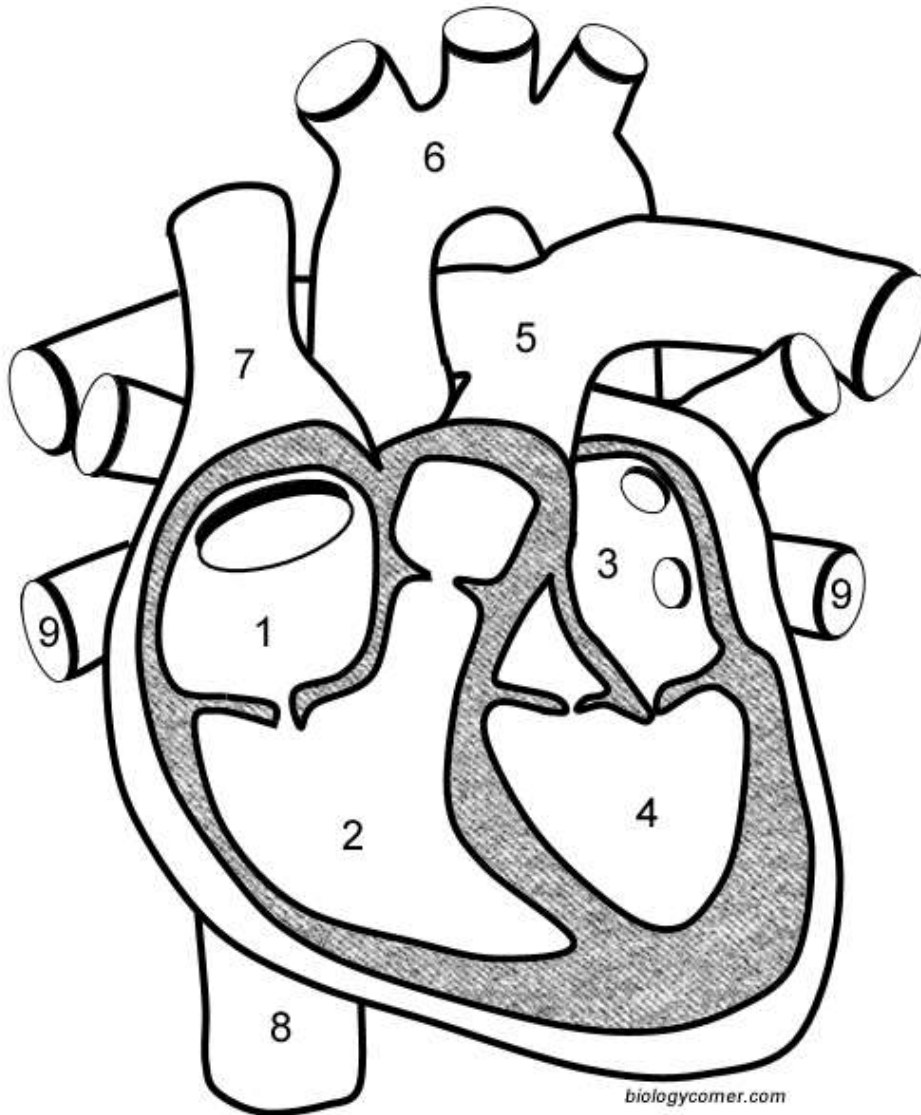


The Human Heart

The human heart is similar to the hearts of other vertebrates. Mammals and birds (and some reptiles) have what is known as a double-loop circulatory system, where blood leaves the heart, goes to the lungs where it becomes oxygenated and then returns to the heart before delivering the oxygenated blood to the rest of the body.



The heart has four chambers, and most diagrams will show the heart as it is viewed from the ventral side. This means that as you look at the heart, the left side refers to the "patient's" left side and not your left side. On the heart image, 1 indicates the right atrium, and 2 indicates the right ventricle. 3 and 4 are the left side chambers.

Blood that has traveled through the body supplying nutrients to tissues eventually returns to the heart through the **superior vena cava** (7) and the **inferior vena cava** (8) and then enters the right atrium (1). From the right atrium, a small contraction pushes blood into the right ventricle (2). A valve between the two chambers, called the **tricuspid**, prevents blood from leaking back into the atrium.

From the left ventricle, blood is pushed out through the pulmonary valve and into the **pulmonary artery** (5). This artery branches into two arteries that travel to the left and right

lungs. Blood picks up oxygen in the lungs and then returns to the heart via four small **pulmonary veins** (9).

At this point, it may be useful to review the difference between an artery and a vein. By definition, arteries carry blood away from the heart, veins carry blood to the heart. Generally speaking, arteries carry oxygenated blood and veins carry deoxygenated blood, the pulmonary artery and vein is the exception to this rule.

Blood returning from the lungs enters the **left atrium** (3) and then travels to the **left ventricle** (4). The **tricuspid**, or mitral valve, prevents blood from backing up into the atrium. The left ventricle is the strongest part of the heart muscle, as it must produce enough force to push the blood out the **aorta** (6) through the aortic valve and deliver it to the entire body. The three small vessels at the top of the aorta deliver blood to the head and neck, then the aorta curves around the heart and travels down the length of the body to deliver blood to the abdomen and lower extremities.

1. **Label each of the parts** of the heart and associated vessels that are numbered.
2. **Label each of the valves** (these are not identified on the diagram but can be found based on the descriptions in the text). List the valves below.

3. Trace the flow of blood in the heart. Use a **blue arrow** to indicate deoxygenated blood and a **red arrow** to indicate oxygenated blood.
4. Explain why the heart and circulatory system is described as a "double loop"

5. Distinguish between the bicuspid and the tricuspid. What is the purpose of both of these valves?

6. **Mitral regurgitation** is a heart condition that occurs when the mitral valve does not close fully. Based on your knowledge of the heart, describe what happens to the blood of someone who has this condition. (If you are really stumped, look it up!)

7. When you place your hand over your heart, you use your right hand. This is because you feel your heart more strongly on the left side of your chest, even though the heart is centered in the chest cavity. Why do you feel your heartbeat more strongly on the left side?