

Abdominal Arterial Disease

Circulating the Facts About Peripheral Vascular Disease

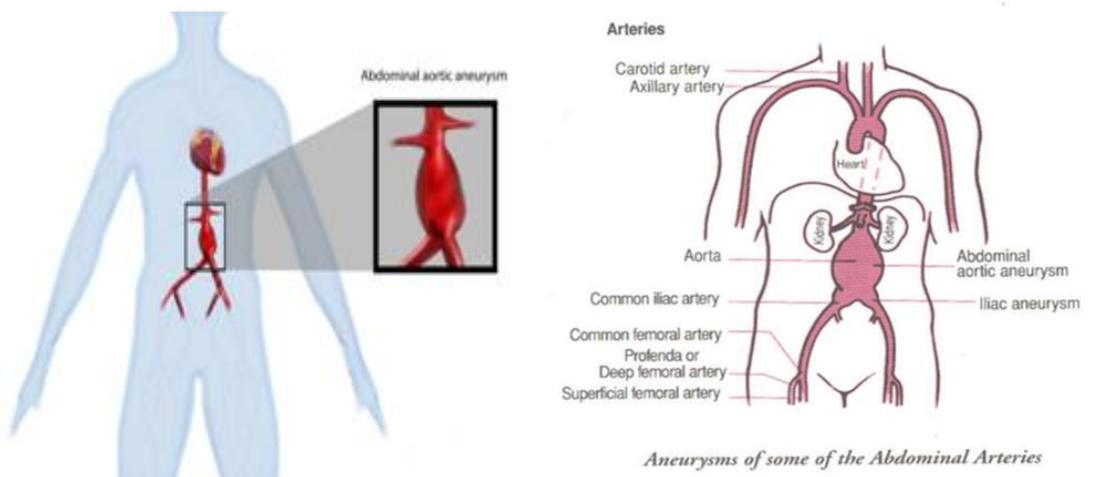
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of the Society for Vascular Nursing*

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Abdominal Aortic Aneurysms

Objectives:

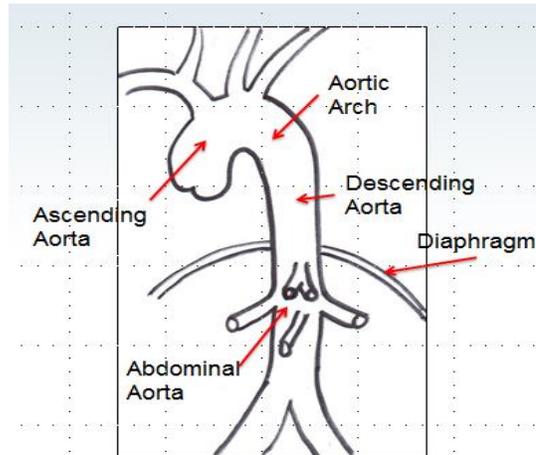
- Define Abdominal Aortic Aneurysm
- Identify the Risk Factors
- Discuss Medical Management and Surgical Repair of Abdominal Aortic Aneurysms



- Unit 1: Review of Aortic Anatomy
- Unit 2: Definition of Aortic Aneurysm
- Unit 3: Risk factors for Aneurysms
- Unit 4: Types of aneurysms
- Unit 5: Diagnostic tests for Abdominal Aortic Aneurysms
- Unit 6: Goals
- Unit 7: Treatment
- Unit 8: Open surgical repair of Abdominal Aortic Aneurysms
- Unit 9: Complications
- Unit 10: Post procedure care

Unit 1: Review of 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.



Unit 2: 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.

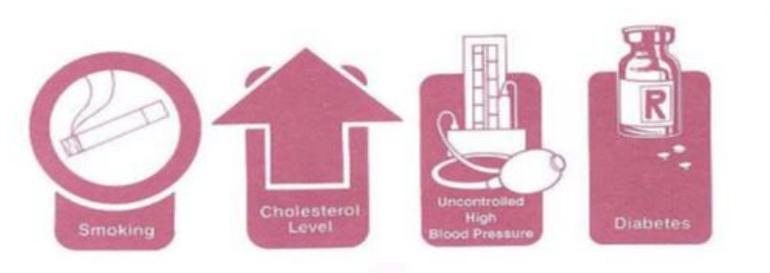
Unit 3: Risk Factors for Aneurysms

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

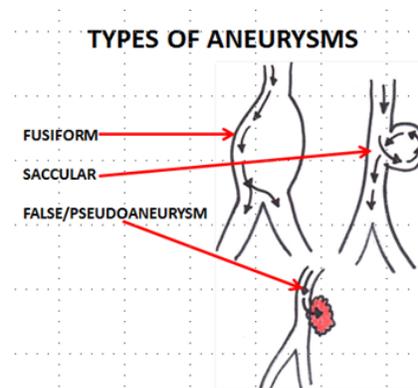


Risk factors that cannot be changed include:

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

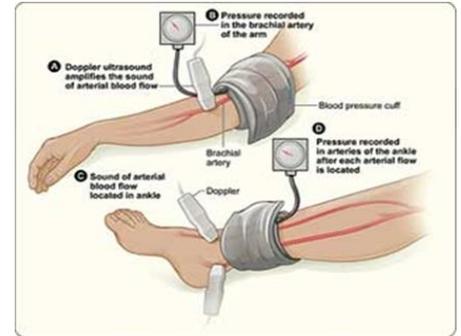
Unit 4: Types of Aneurysms

Aneurysms can be either true or false (pseudoaneurysms). True aneurysms involve all three layers of the aorta. They can take on two types of shapes, fusiform or saccular. Fusiform aneurysms are more common and with a more uniform, symmetrical circumferential shape of the aortic wall. Saccular aneurysms are more localized and have a sack-like unilateral out pouching (ballooning on one side) of the aorta wall. A pseudoaneurysm, or false aneurysm, is a result of leakage from an arterial puncture or tear into surrounding tissues. A false aneurysm may result from prior surgery, trauma or cannulation (from catheter placement).



Unit 5: 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 scanner. 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.

Unit 6: 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.

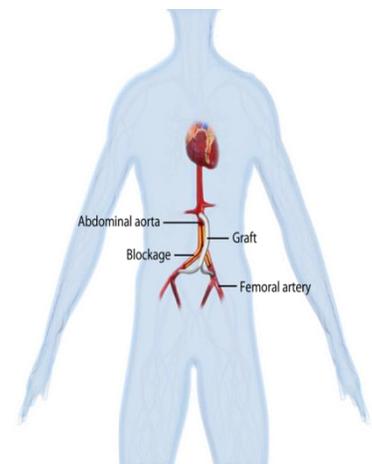
Unit 7: Treatment

It is recommended that an AAA be treated when the size of the aneurysm is larger than 5.0 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.

Unit 8: Open surgical repair

The standard approach for open surgery is an incision down the middle of your abdomen. This incision will begin just below your breastbone and end just below your navel. This allows for the aorta to be seen by the surgeon. This surgery is done in an operating room under general anesthesia. A surgical clamp is placed above and below the aneurysm and a cylinder-like tube called a graft is sown inside of the aneurysm sac. The grafts are made of various materials such as **Dacron** (textile polyester synthetic graft) or **polytetrafluoroethylene** (PTFE which is a non-textile



synthetic graft). This is a major surgery that will generally require 7-10 days in the hospital and takes several hours to complete the surgery.

What are the risks?

As with any surgical procedure, complications can occur. Possible complications may include, but are not limited to, the following:

- Myocardial infarction (heart attack)
- Irregular heart rhythms (arrhythmias)
- Bleeding during or after surgery
- Injury to the bowel (intestines)
- Limb ischemia (loss of blood flow to legs / feet)
- Embolus (clot) to other parts of the body
- Infection of the graft or wound
- Lung problems
- Kidney damage
- Spinal cord injury

Unit 9: Care After

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.

You may have a tube in your throat so that breathing can be assisted with a ventilator (breathing machine) until you are stable enough to breathe on your own. As you continue to wake up from the anesthesia and start to breathe on your own, the breathing machine will be adjusted to allow you to take over more of the breathing. When you are awake enough to breathe completely on your own and you are able to cough, the breathing tube will be removed.

After the breathing tube is out, your nurse will assist you to cough and take deep breaths every two hours. This may be uncomfortable due to soreness, but it is extremely important that you do this in order to keep mucus from collecting in your lungs and possibly cause pneumonia. Your nurse will show you how to hug a pillow tightly against your chest while coughing to help ease the discomfort.

You may receive pain medication as needed, through an epidural catheter, or by administering it yourself through a device connected to your intravenous line. You may have a catheter collecting your urine at this time.

You may be on special IV medications to help your blood pressure and your heart, and to control any problems with bleeding. As your condition stabilizes, these medications will be gradually decreased and discontinued as your condition allows.

If you have a drainage tube in your nose you will not be able to eat or drink until the tube is removed. The drainage tube will be removed when your intestinal function has returned to normal, usually two to three days after the procedure.

When your healthcare provider determines that you are ready, you will be moved from the ICU to a post-surgical nursing unit. Your recovery will continue to progress. Your activity will be gradually increased as you get out of bed and walk around for longer periods of time. Your diet will be advanced to solid foods as tolerated.

What can you expect at home after you are discharged from the hospital?

When you get home, it will be very important that you keep your incisions clean with soap and water daily and dry the areas. If you have sutures or staples, these will be removed during your follow-up visit with your healthcare provider.

Your incisions will be sore for several days after your surgery. Pain medications will be prescribed for use at home.

You should not drive until you are cleared by your healthcare provider and until you no longer are taking pain medications. You may be given additional instructions depending upon your particular situation.

You should call your healthcare provider immediately if you experience any of the following:

- Fever and/or chills
- Redness, swelling, or bleeding or other drainage from the incision site
- Increase in pain around the incision site
- Your healthcare team may give you additional or alternate instructions after the procedure, depending on your particular situation