

Activity: Heart Anatomy

In the four-chambered mammalian heart (**Figure 1**), deoxygenated blood from the upper and lower parts of the body enters the right atrium. From the right atrium, deoxygenated blood enters the right ventricle, which pumps it through the pulmonary arteries to the lungs. There, the waste carbon dioxide diffuses from the blood to the lungs, while fresh supplies of oxygen diffuse from the lungs to the blood.

Oxygenated blood returns from the lungs through the pulmonary veins to the left atrium. From there, the blood passes into the left ventricle, where it is pumped through the body's largest artery, the aorta, out to the rest of the body in a network of arteries.

The purpose of this activity is to locate and identify some of the major structures in the mammalian heart.

Materials

fresh or preserved mammalian heart (pig, cow, or sheep)

dissecting pan	scalpel
scissors	probe
gloves	safety goggles



Wear eye protection and a laboratory apron at all times.

Wear gloves when handling preserved specimens.

Use scissors instead of a scalpel, wherever possible.

Always cut away from yourself and others sitting next to you, in case the scalpel slips.

Wash dissecting instruments in a disinfectant solution.

Cuts and scrapes should receive immediate medical attention.

Partially dissected specimens are susceptible to disease organisms. Do not store for any longer than necessary. Dissected remains should be disposed of as directed by your teacher.

Wash thoroughly with soap and water after completing the dissection.

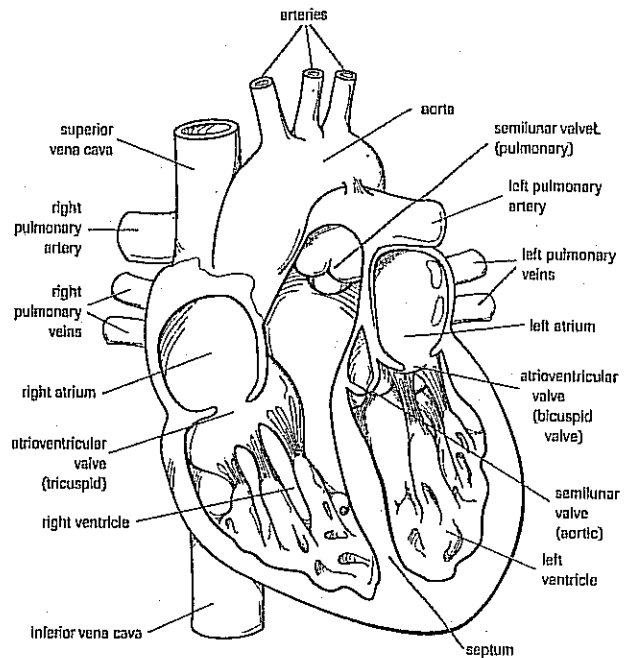


Figure 1

Procedure

1. From the exterior, identify the four heart chambers and all major vessels.
2. Using a scalpel, make a horizontal cut in each atrium. Examine the chambers, any attached vessels, and all valves. Push a probe through each valve—in both directions, if possible.
3. Make a vertical cut in both ventricles. Examine the chambers, any attached vessels, and all valves. Again, test the valves with a probe.
4. Using a dissecting probe, trace the circulation through the pulmonary and the systemic circuit.
5. Locate the aorta. With scissors, cut vertically away from the vessels branching off the aorta. Examine these vessels as your teacher directs.
6. Keep the dissected heart nearby as you answer the questions.
7. Once the dissection and questions are completed, dispose of the heart specimen and clean and store your laboratory equipment.

Analysis

- (a) Indicate whether each of the following structures contains oxygenated blood (OX) or deoxygenated blood (DEOX).
- | | |
|------------------------|----------------------|
| _____ left atrium | _____ right atrium |
| _____ left ventricle | _____ aorta |
| _____ right ventricle | _____ pulmonary vein |
| _____ pulmonary artery | |
- (b) The heart is not symmetrical. Which side is larger, the pulmonary side or the systemic side? Explain why one side of the heart needs more muscle tissue than the other.
- (c) An artery usually carries oxygenated blood away from the heart. What is the one exception? Explain. Revise this definition of an artery:
- (d) How can you distinguish between an atrioventricular valve and a semilunar valve? (*Hint: What does the word *semilunar* mean?*)
- (e) When a stethoscope is used to listen to the heart, what sounds are being heard?
- (f) Explain the purpose of the heart valves and describe how they operate.
- (g) Describe any differences you observed in the structure of veins and arteries. Explain how these differences in structure are related to their function.