

Atherosclerosis

This information is at http://www.nlm.nih.gov/health/dci/Diseases/Atherosclerosis/Atherosclerosis_WhatIs.html and is provided by the NHLBI, one of the Institutes of the National Institutes of Health.

To obtain a free copy of this document, go to www.masterdocs.com.

What is Atherosclerosis?

Atherosclerosis (ath-er-o-skle-RO-sis) is the hardening and narrowing of the arteries. It is caused by the slow buildup of plaque (plak) on the inside of walls of the arteries. Arteries are blood vessels that carry oxygen-rich blood from the heart to other parts of the body.

Plaque is made up of fat, cholesterol, calcium, and other substances found in your blood. As it grows, the buildup of plaque narrows the inside of the artery and, in time, may restrict blood flow. Plaque can be:

- Hard and stable, or
- Soft and unstable.

Hard plaque causes artery walls to thicken and harden. Soft plaque is more likely to break apart from the walls and enter the bloodstream. This can cause a blood clot that can partially or totally block the flow of blood in the artery. When this happens, the organ supplied by the blocked artery starves for blood and oxygen. The organ's cells may either die or suffer severe damage.

Atherosclerosis is a slow, progressive disease that may start in childhood. It can affect the arteries of the brain, heart, kidneys, and the arms and legs. As plaque builds up, it can cause serious diseases and complications. These include:

- Coronary artery disease
 - Angina
 - Heart attack
 - Sudden death
- Cerebrovascular disease
 - Stroke
 - Transient ischemic attack (TIA) or "mini strokes"
- Peripheral arterial disease

Diseases caused by atherosclerosis are the leading cause of illness and death in the U.S.

Other names for atherosclerosis:

- Hardening of the arteries

- Arteriosclerosis

What Causes Atherosclerosis?

Scientists do not know exactly how atherosclerosis begins or the exact cause. It is a slow and complex disease that may start in childhood. In some people, atherosclerosis develops faster as they grow older.

Scientists think that the buildup of plaque starts when the lining of the artery is damaged or injured. Research continues to find out:

- Why and how the arteries become damaged
- How plaque develops and changes over time
- Why plaque can break open and lead to clots.

What Makes Atherosclerosis More Likely?

While scientists do not know the exact cause, they do know that certain conditions increase your chance of developing atherosclerosis. They are called risk factors. Your chance of having atherosclerosis increases with the number of risk factors you have. You can control some risk factors and others you cannot.

Risk factors that you cannot do anything about are:

- Age. As you get older, your risk increases:
 - In men, risk increases after age 45
 - In women, risk increases after age 55.
- Family history of early heart disease. Your risk for atherosclerosis is greater if:
 - Your father or brother was diagnosed with heart disease before age 55
 - Your mother or sister was diagnosed with heart disease before age 65.

Risk factors that you can do something about include:

- High blood cholesterol
- High blood pressure
- Cigarette/tobacco smoking
- Diabetes
- Obesity
- Lack of physical activity.

What Are the Signs and Symptoms of Atherosclerosis?

Atherosclerosis usually does not cause symptoms until it:

- Severely narrows an artery, or
- Totally blocks an artery.

Symptoms you may have depend on which arteries are severely narrowed or blocked. If the arteries:

- That feed the heart (coronary arteries) are affected, you have symptoms of coronary artery disease.
- That feed your brain are affected, you have symptoms of a stroke or a TIA ("mini stroke").
- That feed your legs, pelvis, or arms are affected, you have symptoms of peripheral arterial disease.
- That feed your kidneys are affected, you have symptoms of renovascular hypertension.

How is Atherosclerosis Diagnosed?

Atherosclerosis is often diagnosed after you develop symptoms or complications. To make a diagnosis, your doctor will:

- Ask about your health history and risk factors
- Ask about your family history of atherosclerosis or its complications
- Do a physical exam
- Do certain tests to identify atherosclerosis or its complications.

The physical exam may include:

- Checking your pulses for an abnormal whooshing sound, called a bruit. A bruit can be heard with a stethoscope when placed over the affected artery.
- Checking to see if any of your pulses are weak or absent (for example, in your foot).

Tests your doctor may do include:

- Blood work to check your:
 - Cholesterol levels
 - Blood glucose (sugar) level to screen for diabetes.
- EKG or ECG (electrocardiogram) to measure the rate and regularity of your heartbeat and show evidence of a minor heart attack.
- Chest x-ray, which provides a picture of the lungs, heart, large arteries, ribs, and the diaphragm.
- Ankle/brachial index, which compares the blood pressure in your ankle with the blood pressure in your arm.
- Ultrasound, a test that uses sound waves to create a picture. The picture is more detailed than an x-ray image.
- CT scan, which provides computer-generated images of the heart, brain, or other area of interest.
- Angiography, a test that allows your doctor to look inside your arteries to see if there is any blockage and how much. A thin flexible tube is passed through an artery at the top of the leg (groin) or in the arm to reach the arteries that may be blocked. A dye that can be seen with xray is injected into the arteries. Your doctor can then see the flow of blood through your arteries.
- Exercise stress test, which shows how well your heart pumps at higher workloads when it needs more oxygen. EKG and blood pressure readings are taken before, during, and after exercise to see how your heart responds to exercise. The first EKG and blood pressure readings are done to get a baseline. Readings are then taken while you walk on an exercise treadmill, pedal a stationary bicycle, or receive medicine to make your heart beat faster. The test continues until you reach a

heart rate set by your doctor. The exercise part is stopped if chest pain or a very sharp rise in blood pressure occurs. Monitoring continues for 10 to 15 minutes after exercise or until your heart rate returns to baseline.

How Can I Prevent and Delay Atherosclerosis?

Preventing atherosclerosis starts by knowing which risk factors you have and by taking action to lower your risk. Atherosclerosis is a slow process that starts in childhood and continues as you get older.

Know your family history of health problems related to atherosclerosis. If you or someone in your family has atherosclerosis, be sure to tell your doctor. Make sure everyone in your family is getting enough exercise and maintaining a healthy body weight.

By controlling your risk factors with lifestyle changes and medications, you may prevent or slow the development of atherosclerosis.

If you have any other health conditions, it is important that you follow your doctor's directions to treat them. By staying as healthy as possible, you can lower your risk for getting atherosclerosis and prevent serious complications, like a heart attack.

How is Atherosclerosis Treated?

The goals of treatment are to reduce the symptoms and prevent the complications of atherosclerosis. Your doctor will decide which treatments are best for you after reviewing your symptoms, your risk factors, and the results of your physical exam. Treatment can include:

- Making long-lasting changes in your life
- Medications
- Special procedures and surgery.

Lifestyle Changes

Everyone will need to make certain, long-term lifestyle changes:

- Eat a healthy diet.
 - A low-saturated fat, low-cholesterol diet (TLC diet)
 - A diet lower in salt, total fat, saturated fat, and cholesterol and higher in fruits, vegetables, and low-fat dairy products (DASH diet)
- If you smoke cigarettes/tobacco, quit.
- Exercise, as directed by your doctor.
- Lose weight, if you are overweight or obese.

Medications

To help slow or reverse atherosclerosis, you may need to take medicines to:

- Lower your cholesterol as directed by your doctor
- Lower your blood pressure if you have high blood pressure
- Prevent clots from forming in your arteries and blocking blood flow (anticoagulants)
- Stop platelets from clumping together to form clots (antiplatelet medications such as aspirin).

Special Procedures and Surgery

Some people may need to have one of the following procedures to treat the complications of atherosclerosis:

- **Angioplasty.** This procedure is used to open blocked or narrowed coronary arteries. It can improve blood flow to your heart, relieve chest pain, and possibly prevent a heart attack. Sometimes a stent is placed in the artery to keep it propped open after the procedure.
- **Coronary artery bypass surgery.** This surgery uses arteries or veins from other areas in your body to bypass your diseased coronary arteries. It can improve blood flow to your heart, relieve chest pain, and possibly prevent a heart attack.
- **Carotid artery surgery.** This surgery removes plaque buildup from the carotid artery in the neck. This opens the artery and improves blood flow to the brain.
- **Bypass surgery of the leg arteries.** This surgery uses a healthy blood vessel to bypass the narrowed or blocked blood vessels. The healthy blood vessel redirects blood around the blocked artery, improving blood flow to the leg.

Summary

- Atherosclerosis is the hardening and narrowing of the arteries.
- The slow buildup of plaque on the inside of walls causes the arteries to harden and narrow.
- Plaque is made up of fat, cholesterol, calcium, and other substances found in your blood.
- Atherosclerosis is a slow, progressive disease that may start in childhood.
- Diseases caused by atherosclerosis are the leading cause of illness and death in the U.S.
- Scientists do not know exactly how atherosclerosis begins or the exact cause.
- Atherosclerosis can affect the arteries of the brain, heart, kidneys, and the arms and legs .
- Certain conditions increase your chance of developing atherosclerosis. They are called risk factors. Your chance of having atherosclerosis increases with the number of risk factors you have. You can control some risk factors and others you cannot.

- Atherosclerosis usually does not cause symptoms until it severely narrows or totally blocks an artery.
- Atherosclerosis is often diagnosed after you develop symptoms or complications.
- The goal of treatment is to slow or even reverse atherosclerosis.
- Your doctor will decide which treatment is best for you after reviewing your symptoms, your risk factors, and the results of your physical exam.
- Treatment can include making long-lasting changes in your life, taking medications, and having surgery.
- Preventing atherosclerosis starts by knowing which risk factors you have and by taking action to lower your risk.

This document is provided as a service to the public by TMT (Taylor MicroTechnology, Inc.). TMT does not provide medical advice to you. TMT does inform you of publicly available medical information. However, please realize that the possible diagnoses provided may not include the cause of your own pain, and that a reliable diagnosis can only be obtained by contacting your own health care provider. For details of the Content Disclaimer and Legal Disclaimers regarding materials provided by TMT, see www.masterdocs.com/disclaimer.htm.