

## PATIENT INFORMATION

# Endovascular Abdominal Aortic Aneurysm Repair

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

---

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 Endovascular Aortic Aneurysm Repair. 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.

# Abdominal Aortic Aneurysm Disease

---

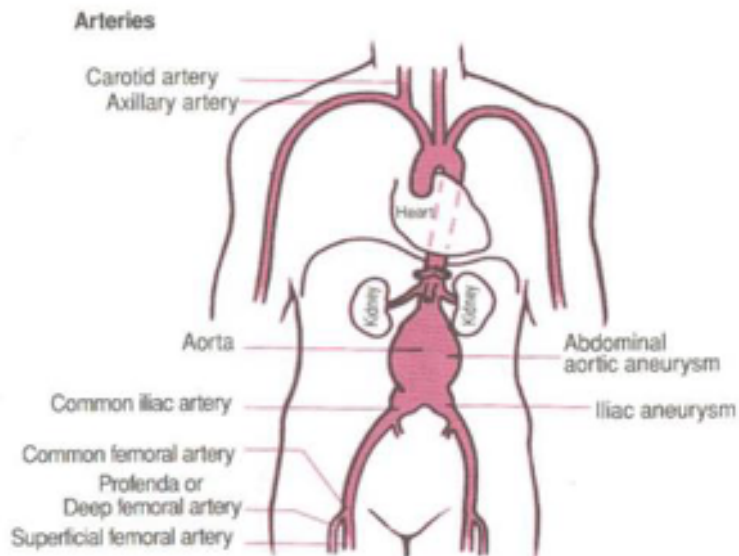
This booklet will give you and your family general information about **abdominal aortic aneurysm disease** and treatment using a stent graft.

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 aortic aneurysm disease
- Tests done to diagnosis your disease
- Endovascular treatment for disease aortic aneurysm
- Your patient pathway/guideline for your hospital stay
- Information about what to expect after surgery
- Information for discharge

# Abdominal Aortic Aneurysm



*Aneurysms of some of the Abdominal Arteries*

## **Abdominal Aortic Anatomy**

The abdominal aorta is the largest blood vessel in the body and directs oxygenated blood flow from the heart to the rest of the body. This provides necessary food and oxygen to all body cells. The abdominal aorta contains the celiac, superior mesenteric, inferior mesenteric, renal and iliac arteries. It begins at the diaphragm and ends at the iliac artery branching.

## **Definition of Abdominal Aortic Aneurysm**

Normally, the lining of an artery is strong and smooth, allowing for blood to flow easily through it. The arterial wall consists of three layers. A true aneurysm involves dilation of all three arterial wall layers.

Abdominal aortic aneurysms occur over time due to changes of the arterial wall. The wall of the artery weakens and enlarges like a balloon (aneurysm).

The precise cause of an aneurysm is unknown. As the wall dilates, the arterial wall thins. The larger the aneurysm size, the greater the risk for rupture.

## **Risk Factors for Aneurysms**

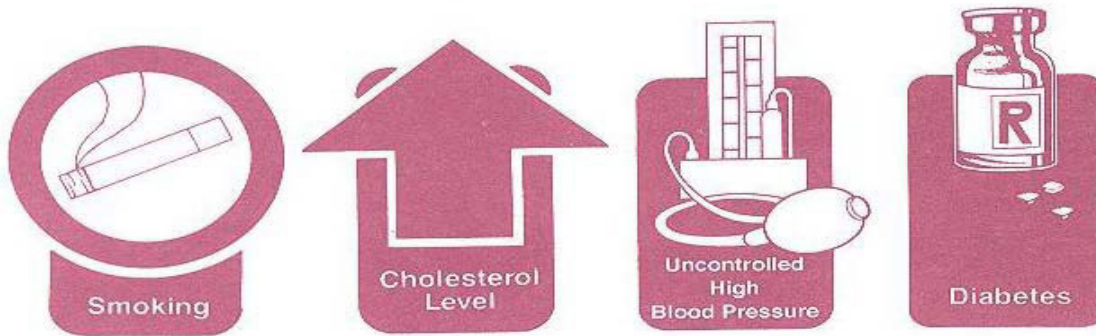
Aortic Aneurysms occur 4-5 times more frequently in men than women over the age of 65. Patients, who smoke, have coronary artery disease, and peripheral artery disease are more likely to develop abdominal aortic aneurysms. Smokers die 4 times more often from a ruptured abdominal aortic aneurysm than nonsmokers.

The cause of an abdominal aortic aneurysm is unknown; however, we do know that these factors contribute to their development.

**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

**Diagnostic tests for Abdominal Aortic Aneurysms (AAA)**

Diagnostic tests begin with a physical exam. The physical exam includes a pulse exam, arterial auscultation and palpation of the abdomen. This will detect only 30-40% of AAA's and this is dependent on aneurysm size. A person's size may make it difficult to examine the abdomen, requiring more diagnostic testing.

**Non-Invasive Testing** is performed without the use of needles, contrast or x-ray. It is painless and without known risks or side effects. With the use of a special ultrasound, the vascular technician can make recordings of the blood flow at different points along arms and legs. Blood pressure cuffs are placed around your arms and legs and pressure readings are compared. From these tests, the location and severity of your disease can be determined.

**Abdominal Aortic Duplex** is an ultrasound of the abdomen using high-frequency sound waves and a computer to create images of blood vessels, tissues and organs. It can provide information on a blood vessels location, size, shape and blood flow at a low cost. It does have limitations when it comes to patient's size and bowel gas.

You will be asked to not eat 3-4 hours before this study. You will need to lie flat during the test. Gel will be applied to your skin and a probe will be guided over your abdomen.

**Invasive Testing** may require some preparation and possibly a short hospital stay. These tests are usually for surgical planning. You may need to sign consent for these studies.

**Computed Tomography (CT) Scan or CT Angiography (CTA)** is an imaging study utilizing non-contrast and / or intravenous (IV) contrast to identify specific anatomy. You will lie on a table and be asked to remain still while you pass through a donut shaped X-rays will be taken. An IV will be used if contrast is needed for the study.

**Magnetic Resonance Imaging (MRI) / Magnetic Resonance Angiography (MRA)** is an imaging study which creates images of blood vessels which can be three-dimensional this study does not use x-rays; instead, it uses a strong magnet that sends out radio waves to create the images. It may or may not involve the use of contrast or IV's. You will be asked specific questions about your past medical and surgical history. You will lie on a table and be asked to remain still while you pass through a donut shaped scanner. An IV will be used if contrast is needed for the study.

**Arteriogram** is an x-ray of the arteries using contrast to highlight the blood vessel. It is completed by injecting contrast through a needle in either the groin or the upper arm.

**Intravascular ultrasound (IVUS)** is a study that sends high frequency sound waves into the blood vessel from a catheter inside the artery forming an image. The technique of doing this test is similar to an arteriogram. No contrast is necessary for this study

### **Goals**

When a patient is diagnosed with an AAA, there are several goals that your healthcare provider wishes to achieve:

- Relieve any symptoms that you may have related to the AAA
- Stop the growth in size of your aneurysm
- Avoid rupture of the aneurysm

Achieving these goals will ultimately lead to a longer life and prevent death.

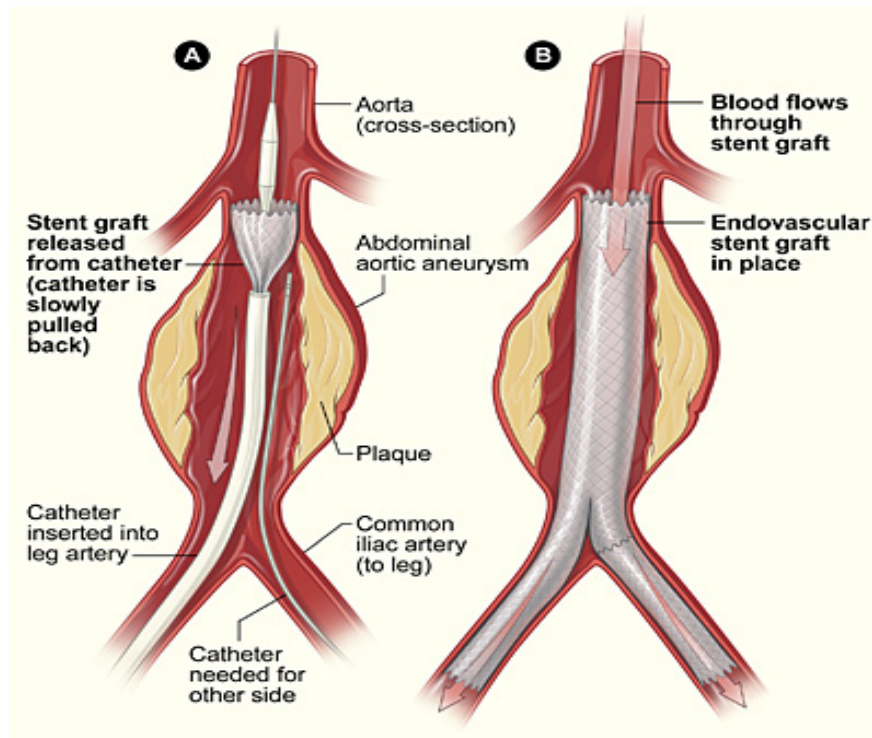
No matter the size or location of your AAA, you should be treated from a medical standpoint, which is consistent with the recommendations for any patient with atherosclerotic disease. Your blood pressure should be carefully controlled and you should stop smoking if you do so.

## Treatment

It is recommended that an AAA be treated when the size of the aneurysm is larger than 5.5 cm, has been growing larger than 0.5 cm in the past six months or has grown larger while monitoring the aneurysm size. If your AAA is causing pain, this is an indication for treating your aneurysm.

There are two ways to surgically treat an abdominal aortic aneurysm. One is an **endovascular repair** and the other is an open repair. Your healthcare provider will determine which procedure is appropriate for you.

Endovascular repair is a minimally invasive procedure. This means it is done with a small cut (incision). It is often done under general anesthesia, so you sleep through the procedure. During the procedure, a surgeon makes an incision through an artery in your groin. A thin, flexible tube (catheter) is threaded up through the artery and to the site of the aortic aneurysm. A stent graft is sent along the catheter to the aneurysm. The stent graft is a tube made of a thin metal mesh (the stent), covered with a thin polyester fabric (the graft). This stent graft is opened inside the aorta and fastened in place. The stent graft stays in place, and blood flows through it. It protects that part of the aorta, and prevents the aneurysm from bursting.





## **What are the risks of endovascular repair of an abdominal aortic aneurysm?**

Every procedure has some risks. The risks of this procedure include:

- Heavy bleeding at the insertion site
- Blood that still flows through the aneurysm bulge
- A graft that moves, bends, or comes loose
- Infection
- Heart attack
- Reaction to anesthesia
- Reduced blood flow to the legs, intestines, or kidneys
- Pressure in the abdomen that can damage organs (abdominal compartment syndrome)
- The need to change to open surgery during the procedure

Your risks may vary depending on your age, your overall health, and the size and location of your aneurysm. Talk with your healthcare provider to learn which risks apply to you. Tell your provider about any questions or concerns you have.

### **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.

## **What happens during an endovascular repair of an abdominal aortic aneurysm?**

A vascular surgeon and a team of specialized healthcare providers will perform the procedure. Your provider can explain what to expect for your surgery. This is an example of how it is done:

1. You will be given anesthesia. This prevents pain and causes you to sleep through the procedure.
2. Your vital signs, like your heart rate and blood pressure, during the procedure.
3. Your surgeon will make a small cut in your groin and into an artery there. He or she will then insert a thin, flexible tube (catheter) into the artery.
4. The tube will be gently guided all the way to site of the aneurysm. The surgeon will use moving X-ray pictures to get to the right spot.
5. A stent graft is sent along the catheter to the aneurysm. The stent graft is a tube made of a thin metal mesh (the stent), covered with a thin polyester fabric (the graft). The tube is collapsed so it is narrow and can fit through your blood vessel.
6. When the stent graft reaches the aorta, it is opened up and fastened in place. The stent graft then stays in place, and blood flows through it. It protects that part of the aorta, and prevents the aneurysm from bursting.
7. Your surgeon will remove the catheter. The incision in your groin is closed and a small bandage is put on the wound.

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>Operation Date</b>	<b>Admission/ ICU</b>	<b>Post – Day 1</b>
<b>Expected Outcomes</b>	Graft placed successfully to exclude your Aneurysm	Groin incisions dry Pulses in your feet Vital signs stable	Groin incisions dry Pulses in your feet Vital signs stable You are able to move around. Home before 10:00 am
<b>Consults</b>	Anesthesia Case Management	Case management for discharge planning	
<b>Assessment and Monitoring</b>	Your Caretakers will check you frequently for: Abdominal pain Back pain Pulses in your feet Vital signs Neurological changes	Your Caretakers will continue to check following: Both groins for pulse, bruising or bleeding Abdominal pain Back pain Pulses in your feet Vital signs Neurological changes	Your Caretakers will continue to check following: Both groins for pulse, bruising or bleeding Abdominal pain Back pain Pulses in your feet Vital signs Neurological changes
<b>Labs, Tests and Treatments</b>	Blood work Electrocardiogram if needed X-ray of chest if needed	Blood work	
<b>Medications</b>	Home medications verified IV fluid started Antibiotic given before your procedure	Home medications started IV fluids continued until you can eat and drink Cholesterol medication and blood thinner started if you are not taking already. Pain medicine as needed	Discontinue IV fluids Home medications continued, including blood thinner and Cholesterol medication
<b>Diet</b>	Nothing to eat or drink	Cardiac diet with previous home restrictions	Cardiac diet with previous home restrictions
<b>Activity</b>	Normal	Bedrest lying flat for 6 hours after the procedure and then you can get up in chair and ambulate with assistance	Normal with weight lifting restrictions, less than 5 lbs.
<b>Patient education</b>	Educational booklet will be given to you. Smoking cessation	Breathing exercises every hour while awake. Long term risk management education (see top right)	Education for after surgery activities and restrictions.
<b>Discharge planning</b>	Caretakers will evaluate your needs before discharge for family support, home health, transportation or care facility	Caretakers will plan for your needs after discharge such as family support, home health, transportation or care facility	Discharge instructions given Prescriptions given if needed Follow appointment will be made to see your doctor in 2-4 weeks. Order for testing will be made for CT

# Your Care in Hospital – After Surgery

---

After the procedure, you will be taken to the intensive care unit (ICU) to be closely monitored. You will be connected to monitors that will constantly display your blood pressure, pulse, breathing rate, and your oxygen level.

The nurses will also continue to check your groins for bleeding, bruising and pulses. They will also check the circulation in your feet to make sure that the graft is open and you have good pulses in your feet.

## **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.

## **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 groin incisions are small and will be closed by sutures under the skin and skin glue applied on top. 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

---

## 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.
- Breathe out through your mouth.

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



# Preparing for Discharge

---

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 incisions.
- 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 5 lbs. for 48 hours, after you are discharged. For 1 to 2 weeks, avoid lifting more than 10 lbs. or 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 one week after your surgery.

## 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 253-697-3200 (Puyallup office) or 253-403-8410 (Tacoma office) to reschedule.**

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

- If there is bleeding from the incision site that does not stop when pressure is applied.
- Painful swelling in the groin area.
- Leg swelling that does not improve with elevation above the heart.
- If your leg(s) become cold, painful or numb.
- Chest pain.
- Shortness of breath.
- Redness or swelling around your incision.
- If you have chills or a fever over 101 degrees F.

**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



MultiCare 

