

Your Heart and How It Works

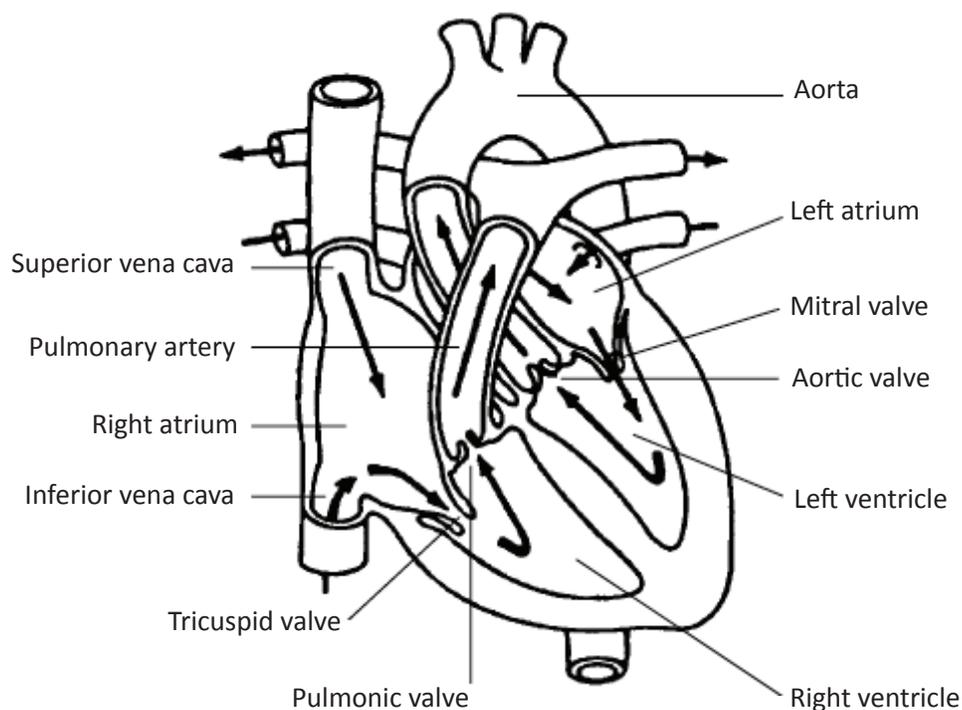
The heart

If you have questions, ask your physician or nurse.

The heart is the largest muscle in the human body. It is about the size of a closed fist. The average heart beats 100,000 times a day, pumping about 2,000 gallons of blood. The right side of the heart pumps blood to the lungs where it gets oxygen; the left side of the heart then pumps the blood out to all parts of the body.

The heart has 4 chambers that pump the blood. The 2 upper chambers are called the right atrium and left atrium. The 2 lower chambers are called the right ventricle and left ventricle. Figure 1 shows where the atria and ventricles are in the heart.

Figure 1

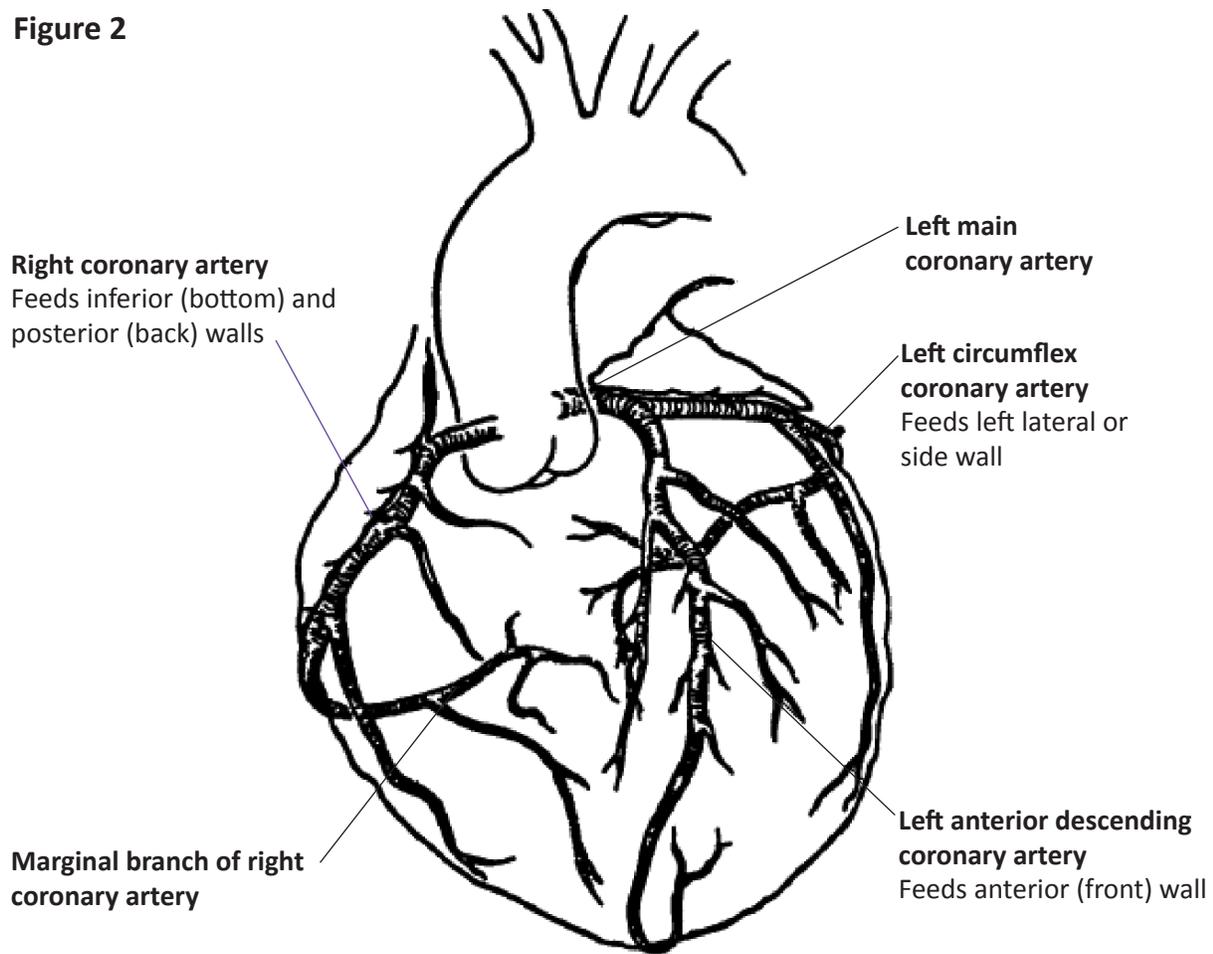


There are 4 valves in the heart that open and close with each heartbeat. This ensures the blood flows in only one direction. The mitral and tricuspid valves direct the blood from the upper chambers (atria) to the lower chambers (ventricles). The aortic and pulmonary valves then direct the blood flow from the lower chambers out to the lungs and other parts of the body. The closing of the heart valves produces the sound of the heartbeat.

Coronary arteries

The heart, like any other muscle, needs oxygen to do its work well. Oxygen is delivered to the heart via coronary arteries that lie on the surface of the heart (see Figure 2).

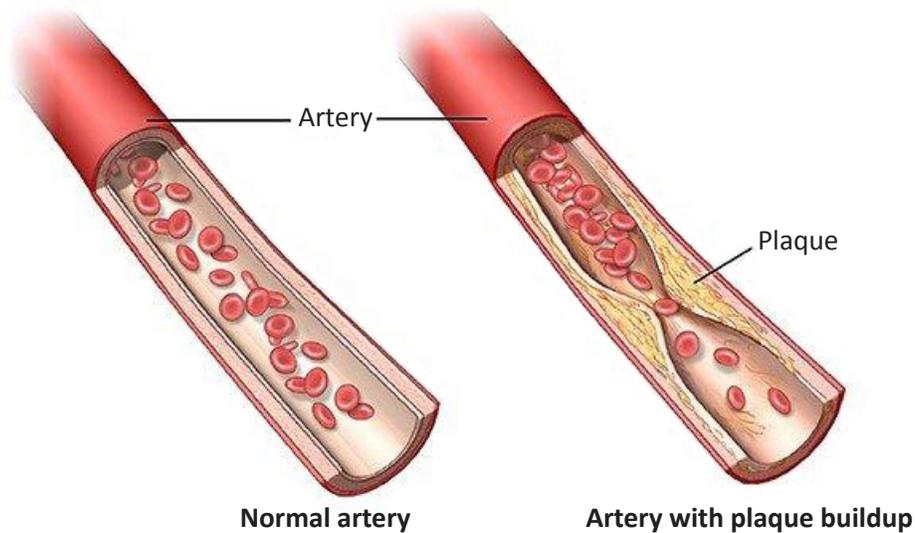
Figure 2



Coronary artery disease (CAD)

Coronary artery disease (CAD) affects the arteries of the heart. CAD occurs when the arteries become clogged with plaque. Plaque consists of fat, cholesterol and calcium that collect in the arteries. As plaque builds up, the wall of the artery becomes rough, hard and narrowed over time (see Figure 3). This is known as atherosclerosis and decreases blood flow to the heart muscle. If the blood flow is decreased, the heart muscle does not get the oxygen and nutrients it needs to function at its best. This can cause damage to the heart muscle. CAD is the leading cause of death in the United States.

Figure 3. Atherosclerosis



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Risk factors

Some common risk factors for CAD include:

- Obesity
- Smoking
- Physical inactivity
- High stress
- Unhealthy diet
- Diabetes
- High blood pressure
- Family history of CAD
- High blood cholesterol levels
- Being older than 45 (for men)
- Being post-menopausal (for women)

With the exception of family history, age and menopause, most of these risk factors can be controlled and modified with a heart-healthy lifestyle.

For more information regarding CAD risk factors, go to the American Heart Association's website at heart.org.

Symptoms

With CAD, you may have one or more of the following symptoms:

- Nausea
- Dizziness
- Sweating
- Weakness

- Shortness of breath
- Chest pain or angina
- Skipped or fast heartbeats (palpitations)

Angina

The most common symptom of CAD is a type of chest pain called angina, which occurs when the heart muscle is not getting enough oxygen and nutrients. Angina is often felt in the chest and is described as:

- A squeezing sensation
- Sharp or crushing pain
- Heaviness, fullness, aching or burning

Angina pain also may be felt in the shoulders, neck, throat, jaw or back. Angina symptoms often get worse during activity. Other symptoms of angina may include:

- Nausea
- Sweating
- Difficulty breathing
- Extreme fatigue or weakness

These symptoms are more common in women and patients with diabetes.

If untreated, angina may lead to a heart attack (myocardial infarction).

Heart attack

A heart attack is an injury to the heart muscle. Injury occurs when plaque breaks in a coronary artery. A blood clot forms around the breakage and may block the blood flow to the heart muscle. Heart muscle that no longer gets adequate blood flow can have permanent damage or tissue death known as scarring. Scarred heart tissue cannot function properly which may lead to heart failure, arrhythmias or death. If untreated, gradual buildup of plaque over time can also cause heart failure and arrhythmias.

If you have signs or symptoms of CAD, call your physician right away. Your physician will want to order tests such as an ECG, echocardiogram, exercise stress test and/or cardiac catheterization for you.

Ask your physician or nurse for more information on how to improve and maintain your health.

Northwestern Medicine – Health Information Resources

For more information, contact Northwestern Memorial Hospital's Alberto Culver Health Learning Center (HLC) at hlc@nm.org, or by calling 312.926.5465. Health information professionals can help you find the information you need and provide you with personal support at no charge.

For more information about Northwestern Medicine, please visit our website at nm.org.

Para asistencia en español, por favor llamar al Departamento de Representantes para Pacientes al 312.926.3112.

The entities that come together as Northwestern Medicine are committed to representing the communities we serve, fostering a culture of inclusion, delivering culturally competent care, providing access to treatment and programs in a nondiscriminatory manner and eliminating healthcare disparities. For questions, please call either Northwestern Memorial Hospital's Patient Representatives Department at 312.926.3112, TDD/TTY 312.926.6363 or the Northwestern Medical Group Patient Representatives Department at 312.695.1100, TDD/TTY 312.926.6363.

Developed by: NMH Cardiac Nursing and Bluhm Cardiovascular Institute