

Mesenteric Arterial Disease

The Vascular Group, PLLC

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Mesenteric arteries carry oxygen rich blood to the gastrointestinal tract. The stomach, small and large intestines, colon, and rectum are dependent on this blood supply to carry out digestive processes. Obstruction of blood flow can result in ischemia (lack of blood supply) of the intestines. The inner wall of a normal artery is smooth and blood flows through it without difficulty. When atherosclerosis (also known as hardening of the arteries) develops it is due to the lining of the artery becoming rough and thickened. The thickening of the arterial walls is often caused by deposits of fatty materials, such as cholesterol, clogging the arteries. Changes that occur in the blood vessels do not occur overnight but develop over many years.

There are two categories of mesenteric ischemia: **Acute** Intestinal Ischemia and **Chronic** Intestinal Ischemia.

Acute Intestinal Ischemia is recognized and diagnosed by symptoms. It can present with an acute (sudden) onset of severe abdominal pain, vomiting and diarrhea. It can occur gradually, with pain after eating, weight loss and change in bowel habits.

Chronic Intestinal Ischemia is caused by atherosclerosis, or hardening of the arteries. This causes plaque to build up on the inner layer of the artery. Atherosclerosis usually progresses slowly in the mesenteric vessels. The most common symptom is abdominal pain after eating increasing in severity over several weeks or months. The type of pain varies with each patient, from a continuous, dull ache to colicky pain. Less food is ingested, leading to weight loss.

Some symptoms that may occur are:

- Vomiting
- Diarrhea
- Abdominal Pain (especially after eating)
- Weight loss
- Change in Bowel Habits

RISK FACTORS FOR ARTERIAL DISEASE OR ATHEROSCLEROSIS

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.

Diagnostic Tests

Non Invasive Testing – Doppler

You may eat and drink before the exam and take your usual dose of medications unless instructed otherwise. This is an ultrasound stethoscope. The vascular technician will place a hand held transducer, or probe, on your skin with some gel to perform the test. This test takes about fifteen minutes to complete. You should avoid eating or drinking four hours prior to your abdominal ultrasound. It is difficult for the technician to visualize the arteries if your abdomen is full.

Invasive Arterial Testing – Angiogram

Magnetic resonance Angiography (MRA)

This test uses a large scanner that is magnetic based to produce images based on water content. This is a not a painful process. It requires approximately 45-60 minutes to complete the test. We need to know if you are claustrophobic (fearful of small places) or have metal clips, implants or a pacemaker. Remove any jewelry or watches before the test.

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 before the test. They 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 the test, 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.

Some of our patients will need to take a medication called **Mucomyst** the day before the procedure. It is a small amount of a clear liquid with a bitter taste that can be taken in a small amount of fruit juice.

ONLY if we have indicated that you will need it, it will be taken as follows:

- One dose at 3pm the day before procedure
- One dose at 7pm the evening before procedure
- One dose in am of procedure just prior to leaving for your test

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.

Admission procedure

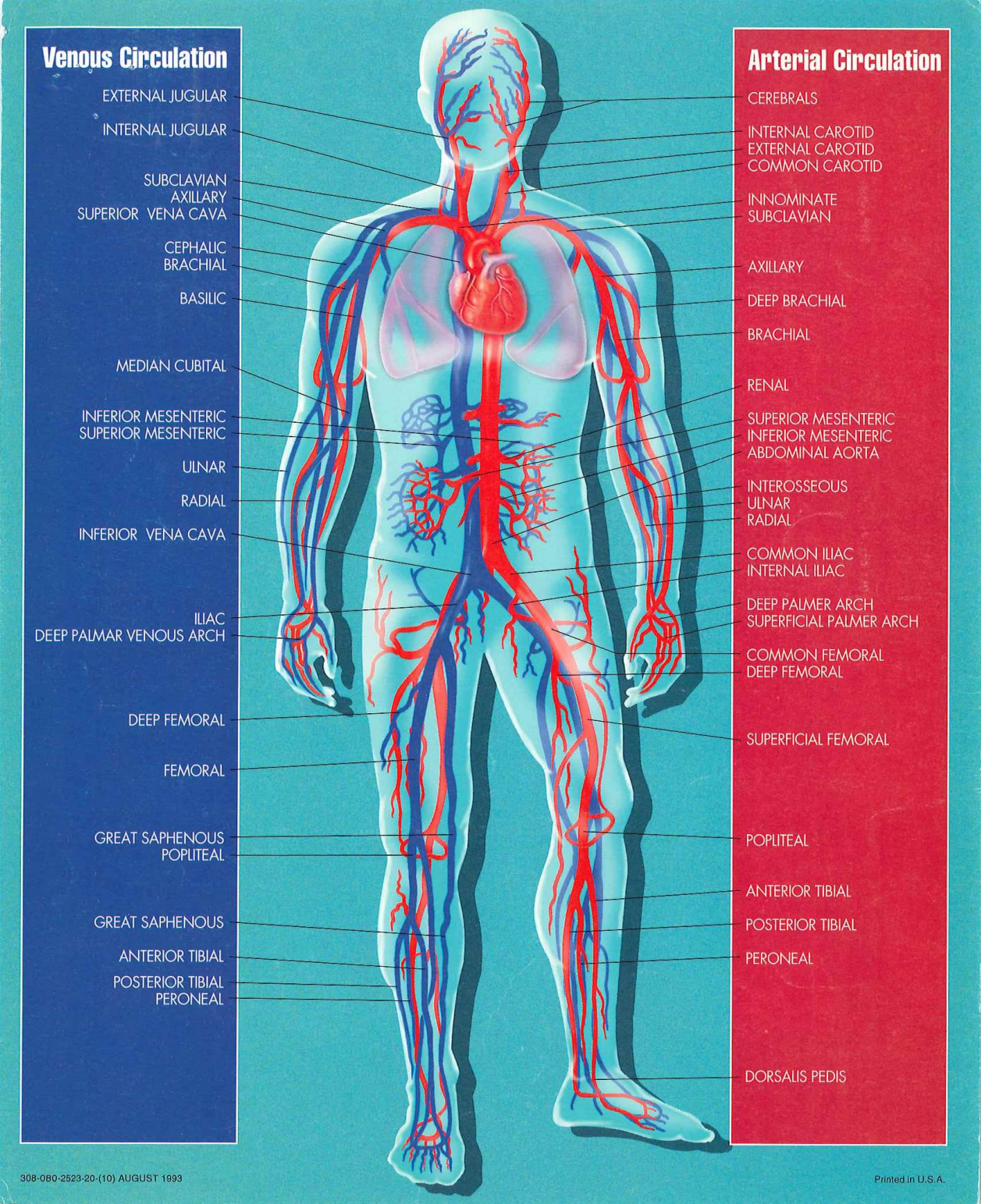
You will be admitted on the Vascular Surgery service under the care of the Vascular Surgeons. Your referring physician and any other medical specialists will be notified of your admission and surgery date.

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.



Venous Circulation

- EXTERNAL JUGULAR
- INTERNAL JUGULAR
- SUBCLAVIAN
- AXILLARY
- SUPERIOR VENA CAVA
- CEPHALIC
- BRACHIAL
- BASILIC
- MEDIAN CUBITAL
- INFERIOR MESENTERIC
- SUPERIOR MESENTERIC
- ULNAR
- RADIAL
- INFERIOR VENA CAVA
- ILIAC
- DEEP PALMAR VENOUS ARCH
- DEEP FEMORAL
- FEMORAL
- GREAT SAPHENOUS
- POPLITEAL
- GREAT SAPHENOUS
- ANTERIOR TIBIAL
- POSTERIOR TIBIAL
- PERONEAL

Arterial Circulation

- CEREBRALS
- INTERNAL CAROTID
- EXTERNAL CAROTID
- COMMON CAROTID
- INNOMINATE
- SUBCLAVIAN
- AXILLARY
- DEEP BRACHIAL
- BRACHIAL
- RENAL
- SUPERIOR MESENTERIC
- INFERIOR MESENTERIC
- ABDOMINAL AORTA
- INTEROSSEOUS
- ULNAR
- RADIAL
- COMMON ILIAC
- INTERNAL ILIAC
- DEEP PALMAR ARCH
- SUPERFICIAL PALMAR ARCH
- COMMON FEMORAL
- DEEP FEMORAL
- SUPERFICIAL FEMORAL
- POPLITEAL
- ANTERIOR TIBIAL
- POSTERIOR TIBIAL
- PERONEAL
- DORSALIS PEDIS

TREATMENT FOR MESENTERIC ARTERIAL ISCHEMIA

Risk Factors

Eliminate or minimize your risk factors for atherosclerosis; don't smoke, see a doctor to control your blood pressure or diabetes, eat a low fat and low cholesterol diet, lose weight if overweight, and perform regular exercise.

Angioplasty and Stenting

This procedure may be used for short areas of blood vessels narrowing. This would be done at the same time as your angiogram if the doctor felt that it would be successful. 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 may 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

Depending on the exact location and extent of your blockage the doctor will determine what surgery will be performed. Your doctor will have a general idea of what surgery needs to be performed after talking to you about your symptoms, and reviewing your tests. The angiogram will give the doctor the exact location of your blockage. It essentially gives the doctor a road map of you arteries.

Bypass

A large incision will be made along your left side. A bypass will be placed from your aorta extending to below the blockage in the mesenteric artery. This is generally performed by using a synthetic graft. The operation takes approximately three hours.

This is major surgery and requires very close monitoring. You will be given general anesthesia. You will have a urinary catheter in your bladder, and special intravenous lines inserted. You will also have continuous cardiac (heart) monitoring. Generally, you will need to go to the intensive care unit after surgery. You may notice a generalized “puffiness” of your body. You may notice a generalized “puffiness” of your body. This is due to the increased volume of fluid that you will be receiving during surgery.

You will be on a ventilator, or breathing machine, which is due to your being too sleepy to breathe on your own. Once the anesthesia wears off, usually by morning, the breathing tube will be removed.

What can I expect after surgery?

Days 1 and 2 – You will be in the intensive care unit (ICU) after you are released from the Post Anesthesia Care Unit (recovery room). You will be on a cardiac monitor and will be watched very closely. You will be weighed daily. Usually you have extra fluid on board from the surgery. The doctor will determine by your weight, if you need a diuretic, or water pill, to help your body get rid of this extra fluid. When the breathing tube has been removed and you are stable, you will be moved to a surgery floor. This is usually the afternoon following surgery. You may remain on a cardiac monitor, but will be able to move freely. You will get out of bed to a chair with assistance.

Days 3 and 4 – The catheter may be removed during this time. The nursing staff will help you to walk into the hallway. You will be encouraged to cough and deep breathe. Due to the anesthesia and your incision you are at risk of developing pneumonia. Don't forget to cough! Pain medication is ordered for you, but you have to ask for it. So, if you are in pain ask for medication, it will help!

Days 5 to 8 – Your weight is usually back to normal and your catheter should be removed by now. You will be feeling steadier on your feet. Usually at this point it is just a matter of time before you are ready to go home. Once you are moving around a little more and you and your physician feel you are medically and physically ready you will be discharged. The time of discharge is 10:00am.

What can I expect when I go home?

It is normal for you to feel tired. This will last for about four to six weeks. It is important however, that you push yourself to get up every day, get dressed, and take short frequent walks four to five times a day (no set distance, whatever you can tolerate). You should gradually increase this, however when you feel tired you should rest.

Please remember, no heavy lifting, pushing or pulling anything heavier than **ten pounds** for three months. Sorry, no golf. This is to prevent a hernia along the incision line. No driving until after you see your physician, usually two weeks after discharge.

DIET

It is common to have a poor appetite. Choose healthy foods, it may help to eat six small meals a day instead of three large ones. Constipation is also very common, but can be helped by increasing your fluid and fiber intake. If you have had a problem with constipation in the past, whatever has worked for you is fine. Any over the counter cathartic is okay to use.

WOUND CARE

Mild swelling around the incision is normal. It may be difficult and uncomfortable to wear pants initially. It is probably easier to wear loose elastic waist pants, like sweat pants, for a while.

You will have staples along your incision. These will be removed on your first post-operative visit which is two weeks after you are discharged.

What to Report

- Redness that extends away from your incision
- Drainage, not the color, odor and amount
- Temperature greater than 101 for twenty four hours
- A sudden change in the ability to move or use your leg, or a loss of the ability to feel your leg

It is important to remember that you and your body have been through major surgery. Be patient, it takes four to six weeks before you start feeling yourself again. It takes three months before you feel completely normal.

Please keep your follow up appointments. If any problems occur, do not hesitate to call the Vascular Group. There is always someone there to answer your questions.

COMPLICATIONS

While precautions are taken to prevent complications, our records show that aortic surgeries performed by The Vascular Group have approximately a three percent risk of complication; while ninety seven 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 type of complications known have been listed, other unforeseen or remote complications may also occur.

Possible complications include bleeding, infection, graft blockage, incidental removal of the spleen or gallbladder, stroke, difficulties in breathing (fluid in lungs, pneumonia), heart rate and/or rhythm disturbances, heart attack/heart failure, kidney failure, gastrointestinal bleeding, ileus (absence of bowel motility), intestinal ischemia or lack of blood supply, nerve injury, paraplegia (paralysis of the legs), sexual dysfunction/male impotence, pseudo aneurysm (leakage of blood from the graft and artery connection), formation of blood clots, limb loss and death.

If you have any questions or you feel you need more information, please call The Vascular group and ask to speak to a Nurse Clinician or Physician (518) 262-5640 or 1-877-827-2852.

IMPORTANT INFORMATION FOR PEOPLE WHO RECEIVE A SYNTHETIC GRAFT

It is currently recommended that people with man-made prosthetic grafts (including Goretex) receive oral antibiotics on the same day as any invasive procedures. This includes minor surgeries and some dental work. This recommendation is aimed at preventing infection of the graft material. Please cut out the following wallet sized card and present it to your dentist and doctors with your next office visit. They should keep a copy of it on file for their records.

Name:

Dear Doctor or Dentist, this patient has a prosthetic intravascular graft. It is recommended that he/she take antibiotics prior to any invasive procedures in order to prevent graft infection. For dosing regimens, please follow the Endocarditis Prophylaxis Regimen for Patients at Risk. If you have any question, please call the Vascular Group at (518) 262-5640 or 1-877-827-2852.

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 effect of one cigarette lasts 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 symptoms 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.

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.

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 the size of a deck of cards).

Limit your intake of butter, cream, hydrogenated margarine, shortening, coconut oil and food made from these products (usually 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 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 and 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 (high blood sugar) 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 three to four times daily. 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.