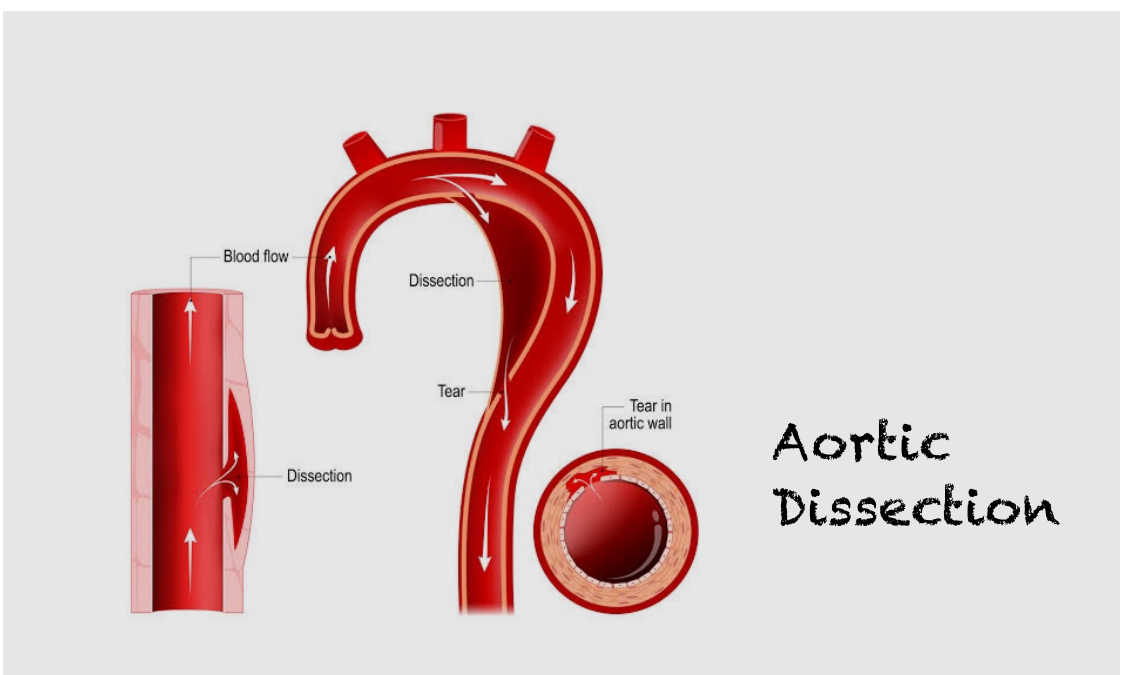
✓ Poss. complications:

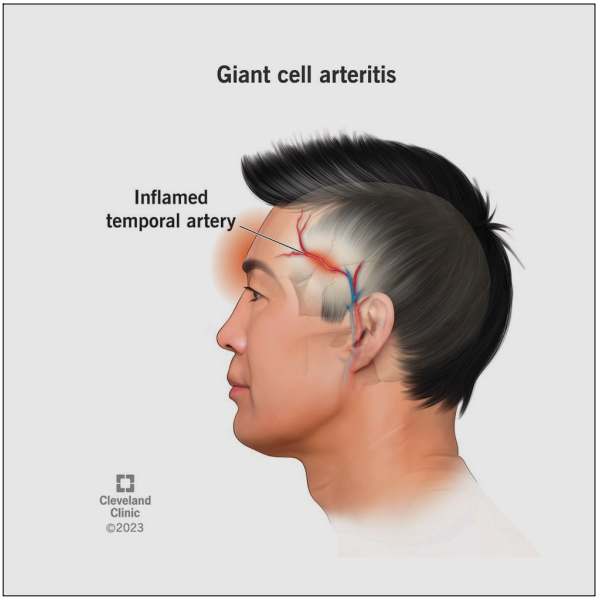
Aneurysm, aortic regurgitation, retinopathy.



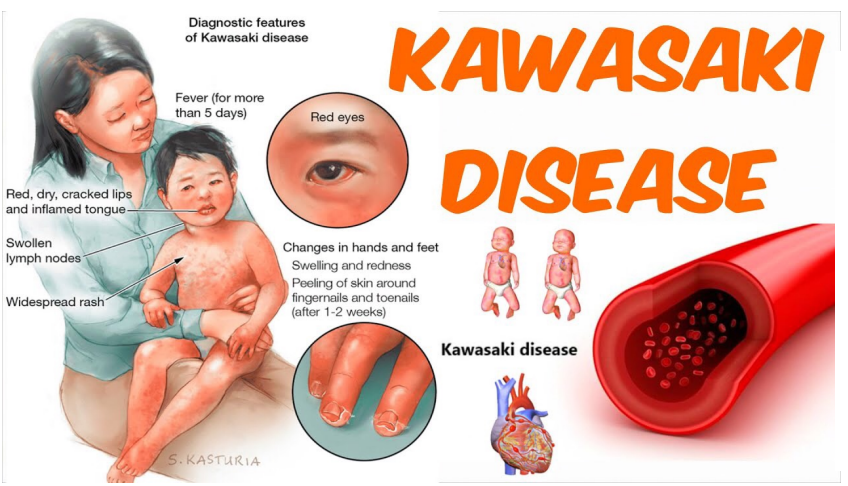
✓ Most common in women < 40 y. o.; esp. Asian ancestry.



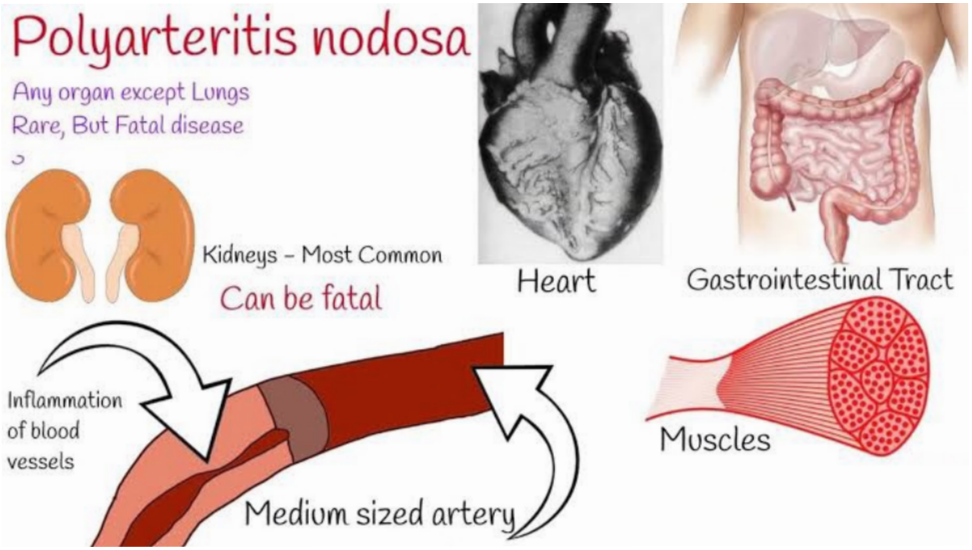




Raised ESR	Unilateral headache Scalp tenderness Vision loss



- High fever (more than 5 days)
- Widespread rash
- Bilateral conjunctivitis
- Strawberry tongue
- Coronary artery aneurysms



- Renal impairment
- Hypertension
- Cardiovascular events
- Tender skin nodules

Microscopic Polyangiitis

ANCA- Associated;
Necrotizing pauci-immune, and no granulomas

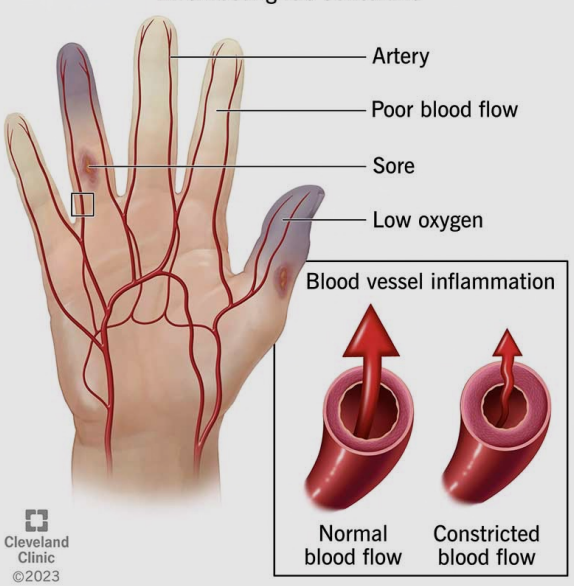
- ✓ Affects mostly small vessels, including venules and capillaries.
- ✓ Kidneys
  - Glomeruloneprhitis with rapid progression to renal failure.

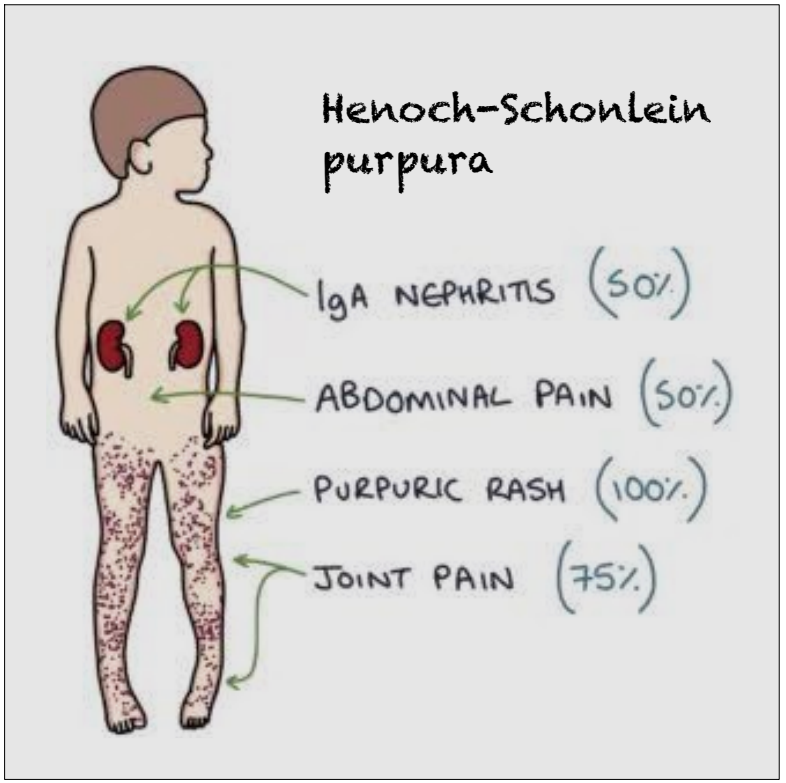
- ✓ Skin
  - Purpuric rash

- ✓ Lungs are less commonly invovled
  - Alveolar hemrrohage, fibrosis possible.
- ✓ Tends to occur in adults 50-60 y.o.

Buerger's Disease

Thromboangiitis obliterans

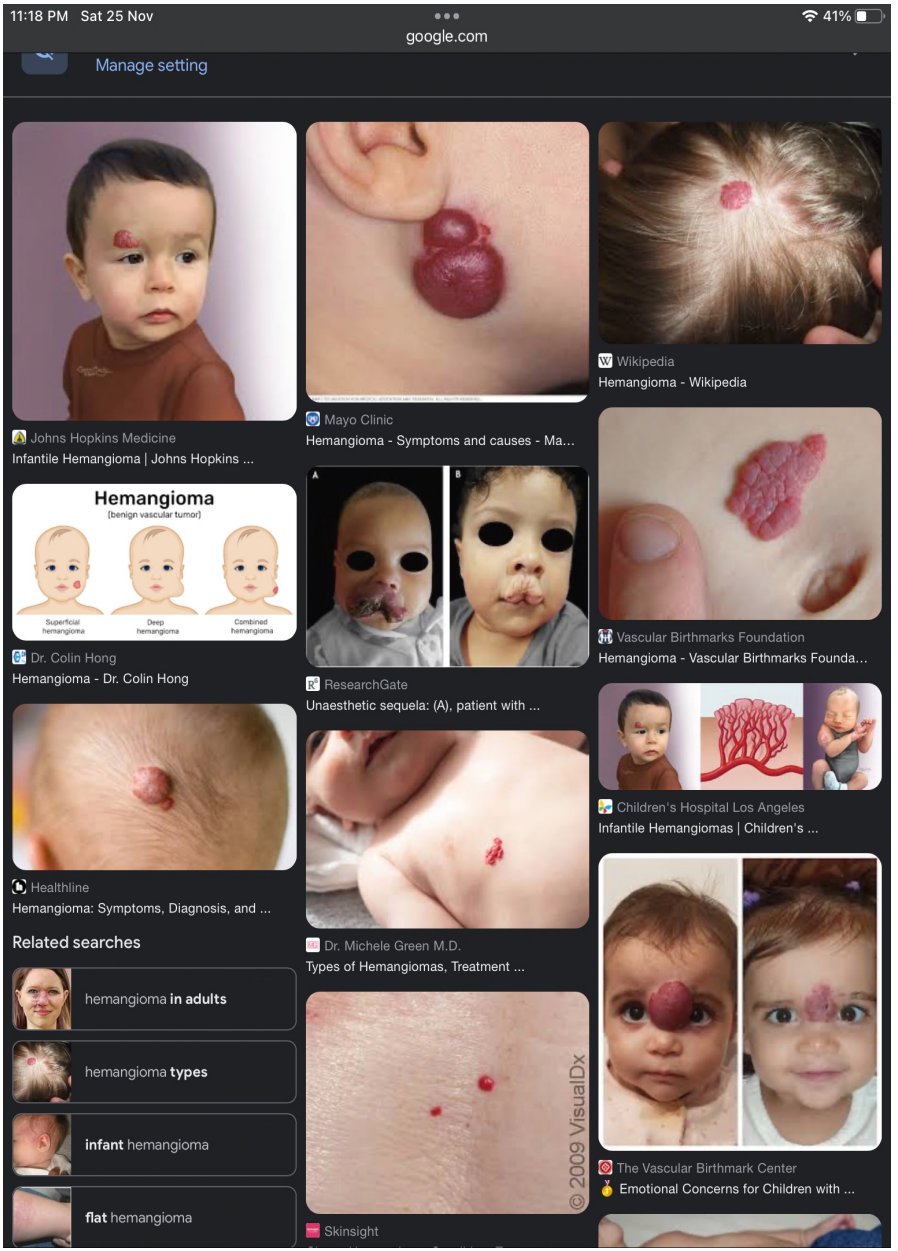




Purpura (non-blanching rash)

IgA nephritis

* palpable purpura of buttocks and lower extremities
* Colicky abdominal pain
* polyarthritis
* microscopic hematuria, proteinuria
* fever



CAPILLARY HEMANGIOMA

Nevus Flammeus

Wikipedia
Nevus flammeus nuchae - Wikipedia

Brown Med-Peds
Nevus Simplex vs Nevus Flammeus: Do You...

Brown Med-Peds
Nevus Simplex vs Nevus Flammeus: Do You...

Consultant360
Port-Wine Stain Versus Salmon Patch ...

ResearchGate
Nevus flammeus involving the right ...

Why Yoga Vana?
Osteohypertrophic Nevus Flammeus

Brown Med-Peds
Nevus Simplex vs Nevus Flammeus: Do You...

MSD Manuals
Capillary Malformations - Dermatologic ...

X.com
A port-wine stain (nevus flammeus ...

Ready. Set. Food!
Port-Wine Stains (Nevus Flammeus) In ...

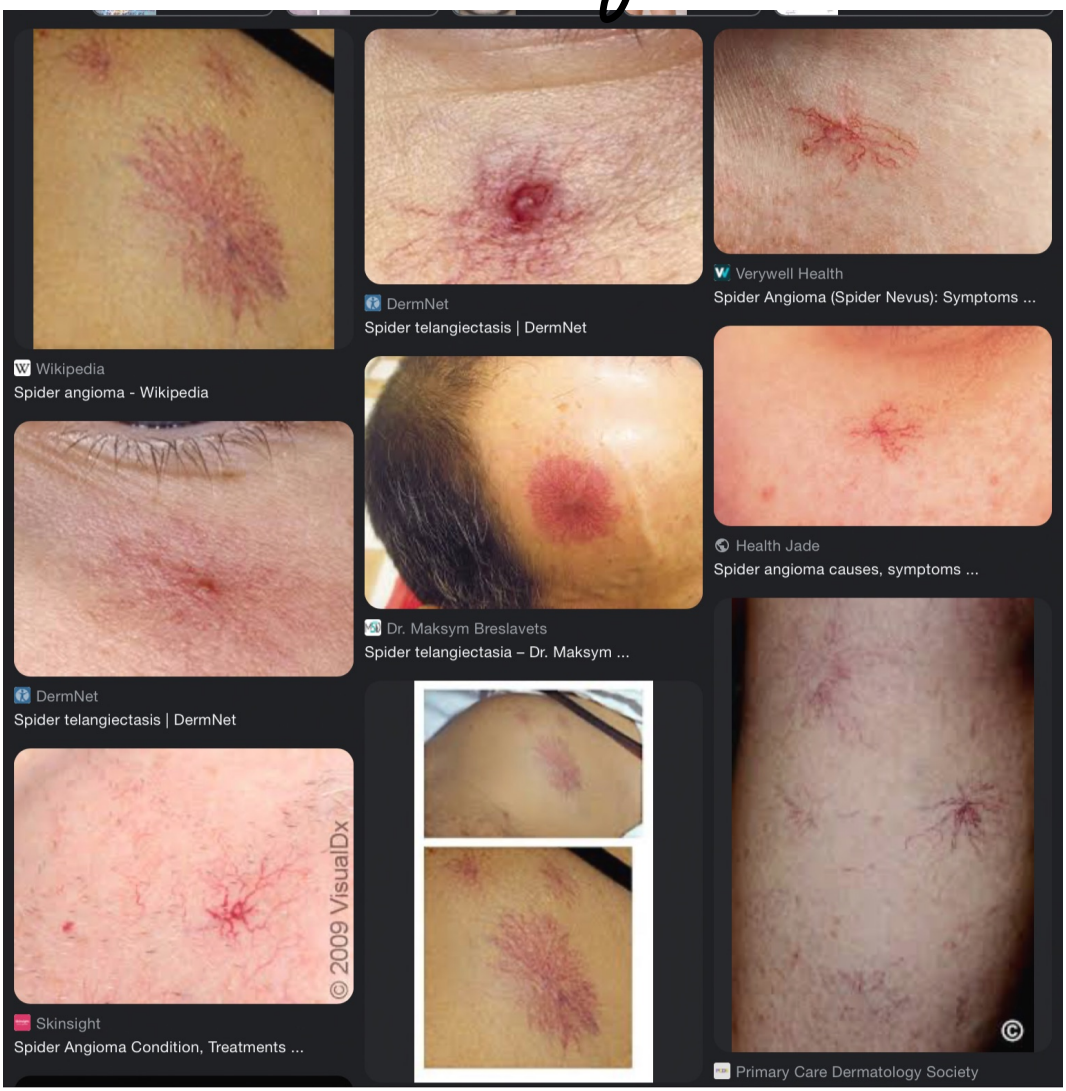
Related searches

nevus flammeus **vs** nevus **simplex**

nevus flammeus **vs heman-gioma**

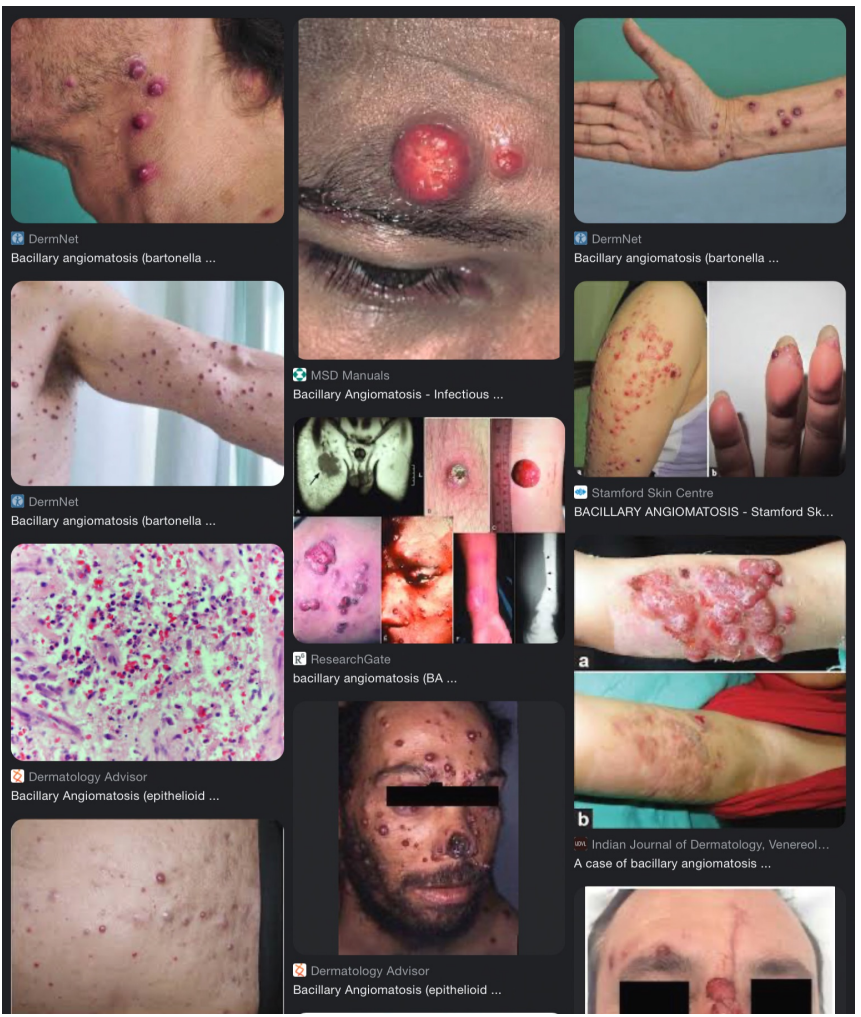
salmon patch nevus flammeus

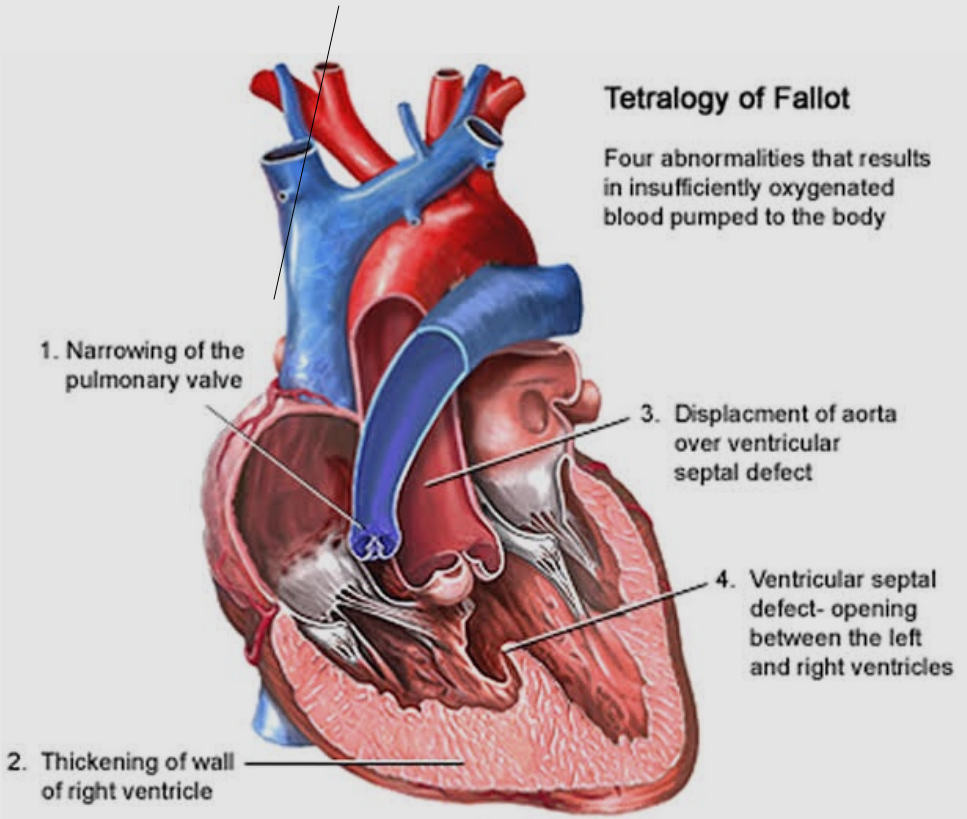
Spider Telengrectasia

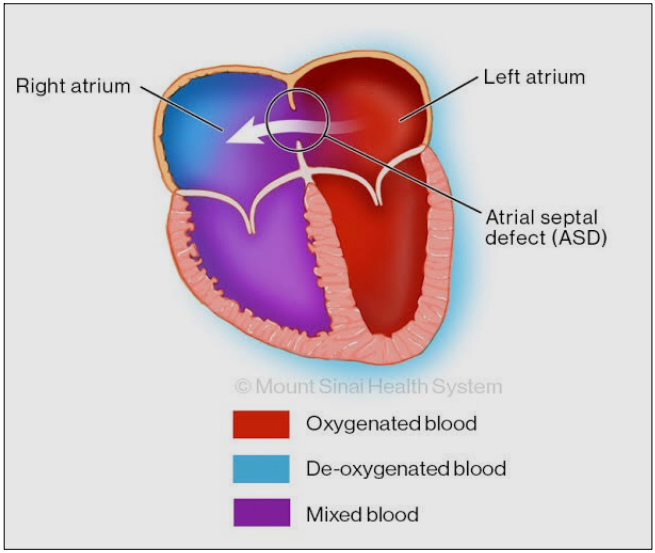


Glomus Tumor under fingernail

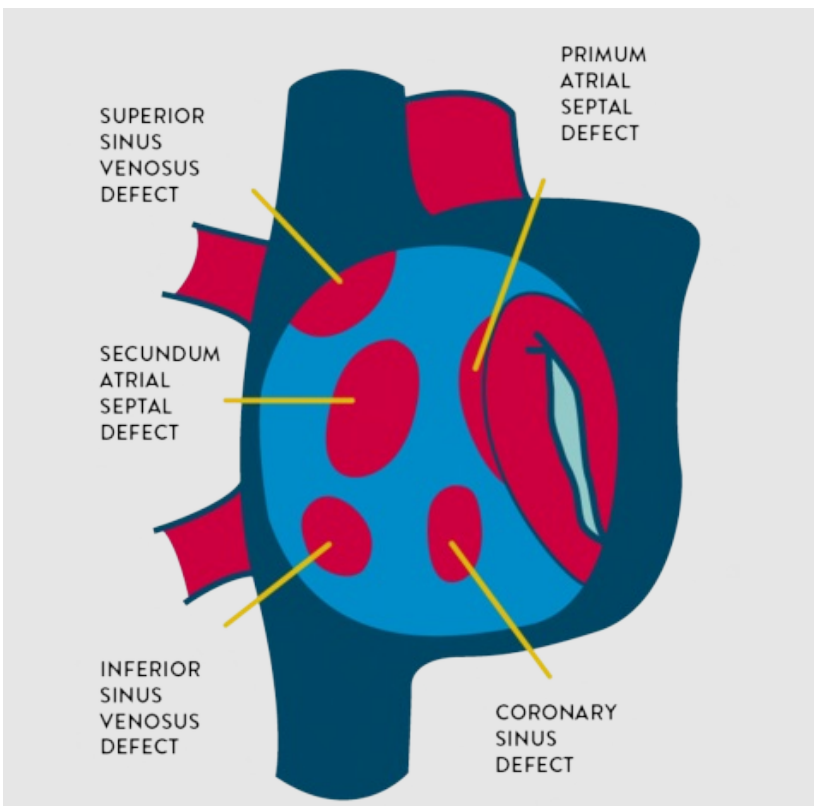
Bacillary Angiomatosis
seen in AIDs patient



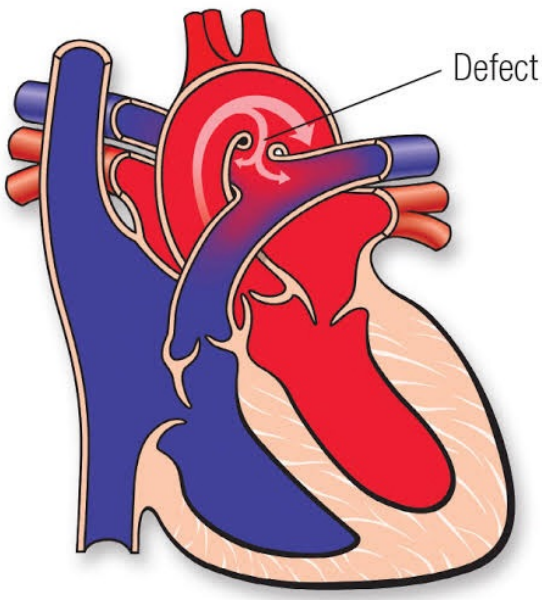




ATRIAL SEPTAL DEFECT



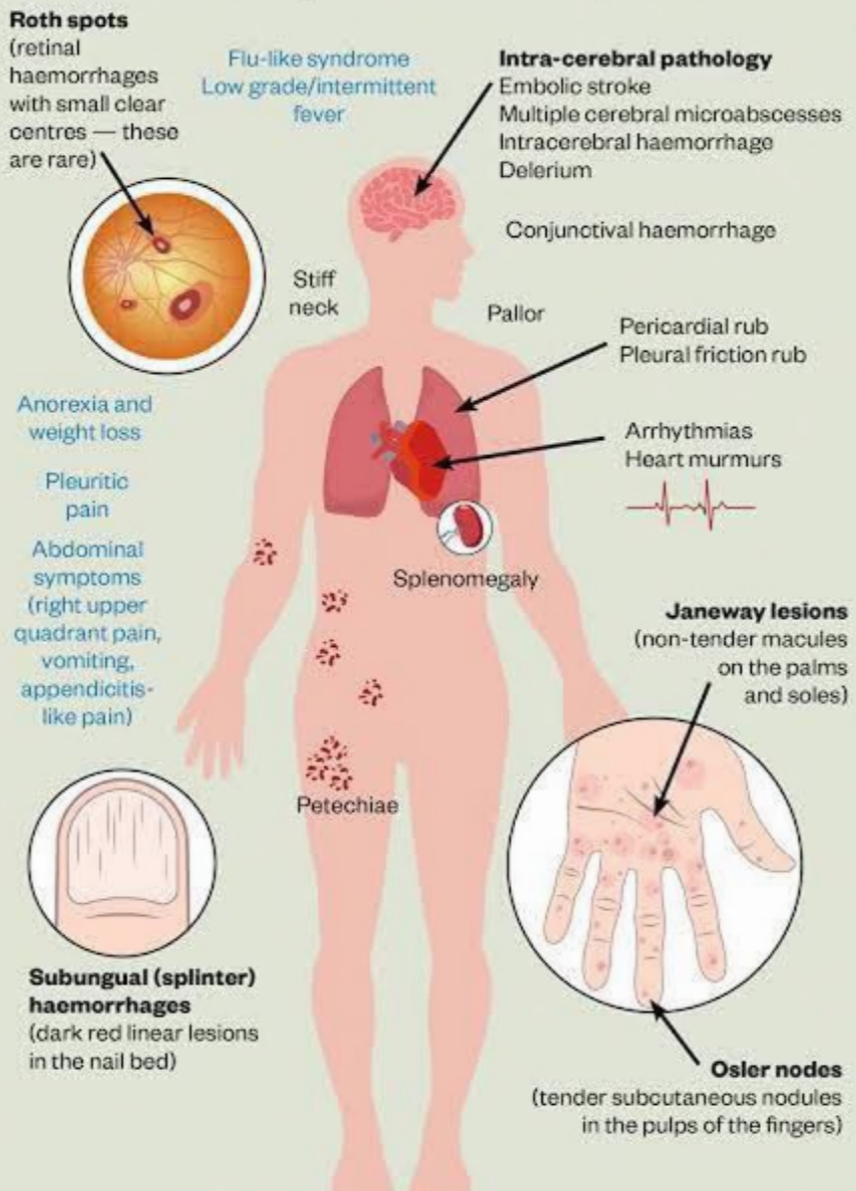
Patent Ductus Arteriosus

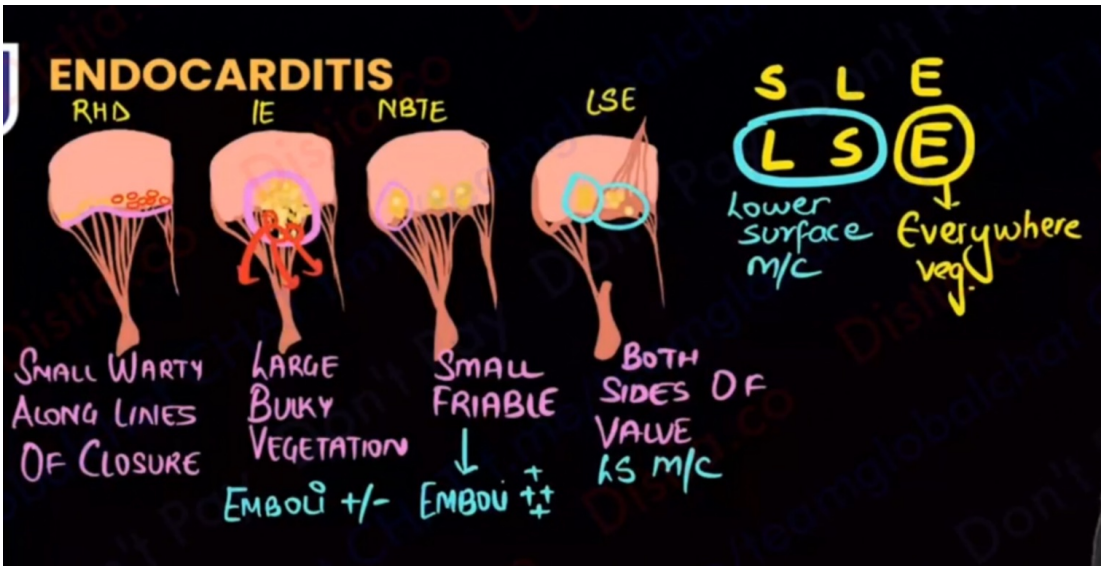


Infective endocarditis

An infection of the endocardial surface of the heart. Intractable congestive heart failure may result. If left untreated it is generally fatal.

Subacute endocarditis — symptoms are subtle and non-specific (in blue)

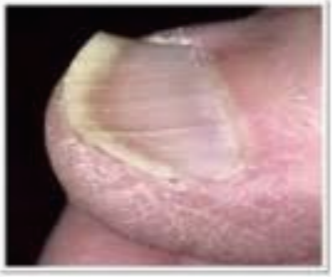




ENDOCARDITIS

Rheumatic Heart Disease	Infective Endocarditis	NBTE	LSE
Small, warty	Large bulky	Small, friable	Medium sized
Along lines of closure	Upper surface of cusps	Along the lines of closure	Both surfaces,more commonly on lower surface
Sterile	Non-sterile	Sterile	Sterile
Emboli -	Emboli +/-	Emboli +++	Emboli -

Clubbing



Koilonychia

Palmar erythema

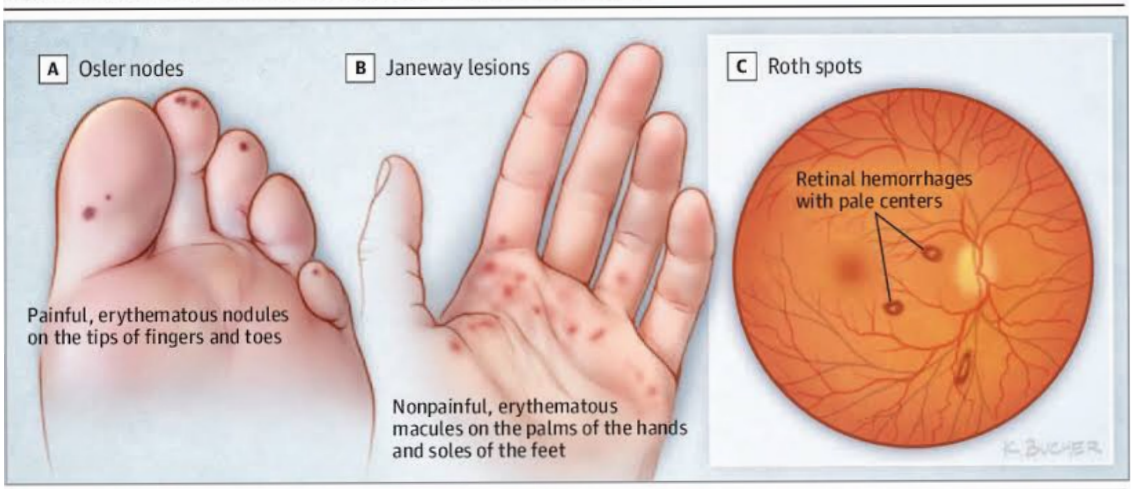
Splinter haemorrhages

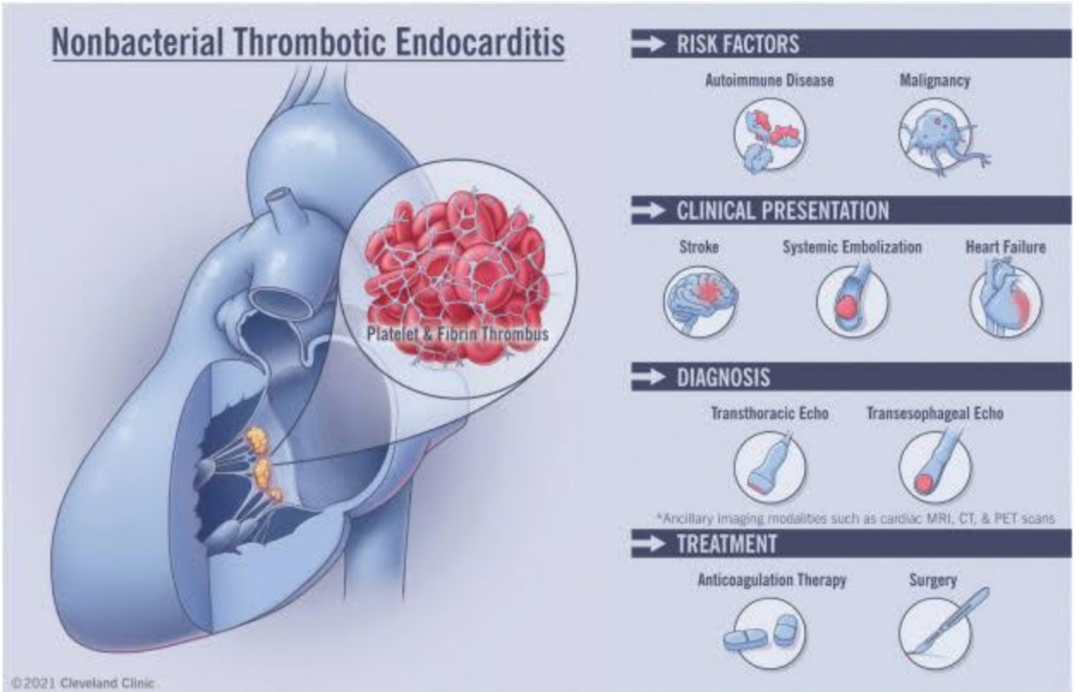
Osler nodes

Janeway lesions

Infective Endocarditis

Figure 1. Classic, but Uncommon, Signs of Infective Endocarditis

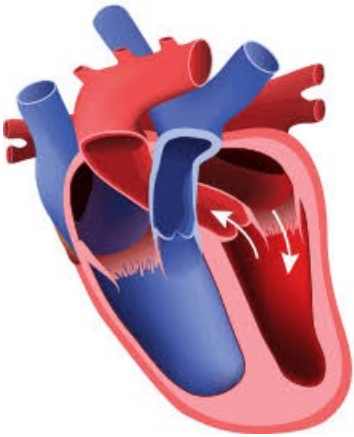




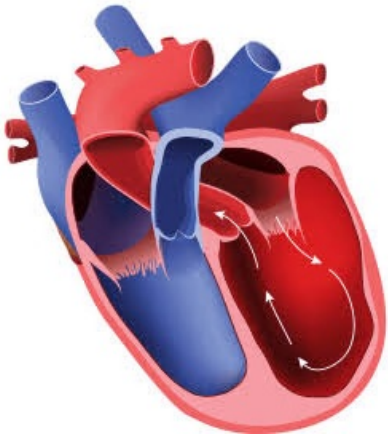
Risk factors:

* Mucinous adenocarcinoma of pancreas
* Acute promyelocytic leukemia
* Excessive burns
* Sepsis
* Endocardial trauma

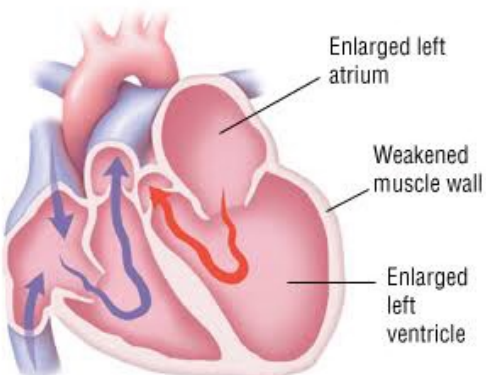
Normal Heart



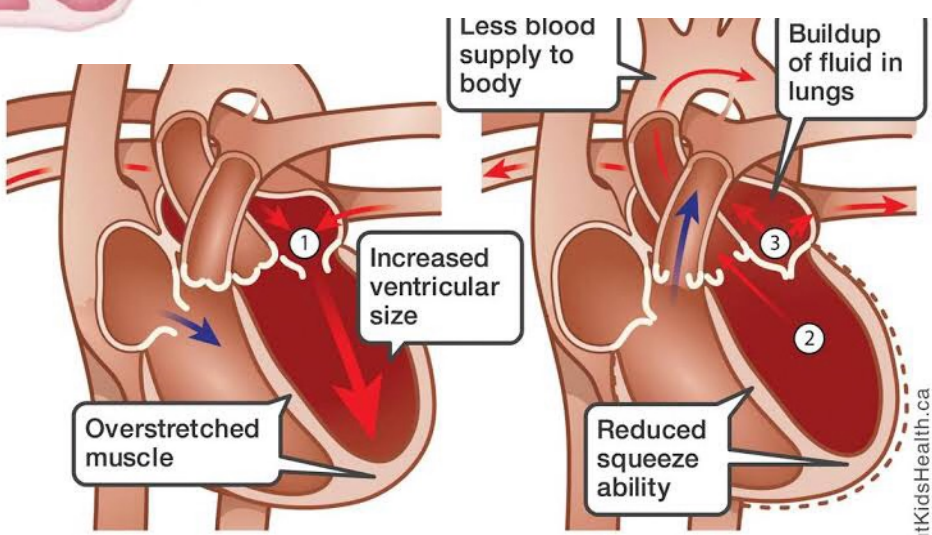
Dilated Cardiomyopathy

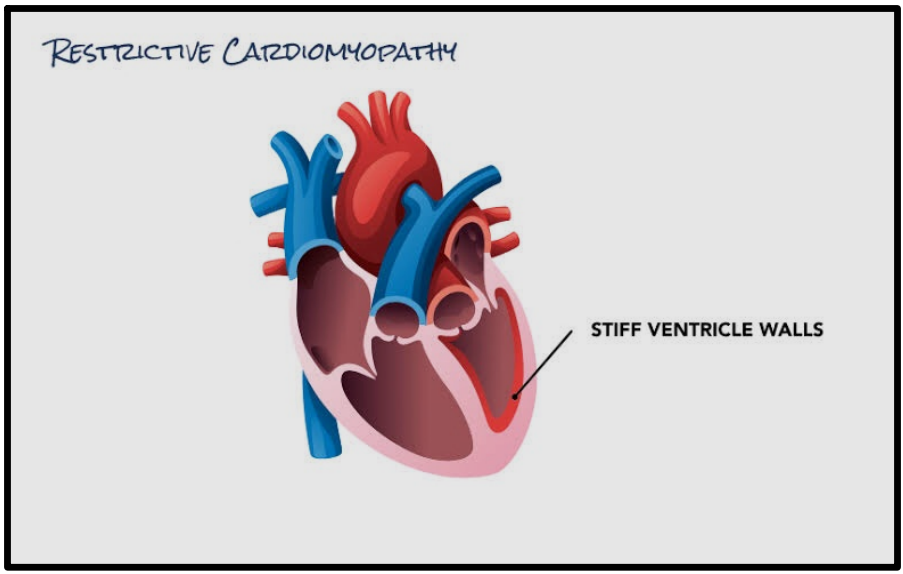


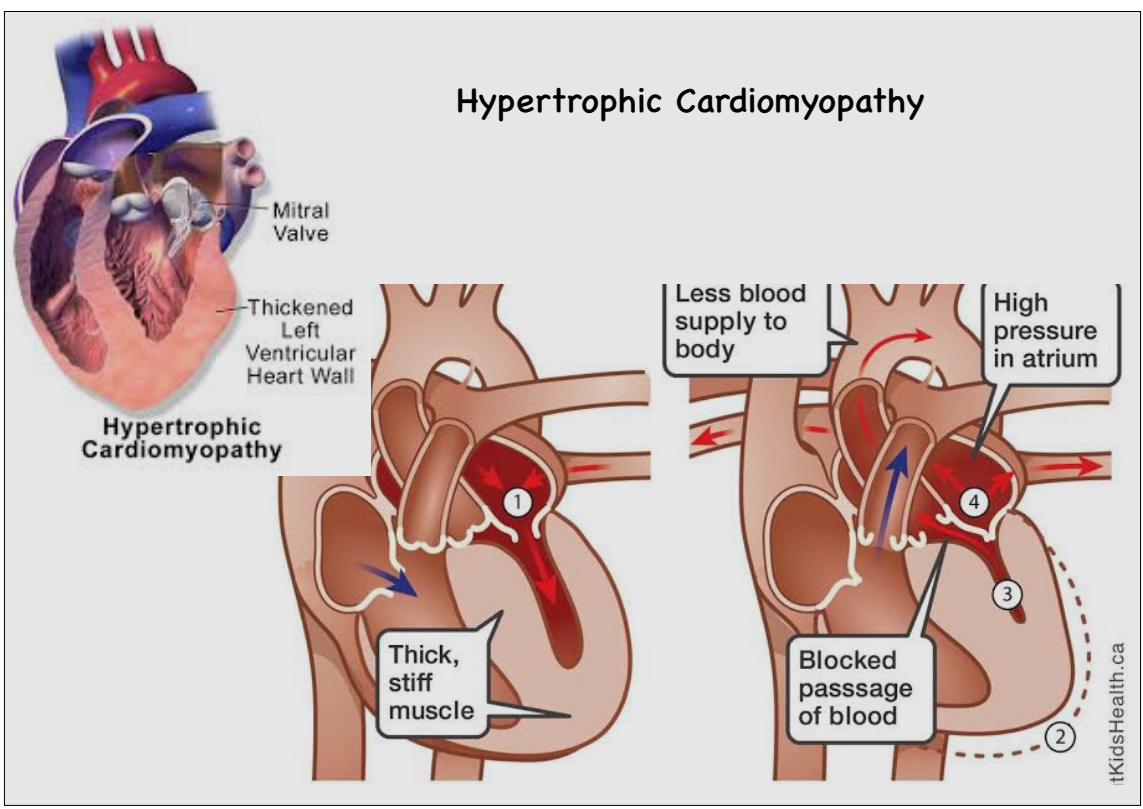
Dilated cardiomyopathy

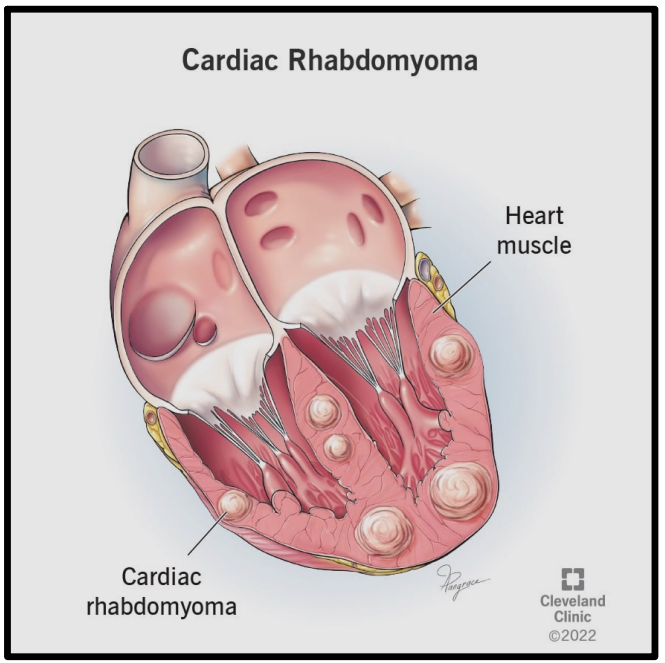


DILATED
Cardiomyopathy

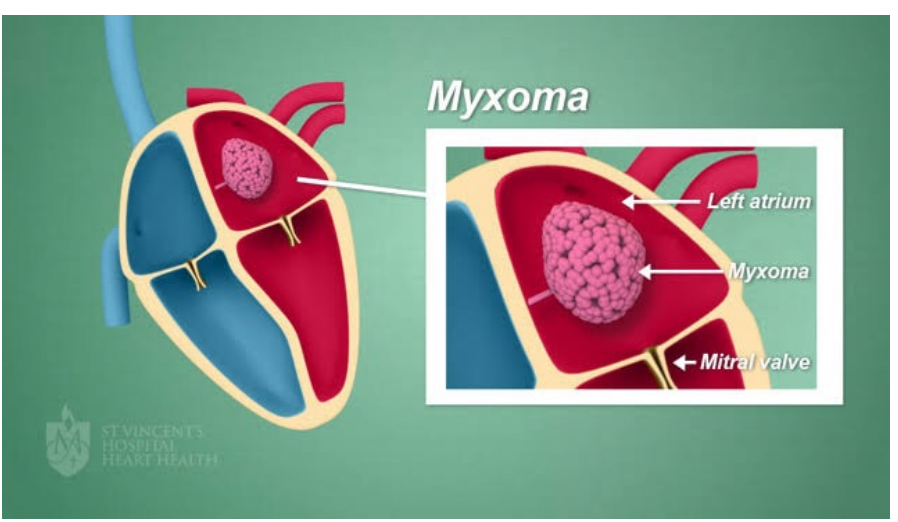






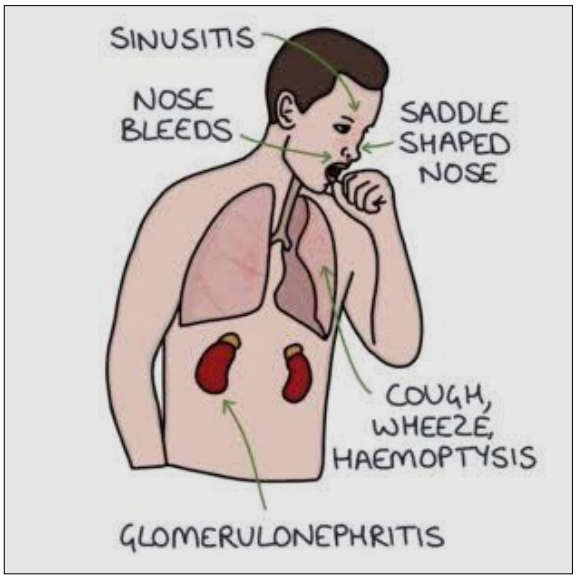


Cardiac Tumors



Vasculitis	Vessels	Lab Findings	Key Features
Henoch-Schonlein Purpura	Small	–	Purpura (non-blanching rash) IgA nephritis
Microscopic Polyangiitis	Small	p-ANCA	Glomerulonephritis Diffuse alveolar haemorrhage
Granulomatosis with Polyangiitis	Small	c-ANCA	Nasal symptoms Respiratory symptoms Glomerulonephritis
Eosinophilic Granulomatosis with Polyangiitis	Small	p-ANCA Raised eosinophils	Late-onset asthma Sinusitis and rhinitis
Polyarteritis Nodosa	Medium	–	Renal impairment Hypertension Cardiovascular events Tender skin nodules

Kawasaki Disease	Medium	–	High fever (more than 5 days) Widespread rash Bilateral conjunctivitis Strawberry tongue Coronary artery aneurysms
Giant Cell Arteritis	Large	Raised ESR	Unilateral headache Scalp tenderness Vision loss
Takayasu's Arteritis	Large	–	Aortic arch affected "Pulseless" disease



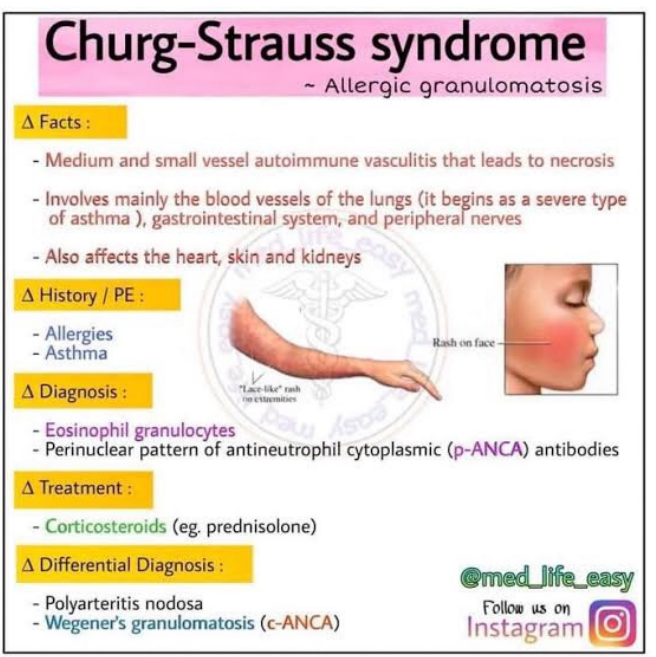
Wegener's Granulomatosis

* upper respiratory tract
* lung
* renal vessels

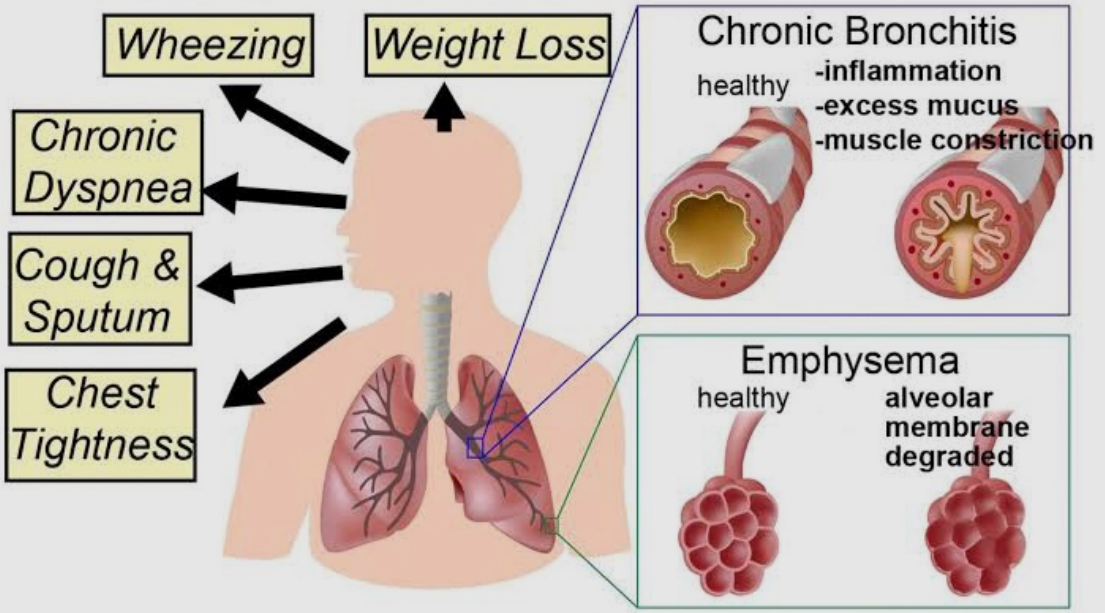
Churg Strauss Syndrome

Affect Vessels of

* skin
* lung
* heart

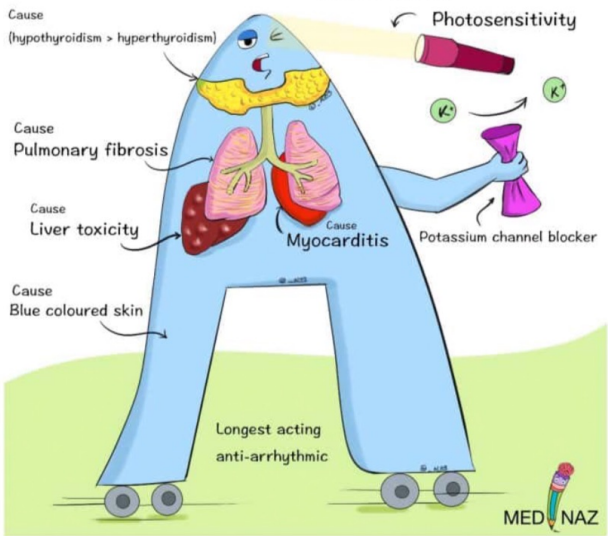


Chronic Obstructive Pulmonary Disease



Amiodarone

www.medinaz.com

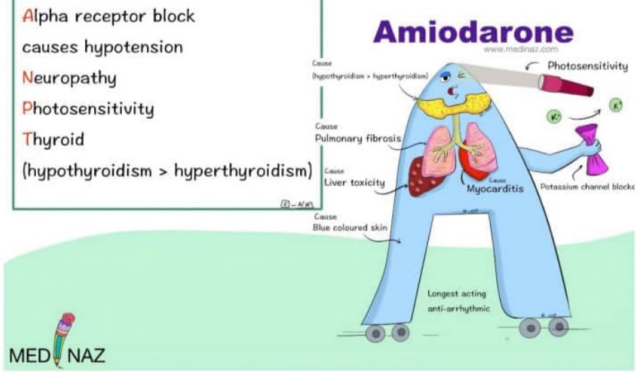


Amiodarone side-effects

www.medinaz.com

Pulmonary fibrosis
Corneal microdeposits
Blue coloured skin
Myocarditis
Liver toxicity
Alpha receptor block
causes hypotension
Neuropathy
Photosensitivity
Thyroid
(hypothyroidism > hyperthyroidism)

"Potassium Channel Blocker Makes Liver And Nerve Photo Toxic"



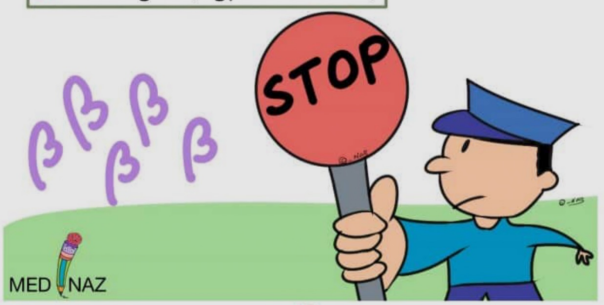
MED NAZ

Beta-blockers: main contraindications

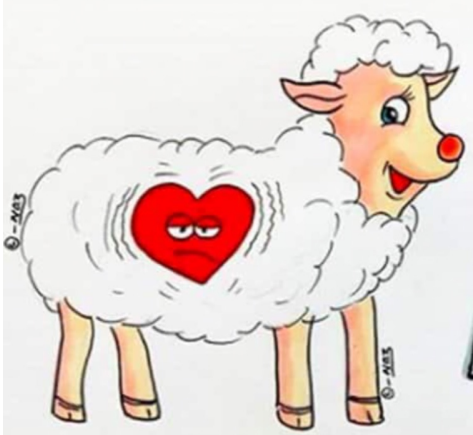
www.medinaz.com

Asthma
Block (heart block)
COPD
Diabetes mellitus
Electrolyte (hyperkalemia)

"ABCDE"



Ventricular Trachycardia treatment



L = Lidocaine
A = Amiodarone
M = Mexiltene/Magnesium
B = Beta-blocker

Supraventricular Tachycardia T/t

www.medinaz.com

Adenosine
Beta blocker
Calcium channel blocker
Digoxin
Excitation (vagal stimulation)

"ABCDE"

Management of PSVT

(Paroxysmal SupraVentricular Tachycardia)

Adenosine > Beta (β) blocker
> Calcium channel blocker (verapamil) > Digoxin

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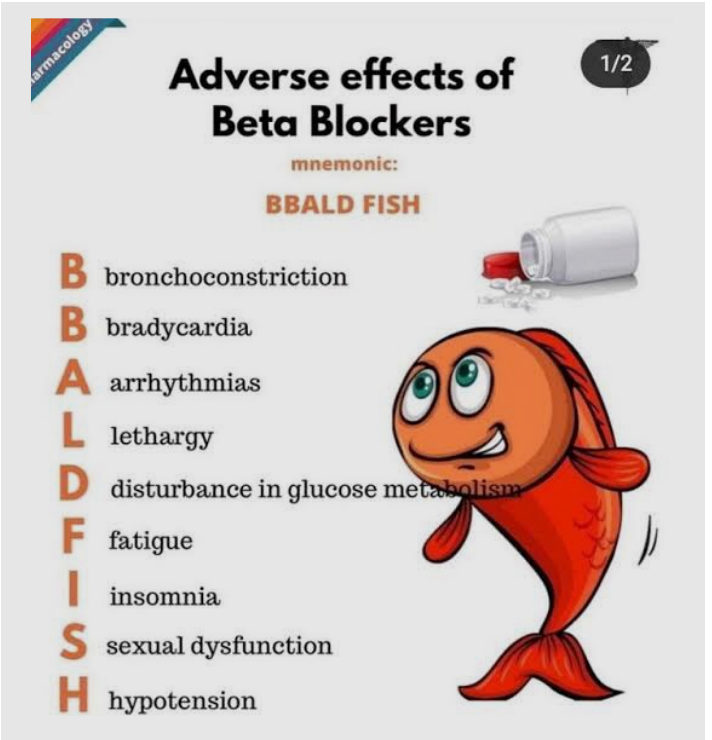
A > B > C > D



ASSOCIATIONS

* Patent Ductus Arteriosus - prematurity, congenital rubella
* Atrioventricular septal defect - Down Syndrome
* Ventricular septal defect - Fetal alcohol syndrome
* Pre ductal coarctation of Aorta - Turner syndrome, PDA
* Dilated Cardiomyopathy- Thiamine deficiency (beri beri heart)
* Hyaline Arteriosclerosis - Diabetes mellitis, Essential hypertension
* Hyperplastic Arteriosclerosis - Malignant hypertension
* Aortic dissection - Hypertension, Marfan syndrome, Ehler Danlos Syndrome, pregnancy
* Polyarteritis Nodosa (PAN) - Hepatitis B associated (30% cases)
* Beurger disease - Smoking, HLA-A9 and HLA-B5
* Henoch-Schonlein purpura - often follows a viral upper respiratory infection
* Raynaud Phenomenon - associated with tissue ischemia and injury, SLE, Systemic sclerosis, atherosclerosis, Beurger disease
* Raynaud disease - NOT associated with tissue injury
* Centriacinar emphysema - Smoking
* Panacinar emphysema - Alpha 1 anti trypsin deficiency
* Libman Sacks disease - SLE
* Spider telengiectasia - hyper estrenism
* Bacillary Angiomatosis - AIDs
* Transposition of great arteries - Diabetic mothers
* Truncus arteriosus - DiGeorge syndrome
* Rhabdomyoma- Tuberous sclerosis
* Myxoma - Carney syndrome
* Abdominal aortic aneurysm- Atherosclerosis

classically seen in male smokers >60 yrs old with hypertension

ASSOCIATIONS

* Ventricular septal defect - fetal alcohol syndrome
* Patent ductus arteriosus - Congenital rubella, premature birth
* Transposition of great vessels - Maternal diabetes
* Atrial septal defect - Ostium primum associated with Down syndrome
* Preductal (Infantile) coarctation of aorta - Turner syndrome, PDA
* Mitral valve prolapse - Marfan syndrome, Ehlers Danlos Syndrome
* Mitral stenosis - chronic rheumatic valve disease
* Liver hemangioma - exposure to polyvinyl chloride, arsenic, thorotrast
* Kaposi sarcoma - HHV8
* Hyaline arteriosclerosis - benign/ essential hypertension or diabetes
* Hyperplastic arteriosclerosis - malignant hypertension
* Tricuspid atresia - Hypoplasia of right ventricle
* Atrioventricular septal defect - Down syndrome
* Aortic and Mitral stenosis - Rheumatic heart disease
* Mitral regurgitation- Rheumatic heart disease
* Aortic Regurgitation - Chronic rheumatic fever, Takayasu arteritis, Syphilis
* Infective endocarditis - Rheumatic heart disease, Mitral valve prolapse, aortic stenosis, artificial valves, indwelling catheters, Diabetes, HIV
* Restrictive cardiomyopathy - Amyloidosis, sarcoidosis
* Myocarditis - Rheumatic fever, SLE
* Serous pericarditis - Rheumatic fever, SLE, Scleroderma, Tumors, Uremia
* Fibrinous (Serofibrinous) pericarditis - Acute MI, Rheumatoid arthritis, Dressler syndrome
* Hemorrhagic and casseous pericarditis- Tuberculosis
* Constrictive pericarditis- TB, Post cardiac surgery

- Productive Cough
    * Chronic bronchitis
    * Air pollutants/ irritants
    * Asthma
    * Aspiration
    * Pneumonia
    * Tuberculosis
- Non - Productive Cough
    * Viral infection (common cold)
    * GERD
    * Heart failure

DISEASE FINDINGS

* Rheumatic fever - Rheumatoid factor, Aschoff bodies
* Infective endocarditis - Roth spots, Osler nodes, Janeway lesions
* Lung cancer - coin lesion
* Coin lesion also seen in - Granuloma (esp due to fungus or TB), bronchial hamartoma
* Squamous cell carcinoma - keratin pearls
* Poly arteritis nodosa - string of pearls appearance (areas of dilatation and constriction seen on angiography)
* Hyperplastic arteriosclerosis - concentric onion skin thickening of arteriolar walls
* Malignant HTN - fibrinoid necrosis and Hyperplastic arteriosclerosis
* * Wegener's Granulomatosis - elevated serum c-ANCA in 95% cases
* Churgg Strauss Syndrome - p-ANCA positive in 50% cases, eosinophilia, asthma
* Microscopic polyangiitis - perinuclear antineutrophil cytoplasmic autoantibodies (p-ANCA) in 70% cases
* Congestive heart failure - Left sided heart failure - increased BNP
* Right sided heart failure- Generalized edema (anasarca), congestive hepatomegaly, Nutmeg liver, S3 and S4 heart sounds, pitting and pretibial edema (hallmark of right sided HF)
* Prinzmetal variant angina - ST Segment elevation
* Transmural MI - New Q waves develop
* ECG Changes in MI - Q waves, ST elevation, T wave inversion
* Tetralogy of fallot - boot shaped heart (due to RV hypertrophy)
* Complication of patent ductus arteriotus - Eisenmenger syndrome, pink upper body and cyanotic lower body

DISEASE FINDINGS

* Preductal coarctation of aorta (Infantile type) - upper body is pink and lower body is cyanotic
* Post ductal coarctation of aorta (Adult Type) - Hypertension in upper extremities, hypotension and weak pulses in lower extremities, radiofemoral delay (delay in femoral pulse as compared to radial)
* Group A beta hemolytic streptococcal infection- Elevated ASO titers (ASO - Anti Streptolysin O)
* Myocarditis in RF - scattered Aschoff bodies within interstitial connective tissue
* Endocarditis in Rheumatic fever - Elevated CK-MB and troponins
* Constrictive Pericarditis
    - kussmaul's sign - JVP rising paradoxically with inspiration
    - Increased JVP with prominent y descent
    - Hepatomegaly, ascites, peripheral edema
    - Right sided HF > Left sided HF
* Rhabdomyoma - spider cells
* Takayasu Arteritis - weak or absent pulse in upper extremity
* Thoracic aneurysm - tree bark appearance of aorta
* Chronic Bronchitis- Reid index increase to >50% (normal is 40%)

Reid's index also increased in emphysema

Reid's index not increased in asthma

* Asthma - Charcot Leyden crystal, Credia bodies, Curshmann spiral
* Bronchiectasis - cough, dyspnea, foul smelling sputum
* Interstitial pulmonary fibrosis - honey comb lung
* Sarcoidosis - asteroid bodies within giant cells of granulomas, Schaumann bodies, lamellar bodies, elevated serum ACE, hypercalcemia
* ARDS - White out on chest X Ray
* Neonatal Respiratory distress syndrome - Ground glass appearance on X Ray

VIRUS AND BACTERIA ASSOCIATIONS

* Rhinitis - Rhinovirus
* Nasopharyngeal carcinoma - EBV
* Acute epiglottitis - H. influenza type b
* Laryngotracheobronchitis (croup) - Parainfluenza virus
* Laryngeal papilloma - HPV 6 and 11
* Community acquired pneumonia - Streptococcus pneumonia (most common cause)
* Klabsiella pneumonia - most common cause of Gram negative pneumonia
* IV drug users are at high risk of staphylococcal pneumonia associated with endocarditis
* Tuberculosis - Mycobacterium tuberculosis
* Infective endocarditis causative organisms

1. Streptococcus viridians - most common overall cause
2. Staphylococcus aureus - most common cause in IV drug users
3. Staphylococcus epidermitis - most common cause of prosthetic valve endocarditis
4. HACEK Group (Gram negative bacteria) - Hemophilus, Actinobacillus, Cardiobacterium, Eikenella, Kingella

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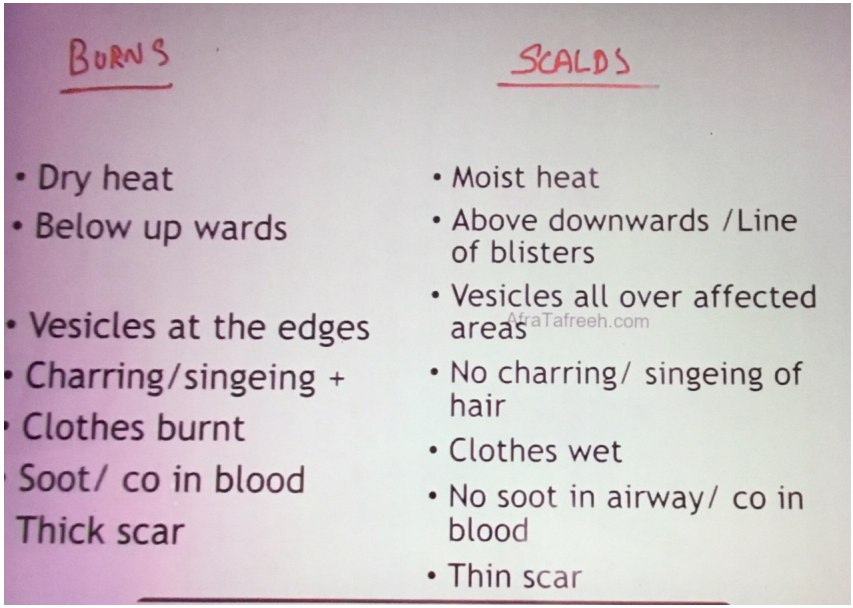
ANTIDOTE OF

* Heparin - Protamine sulfate
* Warfarin - Vitamin K
* Dabigatran - Idarucizumab



DRUG OF CHOICE

* Paroxysmal supraventricular tachycardias and AV nodal arrhythmias - Adenosine
* Hypertensive emergency- Nitroprusside
* Chronic management of CHF - ACEIs and ARBs
* Anti coagulant in pregnancy- Heparin

DRUGS USES

* Opiate withdrawal- Clonidine
* Preferred drugs for initial treatment of hypertension- ACEIs, ARBs, CCBs, Thiazides
* HTN Management in pregnancy - Methyldopa
* Benign Prostatic Hyperplasia - Alpha 1 blockers
* Hypertensive emergency - Diazoxide, Nitroprusside, Labetalol, Nitroglycerin
* Diabetic neuropathy, nephropathy - ACE inhibitors, ARBs
* Acute mountain sickness - Carbonic anhydrase inhibitors (Acetazolamide, Dorzolamide)
*

Table 3.3 ■ **Commonly used drugs for hypertension associated with the following comorbid conditions**

Comorbid conditions	Drugs
Angina/post-MI	β-Blockers, ACE inhibitors, ARBs
Congestive cardiac failure/left ventricular failure	ACE inhibitors, loop diuretics, ARBs
Diabetes mellitus and diabetic nephropathy	ACE inhibitors, ARBs, CCBs
Poststroke (secondary prevention)	ACE inhibitors, ARBs, thiazides
Bronchial asthma/COPD	Calcium channel blockers (CCBs)
Hypertensive emergencies	Sodium nitroprusside, labetalol, nitroglycerin
Benign prostatic hyperplasia (BPH)	Selective α_1-blockers
Pregnancy	Nifedipine (sustained release), labetalol, α-methyldopa, hydralazine

Drugs to be Avoided in Specific Conditions

Bronchial asthma/chronic obstructive pulmonary disease (COPD)	Nonselective β-blockers
Peripheral vascular disease	Nonselective β-blockers
Diabetes mellitus	Nonselective β-blockers
Hyperlipidaemias	Thiazides and β-blockers
Gout	Thiazides
Sexually active males	α_1-Blockers and diuretics

Arteriolar vasodilators used in hypertensive emergencies may cause REFLEX TACHYCARDIA
They include:
* Nitrates
* ACEIs (prils)
* ARBs (sartans)
* Hydralazine
* Minoxidil

Drugs causing BRADYCARDIA
* Beta blockers
* Calcium channel blockers
* Digoxin
* Clonidine
* Quinidine

Diuretics and location of action

* Osmotic diuretics - Entire tubule
* Carbonic anhydrase inhibitors - Proximal convulted tubule
* Loop diuretics - Ascending loop of Henle
* Thiazides - Distal convoluted tubule
* Potassium sparing diuretics - Collecting ducts and tubules

ACE inhibitors - pril
ARBs - sartan
Beta blockers - olol
DHP calcium channel blockers - dipine
Selective alpha 1 blockers - zosin
HMG CoA reducatase inhibitors- statins
Thrombolytic drugs - teplase
Methylxanthines - phylline
Leukotriene receptor anatagonist - lukast (+ zileuton)
P2Y12 receptor antagonist - grel, grelor (+ticlopidine)

DRUGS OF CHOICE

Cardiovascular system

Angina acute attack – Sublingual nitroglycerine

Long term prophylaxis in stable angina – Beta blockers

Aortic dissection – Labetalol

Arterial fibrillation and flutter – Acute attack – IV Ibutilide
Rhythm control – Amiodarone
Rate control – Beta blockers

Anticoagulation in Atrial fibrillation – Dabigartan, Apixaban

Acute CHF first drug of choice – Furosemide

Acute CHF Inotrope of choice – Dobutamine

Chronic CHF – ACE inhibitors / ARBs

Hypertriglyceridemia – Fibrates

Chylomicronemia syndrome – Fibrates

Type III hyperlipoproteinemia – Fibrates

Hypercholesterolemia – Statins

Hypertension first line drugs – ACE inhibitors, ARB, CCB

Resistant hypertension – Aldosterone antagonists

Hypertension in elderly – CCB

Hypertension in young patients - ACE inhibitors / ARBs

PSVT – IV Adenosine

PSVT prophylaxis – Verapamil or beta blockers

Anaphylactic shock – Epinephrine

Cardiogenic shock – Norepinephrine or Dopamine

Septic shock – Norepinephrine

Vasodialatory shock – Norepinephrine

SVT treatment & prophylaxis – Verapamil

SVT associated CHF – Digoxin

Torsades de pontes – Magnesium sulphate

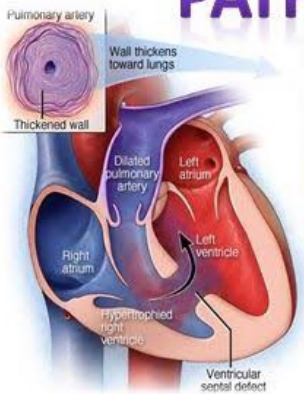
Ventricular extrasystole (symptomatic) – beta blockers

Ventricular fibrillation – Amiodarone

Ventricular trachycardia in MI and digitalis toxicity – Lidocaine

WPW syndrome – IV procainamide

EISENMENGER SYNDROME PATHOPHYSIOLOGY



1. Systemic to pulmonary circulation connection
2. Left to right shunting of blood
3. Increased pulmonary blood flow
4. Irreversible pulmonary vascular injury
5. Irreversible pulmonary vascular resistance
6. Right to left shunting of blood
- Hypoxia and erythrocytosis

1. Cough

Origin	cause	charactiristic
Pharynx	Post. Nasal drip	Usualy persistent
Larynx	Laryngitis, tumour, whooping cough	Harsh barking painful persistent
Trachea	Tracheitis	Painful
	Asthma	Dry or productive,worse at night, cold exp, or allergen
	COPD	Worse in the morning , often productive
	Bronchial carcinoma	Persistent, associated with hemoptysis
	Pneumonia	Initialy dry the productive
	Bronchiectasis	Productive, positional changes
	Pulmonary edema	Often at night, frothy sputum
	Pulmonary tuberculosis	Productive, wt. Loss, fever
	Interstitial lung disease	Dry, irritant, distressing

Trigger	Diagnostic category
Physical activity	Any cause
	Airway hyper-reactivity/asthma phenotype
	Eosinophilic airway inflammation
	Upper airway associations
Feeding/meals	Airway aspiration
	Airway anomaly (e.g., tracheo-esophageal fistula)
Allergens	Upper airway associations
	Airway inflammation
Pollution (indoor or outdoor)	Upper airway associations
	Airway inflammation
	Post-infectious
Tobacco smoke and e-cigarettes	Upper airway associations
	Airway inflammation
	Post-infectious
Fog	Upper airway associations
	Airway inflammation
	Post-infectious
Body position	Airway anomaly
	Airway aspiration
Stress	Tic and somatic syndrome
Temperature (cold)	Airway hyper-reactivity/asthma phenotype

CLINICAL FEATURES

* Pneumonia - fever and chills, productive cough with yellow green (pus) or rusty (bloody) sputum, tachypnea with pleuritic chest pain, decreased breath sounds, dullness to percussion and elevated WBC count
* Lobar pneumonia - consolidation of entire lobe of lung
* Bronchopneumonia - often multifocal and bilateral
* Interstitial (Atypical) pneumonia - diffuse interstitial infiltrates
* Aspiration pneumonia - right lower lobe abcess
* Primary TB - focal, casseating necrosis in lower lobe of lung
* Secondary TB - cavitary foci of caseous necrosis
* TB - fever, night sweat, cough with hemoptysis, weight loss
* Chronic bronchitis - chronic productive cough lasting at least 3 mobths over a minimum of 2 years (productive cough due to excessive mucus production), cyanosis, associated with smoking
* Emphysema - smoking, dyspnea and cough with minimal sputum, weight loss, barrel chest, hypoxemia, pink puffers
* Asthma - dyspnea, wheezing, productive cough
* Bronchiectasis - cough, dyspnea, foul smelling sputum
* Idiopathic pulmonary fibrosis - progressive dyspnea and cough, fibrosis on lung CT (initially seen in subpleural patches, but eventually results in diffuse patches with end stage honeycomb lung)
* Sarcoidosis - non casseating granulomas in multiple organs, asteroid bodies often seen within giant cells of granulomas, dyspnea, cough, elevated serum ACE, hypercalcemia
* Hypersensitivity pneumonitis - granulomatous reaction to inhaled organic antigens (pigeon breeders lung), fever, cough, dyspnea hours after exposure
* Acute Respiratory distress syndrome - diffuse alveolar damage, hyaline membranes in alveoli, hypoxemia and cyanosis with respiratory distress
* Coin lesion - may be seen in lung cancer, granuloma (often due to TB or fungus) or bronchial hamartoma
* Lung cancer - cough, sputum production, weight loss, anorexia, fatigue, dyspnea, hemoptysis, chest pain
* Small cell carcinoma - L myc
* Adenocarcinoma - k-ras
* Squamous cell carcinoma - p53
* Carcinoid tumor - When central, it classically forms a polyp-like mass in bronchus
* Metastasis to lung - cannon ball nodules

Refampicin

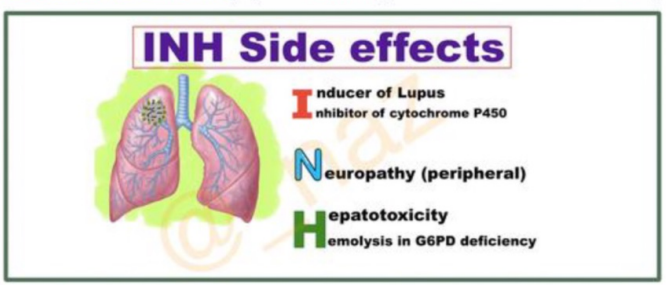
- Bactericidal and acts by inhibiting DNA dependent RNA polymerase
- It undergoes enterohepatic circulation and can be used safely in renal failure patient
- It can penetrate BBB and placental barrier
- Only bactericidal drug active against dormant bacteria and solid caseous lesions
- It is the most effective and fastest acting drug in leprosy
- It is the least toxic drug for TB and is also the safest drug in pregnancy

Rifampin's 4 R's:

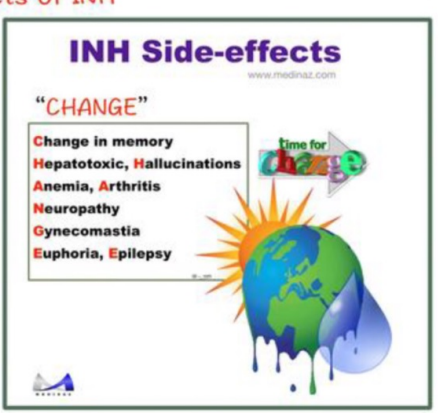
R**N**A polymerase inhibitor
R**a**mps up microsomal cytochrome P-450
R**e**d/orange body fluids
R**a**pid resistance if used alone

Isoniazid

- Isoniazid is a prodrug activated by catalase-peroxidase
- Bacteriostatic against resting and bactericidal against rapidly dividing organisms
- Metabolized by Acetylation which is genetically controlled
- Kat G gene mutation is the most common mechanism of resistance
- DOC for prophylaxis of TB
- Isoniazid causes B 6 deficiency (peripheral neuropathy, sideroblastic anemia) (Mn. INH Injures Neurons and Hepatocytes)



- Peripheral neuritis can be prevented and treated by pyridoxine
- Can cause hemolysis in G6PD deficient patients
- Side effects of INH



MEDINAZ

Ethambutol

- Bacteriostatic and inhibit arabinosyl transferase
- Contraindicated in Children
- Ethambutol cause Optic neuropathy

Eyethambutol = Eye problem

Pyrazinamide

- Weakly bactericidal and works best at acidic pH (eg, in host phagolysosomes)

Pyrazinamide is a prodrug that is converted to the active compound pyrazinoic acid

Pyrazinamide = Prodrug

Mycobacterium

- **Obligate aerobe**, sensitive to UV
- **Acid fast** rods w/ waxy cell wall; ↑Lipid concentration (mycolic acid)
  - Resistance to desiccation (drying), chemicals (NaOH)

M. tuberculosis

Features	Pathogenesis	Diseases	Treatment
• Acid fast due to mycolic acid • **Auramine-rhodamine stain** (fluorescent green) • Slow growing on **Lowenstein Jensen** • Produces **niacin** • Produces **heat sensitive catalase** (∅ at 68.0°C) Reservoir= Lungs Transmission= Respiratory droplets	• Facultative intracellular organism • **Sulfatides**—inhibit phagosome-lysosome fusion • **Cord factor** (trehalose dimycolate)—**serpentine growth** in vitro, inhibits leukocyte migration (disrupts mitochondrial respiration and oxidative phosphorylation) • **Tuberculin** (surface protein) as well as mycolic acid—delayed hypersensitivity and cell-mediated immunity (CMI mediates granulomas and caseation) • Damage caused by immune system (cell-mediated)	**Primary pulmonary tuberculosis** • Replication in naïve alveolar macrophages (kills macrophage until CMI is set up—Ghon focus- calcified tubercle in middle/lower lungs) • Macrophages transport bacilli to regional lymph node (Ghon complex) and most people heal without disease • Organisms walled off in Ghon complex remain viable unless treated Latent phase (years)—become tuberculin ⊕ **Reactivational tuberculosis (secondary)** • Erosion of granulomas into airways (high O_2) later in life under conditions of ↓T-cell immunity= mycobaterial replication/disease • Complex disease w/ potential of infecting any organ system • Dissemination→ seeds other organs (miliary TB)→ Vertebral column (Pott's disease); chronic meningitis (at base of brain); **MC organ involved is kidney** (sterile pyuria) **PPD skin test** (Mantoux)→ ⊕ zone of induration at 48-72 hrs if: ≥ 5mm in HIV+ or those w/ recent TB exposure ≥ 10mm in high risk (IVDA, poverty, immigrants) ≥ 15mm in low risk	Uncomplicated TB • 2 months→ isoniazid+ rifampin + pyrazinamide • Next 4 months→ isonizid + rifampin • Drug resistance add ethambutol (and/or streptomycin) Prevention Family members take isoniazid (+rifampin) for 6 months ****Must do PPD before starting anti-TNF therapy** (Infliximab, adalimumab, etanercept- acts as receptor decoy)

M. leprae

Features	Pathogenesis	Diseases	Treatment
• **Acid fast rods** (seen in punch biopsy) • **Obligate intracellular parasites** (cannot be cultured in vitro) • Optimal growth at less than body temp • **Phenolase** ⊕ Reservoir • Mucosa, skin, nerves • Armadillos in Texas/Louisiana Transmission • Nasal discharge from untreated lepromatous leprosy patients	• Obligate intracellular parasite • Cooler parts of body	Leprosy (Hansen's disease) **Tuberculoid**: **Strong CMI (TH1)**; Lepromin test ⊕; Low number of organisms; Damage due to CMI killing infected cells • Granulomas→ nerve damage/ enlargement • Sensation loss→ burns/trauma Symptoms • **Fewer lesions**; macular • Nerve enlargement • Paresthesia **Lepromatous**: **Weak CMI (TH2)**; Lepromin test ∅; High number (foam cells filled); Damage due to large number of intracellular organisms • Overgrowth in cells→ nerve damage • Sensation loss→ burns/trauma Symptoms • **Numerous lesions**; nodular • **Loss of eyebrows** • Destruction of nasal septum (saddle nose) • Leonine **(lion-like) facies** • Paresthesia	Diagnosis • Punch biopsy or nasal scrapings→ acid fast • **Cannot be cultured** DOC • **Dapsone + rifampin** (clofazimine added for lepromatous) (Dapsone for close family contacts—can cause hemolysis in G6PD deficiency)

Mycobacterium other than tuberculosis (MOTTs)

- Atypical mycobacteria commonly found in southeastern U.S.
- Noncontagious, found in surface waters, soil, cigarettes

Organism	Transmission	Disease/Presentation	Diagnosis	Treatment
M. avium-intracellulare (MAC)	Respiratory/ ingestion Reservoir- aerosolized water, dust, soil, cigarettes	Fevers, diarrhea, malabsorption/anorexia, bone marrow suppression Lung involvement resembles TB (fever, chills, etc) **Seen in AIDS**, cancer, chronic lung disease	Nonchromogen (no pigments) Blood culture— grows at **41°C**)	Clarithromycin, ethambutol, & rifampin Prophylaxis for AIDS patients at **<50 CD4** with **Azithromycin** or Clarithromycin
M. kansasii		Resembles pulmonary tuberculosis **Seen in AIDS**, organ transplants, silicosis, hairy cell leukemia, chronic bronchitis, COPD	Photochromogen (pigment when exposed to light)	**Rifampin**, ethambutol, isoniazid, & pyridoxine for 12 months
M. scrofulaceum	Contaminated water sources	Painless solitary cervical lymph node in **children (scrofula)** with overlying bluish-purple color (Scrofula in adult most likely secondary TB)	Scotochromogen (pigment when exposed to dark)	Surgery
M. marinum	Abrasion to extremity in non-chlorinated water	Soft tissue infection→ **"fish tank granuloma"** seen in tropical fish enthusiasts (purple papule)	Photochromogen	Clarithromycin + ethambutol

Bordetella pertussis (cysteine NOT required)

- Encapsulated
- **Bordet-Gengou medium** (potato, blood and glycerol)

Reservoir
- Vaccinated humans—(because vaccine is toxoid)
- Mucosal surface pathogen

Transmission
- Respiratory droplets

Attachment (to nasopharyngeal ciliated epithelial cells)
- Filamentous hemagglutinin—allows organism to bind
- Pertussis toxin aids in attachment

Toxins (damage respiratory epithelium)
- **Adenylate cyclase toxin**—impairs leukocyte chemotaxis (inhibits phagocytosis; causes local edema→ **similar to Anthrax edema factor toxin**)

- **Pertussis toxin**—(A and B component, OM protein toxin) **ADP-ribosylation of G_i** interferes with transfer of signals from cell surface to intracellular mediator system= ↑cAMP
  - Lymphocytosis promotion
  - Islet-activation→ **hypoglycemia**
  - Blocks immune effector cells
  - Increased histamine sensitivity

- Tracheal cytotoxin—kills ciliated cells; interferes with cilliary action

- Endotoxin (LPS)

Pertussis (Whooping cough)

Stages (duration)

Incubation (7-10 days)	Very difficult to culture No symptoms
Catarrhal (1-2 weeks)	**BEST chance of culture** Runny nose, low-grade fevers, occasional cough, highly contagious
Paroxysmal (2-4 weeks)	Difficult to culture Fits of rapid forceful coughing followed by inspiratory gasps **(whoops)**, vomiting often follows attacks Adults (persistent cough), children with immunization wearing off, and infants (cough w/ apnea spells) may not have typical whoop
Convalescent (3-4 weeks)	Cannot culture Infrequent/diminished attacks; secondary symptoms (pneumonia, seizures, encephalopathy)

Diagnosis
- **Regan-Lowe** or **Bordet-Gengou** media during catarrhal stage (direct cough plates or nasopharyngeal cultures)
- Direct immunofluorescence (DFA) on nasopharyngeal smear
- PCR and serologic tests (ELISA) available

Supportive care, hospitalization <6 months old

DOC
Erythromycin (14 days including all household contacts)

Vaccine
- DTaP (diphtheria, tetanus, acellular pertussis)
- Acellular pertussis= filamentous hemagglutinin + pertussis toxoid
- Immunity wanes 5-7 years
- Infants not protected by breast milk (IgA) bc mother's immunity has waned

Legionella pneumophila (requires cysteine)

- **Oxidase** ⊕
- Weakly gram negative **pleomorphic rods**
- **Require cysteine & iron**
- **Charcoal yeast extract**

Reservoir
- WATER (rivers, streams, **air-conditioners**, produce misters)

Transmission
- Inspired aerosolized H_2O
- **NOT PERSON TO PERSON!!**

- **Facultative intracellular pathogen** (macrophages→ granulomas)
- Endotoxin (LPS)

Predisposing factors
- **Smokers > 55 yrs w/ high alcohol intake**
- Immunosuppressed patients

Legionnaires disease
- **Atypical pneumonia** (can consolidate however)
- Mental confusion, diarrhea (however NO legionella in GI tract)
- **Causes hyponatremia**
- **Associated w/ air conditioning systems**
- High mortality without treatment

Pontiac Fever
Young person w/ pneumonitis
Can go untreated

Diagnosis→ **DFA** (direct fluorescent antibody) on biopsy, by **silver stain**
Antigen can also be detected in urine

DOC
- **Fluoroquinolones**
- Azithromycin
- Erythromycin

(Add rifampin for immunocompromised)

Prevention—routine decontamination of air-conditioner cooling tanks

Mycoplasmas

- Missing peptidoglycan—No cell wall **(not seen on gram stain)**
- **Requires cholesterol** (plus nucleic acids) for in vitro culture→ fried egg appearance (not seen in M. pneumoniae)

Mycoplasma pneumoniae

Features	Pathogenesis	Diseases	Treatment
• Smallest extracellular bacteria • Sterols/cholesterol in membrane (but does not synthesize cholesterol) • **Eaton's agar** Reservoir • Human respiratory tract Transmission • Respiratory droplets • Close contact: **military recruits, college dorms**	• Surface parasite (not invasive) • **P1 Protein**—attaches to respiratory epithelium • Inhibits ciliary action • Produces hydrogen peroxide, superoxide radicals, cytolytic enzymes (damage respiratory epithelium→ necrosis, bad hacking cough) • Functions as **superantigen**—elicits production of **IL-1, IL-6,** and **TNF-α** (overwhelming immune response; inflammation)	**Walking pneumonia (MCC)** (patients do not feel very sick) • **MC atypical pneumonia in young adults** • **Dry hacking cough**; **pharyngitis,** fever, otitis media • Also common in children and teens **Diagnosis** • Primarily clinical; PCR/nucleic acid probes • ELISA and immunofluerescence sensitive and specific • Mulberry-shaped colonies on sterol-containing media, 10 days • **Positive cold agglutinins** (IgM autoantibody to red cells) test is nonspecific and only positive in 65% of cases (however this plus a clinical presentation has been an effective diagnostic tool)	DOC • **Erythromycin** (and other macrolides) • Tetracyclines **Cephalosporins or penicillins do NOT work→ (no cell wall!!!)**

Ureaplasma urealyticum

• Urease ⊕	• Becomes normal flora of sexually active adults • **Seen in child= sexual abuse**	• Urethritis (yellow mucoid discharge) • Prostatitis • Renal calculi	DOC • **Erythromycin** • Tetracycline

Haemophilus

- Pleomorphic rod (considered **coccobacillus**)
- **Requires growth factors X (hematin) and V (NAD)** for growth on blood agar
- **Satellite phenomenon** (with S. aureus on blood agar)
  - Pinpoint colonies (S. aureus secretes NAD and lysed blood releases hematin)
- **Chocolate agar** (provides both X and V factor)

Haemophilus influenzae

Features	Pathogenesis	Diseases	Treatment
• Encapsulated • 95% of invasive disease caused by capsular type b Reservoir • Human nasopharynx Transmission • Resiratory droplets • Shared toys ***Unvaccinated child***	• **Polysaccharide capsule (most important)**—type b capsule is polyribitol phosphate • **Attachment pili** • IgA protease—colonizing factor • **Latex particle agglutination screen** for capsular antigen in CSF	**Meningitis** • Epidemic in unvaccinated children ages 3 months (after maternal antibody wanes) to 2 years (before immune response is adequate) • *Before 1990*-- MCC meningitis in 1-5 yr old **Epiglottitis→** Unvaccinated toddlers—**catcher's stance w/ drooling** (dog sniffing position—drop heads to catch breath due to swelling of epiglottis) Nontypable strains Otitis media/sinusitis→ 2nd MCC cause (also presents w/ conjunctivitis) Bronchitis→ exacerbations of acute bronchitis in smokers w/ COPD Pneumonia→ smoking history; rare in vaccinated children	DOC • Ceftriaxone • Cefotaxime Rifampin= prophylaxis Vaccine • **Conjugate capsular polysaccharide protein vaccine coupled to protein carrier (diptheria toxoid)** • Prevents type b • **T-cell dependent** • Not live; 2, 4, 6 months • Booster at 15 months

Haemophilus ducreyi

Reservoir • Human genitals Transmission • Sexual and direct contact	No exotoxins	Chancroid • **PAINFUL genital ulcer** (syphilis is painless) • Often associated with unilateral swollen lymph node (can rupture releasing pus) Painful chancroid= "you do cry with ducreyi"	DOC • **Azithromycin and/or Ceftriaxone** • Ciprofloxacin

Gardnerella vaginalis

• **Gram-variable rod** (gram ⊕ that could become gram ∅ after culturing) Reservoir= normal flora • Vagina Transmission= endogenous • Flora gets disturbed (stress, menses, antibiotics, ↑pH)	• Polymicrobial infections • Works synergistically with other normal flora *(Lactobacillus, Mobiluncus, Bacteroides, Peptostreptococcus)* • ↑pH associated with reduction of vaginal Lactobacillus	Bacterial vaginosis Vaginal odor, **thin, gray discharge** Diagnosis pH >4.5, Vaginal saline smear→ **clue cells** (vaginal epithelial cells that contain tiny plemorphic gram negative bacilli within the cytoplasm) Whiff test: add **KOH to sample→ "fishy"** amine odor Other discharges • Gonorrhea→ cloudy yellow-green, purulent • Chlamydia→ clear, white • Trichomonas→ frothy green w/ foul odor (strawberry cervix) • Candida→ cottage cheese (only one with decreased pH)	DOC • **Metronidazole** • Clindamycin

Antimycobacterial Drugs

Drug	Use	MOA and Resistance	Side Effects
Isoniazid	**Tuberculosis** Standard= 2 months: Isoniazid, Rifampin, Ethambutol, Pyrazinamide 4 months: Isonizid + Rifampin Prophylaxis— Isoniazid (+ rifampin if intolerant)	Prodrug requiring conversion by catalase→ inhibits mycolic acid synthesis Resistance: deletions in katG gene (encodes catalase)	Hepatitis (age/dose dependant) Peripheral Neuritis & sideroblastic anemia (must supplement with vitamin B6) SLE in slow acetylators
Rifampin		Inhibits DNA-dependent RNA polymerase (nucleic acid synthesis inhibitors)	Hepatitis **Inducer of p450 (OC failure)** **Body secretions turn orange** (metabolites in urine, sclera)
Ethambutol		Inhibits synthesis of arbingalactan (cell-wall component)	Dose-dependent retrobulbar neuritis **Decreased red-green discrimination** and visual acuity
Pyrazinamide		Decreased pH in the tubercle cavity	Hepatitis, phototoxicity Hyperuricemia (competes with uric acid secretion)
Streptomycin		Protein synthesis inhibition	Nephrotoxicity, Ototoxicity Vestibular dysfunction
Dapsone	**Leprosy**	Related to sulfonamides: inhibits DHT synthase	Hemolytic anemia in G6PD deficiency, Lepra reaction (Jarish Herxheimer)
Clofazimine	Lepra reaction from Dapsone	Binds to DNA and inhibits template function Produces cytotoxic free radicals that kill bacteria	Dye with a half life of 70 days; can cause **reddish black skin**

Respiratory System

Most Common . . .

Cause of pneumonia in debilitated, hospitalized patient	***Klebsiella***
Cause of epiglottitis	***Haemophilus influenzae*** **type b**
Cause of IV drug user bacteremia/pneumonia	***Staphylococcus aureus***
Cause of opportunistic infection of AIDS	***Pneumocystis jirovecii*** **is most common overall.**
Death in patients with Alzheimer disease	**Pneumonia**
Fatal genetic defect in Caucasians	**Cystic fibrosis**
Pneumonia—community—atypical	1. ***Mycoplasma*** 2. *Legionella*
Pneumonia—community—typical	1. ***Streptococcus pneumoniae*** 2. *H. influenzae* 3. *Klebsiella*
Pneumonia—hospital acquired	1. ***Klebsiella*** 2. ***Pseudomonas*** 3. ***Escherichia coli***
Pulmonary hypertension	**Chronic obstructive pulmonary disease (COPD)**
Cancer associated with syndrome of inappropriate secretion of antidiuretic hormone (SIADH)	**Small cell carcinoma of the lung**
Tracheoesophageal fistula	**Lower esophagus communicates with trachea; upper esophagus ends in blind pouch.**

Cardiovascular System

Most Common . . .

Acute mitral insufficiency—children	**Kawasaki disease**
Aneurysm	**Abdominal aorta**
AV fistula	**Penetrating knife wound**
Cancer of the heart—adults	**Metastases**
Cancer of the heart—primary—adults	**Myxoma "ball valve"**
Cancer of the heart—primary—kids	**Rhabdomyoma**
Cardiomyopathy	**Dilated (congestive) cardiomyopathy**
Cause of acute endocarditis	***Staphylococcus aureus***
Cause of subacute endocarditis	**Viridans streptococci**
Congenital cardiac anomaly	**Ventricular septal defect** (membranous > muscular)
Congenital early cyanosis	**Tetralogy of Fallot**
Coronary artery thrombosis	**Left anterior descending**
Death in hypertension	1. **Acute mitral insufficiency** 2. Lenticulostriate stroke 3. Renal failure (benign nephrosclerosis)
Death in the United States	**Ischemic heart disease**
Heart murmur	**Mitral valve prolapse**
Heart valve in bacterial endocarditis	**Mitral**
Heart valve in bacterial endocarditis in IV drug users	**Tricuspid**
Heart valve involved in rheumatic fever	**Mitral** > aortic
Hypertension	1. **Essential (95%)** 2. Renal disease
Hypertension—children	**Renal disease**, cystic disease, Wilms tumor
Hypertension—young women	**Oral contraceptives**
Myocarditis	**Coxsackie B virus**
Right heart failure	**Left heart failure**
Secondary hypertension	**Renal disease**
Sites of atherosclerosis	**Abdominal aorta** > coronary > popliteal > carotid
Vasculitis (of medium and small arteries)	**Temporal arteritis**

AV, atrioventricular; IV, intravenous.

Croup (Laryngotracheobronchitis)

Croup

Paeds Revision

Overview:

- **Viral** Upper Respiratory Tract Infection (**URTI**) that typically affects babies and children between **6 months** and **6 years**
- Most common pathogen: Parainfluenza Virus (**75%**)
- The infection affects the **larynx**, **trachea** and **bronchi**.
- **Swelling** and **inflammation** in these areas make it **difficult to breathe**

Signs + Symptoms:

- 3 Classic Features:
  - Barking Cough, Stidor, Hoarse voice
- Flu like symptoms (Temperature, Coryza)
- In **moderate** to **severe** cases, upper airway **obstruction** can cause **respiratory distress**

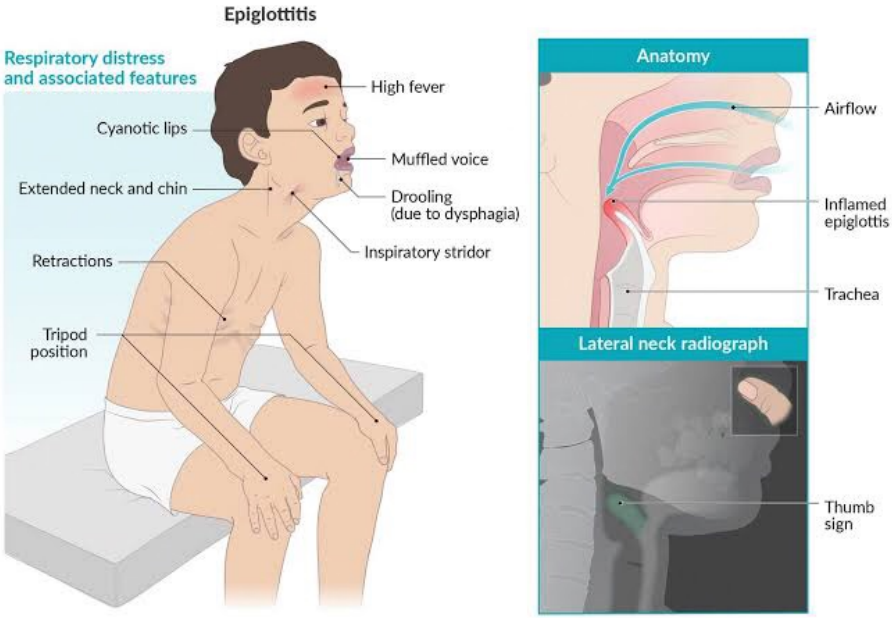
Paeds Revision's Quick Fact:

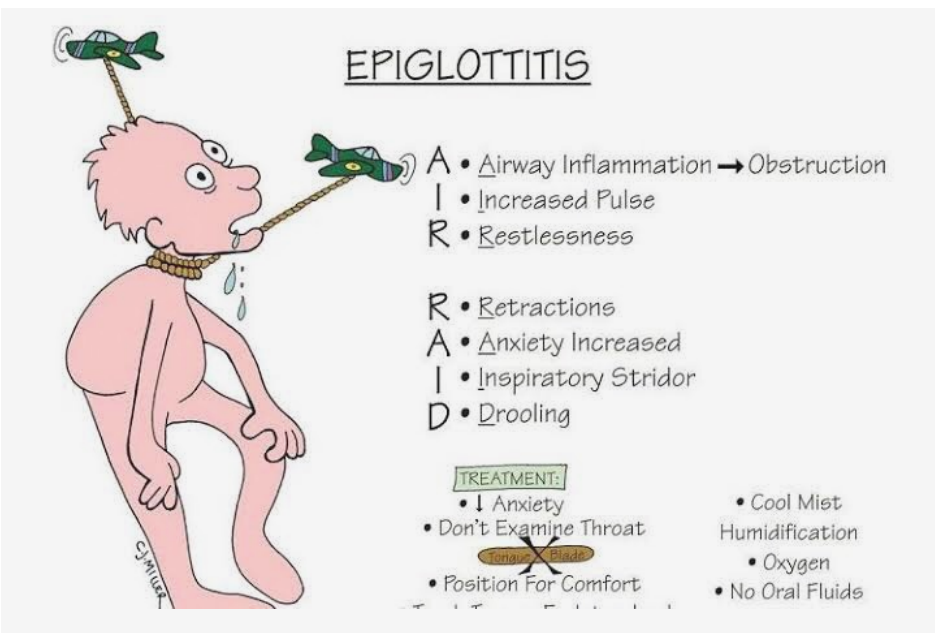
Mild Croup typically resolves within 48 hours

Treatment:

- **All patients** receive **Oxygen support** and **oral dexamethasone (0.15mg/kg)**
- **Admit** moderate to severe cases, and further management includes **nebulised epinephrine** and **senior support**
- If mild and not deteriorating after dexamethasone, then home with **strict safety netting advice** and **low threshold** to seek medical attention again

@paedsrevision /paedsrevision

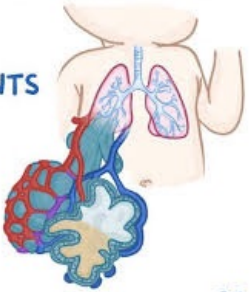


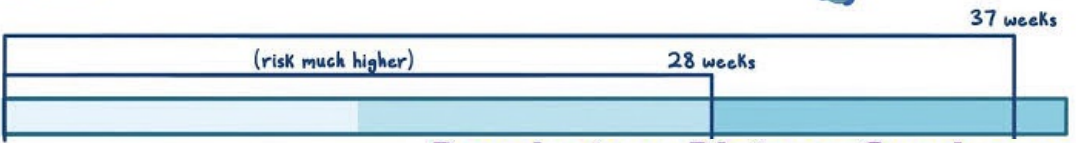


NEONATAL RESPIRATORY DISTRESS SYNDROME

* RESPIRATORY CONDITION caused by DEFICIENCY of LUNG SURFACTANT
* MOST COMMONLY AFFECTS PRETERM INFANTS

~ ALVEOLAR COLLAPSE
~ NONCARDIOGENIC PULMONARY EDEMA
↳ HYPOXEMIA
↳ RESPIRATORY FAILURE

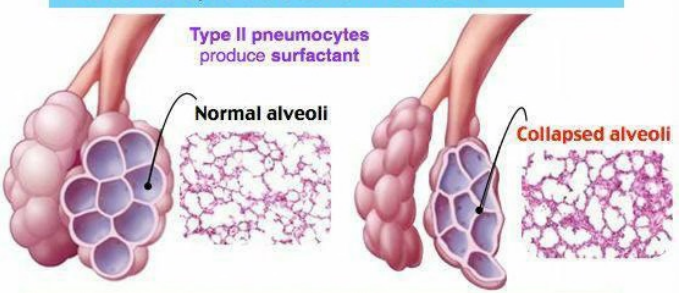




Respiratory Distress Syndrome

↳ **Deficient surfactant in the lining of the alveoli** (premature infants)

Surfactant **GRADUALLY** increases until **33-36 weeks** gestation
After 36 weeks, there is a **SURGE** in surfactant



INCREASED Risk	DECREASED Risk
• Diabetic mother	• Prolonged rupture of membranes
• C-section delivery	• Prenatally administered steroids
• Birth asphyxia	

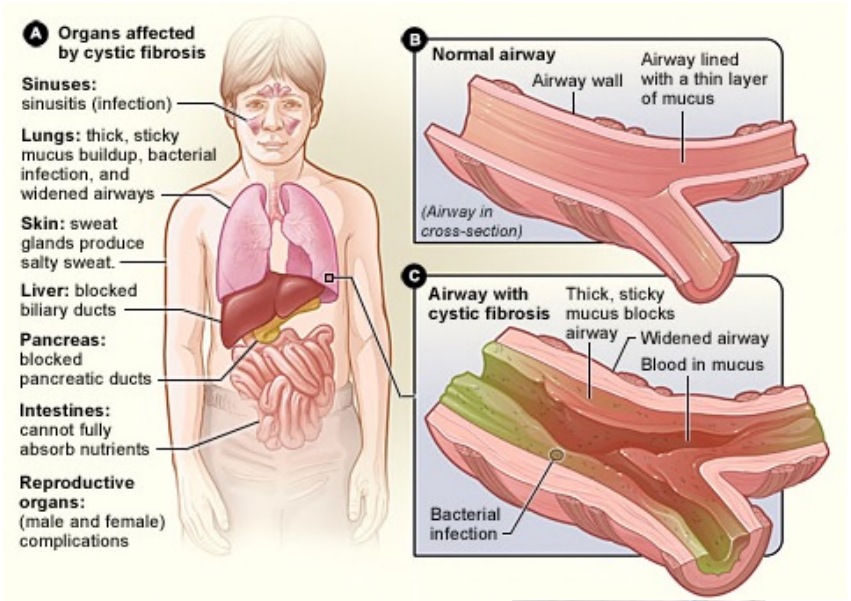
Clinical
- Tachypnea
- Nasal flaring
- Expiratory grunting
- Retractions

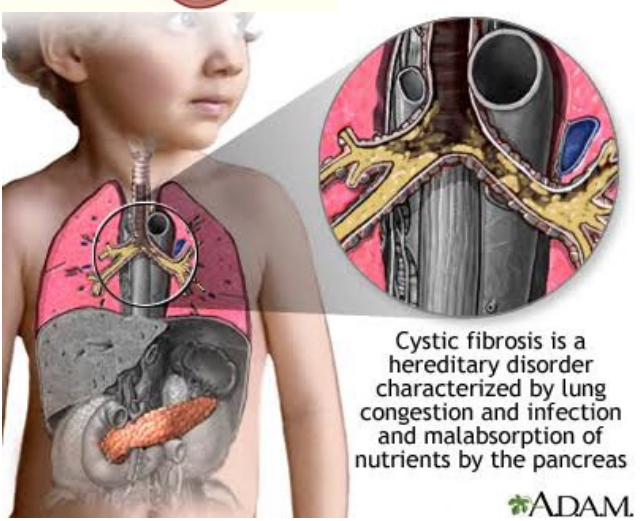
Management
- Mechanical ventilation
- Exogenous surfactant

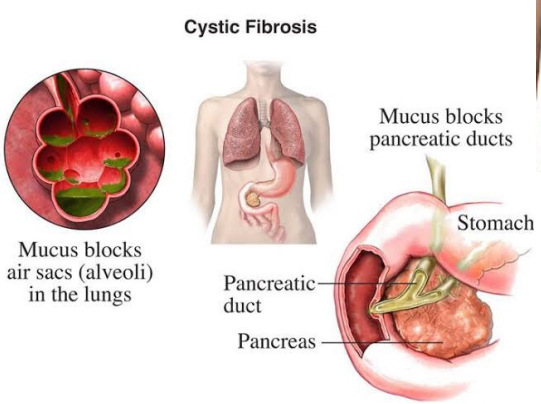
RoshReview

Infants with Respiratory Distress Syndrome that require **prolonged ventilator support** are at risk for **bronchopulmonary dysplasia**

Characteristics	Asthma	Reactive airway disease
Definition	An inflammatory response of the airways and bronchial tubes	An irritation of the bronchial passages due to some irritant
Duration of the condition	Chronic, long-term	Acute, usually only one occurrence
Diagnosis	Lung challenge tests, spirometry, blood tests showing high levels of eosinophils, and physical exam	A physical exam and elimination of other conditions
Age when diagnosis can be made	After age 5	Before or after age 5
Treatment	Inhalers with bronchodilators, as well as medicine such as corticosteroids	Rescue inhalers and avoiding irritants







50% = Cystic fibrosis *(Staphylococcus aureus)*

Bronchopulmonary aspergillosis

Ciliary dyskinesia (e.g., (Kartagener's syndrome)

Poor mucus clearance

BRONCHIECTASIS

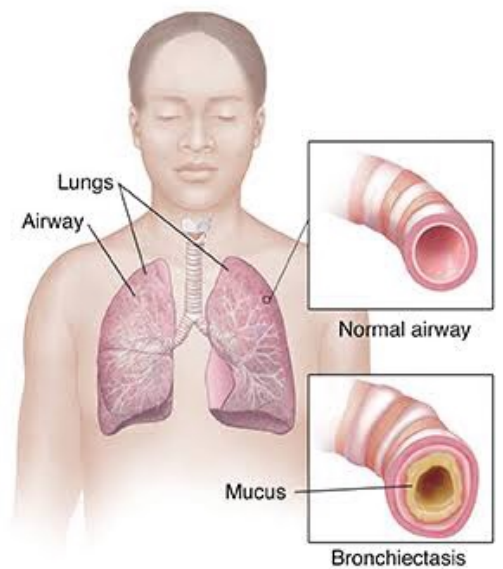
Bronchial obstruction (distal atelectasis)

Disruption of bronchiole wall

- Tuberculosis
- Necrotizing infections

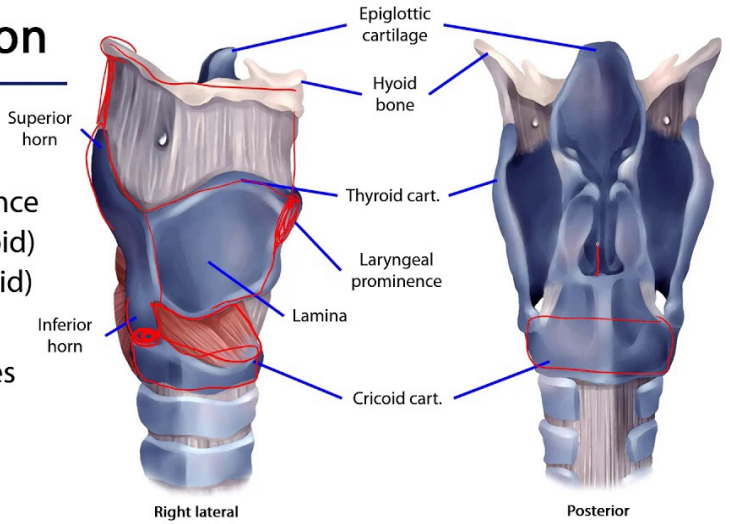
Repeated infection/ inflammation

- Exercise
- AIDS
- Transplant rejection
- Rheumatoid lung disease



Laryngoskeleton

- Thyroid cartilage
  - Laminae
  - Laryngeal prominence
  - Superior horns (hyoid)
  - Inferior horns (cricoid)
- Cricoid cartilage
  - Completely encircles
- Epiglottic cartilage



ACUTE LARYNGITIS

Laryngitis is defined as any inflammatory process involving the larynx and can be caused by a variety of infectious and non-infectious processes. OR Inflammation of the mucous membrane of the voice box or larynx, usually accompanied by hoarseness, sore throat and coughing.

Symptoms:

General

- Fever
- Weakness
- Lethargy

Lungs

- Paroxysmal cough
- Dry, scratchy throat
- Voice hoarse or absent
- Raw, irritated throat
- Swallowing difficult and/or painful

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CAUSES

- Viral Infection
- Cold
- Flu
- Inhalation of chemical Flue
- Sinus
- Allergic

DIET & REGIMEN

- Breathe moist air
- Rest your voice as much as possible
- Drink plenty of fluids
- Moisten your throat
- Avoid decongestants
- Avoid whispering

TREATMENT

- Antibiotic
- Steam Inhalation
- Humidifier

MEDICINES

- Belladonna
- Bromium
- Lycopodium
- Mercurius
- Senega
- Spongia tosta

Congenital vocal cord paralysis

Unilateral: birth trauma, congenital anomaly of great vessel or heart

Bilateral:

- Hydrocephalus
- Arnold-Chiari malformation
- Intra-cerebral hemorrhage
- Meningocoele
- Cerebral agenesis
- Nucleus ambiguus agenesis

ATELECTASIS

REVERSIBLE COLLAPSE of LOBE or ENTIRE LUNG

OBSTRUCTIVE

└ BLOCKAGE of AIRWAY

intrathoracic tumors

aspirated foreign bodies

mucous plug

NON-OBSTRUCTIVE

└ COMPRESSION or LOSS of SURFACTANT

PHASES OF THE CARDIAC CYCLE

Atriole systole begins

Atrial contraction forces blood into ventricles

Ventricular systole (first phase)

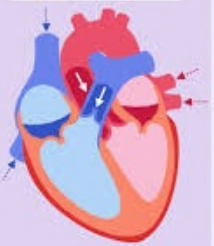
Ventricular contraction pushes AV valves closed

Ventricular systole (second phase)

Semilunar valves open and blood is ejected

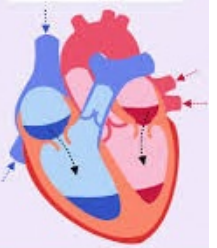
Ventricular diastole (early)

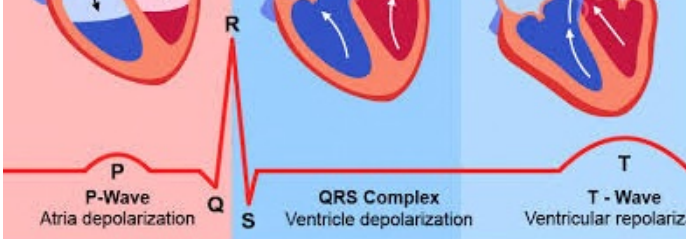
Semilunar valves close and blood flows into atria



Ventricular diastole (late)

Chambers relax and blood fills ventricles passively





P-Wave
Atria depolarization

QRS Complex
Ventricle depolarization

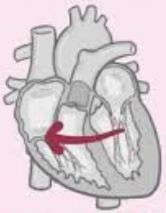
T - Wave
Ventricular repolarization

Atrial Diastole | **Atrial Systole** | **Atrial Diastole**

Ventricular Diastole | **Ventricular Systole** | **Ventricular Diastole**

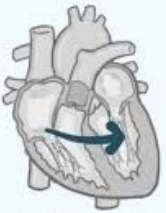
CONGENITAL HEART DEFECTS

ACYANOTIC DEFECTS



- VENTRICULAR SEPTAL DEFECT (VSD)
- ATRIAL SEPTAL DEFECT (ASD)
- PATENT DUCTUS ARTERIOSUS (PDA)
- COARCTATION

CYANOTIC DEFECTS



- TETRALOGY
- TRANSPOSITION
- TRUNCUS ARTERIOSUS
- TOTAL ANOMALOUS PULMONARY VENOUS RETURN
- HYPOPLASTIC LEFT HEART SYNDROME

Blue Bloater

Chronic Bronchitis

Symptoms

- Chronic , productive cough
- Purulent sputum
- Hemoptysis
- Mild dyspnea initially
- Cyanosis (due to hypoxemia)
- Peripheral edema (due to cor pulmonale)
- Crackles, wheezes
- Prolonged expiration
- Obese

Complications

- Secondary polycythemia vera due to hypoxemia
- Pulmonary hypertension due to reactive vasoconstriction from hypoxemia
- Cor pulmonale from chronic pulmonary hypertension

Pink Puffer

Emphysema

Symptoms

- Dyspnea
- Minimal cough
- Increased minute ventilation
- Pink skin, Pursed-lip breathing
- Accessory muscle use
- Cachexia
- Hyperinflation, barrel chest
- Decreased breath sounds
- Tachypnea

Complications

- Pneumothorax due to bullae
- Weight loss due to work of breathing

CHRONIC BRONCHITIS
"BLUE BLOATER"

* COLOR DUSKY TO CYANOTIC
* RECURRENT COUGH & ↑ SPUTUM PRODUCTION
* HYPOXIA
* HYPERCAPNIA
* ACIDOSIS
* EDEMATOUS
* ↑ RESP RATE
* EXERTIONAL DYSPNEA
* ↑ INCIDENCE IN HEAVY CIGARETTE SMOKERS
* DIGITAL CLUBBING

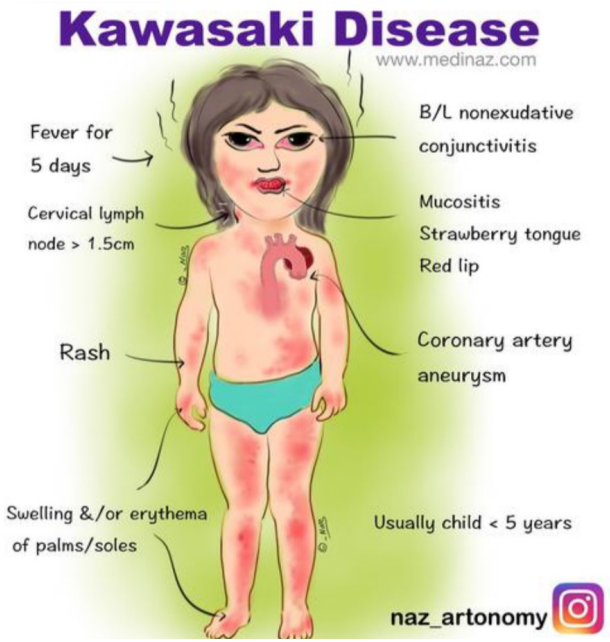
* CARDIAC ENLARGEMENT
* USE OF ACCESSORY MUSCLES TO BREATHE
* COR PULMONALE

@emssafe

EMPHYSEMA

"PINK PUFFER"

* ↑CO_2 Retention (Pink)
* Minimal Cyanosis
* Purse Lip Breathing
* Dyspnea
* Hyperresonance on Chest Percussion
* Orthopneic
* Barrel Chest
* Exertional Dyspnea
* Prolonged Expiratory Time
* Speaks in Short Jerky Sentences
* Anxious
* Use of Accessory Muscles to Breathe
* Thin Appearance



KAWASAKI DISEASE

Sausage fingers
Conjunctival redness
Rash
Extremity involvement
Adenopathy
Mucosal erythema
FEVER

Bacterial Endocarditis

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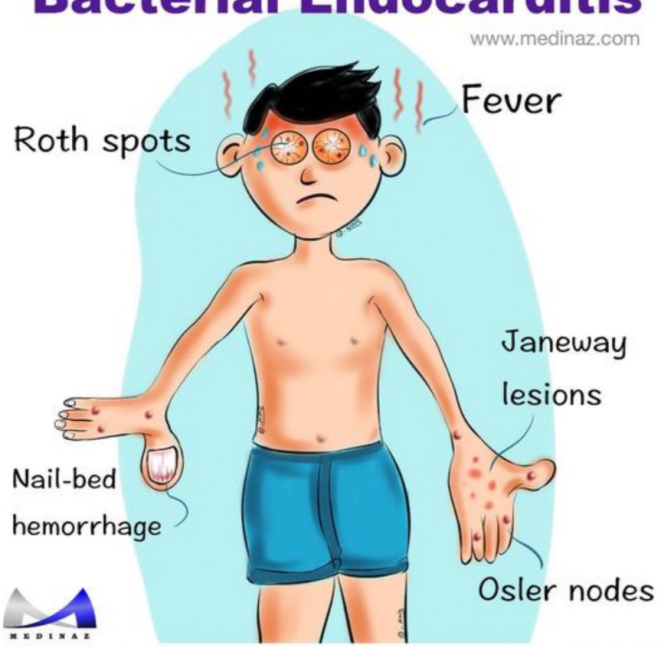

Bacterial Endocarditis

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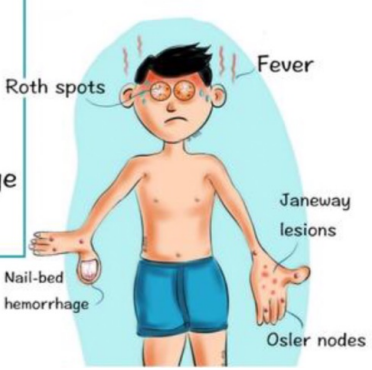
Fever
Roth spots
Osler nodes
Murmur
Janeway lesions
Anemia
Nail-bed hemorrhage
Emboli

"FROM JANE"



Rheumatic Fever

(Major criteria)

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Joint (migratory polyarthritis)

Carditis

Nodules in skin (subcutaneous)

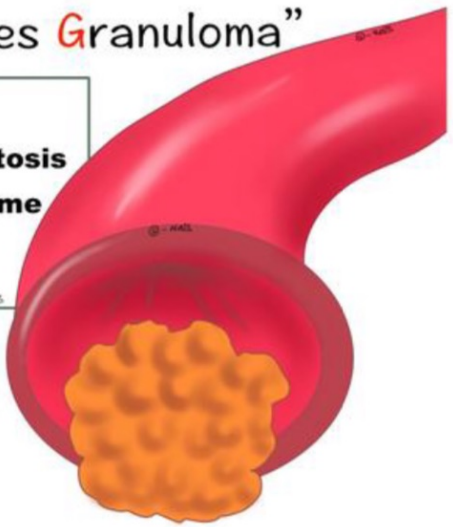
Erythema marginatum

Sydenham chorea

Vasculitis Causing Granuloma

"This Way Comes Granuloma"

Takayasu arteritis
Wegener's granulomatosis
Churg Strauss Syndrome
Giant cell arteritis



6 P's of DYSPNEA

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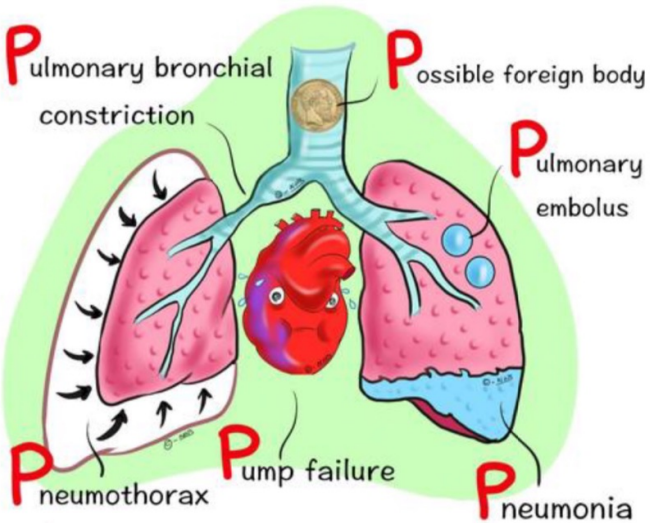

Type	% of cases	Location	Link to smoking	Notes
Adeno	40% The most common in adults	Peripheral	Very Weak	Females > Males… Slow growth, yet, early metastasis KRAS (oncogene)… Grows on old scars (TB, IPF) **Subclass**: Alveolar carcinoma in situ (AIS) (old name: bronchoalveolar carcinoma): Arises from Clara cells, type-II pneumocytes…cupfuls of frothy sputum… Mild cases: misdiagnosed as pneumonia….Severe cases (CXR): misdiagnosed as ARDS.
Squamous	25%	Central	Strong	Males > Females… Cavitation, local extension (atelectasis, pneumonitis). Late metastasis…p53 (tumor suppressor gene) Secrete PTHrP —> high serum Ca —> low PTH (negative feedback)
Small (oat-cell)	20%	Central	Strong	Males > Females….Neuroendocrine cells (APUD; Kulchitsky cells: small, dark blue) *myc* (oncogene), p53, RB1 (tumor suppressor gene)...Rapid growth & early metastasis. Secrete ACTH (Cushing) and/or ADH (SIADH)…Assoc. w/ LEMS. +ve for Chromogranin A, neuron-specific enolase, and synaptophysin
Large	10%	*either*	Strong	Early metastasis—> Mediastinum, CNS, Recurrent laryngeal (hoarsness), SVC syn. Undifferentiated (large cells are immature and undifferentiated). If you give them time to differentiate —> squamous or adeno
Bronchial carcinoid	5% in adults. The commonest in children	*either*	None	Male = Female...Neuroendocrine...Iceberg tumor: infiltrates the wall of bronchi and then fans out. Cough, hemoptysis, carcinoid syndrome (diarrhea, flushing, hypotension). 5-HIAA level: could be high. #serotonin.

Lung Carcinoma

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Lung Ca with worst prognosis - Small cell Ca

Lung Ca most responsive to radiotherapy - Small cell Ca

Lung Ca most responsive to chemotherapy - Small cell Ca

Most common type of lung Ca - Adenocarcinoma

Most commonly metastasizing to opposite lung - Adenocarcinoma

Most common type in females - Adenocarcinoma

Most common type in nonsmokers - Adenocarcinoma

Most common in young - Adenocarcinoma

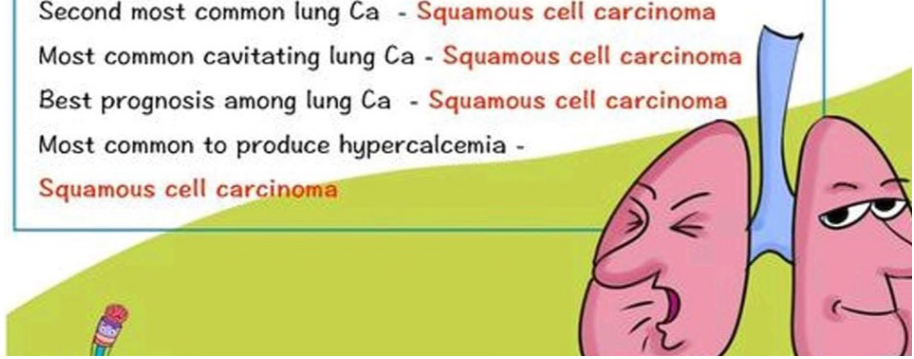
Most common in peripheral location - Adenocarcinoma

Second most common lung Ca - Squamous cell carcinoma

Most common cavitating lung Ca - Squamous cell carcinoma

Best prognosis among lung Ca - Squamous cell carcinoma

Most common to produce hypercalcemia - Squamous cell carcinoma



Systolic murmurs	Diastolic murmurs
Midsystolic Aortic stenosis Pulmonic stenosis Atrial septal defect HOCM **Holosystolic** Mitral regurgitation Tricuspid regurgitation VSD **Late systolic murmur** Mitral valve prolapse	**Early diastolic** Aortic regurgitation Pulmonic regurgitation Austin-Flint **Mid/late diastolic** Mitral stenosis Tricuspid stenosis **Other rare murmurs** Patent ductus arteriosus

Differential diagnosis of Continuous murmurs

- Persistent ductus arteriosus
- Surgically produced shunts in tetralogy of Fallot
- Systemic arteriovenous fistula

* Epiglotitis - Thumb sign
* Steeple sign - Croup
* Takayasu Arteritis - pulseless disease
* Poly arteritis nodosa - string of pearls appearance
* Hyperplastic arteriolosclerosis - onion skin appearance of vessel wall, acute renal failure with characteristic flea bitten appearance
* Thoracic aneurysm- tree bark appearance of aorta
* Abdominal aortic aneurysm- pulsatile abdominal mass
* Left sided heart failure - hemosiderin laden macrophages (heart failure cells)
* Right sided heart failure - nutmeg liver
* Left to right shunt - late cyanosis (Eisenmenger syndrome)
* Right to left shunt - early cyanosis
* Tetralogy of fallot - boot shaped heart on X Ray
* Coarctation of aorta - engorged arteries cause notching of ribs on X Ray
* Rheumatic heart disease - JONES Major criteria
* Aortic stenosis- systolic ejection click followed by crescendo decrescsndo murmur
* Aortic regurgitation- water hammer pulse, Quincke pulse (pulsating nail bed), head bobbing
* Mitral valve prolapse - mid systolic click followed by a regurgitation murmur, become softer with squatting
* Mitral regurgitation- holosytosolic blowing murmur, louder with squatting and expiration
* Mitral stenosis - opening snap followed by diastolic rumble
* Restrictive cardiomyopathy- low voltage EKG with diminished QRS amplitude
* Myxoma - pedunculated mass in left

* Rhinitis - sneezing, congestion, runny nose
* Nasopharyngeal carcinoma biopsy - pleomorphic keratin positive epithelial cells in a background of lymphocytes
* Nasopharyngeal carcinoma- often presents with involvement of cervical lymph nodes
* Acute epiglottitis - fever, sore throat, drooling with dysphagia, muffled voice, inspiratory stridor, risk of airway obstruction
* Laryngotracheobronchitis (Croup) - hoarse, barking cough, inspiratory stridor
* Laryngeal carcinoma - hoarseness, cough, stridor
* Lobar pneumonia - Congestion, Red hepatization, Grey hepatisation, Resolution
* TB - casseating necrosis in lower lobe of lung and hilar lymph nodes, Ghon complex
* MI - coagulative necrosis
* Chronic bronchitis- cor pulmonale (pulmonary HTN, Right sided HF)
* Centri acinar emphysema- smoking
* Pan acinar emphysema- Alpha 1 anti trypsin deficiency
* Emphysema- pink puffers, barrel chest (enlarged lungs)
* Asthma - Curshman spirals, Charcot Leyden cystals
* Bronchiectasis - cough, dyspnea, foul smelling sputum
* Idiopathic pulmonary fibrosis - honeycomb lung
* Sarcoidosis - non casseating granulomas, asteroid bodies, elevated serum ACE
* Anthracosis - black lungs
* Rhabdomyoma - spider cells
* Constrictive pericarditis- Kussmaul's sign (JVP rising paradoxically with inspiration)

* ACE Inhibitors - pril
* ARBs - sartan
* Beta blockers - lol
* Dihydropyridine Calcium channel blockers - dipine
* Selective alpha 1 blockers - zosin
* HMG CoA Reductase Inhibitors - statins
* Thrombolytic drugs - teplase
* Methylxanthines - phylline
* Leukotriene receptor antagonists - lukast (+Zileuton)
* P2Y12 Receptor Antagonist- grel, grelor (+Ticlopidine)
* Direct oral Factor Xa Inhibitors - xaban

Table 3.6 ■ **Drugs used in cardiac arrhythmias**

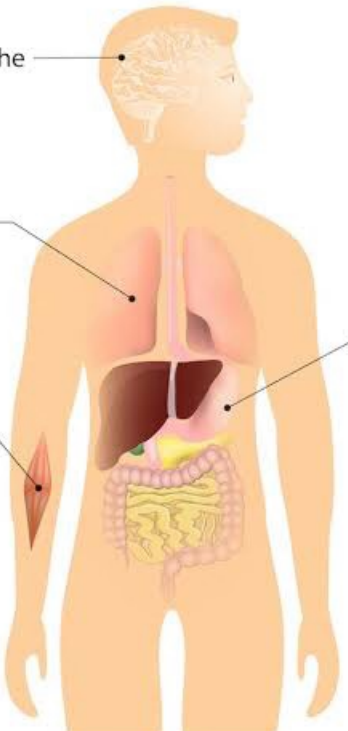
Type of arrhythmia	Drugs used
Paroxysmal supraventricular tachycardia (PSVT)	• Adenosine • Verapamil • Esmolol
Atrial fibrillation	• Amiodarone • Verapamil • Propafenone • Digoxin
Atrial flutter	• Esmolol • Verapamil • Amiodarone • Propafenone
Ventricular tachycardia	• Amiodarone • Propranolol
Ventricular fibrillation	• Amiodarone • Lignocaine

Normal plasma lipid levels (mg/dL)

Total cholesterol	<200
LDL cholesterol	<100
HDL cholesterol	
Men	>40
Women	>50
Triglycerides	<150

DISEASES	DRUG OF CHOICE	ALTERNATIVE DRUGS
Angina pectoris, stable Acute attack	Sublingual nitrates (e.g. Nitroglycerine)	
Prophylaxis	Beta-blockers (the only drugs decreasing angina mortality), Calcium channel blockers (e.g. Verapamil)	Oral nitrates (e.g. Isosorbide mononitrate) Trimetazidine, Oxyfedrine
Angina Prinzmetal's or variant angina	Calcium channel blockers (e.g. Diltiazem)	Beta-blockers are contraindicated
Angina pectoris, unstable	Anticoagulants (Heparin) + Antiplatelet (Aspirin)	

Legionnaires' disease



Headache

Fever
Chills
Ataxia
Tiredness

Respiratory
Cough
Shortness of breath

Gastric
Nausea
Diarrhea
Vomiting

Muscle
Aches

The time between the patient's exposure to the bacterium and the onset of illness is 2 to 10 days.

Legionella pneumophila

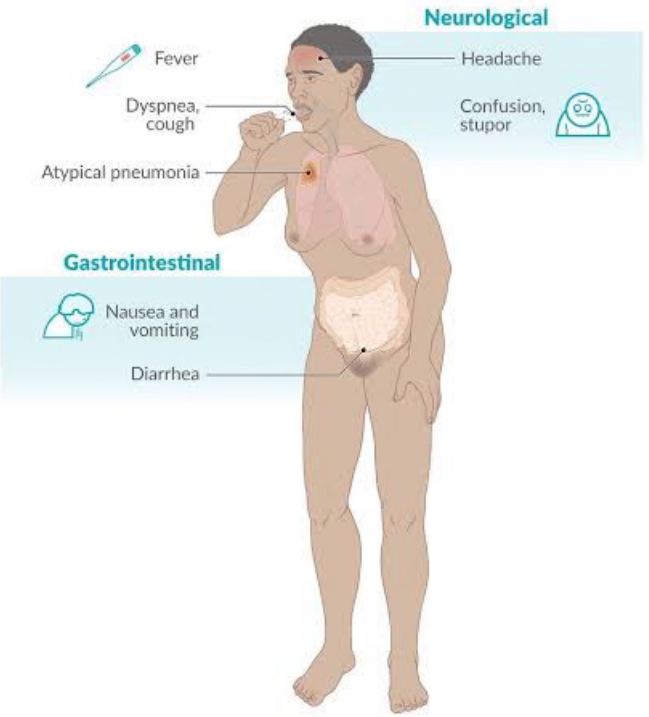
Legionnaires' disease

Etiology
Legionella pneumophila (gram-negative, aerobic, facultative intracellular bacterium)

Pathophysiology
Inhalation of aerosols from contaminated water (e.g., via showers, pools/hot tubs, air conditioning systems) or soil

Diagnostics
- Laboratory studies: hyponatremia
- Confirmatory tests
  - Legionella urinary antigen test
  - PCR
  - Culture with charcoal yeast extract agar (iron and cysteine)

Treatment
Fluoroquinolones or macrolides



* Anthracosis - coal miners
* Silicosis - sandblasters
* Berryliosis - aerospace industry
* Asbestosis - construction workers, plumbers, shipyard workers
* Bagassosis - cane fiber
* Byssinosis - cotton dust
* Farmer's lung - hay or grain dust

DIGITALIS PURPURA (FOXGLOVE)

* Active Ingredients - Digoxin, Digitalis, Digitoxin

Increase contraction of heart

* Signs and symptoms - Nausea, vomiting, bradycardia, heart block, fainting, coma
* Fatal dose -

Digitalis: 15-30 mg

Digitoxin: 15g root

* Fatal period - 24 hours
* Treatment -

Stomach wash ($KMnO_4$)

Atropine 0.6 mg

Potassium salts

* Specific antidote - Novocaine, Propranolol
* Post mortem appearance - irritation of mucosa, reddish brown seeds in stomach
* Medicolegal aspects - Accidental (overdose), homicidal

WHITE OLEANDER (NERIUM ODORUM)

* Active Ingredients - Neriodorin, Neriodorein, Karabin

Neriodorin - similar to digitalis

Neriodorein - tetanic spasms

Karabin - resemble strychnine

* Signs and symptoms - Vomiting, pain, slow pulse, muscular twitching, drowiness, coma
* Fatal dose - 15g root
* Fatal period - 24 hours
* Treatment - Stomach wash, anesthesia, morphine injection
* Post mortem appearance - petechial hemorrhages on heart, detected in burned bodies
* Medicolegal aspects - suicide, abortion, accidental, cattle poisoning

NICOTINE (TOBACCO)

* **Active Ingredients** - alkaloid nictine (paralysis autonomic ganglia)
* **Signs and symptoms:**

Acute - burning in mouth, throat, convulsion, coma, arrhythmias

Chronic - laryngitis, pharyngitis

* **Fatal dose** - 60mg nicotine, 2g tobacco
* **Fatal period** - few min to few hours
* **Treatment** - skin wash, stomach wash, sodium sulphate (15g in 100ml of water)
* **Post mortem appearance** - asphyxia, smell in stomach, pulmonary edema, nicotine resist putrefaction
* **Medicolegal aspects** - Drug of addiction, accidental, infanticide

Chapter 57 — Cardiac Poisons

NAME	INTRODUCTION	SIGNS AND SYMPTOMS	FATAL DOE/ FATAL PERIOD	TREATMENT	POST-MORTEM APPEARANCES	MEDICOLEGAL ASPECTS
DIGITALIS PURPURAE (Foxglove)	Digoxin, Digitalin, Digitonin → Inc contraction of heart	Nausea, Vomiting, Bradycardia, Heart block, Faintness, Coma	15-30mg (Digitalin) 4 mg (Digitoxin) 24 hours	• Stomach wash (KMnO4) • Atropine (0.6mg) • Potassium salts • Novocaine, Propranol	• Irritation of mucosa • Reddish-brown seeds in stomach	• Accidental (Overdose) • Homicidal
WHITE OLEANDER (Nerium odorum)	Nerin → Neriodorin, Neriodorein, kayabin, Tetanic spasm, like strychnine	Vomiting, pain, slow pulse, muscular twitches, drowsiness, coma	15g root 24 hours	• Stomach wash • Anaesthesia • Morphine injection	• Petechial haemorrhages on heart • Detected in burned bodies	• Suicide, Abortion • Accidental • Cattle poisoning
YELLOW OLEANDER (Pila Kanar)	Thevetin, Thevetorin, Cerebrin → cardiac poison, like strychnin	Burning sensation, dryness, dilated pupils, Collapse	15-20 gram of root 24 hours	• Sodium lactate • 5% glucose 1-2 mg atrophine, 2ml adrenaline, 2mg nor-adrenaline ↓ "	• GIT irritation, congestion, engorgement of veins, ecchymosis • can be detected in exhumed bodies	• Suicide • Abortion • Cattle poison
CEREBRA ODOLLAM	Cerebrin, Cerebroside	GIT irritation, cardiac toxicity, diarrhea, bradycardia, collapse	• Kernel of one fruit • 1-2 Days			Accidental (Children) Powdered kernel (Honsude)
ACONTE	Alkaloid aconitine, Picraconitine, Pseudoaconitine, aconine	• Tingling, numbness, vomiting, giddiness, twitching, low pulse, Collapse	Root 1 gram Extract 250mg Tingture 25 drops Alkaloid 4mg FP → 6 hours	Gastric lavage • Atropine, Digitalin • 0.1% novocaine (IV) • Artificial respiration.	• Remnants in stomach • Chloroform odour • Difficult to detect after death • Acetic acid + Rectified spirit → Preserve vomit	• Accidental • Homicidal (arrow poison) • Cattle poison
NICOTINE (TOBACCO)	Alkaloid nigotine → Stimulation → Depression, Paralysis of	Acute:- Burning in mouth, throat, convulsion, coma, arrythmias	60mg nicotine 2 gram tobacco • Few min	• Skin wash • Stomach wash • Sodium sulphate	• Asphyxia • Smell in stomach • Pulmonary edema	• Drug of addiction • Accidental • Infanticide

LUNG SOUND

WHEESE

- Sound:- High Pitched "Musical Flute" - Whistling
- Site:- All Lung Fields
- Phase:- Mainly Expiration(↑) but also Inspiration
- Path.:- Severely Narrowed Bronchus "Broncho constriction"
- Disease:- Asthma, COPD...Others
- Management:- For Asthmatic Attack Albuterol, Ipratropium & Methylprednisolone

STRIDOR

- Sound:- High Pitched Whistle
- Site:- Larynx, Trachea, & Bronchi
- Phase:- Mainly Inspiration
- Path.:- Blocked Larynx, Trachea, or Bronchi
- Disease:- Choking Obstruction, Epiglotitis Group, Laryneal Edema, Tumors or Abscess...Others
- Management:- Med. Emergency! EndoTracheal Intubation or Surgery

RHONCHI

- Sound:- Low Pitched Rattling or Rumbling
- Site:- Trachea or Branchi
- Phase:- Mainly Expiration but also Inspiration
- Path.:- Fluids or Mucos causing Obstruction
- Disease:- Bronchitis, COPD, Infections or CF
- Management:- Chest Percussion ± May Cleared by Coughing & Fluids suction

PLEURAL FRICTION RUB

- Sound:- Low Pitched - Dry Rumbling
- Site:- Anteiror Lateral Lung Fields
- Phase:- Mainly Inspiration(↑) but also Expiration
- Path.:- Inflammed Pleura
- Disease:- Mainly due to Infection! Pneumonia...Others
- Management:- Antibiotics! Infections

FINE CRACKLES

- Sound:- High Pitched Liquidy bubbling or Crackling
- Site:- Bases of Lungs
- Phase:- Inspiration
- Path.:- Inflammation or Congestion of Alveoli
- Disease:- Pulmonary Edema or Infection! Pneumonia ...Others
- Management:- Diuretics for P. Edema Antibiotics for Infections

COARSE CRACKLES

- Sound:- Low Pitched Liquidy bubbling or Crackling
- Site:- All Lung Fields
- Phase:- Expiration & Inspiration
- Path.:- Inflammation or Congestion of Alveoli
- Disease:- Bronchiectasis or Abscess ...Others
- Management:- Antibiotics for Infections

Anti Lipidemic Drugs

* Lowers LDL the most - statins, PCSK9 inhibitors
* Lower TGs the most- Fibrates
* Raise HDL the most - Niacin
* DOC in children and pregnancy - Bile acid sequestrants

COUGH

DRY COUGH	PRODUCTIVE COUGH
Rx by ANTITUSSIVES CODEINE PHOLCODEINE DEXTROMETHORPHAN NOSCAPINE	Rx by MUCOKINETICS • Expectorants • Mucolytics

Mucokinetics (Aid in removal of secretions from lungs)

Expectorants (Increase secretions)

- Guafenesin
- Potassium iodide

Mucolytics (Lyse mucus)

- Ambroxol
- Bromhexine
- Acetylcysteine
- Dornase alfa

BRONCHIAL ASTHMA