



What are the carotid arteries?

The carotid arteries are the blood vessels that carry oxygen-rich blood away from the heart to the head and brain. Located on each side of the neck, these arteries can easily be felt pulsating by placing your fingers gently on either side of your windpipe. The carotid arteries are essential as they supply blood to the large front part of the brain. This is the brain tissue where thinking, speech, personality and sensory (our ability to feel) and motor (our ability to move) functions reside.

Another smaller set of arteries, the vertebral arteries, are located along the back of the neck adjacent to the spine, and supply blood to the back of the brain.

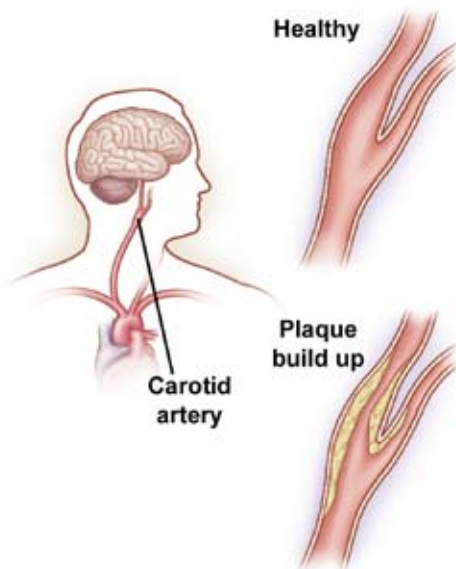


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What is carotid artery disease?

Carotid artery disease is defined by the narrowing or blockage of this artery due to plaque build-up. The process that blocks these arteries (atherosclerosis) is basically the same as that which causes both coronary artery disease and that causes peripheral arterial disease (PAD). The slow build-up of plaque (which is a deposit of cholesterol, calcium, and other cells in the artery wall) is caused by high blood pressure, diabetes, tobacco use, high blood cholesterol, and other modifiable risk factors.

Over time, this narrowing may eventually become so severe that a blockage decreases blood flow to the brain and may tragically cause a stroke. A stroke can also occur if a piece of plaque or a blood clot breaks off from the wall of the carotid artery and travels to the smaller arteries of the brain.

The brain survives on a continuous supply of oxygen and glucose carried to it by blood. Cells deprived of fresh blood for more than a few minutes will be damaged, a condition known as “ischemia,” or the brain cells may die, a condition known as “infarction”. When blood flow to the brain is blocked, the result is sometimes called “an ischemic event.” This could be a stroke, which is permanent loss of brain function, or a “transient ischemic attack” (or TIA), which implies a temporary alteration of brain function. Brain damage can be permanent if this lack of blood flow lasts for more than 3 to 6 hours.

Stroke can also occur from other causes than carotid artery disease, for example from heart disease (heart valve problems, heart failure, or atrial fibrillation) or if bleeding occurs in brain tissue. Nevertheless, carotid artery disease is one of the most common causes of stroke. According to the National Stroke Council, more than half of the strokes in the United States occur because of carotid artery disease.

What are the symptoms of carotid artery disease?

As for all artery diseases, there are usually no advanced warning signs for early forms of carotid artery disease. For many individuals, the first obvious sign often is a TIA or mini-stroke. Symptoms for a stroke or TIA are similar and may include blurring, dimming, or loss of vision; tingling around the mouth, difficulty with speech, the inability to normally move an arm or leg, the inability to feel (numbness) in a part of the body, and rarely, a sudden severe headache. The difference between a stroke and

a TIA is that the symptoms of a TIA are not permanent and can last from a few minutes to 24 hours. A TIA is a very powerful warning sign; although the symptoms may resolve completely, the occurrence of a TIA offers an individual who is at risk of a permanent stroke an extra opportunity to take action. However, a TIA should still be treated as a medical emergency. If you think you are experiencing a stroke or TIA, get medical attention immediately!

What are the risk factors for carotid artery disease?

Carotid artery disease is part of the arterial circulatory system and has similar risk factors as PAD and coronary heart disease:

- Family history of atherosclerosis (build-up of plaque in the peripheral, coronary or carotid arteries)
- Age (Men have a higher risk before age 75, women have a higher risk after age 75)
- Smoking
- Hypertension
- Diabetes
- High cholesterol, and especially high amounts of “low density lipoprotein” (or LDL, the bad form of cholesterol)—although this risk factor appears to be less strong for stroke than it is for coronary artery disease

Most importantly, if you have an atherosclerotic artery disease such as PAD or coronary heart disease, you are at high risk for carotid artery disease and stroke.

How is carotid artery disease diagnosed?

The diagnosis of carotid artery disease is usually based on the performance of an ultrasound study of the neck arteries (a carotid artery duplex scan). Alternatively, the artery can be visualized by a magnetic resonance angiogram (MRA) or standard angiogram.

Prevention of carotid artery disease

Take care of your health through exercise and proper nutrition and take all medications as your doctor prescribes. If you have risk factors for carotid artery disease you should talk with your health care professional. If you have any symptoms, never hesitate or delay to seek help. Minutes are critical. It's up to you to do all you can to reduce your risk. No surprise — prevention is the best medicine!

How is carotid artery disease treated?

Treatment for carotid artery disease normally consists of normalization of those risk factors that cause artery blockages, specific medications (usually antiplatelet medications), and sometimes treatment to open the narrowed carotid artery with an angioplasty and stent, or by a surgical procedure. Anyone with any degree of narrowing of a carotid artery, or with any history of stroke or TIA, should quit the use of all tobacco products immediately, control their high blood pressure, normalize their blood cholesterol by diet and medications, and exercise regularly.

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Treatment, continued...

Doctors also will want to reduce your risk for developing blood clots in order to prevent stroke or heart attack. Your doctor may prescribe a daily antiplatelet medication, such as aspirin, Plavix (clopidogrel), Aggrenox (aspirin combined with dipyridamole), or warfarin. The choice of medication is one that is best made by your own physician. Individuals with severe blockages of the carotid artery (usually at least 60 - 70 percent blockage) may be recommended for a surgical treatment called carotid endarterectomy. During this procedure the plaque from inside the artery wall will be surgically removed and the blood flow is restored to normal. Carotid endarterectomy is successful because the plaque in the carotid artery is limited to a very small area in the mid-portion of the artery in the neck. This allows the procedure to be performed through a small incision, and in many cases under regional anesthesia. Most patients can go home the morning after surgery.

Recovery from surgery is usually rapid and people can quickly resume their normal activities without any restrictions.

A new “nonsurgical” endovascular treatment uses angioplasty and stents to open blocked carotid arteries. This procedure’s safety and efficacy continues to be studied in several medical centers. This procedure involves the placement of a small flexible tube (catheter) into an artery in the groin. The catheter is then directed to the neck to reach the carotid artery blockage. A balloon pushes open the artery wall and a stent (a small metallic coil) is often left to keep the artery open.

FAQs on carotid artery disease

Q. My doctor recommended that I have a carotid endarterectomy. What is involved, and how safe is it?

A. Carotid endarterectomy is a surgical procedure to remove plaque that has built up in the arteries along each side of your neck, the carotid arteries. The procedure takes about an hour, but the speed of the operation is less important than the skill of the surgeon. It is important to ask the vascular surgeon what his or her mortality

rate is for this operation, and if it is more than one or two percent for someone without symptoms, then check with another surgeon. This procedure performed by an experienced surgeon is relatively safe and successful. Many patients enter the hospital the morning of the operation and stay only a day. Once home, you should stay quiet for a few days and then return to normal activities gradually over the next week or so, without any severe straining for four to six weeks.

Q. Please advise on the purpose of an ultrasound of the carotid arteries. Recently, during a physical, my husband’s doctor did not like the sound of his carotid arteries and has ordered an ultrasound.

A. An ultrasound provides information about how blood flows in your arteries both as a waveform that looks similar to a heart EKG and as an image of the artery. The shape of the waveform gives the doctor useful information about the blood flow. The images help to determine if you have plaque, narrowed arteries or blockages in the blood vessels of the carotid. The ultrasound can give a doctor information about the speed of the blood at different points along the carotid, or if it slows or speeds up which indicates a narrowing. Think of a river: if it goes through a narrow channel, it will go faster than if it goes through a wider section.

Often ultrasounds are in color, which also lets the doctor know if the blood is flowing correctly or not.

The advantage is that it does not hurt to have the exam. Your husband will lie on an exam table. Gel is spread on his neck and an ultrasound instrument will be moved over the neck to track the flow in the carotid artery. It would be normal for an adult to have some narrowing, but if the narrowing is significant, the risk for a stroke or TIA increases.

The result of the ultrasound exam will help the doctor determine if additional treatment is needed at this time.