Dissection of the Sheep Heart and Human Heart

Objectives
After completing this lab, you should be able to:
1. Locate and identify the major structures of the sheep heart.
2. Describe the function of the major structures of the sheep and human heart.
3. Identify the corresponding structures in the human heart model.
4. Compare the structures of the sheep heart with those of the human heart.
5. Know the path of blood through and out of the heart

Materials
Preserved sheep heart
Dissecting tray and instruments
Vinyl dissecting aprons
Disposable gloves
Anatomy & Physiology / Revealed, Version 2.0 CD-ROM
Human heart model

INTRODUCTION
The heart is a cone-shaped muscular organ, about the size of your fist. It is located in the mediastinum region (central region of the thoracic cavity), between the lungs, and behind the sternum. The heart is a hollow organ, containing 4 chambers. At least one blood vessel attaches to each of the chambers. The heart valves keep the blood moving forward because backward flow closes the valves. Contraction of the heart pumps blood through the heart and out into arteries. The right ventricle pumps blood into the pulmonary trunk, which leads to the pulmonary arteries, and the left ventricle pumps blood into the aorta, which is the major artery in the body.

You will learn the major structures of the heart by dissecting the sheep heart. While you are examining the major structures of the sheep heart, compare them with the corresponding organs of the human heart model. Then you will dissect the human heart by using your Anatomy & Physiology / Revealed, Version 2.0 CD to identify the major structures of the human heart and learn functions of each.
KNOW the location and function of the following parts on the sheep heart (and human heart too):

Base and apex of the heart
Left and right atrium
Left and right ventricle
Anterior and posterior interventricular sulcus
Interventricular Septum
Aorta
Pulmonary trunk
Pulmonary arteries (right and left) – Know them in a diagram only
Pulmonary veins (2 right and 2 left) – Know them in a diagram only
Superior and Inferior vena cava
Tricuspid and Bicuspid (Mitral) valves
Aortic and Pulmonary valves – Know them in a diagram only
Chordae Tendineae
Papillary muscles
The three (3) layers of the heart wall: epicardium, myocardium, endocardium
Pericardium

SHEEP HEART DISSECTION PROCEDURE:

1. Obtain all dissecting instruments, dissecting apron, tray, gloves, and a sheep heart.

2. Remove the pericardium, the tough fibrous membrane surrounding the heart containing a lot of adipose tissue. Lift it up and notice that it attaches to the base of the heart. Using the dissecting scissors cut it as close to the major blood vessels at the superior aspect (base) of the heart.

3. With the tip of the dissecting needle, separate a small portion of the epicardium (visceral pericardium) from the myocardium and note how the epicardium covers the surface of the heart.

Epicardium
Myocardium (a piece of epicardium has been removed to view the myocardium underneath).
4. Identify the anterior and posterior view of the heart.

**Anterior (Ventral) View:** notice the anterior interventricular sulcus

**Posterior (Dorsal) View:** notice the posterior interventricular sulcus

5. Distinguish the four chambers of the heart.

Lay the heart on the dissecting tray, anterior surface up. Locate the **right and left ventricle** and **right and left atrium**.

**Atrium** = singular
**Atria** = plural

Compare the thickness of the wall of the right ventricle with that of the left ventricle by pressing the wall of each ventricle between your thumb and finger.

Which ventricle has a thicker wall? ____________________

**Note:** the left coronary artery is located in this sulcus!
Lay the heart on the dissecting tray, posterior surface up. Locate the **right and left ventricle** and **right and left atrium**.

6. Locate the major blood vessels of the heart. Lay the heart on the dissecting tray, anterior surface up. Locate the **pulmonary trunk aorta**, and **superior vena cava**.

**Posterior View**

- Left Atrium
- Right Atrium
- Right Ventricle
- Name this sulcus:

**Anterior View**

- Superior Vena Cava
- Aorta
- Pulmonary Trunk
- Brachiocephalic artery

**Insert the blunt probe in the pulmonary trunk. To which ventricle does the probe go to?**

**Insert the blunt probe in the aorta. To which ventricle does the probe go to?**

**Insert the blunt probe in the superior vena cava. To which atrium does the probe go to?**
Lay the heart on the dissecting tray, posterior surface up. Locate the **inferior vena cava** and **superior vena cava**.

7. Use the scalpel to open the heart chambers: make an incision along the coronal plane, from the superior portion of the **left ventricle** to the superior portion of the **right ventricle**.

**Notice** the thickness of the vena cavae walls. Compare these venous walls to the thickness of the wall at the aorta.

Which blood vessel has a thicker wall? **Why?**
8. Open the heart ventricles and using the pointed needle separate a small portion of the **endocardium**. *Hint:* thin layer; it lines the heart chambers and heart valves.

9. Identify the right ventricle, left ventricle, and **interventricular septum** in the interior of the sheep heart.

Which ventricle has thicker walls?

**WHY?** ______________________

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____________________________

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FACT: 99% of the heart wall is made up of myocardium!

**Review:** using the pointed needle, identify the three layers of the heart wall.

10. Identify the **tricuspid valve** and **bicuspid (mitral) valve**.

**Fill in the blank:**

1. The tricuspid valve is between the __________ atrium and __________ ventricle.

2. The bicuspid (mitral) valve is between the __________ atrium and __________ ventricle.
11. Locate and identify the chordae tendineae and papillary muscles.

Describe the function of chordae tendineae:
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Describe the function of papillary muscles:
______________________________________________________________________________
______________________________________________________________________________
Coronal Section of the Human Heart.
Label the structures, chambers, valves found in the human heart using the terms provided.

9. ____________________________
10. ___________________________
11. ___________________________
12. ___________________________
13. ___________________________
14. ___________________________
15. ___________________________
16. ___________________________
17. ___________________________

Terms:
Chordae Tendineae
Pulmonary Valve
Mitral (Bicuspid) Valve
Tricuspid valve
Papillary Muscle
Right Atrium
Left Atrium
Right Ventricle
Left Ventricle