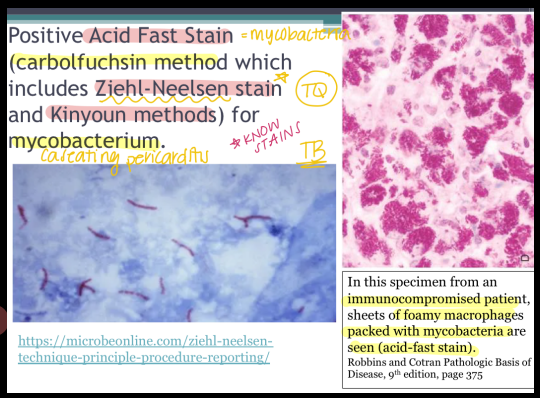
Pericarditis = outer portion

- immunologic: SLE, scleroderma, Dressler syndrome
  - eosinophilic
- infectious
  - viral: coxacki A&B
  - Bacterial:
  - Fungal:
  - Protozoa:

WBOT ★caseous pericarditis

p+ px w/ pleuritic CP, diffuse ST↑, pain relieved by leaning forward → CONSTRICTIVE PERICARDITIS

★★



★Pericardial Effusion = water bottle heart

ACUTE → cardiac tamponade → BECK'S TRIAD + pulsus paradoxus: ↓BP during inspiration

1. muffled ♡ sounds
2. JVD - blood backing up
3. Hypotension & tachycardia

Serous = pericardial effusion of serous fluid

★viral infection in YA

- sudden/severe onset pleuritic chest pain relieved by sitting up & leaning forward

★★Diffuse ST elevation

+ water-bottle heart on Xray

VIRAL = COXACKIE B

★★WBOT

Fibrinous/Serofibrinous (MC)

★Dressler Syndrome, uremia, radiation, rheumatic fever

(2-6 wks) post-MI, pleuritic chest pain, palpitations, arthralgia +Fever, Tach, friction rub

Tx Dressler syndrome = IBUPROFEN

anti-actin & myosin antibodies causing autoimmune rxn

WBOT

Purulent/Suppurative

★NG

infx by:

1. extension
2. pericardial seeding
3. Lymphatic extension
4. Direct introduction

BACTERIA

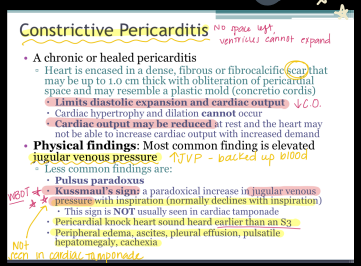
★gram stain strep pneumo

→ can progress to constrictive pericarditis

calcification → seen in chronic or healed pericarditis

- ↓C.O.
- pulsus paradox
- Kussmaul's sign = ↑JVP w/ inspiration

WBOT ★★

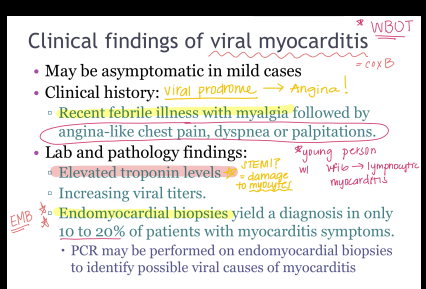


Myocarditis: non ischemic inflammation (infx & immune mediated)

★Dallas criteria

- inflammatory infiltrate w/ necrosis or degeneration

★Diagnosis based on cell type



→ Lymphocytes: viral infx → coxackie A&B + enteroviruses

★★WBOT: young pt dies of SCD w/ fib, histology shows lymphocytic infiltrate. = viral myocarditis

→ Neutrophils: bacterial infx: Lyme, C. diptheriae, N. meningitidis → multisystem dz, may need temporary pacemaker

→ Eosinophils: parasite: T. cruzii Chagas dz

- chagoma + Romano's sign
- Reduviid bug
- ★Heart & GI affected
  - Cardiomyopathy (Dilated)
    - RBBB
  - Mega colon

→ immune-mediated myocarditis → Lupus, drug hypersensitivity

	PERICARDITIS	MYOCARDITIS
CLINICAL	Sharp or pleuritic chest pain, worse when supine ← Beck's Triad? Pain radiating to left trapezius ridge Dyspnea	Flu-Like (myalgias, fatigue, fever) Dyspnea, new CHF Pediatrics - grunting, retractions
ETIOLOGY	Viruses & Idiopathic Most Common Lupus/Sarcoid Radiation Drugs (procainamide, hydralazine)	Infectious (influenza, lyme, chagas, etc) ↑
DIAGNOSIS	Clinical EKG Stages: ← ALL LEADS (1) PR depression with ST elevation (III>II and no ST depression in aVL suggests pericarditis) (2) Normalization (3) T wave inversion Pericardial effusion on ultrasound Troponin may be elevated	Difficult EKG - Sinus tachy, dysrhythmia, Troponin may be elevated ECHO may show hypokinesis Gold std: biopsy ← EMB
TREATMENT	Ibuprofen 400-800 mg q6-8 hrs x 2 weeks Colchicine 0.5 mg BID (prevents recurrence) *Note: in US formulation is 0.6mg tablets Admit for high risk: large effusion, T >38 C, signs of myopericarditis	Admit to monitored setting Supportive (may need LVAD, ECMO) Extracorporeal membrane oxygenation

Endocarditis

* infective endocarditis: valves!
  Sxs: Fever, arrhythmia, anemia

- Acute = toxic presentation - treat empirically
  = Staph. Aureus

- Subacute = mild toxicity
  = Strep viridans/enterococcus

* Septicemia: FEVER
  - alt. mental status

IE: Bacterial etiologies

Etiology:

- **Native valves**
  - Oral *Streptococcus* **#1** (*Enterococcus*) strep viridans
    - *S. aureus*, Coagulase negative *Staphylococcus*, Gram Negative rods (HACEK)
- **Prosthetic valves (early)**
  - Coagulase negative *Staphylococcus* **#1** (*S. epidermidis*)
    - *S. aureus*, HACEK, Oral *Streptococcus* and *Enterococcus*, *Candida*
- **Prosthetic valve (late)**
  - Oral *Streptococcus* **#1** (*Enterococcus*)
    - Coagulase negative *Staphylococcus*, *S. aureus*, HACEK, *Candida*
- **IV drug user**
  - *Staphylococcus aureus* #1
    - Oral *Streptococcus* and *Enterococcus*, Gram Negative rods (HACEK), *Candida*, Coagulase negative *Staphylococcus*

❖ **HACEK Group Infections:** Group of gram-negative fastidious rods
- *Haemophilus aphrophilus, Actinobacillus actinomycetemcomitans, Cardiobacterium hominis, Eikenella corrodens, Kingella kingae*

➢ **Most common cause of gram-negative endocarditis in non-IV drug users*****

L03 Congenital Heart Dz of Adults

★ Greatest cnv. risk factor = MATERNAL DIABETES ★ → ESP Transposition of Great Vessels ★

★ Congenital aortic stenosis = BICUSPID VALVE fused @ raphe
- younger pt w/ exertional syncope, SOB, chest pain
- crescendo-decrescendo systolic murmur

DING DING DING

★ COMPLICATIONS:
★ aortic dissection/dilation ★★ WBOT & BERRY ANEURYSMS
- bicuspid often involved w/ coarctation → think TURNERS
- LV Hypertrophy

★ Coarctation of Aorta:
- young pt w/ HTN, diff. BP UE vs LE + "3-sign on xray" + Rib Notching
★ Males & TURNERS SYNDROME ★
★ COEXISTS w/:
★★ WBOT
- ★ saccular / berry aneurysms @ circle of willis
- ★ bicuspid aorta
- ★ congenital mitral valve dz

★ Pulmonic stenosis
- Noonans or part of TOF
- crescendo decrescendo systolic murmur @ left 2nd intercostal

px w/ exertional fatigue, dyspnea, CP, syncope
RIGHT V Hypertrophy - pulmonary edema?

★ ATRIAL SEPTAL DEFECT MC- osteum secundum; Trisomy 21 - ostium primum
★ FIXED SPLIT S2 in young adult w/ new exertional fatigue
- complications:
  - irreversible pulmonary HTN
  - paradoxical embolism → pt may present w/ DVT that became stroke
  - atrial arrhythmias → px w/ AFib

Repair that shit!!

★ VENTRICULAR SEPTAL DEFECT = MOST COMMON CONGENITAL BIRTH DEFECT
- L → R shunt can produce irreversible pulm HTN
- small, moderate or large → EISENMENGER'S COMPLEX ★★ WBOT
  L → R shunt → pulm HTN
  ↑R pressure reverses shunt → cyanosis

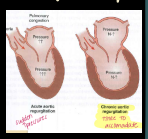
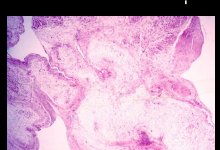
★ PDA = CONTINUOUS MACHINE-LIKE MURMUR
- also causes eisenmenger syndrome
★ TO CLOSE → indometnicin / ibuprofen // TO OPEN: PGE2

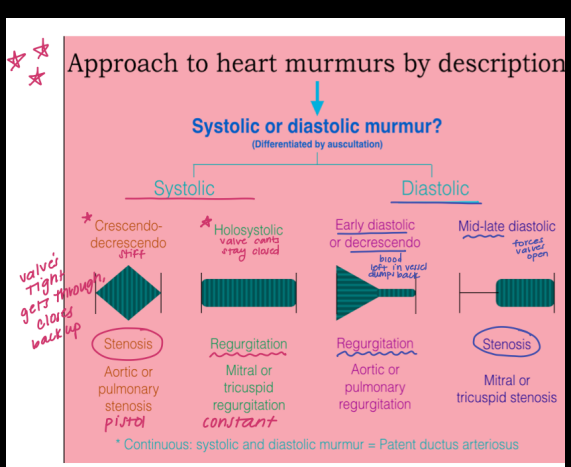
★ Ebstein's Anomaly = atrialization of RV
★ LITHIUM use in first trimester
→ SVT & WPW + exercise induced cyanosis ★★ WBOT

★ Congenitally corrected Transposition of GV = NOT CYANOTIC aka can px in adults w/o detection

★ Tetralogy of Fallot = DIGEORGE SYNDROME ★★ 22q11.2 microdeletion

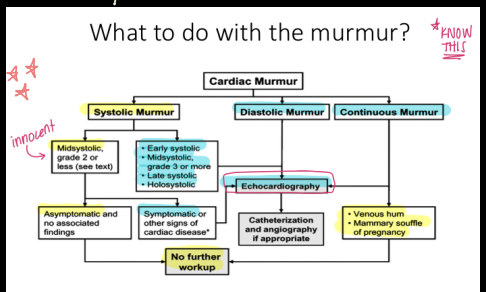
Valvular Heart Dz

	GROSS / ETIO	SYMPTOMS	DIAGNOSIS
AORTIC REGURG 	CHRONIC: volume overload, thick LV + dilation to ↑SV - caused by aortic root dilation & leaflet abnormalities ACUTE: commonly caused by ★ AORTIC DISSECTION ★ INFECTIVE ENDOCARDITIS → SURGICAL EMERGENCY		CHRONIC: Diastolic blowing murmur ★ Widened pulse Pressure ★ ⊕ Quinke pulse – finger pulsations if symptomatic or LVEF <50% = valve REPLACEMENT WBOT ACUTE: short diastolic blowing murmur → Both require surgery
AORTIC STENOSIS	★ Senile - NO FUSION, just calcification ★★ WBOT ★ RHD - only rheumatic if fusion AND Mitral valve involvement	Angina, syncope, SOB	★ systolic ejection murmur RADIATING TO NECK + S4 Tx → if symptomatic or LVEF <50% → valve replacement ★★ BICUSPID AORTA - calcifications, endarteritis - Ejection click - AORTIC ANEURYSM ↓ GET AN ECHO ★★ WBOT
MITRAL REGURG	★ MVP - Marfans! ★ ischemic papillary muscles after MI	Dyspnea, orthopnea, & PND	CHRONIC Holosystolic apical murmur radiating to axilla maybe S3 w/ CHF follow before they get symptomatic ACUTE = EMERGENCY ★ Hypotension, HF, SHOCK ★ Holosystolic murmur radiates to BACK → Require surgical intervention
MITRAL STENOSIS	ALL CASES CAUSED BY RHEUMATIC HEART DZ ★★ pt px in 40s - 50s ★ fish mouth / button hole - LA dilates - pulm pressure increases → pulm. HTN ★★	Pulmonary HTN → Hemoptysis Hoarseness - LA presses on Rec.L. = Ortner's syndrome ★ Mitral Facies	Opening SNAP followed by low pitched early diastolic rumble ★ surgical intervention based on Diameter symptoms @ any point = valvotomy - open valve up w/ balloon (Not a replacement)
MITRAL VALVE PROLAPSE	★ HOODING of leaflets w/ elongated chordae tendinae ON HISTO: myxomatous increase of proteoglycans ★★★  WBOT	Usually asymptomatic ★ watch out for Marfans & Ehlers Danlos	★ Midsystolic click



★ indications for ECHO:
- Diastolic murmur
- grade 3+
- symptomatic
- systolic murmur + click

WBOT



L11 Valve Path II

INFECTIVE ENDOCARDITIS

- strep. viridans — previously damaged native valves
  - gram ⊕ cat ⊖ optochin resistant diplococci
- S. aureus — IV drug users & nosocomial
  - gram ⊕ cat ⊕ coag ⊕ β hemolytic cocci
- S. epidermidis — prosthetic valves
  - gram ⊕ coag ⊖ cat ⊕ cocci
- HACEK group — commensals of oral cavity
  - may be culture NEGATIVE

WBOT

Haemophilus aphrophilus (now called *Aggregatibacter aphrophilus and Aggregatibacter paraphrophilus) Actinobacillus actinomycetemcomitans (subsequently called Aggregatibacter actinomycetemcomitans), Cardiobacterium hominis, Eikenella corrodens* and *Kingella kingae*

- gram-negative bacilli that are commensals in the oral cavity.
- **may be culture negative because fastidious, slow-growing**

Dukes Criteria - Dx
- Janeway, osler nodes, Roth spots

Gross Morphology - BULKY vegetations can cause EMBOLI → septic infarcts @ brain / kidney, mycotic aneurysms → STROKE

Histology - lots of NØ, fibrin, bacterial colonies

WBOT
- Osler nodes = immunologic vasculitis ∴ painful
- Janeway lesions = hemorrhagic microabscess due to septic emboli

NON-infective ENDOCARDITIS

NBTE: @ line of closure of mitral valve loosely attached vegetations
ASSOCIATED WI: hypercoagulabe states → mucinous adenocarcinoma → pt has pancreatic cancer

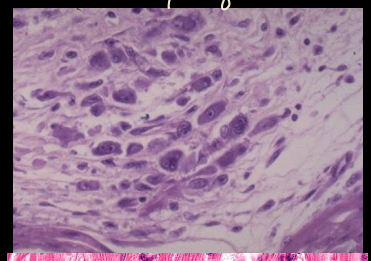
NonBacterial Thrombotic EMboli

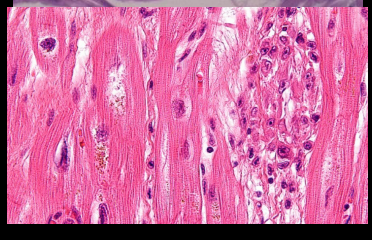
WBOT

Libman-Sacks vegetations on both sides of leaflets
+fibrinoid necrosis
SLE
- rarely causes problems
- Antiphospholipid syndrome may cause NBTE

RHEUMATIC HEART DISEASE due to M-protein molecular mimicry → Fibrinoid necrosis

- ACUTE = Mitral regurg; friction rub, tach, arrythmias, HF → McCallum's plaques
  - ASCHOFF BODIES = activated MΦ
  - Anitschkow cells = caterpillar cells
    - made of nuclear chromatin
- CHRONIC = Mitral stenosis; YEARS / DECADES → FISH MOUTH fused chordae
  + Aortic stenosis → FUSION





L12: PEDS

★ For Tachydysrhythmias:

NEVER use CCB to tx:

- infants
- anyone w/ WPW
- children w/ CHF
- children on Beta Blockers

→ Hypotension & cardiac arrest

★ Girl got up to brush hair & fell over = situational syncope (Tvagal tone)

★RED FLAGS FOR SYNCOPE

shouldn't play sports, refer to cardiologist

- Recurrent, atypical or unexplained episodes.
- Syncope with exercise !! During sports!
- Syncope with palpitations or chest pain
- History of cardiac abnormalities repaired
- Abnormal cardiac physical exam or ECG
- Neurologic deficits @Romberg. New murmurs
- History or family history of neurologic disorders. any hx of unexplained death <50

L13 Ped CV disorders

WBOT

Kawasaki

Tx: IVIG & Aspirin

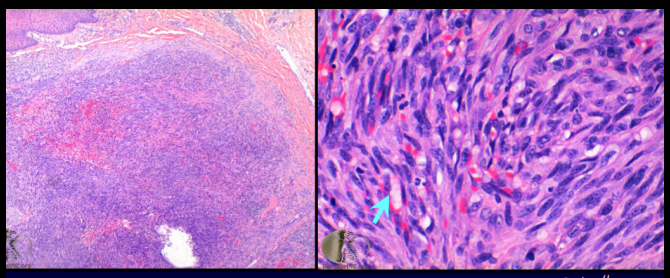
There are three distinct phases of Kawasaki disease:

WBOT

1. acute febrile phase day 1-11 → rash, conjunctivis, lymphadenopathy, strawberry tongue
2. subacute phase days 11-21 → peeling hands & feet → greatest risk for sudden death
3. convalescent phase days 21-60 ← CHRONIC up to 2mos → cardiac complications

There is also a chronic phase for children developing cardiac complications. → presence of coronary aneurysms

Kaposi Sarcoma CD31 & 34+



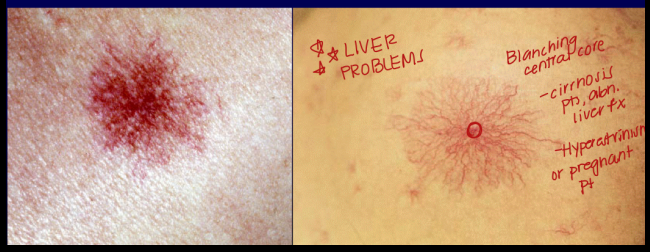
- Vessels lined by thin endothelial cells dissecting stroma (spindle cells!)
- Spindle cell proliferation with slitlike spaces containing RBC ★★★ TQ
- Admixed with a variable chronic inflammatory infiltrate
- Positive for both endothelial (CD31, CD34) and smooth muscle markers (smooth muscle actin)

★LIVER PROBLEMS/HYPERESTRINISM

Vascular ectasias

Spider telangiectasia

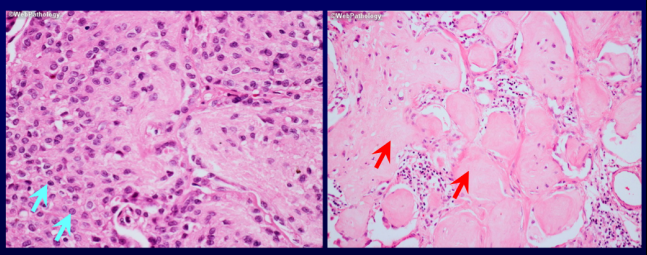
- Radial, pulsatile array of dilated subcutaneous arteries or arterioles around a central core
- Blanches with pressure applied to its center, usually on face, neck, upper chest of pregnant women and patients with cirrhosis, may be associated with hyperestrinism



Epithelioid Hemangioendothelioma:

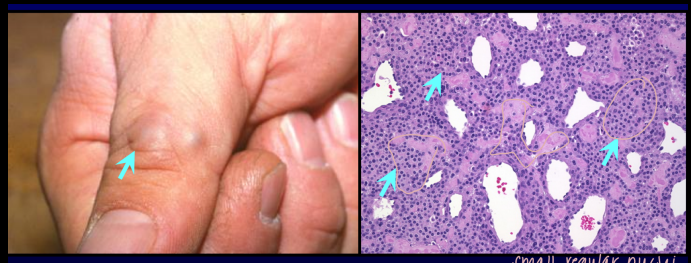
pithelioid hemangioendothelioma

Clinical and pathologic findings



- Gross: Reddish-brown lobulated masses, well demarcated with irregular scalloped borders and a red hemorrhagic appearance
- Microscopically: Anastomosing cords, solid nests, or short strands of round to slightly spindled eosinophilic neoplastic endothelial cells embedded in a chondroid-like or hyalinized stroma

Glomus Tumor: PAINFUL smooth m & CD34+



- Blue or red blanchable papules or nodules in deep dermis or subcutis PAINFUL
- Round and regular tumor cells with uniform circular nuclei
- Positive for smooth muscle actin, may be positive for CD34 ★★ myoleiomas marker for smooth muscle!! ★★

http://emedicine.medscape.com/article/1083405-overview
http://webpathology.com/case.asp?case=480

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CHECK FOR VHL ↓

Hemangioblastoma Benign

- Benign, predominantly involving central nervous system optical abnormalities
- 1-2% of intracranial tumors
- Often in cerebellum; also spinal cord, meninges
- Slow growing and indolent
- Symptoms due to mass effect and peritumoral edema
- Either part of von Hippel-Lindau disease or sporadic (often with somatic mutation of VHL gene) young pt w/ neuro abnorm. w/ hemangioblastoma
- Loss of VHL promotes increased production of vascular endothelial growth factor and erythropoietin ↑VEGF
- May be associated with loss of unknown tumor suppressor gene at 22q13 ★★ do genetic studies (like clear cell renal carcinoma)

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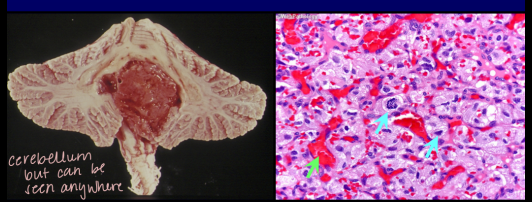
→

emangioblastoma

Pathological findings



- Reddish neoplastic growth
- Proliferation of capillaries with variable sized, closely packed, thin walled vessels
- Atypical stromal cells with hyperchromatic nuclei apoptosis seen

★pay attn to genetic study VHL★

:tp://anocef.org/atlas/en/m/mPI08a1.html
:tp://www.webpathology.com/case.asp?case=634

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