

## **STROKE**

### **What happens to movement and sensation after a stroke?**

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Stroke is caused by a sudden disruption of blood to the brain [1]. It is caused by either a blockage in the blood vessels called an ischaemic stroke, or a bleed in the brain known as a haemorrhagic stroke [2]. Ischaemic strokes are the most common, occurring in approximately 85% of cases [1], however haemorrhagic strokes have a higher fatality rate and are thought to have poorer recovery of function [3]. Stroke has been estimated to affect more than 60,000 Australian each year [4]. This figure is predicted to increase over the coming decades due to an ageing population and the increasing incidence of obesity, diabetes, hypertension and inactivity in the community [1, 5].

As well as affecting the brain, stroke is a neurological condition that can result in devastating and long lasting changes to the muscles and nerves of the body. These changes may occur in isolation, or as part of complex physical and cognitive impairments. As such, the majority of those surviving a stroke will have some form of long-term physical or cognitive disability, and in Australia stroke is the leading cause of acquired disability affecting movement [3]. One of the most common physical impairments after a stroke is hemiparesis [6], or weakness on the side of the body opposite the damaged part of the brain. Although weakness is usually greater on one side, it can also occur on the other side of the body. It is estimated 50% of stroke patients will have long-term muscle weakness that limits their ability to walk and move by themselves [6]. Another common impairment after a stroke is the loss of fine dexterous control of the hand and fingers, or the inability to manipulate objects. This impairment most obviously affects a person's ability to perform daily activities such as dressing, cooking and bathing, but also impacts leisure and work activities. The inability to perform these daily tasks not only reduced the quality of life of the patient, but can also increase the burden of care for friends, family and carers.

Changes in sensation are also common after a stroke. These changes can occur in many types of sensation including touch; proprioception which is the ability to know where the body is in space; and astereognosis which is the inability to recognise a held object by touch [7-13]. People may also experience tingling, pins and needles, and numbness in different parts of the body. Immediately after a stroke it is estimated changes in proprioception and touch may occur in 25% to 85% of patients [8, 10, 14, 15]. Sensory changes may initially appear minor compared to movement impairments however poor sensation can affect personal safety, self-care and the ability to perform everyday activities.

Changes in movement and sensation are caused not only by the damage to the brain, but also by changes in the muscles and nerves themselves. The muscles and joints for example can become stiff and in some people, muscles may start to become smaller. The muscles may not produce as much strength as they did before the stroke and patients will feel weak and tired. Likewise, the nerves responsible for carrying signals between the brain and the body may not communicate effectively and the movement commands may become mixed. Reflexes in the body, which help to integrate the sensory information with movement can also become overexcited and may result in jerky or uncoordinated movements.

Stroke is a highly very variable condition, and the changes that occur in the brain, muscles and nerves are different between people [16]. Differences will depend on the size and location of the stroke in the brain, but will also change with age, general health and lifestyle of the person. There is no cure for a stroke and rehabilitation is the primary way to improve movement and sensation deficits. Researchers and therapists are working together to find ways of improving rehabilitation of these impairments after stroke. However, the best way to avoid these disabilities is to maintain a healthy and active lifestyle.

## Reference for essay

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