

HIGH-YIELD CARDIOVASCULAR SYSTEM NOTES

FOR USMLE STEP 1 AND STEP 2

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High-Yield Notes for USMLE Step 1 & Step 2 CK

STEP 1 - PATHOPHYSIOLOGY & BASIC SCIENCE

CARDIAC EMBRYOLOGY

- Truncus arteriosus → Aorta + Pulmonary trunk
- Bulbus cordis → Smooth outflow tracts (RV + LV)
- Primitive ventricle → Trabeculated ventricles
- Sinus venosus → Smooth RA + Coronary sinus
- Endocardial cushions → AV valves + Atrial septum + Membranous ventricular septum

CONGENITAL HEART DEFECTS

- Most common congenital heart defect → VSD
- Most common cyanotic defect → Tetralogy of Fallot

- Newborn + continuous machine murmur + bounding pulses → PDA
- Fixed split S2 → ASD (ostium secundum)
- Down syndrome + ASD → Ostium primum type
- Congenital rubella + PDA → give Indomethacin to close
- Cyanotic baby needs PDA open → give PGE1 (Alprostadil)
- Boot-shaped heart on CXR + cyanosis worsens with crying → Tetralogy of Fallot
- ToF = VSD + Pulmonary stenosis + RVH + Overriding aorta
- Baby squats during crying spell → ↑ SVR → ↓ R→L shunt → ↑ oxygenation
- "Egg on string" CXR → Transposition of great arteries

- Turner syndrome + coarctation of aorta → Preductal type
- Upper limb HTN + weak femoral pulses + rib notching on CXR → Postductal coarctation
- "3 sign" on CXR → Coarctation of aorta
- Coarctation associated with → Bicuspid aortic valve + Berry aneurysms.
- Eisenmenger syndrome → Uncorrected L→R shunt → Pulmonary HTN → Shunt reversal → Cyanosis + Clubbing + Polycythemia

CORONARY ANATOMY

- Most commonly occluded coronary artery → LAD
- LAD supplies → Anterior LV + Anterior 2/3 septum + Apex

- RCA supplies → RV + Inferior LV + Posterior 1/3 septum
- SA node blood supply → RCA (60%), LCX (40%)
- AV node blood supply → RCA (90%)
- Right dominant circulation → RCA gives PDA (70% of people)

ISCHEMIC HEART DISEASE

- Chest pain + ST elevation → STEMI → Give thrombolytics or PCI
- Chest pain + ST depression or T wave inversion → NSTEMI/Unstable angina
- Troponin elevated → MI (not just angina)
- First enzyme elevated in MI (2-4 hrs) → Troponin

- ECG changes in MI: Hyperacute T waves (minutes) → ST elevation (hours) → Q waves (days) → T wave inversion (weeks)
- Transmural MI (full thickness) → Q waves on ECG
- Subendocardial MI (inner 1/3) → ST depression, no Q waves
- Most common cause of death immediately post-MI → Ventricular arrhythmia (V-fib)
- Most common cause of death 3-7 days post-MI → Cardiac rupture (free wall → tamponade, papillary muscle → acute MR, septum → VSD)
- Dressler syndrome → Post-MI pericarditis 2-10 weeks later → autoimmune

HEART FAILURE

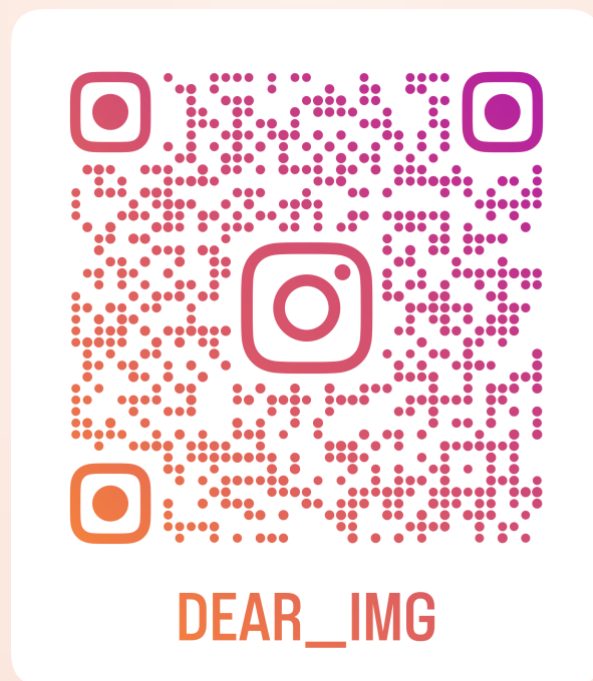
- Systolic HF → Reduced EF (<40%) → Dilated chambers → S3 gallop
- Diastolic HF → Preserved EF (>50%) → Stiff ventricle → S4 gallop
- S3 = Rapid ventricular filling → Seen in systolic HF, young athletes
- S4 = Atrial contraction against stiff ventricle → Diastolic HF, HTN, AS
- Crackles + ↑ JVP + peripheral edema → Congestive heart failure
- BNP elevated → Heart failure (released by ventricles in response to stretch)
- ACE inhibitors contraindicated in → Bilateral renal artery stenosis, Pregnancy, Angioedema history

VALVULAR DISEASE



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