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Health Education Sheet

Abdominal Aortic Aneurysms

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What are abdominal aortic aneurysms?

An aneurysm is a weak segment in the wall of an artery that stretches outward as blood presses against it, causing it to bulge like a balloon. If this "balloon" expands too much, stretching and thinning the arterial wall it presents a risk of bursting and causing uncontrolled, possibly life-threatening internal bleeding.

Aneurysms can develop in any artery within the body, but the preponderance of them arise in the brain and in the aorta which is the large trunk artery just below the heart, through which almost all of one's blood passes before flowing to other parts of the body. The majority of aneurysms develop in the aorta, and although they can develop in the thoracic aorta (the section in the chest), most occur in the abdominal aorta, the section located between the midriff and the pelvis. The normal aorta is about an inch in diameter, and blood moves through it at a speed of about eight

inches a minute.

The surgeons and interventional radiologists of Connecticut Vascular Institute (CVI) have extensive experience in correction of this problem and have been pioneers in development of techniques for dealing with it. CVI has the most extensive experience in Connecticut performing the state-of-the-art interventional radiology technique of stent-graft repair (for more information on interventional radiology [click here](#)).

The approach to requiring an abdominal aortic aneurysm required will vary depending the individual aortic aneurysm case, and CVI surgeons and interventional radiologists work closely together to ensure that the treatment approach used is the one best suited to each patient.

It should be emphasized that the presence of an aortic aneurysm is an extremely serious matter. While some aneurysms remain small and never rupture, many enlarge and do rupture. If a rupture occurs, immediate treatment is essential., but is often ineffective. Without treatment, rupture is invariably fatal.

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How common are abdominal aortic aneurysms?

In the United States, abdominal aortic aneurysms occur in about six percent of people older than 60, and at least four times more often in men than women. Some 40,000 people undergo procedures to deal with the presence of aneurysms each year, and 15,000 die from aneurysms that have burst.

The good news is that aneurysms that are caught early, when small, can be dealt with and the risk of bursting avoided. When AAAs are repaired before they can rupture, the mortality rate is less than four percent, compared to a mortality rate up to 75 percent for repair procedures that take place after rupture.

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What causes abdominal aortic aneurysms?

Previously, the development of abdominal aortic aneurysms had been considered a consequence of atherosclerosis, the build up of plaque from cholesterol and other fats within the arteries (sometimes also referred to as hardening of the arteries). Today, along with atherosclerosis, a genetic propensity, hypertension, smoking, inflammation and simply the aging process are considered factors in the development of weakness in arterial walls.

The specific mechanisms are not clear. It's suspected that certain enzymes associated with atherosclerosis destroy collagen and elastic in an arterial wall, resulting in weakness. The general loss of elasticity in the wall that comes with aging, infection and inflammation that might be associated with other medical problems, and a genetic propensity may contribute to the

phenomenon.

Normally the aortic wall is relatively flexible, able to expand and contract as normal blood flow requires. If that elasticity is lost as one ages and the wall is weakened by atherosclerosis, it is vulnerable to the stretching out and bulging that becomes an aneurysm.

As for a genetic factor, it is known that about a quarter of people who develop AAAs have a history of similar problems in their immediate families.

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What are the risk factors for developing an abdominal aortic aneurysm?

Aneurysms can affect anyone, male or female, and at any age.

Your risks are higher, however, if you:

- Are male
- Are age 60 or older
- Have atherosclerosis
- Have Hypertension
- Smoke
- Members of your immediate family have experienced abdominal aortic aneurysms
- Have Marfan's disease, a disorder of the connective tissue, or other genetic problems that may weaken the aorta

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When does an aneurysm become dangerous?

Aneurysms that are small in size — that is, less than two inches (5 centimeters) in diameter — are usually considered unlikely to rupture and are not considered an imminent danger. As noted, many aneurysms do not enlarge beyond a small diameter. In this case, your doctor may feel that an approach of "watchful waiting" — doing nothing and monitoring the aneurysm's condition with regular checkups — is appropriate.

About half of all abdominal aortic aneurysms detected are in the small category.

It perhaps should be noted that a small aneurysm experienced along with some other medical problem (such as high blood pressure) may require more aggressive action, even if it is only making sure the blood pressure is controlled.

An abdominal aortic aneurysm determined to be larger than two

inches (5 cm) in diameter is viewed as being at risk of rupturing and in need of repair.

An additional risk associated with an unruptured aortic aneurysm is that of blood clots developing within the aneurysm, breaking loose and moving through the bloodstream. "Blue toe" — a painful condition in which a toe turns blue or even black — can be an indication that blood supply to the feet has been blocked by a clot which came from the aneurysm and lodged in an artery in the legs or feet.

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What are the symptoms of an aortic aneurysm?

Often an aneurysm presents no obvious symptoms until a rupture occurs. Fortunately, many aneurysms are detected in the course of a routine physical exam, or during an ultrasound test.

If the bulging aneurysm is large and pressing against other organs, you could conceivably have symptoms such as pressure, pain or a sense of fullness in your abdomen or pelvis, pain in the small of your back, or a sense of pulsating in the abdominal region from the unusual movement of blood.

If the aneurysm ruptures, there are definite symptoms, including:

- Sudden, severe abdominal pain
- Rapid pulse
- Low blood pressure
- Clammy Skin
- Nausea
- Dizziness
- Possible fainting
- Sweating

If a rupture occurs, this is an extremely serious event that requires immediate treatment. Without treatment one is at risk of dying.

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How are aortic aneurysms detected or diagnosed?

A large percentage of abdominal aortic aneurysms can be detected by a good physical examination.

If your doctor suspects the presence of an aneurysm, he or she will order diagnostic imaging of your abdomen, whether by x-ray, computerized tomographic scanning (CT scan), ultrasound or magnetic resonance imaging (MRI).

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What are the treatment options for an abdominal aortic aneurysm?

Since an aneurysm that is less than two inches (5 cm) in diameter is not considered at risk, the treatment for it usually consists of simply monitoring it carefully over time. In this case, for example, regular ultrasound scans may be useful to measure any changes in size. Medications to lower blood pressure or deal with other problems may also be considered appropriate.

Treatment for a larger aneurysm that is considered to be at risk for rupture can take the form of either conventional surgery performed by a vascular surgeon, or an endovascular repair — done through catheters from within the artery through small incisions in the thigh — procedure performed by a team involving an interventional radiologist and a vascular surgeon.

The appropriate approach depends on the size and structure of the aneurysm, how fast it is growing, its location and what other symptoms are present. It's important to remember that any form of intervention for an AAA is considered a serious procedure, and the benefits need to be weighed against the risks of living with the aneurysm. The CVI vascular surgeons and interventional radiologists will help guide you to the best approach.

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What does conventional surgery involve?

The night before surgery, you'll be asked not to eat or drink anything after midnight. Upon arrival at the hospital, you'll be given antibiotics as a precaution and have intravenous lines inserted into your arm to keep you hydrated and provide a channel for medications during the procedure. During surgery, you'll be unconscious with a general anesthetic.

During the operation, the surgeon will make an incision in your abdomen to access the aneurysm. Heparin or another anticoagulant will be introduced to prevent blood clots, and relevant arteries and veins will be clamped to stop blood flow in the area of the aneurysm.

Then the damaged section of aorta will be removed and replaced with a synthetic tube made of Dacron, which will be secured with stitches. The clamps will be removed slowly to allow blood flow to resume gradually.

Following surgery you're likely to spend a night in intensive care, six to eight days in the hospital and four to seven weeks recovering at home.

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How is stent-graft repair performed?

As with conventional surgery, the night before your stent-graft procedure, you'll be asked not to eat or drink anything after midnight. Upon arrival at the hospital, you'll be given antibiotics as a precaution and have intravenous lines inserted into your arm to keep you hydrated and provide a channel for medications during the procedure. Stent-graft repair is performed with sedation and general anesthesia.

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What can I do to prevent development of an abdominal aortic aneurysm?

There is little you can do to specifically prevent the development of an aneurysm. The most important thing you can do is act to deal with underlying problems that contribute to formation of aneurysms, such as atherosclerosis and high blood pressure.

Ways to do this include:

- Control your cholesterol through diet
- Exercise regularly
- Lose or keep off excess weight
- Don't smoke
- Control your blood pressure
- Talk with your doctor about medications for blood pressure or cholesterol if lifestyle changes don't work.
- Have regular physical exam and ask your doctor for an ultrasound exam if you have a family history of aneurismal disease.

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What should I think about in considering treatment for my aortic aneurysms?

No approach is right for everyone. Whatever action is taken should be suited to your situation, including the size, location and rate of growth of your aneurysm, your general physical condition, and other factors. Any form of surgery for an AAA is a serious procedure.

Conventional surgery has long been the standard treatment and continues to be the very appropriate for many people. A stent-graft procedure offers the advantages of being performed with smaller incisions and with a much shorter hospitalization and recovery times. It may be preferable for many people who's physical condition precludes traditional surgery.

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For additional information

You can find much additional information about abdominal aortic aneurysms at web sites sponsored by government agencies, societies and healthcare institutions. It should perhaps be noted that the World Wide Web is open to many sources posting questionable information and promises, and you are encouraged to seek information from established, reputable organizations.

Likely sources include:

The Society of Interventional Radiology

www.sirweb.org

Emedicine

www.emedicine.com

Heart Center Online

www.heartcenteronline.com

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