

Abdominal Aortic Aneurysm

The Vascular Group, PLLC

ABDOMINAL AORTIC ANEURYSM

The inner wall of a normal artery is smooth and blood flows through it without difficulty. An aneurysm occurs when the wall of an artery weakens and swells like a balloon. Most abdominal aortic aneurysms (AAA) are atherosclerotic in origin. This means that it happens as a result of plaque deposits on the wall of the artery that weakens it. Most abdominal aortic aneurysms occur below the renal (kidney) arteries. Most people are unaware that they have one and it is usually found when looking into another problem.

The normal diameter (width) of the aorta is 2cm (3/4"). Patients with abdominal aortic aneurysms measuring greater or equal to 5.0cm are usually candidates for surgery. Each patient is evaluated separately, and depending on your general health or the rate at which the aneurysm is growing may change the parameters that are used. The aneurysm did not occur overnight, it usually gradually increases, sometimes over quite a few years.

Aneurysms are usually without symptoms, but in a small percentage of patients symptoms may occur. If the following symptoms do occur it is very important to notify your doctor immediately, or go to the emergency room.

- Low back pain
- Abdominal Pain

Risk Factors for Aneurysmal Disease

- Family history – if you have been diagnosed with an abdominal aortic aneurysm it is important for your family members, 50 years old or greater, to be screened.
- Cigarette smoking
- Hypertension (high blood pressure)
- High cholesterol
- Diabetes
- Obesity
- Stress
- Inactivity

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

DIAGNOSTIC TESTS

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

Pulse Volume Recording (PVR)

Blood pressure cuffs are placed at various levels on your legs. The cuffs are inflated with a standardized quantity of air. Volume changes that occur beneath the cuff are recorded on graph paper. From this test the doctors can determine if you have any narrowing of the arteries in your legs. It takes about 15 minutes to do this test.

Ultrasound

A vascular technologist will apply ultrasound gel to your abdomen, a probe will be placed on your abdomen and then frequency sound waves are sent through the skin and form a picture of the aorta on the screen. This can detect the aneurysm and measure its approximate size.

Computerized Tomography Angiogram (CTA Scan)

This is the same preparation as the above test except you will have intravenous contrast injected through an intravenous line. If you have renal insufficiency (trouble with your kidneys) other precautions will be taken as well. This test takes smaller cuts or pictures closer together which are important to determine what type of procedure you will have to repair your aneurysm. It is also an important follow up test after an Endograft Repair.

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 before the test. They will review the procedure, possible side effects and ask you to sign a consent form. Blood work is usually 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 food 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.

Please let your doctor or nurses 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 specialist 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 518-262-5640 or 1-877-827-2852.

If you are to be admitted the day of surgery (same day 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 prior to your surgery.

SURGERY FOR OPEN REPAIR OF ABDOMINAL AORTIC ANEURYSM (AAA)

What can I expect before surgery?

The surgery is done using general anesthesia, meaning you will be asleep for the surgery. Someone from the anesthesia department will speak to you before surgery and will discuss this with you before you sign a permission form.

You will not be allowed to eat or drink for eight hours prior to surgery. You will have intravenous lines inserted so that you can receive fluids before and during your surgery. Someone will review your medications to see which, if any, you can receive the morning of surgery. As well as talk to you about the importance of deep breathing and coughing exercises, and the importance of walking after surgery.

What can I expect during surgery?

Open Technique - Using this technique the aneurysm is opened, the contents within it are removed, and a piece of synthetic graft is sewn in place where the aneurysm was. If needed, they will bypass to your iliac or femoral arteries on each side. You will therefore have a large incision on your left side and possibly smaller incisions in your right groin area or both groins. The surgery takes approximately 3 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. 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 may 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.

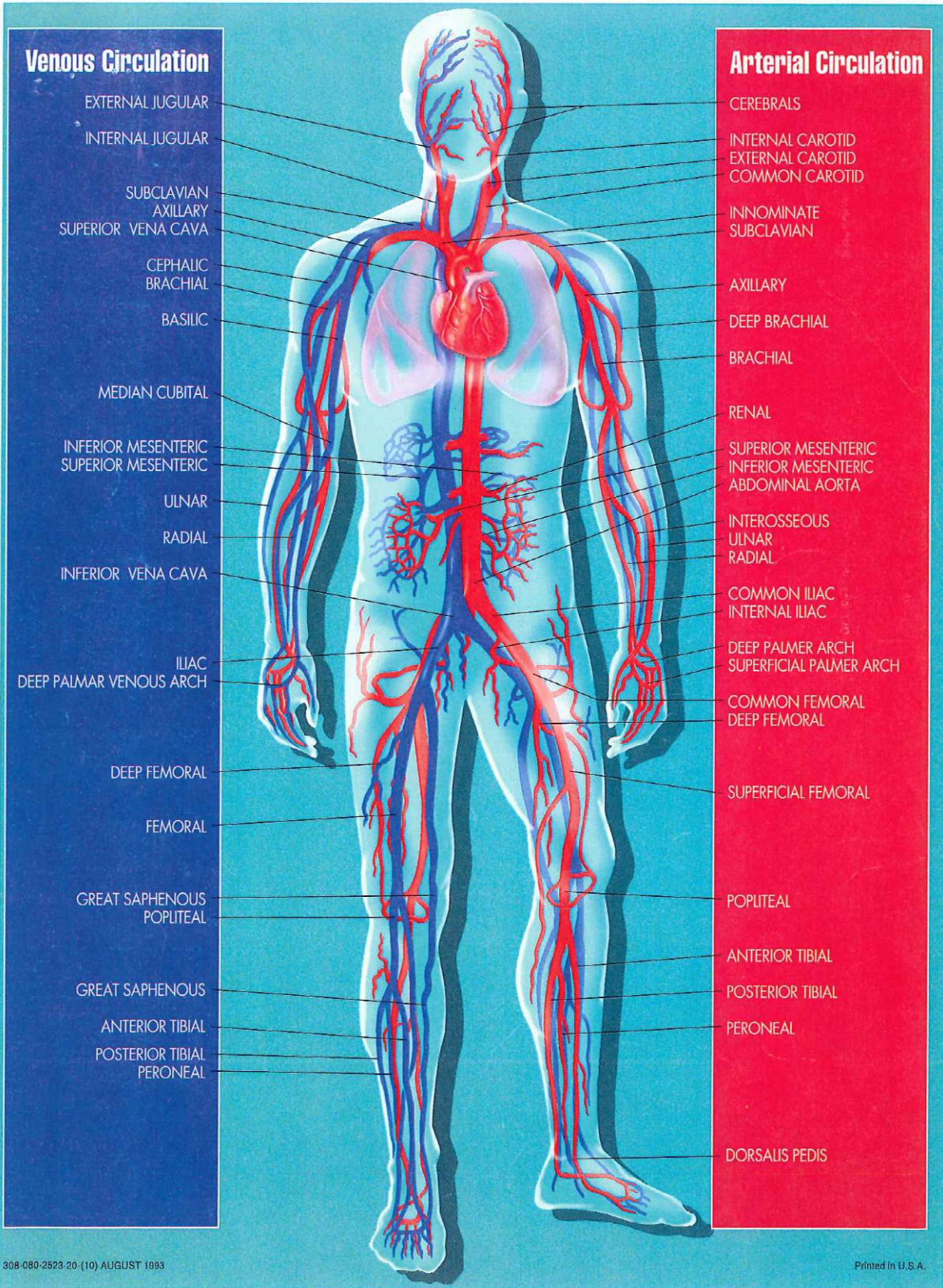
Days 3 and 4 – The catheter may be removed during this time. The nursing staff will help you to walk into the hallway. You will be encouraged to cough and deep breathe. Due to the anesthesia and your incision you are at risk of developing pneumonia. Don't forget to cough! Pain medication is ordered for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

What can I expect when I go home?

It is normal for you to feel tired. This will last for about 4 to 6 weeks. It is important however, that you push yourself to get up every day, get dressed, and take short frequent walks 4 to 5 times a day, no set distance, whatever you can tolerate. You should gradually increase this. When you feel tired you should rest.

Please Remember – No heavy lifting, pushing, or pulling for three months (nothing heavier than **10 pounds**). 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.

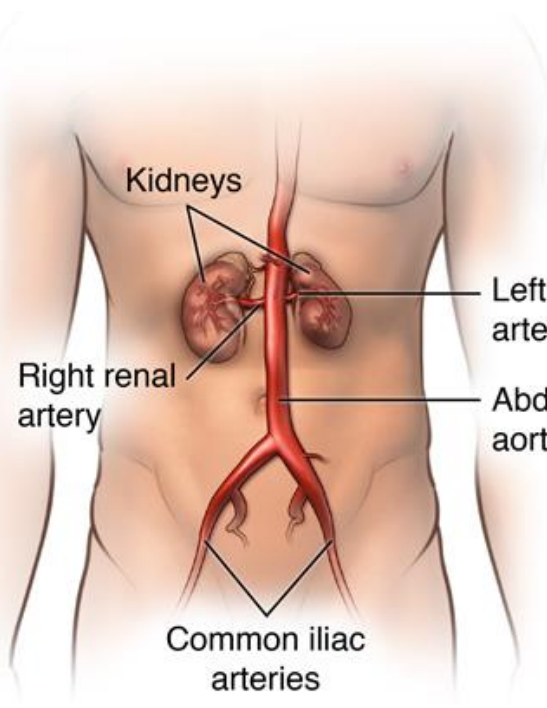


Venous Circulation

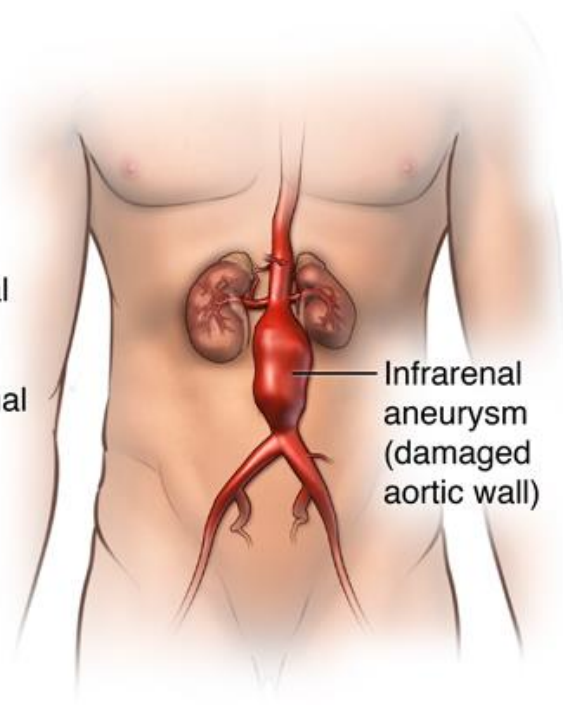
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- INTERNAL JUGULAR
- SUBCLAVIAN
- AXILLARY
- SUPERIOR VENA CAVA
- CEPHALIC
- BRACHIAL
- BASILIC
- MEDIAN CUBITAL
- INFERIOR MESENTERIC
- SUPERIOR MESENTERIC
- ULNAR
- RADIAL
- INFERIOR VENA CAVA
- ILIAC
- DEEP PALMAR VENOUS ARCH
- DEEP FEMORAL
- FEMORAL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

Arterial Circulation

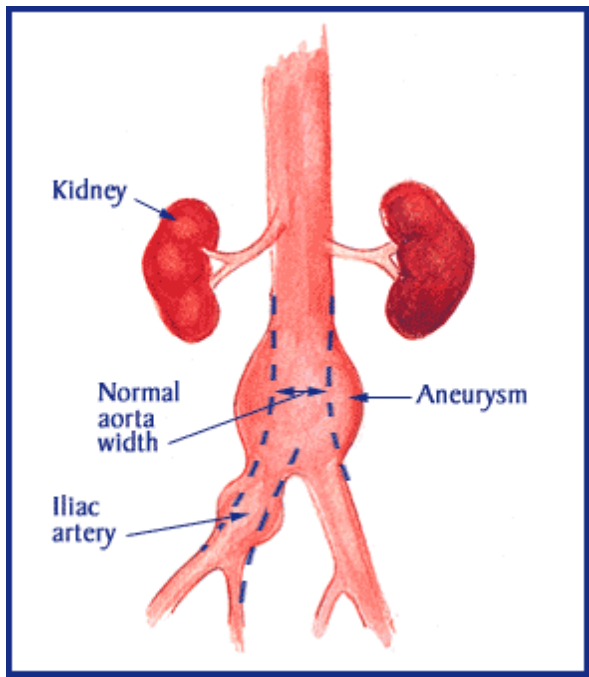
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- INTERNAL CAROTID
- EXTERNAL CAROTID
- COMMON CAROTID
- INNOMINATE
- SUBCLAVIAN
- AXILLARY
- DEEP BRACHIAL
- BRACHIAL
- RENAL
- SUPERIOR MESENTERIC
- INFERIOR MESENTERIC
- ABDOMINAL AORTA
- INTEROSSEOUS
- ULNAR
- RADIAL
- COMMON ILIAC
- INTERNAL ILIAC
- DEEP PALMER ARCH
- SUPERFICIAL PALMER ARCH
- COMMON FEMORAL
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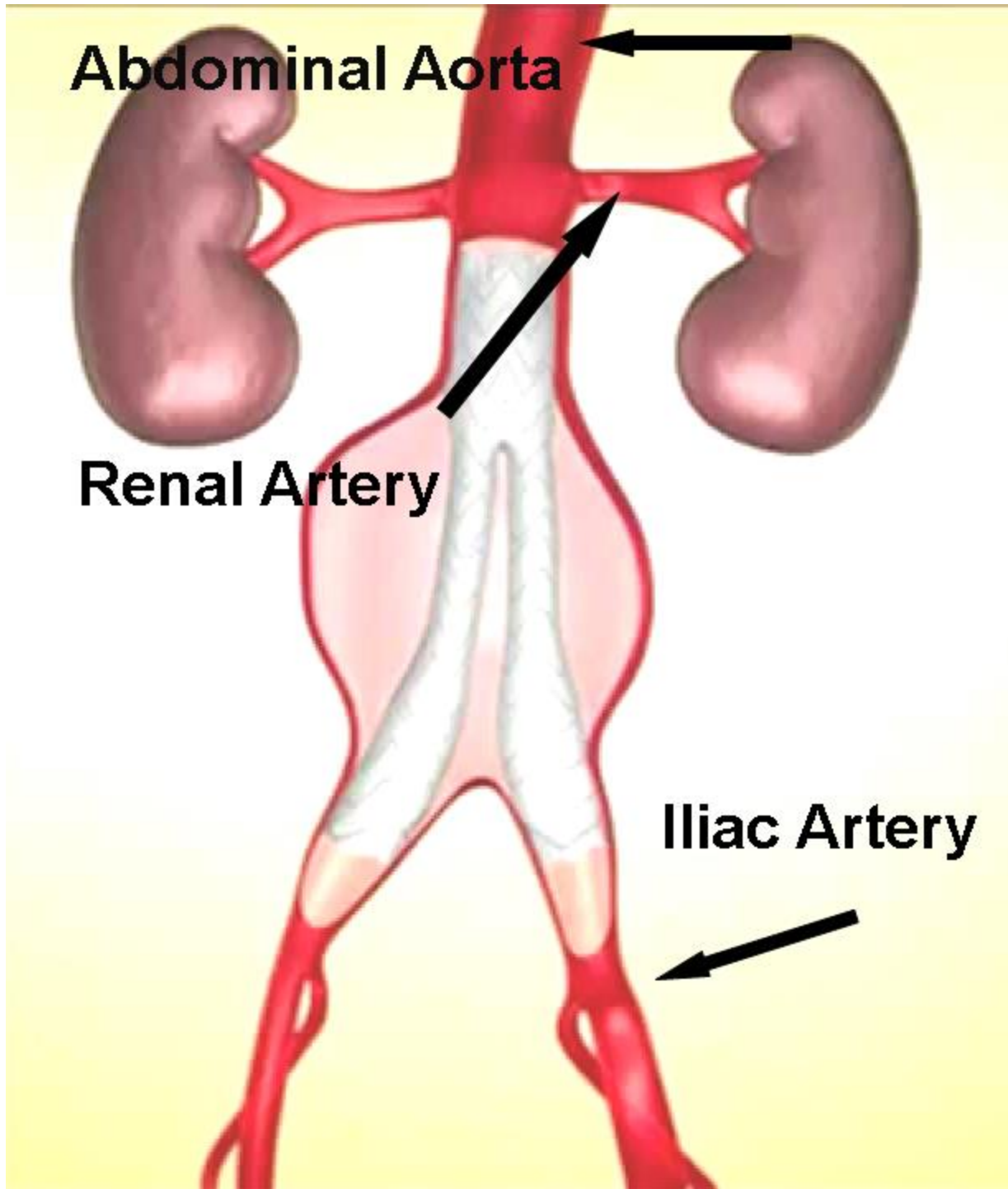


Normal abdominal aorta



Abdominal aortic aneurysm





SURGERY FOR REPAIR OF ABDOMINAL AORTIC ANEURYSM (AAA) USING ENDOVASCULAR STENT GRAFTING

What can I expect before surgery?

You will not be allowed to eat or drink for eight hours prior to surgery. You will have intravenous line inserted so that you can receive fluids before and during your surgery. Someone will review your medications to see which, if any, you can receive the morning of surgery. As well as talk to you about the importance of deep breathing and coughing exercises, and the importance of walking after surgery.

This surgery is usually done using regional anesthesia such as spinal or epidural anesthesia. Someone from the anesthesia department will speak with you before surgery to discuss this with you and have you sign a permission form.

What can I expect during surgery?

Endovascular Technique

Using this technique a stent graft, which is a woven polyester tube covered by a tubular metal web, is placed inside the diseased vessel without opening the surrounding tissue or the blood vessel. This technique effectively excludes the aneurysm from normal blood flow.

For the surgery you will have incisions in both groins. A catheter with the endograft is advanced up the artery in your groin and put in place to exclude the aneurysm sac. The surgery takes approximately two hours. You will have a urinary catheter in your bladder.

Endovascular Stent grafting requires more frequent monitoring than conventional surgery as long term results are unknown. That is why you will need to be monitored for the rest of your life with CTA's (6 weeks and every 6 months thereafter) and ultrasounds (every 6 months). If feel you cannot adhere to this schedule please discuss this with your surgeon.

What can I expect after surgery?

Day 1-2

After you are released from the Post Anesthesia Care Unit (PACU) or Recovery Room you will be admitted to a regular surgical floor. The day after your surgery the nursing staff will help you get out of bed and walk around the unit. You will be discharged in 1-2 days following the procedure.

What can I expect when I go home?

While you only have small incisions in your groins your body will have undergone a major procedure. Therefore, it is normal to be tired. This can last up to four weeks. It is important, just as with the open technique that you get up every day, get dressed and take frequent walks 4-5 times a day. No showering for 48 hours and no tub baths for two weeks following the procedure. No heavy lifting (nothing greater than **10 pounds**) for four weeks. No driving until after you are seen in the office after surgery.

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. This 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 medication 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 (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.
- It is okay for you to shower (NOT A BATH), avoid having direct stream of water on your incision and then pat the area dry.

WHAT TO REPORT

- Redness that extends away from your incision.
- Drainage, note the color, odor and amounts.
- Temperature greater than 101f for 24 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 4 to 6 weeks before you start feeling yourself again. It takes 3 months before you feel completely “normal”. **

COMPLICATIONS

While precautions are taken to prevent complications, our records show that aortic surgeries performed by The Vascular Group have approximately a 3 to 5% risk of complications. This means that 3 to 5 out of every 100 operations have some sort of complications; while 95 to 97 out of 100 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, graft 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 need more information, please call the Vascular Group and ask to speak to the Nurse Clinician or Physician.

IMPORTANT INFORMATION FOR PEOPLE WHO RECEIVE A SYNTHETIC (MAN-MADE) GRAFT:

It is currently recommended that people with man-made prosthetic grafts (this includes Gortex) 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 questions, please call Vascular Surgery at Albany Medical Center (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 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 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 2 or 3 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 2 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, and 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 (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 3 to 4 times a day. 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.