High Yield Cardiology Internal Medicine Shelf

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-Compiled from UWorld, OnlineMedEd, MTB, NBME

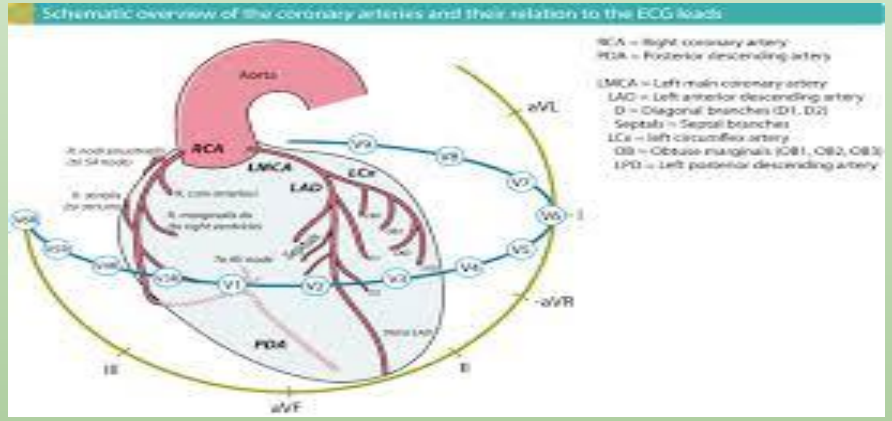
Chest pain

- Cardiac chest pain

- Most likely to present without cardiac chest pain
- Best initial test
  - What are you looking for on EKG?
  - What are you looking for on troponins?
  - Reinfarction?
- Medications

- 1. Substernal 2. Worsened with exertion and relieved by rest 3. Relieved by nitroglycerin
- Diabetics and females
- EKG (outpatient), troponins (ER)
  - STE (>2mm), new LBBB
  - Troponins-increasing >0.04, 3x
  - Troponin for reinfarction-myoglobin
- Morphine, O2, Nitrates, Aspirin, BB, ACEi, Statin, Heparin (MONA BASH)

Localization



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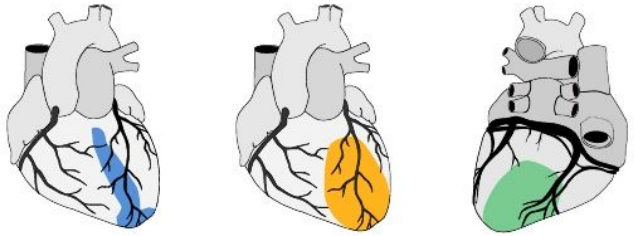


I	aVR	V1	V4
II	aVL	V2	V5
III	aVF	V3	V6

Inferior: II, III, AVF
Septal: V1, V2
Anterior: V3, V4
Lateral: I, AVL, V5, V6

CAD

- Risk factors
- So, if the troponins are negative and the EKG is normal-what is the next best step?
- Who cannot be stressed?
- What chemical stress would you avoid in an asthmatic?
- What are you looking for on nuclear imaging?

- DM (#1), HTN, HLD, Age>45M, >55F, smoking
- Stress them
- LBBB, LVH, Pacer, Digoxin
- Dipyridamole (other options are adenosine, dobutamine with echo)
- Reversible defects-if a defect is present at rest and under stress, it cannot be salvaged through an intervention. However, if there is a defect that is only present during stress, an intervention can salvage it.

Intervention options

- PCI timeline?
- When can you use thrombolytics?
  - Time limit?
  - Contraindication to thrombolytics?
- What can you stent?
- When do you need to call CT surgery?

- Door to balloon in 90 minutes
- Question has to go out of the way to tell you they are in the boonies
  - <30 minutes if no PCI or PCI >2 hours away
  - Intracranial hemorrhage
  - Recent ischemic stroke (6 mo)
  - Surgery past 2 weeks
  - BP >185/110
- Stent >70%
- CT for CABG if
  - L main
  - >3 vessels
  - >2 vessels in DM

Discharge medications and complications

- What meds are you sending them home on?
  - How long for the clopidogrel?
  - What BB?
  - What statins and what is the goal?
- MCC death post MI
- Short acting nitrates, ASA (+ clopidogrel if stenting), BB, ACEi, Statin
  - 6 months if DES, 1 month bare metal
  - Metoprolol, bisoprolol, carvedilol
  - High intensity (atorvastatin, rosuvastatin; goal <70)
- Arrhythmia

Post MI Complications

- RCA occlusion-leads
  - Initial treatment
  - Severe pulmonary edema and new holosystolic murmur 3-5 days post MI
- LAD occlusion-leads
  - New onset chest pain, shock, distant heart sounds
- LAD or RCA-new holosystolic murmur, step up in O2 level from RA to RV
- HR <60 post MI
- Re-infarction?
- Pleuritic CP weeks later?
- Persistent STE?
- II, III, aVF
  - Fluids-nitro will not help because the issue is preload
  - Papillary muscle rupture, leads to new MR murmur
- V1, V2, V3, V4
  - Free wall rupture, leads to a new tamponade presentation
- Interventricular septum rupture, leads to VSD murmur
- Bradycardia post MI
- Myoglobin
- Dressler-give NSAIDS
- Aneurysm

MI

I Lateral	aVR	V1 Septal	V4 Anterior
II Inferior	aVL Lateral	V2 Septal	V5 Lateral
III Inferior	aVF Inferior	V3 Anterior	V6 Lateral

EMS12Lead.com

EKGs

- EKGs are measuring vectors based on particular lead placement
  - Heart should depolarize from R to L and top to bottom
    - Natural conduction system is the most efficient conduction system
      - If you have the current depolarizing but in a direction that the system isn't made for-timing of a particular segment is going to be off
        - Wide QRS-WPW, LBBB, RBBB
  - Net current towards something gives an upward deflection, away gives a downward deflection

EKGs

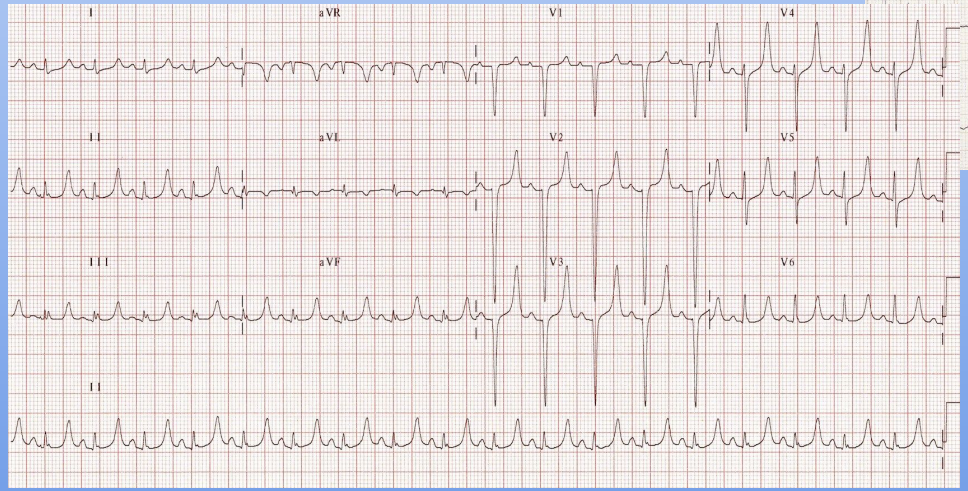
- PR
  - Glimpse of SA to AV conduction
  - Shortened (<.2) in WPW because the Bundle of Kent depolarizes before the conduction from SA to AV occurs
  - Prolonged (>.2) in AV Blocks
- QRS
  - If the heart cannot use that conduction pathway because there is a block or current is going the wrong direction, it will take >.12s
    - RBBB, LBBB, pacemaker, WPW

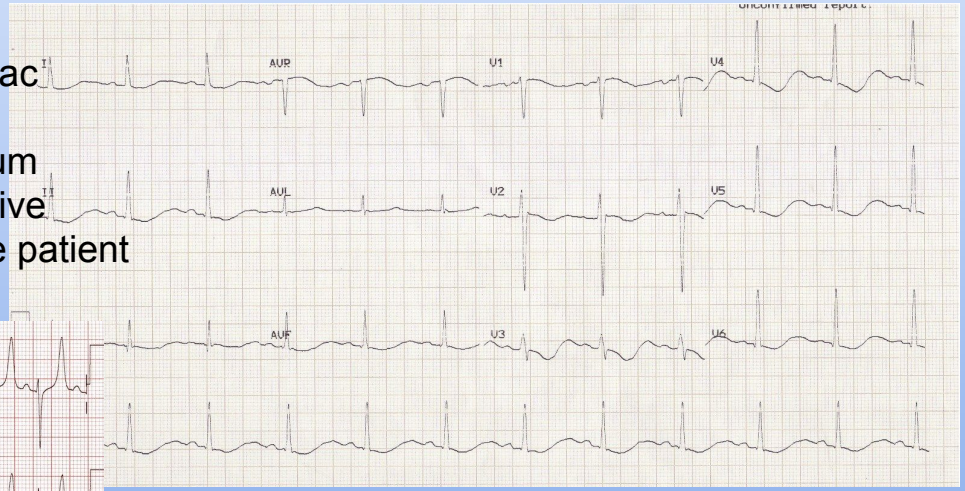
Electrolytes on EKGs

Hyperkalemia-peaked t wave

Treatment?

1. Calcium gluconate-stabilize cardiac membrane
2. Kayexalate-poop out the potassium
3. Insulin and glucose (do not just give insulin because you will make the patient hypoglycemic)



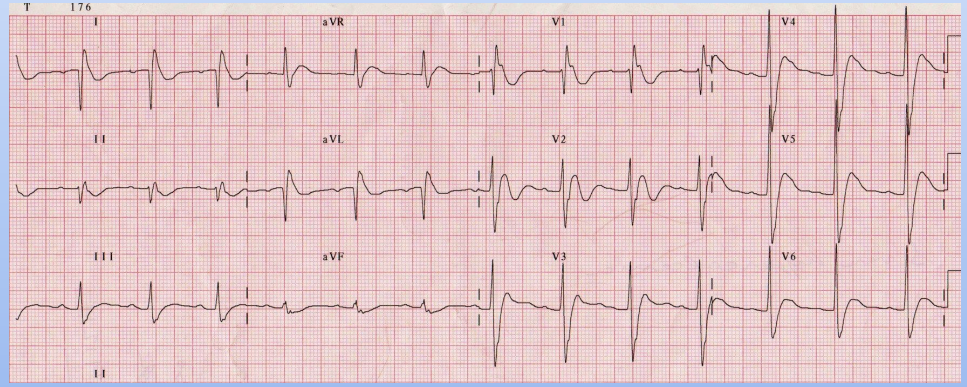


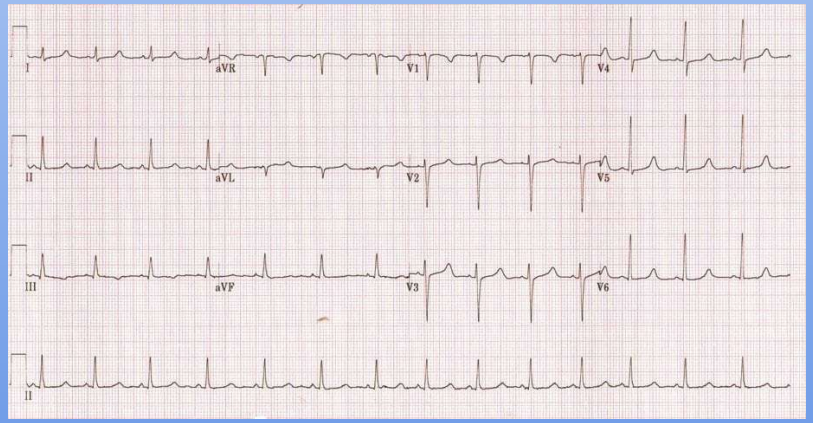
Hypokalemia-u wave

As an aside, most questions involve hyperkalemia in context of crush or burn victims

Electrolytes on EKGs

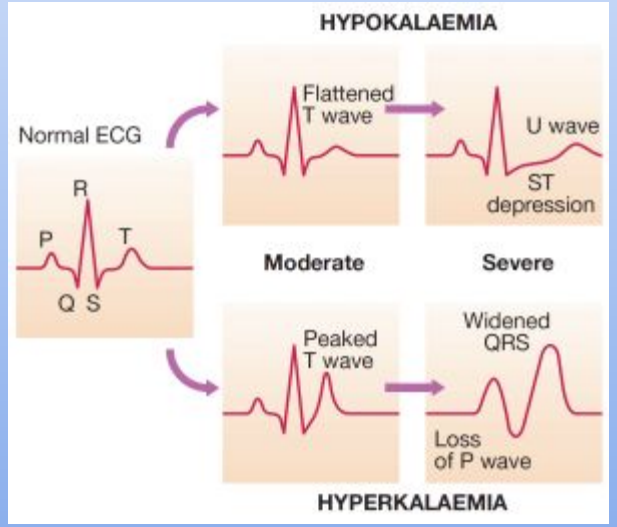
Hypocalcemia prolonged QT

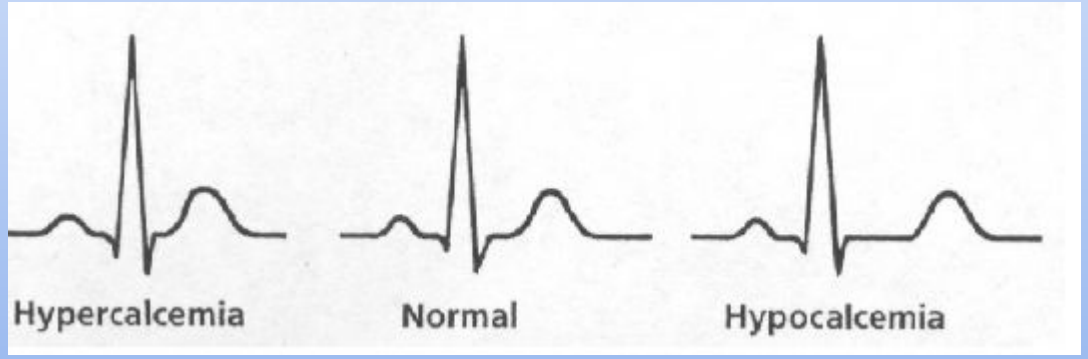




Hypercalcemia-shortened QT
Treatment?
If severe >14 treat with NS hydration, calcitonin, and pamidronate or another bisphosphonate for maintenance

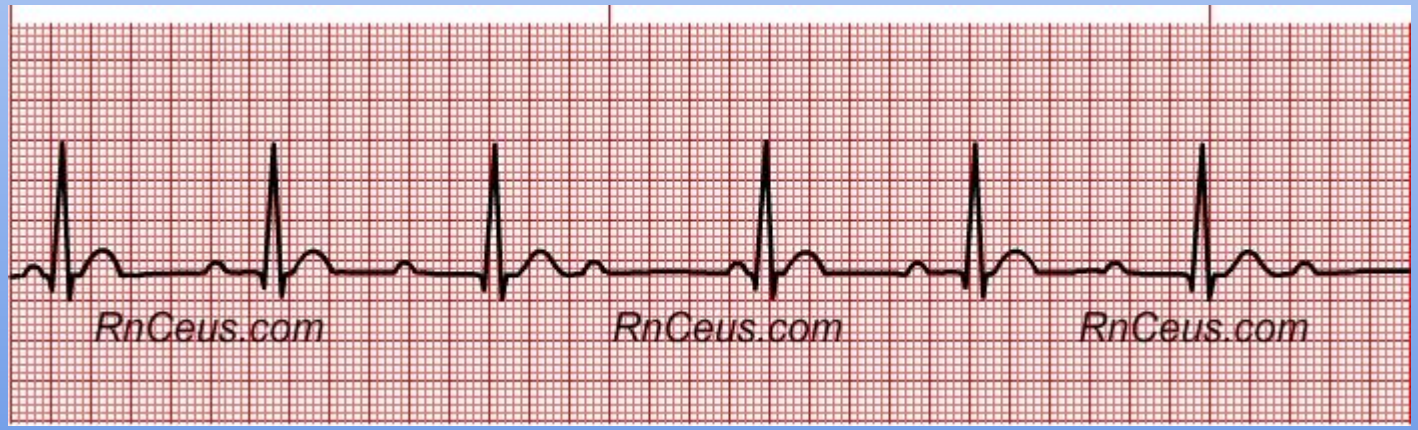
Electrolytes on EKGs

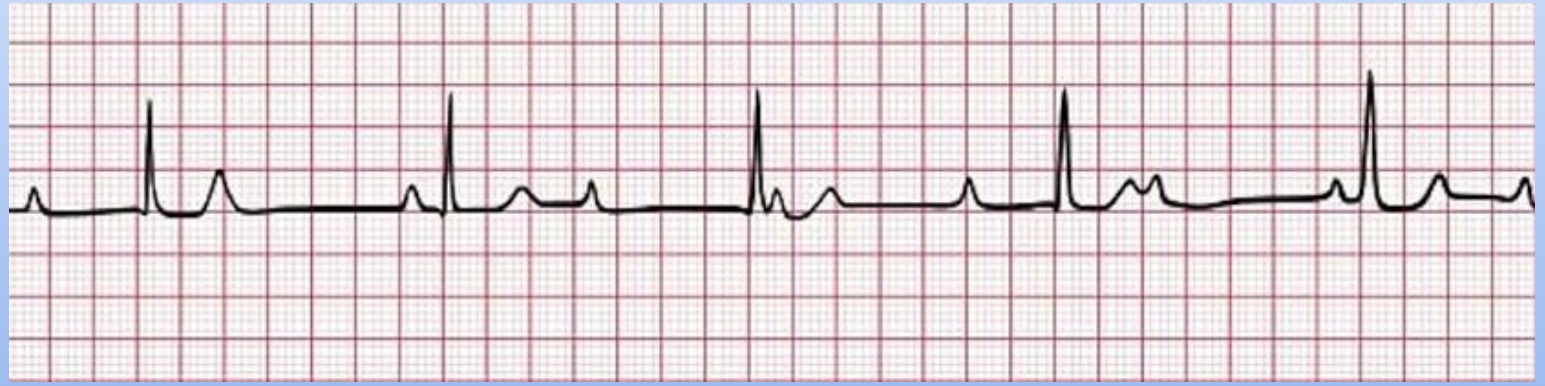




First degree AV block-just long PR intervals

Second degree Type I-PR lengthens then drops a beat





3rd degree-no association
-Lyme and Lupus
-Cannon a-waves on PE

2nd degree type II-randomly dropped beats

Atrial flutter

Atrial fibrillation

Atrial Fibrillation

- EKG?
- Risk factors for development of atrial fibrillation?
- Management?
- What will you check in a patient with new onset Afib?
- Considered acute vs chronic?

- Irregularly irregular-no p waves and irregular RR intervals
- AE from HTN or CAD
- Rate or rhythm control (more common rate), and anti-coagulation
- MCC is hyperthyroidism so check TSH/T4
- <48 hours is acute and does not require anticoagulation before shocking

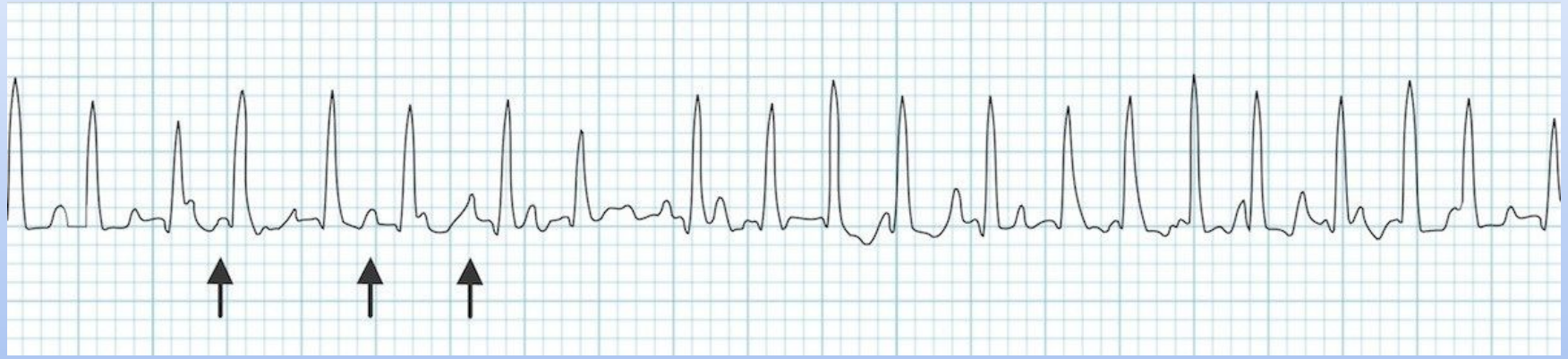
To Anticoagulate or Not

- CHA2DS2-VASc-What scores for what?
  - C?
  - H?
  - A?
  - D?
  - S?
  - V?
  - A?
  - Sc?

- >2 NOAC or OAC, <2 ASA or nothing
  - CHF
  - HTN
  - Age >75
  - DM
  - Stroke
  - Vascular (PAD, MI)
  - Age 65-74
  - Sex (Female)

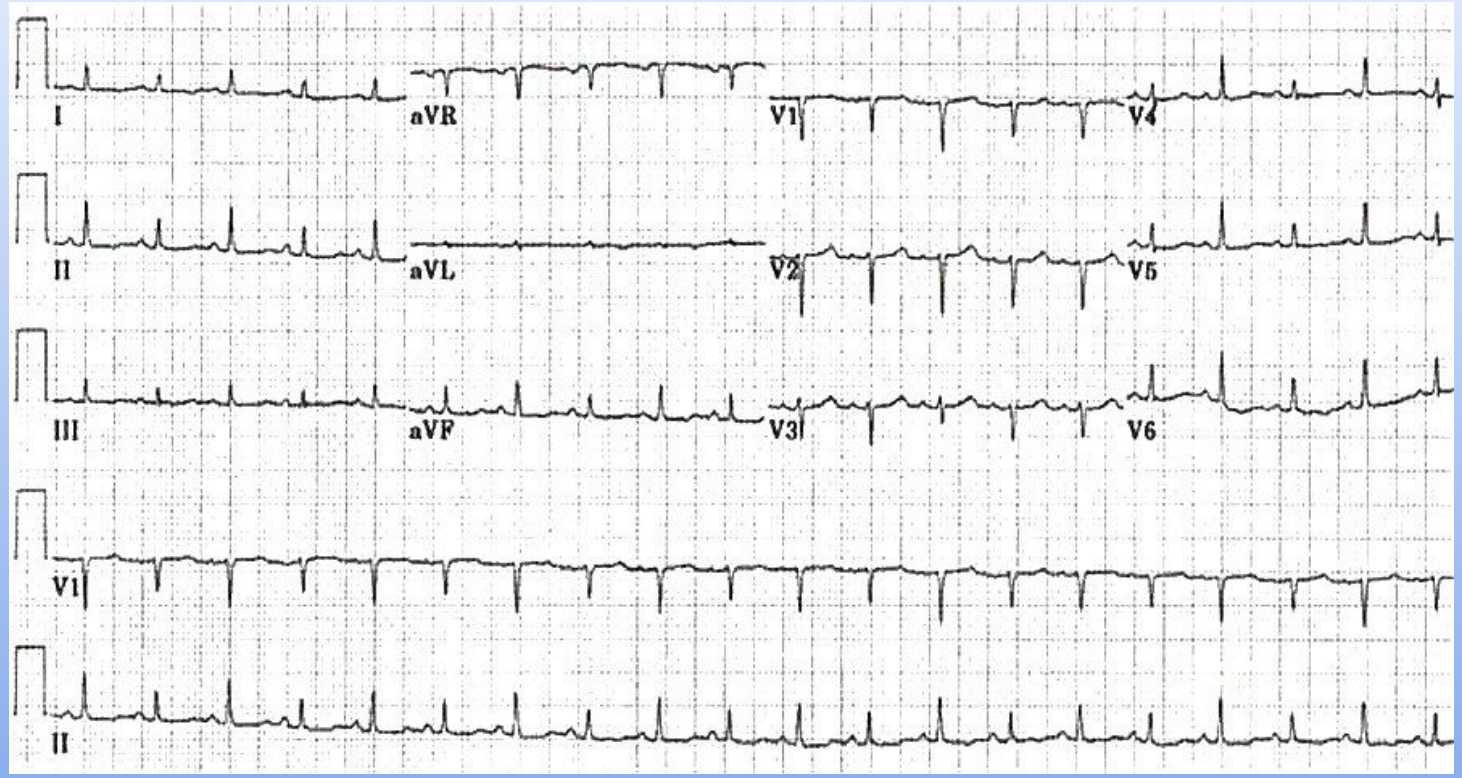
Atrial flutter

- Consistent electrical circuit
- Sawtooth appearance
- Consistent RR interval
- Treat with OAC, rate or rhythm control



Multifocal Atrial Tachycardia

High yield association-lung disease (COPD)



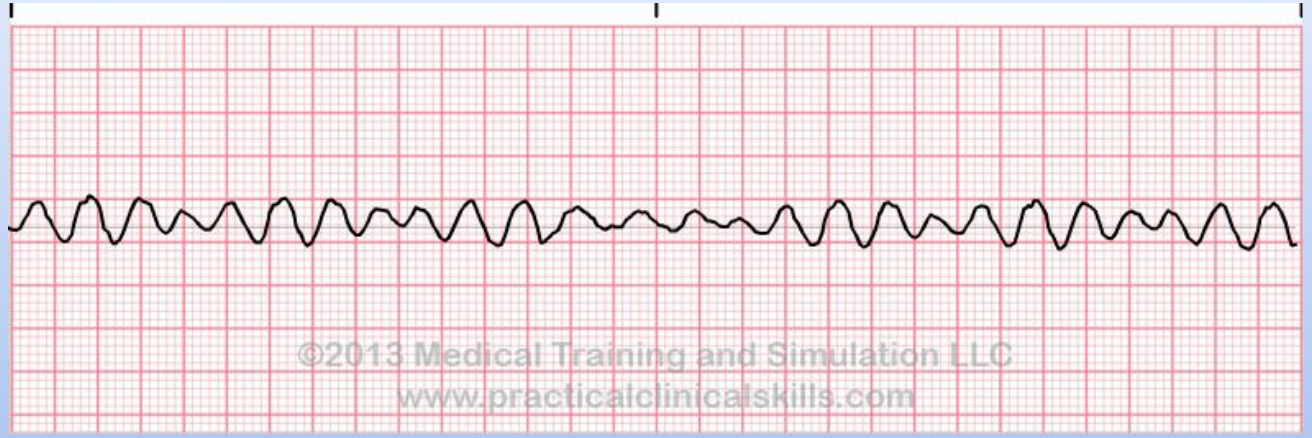
Electrical alternans in cardiac tamponade
Distant heart sounds, JVD, hypotension (Becks Triad)
Pulsus paradoxus (fall in BP>10 w/ inspiration)

- EKG?
- What is causing it?
- Drugs to avoid?
- Tx?

- WPW
- Accessory pathway through Bundle of Kent
- Avoid adenosine, beta blockers, CCB, and digoxin (ABCD-essentially all drugs that slow conduction through AV node because increases chance of vfib)
- Tx with procainamide

SVT-come in with palpitations and sweating
Tx? Carotid massage first, then try meds

VTach



VFib

Torsades
Tx? Mg
Associations-medications (ondansetron, anti-psych, FQN)

ACLS

- Unstable-hypotension, change in consciousness, chest pain?
- Symptomatic bradycardia tx?
- Shockable rhythms?
- Medications in VFib and pVT?

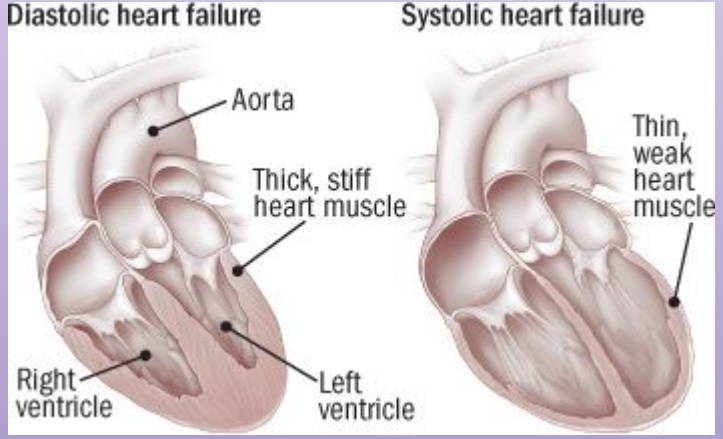
- DC conversion
- Atropine and pacemaker
- VFib and pulseless VTach
- Alternating epinephrine and amiodarone between CPR

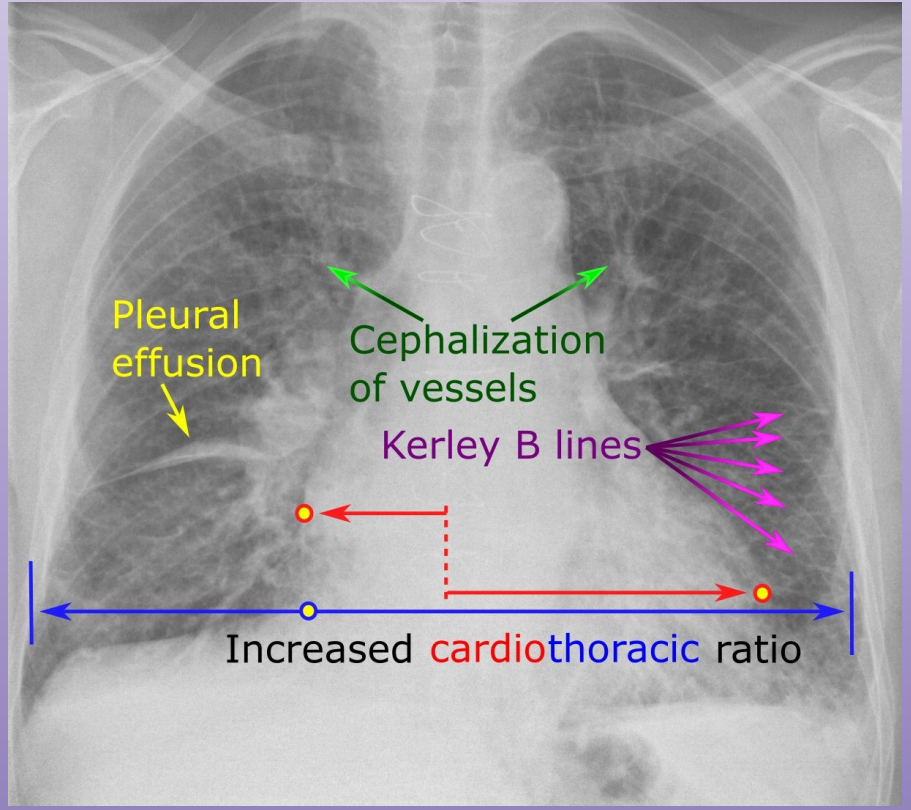
Congestive Heart Failure

- Forms of CHF
- Best initial test
- Most accurate test
    - When would you actually use this?
- Medications-special note of decreased mortality
- Medications for acute decompensation
- Salt and fluid recommendations
- Indications for implantable defibrillator

- Diastolic dysfunction (preserved EF >50%), systolic dysfunction (reduced EF <40% in setting of ischemic heart disease and HTN)
- Transthoracic echo, if first presentation of CHF-EKG is indicated to ensure decompensation is not a result of ischemia/infarction
- MUGA
    - Pre-chemotherapy for a cardiotoxic agent (ex. doxorubicin)
- ACEi, BB (carvedilol, bisoprolol, metoprolol), spironolactone (NYHF III, IV), (diuretics, digoxin do not decrease mortality but it improves symptoms and decreases admissions)
- Lasix, Morphine, Nitrates, O2, Positional relief (LMNOP)
- <2L fluid, <2g salt
- EF <35% and NYHF III, IV

Congestive Heart Failure



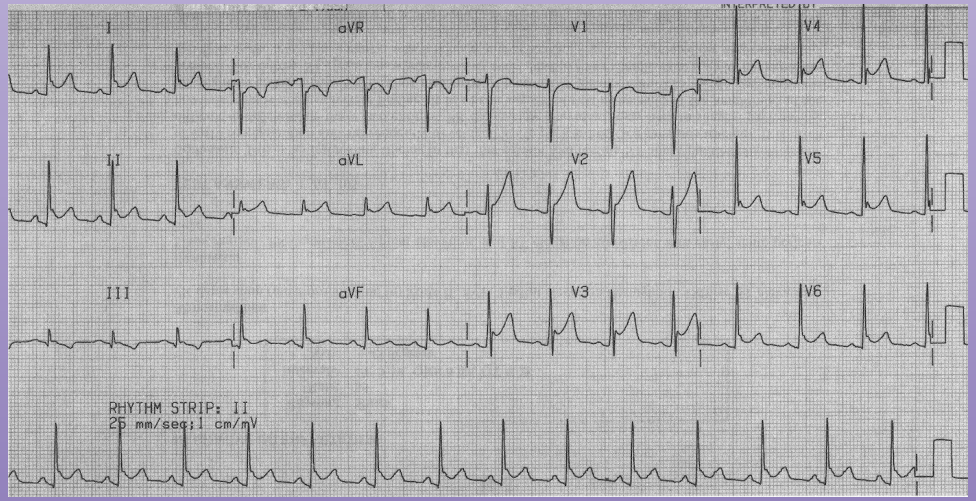


Cor pulmonale

- Common causes are COPD, ILD, OSA.
- Present with dyspnea on exertion.
- Exam shows increased JVP, peripheral edema, loud S2, right sided heave, and pulsatile liver from congestion.

Pericarditis

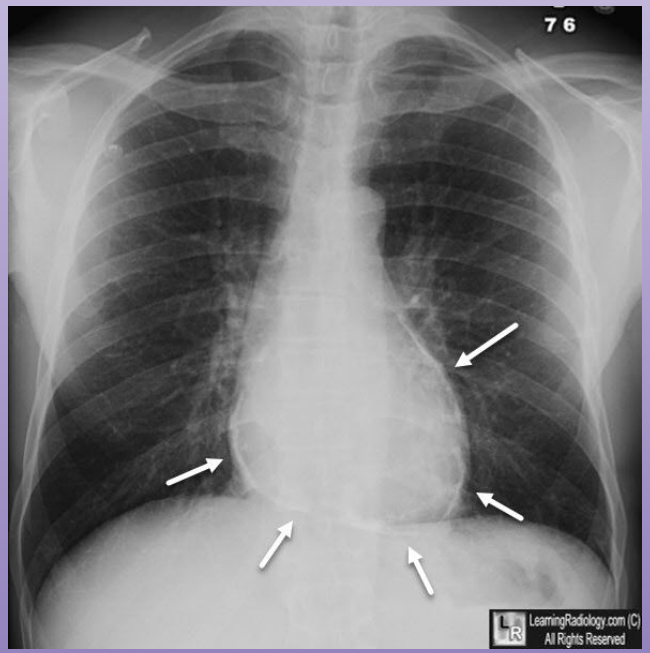
- EKG in pericarditis
- Best initial treatment
  - Uremia
- Role of colchicine
- MCC
  - Others



- Diffuse STE (concave) and PR depression
- NSAIDS
  - Indication for hemodialysis
- Decreases recurrences
- Viral
  - MC other etiology in practice questions-Lupus, RA

Pericarditis

- Calcifications on imaging, pulsus paradoxus, pericardial knock, and Kussmaul's sign



- Constrictive pericarditis
  - Can occur in setting of viral pericarditis, cardiac surgery, or radiation therapy

Endocarditis

- Best initial test
- Best initial treatment
- IVDU-MC valve
  - What would the murmur sound like?
- MC valve for HACEK and Strep pneumo
  - What would the murmur sound like?
  - Treatment if HACEK
- What do you do if you find strep bovis?
- Who gets penicillin ppx in oral procedures?

- Blood culture (x3-do before imaging), TTE, TEE
- Vancomycin and gentamicin
- Tricuspid
  - Holosystolic murmur, increases with inspiration
- Mitral valve
  - Holosystolic murmur
  - Ceftriaxone
- Colonoscopy
- Prosthetic valve, previous history of endocarditis, cardiac transplant, unrepaired cyanotic heart defect

Cardiomyopathy

- Different forms of cardiomyopathy
- Causes of dilated cardiomyopathy
  - Medications that decrease mortality
- Causes of hypertrophic cardiomyopathy
  - Meds to avoid
  - Tx

- Dilated, hypertrophic, hypertrophic obstructive, restrictive
- Myocardial infarction, alcohol, postviral, radiation/doxorubicin, Chagas
  - ACEi/ARBs, BB, and spironolactone
- MCC HTN
  - Avoid increase in HR and decrease in LV chamber size (ACEi, ARB)
  - Tx with BB, diuretics

Cardiomyopathy

- Causes of hypertrophic obstructive cardiomyopathy
  - Tx
- Causes of restrictive cardiomyopathy
  - Pt with CHF, LVH and proteinuria; no HTN; waxy skin, anemia, big tongue
  - EKG
  - Echo
- AD sarcomere mutation
  - Ablation of septum, defibrillators; BB, CCB
- Sarcoidosis, amyloidosis, hemochromatosis, fibrosis, scleroderma
  - Amyloidosis
  - Low voltage
  - Speckling

Murmurs

- If it is a text question-go to the description of the murmur and start eliminating (Megri's Method)
  - Systolic
    - ASS (Aortic stenosis, pulmonic stenosis, tricuspid regurg, mitral regurg)
  - Diastolic
    - Aortic regurg, pulmonic regurg, tricuspid stenosis, mitral stenosis
  - Holosystolic
    - VSD, tricuspid and mitral regurg
- If you get in trouble-try to think about the murmur relative to the cardiac cycle
  - Murmurs-think of as feed forward issues or backflow issues
    - Feed forward-from valves that should be open but are not good at opening because they are stenosed
    - Backflow-valves that should be closed that are allowing backflow
    - Systole-open A/P, closed M/T
    - Diastole-open M/T, closed A/P

Murmurs

- Best initial test?
- What kind of murmurs are we concerned about?

- Echo
- Grade III or more, diastolic, pansystolic, radiating, or symptomatic

Aortic stenosis

- Pathophysiology of AS
- Presentation
- Murmur

- Senile calcifications (MC>70), bicuspid aortic valve (association with Turner's), late manifestation rheumatic heart
- Syncope, CHF, angina
- Systolic murmur, radiates to carotids

MVP

- Murmur?
- Pathology?
- Treatment?
- Repercussions?

- Late systolic with click
- Myxomatous degeneration
- Treatment only indicated if symptomatic with heart palpitations, treat with BB
- Predisposes to IE (Strep Viridans-only damaged valves)

Aortic regurgitation/dissection

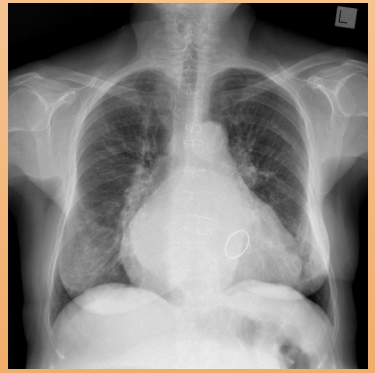
- Widened pulse pressure and diastolic murmur?
- Patient experience of AR?
- Associations?
- Pain radiating to the back, pressure >20 between arms, new onset aortic regurgitation?
- Most specific and sensitive?

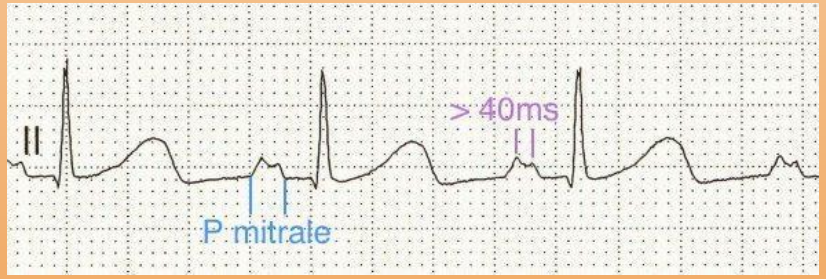
- Aortic Regurgitation
- Aware of heart beat due to LV enlargement
- Connective tissue diseases, syphilis, ankylosing spondylitis
- Aortic dissection
- TEE

Mitral regurgitation

- Murmur and radiation
- Cause?
- In setting of IE or MI?
- P wave abnormalities in EKG?
- Manifestations of LAE?

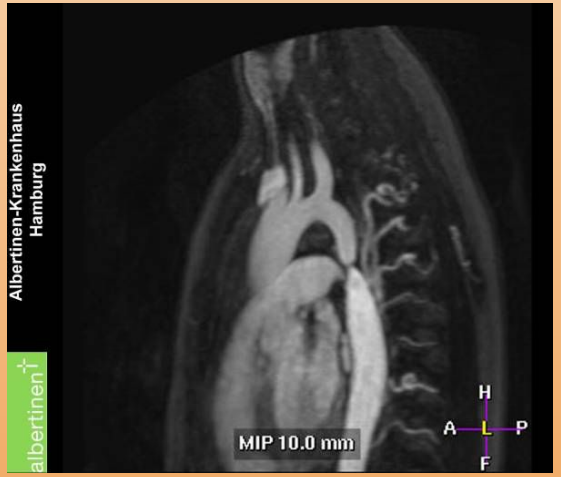
- Holosystolic, radiation to axilla
- Can be manifestation of RF, MVP is the most common cause of MR in developed countries
- Chordae in IE, papillary muscle rupture
- Looks like m
- Predisposes to A. Fib, splays carina on XR, can cause hoarseness and dysphagia



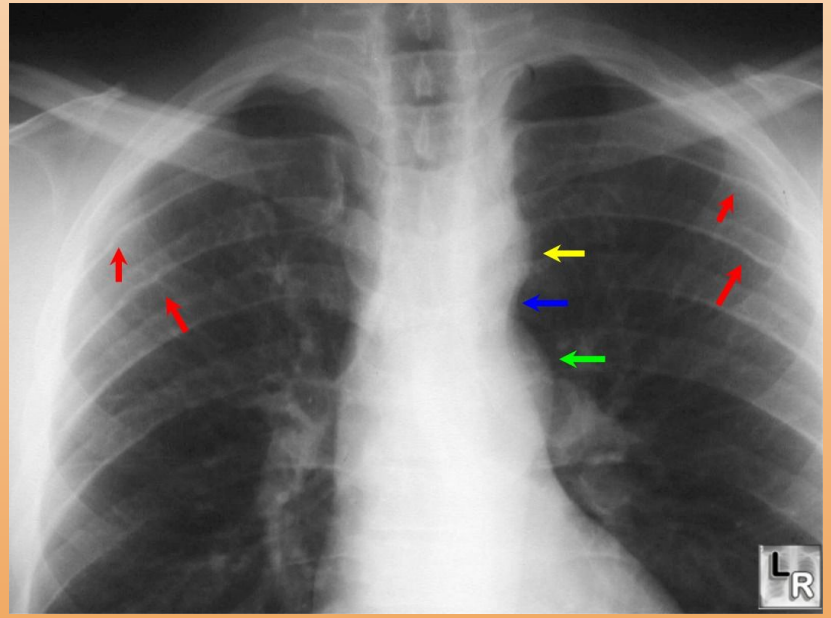


Coarctation of the aorta

- Underdeveloped lower extremity with brachial-femoral pulse delay
  - EKG?
  - CXR?
  - High yield association-genetics?

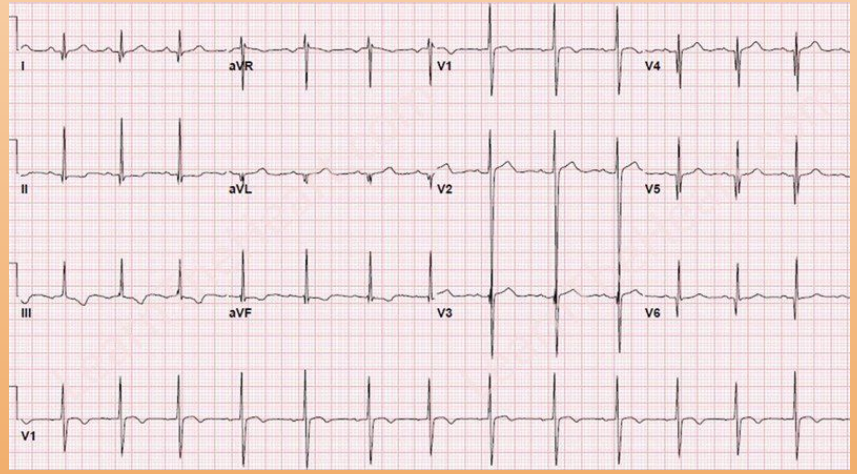


- Coarctation of the aorta
  - LVH
  - 3 sign with rib notching
  - Turner syndrome



HOCM

- Dysfunction in HOCM?
- Murmur?
- EKG?
- Treatment?



- Diastolic then systolic due to fibrous replacement of sarcomeres
- Mitral regurg
- Septal Q waves
- CCB or BB

Maneuvers on Murmurs

	Venous Return / Preload		Afterload		Drugs	
	Increase (Leg raise / Squat)	Decrease (Valsalva / Standing)	Increase (Handgrip)	Decrease (Amyl Nitrate)	Diuretic	ACEIs
MS, AS	↑	↓	↓(AS)	↑(AS)	Yes, but better	
					AS (Replace)	×
			Negligible Effect in (MS)		MS(Ballon)	
MR, AR	↑	↓	↑	↓	✔	✔
VSD	↑	↓	↑	↓	✔	✔
HOCM	↓	↑	↓	↑	×	×
MVP	↓	↑	↓	↑	×	×

Murmur buzzwords

- Holosystolic(MR, VSD, TR)
- Early systolic (AS, PS, HOCOM)
- Mid systolic (MVP, ASD)
- Diastolic (MS, TS, AR, PR)

- Murmur with Click-MVP
- Radiates to the Axilla-MR
- Opening snap-MS
- Hyperdynamic circulation or signs-AR

Cardiotoxicity

- Best indication for MUGA to determine EF before starting cardiotoxic medications
- MC cause in questions-doxorubicin