

Stroke treatments



Cerebral Aneurysm | Clipping/Coiling

A hemorrhagic stroke may be caused by the bursting of an aneurysm, which is an abnormal bulge in a blood vessel in the brain. In an aneurysm, the weak spot in the vessel wall can be stretched over the years, often by high blood pressure. As the aneurysm expands, the walls become weaker.

Aneurysms are dangerous because they can leak or burst (*rupture*). When a cerebral aneurysm ruptures, it causes bleeding in the brain (*subarachnoid hemorrhage*). The blood flow to the area of the brain supplied by the artery is also reduced. This can cause stroke, seizures, or coma.

A ruptured cerebral aneurysm is a medical emergency. This can cause permanent brain damage or death.

What are the causes?

The exact cause of this condition is not known.

What increases the risk?

This condition is more likely to develop in people who:

- Are older. The condition is most common in people between the ages of 50–60.
- Are female
- Have a family history of aneurysm in two or more direct relatives.

- Have certain conditions that are passed along from parent to child (*inherited*). They include:
 - Autosomal dominant polycystic kidney disease. This is a condition in which small, fluid-filled sacs (*cysts*) develop in the kidney.
 - Neurofibromatosis type 1. In this condition, flat spots develop under the skin (*pigmentation*) and tumors grow along nerves in the skin, brain, and other parts of the body.
 - Ehlers-Danlos syndrome. This is a condition in which bad connective tissue causes loose or unstable joints and creates a very soft skin that bruises or tears easily.
- Smoke.
- Have high blood pressure (*hypertension*).
- Abuse alcohol.

What are the signs or symptoms?

The signs and symptoms of a cerebral aneurysm that has not leaked or ruptured can depend on its size and rate of growth. A small, unchanging aneurysm generally does not cause symptoms. A larger aneurysm that is steadily growing can increase pressure on the brain or nerves.

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The increased pressure from a cerebral aneurysm that has not leaked or ruptured can cause:

- A headache.
- Vision problems.
- Numbness or weakness in an arm or leg.
- Memory problems.
- Problems speaking.
- Seizures.

If an aneurysm leaks or ruptures, it can cause a life-threatening condition, such as stroke. Symptoms may include:

- A sudden, severe headache with no known cause. The headache is often described as the worst headache ever experienced.
- Stiff neck.
- Nausea or vomiting, especially when combined with other symptoms, such as a headache.
- Sudden weakness or numbness of the face, arm, or leg, especially on one side of the body.
- Sudden trouble walking or difficulty moving the arms or legs.
- Double vision.
- Sudden trouble seeing in one or both eyes.
- Trouble speaking or understanding speech (*aphasia*).
- Trouble swallowing.
- Dizziness.
- Loss of balance or coordination.
- Intolerance to light.
- Sudden confusion or loss of consciousness.

How is this diagnosed?

This condition is diagnosed using certain tests, including:

- CT scan.
- Computed tomographic angiogram (CTA). This test uses a dye and a scanner to produce images of your blood vessels.
- Magnetic resonance angiogram (MRA). This test uses an MRI machine to produce images of your blood vessels.
- Digital subtraction angiogram (DSA). This test involves placing a flexible, thin tube (*catheter*) into the artery in your thigh and guiding it up to the arteries in the brain. A dye is then injected into the area and X-rays are taken to create images of your blood vessels.

How is this treated?

Unruptured aneurysm

Treatment is complex when an aneurysm is found and it is not causing problems. Treatment is individualized, as each case is different. Many factors must be considered, such as the size and exact location of your aneurysm, your age, your overall health, and your preferences. Small aneurysms in certain locations of the brain have a very low chance of bleeding or rupturing. These small aneurysms may not be treated.

In some cases, however, treatment may be required. Treatment depends on the size and location of the aneurysm. They may include:

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- **Coiling.** During this procedure, a catheter is inserted and advanced through a blood vessel. Once the catheter reaches the aneurysm, tiny coils are used to block blood flow into the aneurysm. This procedure is sometimes done at the same time as a DSA.
- **Surgical clipping.** During surgery, a clip is placed at the base of the aneurysm. The clip prevents blood from continuing to enter the aneurysm.
- **Flow diversion.** This procedure is used to divert blood flow around the aneurysm with a stent that is placed across the opening of an aneurysm.

Ruptured aneurysm

Immediate emergency surgery or coiling may be needed to help prevent damage to the brain and to reduce the risk of rebleeding. The timing of treatment is an important factor in preventing complications. Successful early treatment of a ruptured aneurysm within the first 3 days of a bleed helps to prevent rebleeding and blood vessel spasm. In some cases, there may be a reason to treat 10–14 days after a rupture. Many factors are considered when making this decision, and each case is handled individually.

Follow these instructions at home:

If your aneurysm is not treated:

- Take over-the-counter and prescription medicines only as told by your health care provider.
 - Follow a diet suggested by your health care provider. Certain dietary changes may be advised to address high blood pressure (*hypertension*), such as choosing foods that are low in salt (*sodium*), saturated fat, *trans* fat, and cholesterol.
- Stay physically active. It is recommended that you get at least 30 minutes of activity on most or all days.
 - **Do not** use any products that contain nicotine or tobacco, such as cigarettes and e-cigarettes. If you need help quitting, ask your health care provider.
 - Limit alcohol intake to no more than 1 drink a day for nonpregnant women and 2 drinks a day for men. One drink equals 12 oz of beer, 5 oz of wine, or 1½ oz of hard liquor.
 - **Do not** use street drugs. If you need help quitting, ask your health care provider.
 - Keep all follow-up visits as told by your health care provider. This is important. This includes any referrals, imaging studies, and laboratory tests. Proper follow-up may prevent an aneurysm rupture or a stroke.

Get help right away if:

- You have a sudden, severe headache with no known cause. This may include a stiff neck.
- You have sudden nausea or vomiting with a severe headache.
- You have a seizure.
- You have other symptoms of stroke. The acronym **BEFAST** is an easy way to remember the main warning signs of stroke.

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- **B** = Balance problems. Signs include dizziness, sudden trouble walking, or loss of balance.
- **E** = Eye problems. This includes trouble seeing or a sudden change in vision.
- **F** = Face changes. This includes sudden weakness or numbness of the face, or the face or eyelid drooping to one side.
- **A** = Arm weakness or numbness. This happens suddenly and usually on one side of the body.
- **S** = Speech problems. This includes trouble speaking or trouble understanding.
- **T** = Time. Time to call 911 or seek emergency care. **Do not** wait to see if symptoms will go away. Make note of the time your symptoms started.

Get help right away if you have:

- ▲ A sudden, severe headache with no known cause
- ▲ Nausea or vomiting occurring with another symptom
- ▲ Sudden weakness or numbness of your face, arm or leg, especially on one side of your body
- ▲ Sudden trouble walking or difficulty moving your arms or legs
- ▲ Sudden confusion

Summary

- An aneurysm is a bulge in an artery.
- Aneurysms are dangerous because they can leak or burst (*rupture*). When a cerebral aneurysm ruptures, it causes bleeding in the brain.
- Treatment depends on whether the aneurysm is ruptured. A ruptured aneurysm is a medical emergency.
- Get help right away if you have symptoms of stroke. The acronym BEFAST is an easy way to remember the main warning signs of stroke.

This information is not intended to replace advice given to you by your health care provider. Make sure you discuss any questions you have with your health care provider.