

Carotid Artery Disease



What is carotid artery disease?

The carotid arteries are the main blood vessels that send blood and oxygen to the brain. It's called carotid artery disease when these vessels become narrowed. It may also be called carotid artery stenosis. The narrowing is caused by atherosclerosis. This is the buildup of fatty deposits, calcium, fibrous tissue and other cell debris that lines the inside of the artery. Carotid artery disease is like coronary artery disease. In that disease, buildup occurs in the arteries of the heart. That may cause a heart attack.

Carotid artery disease reduces the flow of oxygen to the brain. The brain needs a constant supply of oxygen to work. Even a brief pause in blood supply can cause problems. Brain cells start to die after just a few minutes without blood or oxygen. A stroke can result if the narrowing of the carotid arteries is severe enough that blood flow is blocked. It can block blood flow to the brain if a piece of plaque breaks off. This too can cause a stroke.

What causes carotid artery disease?

Atherosclerosis causes most carotid artery disease. In this condition, fatty deposits, calcium, fibrous tissue, and other cell debris build up along the lining of the arteries. This is called plaque. The plaque narrows the insides of the arteries. This decreases blood flow. Or fully blocks the flow of blood to the brain.

Who is at risk for carotid artery disease?

Risk factors linked with atherosclerosis include:

- Older age
- Male
- Family history
- Race
- Genetic factors
- High cholesterol
- High blood pressure
- Smoking
- Diabetes
- Overweight
- Diet high in saturated fat
- Lack of exercise

These factors increase a person's risk. But they don't always cause the disease. Knowing your risk factors can help you make lifestyle changes. You can work with your healthcare provider to reduce the chance you will get the disease.

What are the symptoms of carotid artery disease?

The disease may have no symptoms. In some cases, the first sign of the disease is a transient ischemic attack (TIA) or stroke.

A TIA is a sudden, short-term loss of blood flow to a part of the brain. It usually lasts a few minutes to an hour. Symptoms go away fully within 24 hours. There are no lasting effects. When symptoms continue, it is a stroke.

Symptoms of a TIA or stroke may include:

- Sudden weakness or clumsiness of an arm or leg on one side of the body
- Sudden paralysis of an arm or leg on one side of the body
- Loss of coordination or movement
- Confusion, loss of ability to concentrate
- Dizziness, fainting, or headache
- Numbness or loss of feeling in the face or in an arm or leg
- Temporary loss of vision or blurred vision
- Inability to speak clearly or slurred speech

If you or a loved one has any of these symptoms, call for medical help right away. A TIA may be a warning sign that a stroke is about to occur. But TIAs don't happen before all strokes.

The symptoms of a TIA and stroke are the same. A stroke is loss of blood flow (ischemia) to the brain that lasts long enough to cause brain damage. Brain cells start to die after just a few minutes without oxygen.

The effects after a stroke depends on the size and place in the brain that had loss of blood flow. This may include problems with:

- Moving
- Speaking
- Thinking
- Remembering
- Bowel and bladder function
- Eating
- Emotional control
- Other vital body functions

Recovery also depends on the size and place of the stroke. A stroke may result in long-term problems, such as weakness in an arm or leg. It may cause paralysis, loss of speech, or even death.

The symptoms of carotid artery disease may look like other health problems. See your healthcare provider for a diagnosis.

How is carotid artery disease diagnosed?

Your healthcare provider will ask about your health history. They will do a physical exam. You will need tests. These may include:

- **Listening to the carotid arteries.** For this test, your healthcare provider places a stethoscope over the carotid artery. This is done to listen for a sound called a bruit (BREW-ee). This sound is made when blood passes through a narrowed artery. A bruit can be a sign of atherosclerosis. But an artery may be diseased and not make this sound.
- **Carotid artery duplex scan.** This test is done to assess the blood flow of the carotid arteries. A probe called a transducer sends out ultrasonic sound waves. The transducer is also like a microphone. It is placed on the carotid arteries at certain locations and angles. The sound waves move through the skin and other body tissues to the blood vessels. The sound waves echo off the blood cells. The transducer

sends the waves to an amplifier. Your healthcare provider can hear the sound waves. Not enough or no sounds may mean blood flow is blocked.

- **MRI.** This test uses large magnets, radio waves, and a computer to make detailed images of tissues in the body. X-rays are not used. For this test, you lie inside a big tube while magnets pass around your body. It's very loud.
- **MR angiography.** This test uses MRI technology and IV contrast dye to make the blood vessels visible. Contrast dye causes blood vessels to show up well on the MRI image. This is so the healthcare provider can see them.
- **CT angiography (CTA).** This test uses X-rays and a computer along with contrast dye to make detailed images of the body. A CTA shows pictures of blood vessels and tissues. It helps find narrowed blood vessels.
- **Angiography.** This test is used to see how blocked the carotid arteries are. It is done by taking X-ray images while a contrast dye is injected. The contrast dye shows the shape and flow of blood through the arteries. X-ray images are made at the same time.

How is carotid artery disease treated?

Treatment will depend on your symptoms, age, and general health. It will also depend on how severe the condition is.

If a carotid artery is less than half narrowed, it is often treated with medicine and lifestyle changes. If the artery is between 50% and 70% narrowed, medicine or surgery may be done.

Medical treatment may include the information below:

Lifestyle changes

- **Quitting smoking.** This can reduce the risk for carotid artery disease and cardiovascular disease. All nicotine products narrow the blood vessels. This includes electronic cigarettes. This decreases blood flow through the arteries.
- **Lowering cholesterol.** Eat a low-fat, low-cholesterol diet. Eat plenty of vegetables, lean meats (no red meats), fruits, and high-fiber grains. Don't eat processed foods, or foods high in saturated and trans-fats. When diet and exercise are not enough to control cholesterol, you may need medicines.
- **Lowering blood sugar.** High blood sugar (glucose) can cause damage to the lining of the carotid arteries. Control glucose levels through a low-sugar diet, and regular exercise. If you have diabetes, you may need medicine or other treatment.
- **Exercising.** Lack of exercise can cause weight gain. It can raise blood pressure and cholesterol. Exercise can help you keep a healthy weight and reduce risks for carotid artery disease.
- **Lowering blood pressure.** High blood pressure causes wear and tear and inflammation in blood vessels. This raises the risk for artery narrowing. Blood pressure should be below 140/90 mm/Hg for most people. People with diabetes may need even lower blood pressure.

Medicines

Medicines that may be used include:

- **Antiplatelets.** These medicines make platelets in the blood less able to stick together and cause clots. These medicines include aspirin, clopidogrel, and dipyridamole.
- **Cholesterol medicines.** Statins are a type of medicines that lower cholesterol. They include simvastatin and atorvastatin. Studies have shown that some statins can decrease the thickness of the carotid artery wall. This can increase the size of the opening of the artery.

- **Blood pressure medicines.** Several types of medicines work to lower blood pressure.

You may need stronger treatment, especially if you have symptoms, if a carotid artery is narrowed from 50% to 70%.

Surgery is usually advised for carotid narrowing of more than 70%. Surgery lowers the risk for stroke after symptoms. These include TIA or minor stroke.

Types of surgery include:

- **Carotid endarterectomy (CEA).** This is surgery to remove plaque and blood clots from the carotid arteries. CEA may help prevent a stroke in people who have symptoms and a narrowing of 70% or more.
- **Carotid artery angioplasty with stenting.** This is a choice for people who are unable to have CEA. It uses a very small tube (catheter). This tube is put into a blood vessel in the groin. It is pushed up to the carotid arteries. Once the tube is in place, a small balloon is inflated at the tip of it. This opens the artery. Then a stent is put in place. A stent is a thin, metal-mesh tube. It is used to hold the artery open.

What are possible complications of carotid artery disease?

The main complication is a stroke. A stroke can cause serious disability. It may even cause death.

Can carotid artery disease be prevented?

You can prevent or delay the disease like you would prevent heart disease. This includes:

- **Diet changes.** Eat a healthy diet. It should include plenty of fresh fruits and vegetables. Eat lean meats, such as poultry and fish. Eat low-fat or nonfat dairy foods. Limit your intake of salt, sugar, processed foods, saturated fats, and alcohol.
- **Exercise.** Aim for 30 minutes of moderate to vigorous physical activity 5 days per week, or as directed by your healthcare provider. Start with exercise blocks of 5 to 10 minutes if 30 straight minutes is too much for you. Any movement is better than none. Exercises that strengthen muscles should be done 2 days per week. Examples of these are resistance bands or weights.
- **Manage your weight.** If you are overweight, take steps to lose weight. Ask your healthcare provider for help if you're not sure how to start.
- **Quit smoking.** If you smoke, break the habit. Enroll in a program to help you stop smoking. This can improve your chances of success. Ask your healthcare provider about prescription medicine.
- **Control stress.** Learn ways to manage stress in your home and work life.

When should I call my healthcare provider?

Learn the symptoms of stroke. Have your family members also learn them. If you think you are having symptoms of a stroke, call 911 right away.

Key points about carotid artery disease

- Carotid artery disease is when plaque builds up and causes narrowing of the carotid arteries. These arteries send oxygen-rich blood from the heart to the brain.
- Narrowing of the carotid arteries can cause a stroke. Symptoms of a stroke should be treated right away.
- Eating a healthy diet is one way to reduce the risk of carotid artery disease. Exercise, quitting smoking, blood pressure control, and medicine can also help.
- Opening the carotid arteries can be done with surgery. Or with angioplasty and a stent.
- Carotid artery disease can be prevented or delayed through healthy lifestyle practices

- Carotid artery disease may not have symptoms. See your healthcare provider for screening and diagnosis if you have important risk factors.

Next steps

Tips to help you get the most from a visit to your healthcare provider:

- Know the reason for your visit and what you want to happen.
- Before your visit, write down questions you want answered.
- Bring someone with you to help you ask questions and remember what your provider tells you.
- At the visit, write down the name of a new diagnosis, and any new medicines, treatments, or tests. Also write down any new instructions your provider gives you.
- Know why a new medicine or treatment is prescribed, and how it will help you. Also know what the side effects are.
- Ask if your condition can be treated in other ways.
- Know why a test or procedure is recommended and what the results could mean.
- Know what to expect if you do not take the medicine or have the test or procedure.
- If you have a follow-up appointment, write down the date, time, and purpose for that visit.
- Know how you can contact your healthcare provider if you have questions, especially after office hours or on weekends.

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