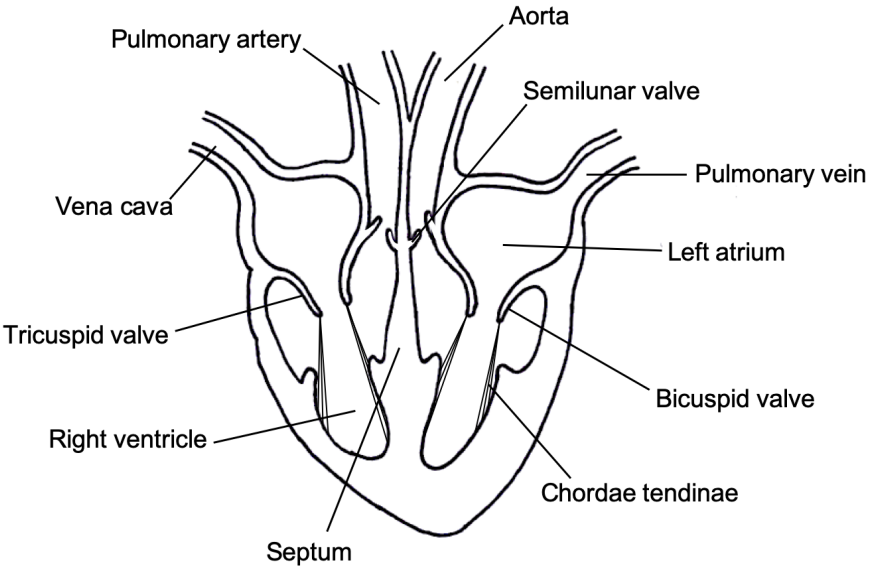
WJEC Wales Biology A Level

SP 2.3c: Dissection of a mammalian heart

Practical notes

Introduction

The mammalian heart is a **muscular pump** that pushes blood around the body. It consists of **four chambers** and associated **blood vessels**. The left and right side of the heart is separated by a muscular wall, the **septum**. Recall the structure of the heart in the diagram below:



Dissections are essential to the understanding of **internal processes** within organs such as the heart.

Equipment

- Mammalian heart
- Dissection board
- Scalpel
- Mounted needle
- Scissors
- Fine forceps
- Glass rod
- Paper towels
- Disinfectant
- Non-latex disposable gloves

Risk assessment

Hazard	Risk	Precaution	Emergency
Sharp tools e.g. scalpel, scissors	Cuts	Direction of cut away from the body; do not attempt to change blade; keep scalpel away from the edge of the desk	Elevate cuts and apply pressure; wash minor cuts in cold water; seek medical assistance
Mounted needle	Pricking skin	Hold with pointed end downwards; keep away from the edge of the desk	Seek medical advice
Biohazard	Contamination	Cover any cuts; wear disposable gloves (optional); wash hands after handling heart; use disinfectant	Seek medical advice
Disinfectant	Flammable	Make sure that there are no naked flames in the room	Put out small fires with a damp cloth; evacuate the building

Method

External examination

1. Place your fingers inside of the **four chambers** of the heart. Note the differences in the wall thicknesses. *The left ventricle is much thicker than the right ventricle because it must pump blood a further distance - it must generate a greater force of contraction so that blood can be pumped at a higher pressure. The ventricle walls are also thicker than those of the atria.*

2. Identify the **associated blood vessels**: aorta, pulmonary arteries, pulmonary veins, inferior and superior vena cava. *Arteries are thicker and more rubbery than veins*.

3. Look into the arteries and try to identify the **semilunar valves**. *These are located at their bases.* Use forceps to locate the **atrioventricular valves**.

4. Locate the **coronary artery** on the external surface. *This is highly branched and runs diagonally across the surface*. Identify where it joins the **aorta**.

5. Draw a labelled scientific diagram of the **external** structure.

Internal examination

1. Using scissors, cut through the wall of the left atrium down to the **apex** of the left ventricle.

2. Open up the left atrium and left ventricle. Identify the **bicuspid valve** (*bi - two flaps)* and observe the heart strings, **chordae tendinae**. *These are attached to the muscular wall of the left ventricle and prevent the inversion of the bicuspid valve*. Locate the **semi-lunar valve**.

3. Use a glass rod to follow the path of **blood flow**: via the pulmonary vein, left atrium and through the bicuspid valve into the left ventricle; via the left ventricle through the semilunar valve and out of the aorta.

4. Note the muscular surface of the ventricle chambers which ensures smooth blood flow.

5. Repeat steps 1 to 3 for the **right** side. Identify the **tricuspid valve** (*tri - three flaps).*

6. Draw a labelled scientific diagram of the **internal** structure.

Tips for labelled scientific drawings

- Drawing should fill at least half of the provided space
- Only draw what you can see
- Use a **sharp pencil**
- Ensure lines are **single**, **complete** and **non-overlapping**
- Do **not** use shading or colour
- Create **straight lines** for labels using a ruler
- Lines should **not** intersect
- Label lines should **not** have arrow heads
- Include a **scale**
- Include a **magnification**
- Include a **title**