

All About the Heart



THE OHIO STATE UNIVERSITY
WEXNER MEDICAL CENTER

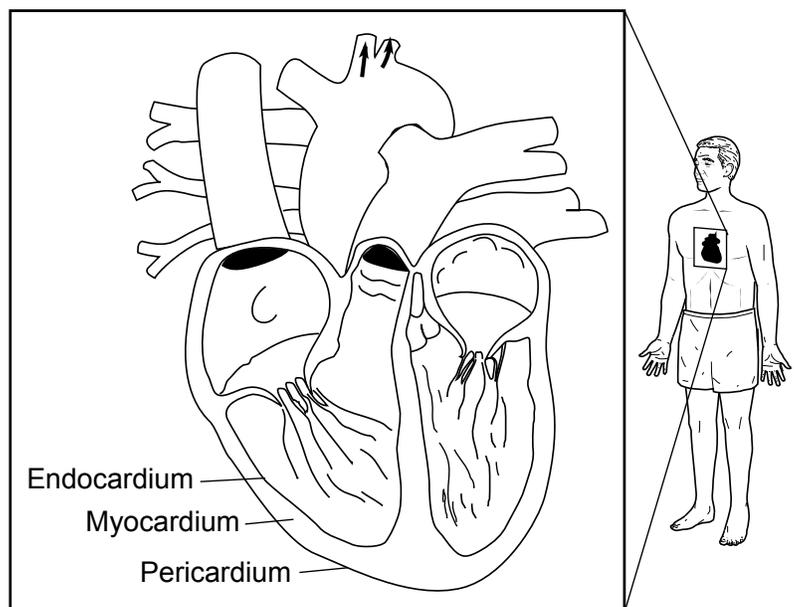
Your heart is a muscle. It is slightly larger than your fist and weighs less than a pound. It is located to the left of the middle of your chest. Your heart pumps blood to the lungs and to all parts of your body. The blood provides your body with oxygen and nutrients. It also carries away waste.

Structures of the heart

Layers

Your heart muscle has three layers:

- Myocardium: This thickest layer is also the middle layer
- Pericardium: This outside layer surrounds the myocardium
- Endocardium: This thin layer lines the inside of the myocardium

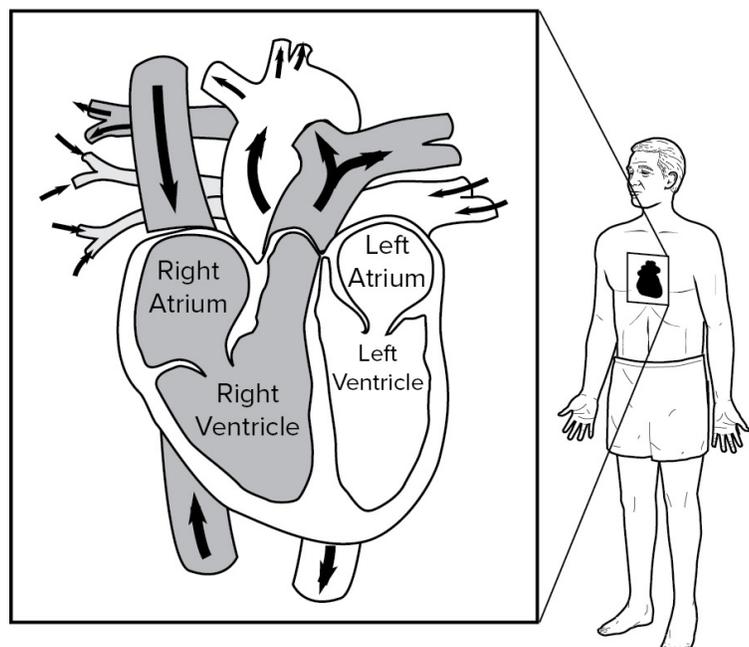


Chambers

The normal heart has four chambers.

A wall divides the heart into a right side and a left side. Each side of the heart is divided into two chambers.

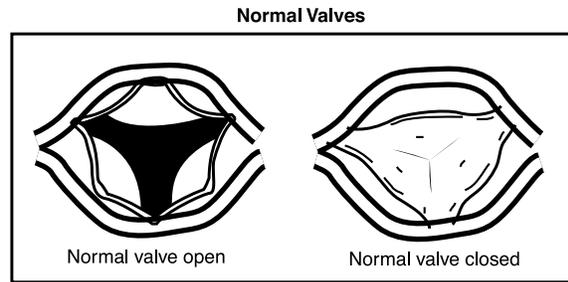
The upper chamber is called the atrium and the lower chamber is called the ventricle. These chambers are separated by valves that open and close.



Valves

The valves allow blood to flow only in one direction. Valves direct the flow of blood through the heart, to the lungs and to the rest of the body. There are four valves:

- Tricuspid: Located between the right atrium and ventricle
- Pulmonic: Located between the right ventricle and lungs
- Mitral: Located between the left atrium and ventricle
- Aortic: Located between the left ventricle and the rest of the body



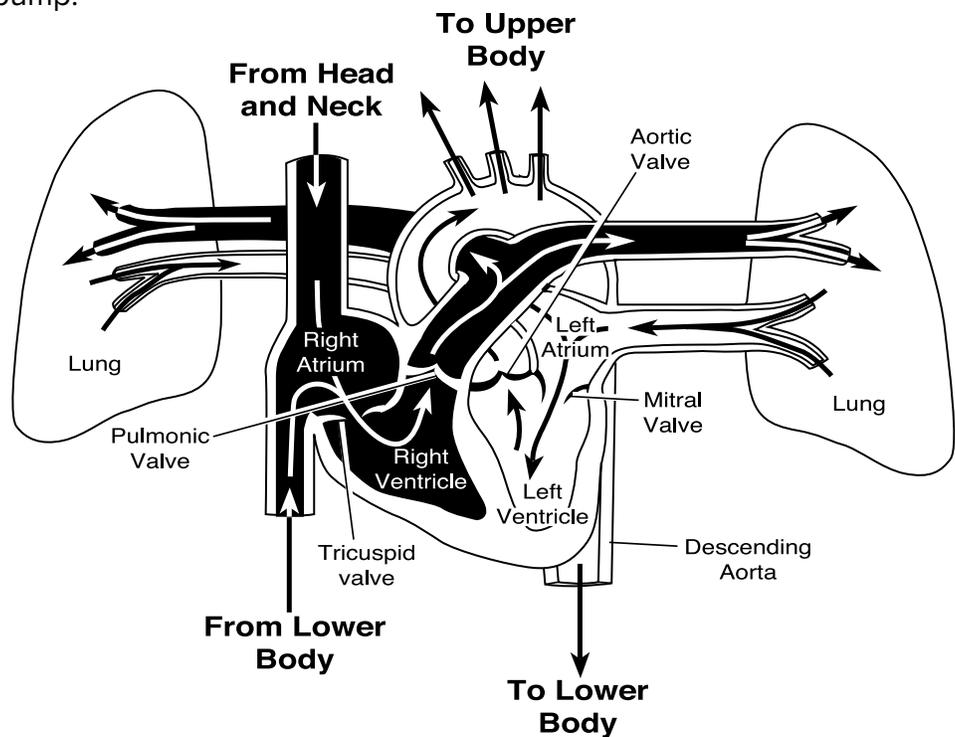
Blood vessels

Blood vessels carry blood to and away from the heart. Vessels that carry blood from the heart to the body are called **arteries**. Vessels that carry blood from the body back to the heart are called **veins**.

Blood flow through the heart

Your heart acts as a double pump:

- The right side pumps blood to your lungs, where the blood picks up oxygen and then returns it to the left side of the heart.
- The left ventricle then pumps blood out to your body through the large artery, called the aorta.
- Oxygen is removed from your blood by the cells, so it can be used by your body.
- The blood then returns to the right side of the heart through your veins.



The right side of the heart once again pumps your blood to the lungs where oxygen is picked up.

- This process occurs with each heartbeat.

Each heartbeat has two phases:

- The resting phase is called **diastole**. During diastole, blood from the atria fills the ventricles.
- Then the ventricles pump blood to your body or lungs. This pumping phase is called **systole**.

Systole and diastole are shown in your blood pressure numbers. Systole is the top number and diastole, the bottom, as in 120/80.

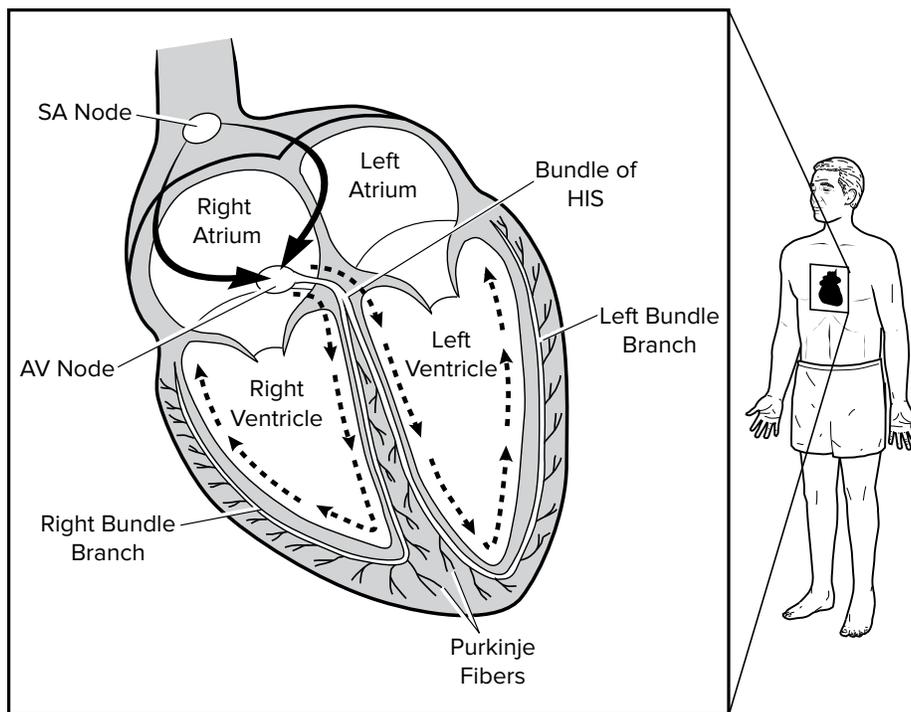
The work of the heart changes with your body's needs. For example, when you exercise, your body needs more blood and oxygen. Your heart pumps harder and faster to deliver more blood to the body. When you sleep, less blood and oxygen is needed and your heart slows down.

The heart's conduction system

Your heart has a normal conduction or electrical system that stimulates the heart muscle to beat.

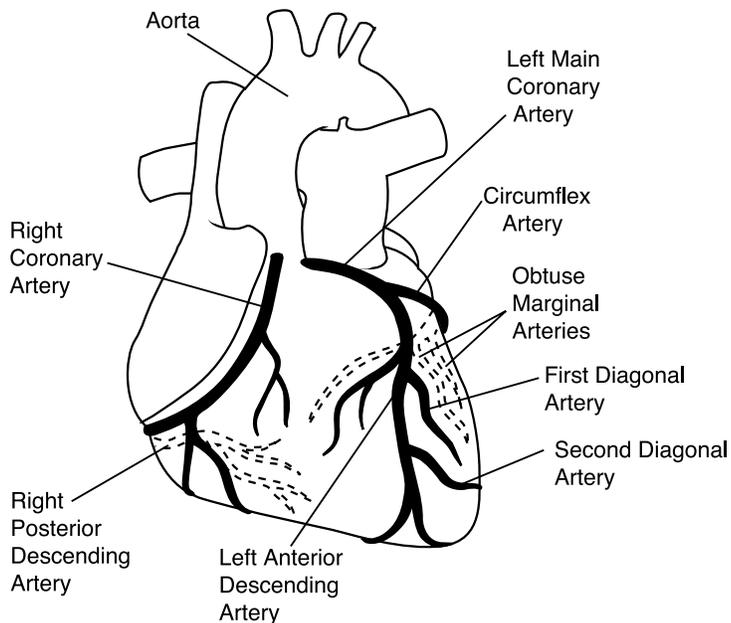
Electrical impulses travel in a normal fashion from the upper chambers to the lower chambers over this conduction system. This diagram shows how the impulse travels over the conduction system.

1. Normal heartbeats begin at the **SA node** that acts as the heart's "pacemaker." The SA node is also called the **sinus node**.
2. The electrical impulse spreads across the right and left atria.
3. The impulse travels through the **AV node** to the **Bundle of HIS**.
4. The Bundle of HIS divides into a **left and a right bundle branch**. The impulse spreads through these bundle branches into the **Purkinje** (pŭr-kin'jē) **fibers** in the ventricles.

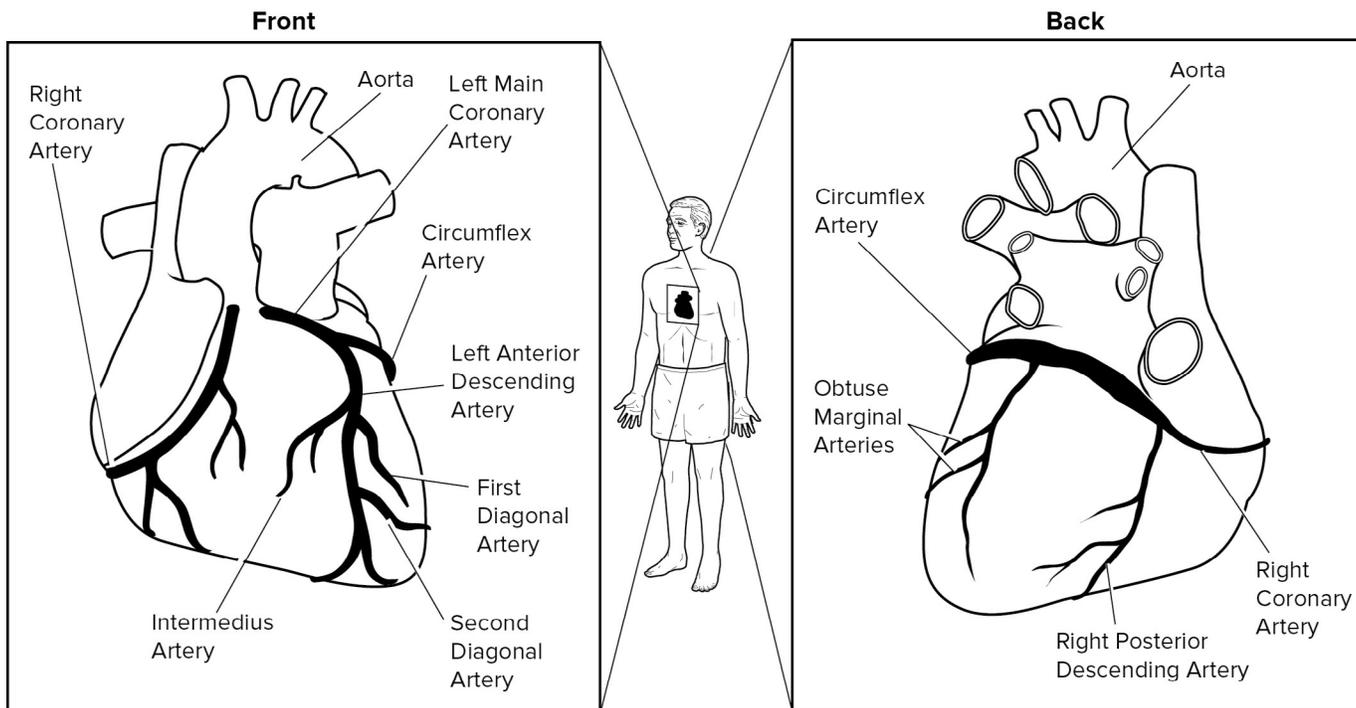


Blood supply of the heart (coronary arteries)

The heart muscle itself must receive a constant supply of oxygen. Oxygen is carried in the blood through the coronary arteries. Two main coronary arteries, a right and a left, supply the heart muscle with blood. These arteries are located on the surface of the heart. They divide into many smaller branches that go into the heart muscle. All parts of the heart muscle are supplied with oxygen-rich blood through these small arteries.



Here is how these arteries wrap around from the front to the back of the heart:



In summary

- Your heart pumps blood and oxygen to all parts of your body. With exercise and activity, your body and heart need more blood and oxygen.
- Your heart has valves that direct the flow of blood through the heart, to the lungs, and the rest of your body.
- Your heart has a normal conduction or electrical system that stimulates the heart muscle to beat.
- Your heart muscle itself must receive a constant supply of oxygen.

Talk to your doctor or health care team if you have any questions about your care.

For more health information, contact the Library for Health Information at **614-293-3707** or e-mail **health-info@osu.edu**.