

Strokes and aneurysms



As one of the most vital organs in your body, your brain needs a constant blood supply. When disease or injury affects the brain's blood vessels, expert and timely care can literally be a life-saver.

If you or someone you care about has a stroke or a brain aneurysm, specialist care is available. Our neurologists and neurosurgeons use advanced technologies and procedures to diagnose and manage strokes and brain aneurysms.

About strokes and brain aneurysms

What is a stroke?

A stroke happens when blood supply to a part of the brain is reduced or stopped. This prevents the brain from getting the oxygen and nutrients it needs. As a result, brain cells can die and the affected area can be permanently damaged.

One in four Australians will have stroke at some time in their lives. A stroke can be fatal. It can also lead to permanent difficulties with movement, communication, swallowing, sensation and cognitive (thinking) function.

What is a brain aneurysm?

An aneurysm is a bulge or abnormal swelling in a blood vessel wall. When this occurs in a blood vessel in the brain, it is known as a cerebral aneurysm or brain aneurysm.

Aneurysms usually start as a weakness in the blood vessel wall which bulges out over time. Aneurysms are more common in arteries than veins. They are often harmless and don't cause any symptoms. However, they can be fatal if they rupture.

Brain aneurysms are classed as either saccular or berry aneurysms or fusiform aneurysms. Saccular aneurysms are more common. They are round or oval-shaped and are connected to the artery by a narrow neck. Fusiform aneurysms involve a general widening of the artery wall.

Early recognition and treatment of a stroke or aneurysm in the brain could save someone's life and give them the best chance of making a good recovery.

Stroke and aneurysm symptoms

Your brain is the control centre for all your body's functions, so interrupted blood supply can cause a wide range of symptoms. These will depend on which part of the brain is affected and the severity of the damage.

Common stroke symptoms include sudden:

- weakness or numbness in the arm, leg or face – often on one side of the body
- difficulty speaking or understanding
- problems with balance, walking or coordination
- sight problems in one or both eyes
- dizziness or severe headache
- drowsiness, nausea or vomiting
- confusion.

Stroke symptoms sometimes last a short time and then resolve on their own. This is called a transient ischemic attack (TIA) or mini stroke.

A brain aneurysm may not cause any symptoms unless it grows very big or ruptures. Sometimes a cerebral aneurysm is discovered during testing for something else. Symptoms of a ruptured brain aneurysm depend on which blood vessel is involved. They can include sudden:

- severe headache
- neck pain and stiffness
- muscle weakness or paralysis
- speech and vision changes
- drowsiness
- seizures.

A stroke, TIA or ruptured brain aneurysm is a life-threatening emergency. If you or someone around you has the above symptoms, call 000 (triple zero) and ask for an ambulance.

What causes strokes and aneurysms?

Both strokes and aneurysms are problems with the brain's blood supply.

Causes of aneurysm include:

- inherited or birth conditions (some people are born with an aneurysm)
- trauma or injury
- atherosclerosis (thickening or hardening of the arteries caused by a build-up of fatty deposits)
- some connective tissue conditions.

Smoking, high blood pressure and high cholesterol can also raise the risk of some types of aneurysms.

There are two main causes or types of strokes:

Ischaemic stroke

In an ischemic stroke, a blockage or narrowing in a blood vessel causes reduced blood supply to the brain. Common causes of ischaemic stroke include blood clots and atherosclerosis. This is the most common type of stroke.

Haemorrhagic stroke

This occurs when a blood vessel ruptures, causing blood to leak into the brain. The brain is deprived of oxygen and nutrients and can also be exposed to toxic substances. The bleeding can also raise pressure inside the skull, compressing brain tissue and causing further damage.

Things that can raise the risk of having a stroke include:

- smoking
- diabetes
- high blood pressure
- high cholesterol
- being above a healthy weight
- atrial fibrillation (an irregular heart rhythm)
- a hole in the heart
- eating an unhealthy diet
- lack of physical activity
- drinking alcohol
- taking hormone replacement therapy or the contraceptive pill
- being pregnant.

In some people, the cause of a stroke or aneurysm cannot be found. The important thing is that expert care is available.

Referral for stroke or aneurysm management

If your doctor suspects you've had a stroke or a brain aneurysm, a neurologist can provide further assessment and treatment.

To start your treatment with us, ask your GP for a referral to one of our experienced neurological specialists.

Your doctor can address the referral to a specific specialist, or simply to 'Dear Doctor'.

Stroke and aneurysm prevention

While it's not always possible to prevent a stroke or aneurysm, you may be able to lower your risk by:

- getting your blood pressure, blood glucose levels, heart rate, and cholesterol checked regularly
- getting support to quit smoking or reduce your alcohol use
- eating a healthy diet
- being physically active
- drinking alcohol in moderation
- learning to relax and getting enough sleep.

How are strokes and aneurysms diagnosed?

The following tests can help you and your healthcare team to get an accurate diagnosis.

Physical examination

Your doctor will conduct physical tests to see how your nervous system is working. For example, they might look at your muscle strength, walking, co-ordination, balance, vision, sensation, and reflexes.

Blood tests

Blood tests can detect underlying conditions such as diabetes or high cholesterol and check how effectively your blood clots.

CT (computerised tomography) scan

This test uses x-rays to take multiple images of your brain, which a computer puts together to provide detailed pictures.

MRI (magnetic resonance imaging)

In an MRI scan, the machine uses a powerful magnet, radio waves and a computer to generate detailed, cross-sectional images. This helps doctors see what's happening in your brain.

MRA (magnetic resonance angiography)

This imaging technique uses the same process as an MRI to create images of the blood vessels. It provides detail about blood flow and can help with identifying and evaluating brain aneurysms.

Cerebral angiogram

In this test, specialists pass a thin tube (called a catheter) through an artery in the arm or leg to the area of the brain being examined. Then they inject a small amount of radioactive solution, which clearly highlights the blood vessels on images.

Ultrasound

These tests use sound waves to create a detailed image of the tissues. An ultrasound can show how well blood flows through the arteries.

Heart tests

Problems with the heart and circulatory system can lead to a stroke, so these may need to be assessed. Your doctor will check your blood pressure. You may need to wear a Holter monitor, which monitors your blood pressure over 24 hours or more. You might also be referred for an electrocardiogram (ECG) to check your heart rhythm.

Brain aneurysm and stroke treatment

Treatment for strokes and aneurysms will depend on various factors, such as whether an aneurysm has ruptured or how long ago the stroke occurred.

Treatment immediately after a stroke or ruptured cerebral aneurysm aims to rapidly restore blood flow to the brain. Timely treatment can minimise damage and give someone the best chance of survival and recovery.

Immediate treatment for an ischaemic stroke may include:

- medications to dissolve the blood clot
- endovascular thrombectomy – in this procedure, a specialist doctor passes a thin tube (called a catheter) through a blood vessel in your leg to your brain. This is used to locate and remove the blood clot.

Immediate treatment after a haemorrhagic stroke may involve:

- medications to control your blood pressure
- surgery to relieve brain swelling or repair a ruptured blood vessel – some people need a procedure known as a craniotomy, which involves removing a section of the skull so surgeons can get to the source of the bleeding. Once there, they can repair damaged vessels and remove blood from around the brain. After the bleeding has stopped, they replace the section of the skull.
- shunt surgery – after a haemorrhagic stroke, some people experience a complication known as hydrocephalus. In this condition, the fluid surrounding the brain and spinal cord builds up inside the brain's cavities. It can be treated by placing a tube (called a shunt) into the brain to allow fluid to drain away.

Surgical options for treating a brain aneurysm include:

- endovascular repair – in this procedure, a specialist doctor passes a catheter through an artery in your leg to the blood vessel where the aneurysm is located. Then they inject a contrast material, which allows the surgeon to better see the arteries and aneurysm on a monitor. Next, they place a small metal cage (called a stent) or coils into the aneurysm. This helps to close the aneurysm and stop the bleeding.
- clipping – in this procedure, surgeons insert a metal clip at the base of the aneurysm to help stop it from rupturing. This procedure usually requires a craniotomy.

Preventative stroke treatment

Over 80% of strokes are preventable. If your doctor suspects you're at risk of having a stroke, they might advise you to take measures to lower that risk. These include:

- treating health conditions that could raise your stroke risk, such as diabetes, high blood pressure, high cholesterol and atrial fibrillation
- getting support to help you quit smoking, reach a healthy weight or cut down on alcohol
- making healthy changes such as getting more active or eating healthily.

If doctors discover narrowing in a neck artery that supplies blood to the brain, they may recommend a surgical procedure called a carotid endarterectomy. This involves opening up the carotid artery and removing fatty deposits to help improve blood flow.

Preventative brain aneurysm treatment

If doctors find a small aneurysm in your brain, you will need to have it checked regularly. If it reaches a certain size, your specialists might recommend a procedure to help reduce the risk of rupture.

They might also recommend other strategies to help prevent it from bursting, including:

- medications to treat blood pressure and high cholesterol
- quitting smoking
- cutting down on alcohol
- managing stress
- not lifting heavy weights.

Recovery from a stroke or ruptured aneurysm

Your recovery time will depend on your condition and which type of treatment or procedure you have. Factors such as your age, health, and lifestyle can also influence your recovery. Importantly, aneurysms and strokes are chronic health conditions that typically require ongoing management. After initial measures to restore the brain's blood flow, treatment often involves managing the symptoms and reducing any risk of complications.

If you have brain surgery, here's a general guide on what to expect afterwards.

Hospital stay

Most people need to spend a few days or more in hospital for monitoring. The length of your hospital stay will vary depending on the type of surgery and your post-operative progress.

Medications

Your healthcare team might prescribe medications, such as pain relievers, antibiotics, and anti-seizure medications.

Physical recovery

After any brain procedure, you might need rehabilitation to restore your physical function. You may have physiotherapy to help with mobility, strength, balance, coordination and flexibility.

Cognitive recovery

Some people experience changes to their cognitive (thinking) function after brain surgery. These changes can include difficulties with memory, concentration, attention, and problem-solving. Working with an occupational therapist can support your cognitive recovery.

Speech and language therapy

If a stroke or aneurysm affects brain areas involved in speech and language, you might need speech therapy to regain or improve your communication skills. Speech therapists can also help with swallowing difficulties.

Emotional and psychological support

Experiencing a stroke or aneurysm can be emotionally challenging and can affect your mental wellbeing. Some people will benefit from the support of mental health professionals, as well as that of their loved ones, during the recovery period.

Follow-up

You will have regular follow-up visits with your healthcare team to monitor your recovery, manage any complications, and adjust treatment as needed. Your healthcare team will work with you and your loved ones to develop a plan to help you recover, regain function, and get back to activities that are important to you.

Recovery after a stroke or aneurysm is a gradual process that can take weeks to a year or more. To help your recovery go smoothly, it's important to follow your healthcare team's instructions, attend rehabilitation sessions, and let them know about any concerns.

Sources

Information provided and reviewed by A/Prof Andrew Davidson, Neurosurgeon at Melbourne Private Hospital.

<https://www.betterhealth.vic.gov.au/health/conditionsandtreatments/aneurysm>

<https://www.healthdirect.gov.au/aneurysms>

<https://www.betterhealth.vic.gov.au/health/conditionsandtreatments/stroke>

<https://strokefoundation.org.au/about-stroke/learn/what-is-a-stroke>

<https://www.healthdirect.gov.au/stroke>

<https://www.nhs.uk/conditions/stroke/treatment/>

<https://medlineplus.gov/ency/article/007372.htm>

<https://www.nia.nih.gov/health/stroke>