



# STROKE

## What is stroke?

The millions of neurons within the brain require a steady blood supply to provide oxygen, sugars and other essential nutrients. Strokes occur when this blood flow is interrupted. In the majority of cases this occurs when the arteries that carry blood to the brain become blocked by a blood clot (ischemic stroke), though strokes can also result from ruptured arteries (haemorrhagic stroke).

Without their supply of oxygen and nutrients, neurons die, causing damage to the brain. Depending on the severity of the stroke, this damage can be permanent. In other cases, the damage to the brain tissue is reversible.

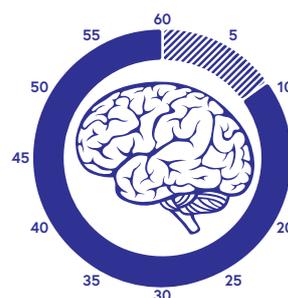
Strokes can lead to a loss of feeling or inability to move on one side of the body, dizziness, headache, loss of vision in one eye and difficulty speaking or understanding.

The symptoms and effects of stroke depend upon where in the brain the damage occurs. Damage to the right side of the brain usually affects the left side of the body, and vice versa. Other effects of damage to the right side of the brain include

impairment of spatial and perceptual abilities, memory, and judgement, with people often exhibiting impulsive behaviour. Damage to the left side of the brain can also result in speech and language difficulties, memory loss and development of slow, cautious behaviour that can make it hard to complete tasks unaided.

Damage to the cerebellum region can result in difficulties with balance, reflexes, coordination, dizziness and nausea. A stroke occurring in the brain stem can have an impact on essential bodily function, including breathing, heartbeat, eye movements, hearing, speech and swallowing, as well as potential paralysis.

In Australia, someone suffers from a stroke every 9 minutes.



EVERY  
**NINE**  
MINUTES

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If a stroke is caused by a blood clot (ischemic stroke) its impacts can be dramatically lessened if clot-busting drugs are given to the patient within a 4.5 hour window. For this treatment to be effective, it is crucial to determine if a stroke is in fact caused by a blood clot or a ruptured artery.

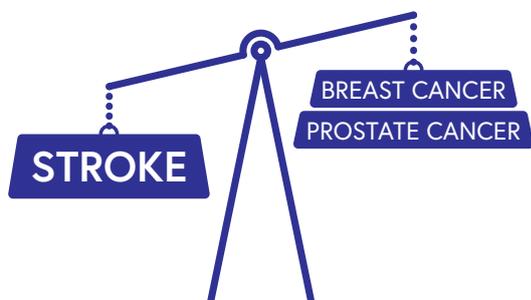
To do just this, the Hunter Medical Research Institute (HMRI) has teamed up with Medfield Diagnostic Sweden to develop Stroke Finder, a neurotechnology tool that identifies the type and location of the interrupted blood flow. This tool takes the form of a helmet that emits and receives advanced microwave technology. It could be used within ambulances or hospital emergency rooms. This device is soon to enter clinical trial stage.

Researchers at the University of Melbourne are examining ways to repair the damage that stroke does to the brain. Their approach combines a neurotechnology application—using brain stimulation to 'reactivate' damaged regions of the brain—with drug treatments that target the abnormal increase in types of cells called astrocytes that can occur following stroke and other brain trauma events.

The Australian Brain Initiative will nurture the basic brain research required to better understand how the brain functions develop methods needed to effectively treat stroke and other brain disorders.

The Initiative will also progress collaboration between research and industry to advance neurotechnology devices that will transform not only the capabilities of neuroscience research but also the lives of those living with the effects of brain trauma conditions and other brain disorders.

Stroke is one of the biggest killers—it kills more women than breast cancer and more men than prostate cancer.



By 2050, it's predicted there will be one million people living with the effects of stroke in Australia.

## ONE MILLION BY 2050