

# Understanding Stroke

## What Is Stroke?

Stroke refers to the sudden death of brain tissue caused by a lack of oxygen resulting from an interrupted blood supply. There are two ways that brain tissue death can occur. **Ischaemic stroke** is a blockage or reduction of blood flow in an artery that feeds that area of the brain. It is the most common cause of stroke. An **infarct** is the area of the brain that has "died" because of this lack of oxygen. **Haemorrhagic stroke** results from bleeding within and around the brain causing compression and tissue injury.

## Ischaemic Stroke

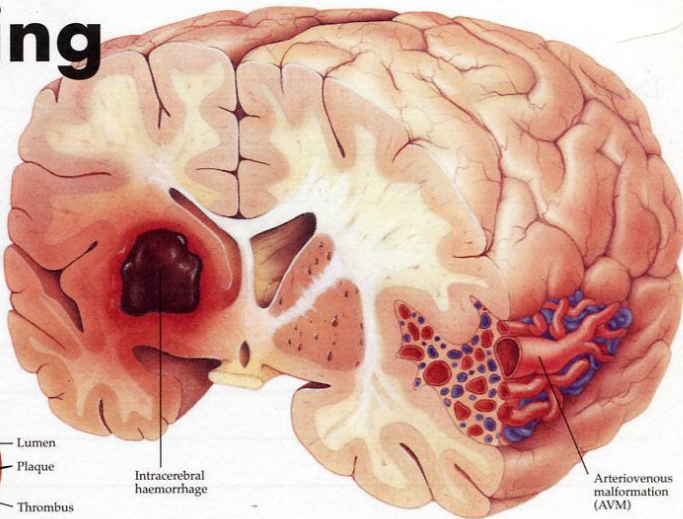
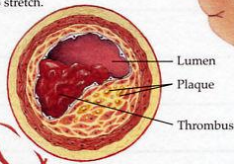
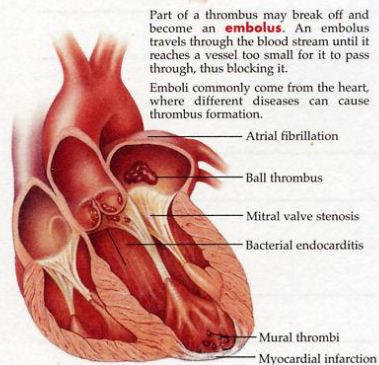
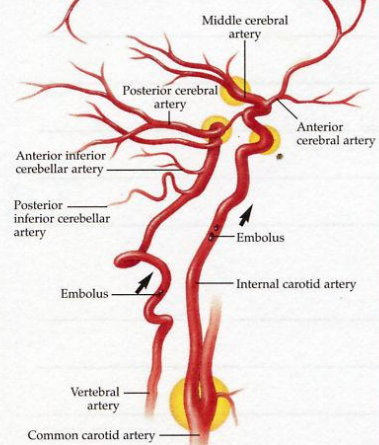
This type of stroke results from a blockage or reduction of blood flow to an area of the brain. This blockage may result from atherosclerosis and blood clot formation.

**Atherosclerosis** is the deposit of cholesterol and plaque within the walls of arteries. These deposits may become large enough to narrow the lumen and reduce the flow of blood while also causing the artery to lose its ability to stretch.

A **thrombus**, or blood clot, forms on the roughened surface of atherosclerotic plaques that develop in the wall of the artery. The thrombus can enlarge and eventually block the lumen of the artery.

## Common Sites of Plaque Formation

(Indicated by yellow circles)

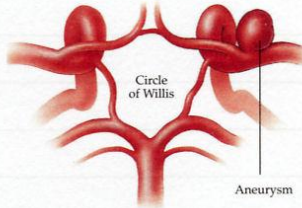


## Haemorrhagic Stroke

This type of stroke is caused by bleeding within and around the brain. Bleeding that fills the spaces between the brain and the skull is called a **subarachnoid haemorrhage**. It is caused by ruptured aneurysms, arteriovenous malformations, and head trauma. Bleeding within the brain tissue itself is known as **intracerebral haemorrhage** and is primarily caused by hypertension.

An **aneurysm** is a weakening of the arterial wall that causes it to stretch and balloon. It usually occurs where the artery branches.

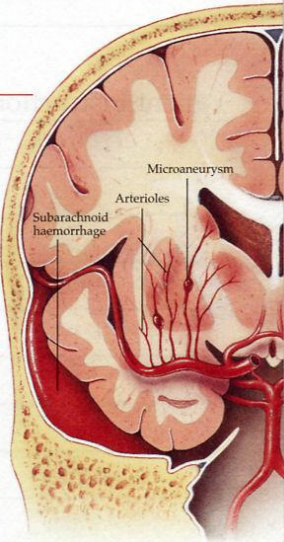
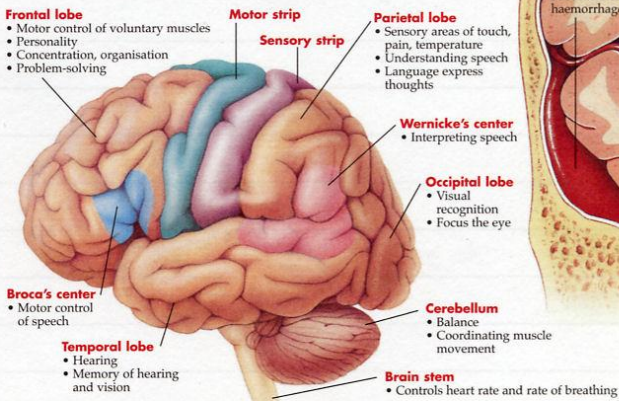
**Hypertension** is an elevation of blood pressure that may cause tiny arterioles to burst causing the tissue beyond the rupture to die. Blood vessels in the dead tissue then leak causing more bleeding.



An **arteriovenous malformation (AVM)** is an abnormality of the brain's blood vessels in which arteries lead directly into veins without first going through a capillary bed. The pressure of the blood coming through the arteries is too high for the veins, causing them to dilate in order to transport the higher volume of blood. AVMs may burst and also cause symptoms by putting pressures on sensitive areas causing seizures, or pain.

## Normal Functional Areas of Brain

The brain has two sides: a right hemisphere that controls the left side of the body and a left hemisphere that controls the right side of the body. Each hemisphere has four lobes and a cerebellum that control our daily functions. Depending on what part of the brain has been affected, stroke victims experience a variety of neurological deficits. Rehabilitation is crucial to the stroke patient's recovery. Physical therapists and speech therapists help patients "relearn" their lost functions and devise ways to cope with the loss of those they cannot regain.



## Events Leading to Stroke

Stroke victims often have small strokes or "warning signs," before a large permanent attack.

**Transient Ischaemic Attacks (TIAs)** are brief attacks that last anywhere from a few minutes to 24 hours. The symptoms resolve completely and the person returns to normal. It is possible to have several TIAs before a large attack.

**Complete Infarction (CI)** is an attack that leaves permanent tissue death and results in serious neurological deficits. Recovery is usually not total and takes longer than three weeks.

## Common Neurological Deficits After Stroke

### Left-brain stroke

- Right-sided paralysis
- Speech/language deficits
- Slow, cautious behaviour
- Hemianopsia of right visual field
- Memory loss in language
- Aphasia
- Apraxia

### Right-brain stroke

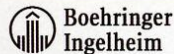
- Left-sided paralysis
- Spatial/perceptual deficits
- Quick, impulsive behaviour
- Hemianopsia of left visual field
- Memory loss in performance

## Related Terms

- Paralysis** - Loss of muscle function and sensation
- Hemiparesis** - Weakness of muscles on one side of body
- Hemianopsia** - Loss of sight in half of visual field
- Aphasia** - Difficulty with oral communication, reduced ability to read or write
- Apraxia** - Inability to control muscles; movement is uncoordinated and jerky

## Risks for Stroke

- Hypertension**
- Cigarette smoking**
- Carotid stenosis**
- Vertebral stenosis**
- Diabetes**
- Atrial fibrillation**
- Previous TIAs**
- High cholesterol**
- Obesity**
- High alcohol consumption**
- Oral contraceptive use**
- Family history of stroke**



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