

Heart and Blood Flow

by Sophia

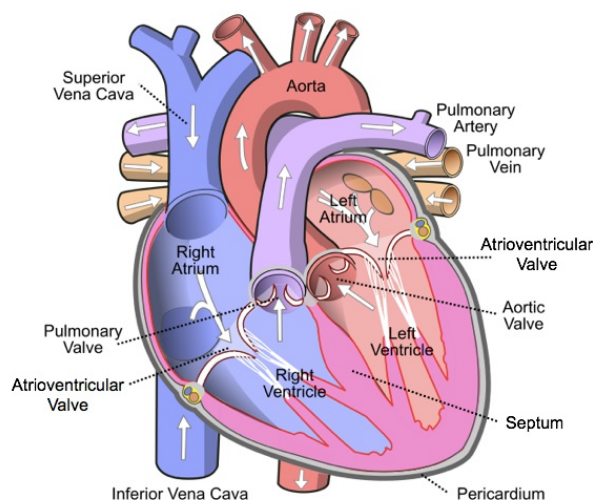


WHAT'S COVERED

In this lesson, you will learn to identify the major structures of the heart and the specific role in the overall functioning of the heart. Specifically, this lesson will cover:

1. The Structure of the Heart

The heart is primarily made of **myocardium** and is a muscular pump whose job is to move blood throughout the body. The heart is a very complex organ made up of different parts, such as chambers, blood vessels, and valves.



TERM TO KNOW

Myocardium

The muscular tissue that composes the heart.

1a. Chambers

Our heart is broken up into right and left halves and is composed of four chambers in total. The top chambers are the atria (singular, **atrium**), and the bottom chambers are the **ventricles**. Blood flows into our atria and then down into our ventricles. From there, it will be pumped toward either our body or lungs.

The **septum** separates the right and left halves of the heart, and the **pericardium** is the outer portion. The pericardium is a fluid-filled sac that surrounds the heart; the pericardium's job is to protect and to lubricate the

heart.



TERMS TO KNOW

Atrium

The right and left upper chambers of the heart.

Ventricle

The right and left lower chambers of the heart.

Septum

A wall of tissue that separates the right and left halves of the heart.

Pericardium

A fluid-filled sac that surrounds the heart and provides protection and lubrication.

1b. Blood Vessels

Blood returns from the body in two veins:

- **Superior Vena Cava:** A vein whose job is to deliver oxygen-depleted blood from the upper portion of our body into the right atrium.
- **Inferior Vena Cava:** A vein whose job is to deliver oxygen-depleted blood from the bottom portion of our body into the right atrium.

The **aorta** is another important structure of the heart. It is an artery that delivers blood to the body and systemic circuit.



TERMS TO KNOW

Superior Vena Cava

A vein that delivers deoxygenated blood from the upper portion of the body to the right atrium.

Inferior Vena Cava

A vein that delivers deoxygenated blood from the lower portion of the body to the right atrium.

Aorta

An artery that delivers blood to the systemic circuit.

1c. Valves

There are also four important valves in the heart that regulate blood flow.

Heart Valves	
Pulmonary valve	Part of the right ventricle. Our pulmonary valve allows blood to flow from our right ventricle to our pulmonary artery.
Aortic valve	Allows blood to flow from the left ventricle to the aorta.
Atrioventricular valves	There are right and left atrioventricular valves, or AVs for short. Atrioventricular valves allow blood to flow from the atrium to the ventricles. When blood flows into the atrium, the atrioventricular valve will then open, allowing that blood to flow down into the ventricle. When blood is pumped out of the ventricle to either the lungs or the body, the valves close to prevent blood from flowing backward.



TERMS TO KNOW

Pulmonary Valve

A valve that allows blood to flow from the right ventricle to the pulmonary artery while preventing backflow.

Aortic Valve

A valve that allows blood to flow from the left ventricle to the aorta while preventing backflow.

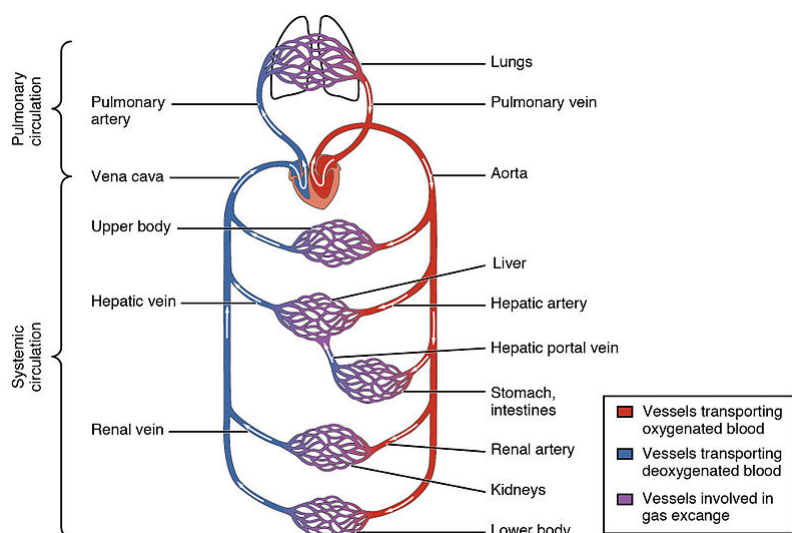
Atrioventricular Valve

A valve that allows blood to flow from the atrium to the ventricle while preventing backflow of blood.

2. The Circuits of the Heart

Our heart is divided into two halves, and each half is divided into two chambers, so there are four chambers total in the heart. Each half of our heart pumps blood into one of two different circuits:

- Pulmonary Circuit
- Systemic Circuit



The pulmonary circuit is the first circuit to examine. Deoxygenated blood (blood in which oxygen has been removed by the body's oxygen-hungry tissues) enters the right atrium. This deoxygenated blood then moves into the right ventricle and is pumped up to the lungs. Once it reaches the lungs, it will be able to latch onto more oxygen. It then becomes oxygen-rich. It flows back to the heart, and the circuit is complete.

Once the blood has been enriched with oxygen and has returned to the heart from the lungs, it is pumped into the systemic circuit. The systemic system carries oxygen-rich blood from our heart to the rest of our body and then back to the right side of the heart.



THINK ABOUT IT

Question: If blood goes through the pulmonary circuit to become enriched with oxygen, what happens with oxygen in the systemic circuit?

Answer: It will get depleted. As the oxygen-rich blood passes through your body, the oxygen is used. The

oxygen-depleted blood will return to the heart and then enter the pulmonary circuit again.



TERMS TO KNOW

Pulmonary Circuit

One of the two circuits of blood flow in which the right side of the heart pumps blood, low in oxygen, to the lungs and returns it to the left atrium.

Systemic Circuit

One of the two circuits of blood flow in which the left side of the heart pumps oxygen-rich blood to the body and returns it to the right atrium.



SUMMARY

The **structure of the heart** includes four **chambers**. The top two chambers are the atria, and the bottom two are ventricles. They are identified by being on either the right or left side of the heart. The septum is the structure that divides the right side from the left. The pericardium is the fluid-filled sac that surrounds the heart. Large arteries take oxygen-rich blood from the heart to the rest of the body, and large veins return oxygen-depleted blood to the heart to be delivered to the lungs. The heart has many important **valves** to allow blood to flow from one area to another, without allowing for backflow.

The function of the heart is to be the pump that circulates oxygen-rich blood from the lungs to the rest of the body (**the systemic circuit**), and bring back oxygen-depleted blood back through the heart, and into the lungs (**the pulmonary circuit**).

Keep up the learning, and have a great day!

Source: THIS WORK IS ADAPTED FROM SOPHIA AUTHOR AMANDA SODERLIND



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TERMS TO KNOW

Aorta

An artery that delivers blood to the systemic circuit.

Aortic Valve

A valve that allows blood to flow from the left ventricle to the aorta while preventing backflow.

Atrioventricular Valve

A valve that allows blood to flow from the atrium to the ventricle while preventing backflow of blood.

Atrium

The right and left upper chambers of the heart.

Inferior Vena Cava

A vein that delivers deoxygenated blood from the lower portion of the body to the right atrium.

Myocardium

The muscular tissue that composes the heart.

Pericardium

A fluid filled sac that surrounds the heart and provides protection and lubrication.

Pulmonary Circuit

One of the two circuits of blood flow in which the right side of the heart pumps blood low in oxygen to the lungs and returns it to the left atrium.

Pulmonary Valve

A valve that allows blood to flow from the right ventricle to the pulmonary artery while preventing backflow.

Septum

A wall of tissue that separates the right and left halves of the heart.

Superior Vena Cava

A vein that delivers deoxygenated blood from the upper portion of the body to the right atrium.

Systemic Circuit

One of the two circuits of blood flow in which the left side of the heart pumps oxygen rich blood to the body and returns it to the right atrium.

Ventricle

The right and left lower chambers of the heart.