

Stroke prevention for high risk groups

A stroke interrupts blood flow to an area of the brain. A brain artery can be blocked by a blood clot (embolism) or by narrowing of the artery by atherosclerosis. Blocking of an artery results in an ischaemic stroke. A brain artery can also rupture, causing bleeding into the brain (haemorrhagic stroke). Brain cells in the immediate area are killed because they are deprived of oxygen.

In stroke, the dead area is known as an infarct. Without prompt medical treatment, the area of brain cells surrounding the infarct will also die. In 2010, Australians suffered around 60,000 new and recurrent strokes. This makes stroke Australia's second biggest killer after heart disease.

Certain conditions such as hypertension (high blood pressure), atrial fibrillation (a particular irregularity of the heartbeat) and atherosclerosis (hardening of the arteries) can substantially increase a person's risk of stroke. Someone who has already experienced a stroke is at increased risk of having another. Risk reduction strategies include medications, surgery and lifestyle changes.

Lifestyle factors and risk of stroke

Making certain lifestyle changes can significantly reduce your risk of stroke. Suggestions include:

- Maintain a healthy weight for your height.
- Exercise regularly.
- Choose a low fat, high fibre, low salt diet.
- Quit smoking.
- Make sure diabetes is well controlled.
- Limit consumption of alcohol to no more than one standard drink per day (if you are female) or two standard drinks per day (if you are male).
- Have your blood pressure and cholesterol levels regularly checked by your doctor.

High blood pressure

High blood pressure (hypertension) is the most significant risk factor for stroke. Blood pressure refers to the pressure inside the arteries. Hypertension means that the blood is exerting more pressure than is normal or healthy. Over time, this weakens and damages blood vessel walls, which can lead to cerebral haemorrhage.

Hypertension may also cause thickening of the artery walls, resulting in narrowing and eventual blockage of the vessel (ischaemic stroke). In atherosclerosis, the pressure of your pumping blood could 'hose off' debris from damaged artery walls. The circulating debris (embolism) can cause a stroke by lodging in and blocking a blood vessel of the brain.

Strategies for reducing high blood pressure

Strategies include:

- Have your blood pressure regularly checked by your doctor.
- Maintain a healthy weight for your height.
- Exercise regularly.
- Choose a low fat, high fibre diet.
- Reduce or eliminate salt from your diet.
- Limit your alcohol intake to two standard drinks per day (for men) and one standard drink per day (for women).
- Stop smoking.
- Take antihypertensive medications to help control high blood pressure.

Atrial fibrillation

Atrial fibrillation is the term given to a particular type of irregular heartbeat. The heart is made up of four chambers. The top two are the atria, which receive blood from the veins and pump it to the two ventricles. The ventricles are the lower two chambers, which pump blood to the lungs and the rest of the body. In atrial fibrillation, the pathway of the electrical stimulation to the atria is abnormal. This causes the muscle fibres in the atria to twitch, rather than to beat normally, and the ventricles beat irregularly, resulting in an irregular pulse.

People with atrial fibrillation are at increased risk of ischaemic stroke. This is because the inefficient pumping of the atria allows blood to stagnate and ultimately form clots in the atria. Parts of these clots may then break off, travel in the blood (emboli) to the brain and block an artery, causing a stroke.

There are several different classifications of atrial fibrillation, including:

- **Sustained atrial fibrillation** – the heartbeat is always irregular.
- **Paroxysmal atrial fibrillation** – the heartbeat is sometimes irregular.
- **Atrial fibrillation associated with other diseases** – other diseases are sometimes associated with atrial fibrillation, such as thyroid disease (thyrotoxicosis) and heart valvular disease.

Treatment for atrial fibrillation

Associated diseases, such as thyrotoxicosis, may require treatment. The decision on how to treat atrial fibrillation depends on a number of factors, including how long the patient has had the condition and whether it is intermittent or sustained.

Treatment options include:

- **Warfarin or aspirin** – to prevent the formation of blood clots and reduce the risk of emboli going to the brain and producing ischaemic strokes. Warfarin is an anticoagulant drug, generally used in cases of sustained atrial fibrillation of recent onset. Warfarin provides a strong protective effect for people who have had a TIA or a stroke and have AF. There are other new drug types undergoing research that may soon be available and provide other effective prevention in people with atrial fibrillation.
- **Medication** – speak to your doctor to make sure the amount you are taking is right for you. You should not stop taking any medication without speaking to your doctor first.
- **Cardiac electrical treatment** (cardioversion) – to try to make the heart beat regularly again.
- **Use of digoxin** – to slow the heart rate, if reversion to a normal beating heart cannot be achieved.

Atherosclerosis

Atherosclerosis is an inflammatory disease in the walls of the arteries and is a major cause of stroke. The term 'atherosclerosis' literally translates as hardening of the arteries. Healthy arteries are flexible and smooth-walled, allowing unimpeded blood flow. Arteries affected by atherosclerosis become stiff, inflexible and narrowed by deposits of cholesterol-laden 'plaque'.

This plaque destabilises the lining of the artery and can lead to the formation of blood clots within the vessel (atherothrombosis). These clots can then either block the artery or break off and flow downstream in the blood, lodging in a smaller vessel (embolism). Either of these events (atherothrombosis or embolism) can cause an ischaemic stroke. Atherosclerosis can also weaken the walls of smaller arteries and result in haemorrhagic strokes.

Treatment for atherosclerosis

Treatment options include:

- Appropriate lifestyle changes
- Medications that reduce the amount of fats circulating in the blood

- Antiplatelet medications (such as aspirin) or anticoagulant drugs (such as warfarin) to prevent blood clots forming
- Antihypertensive medications to reduce high blood pressure.

Carotid artery stenosis

Hardening of the arteries in the neck (carotid arteries) can be a high risk for stroke, because these arteries are responsible for delivering blood to the brain. Atherosclerosis of the carotid arteries causes narrowing. This is called carotid artery stenosis or carotid stenosis.

Most people with carotid stenosis are not aware of the condition until they have a transient ischaemic attack (TIA). A TIA is a powerful warning that a full stroke is pending, possibly within hours, days, weeks or months. Apart from medications to control atherosclerosis, treatment may include surgery to unblock the carotid arteries.

Team of medical professionals

A person at high risk of stroke will have their condition managed by a team of medical professionals, which may include:

- Your doctor
- Cardiologist (heart specialist)
- Geriatrician (specialist in diseases common in old age)
- Neurologist (brain specialist)
- Vascular surgeon (surgeon specialising in blood vessels)
- Neurosurgeon (brain surgeon).

Where to get help

- Your doctor
- Specialists, including cardiologist, geriatrician, neurologist, vascular surgeon and neurosurgeon
- National Stroke Foundation StrokeLine Tel. 1800 787 653
- Heart Foundation Heartline Tel. 1300 36 27 87
- Quitline Tel. 137 848

Things to remember

- Certain conditions such as hypertension (high blood pressure), atrial fibrillation (irregular heartbeat) and atherosclerosis (hardening of the arteries) can substantially increase your risk of stroke.
- Someone who has already experienced a stroke is at increased risk of having another.
- Risk reduction strategies include medications, surgery to unblock arteries and lifestyle changes.

This page has been produced in consultation with, and approved by:

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