

Abdominal Aortic Aneurysm (AAA)

What is an abdominal aortic aneurysm?

An aneurysm is a swelling or dilatation in a blood vessel. Aneurysms can occur in any blood vessel, but are much more common in arteries, although they do occur rarely in veins. An abdominal aortic aneurysm (AAA) is a dilatation in the abdominal (tummy) part of a major artery - the aorta. This is one of the commonest types of aneurysm.

Are aortic aneurysms common?

Aortic aneurysms are fairly common especially in older men. About 6% of men (6 in 100) aged 80 years will have an aneurysm. They are more common in brothers and there is an increased risk of an aortic aneurysm if you suffer from high blood pressure or atherosclerosis (hardening of the arteries) especially in smokers. Aortic aneurysms seem to be relatively rare in Asian populations.

Why do aortic aneurysms develop?

We do not know exactly why some people develop aortic aneurysms. They are much more common in men and may sometimes run in the family. There seems to be an approximately four times increased risk of having an aneurysm for the brother of a patient with an aneurysm. Most brothers (more than 80%) will not develop an aneurysm. Surprisingly, the presence of diabetes seems to have a slight protective effect on aneurysm development.

Aneurysms may develop because of a weakness in the tissues holding the blood vessels together or possibly an imbalance in various enzymes (matrix metalloproteinases or MMPs) that are found in the blood vessel wall. No specific genes have yet been identified in relation to aneurysms.

Why are aortic aneurysms important?

Aortic aneurysms are important because sometimes they can burst. When an aortic aneurysm bursts it is a catastrophic event in which the patient can die from internal bleeding in a matter of minutes. In most people a burst (ruptured) aortic aneurysm is fatal.

The risk of an aneurysm rupturing varies with the aneurysm size. The larger the aortic aneurysm the more risk of it rupturing. Small aneurysms less than 5 cms in diameter have an annual risk of rupture of less than 1% (1 in 100). This risk increases to about 15% when the aneurysm is 6cms or greater. In women the risks are greater. A woman with an aneurysm between 5.0 and 5.9 cms has about a 4% risk of rupture over the next year. Once the aneurysm size increases beyond 6.0cms the risk of rupture increases to 22 - 30% over the next year.

Less commonly aortic aneurysms can cause other symptoms. The aneurysm is usually lined by blood clot, which in most people, is not dangerous. Occasionally, parts of this blood clot can be dislodged and travel downwards to block arteries to the leg (embolism). As the aneurysm enlarges it can cause pressure on nerves and can occasionally lead to pressure on the ureter (the tube between the kidney and bladder). This can prevent urine draining from the kidneys normally and the kidneys can become damaged.

Repair of an aortic aneurysm will stop these complications developing.

Can aortic aneurysms be prevented?

At present aortic aneurysms cannot be prevented from developing, but their growth may be slowed by some simple measures. If you smoke, this increases the rate of growth of aortic aneurysms and you should stop immediately. Your blood pressure should be checked and if it is persistently raised you should have treatment to reduce your blood pressure. High blood pressure is a risk factor for aneurysm rupture. This does not mean your aortic aneurysm will rupture if you have high blood pressure, but it does place it at slightly higher risk of rupture.

It is important to have your risk factors for hardening of the arteries (atherosclerosis) monitored and treated if necessary.

The risk factors for Atherosclerosis include:

- Smoking
- High blood pressure
- High cholesterol
- Diabetes

How will I know if have an aortic aneurysm?

Unfortunately, many people will not know if they have an aortic aneurysm, because they rarely cause symptoms until they burst. Aortic aneurysms are sometimes found during a routine examination for other conditions such as prostate problems or gallstones. If you are a man over the age of 60 years, a smoker with high blood pressure and have a brother or father with an aortic aneurysm, then this puts you at increased risk. If you also have hardening of the arteries at other sites (eg previous stroke or heart attack) then you may also be at increased risk. Occasionally patients present with embolism of blood clot in the aneurysm sac to the lower limb arteries.

Although examination by your doctor may be helpful in diagnosing a large aortic aneurysm, it is not a sensitive method of diagnosing smaller aneurysms. The best way to diagnose an aneurysm is with an ultrasound scan of the abdomen. This is a very quick, simple, accurate and safe test.

Occasionally, patients experience abdominal and back pain and the aneurysm becomes tender or painful before it ruptures. If this happens and you know you have an aneurysm, then it is important to seek emergency medical advice.

Before surgery most patients will undergo CT (computed tomography) scanning to show the aneurysm in more detail.



When do aortic aneurysms require treatment?

In healthy people the aorta (the main blood vessel that becomes swollen) is usually about 2.0-2.5 cms (20-25mm) in diameter although this can vary with age and whether you are a man or a woman. We know from large studies in the USA and UK that aneurysms less than 5cms across can be safely watched as long as they are monitored on a regular basis. For aneurysms less than 4.4 cms across or less, a yearly ultrasound scan is sufficient to monitor aneurysm growth. For aneurysms between 4.5 and 4.9 cms across, a scan every 6 months is advised.

When an aneurysm reaches 5cms most surgeons would consider offering surgical intervention. This is because, at this size, the aneurysm has a greater risk of rupture. It then becomes as safe to have an operation to repair the aneurysm, as it is to leave the aneurysm alone. Surgery may also be considered if your aneurysm is rapidly expanding on regular scans or it starts to cause other complications (see above). Rapid expansion means more than 7mm in 6 months or 10mm in one year.

Whether you proceed with surgery will not just depend on the size of the aneurysm. It is important that each patient is fit enough to withstand the operation. Fitness for surgery can be affected by many factors and the decision whether or not to proceed with surgery can be a difficult one, as it is a very major operation. It will only be after a detailed discussion with your surgeon, regarding your own personal circumstances and type of treatment available, that a decision can be reached.

If your aneurysm bursts it usually causes severe back and abdominal pain. The bleeding can stop temporarily in some patients and in these patients an emergency operation can be successful at repairing the aneurysm. The majority of patients (70-80%) with a ruptured abdominal aneurysm will not survive.

It is important to remember that although any anxiety you may have had about your aortic aneurysm will be relieved by having it repaired, the operation will not make you feel physically better. This is because most patients do not have symptoms from their aneurysm before the operation. The operation is a treatment to prevent the aneurysm rupturing or causing other complications in the future.

Thoracoabdominal aneurysms

Most (90%) aortic aneurysms are found below the arteries to the kidneys (renal arteries) in the abdomen. Some aneurysms can extend upwards to involve the arteries to the kidneys, the arteries to the intestines, liver and stomach. More extensive aneurysms will involve the aorta from where it leaves the heart and can extend throughout the chest. Thoracic (in the chest) aneurysms are probably under-recognised and may involve single or multiple segments of the aorta in the chest. There are rare genetic conditions which can predispose to thoracic aneurysms such as Ehlers-Danlos syndrome and Marfan syndrome. Aneurysms above 5.5cms carry a significant increased risk of rupture.

Thoracic aneurysms are much more difficult to repair and carry much greater risks from treatment. Open surgery for these aneurysms is massive surgery, but until recently was the only treatment available. Newer endovascular treatments are revolutionising therapy in patients with these aneurysms and extending the treatment to patients who previously would have been considered unfit for open repair. Detailed anatomical information is required not only about the aneurysm but also about the aortic branches and their relationship to one another in 3-D. This is a rapidly developing area with different devices and different combinations of treatments being explored.