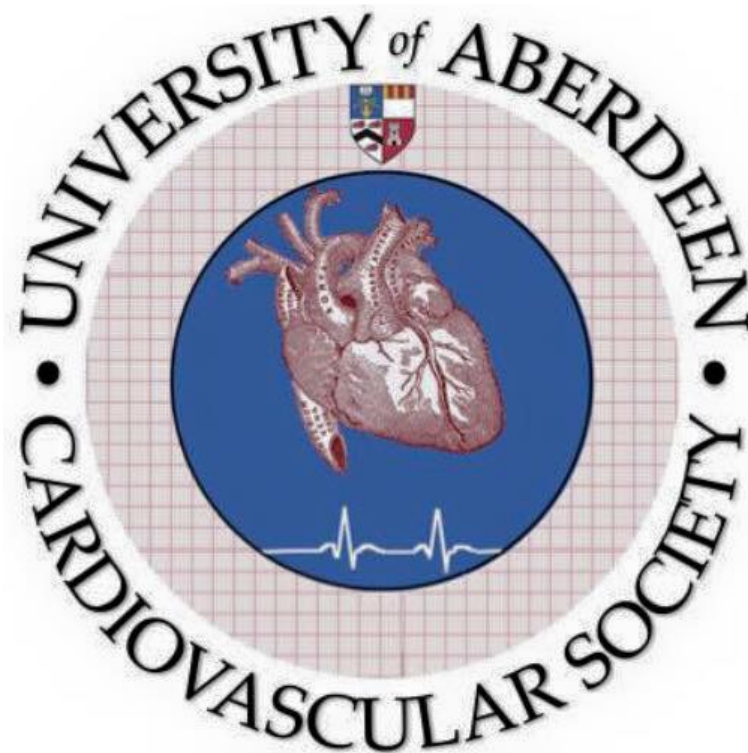

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UNIVERSITY OF ABERDEEN



Clinical Anatomy

Prepared by: UoACVS

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Proposal number: 123-4567

STATION 1

Chambers of the heart

Identify Each of the features underneath and describe their functions

Chamber	Position/Functions of the contents
Right Atrium and Auricle	<p>Pectinate Muscle: Originates from the crista terminalis - increases force of atrial contraction</p> <p>Fossa Ovalis: Remnant of the foramen ovale which shunted blood in fetal circulation to bypass lungs</p> <p>Auricle: Fills up during times when blood flow to the heart is high e.g. exercise. Commonly a source of blood clots causing stroke in patients with atrial fibrillation</p> <p>SAN: Generates the electrical signals telling the myocytes to contract. Influenced by the vagus nerve and T1-4. At rest the heart is under vagal restraint. Damage to the vagus speeds up heart rate</p>
Right Ventricle	<p>Chordae tendinae and Papillary Muscles (x3): Prevent the tricuspid valve from blowing out during systole. Note how there's three because it's the TRicuspid valve it acts on i.e. there's three cusps of the valve</p> <p>Trabeculae Carneae: Similar function to papillary muscles preventing inversion of the valves. They are the fleshy struts going down the ventricular wall</p> <p>Moderator Band: also known as the septomarginal trabecula. Prevents blowout and overfilling of the right ventricle. Attaches from the wall of the right ventricle to the IV septum. It also acts as a conduction pathway from the right bundle branch</p>
Left Atrium and Auricle	<p>Pulmonary Veins: Carry oxygenated blood from the lungs back into the left atrium There are 4 of these, 2 from each lung</p>

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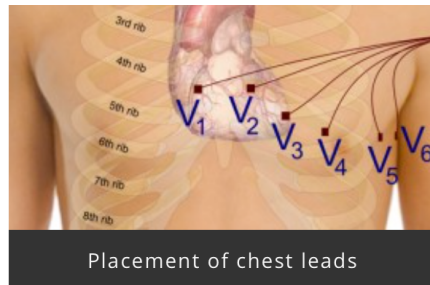
Chamber	Position/Functions of the contents
Left ventricle	<p>Thick Ventricular Wall: Needed to generate enough pressure to pump blood around the entire systemic circulation</p> <p>Papillary Muscles (x2) and Chordae tendinae: Prevent blowout of the mitral valve. There are only 2 as it is a bicuspid valve</p>

STATION 1 (CONTINUED)

The Heart's Conducting System

Identify which leads on the ECG look at which areas of the heart. Compare the heart specimens with the trace provided.

View of heart	Leads
Inferior	II, III, aVF
Lateral	I, aVL, V5, V6
Anterior	V3, V4
Septal	V1, V2

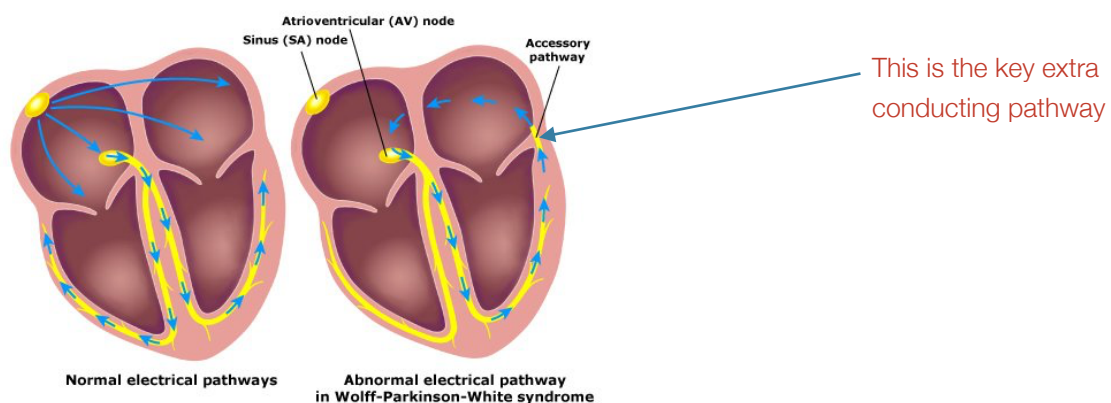


If you need this explained further come get me and I'll explain it to them.

What's the Difference between Normal Electrical Circulation and the circulation in Wolff Parkinson White syndrome? What is the insulating layer called that has been affected?

Annulus fibrosus - insulates the electrical activity from the atria and stops it reaching the ventricles without going through the AV node. Defects in this happen in Wolff-Parkinson White Syndrome and so the heart can short circuit and you get SVT

Can you demonstrate the different parts of the conducting system on the cadaver heart and show where the defect would be in Wolff Parkinson White syndrome.

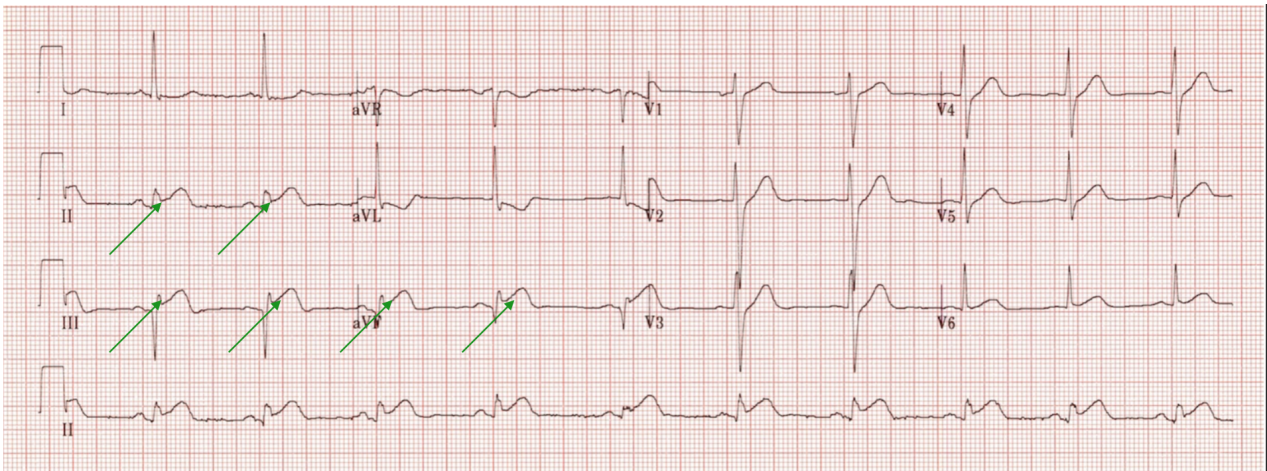


How would this defect appear on an ECG?

Characteristic “delta” wave which looks like a little blip just before the QRS complex. It’s been arrowed on the diagram I’ve provided on the board

Which coronary artery is affected in the ECG provided

Right coronary Artery - It’s an Inferior STEMI because the ST elevation is in Limb lead II,III and aVF. There is also some reciprocal ST depression in other leads which the students may point out. This isn’t as important

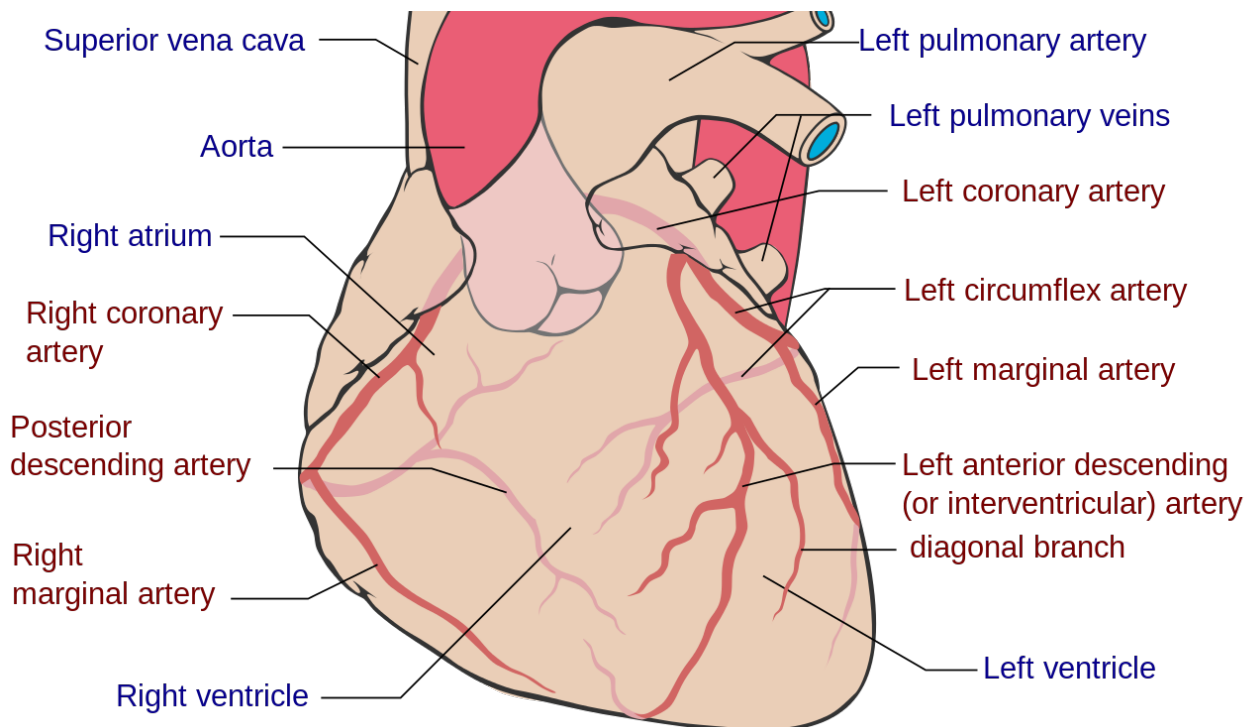


STATION 2

Blood Supply to the heart

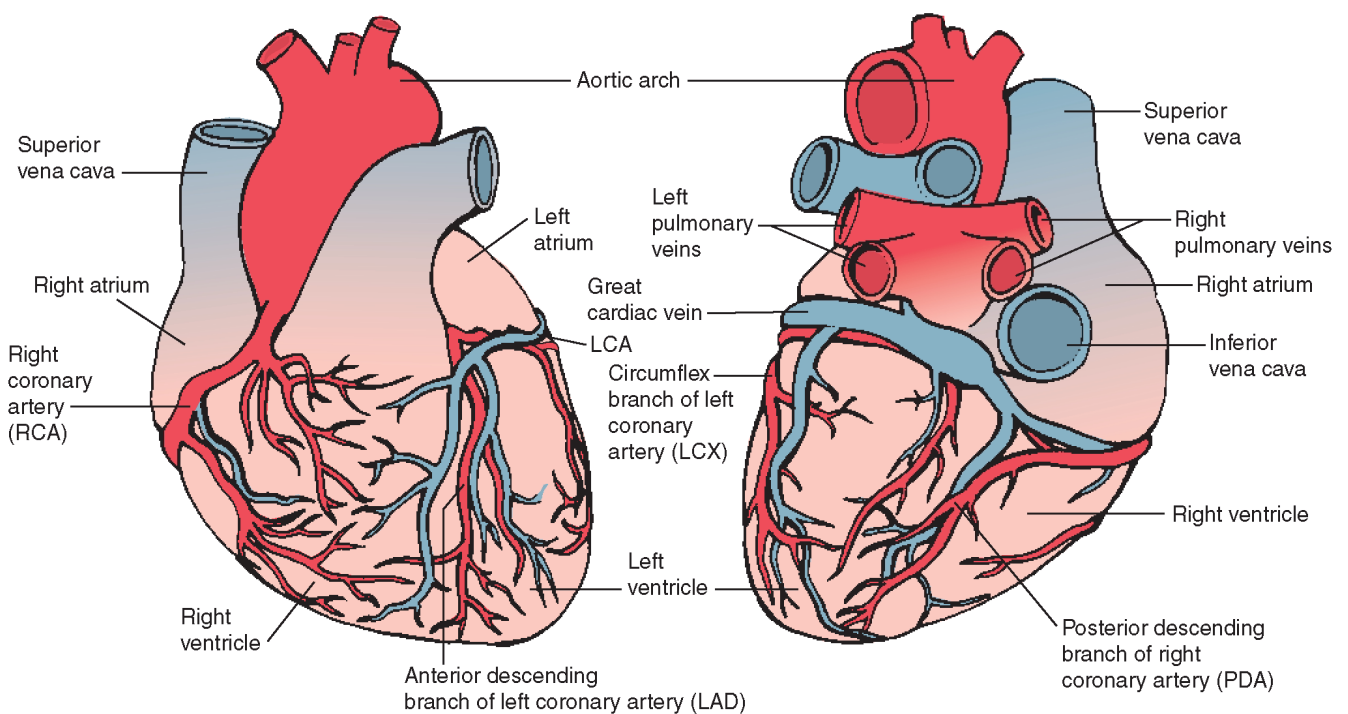
Identify these arteries on the specimen

- **Left and Right Coronary Arteries**
- **Left anterior Descending Artery (lying in the IV groove)**
- **Right marginal artery**
- **Circumflex Artery**
- **Posterior descending Artery (AKA posterior interventricular artery)**



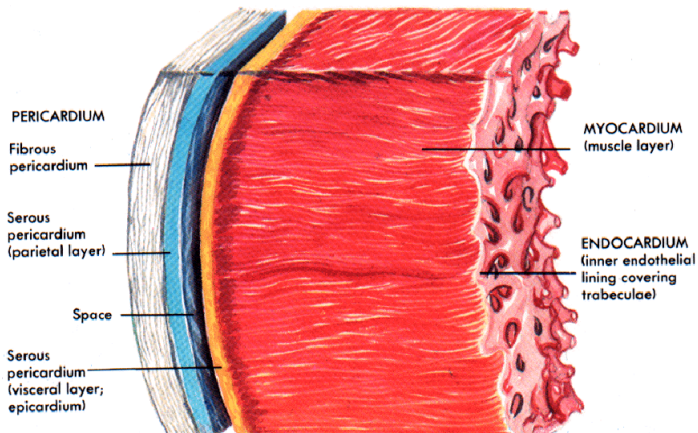
Which Arteries do each of these veins run alongside

- **Great Cardiac Vein** (Left anterior Descending)
- **Middle Cardiac Vein** (Posterior interventricular artery)
- **Small Cardiac Vein** (Right coronary artery)
- **Venae cordis minimae** (Not associated with an artery - tiny veins draining directly into the right atrium)



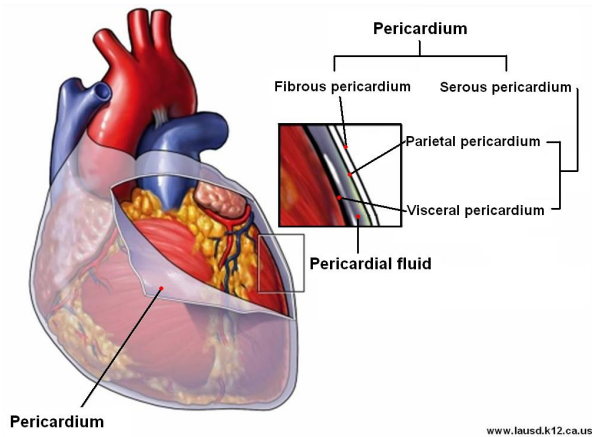
Nervous supply to the Heart

Give the innervation of each of these structures



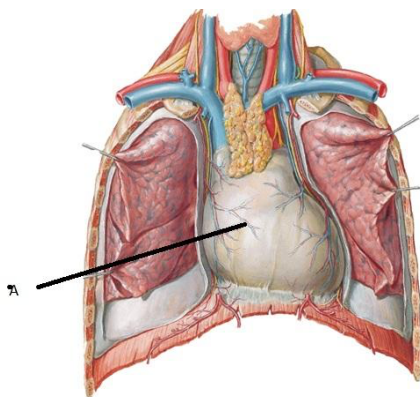
Myocardium

- Somatic (motor/sensory): None
- Sympathetic: T1-4
- Parasympathetic: vagus nerve



Visceral Pericardium

- Somatic (motor/sensory): none
- Sympathetic: T1-4
- Parasympathetic vagus



Parietal Pericardium, Fibrous pericardium, Parietal Pleura

- Somatic (motor.sensory): Sensory phrenic - nerve
- Sympathetic: none
- Parasympathetic: none

STATION 3

Identify the phrenic and vagus nerves and the sympathetic chain.

All of these nerves can be affected by tumours of the lungs. How would a tumour compressing each nerve in turn present in the clinic?

Vagus: Hoarse voice (recurrent laryngeal nerve), increase in HR because no vagal restraint

Sympathetic Chain: horner's syndrome, Reduction in HR and SV and also other effects on different parts of body depending on which level it's compressed at

Phrenic Nerve: Paralysis of one hemidiaphragm

What other structures in the thorax could a tumour of the lungs compress and what would be the consequences?

Brachial plexus, thoracic duct, SVC, could cause mediastinal shift etc etc

When there are tumours in the lungs sometimes the mediastinum can become shifted to one side. This can also happen e.g. when there is enlargement of one chamber of the heart. If you had high blood pressure which chamber of the heart would be enlarged?

Left ventricle

What would cause enlargement of the other chamber?

Cor Pulmonale or pulmonary hypertension

What signs can you illicit to demonstrate that the mediastinum has shifted?

Displaced apex beat, tracheal deviation, heaves (right ventricular hypertrophy)

STATION 4

For each of the images provided identify the congenital defect? Can you think of any genetic abnormalities that may predispose you to getting these defects?

1 - coarctation of the Aorta (Turner's syndrome)

2- Tetralogy of Fallot (Di George Syndrome i.e. CATCH 22 syndrome)

3 - Ventricular septal defect (trisomy type chromosomal problems)

Which of these defects are defined as cyanotic heart defects and why? (Think in terms of shunting of blood)

Cyanotic heart defects are caused when there is a Right to left shunt of blood e.g. transposition of the great vessels, tetralogy of fallot etc.

Remember that in VSD and ASD because the pressure in the left ventricle is greater than that in the right ventricle the shunt isn't from right to left it's actually left to right and hence they are not cyanotic until a very late stage

Image 4 shows the Aortic Arches (AKA the pharyngeal arches or branchial arches). What happens to each of the arches during development?

1st - maxillary artery

2nd - Hyoid and Stapedial arteries

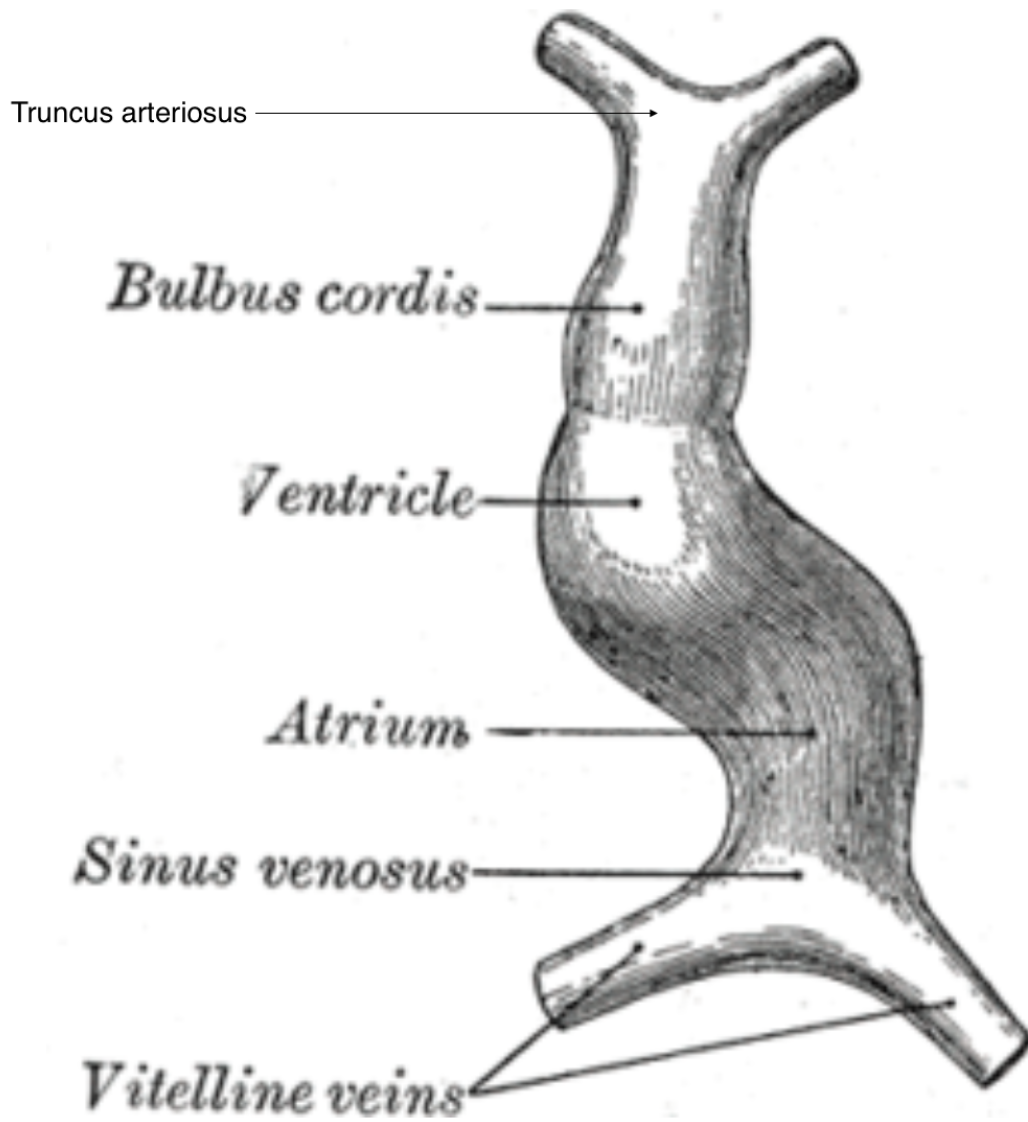
3rd -Common carotid and internal carotid

4th - The fourth right arch forms the right subclavian as far as the origin of its internal mammary branch; while the fourth left arch constitutes the arch of the aorta between the origin of the left carotid artery and the termination of the ductus arteriosus.

5th - never forms

6th - The proximal part of the sixth right arch persists as the proximal part of the right pulmonary artery while the distal section degenerates; The sixth left arch gives off the left pulmonary artery and forms the ductus arteriosus;

Image 5 shows the tubular heart. Label the different chambers.



STATION 5

For Each Image state what type of imaging it is and the reasoning behind this. Be specific e.g. T2 weighted MRI of the thorax, not just MRI

Ones used are Echocardiogram, CT (bone is white), coronal and a sagittal MRI T2 (fluid is white), angiogram (vessels highlighted with radio-opaque dye)

What Pathology is shown in Image 3 (be specific by naming the location)

Stenosis in the left circumflex artery

How might the patient in image 3 have presented in the ward?

In a younger patient - Chest pain, breathless, asymptomatic (picked up on ECG or angiogram), reduced exercise capacity, (any you can think of), syncope

In an older patient - confused, immobility, falls

What is the immediate management plan and long term prevention plan for the patient in image 3

ABC approach to any acute situation - Balloon dilatation, PCI, CABG, statins, aspirin, clopidogrel, GII/III receptor antagonists, warfarin, beta blockers, ACE inhibitors

Fix acute problems e.g. ischaemia then prevent infarction from happening in the future by lowering BP and giving anticlotting meds. Also reduce cholesterol

Image 4 has the crista terminalis labeled. What is this?

The line of union between the right atrium and the right atrial appendage