

## **Assessing a new gait training technology for improved walking in people with brain and spinal cord injury**

**Investigators:** Dr Brenton Hordacre, Professor Susan Hillier, Dr Jeric Uy, Dr Carolyn Murray, Dr Francois Fraysse

People who have experienced brain or spinal cord injury often want to learn to walk again. Rehabilitation of walking requires lots of practice. This means doing intense training so that the movement can be re-learned, and both strength and endurance increase. Providing enough walking practice after complex injuries, such as brain or spinal cord injury, can be challenging as it requires a lot of effort, both from the person with brain or spinal cord injury, and the therapist. New technologies might be able to assist in helping people re-learn to walk again.

In this study, we evaluated a treadmill that included several pieces of technology to maximise learning and increase the amount of walking practice. Briefly, the treadmill technology included a body weight support harness, helping to safely assist people to stand and maintain an upright position during walking. The technology also provided assistance to move the hips/knees in a walking pattern, included feedback on foot placement, and used augmented reality to keep people engaged and provide an external focus.

We tested this equipment through a randomised cross-over study, meaning people participate in both a treatment program, and a usual care phase, so we can determine if this equipment was beneficial or not. Twenty-eight people volunteered to participate in this study (19 brain injury, 9 spinal cord injury). The study provided 10 treatment sessions over 5 weeks. The amount of assistance and support was adapted to each person.

The gait training technology was safe, acceptable and led to improvements in walking and quality of life. Compared to usual care, the treadmill technology helped people to walk faster, improve their independence in walking, reducing sedentary time in the community and improving health related quality of life.

Interviews with participants identified themes of “It took a lot of effort”, “restoring confidence and feeling empowered”, and “feeling good afterwards”. The gait training technology appears suited to help people with brain and spinal cord injury complete more intensive, safe, mobility training to improve health outcomes.

We have now translated these research findings to a clinical service. Specifically, walking rehabilitation using the gait training technology is available to the community through our health clinic – UniSA Health and Medical Clinic. If people are interested in accessing this technology as part of their rehabilitation, they are encouraged to contact Dr Brenton Hordacre (UniSA, [Brenton.hordacre@unisa.edu.au](mailto:Brenton.hordacre@unisa.edu.au)).