

## PATIENT INFORMATION

# Carotid Endarterectomy

Please pack this booklet with your belongings that you will bring to hospital.  
You will need to refer to this booklet after surgery.

MultiCare 



[pulseheartinstitute.org](http://pulseheartinstitute.org)



# Introduction

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Welcome to **Pulse Heart and Vascular Institute** / MultiCare

This booklet was prepared for you by the Vascular Surgery team to help you understand:

- your condition and your surgery
- how you can help yourself
- your care in hospital
- your needs, care and resources after discharge

Your health-care team has made a plan of care (Clinical Pathway) formulated by Best Practice guidelines with the goal of successful outcome after your Carotid Endarterectomy. The clinical pathway describes some of the usual care for people with your condition. This plan will be adapted for your specific needs.

## ***Please***

Read the booklet carefully. Share it with your family.

Ask questions if there is something you don't understand.

Pack the booklet with your belongings and bring it with you when you are admitted to hospital.

# Carotid Artery Disease

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This booklet will give you and your family general information about **carotid artery disease** and surgery.

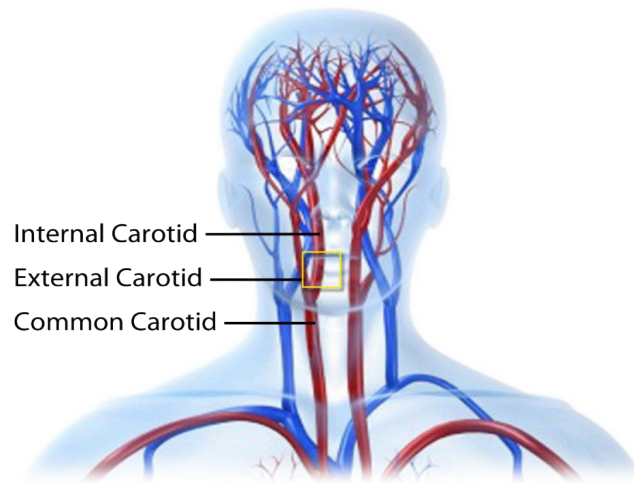
Your healthcare team (doctors, nurses and vascular technologists) will be involved in the assessment, diagnosis and treatment of your carotid artery disease.

**This booklet will describe:**

- The blood vessels involved
- Risk factors for carotid artery disease
- Tests done to diagnosis your disease
- Treatment and surgery available for carotid artery disease
- Your patient pathway/guideline for your hospital stay
- Information about what to expect after surgery
- Information for discharge

# What is Carotid Artery Disease?

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The carotid arteries are blood vessels in the neck, on either side of the windpipe. They carry blood to the head and brain. Normally, the inner vessel walls are smooth (FIGURE 1). Over time, these arteries may become thickened and blocked due to atherosclerosis (FIGURE 2). Atherosclerosis is the buildup of cholesterol, protein and other substances together known as “plaque”. This buildup of plaque in the neck arteries over time causes the artery to become narrowed and blocked (called stenosis). This is known as carotid artery disease.

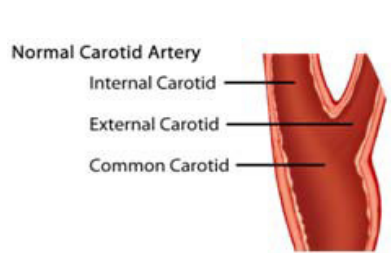


Figure 1

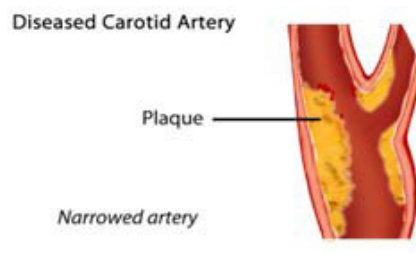


Figure 2

**Carotid artery disease may cause the following symptoms:**

- Sudden weakness or numbness in the face or limbs, often on just one side of the body
- Unable to move one or more of limbs
- Trouble speaking or understanding speech
- Sudden trouble seeing in one or both eyes
- Dizziness or loss of balance
- A sudden, severe headache

**Who can get Carotid Artery Disease?**

Atherosclerosis may occur at any age, but is more common in people over the age of 45. It is not known who will develop this disease. Many people with atherosclerosis share certain risk factors. Some of these risk factors may be changed or treated and some may not.

**Risk factors that can be changed or treated include:**

- Tobacco use and exposure to second hand smoke
- High blood pressure (hypertension)
- High levels of blood lipids (cholesterol)
- Diabetes
- Heart disease
- Obesity
- Sedentary lifestyle (lack of exercise)
- Other problems (poor nutrition, high homocysteine level)



**Risk factors that cannot be changed include:**

- Aging
- Sex (male/female)
- Family history of arterial disease
- Race
- Genetic conditions

Even though you may not have any symptoms to suggest carotid artery disease your physician may be able to hear a sound, known as a “bruit” in your neck, which may indicate a narrowing in your carotid artery. This will help to decide if you need special tests. These tests may be non-invasive and/or invasive.

***Carotid Artery Ultrasound:*** This test uses sound waves. It shows the structure of the arteries in your neck. It is also used to check how blood flows to your brain. A gel will be placed on your neck. This allows sound waves to pass into your artery. The technologist will move a small instrument on your neck. Pictures of your blood flow will be seen on a monitor. This test will take about 30 to 60 minutes.

***Invasive Testing:*** You may need to have tests that require the use of needles, contrast and/or x-ray. You will be told of any instructions needed before the test. Tell your healthcare provider if you have any allergies beforehand.

***Magnetic Resonance Imaging (MRI):*** A x-ray procedure that does not use radiation. Strong magnetic fields and radio waves with a computer make detailed pictures of the body. If you have a pacemaker or another metal device, you cannot have a MRI.

***Magnetic Resonance Angiography (MRA):*** A type of MRI that gives pictures of blood vessels in the body. The test uses a contrast medium to help see the blood vessels. An intravenous (IV) line is inserted in your arm and the contrast is injected through it. Pictures of blocked and narrowed arteries in your neck and head are created. If you have a pacemaker or other metal devices, you cannot have a MRA.

***Computed Tomography Angiography (CTA):*** This test is similar to the MRA. Contrast is injected through an IV. The contrast creates images of blockages and/or narrowing of the arteries and x-ray pictures are taken.

***Carotid Angiography/Angiogram:*** This is an x-ray test that looks at the carotid arteries and other blood vessels in the head. The test is done in a specialized x-ray room. Contrast is injected through a catheter (hollow tube), put in into an artery in your groin or arm through a skin puncture site. The skin will be numbed so you will not feel the area being worked on. The contrast highlights the blood vessels while x-rays are taken. This will show narrowing or blockage of the arteries in a different way than a MRI or MRA. Afterwards, the tube will be removed and a bandage will be applied to the skin puncture. An angiogram will take between 30 to 60 minutes.

You cannot eat or drink before the study. You will be awake but will be given medication to help you relax. Depending upon the catheter location, after the study you may be asked to lie flat for a few hours. Your blood pressure and bandage over the skin puncture will be checked often.

## What Treatments are Available for Carotid Artery Disease?

The treatment for carotid artery disease depends upon:

- The location and/or degree of stenosis (blockage) found in the carotid artery
- The symptoms you may have experienced
- Your overall state of health

Mild or moderate carotid artery disease may be treated with medicines and control of risk factors.

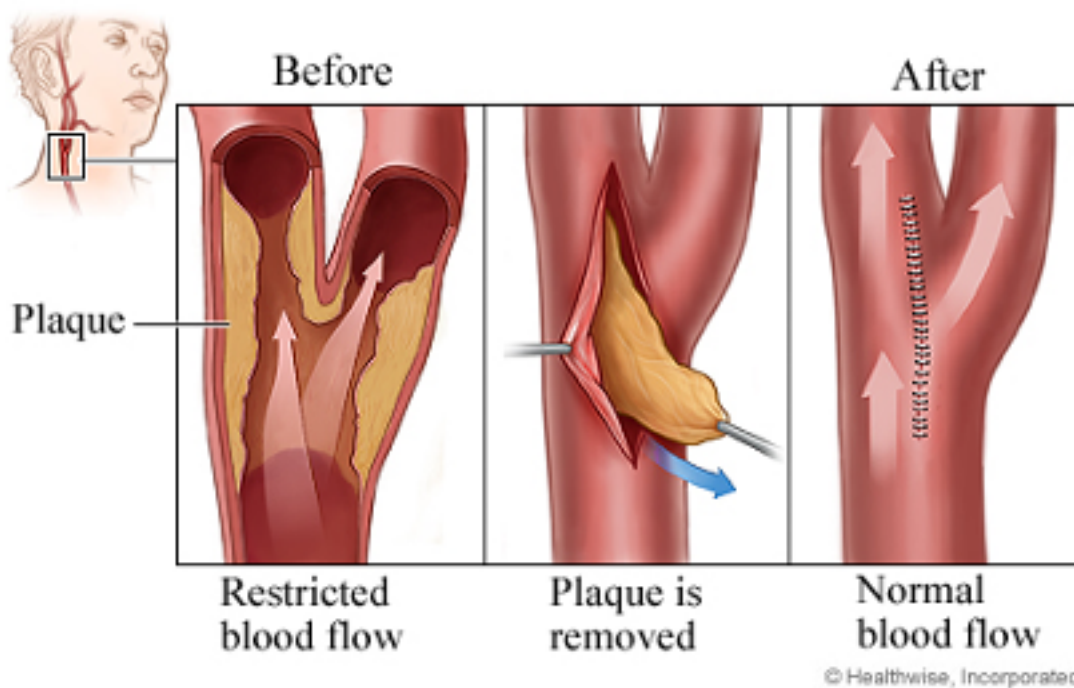
Regular scheduled follow up tests and appointments with your healthcare provider will be made.

Severe carotid artery disease may be treated with an operation known as carotid endarterectomy.

### Carotid Endarterectomy

Carotid endarterectomy is a surgical procedure in which the plaque and inner lining of the artery is removed. An incision is made on the same side of the neck at the location of the carotid narrowing. The artery is exposed and the plaque is carefully removed. The artery is then closed. The skin is then closed and a dressing is applied. Anesthesia may be general or local.

You will come into the hospital the morning of surgery and in most cases you will be discharged within 24-48 hours after the surgery.





**The day before surgery,**

- You may be asked to take a shower with a special soap or use special cleaning wipes
- Do not eat or drink anything after midnight or as instructed before the surgery.
- Your healthcare will review your medicines with you. You may need to change how you take some of the medicines before the surgery.
- If you smoke, you are advised to stop at this time

Your healthcare team will provide you with the information needed to prepare for your surgery. You are encouraged to call the doctor's office to ask questions if anything is unclear.



The following is the patient pathway for your condition. You can use this as a guideline for daily expectations and care throughout your hospitalization.

<b>CAROTID ENDARTERECTOMY PATIENT PATHWAY</b>			
<b>Date</b>	<b>Operation Day</b>	<b>Admission ICU- Post- op 1</b>	<b>Post-op 2</b>
<b>Expected Outcomes</b>	Tongue midline Face symmetrical No difficulty swallowing Vital signs stable	Tongue midline Face symmetrical No difficulty swallowing Incision dry and intact Vital signs stable	Tongue midline Face symmetrical No difficulty swallowing Incision dry and intact Vital signs stable Tolerating increasing activities Discharge in AM -before 10 am
<b>Consults</b>	Anesthesia Case Management	Case management to discuss discharge needs	
<b>Assessment &amp; Monitoring</b>	Your caretakers will check your neurological status often asking you to do the following: Smile, stick your tongue out, can you swallow, squeeze their hands and move your legs. Headache Incision checks Vital signs Pain management Co-morbid conditions Confirm Code status	Your caretakers will check your neurological status often asking you to do the following: Smile, stick your tongue out, can you swallow, squeeze their hands and move your legs. Headache Incision checks Vital signs Pain management Drain management (if you have one)	Your caretakers will check your neurological status often asking you to do the following: Smile, stick your tongue out, can you swallow, squeeze their hands and move your legs Headache Stroke, MI Vital signs Pain management Take out the Drain
<b>Labs, Tests &amp; Treatments</b>	Blood Tongue midline Electrocardiogram	Blood test	
<b>Medications</b>	Verify Home Meds IV fluids	IV fluids 100 cc/hr. Blood pressure within limits Resume home meds, including Statins Aspirin and Cholesterol medication	Saline lock Continue home meds ASA 81 mg daily Statin
<b>Diet</b>	Nothing to eat or drink	Advance as tolerated Cardiac diet Previous home restrictions	Cardiac diet Previous home restrictions
<b>Activity</b>	No restrictions	You will be on bedrest for 6 hours after the surgery with the head raised up 30 degrees, the you can get up in chair, advance activities.	Up in chair Ambulate
<b>Patient Education</b>	Educational booklet on Carotid disease given to patient. Smoking cessation	Incentive spirometer (breathing exercise) every hour while awake	You and your family will be given instruction of after surgery activities and restrictions
<b>Discharge Planning</b>	Evaluate needs for discharge (family support, home health, Care facility, transport)	Evaluate needs for discharge (family support, home health, Care facility, transport)	Discharge instructions given Prescription given. Appointment made for follow up with carotid duplex 2-4 weeks

# Your Care in Hospital – After Surgery

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## **Pain management after surgery**

Your comfort is our concern. It is important that you have effective pain relief. Pain is personal. The amount of pain you feel may not be the same as others feel, even for those who have had the same surgery. Our goal is to help you be comfortable enough to participate in the healing process. Your pain should be controlled enough that you can rest comfortably and that the pain does not prevent you from deep breathing, coughing, turning, or getting out of bed.

Both drug and non-drug treatments can be successful in helping prevent and control pain. You, your doctors and your nurses will decide which ones are right for you to manage your pain.

## **Fall Risk**

You will be at risk of falling after your surgery. We will do everything we can to help you avoid falls while in hospital however, we need your help. When you want to get up call for assistance. Your safety is our concern.

## **Drain**

You may have a small drainage tube in the incision to drain extra fluid. This will be removed the following day when drainage has decreased.

## **Intravenous (IV)**

You will have an IV to replace your fluids until you are able to drink and eat well. Do not pull on the IV tubing.

## **Oxygen**

Under certain conditions, the body may require extra oxygen. These conditions may include lung disease, heart disease and the demands of surgery. Extra oxygen can help restore normal oxygen levels in the blood and body tissues and reduce the workload of the heart and lungs.

During your hospital stay you may receive extra oxygen. This is given through a mask placed over your nose and mouth or small tubes placed in your nostrils (nasal cannula).

The amount of oxygen in your blood is measured by placing a small, painless clip on your finger. This is called pulse oximetry. This measurement is used to check that your body is getting the right amount of oxygen. The nurse will use these measurements to increase, decrease or stop giving you extra oxygen.

You will be encouraged to do deep breathing and coughing exercises to keep your lungs clear. (See the section on Post-Operative Exercises.)

## **Incision**

Your incision will be closed by sutures under the skin and skin glue applied on top. You might have numbness around your incision and up to your jaw line. It will take few weeks and/or months for the numbness to resolve. Occasionally, there will be brushing around your incision especially if you are on blood thinner.

## **Diet**

Once back on the unit, you will be allowed to take fluids as you can tolerate and if you are swallowing without any problems your diet will be advanced to your previous home diet.

Your body needs more energy and protein when recovering from surgery and during illness. Try to include a protein rich food at each meal. Examples of protein rich foods include: meats, poultry, fish, eggs, dairy and dried beans/legumes.

If you are unable to eat well at meals, ask to see the inpatient dietitian. The dietitian can help optimize your nutrition to promote healing, while you are in hospital.

## **Activity while in hospital**

You will be on bedrest for 6 hours after your surgery and then you can get up in chair and advance to ambulate as tolerated.

# Post-operative Exercises

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## Deep breathing and coughing exercises

After surgery, we tend to take smaller breaths. This can be due to pain, anesthetic medications given during surgery, or due to you not being as active as before your surgery. Doing deep breathing and coughing exercises will help to keep your lungs healthy.

You will be given breathing device (incentive spirometry) to do breathing exercises. Your caregiver will give you instructions on this and set your goals.



Deep breathing exercises work best when you are sitting up either in the bed with your head raised or on the side of the bed.

- Take a deep breath in through your nose. Hold for 5 seconds.
- Breath out through your mouth.

Repeat this exercise ten times each hour while you are awake and until your activity level increases.



# Preparing for Discharge

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Where you go after discharge from hospital will depend on your needs. The health-care team will discuss with you and your family and decide together what the best option is for you

## **Discharge planning options**

Social work is available to assist with discharge planning, assessing future care needs, and arranging:

- Home care
- Transportation
- Private health care agencies
- Rehabilitation
- Convalescent care
- Long-term care

Arrange for someone to pick you up at **10 a.m. on the day of discharge**. It is recommended that you have someone staying with you for 24 hours after you come home.

You will receive a follow-up doctor appointment and a prescription for medication.

## **Be sure you understand your discharge instructions:**

### **Restrictions and activities after your surgery**

- You can shower after discharge. Gently dry over your incision.
- Take frequent rest periods as necessary. Let your body be your guide.
- Try to walk each day. Start by walking a little more than you did the day before. Bit by bit, increase the amount you walk.
- You cannot lift anything heavier than 10 lbs. for 48 hours after you are discharged. For 1 to 2 weeks, avoid lifting anything that would make you strain. This may include a child, heavy grocery bags and milk containers, a heavy briefcase or backpack, cat litter or dog food bags, or a vacuum cleaner.
- Avoid strenuous activities, such as bicycle riding, jogging, weight lifting, or aerobic exercise. Your doctor will tell you when it's okay to do strenuous activity.
- No driving until you can turn your head comfortable to both directions and not taking narcotic medications.

## Medications

- Your doctor will tell you if and when you can restart your medicines. He or she will also give you instructions about taking any new medicines.
- If you take blood thinners, such as warfarin (Coumadin), clopidogrel (Plavix), or aspirin, be sure to talk to your doctor. He or she will tell you if and when to start taking those medicines again. Make sure that you understand exactly what your doctor wants you to do.
- Your doctor may advise you to take aspirin when you go home. This helps prevent blood clots. Take your medicines exactly as prescribed. Call your doctor or nurse call line if you think you are having a problem with your medicine.
- Take your pain medication as required. It is normal to experience some wound discomfort for a period of time after discharge. Tylenol is very effective for mild to moderate pain and has very few side effects. It is safe to take for most patients and often will reduce need for stronger medications.
- If you think your pain medicine is making you sick to your stomach: Take your medicine after meals (unless your doctor has told you not to). To avoid constipation (a side effect of many pain medications) add water-soluble fiber to your diet, e.g. bran, whole grains, fruit. If constipation is a problem, you may take a mild laxative
- Do not drive a vehicle or sign any legal papers while you are taking narcotics (e.g. Oxycodone, Hydrocodone and others). Narcotics may slow your reaction time and impair your judgment.

## Diet

- You can eat your normal diet. If your stomach is upset, try bland, low-fat foods like plain rice, broiled chicken, toast, and yogurt.
- Drink plenty of fluids (unless your doctor tells you not to).
- You may notice that your bowel movements are not regular right after your surgery. This is common. Try to avoid constipation and straining with bowel movements. You may want to take a fiber supplement every day. If you have not had a bowel movement after a couple of days, ask your doctor about taking a mild laxative.



## **Smoking**

**Stop Smoking!** Avoid all forms of tobacco (cigarettes, cigars, pipes, chewing tobacco) Smoking damages the lining of the arteries and increases the risk of atherosclerosis.

You will be provided with a separate booklet with information and resources assist you to stop smoking.

## **Follow-up with Physician**

At discharge from the hospital a follow-up appointment will be made in one of three ways:

- Before you are discharged you will be given a follow-up appointment with your surgeon,
- One will be booked for you and you will receive a phone call notifying you of your appointment,
- You will be given a number to call to book your appointment.

**If you are unable to make your appointment, please contact the Pulse Heart Institute at 509-530-5858 to reschedule.**

**Call your surgeon if you have any of the following:**

- Change in neurological status (dizziness, numbness or tingling, vision changes or trouble swallowing)
- Worsening of headache
- Chest pain
- Shortness of breath
- Redness or swelling around your incision

**If you are unable to reach your doctor, please go to the Emergency department.**

**For you to achieve the best long term positive outcome it is recommended that you manage following factors:**

Good blood pressure control

Good cholesterol control

Blood thinner per your Doctors order

Good control of your diabetes

Lifestyle modifications – diet, weight and exercise

# Notes



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Heart Institute