MEDICAL EDUCATION RESOURCE

Mnemonics & Facts to Remember

Mnemonics from the Chapter — Pericardium, Heart, and Foetal Circulation

1. Branches of the Right Coronary Artery (RCA)

Mnemonic: "A Cute Male Prefers Small Parties"

- **A** ? Artery to SA node
- **C** ? Conus branch
- **M** ? Marginal branch (Right marginal)
- **P** ? Posterior interventricular (descending) artery
- **S** ? Septal branches
- **P** ? Posterior ventricular branches

(Helps recall all major branches in their anatomical order.)

2. Branches of the Left Coronary Artery (LCA)

Mnemonic: "Lefties Can Aim Straight"

- **L** ? Left coronary artery
- **C** ? Circumflex artery
- **A** ? Anterior interventricular artery (LAD)

- **S** ? Septal and diagonal branches

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3. Heart Wall Layers

Mnemonic: "Endo, Myo, Epic — three coats thick!"

- **Endocardium** ? Inner endothelial lining
- **Myocardium** ? Muscular middle layer
- **Epicardium** ? Outer serous covering

(Easy to recall histological arrangement of heart wall.)

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4. Openings in the Right Atrium

Mnemonic: "SIVC Cans"

- **S** ? Superior vena cava
- **I** ? Inferior vena cava
- **V** ? Coronary sinus
- **C** ? Cardiac veins (anterior)
- **A** ? Atrioventricular orifice
- **N** ? Nodal (SA node region)
- **S** ? Sinus venarum (smooth part)

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5. Heart Sounds

Mnemonic: "MI-TRI / AORT-PUL"

- **First sound (S?):** Closure of **Mitral** and **Tricuspid** valves
- **Second sound (S?):** Closure of **Aortic** and **Pulmonary** valves

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6. Fetal Shunts and Their Fate

Mnemonic: "Oval Ducks Venously Turn Medial"

- **Oval** ? Foramen ovale ? *Fossa ovalis*
- **Ducks** ? Ductus arteriosus ? *Ligamentum arteriosum*
- **Venously** ? Ductus venosus ? *Ligamentum venosum*
- **Turn** ? Umbilical vein ? *Ligamentum teres hepatis*
- **Medial** ? Umbilical arteries ? *Medial umbilical ligaments*

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7. Cardiac Conducting System

Mnemonic: "SAAV His Right Purkinje"

- **S** ? SA node
- **A** ? Atrial musculature
- **A** ? AV node
- **V** ? AV bundle (Bundle of His)

- **His** ? His bundle branches
- **Right Purkinje** ? Right and left Purkinje fibers

(Recalls sequence of conduction in the heart.)

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8. Tetralogy of Fallot — Four Defects

Mnemonic: "PROVe it!"

- **P** ? Pulmonary stenosis
- **R** ? Right ventricular hypertrophy
- **O** ? Overriding of aorta
- **V** ? Ventricular septal defect

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9. Layers Pierced by a Needle in Pericardiocentesis

Mnemonic: "Skin Fascia Muscle Cartilage Pleura Pericardium"

1. Skin
2. Superficial fascia
3. Pectoralis major
4. Costal cartilage (5th or 6th intercostal space)
5. Internal intercostal muscle
6. Parietal pleura (small portion)

7. Fibrous pericardium
8. Parietal layer of serous pericardium

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10. Developmental Derivatives — Summary Mnemonic

Mnemonic: "Trunk Bulges, Vents and Atriums Split"

- **Truncus arteriosus** ? Aorta and pulmonary trunk
- **Bulbus cordis** ? Right ventricle and outflow tracts
- **Primitive ventricle** ? Left ventricle
- **Primitive atrium** ? Rough parts of both atria
- **Sinus venosus** ? Smooth part of right atrium and coronary sinus

Facts to Remember — Pericardium, Heart, and Foetal Circulation

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General Facts about the Heart

- The **heart** is a **hollow, muscular organ** about the size of a closed fist, weighing around **300 g in males** and **250 g in females**.
- It lies within the **middle mediastinum**, enclosed by the **pericardium**, and is **slightly tilted to the left**.
- The **apex** of the heart lies in the **5th left intercostal space**, 9 cm from the midline.

- The **base** of the heart is formed mainly by the **left atrium**, while the **apex** is formed entirely by the **left ventricle**.

- The **right border** of the heart is formed by the **right atrium**, and the **inferior border** by the **right ventricle**.

Pericardium

- The **fibrous pericardium** is continuous above with the **adventitia of great vessels** and below with the **central tendon of diaphragm**.

- The **transverse pericardial sinus** separates the **aorta and pulmonary trunk (in front)** from the **superior vena cava and left atrium (behind)** — important in cardiac surgery for clamping vessels during bypass.

- The **oblique sinus** is a blind recess behind the left atrium, between the pulmonary veins.

- The **pericardium receives blood supply** from the **pericardiophrenic artery** (branch of internal thoracic artery) and is innervated by the **phrenic nerve (C3–C5)**.

Coronary Circulation

- The **right and left coronary arteries** arise from the **anterior and left posterior aortic sinuses**, respectively.

- **Coronary dominance** is determined by which artery gives rise to the **posterior interventricular artery**:

    - **Right dominance:** 70%

    - **Left dominance:** 10%

    - **Co-dominance:** 20%

- The **left anterior descending (LAD) artery** is the **most commonly occluded** vessel in coronary artery disease.

- **Coronary veins** drain mainly into the **coronary sinus**, which opens into the **right atrium** .

Internal Features of Heart Chambers

- **Right atrium:** Contains **fossa ovalis**, **crista terminalis**, and openings of **SVC, IVC, and coronary sinus**.

- **Right ventricle:** Has **trabeculae carneae**, **moderator band**, and **tricuspid valve** guarding the atrioventricular orifice.

- **Left atrium:** Receives **four pulmonary veins**; smooth inside except for auricular pectinate muscles.

- **Left ventricle:** Thickest chamber, contains **bicuspid (mitral) valve**, **aortic vestibule**, and **aortic valve**.

Valves of the Heart

- **Atrioventricular valves:** Tricuspid (right), Mitral (left).

- **Semilunar valves:** Aortic and Pulmonary.

- The **aortic valve** lies **behind the left margin of the sternum** at the level of the **3rd intercostal space**, while the **pulmonary valve** lies higher.

- Valves open and close **passively** due to **pressure differences**, not muscular control.
- **Papillary muscles and chordae tendineae** prevent valve prolapse during ventricular contraction.

Conducting System

- **SA node** (pacemaker): Upper end of **crista terminalis** near SVC opening.
- **AV node:** Lower part of interatrial septum near coronary sinus opening.
- **AV bundle (Bundle of His):** Only electrical link between atria and ventricles.
- **Purkinje fibers:** Subendocardial conducting fibers ensuring synchronized contraction.
- **Normal heart rate:** 70–75 beats/min (sinus rhythm).

Foetal Circulation

- Oxygenated blood from placenta enters via **umbilical vein**.
- **Ductus venosus** ? bypasses liver to join **IVC**.
- **Foramen ovale** ? directs blood from right to left atrium.
- **Ductus arteriosus** ? connects pulmonary trunk to aorta.
- **Umbilical arteries** ? return deoxygenated blood to placenta.
- **At birth**, the **lungs expand**, pressure in left atrium rises ? **foramen ovale closes**.

- All fetal shunts close functionally within **hours** and anatomically within **weeks** after birth.

Important Postnatal Remnants

FOETAL STRUCTURE	ADULT DERIVATIVE
Foramen ovale	Fossa ovalis
Ductus arteriosus	Ligamentum arteriosum
Ductus venosus	Ligamentum venosum
Umbilical vein	Ligamentum teres hepatis
Umbilical arteries	Medial umbilical ligaments

Clinical Highlights

- **Pericardial effusion** ? fluid accumulation compresses heart (**cardiac tamponade**).
- **Atrial septal defect (ASD):** Failure of foramen ovale closure.
- **Ventricular septal defect (VSD):** Failure of membranous septum formation; most common congenital heart defect.
- **Tetralogy of Fallot:** Cyanotic congenital defect (PROV mnemonic).
- **Patent ductus arteriosus (PDA):** Ductus arteriosus remains open ? left-to-right shunt.
- **Angina pectoris:** Transient myocardial ischemia without necrosis; relieved by nitrates.

- **Myocardial infarction (MI):** Irreversible necrosis of cardiac muscle due to coronary blockage.