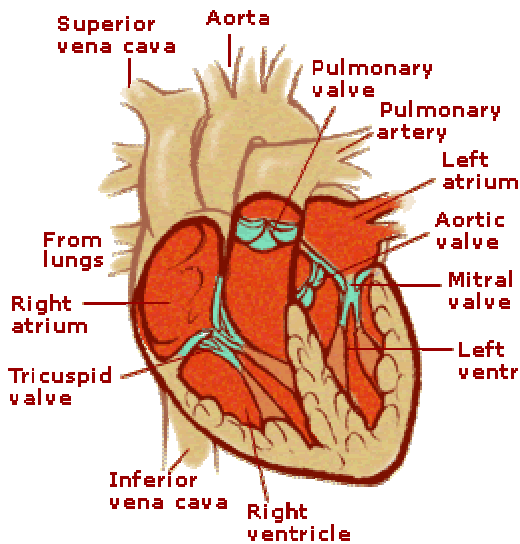


## AmeriSciences Cardio Plus – fighting the ceaseless battle against coronary artery disease

From the moment it begins beating until the moment it stops, the human heart works tirelessly. In an average lifetime, the heart beats more than two and a half billion times, without ever pausing to rest. Like a pumping machine, the heart provides the power needed for life.

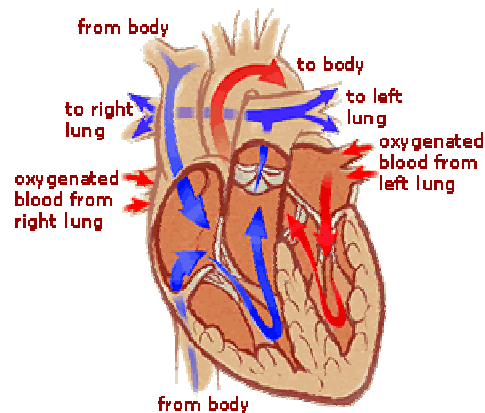
### The heart: chambers and valves



The human heart has four chambers. The upper two are called the "atria"; the lower two are called the "ventricles". The two chambers on the right pump blood to your lungs. The two chambers on the left pump blood to all the other parts of the body. The heart also has four valves, consisting of strong flaps of tissue that open and close. They are called, the "tricuspid," the "pulmonary," the "mitral" and the "aortic" valves. These valves play an important role in pumping blood throughout the body. The valves are one-way doors that allow blood to flow as the heart beats.

### The heart: flow of blood

The heart pumps oxygen and nutrient-rich blood through the aortic valve and into blood vessels that carry the blood throughout the body. After circulating and delivering oxygen to all the cells and tissues, the blood returns to the right atrium of the heart.



Then, it passes through the tricuspid valve into the right ventricle. The heart pumps the blood from the right ventricle through the pulmonary valve into blood vessels that lead into the lungs. The lungs add oxygen to the blood and remove carbon dioxide. Then the blood returns to the heart, moving from the lungs into the left atrium. From there, the

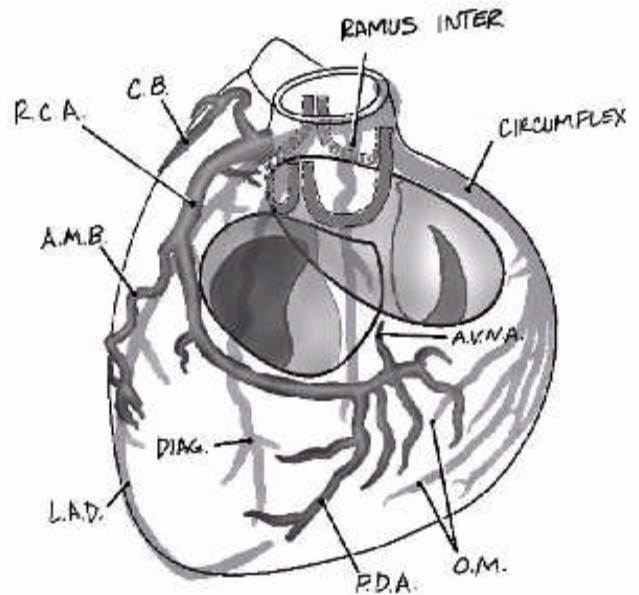
blood passes through the mitral valve into the left ventricle. Finally, the blood is pumped through the aortic valve and goes through the circuit again.

### Coronary artery disease

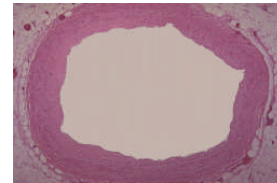
Normal coronary arteries supply blood and therefore oxygen to the heart muscle itself. There are two main divisions of the coronary artery system-

- The Right Coronary Artery
- The Left Anterior Descending Artery and Circumflex – both which branch from the Left Main Coronary Artery

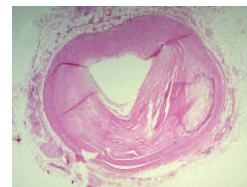
These arteries branch and follow a predictable path (in most people) to supply the entire heart muscle with blood flow.



Normal, healthy, open coronary arteries look like this:



Arteries that are diseased are narrowed and look like this:



## **The symptoms of coronary artery disease**

Angina is the main symptom of coronary artery disease. Angina is the occurrence of the following:

- Intermittent pain, pressure or discomfort in your chest
- Pain in the neck, jaw, arm or fingertips
- Feelings like dull aches, numbness, or pressure
- Feelings like heartburn, gas or indigestion

People with angina experience the discomfort during or immediately after exertion or sudden intense stress due to the demand placed on the muscle of the heart and the limited supply of blood available to the area due to Coronary Artery Disease.

Shortness of breath (difficulty in "catching air") after mild exertion may be another symptom. Weakness, fatigue, sweating, belching, nausea and irregular heartbeats are other symptoms of CAD.

25% to 30% of the people who have CAD do not experience symptoms, and many of the symptoms listed above can be caused by other conditions.

## **The causes of coronary artery disease**

Many factors increase the risk of developing coronary artery disease. They include:

- High levels of cholesterol in the blood
- Age (45 or older for males, 55 or older for women)
- Diabetes
- Menopause
- Family history of premature coronary heart disease
- Smoking
- High blood pressure (hypertension)
- High levels of homocysteine in the blood
- Sedentary lifestyle
- Obesity
- Poor stress management.

## **High homocysteine levels = higher risk of coronary heart disease**

Homocysteine formation results from the normal metabolism of protein. If there are inadequate levels of folic acid, B6 and B12 present in the blood, the metabolism of methionine is halted with the dangerous product, homocysteine.

Homocysteine is corrosive to the internal lining of all vessels. It causes a roughening of the vessel, allowing deposit of cholesterol and/or clotting components, causing a

narrowing of the vessel. The higher the level of homocysteine in the blood, the greater the risk of damage to the artery lining and the causing of plaque in the artery wall. In one study, people who had trouble breaking down homocysteine levels had thirteen times the risk of developing atherosclerosis in other major blood vessels at a young age.

High homocysteine levels can lead to the development of plaque in arteries leading to both the heart and the brain. Plaque in the heart arteries can choke off the heart's blood supply, causing a heart attack. Plaque in the brain arteries can choke off the brain's blood supply, causing a stroke.

### **Cholesterol = the good news and the bad news**

Cholesterol is a waxy substance present in blood. It is white, crystalline, odorless and tasteless. Cholesterol is an essential substance your body uses to form cell membranes, some hormones and other tissues. It enables the body to synthesize bile acids and vitamin E.

There are two dominant types of cholesterol. Because cholesterol cannot dissolve in blood, special carriers known as lipoproteins must transport it to and from the cells. Two of the types of cholesterol are known by their respective lipoproteins. Low-density lipoprotein transports "LDL cholesterol," and high-density lipoprotein transports "HDL cholesterol."

Low-density lipoprotein carries the so-called "bad" cholesterol away from the liver and throughout the bloodstream to various tissues and cells. It can deposit the cholesterol on the inner walls of your coronary arteries. These arteries bring blood and oxygen to your heart.

The cholesterol on the arterial walls can combine with other substances to form plaques. This is called atherosclerosis, or hardening of the arteries. When this happens, blood flow becomes restricted. If blood flow is completely blocked, the heart does not get the oxygen it needs and the muscle becomes permanently damaged. This is called a myocardial infarction, or heart attack. When the brain is similarly starved for oxygen, the result is a stroke.

High-density lipoprotein carries the "good" cholesterol. This cholesterol helps your body get rid of the bad cholesterol in your blood. High-density lipoproteins possibly transport excess or unused cholesterol from the tissues back to the liver, where it is broken down to bile acids and then excreted. Some experts believe HDL cholesterol removes excess LDL cholesterol from atherosclerotic plaques, thereby retarding their growth.

### **Heart attack - a true definition**

A heart attack (myocardial infarction) occurs when a coronary artery abruptly fails to deliver blood to a part of your heart. The portion of the heart's muscle (myocardium) that is deprived of oxygen will be permanently destroyed.

The heart muscle affected doesn't die all at once; rather a heart attack is a continuous process that may last from four to six hours. As time passes, without an intervention to improve blood flow, more heart muscle is deprived of oxygen and dies.

Although a part of your heart has died, the rest of your heart continues to work and pump blood throughout your body.

### **The causes of a heart attack**

Usually, a heart attack is caused when a plaque abruptly cracks or ruptures. Plaque sometimes abruptly cracks and breaks off from the arterial wall. A blood clot may then rapidly form over the disrupted plaque. This clot can completely clog the coronary artery.

Sometimes a coronary artery contracts in a spasm. This can also narrow the artery, prevent blood flow to part of the heart, and cause a heart attack.

### **Reducing the risks of coronary artery disease**

Although one cannot change their age, gender or family history, there are steps that can be taken to lower the other risks:

- Don't smoke
- Follow a diet that is low in saturated fat and cholesterol
- Take medications to control your high blood pressure and diabetes
- Achieve ideal body weight (BMI <25)
- Exercise regularly
- Employ stress avoidance/stress reduction techniques
- Take a multivitamin and antioxidant supplement

*AmeriSciences* offers a premium nutritional supplement containing a combination of antioxidants, cholesterol lowering agents and homocysteine lowering agents to help promote a healthy heart.

Our recommended nutritional solution for the fight against Coronary Heart Disease -

***AmeriSciences Cardio Plus* - formulated to provide the required nutrients to maintain a healthy heart by reducing homocysteine and cholesterol levels.**