



# CAROTID ARTERY DISEASE AND STROKE PREVENTION

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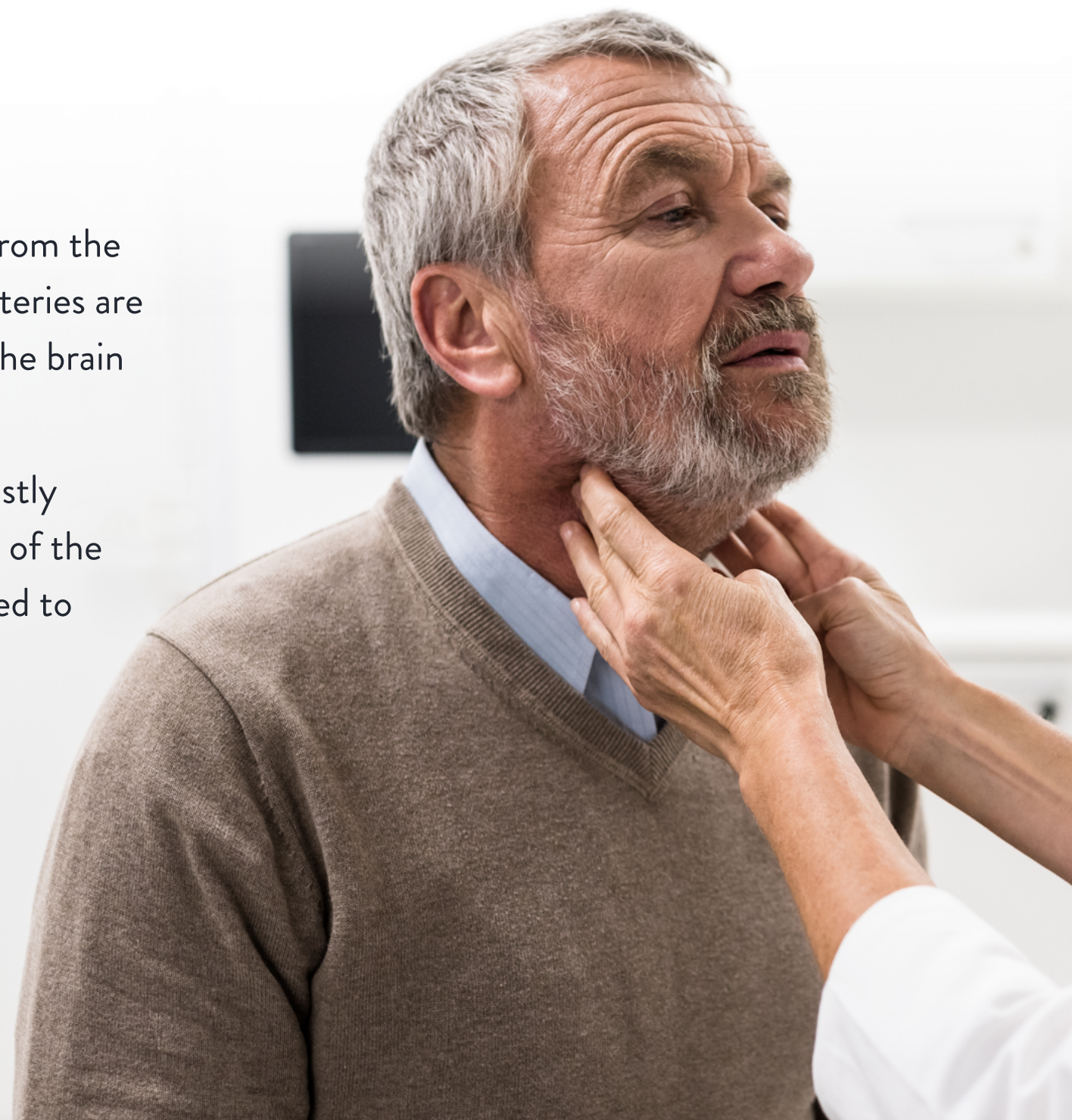


# WHAT IS CAROTID ARTERY DISEASE?<sup>1</sup>

The carotid arteries are two main arteries that carry blood from the heart, up through the neck, to the brain. Healthy carotid arteries are smooth and unobstructed, allowing blood to flow freely to the brain and provide oxygen, glucose, and other nutrients.

Over time, carotid arteries can build up plaque, which is mostly made of fat and cholesterol. This plaque narrows the insides of the arteries and makes them stiff in a process commonly referred to as "hardening of the arteries," or atherosclerosis.

Carotid artery disease results when the carotid arteries have become narrow or obstructed, creating a risk of plaque traveling to the brain, where it can cause a stroke.



1. SVS (n.d.). Carotid Artery Disease Your Vascular Health, <https://vascular.org>

# CAROTID ARTERY DISEASE AND STROKE RISK

## Carotid artery disease increases stroke risk in 3 ways<sup>1</sup>

- Plaque can severely narrow the carotid artery and restrict blood flow
- Plaque can break off from within the carotid artery and block smaller arteries in the brain
- Blood clots can become wedged in a carotid artery stenosis

In 2020, the following estimates were made:<sup>2</sup>



Stroke is the fifth leading cause of death globally



Stroke deaths have increased by 24% from 2010 to 2020



Someone died from a stroke every 3 minutes



Stroke accounted for 1 of every 21 deaths in the United States

## Symptoms of a stroke in men and women<sup>3</sup>



Sudden numbness or weakness in the face, arm, or leg, especially on one side of the body



Sudden confusion, trouble speaking, or difficulty understanding speech



Sudden trouble seeing in one or both eyes



Sudden trouble walking, dizziness, loss of balance, or lack of coordination



Sudden severe headache with no known cause

1. The Texas Heart Institute (2024). Carotid Artery Disease. <https://www.texasheart.org>.

2. Tsao, C., et al. (2023) Heart Disease and Stroke Statistics—2023 Update: A Report from the AHA. Circulation. <https://doi.org/10.1161/CIR.0000000000001123>.

3. CDC (2024). Signs and Symptoms of Stroke. <https://www.cdc.gov/stroke>.



# CAROTID ARTERY DISEASE RISK FACTORS<sup>1</sup>

There are several factors that can increase the chance of developing this condition over time



**High blood pressure** – Too much pressure on artery walls can weaken them and make them easier to damage.



**Diabetes** – Diabetes lowers the ability to process fats, creating a greater risk of high blood pressure and atherosclerosis.



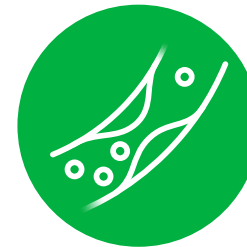
**Family history** – The risk of carotid artery disease is higher if a relative has atherosclerosis or coronary artery disease.



**Obesity** – Excess weight increases the chances of high blood pressure, atherosclerosis and diabetes.



**Tobacco use** – Nicotine can irritate the inner lining of the arteries. Smoking also increases heart rate and blood pressure.



**High blood-fat levels** – High levels of low-density lipoprotein cholesterol and triglycerides aid the buildup of plaques.



**Age** – Arteries become less flexible and more likely to be injured with age.

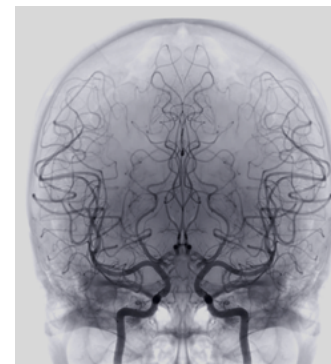
1. Mayo Clinic (2024). Carotid Artery Disease. <https://www.mayoclinic.org>.

# DIAGNOSING CAROTID ARTERY DISEASE

There are several tests used to diagnose carotid artery disease and learn more about the size and location of the blockage, including:<sup>1</sup>



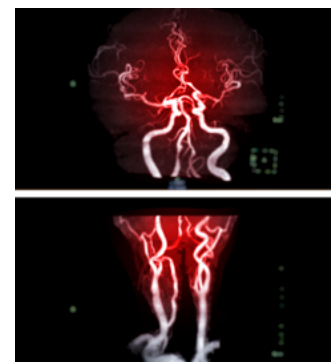
**Ultrasound** – Also called a duplex ultrasound, this type of test uses sound waves to view how blood is flowing through the arteries and locate areas where they may be blocked or narrowed.



**Cerebral Angiography** – A minimally invasive procedure that uses a catheter and contrast material to view inside the arteries and get a close look at the blockage.



**Computed Tomography Angiography (CTA)** – This test uses injectable dye and a CT scanner to create detailed images of the arteries. It may be used on patients with pacemakers or stents from other conditions.



**Magnetic Resonance Angiography (MRA)** – Similar to a CT scan but without using X-rays, this noninvasive test provides detailed images of the arteries.

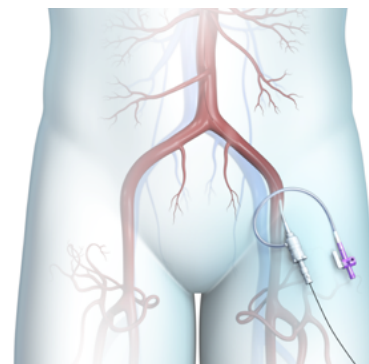
1. Cleveland Clinic (2024). Carotid Artery Disease. <https://my.clevelandclinic.org>.

# TREATMENT OPTIONS

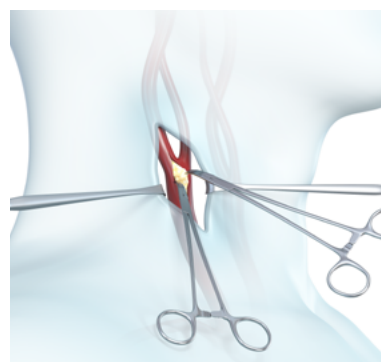
The main goal of treatment is to halt the progression of the disease. Additional therapies may be considered in more severe cases, such as those causing symptoms of TIA or stroke.<sup>1</sup>



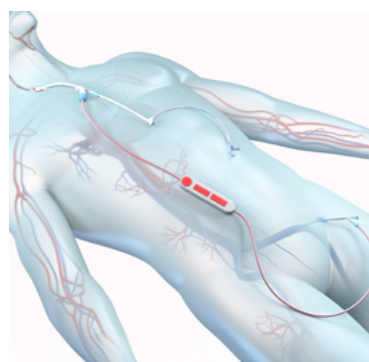
**Optimal Medical Therapy (OMT)** – This treatment combines lifestyle modifications such as diet, exercise, and smoking cessation, with pharmacological therapy, including antiplatelets, lipid-lowering agents, blood pressure reduction, and glycemic control.<sup>2</sup>



**Transfemoral Carotid Artery Stenting (TFCAS)** – A surgeon or interventionalist sends a catheter to the narrowed carotid artery in the neck, then places a stent into the vessel to keep the artery from narrowing again.<sup>3</sup>



**Carotid Endarterectomy (CEA)** – An interventionalist makes an incision along the front of the neck, opens the carotid artery and removes the plaque, then closes the artery with stitches or a patch made with a vein or artificial material.<sup>3</sup>



**Transcarotid Artery Revascularization (TCAR)** – A minimally invasive procedure that can clear blockages and open a narrowed carotid artery. During the TCAR procedure, the surgical team reverses blood flow in the area of the blockage, decreasing the risk of stroke as a surgical balloon and stents are used to reopen the narrowed artery.<sup>4</sup>

1. Elsayed et al. (2021). Outcomes of carotid revascularization in the treatment of restenosis after prior carotid endarterectomy. *Stroke*. <https://doi.org/10.1161/STROKEAHA.120.033667>.

2. Hackman (2021). Optimal Medical Management of Asymptomatic Carotid Stenosis, *AHA/ASA Journal*. <https://doi.org/10.1161/STROKEAHA.120.033994>.

3. Mayo Clinic (2024). Carotid Endarterectomy. <https://www.mayoclinic.org>.

4. Penn Medicine (2024). Transcarotid Artery Revascularization (TCAR), <https://www.pennmedicine.org>

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