

## **Robotic Walking Devices - Briefing Document and Position Paper**

### **Background**

#### **What is a robotic walking device and how can it be used to support people with MS?**

There are various robotic devices that can be used by therapists as part of rehabilitation and treatment programmes to assist with improving physical functioning for people affected by traumatic injuries and neurological conditions such as multiple sclerosis. Robotic walking devices can be broadly classified into two types: wearable devices and non-wearable devices. Wearable devices include bionic limbs and 'exoskeletons'. Non-wearable devices include body-weight supported treadmill systems (BWSTS) and robots that provide physical support with movement. Such devices are considered by practitioners to be supplemental to one-to-one therapy, not a replacement (Umphred et al., 2013, p. 1114-1129).

#### **The evidence base for the use of robotic walking devices**

The evidence base for the use of robotic walking devices in treating people with MS is mixed. Tefertiller et al (2011) conducted a review of the available research on the use of rehabilitation robotics for people with neurological disorders. They concluded that there is good evidence to support their use in people who have suffered a stroke or spinal cord injury, but only limited evidence for their effectiveness for people with MS, acquired brain injury or Parkinson's Disease.

Schwartz et al (2011) found that there were some short-term gains for multiple sclerosis patients using robotic-assisted gait training; however at six month follow-up, most gait and functional parameters had returned to baseline. Similarly, Straudi et al (2015) conclude that robotic walking therapy "is a treatment option in progressive MS patients with severe gait impairments to induce short-lasting effects on mobility and quality of life". Schwartz and Meiner (2015) conclude that, based on the available evidence, further studies are needed into the long-term outcomes for people with neurological conditions.

We note that a recent systematic review and meta-analysis of exercise (including physiotherapy) on walking found significant improvements in walking speed and endurance (Pearson, Dieberg and Smart, 2015). Therefore it should be noted that although there is some promising research into robotic walking devices, traditional therapies have been found to be as effective and the substantial costs involved in using the robotic devices in comparison to traditional exercise and physiotherapy should also be factored in when considering their suitability as treatments for people with MS.

## **Robotic walking devices in Ireland**

Robotic walking is available in four places in Ireland currently. There are two types of robotic walking therapy available: Ekso Robotic Walking Therapy, which is an 'exoskeleton' device, and Lokomat Robotic Walking Therapy which is an enhanced treadmill. Candidates wishing to use these devices should contact the centre closest to them for details. Each operator will have procedures for assessing an individual's suitability for using the device.

- There is a walking device at the National Rehabilitation Hospital (NRH) in Dun Laoghaire, Co. Dublin. It is only available to in-patients of the hospital and is included in their treatment plan where appropriate/where staffing permits.
- The First Step Therapy Centre in Patrickswell, Co. Limerick, has Lokomat Robotic Walking Therapy available. Sessions cost €75. The cost will be covered by some health insurance providers but is not covered by the Long Term Illness Scheme or by a medical card.
- VIP Med on Gardiner Street in Dublin has Lokomat Robotic Walking Therapy available. Prices will depend on the result of an initial assessment and consultation. Some insurance providers may cover all or part of the cost, but it is not covered by the Long Term Illness Scheme or by a medical card.
- The Elite Gym in Cork has an exoskeleton device available. Clients can self-refer and an assessment will be carried out by a physiotherapist to determine if the device is suitable for the client. The cost of the assessment is €50 and then €50 per walk after that. This is not covered by any health insurance or the Long Term Illness Scheme or by a medical card. The gym owner Colin O'Shaughnessey can be contacted on 087 132 6600 for enquiries.

## **MS Ireland's position on robotic walking devices**

MS Ireland is highly supportive of any treatment or therapy that can be demonstrated through research to improve health outcomes and quality of life for people with multiple sclerosis. To this end, MS Ireland would welcome further research into the effectiveness of devices such as the exoskeleton and other robotic mobility aids.

MS Ireland receives enquiries from individuals who wish to fundraise to purchase such devices for local centres. However, it should be noted that these devices are high-cost and resource-intensive, not only in terms of the cost of the device itself but also in the assessment, training and monitoring required to support a client to use one. Also, there is still at present a limited evidence base as to their long-term effectiveness. Other therapies and exercise programmes may have similar effects and be more cost effective.

MS Ireland calls for greater investment in community-based physiotherapy services and for the development of neurorehabilitation services which will enable better outcomes for the

general population of people with MS in terms of mobility, quality of life and slowing the progression of disability.

## **References**

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