❤️ Cardiovascular Anatomy

🫀 Cardiac Surface Anatomy

📌 Key Spatial Relationships

- Left Atrium (LA) → most posterior part of heart
- Right Ventricle (RV) → most anterior part (behind sternum)
- Left Ventricle (LV) → forms majority of inferior (diaphragmatic) surface (~2/3)
- Right Ventricle (RV) → remaining ~1/3 of inferior surface

⚠️ Clinical Correlations

🫁 Left Atrium Enlargement (e.g., Mitral Stenosis)

LA enlargement →

Compresses esophagus → Dysphagia

Compresses left recurrent laryngeal nerve → Hoarseness (Ortner syndrome) 🎤

💡 This nerve is a branch of vagus and loops under aortic arch → vulnerable!

🚑 Trauma

- RV = most anterior → most commonly injured in blunt chest trauma

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🧱 Layers of the Heart Wall & Pericardium

📌 Pericardium Layers (Outer → Inner)

Fibrous pericardium → Parietal pericardium → Pericardial space (contains fluid) → Epicardium (visceral pericardium)

🧠 Key Concepts

- Pericardial space → between parietal & visceral layers
- Innervation of pericardium: Phrenic nerve (C3–C5)

⚠️ Pericarditis Pain

Pericardial inflammation → Irritates phrenic nerve → Referred pain to:

- Neck

- Shoulders (especially left)
- Arms

💡 Think: "C3–C5 keeps the diaphragm alive" → referred pain pattern

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🫀 Table: Heart Wall Layers

Layer	Description
Endocardium	Inner lining
Myocardium	Muscle layer (contractile) 💪
Epicardium	Outer layer (visceral pericardium)

❤️ Coronary Circulation

🔴 Left Anterior Descending (LAD)

Supplies:

- Anterior 2/3 of interventricular septum
- Anterior surface of LV
- Anterolateral papillary muscle

💡 Most commonly occluded artery → "Widow maker"

🔵 Posterior Descending Artery (PDA)

Supplies:

- Posterior 1/3 of IV septum
- Posterior ventricular walls
- Posteromedial papillary muscle

🟡 Right Coronary Artery (RCA)

Supplies:

- SA node
- AV node
- Right ventricle (via acute marginal artery)

⚠️ Clinical Correlation

RCA infarction → SA/AV node ischemia → Bradycardia or heart block

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🔄 Coronary Dominance

📌 Defined by origin of PDA

Type	Description

Right-dominant (most common)	PDA from RCA
Left-dominant	PDA from LCX
Codominant	PDA from both RCA & LCX

⏱️ Coronary Blood Flow Timing

- Maximal flow occurs in early diastole 🫀

  💡 Why?

- During systole → vessels compressed
- During diastole → vessels open → perfusion occurs

🩸 Coronary Venous Drainage

- Coronary sinus:

- Runs in left AV groove
- Drains into right atrium

🔄 Coronary Supply Flowchart

Aorta

→ Left coronary artery (LCA)

→ LAD → anterior septum + LV

→ LCX → lateral LV

→ Right coronary artery (RCA)

→ SA/AV nodes

→ Acute marginal → RV

→ PDA (in right dominance)

🧠 Clinical Connections

- LAD occlusion → anterior MI (most common) 🚨
- PDA infarct → septal defects / conduction issues
- RCA infarct → bradycardia, heart block
- Posteromedial papillary muscle (single blood supply via PDA) → prone to rupture

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💡 Final Takeaways

- LA = posterior → esophagus + nerve compression
- RV = anterior → trauma risk
- LAD = most commonly occluded
- RCA = nodal supply → arrhythmias when infarcted
- Coronary flow = diastolic
- Dominance = defined by PDA origin

-> The End <-