



Diseases and Conditions

Carotid artery disease

By Mayo Clinic Staff

Carotid artery disease occurs when fatty deposits (plaques) clog the blood vessels that deliver blood to your brain and head (carotid arteries). The blockage increases your risk of stroke, a medical emergency that occurs when the blood supply to the brain is interrupted or seriously reduced.

Stroke deprives your brain of oxygen. Within minutes, brain cells begin to die. Stroke is the fourth most common cause of death and the leading cause of permanent disability in the U.S.

Carotid artery disease develops slowly. The first sign that you have the condition may be a stroke or transient ischemic attack (TIA). TIA is a temporary shortage of blood flow to your brain.

Treatment of carotid artery disease usually involves a combination of lifestyle changes, medication and sometimes surgery.

In its early stages, carotid artery disease often doesn't produce any signs or symptoms. The condition may go unnoticed until it's serious enough to deprive your brain of blood, causing a stroke or TIA.

Signs and symptoms of a stroke or TIA include:

- **Sudden numbness or weakness** in the face or limbs, often on only one side of the body
- **Sudden trouble speaking** and understanding
- **Sudden trouble seeing** in one or both eyes
- **Sudden dizziness** or loss of balance
- **Sudden, severe headache** with no known cause

When to see a doctor

Seek emergency care if you experience any signs or symptoms of stroke. Even if they last only a short while and then you feel normal, see a doctor right away. You may have experienced TIA,

an important sign that you're at risk of a full-blown stroke.

Talk to your doctor if you have risk factors for carotid artery disease. Even if you don't have any signs or symptoms, your doctor may recommend aggressive management of your risk factors to protect you from stroke. Seeing a doctor early increases your chances that carotid artery disease will be found and treated before a disabling stroke occurs.

Carotid artery disease is caused by a buildup of plaques in arteries that deliver blood to your brain. Plaques are clumps of cholesterol, calcium, fibrous tissue and other cellular debris that gather at microscopic injury sites within the artery. This process is called atherosclerosis.

Carotid arteries that are clogged with plaques are stiff and narrow. Clogged carotid arteries have trouble delivering oxygen and nutrients to vital brain structures that are responsible for your day-to-day functioning.

Factors that increase your risk of carotid artery disease include:

- **High blood pressure.** Excess pressure on artery walls can weaken them and make them more vulnerable to damage.
- **Tobacco use.** Nicotine can irritate the inner lining of your arteries. Smoking also increases your heart rate and blood pressure.
- **Diabetes.** Diabetes lowers your ability to process fats efficiently, placing you at greater risk of high blood pressure and atherosclerosis.
- **High blood-fat levels.** High levels of low-density lipoprotein cholesterol and high levels of triglycerides, a blood fat, encourage the accumulation of plaques.
- **Family history.** Your risk of carotid artery disease is higher if a relative has atherosclerosis or coronary artery disease.
- **Age.** Arteries become less flexible and more prone to injury with age.
- **Obesity.** Excess weight increases your chances of high blood pressure, atherosclerosis and diabetes.
- **Sleep apnea.** Spells of stopping breathing at night may increase your risk of stroke.
- **Lack of exercise.** It contributes to conditions that damage your arteries, including high blood pressure, diabetes and obesity.

Carotid artery disease causes about 10 to 20 percent of strokes. Stroke is a medical emergency that can leave you with permanent brain damage and muscle weakness. In severe cases, stroke can be fatal.

Carotid artery disease can lead to stroke through:

- **Reduced blood flow.** A carotid artery may become so narrowed by atherosclerosis that not enough blood is able to reach portions of your brain.

- **Ruptured plaques.** A piece of a plaque may break off and flow to smaller arteries in your brain. The plaque fragment may get stuck in one of these smaller arteries, creating a blockage that cuts off blood supply to part of your brain.
- **Blood clot blockage.** Some plaques are prone to cracking and forming irregular surfaces on the artery wall. Your body reacts as if to an injury and sends blood cells that help the clotting process to the area. The result can be a large clot that blocks or slows blood flow to the brain, causing a stroke.

You may be referred to a doctor who specializes in disorders of the brain and nervous system (neurologist).

What you can do

- **Write down your symptoms,** including any that may seem unrelated to the reason why you scheduled the appointment.
- **Make a list of all your medications,** vitamins and supplements.
- **Write down your key medical information,** including other conditions.
- **Write down key personal information,** including any recent changes or stressors in your life.
- **Write down questions to ask** your doctor.
- **Ask a relative or friend to accompany you,** to help you remember what the doctor says.

Questions to ask your doctor

- What's the most likely cause of my symptoms?
- What kinds of tests do I need?
- What kinds of treatments do I need?
- Should I make any lifestyle changes?

In addition to the questions that you've prepared to ask your doctor, don't hesitate to ask other questions during your appointment.

What to expect from your doctor

Your doctor is likely to ask you a number of questions. Being ready to answer them may make time to go over points you want to spend more time on. You may be asked:

- Have you had any stroke-like symptoms, such as weakness on one side of your body, trouble speaking or sudden vision problems?
- When did you first begin experiencing symptoms? How long did they last?
- Do you smoke?

- How much alcohol do you drink?
- Do you exercise regularly?
- What do you eat in a typical day?
- Do you have a family history of heart disease or stroke?
- Do you have symptoms of sleep apnea?
- Have you been diagnosed with any other medical conditions?

Your doctor is likely to start with a thorough medical history and physical examination. The exam generally includes listening for a swooshing sound (bruit) over the carotid artery in your neck, a sound that's characteristic of a narrowed artery. Your doctor may then test your physical and mental capabilities such as strength, memory and speech.

After that, your doctor may recommend:

- **Ultrasound**, to assess blood flow and pressure in the carotid arteries.
- **CT or MRI**, to look for evidence of stroke or other abnormalities.
- **CT angiography or MR angiography**, which provides additional images of blood flow in the carotid arteries. A contrast dye is injected into a blood vessel, and a CT scan or MRI gathers images of your neck and brain.

The goal in treating carotid artery disease is to prevent stroke. Specific treatments depend on the extent of blockage in your carotid arteries.

If blockage is mild to moderate, your doctor may recommend:

- **Lifestyle changes** to slow the progression of atherosclerosis. Recommendations may include quitting smoking, losing weight, eating healthy foods, reducing salt and exercising regularly.
- **Medication** to control blood pressure or lower cholesterol. Your doctor may also recommend taking a daily aspirin or other blood-thinning medication to prevent blood clots.

If blockage is severe, or if you've already had a TIA or stroke, your doctor may recommend removing the blockage from the artery. The options include:

- **Carotid endarterectomy**, the most common treatment for severe carotid artery disease. After making an incision along the front of your neck, the surgeon opens the affected carotid artery and removes the plaques. The artery is repaired with either stitches or a graft.
- **Carotid angioplasty and stenting**, if the blockage is too difficult to reach with carotid endarterectomy or you have other health conditions that make surgery too risky. You are given local anesthesia and a tiny balloon is threaded by catheter to the area of the clog. The balloon is inflated to widen the artery, and a small wire mesh coil (stent) is inserted to keep the artery from narrowing again.

To prevent or slow the progression of carotid artery disease, consider these suggestions:

- **Don't smoke.** Within a few years of quitting, a former smoker's risk of stroke is similar to a nonsmoker's.
- **Maintain a healthy weight.** Being overweight contributes to other risk factors, such as high blood pressure, cardiovascular disease, diabetes and sleep apnea.
- **Limit cholesterol and fat.** Cutting back on saturated fat, in particular, may reduce buildup of plaques in your arteries.
- **Eat a variety of fruits and vegetables.** They contain nutrients such as potassium, folate and antioxidants, which may protect against a TIA or stroke.
- **Limit salt.** Excess salt may increase blood pressure in people who are sensitive to sodium. Experts recommend that healthy adults eat less than 1,500 milligrams of sodium a day.
- **Exercise regularly.** Exercise can lower your blood pressure, increase your level of high-density lipoprotein (HDL) cholesterol — the "good" cholesterol — and improve the overall health of your blood vessels and heart. It also helps you lose weight, control diabetes and reduce stress.
- **Limit alcohol.**
- **Control chronic conditions.** Managing conditions such as diabetes and high blood pressure helps protect your arteries.

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July 19, 2014

Original article: <http://www.mayoclinic.org/diseases-conditions/carotid-artery-disease/basics/symptoms/con-20030206>