



## Treatment

A Stroke is a medical emergency. It is a life-threatening situation with approximately 25% of Strokes being fatal. Immediate treatment saves lives and reduces disability. Treatment varies, depending on the severity and cause of the Stroke. All Strokes require medical treatment. For the vast majority of Strokes hospitalisation is required, possibly including intensive care and life support.

Stroke treatment is changing with medical advancements occurring all the time. It is important, if a Stroke is suspected, to ring 000 immediately. This is an essential step in the treatment process as all ambulances in NSW have paramedics who are trained to recognise the symptoms of Stroke. Once that has occurred they are then in a position to ensure you get to a primary Stroke centre where your treatment will begin.

Once you arrive at a primary Stroke Centre. Medical tests will be undertaken to determine if the person is having a bleeding Stroke (Haemorrhagic) or a Stroke from a blood clot (Ischaemic). Once the type and severity of the Stroke has been established by the medical team, treatment can begin.

### Types of treatment

The hospital Stroke team will determine the most appropriate form of treatment and care based on the results of the medical test they have undertaken. This may include:

- Reperfusion
- Telehealth
- Medications
- Surgery
- Stroke Unit or Hospital Care (See: 'What to expect in hospital')
- Rehabilitation (See: 'Rehabilitation')

### Reperfusion

Reperfusion is the medical terminology which describes a group of treatment options which are used to re-open the blocked arteries and re-establish blood flow to the brain in patients who have had an ischaemic or clot induced Stroke. These therapies are gold-standard and known to reduce disability and death. There are two types of reperfusion therapies:

- *Thrombolysis* (clot busting drugs) and
- *Endovascular Clot Retrieval* (ECR) (surgical removal of the clot).

Both therapies are time critical.

# Types of treatment

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# Types of treatment

## Thrombolysis:

This treatment for Stroke is administered under very strict guidelines as to who is eligible to receive thrombolytic medicine. The most important thing is that the person be treated by a specialised Stroke team within 3 to 4 ½ hours of the start of the symptoms. However, current research indicates that Thrombolysis should be provided no later than four and a half hours from symptom onset. That is why we say Stroke is Time Critical. **TIME IS BRAIN.**

Thrombolytic medicine, **tPA**, (tissue plasminogen activator), is the drug used in thrombolytic treatment. It breaks up blood clots and restores blood flow to the damaged area. Research has indicated that people who receive this medicine are more likely to have less long-term impairment.

However, if the Stroke is caused by bleeding (Haemorrhagic) rather than clotting (Ischaemic), this treatment can make the damage worse - so care is needed to correctly diagnose the **cause of the Stroke**.

## Endovascular Clot Retrieval (ECR):

**Clot retrieval is a neurointerventional surgical procedure for acute ischaemic Stroke** that involves the mechanical removal of a blood clot from a patient's brain. Patients who benefit most from this procedure are those with very large Strokes who are more likely to be at risk of death or significant permanent disability. This makes the provision of these highly specialised ECR services extremely important. It may also be offered as a treatment for patients who have experienced a **Stroke** as the result of narrowing of the arteries in their brain.

A significant benefit of Clot Retrieval as a treatment for Stroke is that research indicates the period of time for the procedure to show benefit is a much longer period after onset of Stroke symptoms than thrombolysis. For this reason, a Stroke pathway has been established within NSW whereby patients may be transported from large distances to receive this groundbreaking treatment and, as a result, even if you live in a rural setting, this is an option to be considered.

There are now six ECR Centres in NSW with four out of those six centres providing ECR on a 24 hour basis and two centres operating in business hours. There are also plans to increase capacity across NSW over the next 10 years.

## TeleStroke

TeleStroke models for Stroke can improve access to reperfusion therapies and provides a significant opportunity to support rural and regional areas deliver the benefits of reperfusion services more widely across NSW.

TeleStroke enables a Stroke Physician located in a major teaching hospital in a metropolitan setting to work in collaboration with local clinicians to deliver best practice Stroke care in rural hospitals where the patient is treated and cared for. Advanced imaging is used (CT SCANS and MRIs), which enable a Stroke physician in a metropolitan hospital to assess the patient and then work with and support the local clinician to administer thrombolysis.



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## Medications

**Blood thinners** such as heparin and coumadin are used to treat Strokes. Aspirin and other anti-platelet agents may be used as well.

Other medications may be needed to control associated symptoms:

- Analgesics (pain killers) may be needed to control severe headache.
- Anti-hypertensive medication may be needed to control high blood pressure.

Nutrients and fluids may be necessary, especially if the person has swallowing difficulties. The nutrients and fluids may be given through an intravenous tube (IV) or a feeding tube in the stomach. Swallowing difficulties may be temporary or permanent.

## Surgical Procedures

### Ischaemic Stroke:

When the carotid artery in the neck is partially blocked by a fatty build-up, called plaque, surgery called **carotid endarterectomy** might be used to remove the accumulated plaque.

**Cerebral angioplasty** is another technique in which balloons, stents and coils are inserted to treat some problems within the brain's blood vessels. Its use depends on its safety and effectiveness.

### Haemorrhagic Stroke:

The treatment for Haemorrhagic Stroke is quite different to Ischaemic Stroke. As indicated earlier, the treatment for an ischaemic Stroke can create a more critical situation in a haemorrhagic Stroke which is a bleeding type Stroke.

For Haemorrhagic Stroke, surgery is often required to remove pooled blood from the brain and to repair damaged blood vessels.

For **small bleeds**, they are often watched and allowed to heal on their own.

In the case of a **large bleed** or if the Stroke extends or appears to be getting worse, **surgery** may be done to 'decompress' the brain – release the blood which has built up, causing swelling. This takes up space in your brain squeezing it against the skull. Surgery is undertaken to drain or remove blood in or around the brain that was caused by a bleeding blood vessel.

A Haemorrhagic Stroke may be caused by a **brain aneurysm**. If this occurs, a surgeon may perform **endovascular coil embolisation** to repair the weak artery. A small coil is inserted into the aneurysm to block it off. The location of the aneurysm, its size and your general health are used to determine if the surgery can be performed.

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An **arteriovenous malformation** is a congenital disorder that causes an abnormal web of blood vessels and veins in the brain, brain stem, or spinal cord.

The vessel walls of an arteriovenous malformation may become weak and leak or rupture. Surgery may repair abnormally formed blood vessels (arteriovenous malformations) that have caused bleeding in the brain.

Life support and coma treatment are performed as needed.

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