A stroke happens when blood supply to the brain is interrupted. Blood is carried to the brain by blood vessels called arteries. Blood contains oxygen and important nutrients for your brain cells. Blood may be interrupted or stop moving through an artery, because the artery is blocked (ischaemic stroke) or bursts (haemorrhagic stroke). When brain cells do not get enough oxygen or nutrients, they die. The area of brain damage is called a cerebral infarct.

Brain cells usually die shortly after the stroke starts. However, some can last a few hours, if the blood supply is not cut off completely. If the blood supply can be returned in the minutes and hours after the stroke, some of these cells may recover. If not, they will also die.

In 2012, Australians suffered around 50,000 new and recurrent strokes – that is 1,000 strokes every week or one stroke every 10 minutes. Stroke is Australia’s second biggest killer after heart disease.

There are sometimes quite specific warning signs before a stroke. By recognising the warning signs and taking action, you may be able to prevent a stroke or reduce its severity. It is important to be able to recognise the warning signs and get medical help as quickly as possible.

**Diagnosis of stroke emergency**

The **FAST** test is an easy way to recognise and remember the most common signs of stroke. Using the **FAST** test involves asking three simple questions. If the person has a problem with any of these functions, dial triple zero (000) for an ambulance immediately.

**FAST** stands for:

- **F**acial weakness – check their face. Has their mouth drooped?
- **A**rm weakness – can they lift both arms?
- **S**peech difficulty – is their speech slurred? Do they understand you?
- **T**ime – is critical. If you see any of these signs, call **000 straight away**.

If you suddenly experience any of these symptoms, get to a hospital immediately. Remember, a stroke is a life-threatening emergency.
Symptoms of a stroke

A stroke is not a heart attack. A stroke happens when the supply of blood to the brain is suddenly interrupted. Some strokes are fatal, while others cause permanent or temporary disability.

The longer a stroke remains untreated, the greater the chance of stroke-related brain damage. Emergency medical treatment soon after symptoms begin improves the chance of survival and successful rehabilitation.

Facial weakness, arm weakness and difficulty with speech are the most common symptoms or signs of stroke, but they are not the only signs. Other signs of stroke may include one, or a combination of:

- weakness or numbness or paralysis of the face, arm or leg on either or both sides of the body
- difficulty speaking or understanding
- dizziness, loss of balance or an unexplained fall
- loss of vision, sudden blurring or decreased vision in one or both eyes
- headache, usually severe and abrupt onset or unexplained change in the pattern of headaches
- difficulty swallowing.

The signs of stroke may occur alone or in combination, and they can last a few seconds or up to 24 hours and then disappear. When symptoms disappear within 24 hours, this episode may be a mini stroke or transient ischaemic attack (TIA).

Transient ischaemic attacks (TIAs)

Transient ischaemic attacks are caused by a temporary cut in blood supply to the brain, due to the partial blockage of an artery by a blood clot or debris. TIAs have the same symptoms as a stroke, but they are temporary and do not usually cause long-term brain damage.

A TIA, or mini-stroke, is a warning of an impending stroke. It may appear hours, days, weeks or months before a full stroke, but is more common within days or a few weeks. Just like full strokes, TIAs need emergency treatment and should not be ignored. Early identification of symptoms and early management from your doctor greatly reduces your chances of a major stroke.

A TIA is:

- transient – symptoms last for less than 24 hours
- ischaemic – failure of blood flow to part of the brain or eye
- attack – sudden onset of symptoms, which vary from person to person, depending on which part of the brain or eye is starved of blood.

How stroke affects the brain

The brain can be considered as a four-part organ, which includes the right and left hemispheres, the cerebellum and the brain stem. A stroke has different effects, depending on which part of the brain is targeted during the attack.

Stroke in the right hemisphere

Some of the major functions of the right hemisphere include perception and control of the left side of the body. A stroke which affects the right hemisphere can cause many changes, including:

- the inability to judge distances, which can lead to falls or loss of hand-to-eye coordination
- short-term memory loss
- neglecting or ignoring anything situated on the left of the body

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impulsive behaviour
paralysis of the left side of the body (‘left hemiplegia’).

**Stroke in the left hemisphere**
Some of the major functions of the left hemisphere include speech and control of the right side of the body. A stroke affecting the left hemisphere can cause many changes, including:
- paralysis of the right side of the body (‘right hemiplegia’)
- various problems with speech and communication
- short-term memory loss.

**Stroke in the cerebellum**
Some of the major functions of the cerebellum include coordination and balance. A stroke affecting the cerebellum can cause many changes, including:
- dizziness
- nausea and vomiting
- loss of coordination
- a tendency to unbalance and fall
- slurred speech.

**Stroke in the brain stem**
Some of the major functions of the brain stem include breathing, heart rate and blood pressure. A stroke that affects the brain stem can cause many changes, including:
- complete paralysis
- coma
- double vision
- swallowing difficulties
- death.

**Effects of a stroke**
There are several factors that impact on recovery and the effects of stroke. These factors include:
- type of stroke
- location of the blocked or burst artery
- which area of the brain is damaged
- how much brain tissue is permanently damaged
- your general health before the stroke
- your level of activity before the stroke.

The brain is divided into several areas that control different functions. These include how you move your body, receive sensory messages (such as touch, sight or smell), use language and think. Because different arteries supply different areas of the brain, where the brain is damaged will determine which functions are affected.

Every stroke is different. Each person affected by stroke will have different problems and different needs. The way in which you might be affected depends on where in the brain the stroke happens and how big the stroke is. A stroke on the right side of the brain generally causes problems on the left side of the body. A stroke on the left side of the brain causes problems on the right side of the body. Some strokes happen at the base of the brain and can cause problems with eating, breathing and moving.

**Living with the effects of stroke**
In some cases, the effects of a small stroke can be overcome and the person can live an almost completely normal life. In other cases, the disabilities are severe and permanent. Support and understanding from family and friends, plus intensive rehabilitation from healthcare professionals, can always improve a stroke survivor’s quality of life.
Some of the healthcare professionals who can help include:

- speech therapists – to maintain or improve speech and communication and assess swallowing difficulties
- occupational therapists – to teach coping strategies and new skills, and help adapt the family home to the needs of the stroke survivor
- physical therapists – to maintain or improve the movement and functioning of the body.

**Cerebral haemorrhage is a type of stroke**

A cerebral haemorrhage is a type of stroke caused by bleeding from a ruptured blood vessel in the brain. It is sometimes called a haemorrhagic stroke. Without prompt medical treatment, this can result in death. A person who survives is often left with permanent disabilities.

Causes include weakened blood vessel walls, head trauma or congenital conditions (conditions that are present at birth). A cerebral haemorrhage is a life-threatening emergency. Approximately one in 10 strokes is caused by cerebral haemorrhage. This type of stroke (haemorrhagic stroke) is usually much more severe than ischaemic stroke, although symptoms are similar.

The major risk factor for cerebral haemorrhage is long-standing high blood pressure (hypertension) that weakens the walls of blood vessels, which then may split under the pressure.

**Treatment of cerebral haemorrhage**

After admission to hospital, treatment depends on the location and severity of the haemorrhage, but may include:

- medications to lower blood pressure after onset of haemorrhage
- treatment for underlying causes, such as long-term use of antihypertensive medications
- certain surgical procedures.

Any suspected signs and symptoms of cerebral haemorrhage require urgent medical attention. Dial triple zero (000) to call an ambulance to take the person to the nearest hospital emergency department.

**Confusion of stroke with migraine**

A migraine is a type of headache, caused by spasms of the arteries leading into the head. Stroke, TIAs and migraine can share certain symptoms (visual disturbances, numbness, tingling, speech difficulties and muscle weakness on one side of the body), which may lead someone with a migraine to fear they are having a stroke.

Problems can occur if a TIA is mistaken for a migraine, because a TIA is usually a warning of a possible stroke. Since the symptoms of TIAs go away within hours, the person may mistakenly believe they suffered nothing more than a migraine. It is extremely dangerous for people to diagnose themselves and they should always seek medical advice.

The broad differences between a migraine and a TIA include:

- visual disturbances – in TIA, the only disturbance is vision loss, whereas visual disturbance in migraine includes flashing lights and zigzagging lines as well
- speed of attack – in TIA, the symptoms occur suddenly. In migraine, symptoms spread slowly over a few minutes
- age of onset – migraine tends to first occur when a person is young, whereas stroke is more common in older people.

**Reduce your risk of stroke**

Stroke risk is influenced by a number of factors. Some of these factors, such as age, gender and family history, cannot be controlled. However, there are a number of risk factors that you can control to reduce your chance of having a stroke.

Lifestyle factors that increase your risk of stroke include:

- high blood pressure
• cigarette smoking
• diabetes
• high cholesterol level
• excessive amounts of alcohol
• being overweight or obese
• a diet high in salt and fat
• lack of exercise.

**Irregular heartbeat can cause stroke**

Atrial fibrillation (AF) is a risk factor for stroke. AF is the term given to a particular type of irregular heartbeat where the left atrium of the heart beats rapidly and unpredictably. In a healthy heart, all four chambers beat rhythmically at somewhere between 60 and 100 times per minute.

The left atrium of someone with AF can beat irregularly at over 400 times per minute. Untreated, AF can increase the risk of stroke and lead to potential heart failure.

The symptoms of AF include:

- pounding or fluttering heartbeat, known as heart palpitations
- dizziness, faintness or light-headedness
- tiredness
- shortness of breath
- chest pain.

**Where to get help**

- In an emergency, always call triple zero (000)
- Nearest hospital emergency department
- Your doctor
- National Stroke Foundation StrokeLine Tel. 1800 787 653
- **enableme** - The Stroke Foundation - Get the information, tips & techniques to equip you in your stroke recovery.

**Things to remember**

- Stroke is a medical emergency.
- A transient ischaemic attack (TIA) can be a warning sign that a large stroke could happen.
- Remember the FAST test and act FAST if you experience any of the signs of stroke.
- Healthcare professionals who can help improve a stroke survivor’s quality of life include speech, occupational and physical therapists.
- You can reduce your risk of stroke by making some healthy lifestyle changes.