

What is atherosclerosis?

Atherosclerosis, also called hardening or blockage of the arteries, is a very common condition affecting the arteries, the thick-walled, high-pressure blood vessels that carry fresh oxygen-rich blood from the heart to the rest of the body. In atherosclerosis, a fatty substance called plaque builds up in the walls of arteries, causing thickening and loss of elasticity.

Plaque can make arteries narrower, leading to reduced or blocked blood flow. Plaques can also split open and cause blood clots to form inside the artery. These blood clots can suddenly block all blood flow through the artery, or can break off and travel through the bloodstream to block another artery elsewhere.

Atherosclerosis can affect the medium-sized and large arteries of the brain, the heart, the kidneys and the legs. A partial blockage of an artery in the heart by atherosclerosis leads to a type of chest pain called [angina](#). If that blockage becomes complete and a part of the heart muscle dies, the result is called a [heart attack](#). When atherosclerosis causes the total obstruction of an artery in the brain, the result is a [stroke](#). Atherosclerosis, then, is the underlying cause of most serious heart and circulatory problems.

How common is atherosclerosis?

In Canada, as in most developed countries, atherosclerosis is the leading cause of illness and death. Despite great medical advances, [heart attacks](#) due to coronary artery disease (atherosclerosis that affects the arteries supplying blood to the heart) and [strokes](#) (due to atherosclerosis that affects the arteries to the brain) are responsible for more deaths than all other causes combined.

According to the most recent data available, one in five deaths in Canada is due to atherosclerosis in its various forms. Heart attacks account for half of these deaths (10% of all deaths in Canada) and strokes for another third (7%).

Who is at risk for atherosclerosis?

In developed countries, atherosclerosis is almost universal. The earliest change of atherosclerosis, called a fatty streak, can be seen in the arteries of many younger people. Most people, however, can successfully reduce their risk of atherosclerosis severe enough to cause heart or other problems.

Some of the risk factors for atherosclerosis cannot be changed. Men are at higher risk, risk increases with age, and risk tends to run in families (having a parent, brother or sister with angina or a [heart attack](#) under age 50 increases your risk).

However, many of the risk factors for atherosclerosis are under your control. Smoking is one of the most important. Lack of exercise, or insufficient exercise, plays a crucial role. Diet makes a difference—too much alcohol or not enough fruits and vegetables can increase your risk of atherosclerosis. Obesity is an epidemic in our society, and contributes to many of the medical conditions that lead to atherosclerosis, such as [diabetes](#), [high blood pressure](#) and high blood [cholesterol](#) levels.

How to prevent atherosclerosis?

Remaining totally free of atherosclerosis is impossible for anyone over the age of 50. However, there is a great deal that you can do to reduce the risk of significant atherosclerosis, with all of the consequences that follow from it.

For most people, lifestyle choices contribute strongly to the development—or reduction—of atherosclerosis. One of the most important single factors is stopping smoking. This is a difficult task for most smokers, but can give immediate and long-lasting benefits. Stopping smoking reduces the risk of atherosclerosis, but also reduces the risk of lung and other cancers, emphysema, and many other serious illnesses. If you are thinking of stopping smoking, talk to your doctor or consult supportive websites such as the one at [Health Canada](#).

Losing weight is appropriate for most people at risk for atherosclerosis. The two key factors in losing weight are to increase activity and to eat appropriately. A minimum of 30 minutes of moderate activity, at least three times a week, is necessary for weight loss and for heart health—get some tips from [Canada's Physical Activity Guide](#). If you have been inactive for a period of time, check in with your physician before starting an exercise program. Appropriate eating habits for most people who are overweight involve eating less of everything, especially high-fat foods and sweets. [Canada's Food Guide](#) is a useful resource.

The other crucial part of avoiding atherosclerosis involves your doctor's help. Having regular preventive health checkups will allow a chance to diagnose problems such as [diabetes](#), [high blood pressure](#), and high levels of [cholesterol](#) in your blood. Treatment of all of these problems, with lifestyle changes and appropriate medication if necessary, is proven to reduce the risk of serious consequences such as [heart attack](#) or [stroke](#). In the prevention of atherosclerosis, the use of cholesterol-lowering medication referred to as “statins”, for individuals with LDL-cholesterol levels above target, has been shown to be safe, and effective at reducing deaths or hospital admissions due to heart attack.

What are the signs and symptoms?

Sometimes the first symptom of atherosclerosis is a [heart attack](#) or [stroke](#). Symptoms of atherosclerosis depend on where the affected artery is located and whether it has gradually become narrowed or suddenly blocked. Sudden blockage can cause a heart attack (if the arteries supplying blood to the heart muscle are blocked), a stroke (if the arteries supplying blood to the brain are blocked) or gangrene of a toe, foot or leg (if the arteries supplying blood to the leg are blocked).

If the artery is narrowed rather than blocked, atherosclerosis usually doesn't cause symptoms until the inside of the artery has been narrowed by more than 70%. In this case, the first symptom is often pain or cramps whenever the blood flow can't keep up with the muscles' need for oxygen. This can cause chest pain ([angina](#)) while exercising if the heart muscle is affected, or leg pain while walking if the leg muscles are affected.

How is the disease diagnosed?

A person with symptoms that suggest a blocked artery may have tests done to discover the location and severity of the artery blockage. For example:

- An angiogram is an x-ray study in which dye is used to detect a blockage or other problem in the arteries supplying blood to the heart. It may be used in patients with chest pain or suspected blockage of the arteries feeding the heart.

- An exercise electrocardiogram (ECG) or “stress test” measures your heart’s electrical activity, blood pressure and heart rate while you exercise, usually by walking on a treadmill. It is usually done to determine the cause of unexplained chest pain, especially if atherosclerosis of the arteries supplying the heart is suspected.

In anyone with symptoms possibly caused by atherosclerosis, doctors will also test blood pressure, blood sugar and blood [cholesterol](#) levels to look for risk factors that may have contributed to the problem. These tests are also usually done as part of an annual physical exam in adults.

How is atherosclerosis treated?

If atherosclerosis becomes severe enough to cause complications (such as [angina](#), [heart attack](#), heart failure, [stroke](#), kidney failure, leg cramps or gangrene), these complications must be treated directly. In addition, however, treatment is usually recommended for the risk factors that have been making the atherosclerosis worse.

Lifestyle changes (see “How to avoid atherosclerosis” above) are a good idea both for those who have already had a complication of atherosclerosis and for those at risk of such a complication. Stopping smoking, losing weight, eating a better diet and exercising more can all slow down the development of atherosclerosis and/or reduce the risk of a heart attack or stroke.

People with atherosclerosis also may benefit from taking certain drugs. Someone who has already had a heart attack is often prescribed a beta-blocker, because these drugs reduce the risk of death by about 25%, although they don’t work in everybody. Low-dose aspirin (such as one baby aspirin or half of an adult aspirin daily) can help prevent blood clots and reduces the risk of a heart attack or stroke in people at particularly high risk. Cholesterol-lowering drugs such as statins can also reduce these risks, even in people who have normal [cholesterol](#) levels.

Living with atherosclerosis

[The Healthy Heart Kit](#)

[Click here](#) to download an emergency wallet card outlining the warning signs and signals of a [stroke](#) or a [heart attack](#), and what actions to take.

Subscribe to the Heart and Stroke Foundation’s [He@lthline](#) to get monthly newsletters containing heart-healthy recipes and tips for lifestyle changes.

[Canada’s Food Guide](#)

[Canada’s Physical Activity Guide](#)



Resources

Patient association

[Heart and Stroke Foundation of Canada](#)

Other sites

[Heart and Stroke Foundation of Canada](#)

[Healthy Heart Society \(in British Columbia\)](#)

[Making the Connection](#)

[Public Health Agency of Canada](#)