



# CAROTID ENDARTERECTOMY TO PREVENT STROKE IN PATIENTS WITH OR WITHOUT SYMPTOMS

If your doctor thinks you have had symptoms of a stroke, you will likely have a *carotid artery ultrasound* exam. This is a test to see if you have blockage of the carotid artery. If this exam shows significant blockage of the *carotid artery*, you may need to undergo a procedure to “open up” the arteries leading to your brain to reduce the risk of future stroke. This surgery is called *carotid endarterectomy*.

Neurologists, from the American Academy of Neurology (AAN), are doctors who treat diseases of the brain and central nervous system. Neurologists who are experts in stroke and experts in the blood vessels leading to the brain reviewed all of the studies for carotid endarterectomy (CE). They made recommendations for using the procedure based on results from previous studies. The experts looked at studies for patients with and patients without symptoms.

This fact sheet will help you discuss carotid endarterectomy with your physician. CE is surgery that removes harmful plaque build-up from the carotid arteries. It is the most used surgical procedure to prevent stroke. The carotid arteries are the main arteries in the neck. They supply blood to the brain.

Most strokes are *ischemic strokes*. Ischemic strokes happen when blood clots or plaque build-up blocks the main arteries to the brain. This can cause drastically reduced blood flow. Reduced blood flow deprives your brain cells of oxygen and nutrients. Narrowing of the carotid arteries may or may not cause symptoms.

Carotid artery *stenosis*— or narrowing— is a major risk factor for ischemic stroke. Narrowing of the arteries is usually caused by plaque in an artery. Plaque forms when cholesterol, fat, and other fatty substances build up in the inner lining of an artery. Your physician may perform a test to determine how much build up is in the arteries.

Depending on the percentage of the artery that is blocked due to narrowing, your general health, and risk factors, the plaque may be removed with carotid endarterectomy. During CE the surgeon makes a cut in your neck and opens the artery. Then the doctor removes as much plaque as possible.

## USE OF CAROTID ENDARTERECTOMY IN PATIENTS WITH SYMPTOMS

Symptoms of a major stroke in the future may include brief vision loss in one eye, weakness or numbness on one side, or difficulty speaking.

Another sign that you may have a major stroke in the future is if you have experienced a *transient ischemic attack (TIA)*. TIA, sometimes called a mini-stroke, may cause temporary paralysis, numbness, speech difficulty, or other neurological symptoms. The symptoms start suddenly and get better in several minutes or up to 24 hours.

For all levels of blockage, there is strong\* evidence that before CE surgery patients should begin a daily aspirin

regimen. Depending upon potential adverse reactions, patients should continue aspirin therapy indefinitely following surgery to reduce complications.

### Majority of the carotid artery blocked – 70% or more

The experts found strong\* evidence that carotid endarterectomy can be effective for people with stroke or TIA symptoms in the previous 6 months and where the majority—70% or more—of the carotid artery is blocked.

There is weak\* evidence that CE is beneficial and should be performed immediately —within 2 weeks— for patients with severe narrowing and a recent TIA or non-disabling stroke.

### More than half of the carotid artery blocked – 50%-to-69%

There is good\* evidence that CE may be considered in patients with more than half—50%-to-69%—of their carotid artery blocked.

Your doctor should also consider whether you are female or if you have experienced a previous stroke or TIA. In trials with women there is weak\* evidence that CE has not been effective. In people who have had a previous stroke or TIA there is weak\* evidence that performing CE within two weeks is beneficial.

Your doctor should also determine if both arteries are blocked. There is weak\* evidence that in patients with symptoms and more than half of their arteries narrowed there is increased risk during the surgery; however, there is also benefit to performing CE.

### Some of the carotid artery blocked – less than 50%

CE should not be used in patients with less than 50% of their artery blocked. Instead your physician may manage the symptoms with other therapies, such as anticlotting medicine.

### USE OF CAROTID ENDARTERECTOMY IN PATIENTS WITHOUT SYMPTOMS

There are many patients who have other symptoms, such as lightheadedness, dizziness, or headaches. These are not necessarily signs of a future major stroke, but may indicate the need for more testing. Some patients may not have any symptoms with carotid artery narrowing.

### Majority of the carotid artery blocked – 60% or more

The experts found strong\* evidence that it is reasonable for doctors to consider CE for patients between the ages of 40 and 75 years and with the majority of the carotid artery blocked—more than 60%.

There is strong\* evidence that prior to CE surgery patients should begin a daily aspirin regimen. This regimen should continue for at least 3 months following surgery to reduce complications.

### RISKS OF CAROTID ENDARTERECTOMY

Carotid endarterectomy can itself cause a stroke in 2-10% of patients. It is important to have your surgery done in a hospital with low complication rates.

### TALK TO YOUR NEUROLOGIST

It is best to see a doctor who has experience in diagnosing and treating conditions related to the supply of blood to the brain. You should have a thorough evaluation by a neurologist. A treatment decision will depend on your risk factors, your general health, and symptoms.

Not every treatment works for every patient. Your doctor may recommend an individualized treatment plan, including lifestyle changes. Your doctor should discuss side effects, if any. All treatments have some side effects; the choice of which side effects can be tolerated depends on the individual.

This is an evidence-based educational service of the American Academy of Neurology. It is designed to provide members and patients with evidence-based guideline recommendations to assist with decision-making in patient care. It is based on an assessment of current scientific and clinical information, and is not intended to exclude any reasonable alternative methodologies. The AAN recognizes that specific patient care decisions are the prerogative of the patient and the physician caring for the patient, based on the circumstances involved. Physicians are encouraged to carefully review the full AAN guidelines so they understand all recommendations associated with care of these patients.

\*After the experts review all of the studies, they describe how strong or weak the data are.

- Strong evidence = research studies with high-quality data collection, this shows that the treatment is either effective, ineffective, or harmful.
- Good evidence = data collection using a combination of high-and-low quality methods, this shows that the treatment is probably either effective, ineffective, or harmful
- Weak evidence = research studies with low-quality data collection, this shows that the treatment is possibly either effective, ineffective, or harmful.
- Not enough evidence = data is insufficient or conflicting, this shows the treatment is unproven to be effective or ineffective.

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