

Carotid Artery Disease

The Vascular Group, PLLC

CAROTID ARTERY DISEASE

The major blood supply to the brain is supplied by the carotid arteries, which are located on either side of the neck. An artery is normally smooth, allowing blood to flow freely. Arteries may become blocked by atherosclerosis or “hardening of the arteries”. You may or may not have any symptoms. Your doctor or health care provider may listen to your neck and hear a “bruit”, which is due to turbulent blood flow. Ulcers may also form inside the artery. These ulcers have a rough surface which may cause particles of atherosclerosis or blood clots to break loose into the circulation to the eye or brain. These may cause a TIA (mini stroke), or stroke. We as a team are able to diagnose, evaluate, and treat carotid artery disease.

Transient Ischemic Attack (TIA) or “Mini Stroke”

This happens due to a brief decrease in blood flow to the brain. Symptoms are temporary, lasting no longer than twenty four hours.

Signs and Symptoms of TIA

- Difficulty understanding or writing words
- Slurred speech
- Changes in vision, temporary loss of vision (described as a shade being drawn down in front of eyes).
- Numbness
- Weakness or loss of function of the arms or legs involving one side of the body, face or mouth.
- Loss of coordination

Cerebral Vascular Accident (CVA) or Stroke

A CVA occurs when symptoms of a TIA do not get better or go away in 24 hours and may worsen through a series of episodes. A stroke may occur without warning and may be mild or severe, often occurring suddenly.

Signs and Symptoms of a CVA

- Paralysis (inability to move) / Facial or mouth drooping on one side of the body
- Loss of all or part of vision
- Difficulty in speaking and/or understanding written or spoken words
- Difficulty swallowing
- Loss of consciousness
- **If you experience any symptoms of a TIA and or CVA you need to go to the emergency room as soon as possible .Long term results are improved if treatment is given within 24 hours!**

DIAGNOSTIC TESTS

Non Invasive Testing

You may eat and drink before the exam and take your usual dose of medications unless instructed otherwise.

Ultrasound – This type of test uses ultrasound to send high frequency sound waves into the artery which are reflected by moving red blood cells. The vascular technician will place a hand held transducer (probe) on your skin with some gel to perform the test. This test takes about fifteen minutes to complete

Computerized Tomography Angiogram (CTA Scan) - A CT scan uses a computer to produce, from X-ray data, a view of your carotid arteries. You will have contrast injected through an intravenous line. If you have reduced kidney function other precautions will be taken as well. The IV will be removed after the completion of the test.

Magnetic Resonance Angiography (MRA) – This test is often used to check for blockages of the arteries in your neck. It uses a large scanner with a powerful magnetic field to produce images based primarily on the water content of the body's fluids, organs, and tissues. It does not use needles or dye, and it is painless. The test takes about thirty to sixty minutes and requires you to lie very still in a noisy tube-like machine. Let your doctor know if you are claustrophobic (cannot stand to be in small spaces) before taking the test. This test cannot be done on people who have metal implants, such as metal plates, pacemakers, orthopedic screws, or cerebral aneurysm clips. It is okay if you have fillings in your teeth, however you must remove any jewelry or watches before the test.

Invasive Arterial Testing - Angiogram

An angiogram is an x-ray of your arteries. This test is done to determine the exact location of disease within your arteries. It is performed by a team of physicians, physician assistants, nurse practitioners, nurses and technicians. You will meet with someone prior to the test. They will review the procedure, possible side effects and ask you to sign a consent form. Blood work is drawn before the test to determine the ability of your blood to clot and your kidney function

You will be required not to eat solid foods eight hours before, and will need to stop liquids three hours before the angiogram. You will receive specific instructions regarding your medications, insulin and blood thinners from your doctor or nurse before the test.

You will not be able to drive for two days following the procedure therefore, you will need to make arrangements for someone to drive you home. No heavy lifting, nothing greater than 10 lbs. for one week.

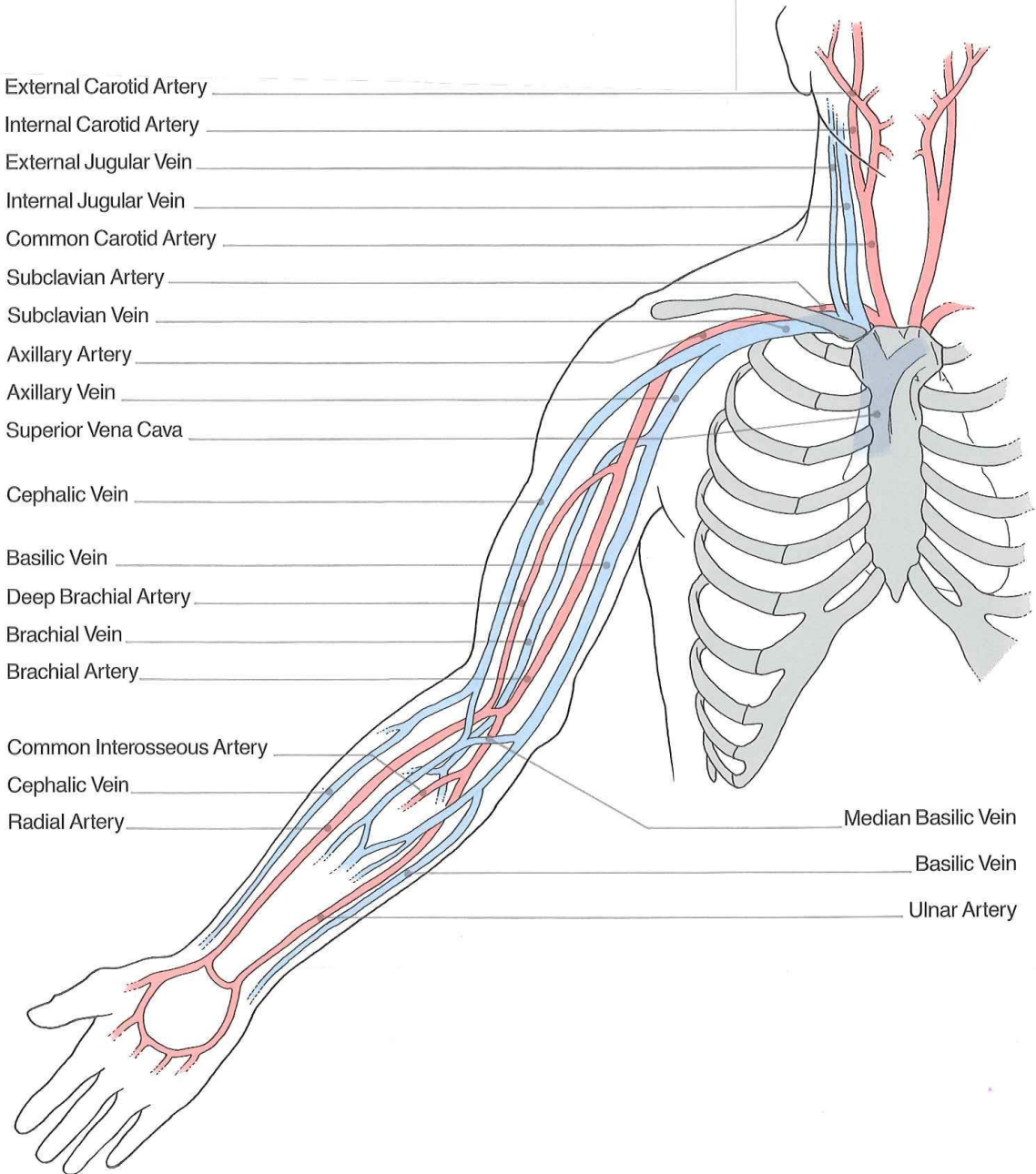
If you are a diabetic please check your finger stick the morning of your procedure.

For angiograms, an intravenous catheter is inserted into a vein in your arm and you may be given intravenous fluids and/or medications to help you relax. The femoral artery in your groin is most often used to insert a catheter in which to inject dye; however the artery in your inner elbow or armpit may also be used. The area is first shaven and then numbed with a local anesthetic.

A catheter is inserted into the artery and dye is injected and then x-rays are taken. You will feel a warm sensation in your body as the dye is injected. When the catheter is removed, the physician will apply pressure to the insertion site for approximately fifteen minutes. The procedure takes one to one and a half hours to complete. After the procedure you will need to be on bed rest with the affected leg or arm straight for approximately four hours. This is to prevent any bleeding at the puncture site.

The dye acts like a diuretic, or water pill, so you may need to urinate frequently. You should drink a lot of fluids to help flush the dye from your kidneys. Notify the nurse or doctor if you have any pain, numbness or tingling during or after the procedure.

Please let your doctor or nurse know prior to the test if you are allergic to contrast dye or shell fish. Then we will take appropriate precautions.



External Carotid Artery _____

Internal Carotid Artery _____

External Jugular Vein _____

Internal Jugular Vein _____

Common Carotid Artery _____

Subclavian Artery _____

Subclavian Vein _____

Axillary Artery _____

Axillary Vein _____

Superior Vena Cava _____

Cephalic Vein _____

Basilic Vein _____

Deep Brachial Artery _____

Brachial Vein _____

Brachial Artery _____

Common Interosseous Artery _____

Cephalic Vein _____

Radial Artery _____

Median Basilic Vein _____

Basilic Vein _____

Ulnar Artery _____

Right

ADMISSION PROCEDURE

You will be admitted on the Vascular Surgery service under the care of the Vascular Surgeons. Your referring physician and any other medical specialists will be notified of your admission and surgery date.

If an angiogram is ordered on the day of admission, you should report to the specified area at the instructed time. Otherwise, you will receive a phone call from the Admitting Office with instructions for your arrival. If you do not receive a phone call by Noon, please contact our office at 518-262-5620 or 1-877-827-2852.

If you are to be admitted the day of surgery you will need to have pre-admission testing prior to your scheduled surgery. At pre-admission testing you will meet with an anesthesiologist, and nurse. You may have blood work, a urine test, EKG, and a chest x-ray. They will review pre-operative instructions including fasting and medications to take the morning of surgery.

This whole procedure takes approximately two to three hours. If you need to have any other testing we will try to schedule it the same day. If you are to be admitted the day before your surgery the above tests will be performed when you are admitted.

For same day surgery the hospital will notify you the day before your surgery after 2:00pm to tell you what time to report to the hospital. If your surgery is on a Monday you will be notified the Friday before your surgery.

TREATMENT OF CAROTID ARTERY DISEASE

Risk Factor Modification

Studies have been done on people with atherosclerosis; this is to help predict which people will be at a high risk of developing this disease. These people usually have one or more of the following risk factors.

- Smoking
- Hypertension (high blood pressure)
- High cholesterol
- Diabetes
- Family history of atherosclerosis
- Obesity
- Inactivity

It is important to try and eliminate or minimize the risk factors that you can control, such as smoking, obesity, diabetes, and your activity level.

CAROTID ARTERY STENTING

Stenting of the carotid arteries is an evolving minimally invasive approach for treatment of carotid artery stenosis. Through new innovations, research techniques, and National Institute of Health trials, we are able to offer this advanced intervention on select patients.

Carotid stenting is generally considered for patients with recurrence of stenosis after previous carotid surgery, previous neck surgery, and/or radiation to the neck region.

The procedure is quite similar to the angiogram except for the following; a small catheter with a balloon is inflated and pushes the plaque against the inner wall of the artery making room for more blood flow. Then a stent is left in place to keep the artery dilated. The balloon is deflated and the catheter is removed. Dye is then injected and x-ray pictures are taken to make sure the artery has opened adequately. You will stay overnight in the hospital.

An antiplatelet agent is usually given prior to the procedure and for some time after 1-3 months or longer. These are used to reduce the risk of platelet aggregation (clumping) and thrombus (clot) formation. Plavix and aspirin are common antiplatelet agents that are generally prescribed before and/or after your stenting.

Surgery

Surgery will depend on the extent of blockage and the associated symptoms that you are experiencing. Your doctor may recommend periodic ultrasounds to monitor the progression of your disease before recommending surgery.

What can I expect before surgery

Someone from the anesthesia department will speak to you before surgery and will discuss the type of anesthesia that will be used with you, called a Cervical Block, and have you sign a permission form. You will not be allowed to eat for eight hours prior to surgery. Someone will review your medications to see which, if any, you can receive the morning of surgery.

What can I expect during surgery?

Carotid Endarterectomy – This is the name of the surgery to repair the blocked carotid artery. You are awake for the surgery. You will be given medication to numb the side of your neck to be operated on and some medicine to help you relax through an I.V. This type of anesthesia minimizes your risks associated with surgery. It is important that you are awake during your surgery so the doctor and anesthesiologist can monitor your neurological status, or brain function. If you lose any function of your brain, the doctor will direct more blood to your brain with a shunt. A shunt is a tube that can channel blood from below the blockage in your artery to above the blockage. Once the surgery is completed, the shunt is removed.

You will have sterile drapes over your face and an oxygen mask around your mouth. After your neck is numbed, a small incision about four inches will be made below the level of the jaw. Once the carotid arteries are exposed, clamps are placed above and below where the blockage or plaque is located. The artery is then opened and the plaque is carefully removed. The artery is then stitched closed as is the muscle in your neck. The skin is closed with skin staples, and a bandage is applied over the area. Some patients also have a small bulb drainage device inserted at the bottom of their incision to drain away any excess fluid. The entire surgery takes about two hours.

What can I expect after surgery?

After surgery you will be taken to the Recovery Room to be closely monitored for around two hours. Then you will go to a hospital room. During this time the nurse will be checking your blood pressure, pulse and dressing frequently. They will also shine a flashlight in your eyes to check your pupil response, ask you simple questions, ask you to move your arms and legs, grasp their hands, smile, and wiggle your tongue from side to side. This is all done to make sure that both sides of your brain are functioning effectively and that you are thinking clearly.

After the cervical block wears off you will be able to eat and drink. Your nurse will check your gag reflex to assure that you will be able to swallow without any difficulty and you will be allowed to eat. You will be able to get out of bed the evening of your surgery.

Post-Operative Days 1 and 2

Your dressing will be removed and if there is no new drainage from the incision it will be left open to air. The staples are removed from your incision and small pieces of tape, steri-strips, are applied over the incision. These will fall off by themselves in one to two weeks. It is normal to have some swelling and numbness at the operative site. If a drain was inserted during the operation, it too will be removed and a small dressing applied. This dressing may be removed after twenty four hours.

You will be discharged if you are medically and physically ready. The time for discharge is 10:00 AM.

DISCHARGE INSTRUCTIONS

What should I expect once I go home?

- When you return home from the hospital you may feel tired. You are encouraged to do light exercise such as walking.
- If you have a history of hypertension (high blood pressure) you will need to have your blood pressure checked every day during the first week you are home.
- Mild swelling around the incision.
- Numbness around the incision and jaw – this may last a few months but will improve with time.
- Mild Headache.

Wound Care

- It is okay to shower, but don't have a direct stream of water on your incision. Pat the area dry.
- If there is drainage from your incision apply a gauze dressing.

Restrictions

- No heavy lifting (nothing heavier than a phone book) for two weeks
- No driving for two weeks

What to Report

- Redness that extends away from the incision
- Foul smelling drainage
- Temperature greater than or equal to 101f for 24 hours
- Elevated blood pressure, greater than or equal to 170/90
- Severe headache
- Any of the symptoms of a T.I.A. or C.V.A.

It is important to keep your follow up appointments. Ultrasounds of your carotid arteries will be scheduled periodically to monitor the surgery that was done. If any problem occurs, do not hesitate to call the Vascular Group at (518) 262-5640. There is always someone available to answer our questions.

COMPLICATIONS

While precautions are taken to prevent complications, our records show that carotid surgeries performed by The Vascular Group have approximately a 1% risk of complications. This means that one out of every hundred operations has some sort of complication; and ninety nine out of every hundred are without complications. We have attempted to outline these possible complications to help you understand the risks associated with your surgery. While the most common types of complications known have been listed, other unforeseen or remote complications may also occur.

Possible complications include but are not limited to: Bleeding, infection, stroke, difficulties in breathing (fluid in the lungs, pneumonia), heart rate and/or rhythm disturbances, heart attack, heart failure, nerve injury, and death.

If you have any questions or feel you need more information, please do not hesitate to call the Vascular Group at (518) 262-5640.

RISK FACTORS FOR ATHEROSCLEROSIS

- Smoking
- Hypertension (high blood pressure)
- Family history of atherosclerosis
- Elevated cholesterol
- Heart disease
- Diabetes
- Age 65 years and older
- Appears more frequently in men than women
- Obesity

It is important to try to eliminate the risk factors for atherosclerosis that are under your control. Avoiding the things that lead to atherosclerosis can slow the progression of the disease. You should discuss these risk factors with your primary care provider.

PREVENTION OF ATHEROSCLEROSIS

Smoking Cessation – Nicotine causes the arteries to constrict, or narrow, preventing blood from reaching the body's organs, tissues, and muscles. Smoking decreases the ability of your lungs to deliver oxygen to your blood and can cause the blood to clot more quickly. Smoking also prevents the development of new blood vessels, which is especially important in people with blockages in their circulation. Many people think that smoking one or two cigarettes a day is okay. They are wrong. The effects of one cigarette last in the body for up to eight hours. Tobacco in any form is harmful and should be avoided. This includes pipes, cigars, cigarettes and chewing tobacco. People with claudication usually notice improvement in their walking once they stop smoking.

Hypertension (High Blood Pressure) – Uncontrolled hypertension increases the workload of the heart. This causes increased stress to your heart and arteries. Hypertension is often "silent" meaning it has no observable symptom and should therefore be monitored regularly.

Cholesterol Monitoring – Cholesterol is a soft, waxy substance that can build up in your artery walls. This restricts blood flow through the arteries. Cholesterol comes from food.

A total cholesterol level less than 200 is considered desirable. Borderline is 200-239 and high is 240 or greater.

Bad cholesterol (LDL) refers to (low-density lipoprotein) and has a lot to do with your family history. Everyone's bad cholesterol comes from two sources: the cholesterol that is absorbed from food and the cholesterol your body produces naturally, based on heredity. The average person should try to maintain an LDL below 130 mg/dl. If you have heart disease or diabetes, your goal should be less than 100 mg/dl. Eliminating smoking helps to decrease LDL.

Good cholesterol (HDL) refers to high-density lipoprotein cholesterol because it helps eliminate the bad cholesterol from the body. The **higher** your HDL cholesterol level the more good lipoproteins you have to remove stuck cholesterol from your blood vessels. Low is less than 40, high is 60 or greater. Increasing activity helps increase HDL so be active!

Diet – In order to prevent atherosclerosis and hypertension it is important to avoid foods containing high amounts of fat, cholesterol, and salt. Choose lean meat, poultry, fish and dry beans as protein sources. Moderate your use of eggs, usually two to three per week, try cooking with less egg yolks and more egg whites, and red meats, portions no larger than a deck of cards. Limit your intake of butter, cream, hydrogenated margarine, shortening, coconut oil and food made from these products. Try to use no more than two tablespoons of fat per day. There are many new low fat, low salt, cholesterol free items available. Read the labels of prepared foods carefully. Trim off visible fat from meat and poultry. Drain the fat from foods as you cook. Broil, bake or boil rather than fry your foods. Learn to enjoy the natural flavors of foods. Cook with only a small amount of salt. Add little or no salt to food. Limit salty foods such as potato chips, pretzels, salted nuts, condiments, cheese, pickled foods or cured meats. Again, read labels carefully. Your medical doctor may prescribe a medication to lower your cholesterol in addition to your dietary restrictions.

Diabetes – People who have diabetes are at an increased risk for developing atherosclerosis. Diabetes speeds up the production of atherosclerotic plaque. It is important to manage your diabetes closely to prevent this from happening. Your medical doctor can help you keep your blood sugar in control.

Exercise – Exercise should be part of your daily activity. You should walk, ride a bicycle, or swim four to five times weekly for at least a half hour. This will help maintain muscle tone, improve circulation, and strengthen the arteries. Consult your medical doctor if you would like to do more vigorous exercise. If you develop difficulty breathing or chest pains, stop the activity and notify your doctor.

Follow Up Appointments – Regular follow up appointments with your vascular surgeon are necessary to monitor the progression of your disease.