

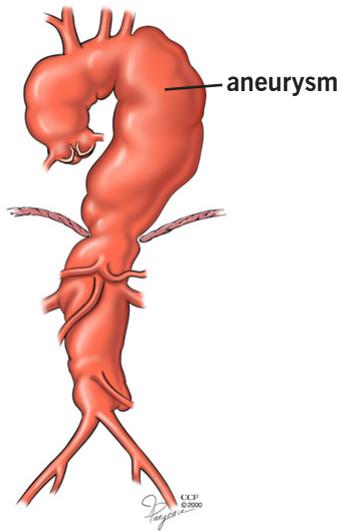


Aortic Aneurysm Guide



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What is an aortic aneurysm?



An aortic aneurysm is a bulge in the aorta that develops in areas where the aorta wall is weak. The pressure of the blood pumping through it causes the weakened section to bulge out like a balloon.

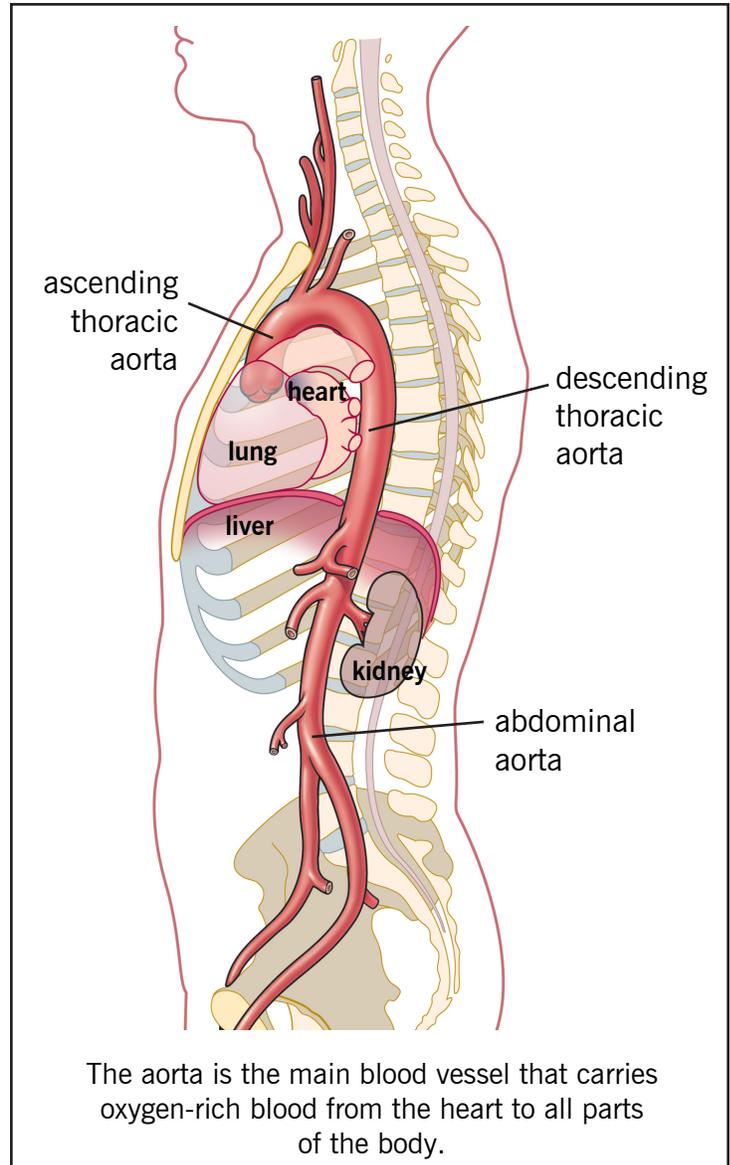
An aneurysm can develop in any section of the aorta. The location of the aneurysm determines its type:

- **Abdominal aortic aneurysms** occur in the section of the aorta that passes through the abdomen. These are the most common type of aortic aneurysm.
- **Thoracic aorta aneurysms** occur in the portion of the aorta in the chest. A thoracic aortic aneurysm can develop in the aortic root, the ascending aorta, aortic arch (the section of the aorta in the chest that bends) or descending aorta.

What are the risks related to an aortic aneurysm?

Aneurysms can grow in size over time. As an aneurysm expands, it can start to cause symptoms. When an aneurysm gets too large, it can rupture and cause life-threatening bleeding or instant death — without any prior warning.

A blood clot may also form in the aneurysm. Small pieces of a blood clot can break off and travel throughout the body. If a fraction of a clot gets stuck in a brain or heart blood vessel, it can cause stroke or heart attack. In other vital organs, like the kidneys or liver, a piece of blood clot can disrupt normal function. At the least, a clot fragment that blocks blood flow in the legs, feet or arm can cause numbness, weakness, tingling, or coldness, light-headedness or localized pain.



What are the symptoms?

Most patients with aortic aneurysms do not have any symptoms at all. The aneurysm is usually discovered by X-ray during a routine health exam for some other, unrelated condition.

Many aortic aneurysms will grow slowly for years before they are large enough to cause symptoms. Even large aneurysms may not cause any symptoms.

When symptoms do occur, pain in the chest or abdomen is most common, depending on the aneurysm's location. Pain may be intermittent or constant.

Some people describe a pulsing sensation in the abdomen as a symptom of an abdominal aortic aneurysm. A thoracic aortic aneurysm may cause back pain, shortness of breath or difficulty swallowing.

Symptoms of thoracic aneurysm are most common when the aneurysm is in the aortic arch.

A ruptured aneurysm usually produces sudden, severe pain and other symptoms such as a loss of consciousness or shock, depending on the location of the aneurysm and the amount of bleeding. A ruptured aneurysm requires emergency treatment.

How are aortic aneurysms diagnosed?

Most aneurysms that are not causing any symptoms often are discovered by X-ray during a routine health exam for some other, unrelated condition. In other cases, an aneurysm is discovered when it has grown large enough to cause symptoms that send the person to the doctor. If an abdominal aortic aneurysm is suspected, your doctor may use ultrasound or CT scanning to diagnose it.

If you have any symptoms of an aneurysm, call your doctor right away so your symptoms can be evaluated. If you feel your symptoms are a medical emergency, do not wait for an appointment. Call 911 immediately and ask to be transported to the nearest hospital.

Glossary of Aneurysm Terms

Abdominal aorta: Section of the aorta that runs through the abdomen.

Abdominal aortic aneurysm: Aneurysm that develops in the abdominal aorta.

Aorta: The main blood vessel that carries oxygen-rich blood from the heart to all parts of the body.

Aortic aneurysm: A bulge in the aorta that develops in a weakened area of the aorta wall. The pressure of the blood pumping through it causes the weakened section to bulge out like a balloon. (See illustration on first page).

Aortic dissection: Tearing in the layers of the aorta that can cause life-threatening internal bleeding. An aortic dissection requires emergent treatment.

Aortic root: The section of the aorta that is attached to the heart. The aortic root includes the annulus (tough, fibrous ring) and leaflets of the aortic valve; and the openings where the coronary arteries attach (coronary ostia). See illustration next page.

Aortic rupture: A section of the aorta that bursts and causes life-threatening internal bleeding. An aortic dissection requires emergent treatment.

Endovascular repair of aortic aneurysm: Less invasive surgical repair of an aortic aneurysm performed through

small groin incisions. A catheter (small, flexible tube) is used to guide a stent-graft through the blood vessels and deliver it to the site of the aneurysm. The stent-graft is deployed in the diseased segment of the aorta to "reline" the aorta like a sleeve to divert blood flow away from the aneurysm.

Saccular aneurysm: A aneurysm that is a small, lopsided blister that develops on one side of the aorta.

Thoracic aorta: Section of the aorta that runs through the chest area and includes the ascending and descending thoracic aorta. See image, page 1.

Thoracic aortic aneurysm: Aneurysm that develops in the thoracic aorta. It can involve the aortic root, ascending aorta, aortic arch or descending aorta. When detected in time, a thoracic aortic aneurysm can be repaired.

Thoracoabdominal aorta: The descending and abdominal aorta.

Thoracoabdominal aneurysm: An aneurysm that develops in the lower part of the thoracic aorta and the upper part of the abdominal aorta.

Thrombus: Blood clot that can occur at the site of the aneurysm. If it dislodges, it can increase the risk of a stroke.

How aortic aneurysms are diagnosed (continued)

CT scanning or MRI typically are used to diagnose thoracic aortic aneurysms.

When the diagnosis of an aortic aneurysm is confirmed, a vascular specialist will use several different imaging tests to gather more information about it, such as its size, shape and precise location. Additional diagnostic tests may include:

- High resolution CT scan
- Angiogram (an x-ray of the blood vessels)
- Transesophageal echocardiography (TEE), to record ultrasound images of the aorta from inside your esophagus
- Intravascular ultrasound (to study the inside of the blood vessels)

Abdominal Aortic Aneurysm Screening

Abdominal ultrasound is an effective preventive screening tool for abdominal aortic aneurysm that should be used in those individuals who have a high risk for aortic aneurysm.

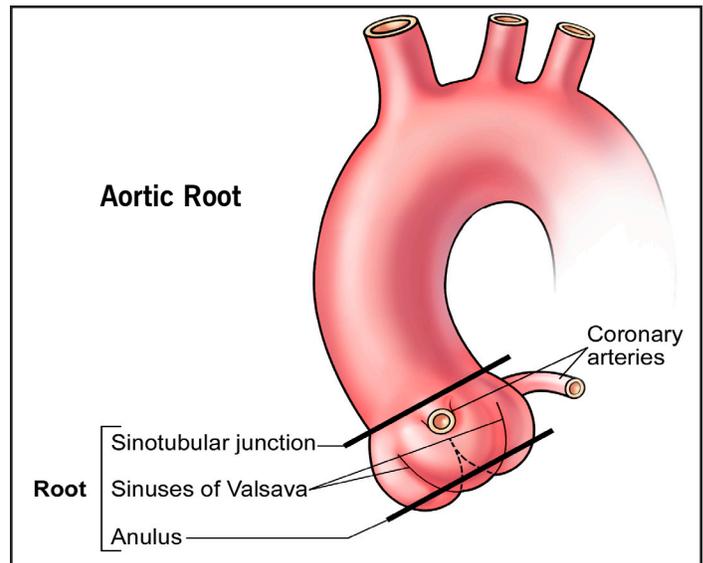
Cleveland Clinic specialists follow screening recommendations from the Society for Vascular Surgery and the Society for Vascular Medicine and Biology. Under these guidelines, abdominal ultrasound screening is recommended for the following patients:

- All men aged 60 to 85 years
- All women aged 60 to 85 years who have cardiovascular risk factors
- All men and women aged 50 and older who have a family history of abdominal aortic aneurysm

Insurance coverage for abdominal aortic aneurysm ultrasound screening depends on your insurance provider. Please contact your insurance provider for specific coverage options.

Medicare now offers a one-time, no-cost abdominal ultrasound to qualified seniors within the first 12 months of enrollment in Medicare. Men who have smoked at least 100 cigarettes during their lifetime, and men and women with a family history of abdominal aortic aneurysm qualify for the Medicare screening.

Based on the U.S. Preventive Services Task Force (USPSTF) Screening for Abdominal Aortic Aneurysm: Recommendation Statement. AHRQ Publication NO. 05-0569-A, February 2005. Agency for Healthcare Research and Quality, Rockville, MD. www.ahrq.gov/clinic/uspstf05/aaascr/aaars.htm



What are the risk factors for aortic aneurysm?

Some of the same risk factors for heart attack also increase the risk of aortic aneurysm, including:

- Atherosclerosis (plaque in the artery walls)
- High blood pressure
- Diabetes
- High cholesterol
- Smoking
- Heredity
- Bicuspid aortic valve

Injury or infection also can cause an aneurysm to develop if the aorta walls weaken as a result.

Inherited Defects

An increasing number of people are at risk of aortic aneurysm due to inherited defects that cause weakness in the blood vessel walls. Marfan syndrome, an inherited disorder of the connective tissue, is a relatively rare condition that often leads to an aortic aneurysm. Cleveland Clinic vascular and cardiovascular surgeons have developed very effective techniques for treating people with Marfan syndrome and have one of the world's largest experiences in surgical treatment for this condition.

For information: 866.289.6911

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What does “watch and wait” mean if I have been diagnosed with an aortic aneurysm?

The goal in treating aneurysms is to reduce the risk of rupture, which increases with aneurysm size. If you have a small aneurysm, your doctor will check it every six to 12 months by CT or ultrasound to determine if it is growing and how rapidly it is increasing in size. This is “watch and wait.”

When an aneurysm reaches a critical size, it is time for treatment. Cleveland Clinic specialists have developed a mathematical formula based on aneurysm size and other measurements that helps doctors determine the best time for treatment. The rate at which the aneurysm is growing, your symptoms, your age and your other medical conditions also are considered when planning treatment.

How are aortic aneurysms treated?

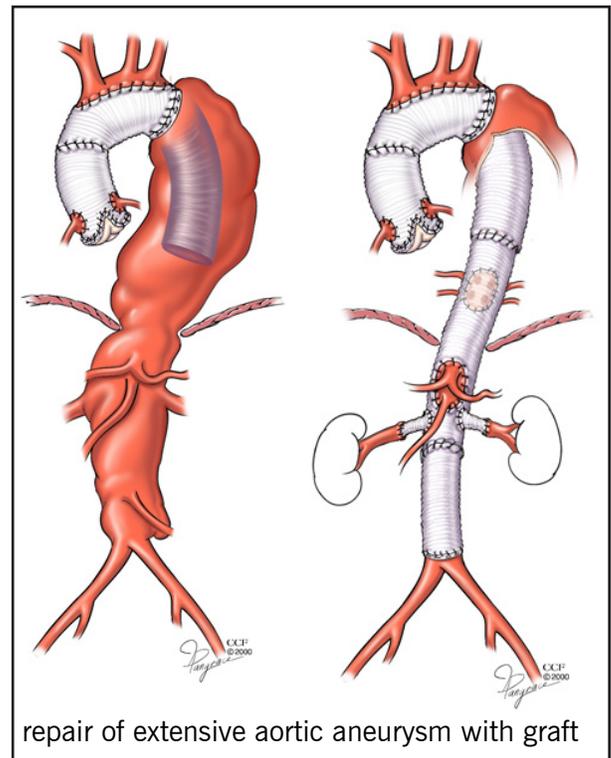
Treatments for aortic aneurysms include open surgery or endovascular repair techniques. These are complex procedures that involve a team of doctors from different specialties working together. More than 1,000 patients undergo treatment for aneurysm at Cleveland Clinic annually.

Your doctor will recommend the best treatment for you depending on the location, shape and size of your aneurysm, other factors such as your age and overall health and information from imaging tests.

If you have an aneurysm that involves a long section of the aorta or multiple aneurysms, the best approach may be a combination of open surgery and endovascular repair. Cleveland Clinic cardiovascular and vascular surgeons are among the most experienced in the world using this hybrid approach.

Open surgical repair

During open surgical repair, an incision is made in the chest or abdomen, depending on the location of the aneurysm. During the procedure, the bulging, diseased area of the aorta is lined with a synthetic graft that is stitched in place to connect it with the normal aorta on either side of the defective area. When the procedure is completed, the new,



synthetic section of the blood vessel functions like a normal, healthy aorta. Cleveland Clinic surgeons are recognized worldwide for developing and applying advanced surgical techniques to treat aortic aneurysm.

The procedure generally takes between 3 and 5 hours, and the hospital stay averages between 5 to 10 days. Some patients stay at a rehabilitation facility for a short time to complete their recovery. Most people return to their normal activities in 6 to 12 weeks. Open surgical repair is a proven treatment with very good long-term results.

Endovascular repair

The endovascular approach is rapidly becoming the preferred treatment for abdominal aortic aneurysm and also is becoming more available for the treatment of thoracic aortic aneurysm. Cleveland Clinic surgeons helped pioneer these advanced aneurysm treatment techniques.

During the endovascular repair procedure, the surgeon makes small incisions in the groin area to access the arteries that connect to the aorta. A guide wire is inserted through the arteries and guided into the affected area of the aorta.

Endovascular repair (continued)

Using X-ray guidance, the surgeon inserts the stent-graft inside a catheter (a long, thin tube) over the guide wire. The stent-graft is a fabric tube supported by metal wire stents (also called a scaffold) that is used to reinforce the weakened area of the aorta.

The surgeon then moves the stent-graft in the catheter along the guide wire to the site of the aneurysm. There, the catheter is withdrawn and the stent-graft expands like a spring on either side of the aneurysm. Once it is securely in place, the stent-graft creates a new passageway for blood flow without pushing on the aneurysm. Over time, the aneurysm will shrink because of the lack of pressure on it.

Endovascular repair offers these advantages:

- The procedure typically takes 1 to 3 hours
- Patients can go home in a few days after the procedure
- There are smaller scars and less trauma compared with open surgical techniques
- Most people return to their normal activities in 2 to 6 weeks after the procedure.

Patients who have an endovascular stent-graft must return to their doctor regularly to have the position of the stent-graft monitored by a CT scan.

Follow-Up Care

Your doctor will want to see you on a regular basis to perform a physical exam and diagnostic tests. Your doctor will use the information gained from these visits to monitor the progress of your treatment. Ask your doctor how often to schedule follow-up appointments.

If you have been diagnosed with an aneurysm or have received aneurysm treatment, it is important that you lead a heart-healthy lifestyle. Your health care team can help you achieve your goals, but it is up to you to take your medications as prescribed, keep your follow-up appointments and be an active member of the treatment team. You can help improve your health by:

- Quitting smoking
- Treating high cholesterol
- Managing high blood pressure and diabetes
- Exercising regularly

Cleveland Clinic offers a structured supervised walking program that can help you succeed and maximize your exercise efforts. Please call 216.444.9353 or 800.223.2273 ext. 49353 to make an appointment for this program.

- Eating a heart-healthy diet
- Maintaining a healthy weight

A registered dietitian can work with you to develop a heart-healthy nutrition program to help you reach your weight loss goals. To make an appointment, please call 216.444.9353 or 800.223.2273 ext. 49353.

- Controlling stress and anger
- Taking prescribed medications as directed
- Following up with your doctor for regular visits

This information is not intended to replace the medical advice of your doctor or health care provider. Please consult your health care provider for advice about a specific medical condition.

Aorta Center

Diseases affecting the entire aorta, from the aortic valve to the blood supply of the pelvic vasculature, are managed at Cleveland Clinic with a comprehensive, multidisciplinary approach. The multi-disciplinary team of experts in the Aorta Center includes cardiologists, vascular medicine physicians, cardiovascular and vascular surgeons and other specialists such as geneticists and rheumatic disease specialists. In addition to conventional surgical therapies, we offer minimally invasive and endovascular approaches for almost every type of aortic disease.

We provide:

- A thorough evaluation of patients using state-of-the-art diagnostic testing
- Multi-disciplinary approach to comprehensive care for patients with diseases of the aorta, connective tissue disorders and Marfan syndrome
- Genetic screening for families of those with genetic disorders, such as Marfan syndrome
- Ongoing research and education to provide patients with high-quality and innovative therapies

The goal is to help patients live longer and improve their quality of life.

About the Sydell and Arnold Miller Family Heart & Vascular Institute

The Sydell and Arnold Miller Family Heart & Vascular Institute at Cleveland Clinic is one of the largest cardiovascular specialty groups in the world, providing patients with expert medical management and a full range of therapies. **Our cardiac care program has been ranked number one since 1995** by *U.S. News & World Report*.

Our areas of expertise combine research, education and clinical practice to provide innovative and scientifically-based treatments for cardiovascular disease. The commitment of our physicians and scientists to the prevention and cure of cardiovascular disease has led to innovative care, better outcomes and improved quality of life for patients with cardiovascular disease.

For More Information

For more information about aorta disease and treatments, please visit our website at www.clevelandclinic.org/heart, participate in a chat with a nurse online, or e-mail us using the Contact Us form.

To make an appointment or to talk with a nurse about aorta disease and available treatment options, please contact the Miller Family Heart & Vascular Resource Center Nurse toll-free at **866.289.6911** (Monday through Friday, 8:30 am to 4:30 pm). We would be happy to answer your questions.

Society for Vascular Surgery, Vascular Web

www.vascularweb.org

Aortic Aneurysm, Medline Plus

www.nlm.nih.gov/medlineplus/aorticaneurysm.html

National Heart Blood and Lung Institute

Types of Aneurysms: www.nhlbi.nih.gov/health/dci/Diseases/arm/arm_types.html

What is an Aneurysm: www.nhlbi.nih.gov/health/dci/Diseases/arm/arm_what.html

Vascular Disease Foundation

www.vdf.org



9500 Euclid Avenue, Cleveland, OH 44195

The Heart & Vascular Institute is one of 26 institutes at Cleveland Clinic that group multiple specialties together to provide collaborative, patient-centered care. The institute, ranked No. 1 in the nation for cardiac care by *U.S. News & World Report* every year since 1995, accommodates more than 234,000 patient visits each year in world-class facilities. Cleveland Clinic is a nonprofit, multispecialty academic medical center. Founded in 1921, it is dedicated to providing quality specialized care and includes an outpatient clinic, a hospital with more than 1,000 staffed beds, an education institute and a research institute.