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Heart Disease Health Center

What Is Atherosclerosis?

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Atherosclerosis -- hardening and narrowing of the **arteries** -- gets a lot of bad press but with good reason. This progressive process silently and slowly blocks arteries, putting **blood** flow at risk.

Atherosclerosis is the usual cause of **heart attacks**, strokes, and peripheral vascular disease -- what together are called "**cardiovascular disease**." **Cardiovascular disease** is the No. 1 killer in America, with more than 800,000 deaths in 2005.

How does atherosclerosis develop? Who gets it, and why? This deadly process is preventable and treatable. Read on, and get to know your enemy.

What Causes Atherosclerosis?

First, an Anatomy 101 review: Arteries are blood vessels that carry blood from the **heart** throughout the body. They're lined by a thin layer of cells called the endothelium. The endothelium works to keep the inside of arteries toned and smooth, which keeps blood flowing.

According to experts, atherosclerosis begins with damage to the endothelium caused by **high blood pressure**, **smoking**, or high **cholesterol**. That damage leads to the formation of plaque.

When bad **cholesterol**, or **LDL**, crosses the damaged endothelium, the **cholesterol** enters the wall of the artery. That causes your white **blood cells** to stream in to digest the **LDL**. Over years, the accumulating mess of **cholesterol** and cells becomes a plaque in the wall of the artery.

Plaque is a jumble of cholesterol, cells, and debris that creates a bump on the artery wall. As atherosclerosis progresses, that bump gets bigger. And when it gets big enough, it can create a blockage. That process goes on throughout your entire body. As a result, not only is your heart at risk but you are also at risk for **stroke** and other kinds of health problems.

Atherosclerosis usually causes no symptoms until middle or older age. But as narrowings become severe, they choke off blood flow and can [cause pain](#). Blockages can also suddenly rupture, causing blood to clot inside an artery at the site of the rupture.

Atherosclerosis and Plaque Attacks

Plaques from atherosclerosis can behave in different ways.

- They can stay within the artery wall. There, the plaque grows to a certain size and stops. Since this plaque doesn't block blood flow, it may never cause symptoms.
- Plaque can grow in a slow, controlled way into the path of blood flow. Eventually, it causes significant blockages. Pain on exertion (in the chest or legs) is the usual symptom.
- The worst-case scenario consists of plaques that suddenly rupture, allowing blood to clot inside an artery. In the [brain](#), this causes a [stroke](#); in the heart, a [heart attack](#).

The plaques of atherosclerosis cause the three main kinds of [cardiovascular disease](#):

- **Coronary artery disease:** Stable plaques in the heart's arteries cause [angina](#) ([chest pain](#) on exertion). Sudden plaque rupture and clotting causes heart muscle to die. This is a [heart attack](#), or myocardial infarction.
- **Cerebrovascular disease:** Ruptured plaques in the [brain](#)'s arteries causes strokes with the potential for permanent [brain damage](#). Temporary blockages in an artery can also cause transient ischemic attacks (TIAs), which are [warning signs of stroke](#); however, there is no [brain](#) injury.
- **Peripheral artery disease:** Narrowing in the arteries of the legs caused by plaque causes poor circulation. This causes pain on walking and poor wound healing. Severe disease may lead to amputations.

Who Gets Atherosclerosis?

It might be easier to ask, who *doesn't* get atherosclerosis?

Atherosclerosis starts early. In autopsies of young American soldiers killed in action in the Korean and Vietnam wars, half to three-quarters had early forms of atherosclerosis.

Even today, a large number of asymptomatic young people have evidence of atherosclerosis. A 2001 study of 262 apparently healthy people's hearts may surprise you:

- 52% had some atherosclerosis.
- Atherosclerosis was present in 85% of those older than 50.
- 17% of teenagers had atherosclerosis.

No one had symptoms, and very few had severe narrowings in any arteries. This was very early disease, detectable only by special tests.

If you are 40 and generally healthy, you have about a 50% chance of developing serious atherosclerosis in your lifetime. The risk goes up as you get older. The majority of adults older than 60 have some atherosclerosis but often do not have noticeable symptoms.

There is good news. Rates of death from atherosclerosis have fallen by 25% since 30 years ago. This is thanks to both better lifestyles and improved treatments.

Atherosclerosis Prevention

Atherosclerosis is progressive, but it's also preventable. For example, nine risk factors are to blame for upwards of 90% of all heart attacks:

- [Smoking](#)
- High cholesterol
- [High blood pressure](#)
- [Diabetes](#)
- Abdominal [obesity](#) ("spare tire")
- Stress
- Not eating [fruits and vegetables](#)
- Excess alcohol intake (more than one drink for women, one or two drinks for men, per day)
- Not [exercising](#) regularly

You may notice all of these have something in common: You can do something about them! Experts agree that reducing your risk factors leads to a lower risk of [cardiovascular disease](#).

For people at moderate or higher risk -- those who've had a heart attack or [stroke](#), or who suffer angina -- taking a baby [aspirin](#) a day can be important. Aspirin helps prevent clots from forming. Ask your doctor before starting daily aspirin, as it can have side effects.

Atherosclerosis Treatment

Once a blockage has developed, it's generally there to stay. With [medication](#) and lifestyle changes, though plaques may slow or stop growing. They may even shrink slightly with aggressive treatment.

- **Lifestyle changes:** Reducing the lifestyle risk factors that lead to atherosclerosis will slow or stop the process. That means a healthy diet, [exercise](#), and no [smoking](#). These lifestyle changes won't remove blockages, but they're proven to lower the risk of heart attacks and strokes.
- **Medication:** Taking drugs for high cholesterol and [high blood pressure](#) will slow and perhaps even halt the progression of atherosclerosis, as well as lower your risk of heart attacks and stroke.

Atherosclerosis Treatment continued...

Using invasive techniques, doctors can also open up blockages from atherosclerosis, or go around them:

- **Angiography and stenting:** [Cardiac catheterization](#) with angiography of the coronary arteries is the most common angiography procedure performed. Using a thin tube inserted into an artery in the leg or

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arm, doctors can access diseased arteries. Blockages are visible on a live X-ray screen. [Angioplasty](#) (catheters with balloon tips) and stenting can often open up a blocked artery. Stenting helps to reduce symptoms, although it does not prevent future heart attacks.

- **Bypass surgery:** Surgeons "harvest" a healthy blood vessel (often from the leg or chest). They use the healthy vessel to bypass a segment blocked by atherosclerosis.

These procedures involve a risk of complications. They are usually saved for people with significant symptoms or limitations caused by atherosclerosis.

WebMD Medical Reference

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