AOPA Evidence Statement no. 2: 
The role of the orthotist in the management of stroke

Providing ankle-foot orthoses to improve walking and balance in stroke survivors
About the Australian Orthotic Prosthetic Association

The Australian Orthotic Prosthetic Association (AOPA) is the peak professional body for orthotist/prosthetists in Australia. AOPA self-regulates the profession through the establishment of standards, codes and guidelines which are upheld by AOPA certified practitioners.

Our certified practitioners are qualified orthotist/prosthetists employed throughout the public and private sectors. They provide the full range of orthotic and prosthetic clinical care to support mobility, quality of life, rehabilitation, and participation goals of their clients.

AOPA’s mission is to self-regulate the profession to ensure the delivery of safe and effective orthotic and prosthetic care in Australia.

AOPA also has a role in member representation and the delivery of member benefits, which contributes to the growth of the profession, the shaping of clinical services and maintaining a profession of excellence.

For more information about the Australian Orthotic Prosthetic Association, visit www.aopa.org.au

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Key message

- Many stroke survivors experience impaired walking and balance which significantly increases the risk of a fall
- Falling results in negative medical and psychological outcomes and increased financial costs
- Ankle-foot orthoses help to control the position of the foot and ankle during walking which may reduce the risk of falls among stroke survivors
- Orthotists are the only allied health professional qualified to provide all types of lower limb orthosis options to support stroke survivors

Stroke in Australia

A major cause of disability in the adult population

In Australia, stroke is a major cause of adult disability. There are approximately 50,000 stroke events every year with 70% of these occurring in people aged 65 and over. Life expectancy after stroke is improving and as a result there are a growing number of people surviving stroke and living with disability. In 2012, more than 420,000 Australians were living with the effects of stroke and by 2032, this number is expected to double with stroke affecting 2.4% of the population.

Mobility impairment after stroke

Impaired walking leads to increased falls risk

Two thirds of stroke survivors sustain a disability that interferes with everyday activities. For many, this impairment relates to difficulty with mobility and impaired walking. Reduced walking ability and poor balance are significant risk factors for falling in stroke survivors.

For people who have experienced a stroke, falling is the number one medical complication that occurs during hospitalization. Stroke survivors experience increased risk of falling during in-patient rehabilitation (10 to 47% fall rate) and during the first year following discharge from hospital (43 to 70% fall rate). In people who have experienced a stroke and who live in the community, walking is most often the activity being performed when the fall occurred.

The cost of stroke

When stroke survivors fall it places considerable burden on the health care system

The consequences of falling in stroke survivors are far-reaching and severe, especially for older people. When compared to the general population, stroke survivors are more likely to experience a fracture as a result of a fall, especially of the hip, and are more likely to lose or die after a hip fracture. Many people who fall go on to develop a fear of falling which may lead to reduced physical activity and deconditioning, and eventually to loss of independence, decreased social activity and caregiver stress.
Evidence for orthotic intervention in stroke survivors

Ankle-foot orthoses improve ankle position and positively impact balance and walking

People who have experienced a stroke often develop altered positioning of the foot and ankle where their toes are pointed down and the sole of the foot is turned inward. This is called an ‘equino-varus’ ankle position (figure 1) but is sometimes referred to as foot drop. It is one factor contributing to falls risk in people who have experienced stroke. During walking foot-drop compromises toe clearance in the swinging limb which can result in failure to clear an obstacle, loss of balance and a fall. In appropriate clients, foot drop may be reduced by the use of an ankle-foot orthosis.

A traditional, plastic ankle-foot orthosis encompasses the ankle joint and the whole or part of the foot\(^8\) (figure 2). This orthosis is worn inside the shoe and extends up above the ankle, enclosing the foot, ankle joint and calf area. Advancements in materials technology and manufacturing techniques have allowed for the introduction of more minimalistic designs, which For stroke survivors with foot drop, the ankle-foot orthosis lifts the toes while stepping and stabilizes the foot and ankle when the foot is on the ground (weight bearing). Ankle-foot orthoses have benefits in both the primary and secondary health care setting; immediately post-stroke to promote safe rehabilitation and facilitate hospital discharge, and for long-term use to facilitate safe community ambulation.

The effectiveness of ankle-foot orthoses in stroke survivors has been examined in two recent systematic reviews and meta-analyses\(^9,10\). The use of an ankle-foot orthosis significantly improved balance and walking across a wide range of outcomes. Balance impairment was improved (i.e., more even weight distribution in standing), walking speed was increased, step and stride length were more symmetrical\(^9\), ankle and knee movement became more normal and the energy cost of walking was reduced\(^10\). Use of an ankle-foot orthosis may improve balance confidence in stroke survivors, which may also result in increased activity levels\(^11\).

An equino-varus ankle position

Figure 1.

An equino-varus ankle position is a common complication of stroke. It occurs due to muscle imbalance and spasticity and can result in significant functional impairment. *(Image source: eOrthopod)*

Ankle-Foot Orthosis

Figure 2.

The ankle-foot orthosis is used to realign joints, improve walking patterns and weight-relieve joints and high-risk areas. The prescription of ankle foot orthoses is complex with a variety of materials, ankle joint options and ranges and the shape needing to best suit the needs of the client.
The position of the Australian Orthotic Prosthetic Association

- The provision of an ankle-foot orthosis for appropriate patients with foot drop represents best practice care for stroke survivors (National Clinical Guideline for Stroke\textsuperscript{12} published by the UK Royal College of Physicians).
- The use of ankle-foot orthoses by stroke survivors can have a substantial positive impact on balance and walking thereby effectively contributing to the safe rehabilitation and ongoing activity of clients living with post-stroke disability.
- In Australia, orthotists are the only allied health professionals who receive appropriate training in the clinical assessment, prescription, design, fitting and ongoing review of orthoses for the entire body, including ankle-foot orthoses.
- Access to orthotists in both the primary and secondary health care settings is essential to improve client outcomes and minimize the burden of disease associated with stroke in Australia.
References