

Lifestyle

Researchers test technical support with robots and functional electrical stimulation

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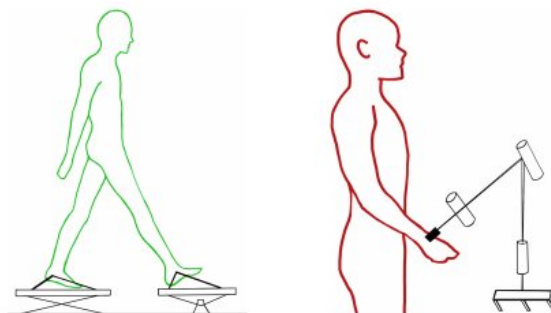


Figure 1-1: Illustrations of end-effector robotic devices, lower limb (left) and upper limb (right). Source: [3]



Figure 1-2: Illustration of exoskeleton devices (from left to right): upper limb exoskeleton, lower limb overground exoskeleton, lower limb body weight supported exoskeleton. Source: [3]

Credits: Robotics and functional electrical stimulation for stroke rehabilitation. <https://eprints.aihta.at/1302/>

Some robots can provide additional clinical benefits to the rehabilitation of stroke patients as a supplement to standard treatments. Alternatively, for functional electrical stimulation of individual muscles or groups of muscles, such additional benefits cannot be demonstrated. These are the results of scientific evidence-based research conducted by the Austrian Institute for Health Technology Assessment (AIHTA) in collaboration with the German Guidelines Working Group. Therefore, after a critical analysis of more than 53 studies, AIHTA recommends a health economy assessment before using these supplemental therapy options.

In Austria alone, the lives of 25,000 people are changing rapidly each year. They suffer a stroke, after which many people become paralyzed in the lower or upper limbs. However, rapid rehabilitation measures often help patients regain full mobility, and walking and daily activities are the main goals of rehabilitation. However, good rehabilitation programs consume a lot of resources, so there are great expectations for supplementing functional electrical stimulation of robots and muscles, among other treatments. However, the extent to which these measurements achieve actual additional clinical benefits has been investigated by AIHTA in collaboration with the German Society of Scientific and Medical Association (AWMF) Working Group (ReMoS / Post-Stroke Mobility Rehabilitation-AG). I did.

The comprehensive analysis was based on a total of over 55 randomized clinical trials and Cochrane reviews. These studies examined specific uses of robot-assisted rehabilitation (RAR) and functional electrical stimulation (FES) in a variety of treatment situations. "The range of devices available is very wide in both RAR and FES," commented Priv. Dozle. Dr. Claudia Wild, director of AIHTA. "Expectations are high accordingly, but unfortunately, as our study shows, they are only partially met. For example, in combination with standard treatment compared to standard treatment without RAR. We were able to determine the additional benefits of some RAR interventions, but for FES. "

In fact, some types of RAR can help in the therapeutic process, especially

when RAR is used for arm rehabilitation in subacute stroke patients. However, evidence of the additional benefits of RAR as a support for walking training is weak. These improvements are believed to be caused by more intensive and frequent patient training achieved without the additional efforts of a physiotherapist. "Therefore, the use of RAR can be very helpful," Dr. Wild concludes. "It may improve treatment outcomes and help reduce the time and physical burden of physiotherapists, as it fails to demonstrate additional benefits over all robotic and product inhomogeneities. It is recommended that the use be evaluated in a health economics analysis as well. This analysis should also include the severity of the stroke and the status and condition of treatment. "

Meanwhile, FES disappointed expectations for additional benefits. These expectations are primarily related to the strengthening of muscles affected by paralysis by external electrical stimulation, as well as the improvement of blood circulation and blood flow. A total of 26 clinical studies were evaluated by AIHTA and a German colleague to investigate the benefits of FES. They found that accompanying standard treatment with electrical stimulation provided little additional benefit. However, there is evidence to suggest that FES (FES with surface electrodes during walking) sub-intervention is not inferior to traditional ankle orthoses. In this case, a health and economic assessment may also be helpful. In addition, six more randomized controlled trials are underway investigating the additional clinical benefits of FES. For Dr. Wild, this is a welcome addition to the database and may also provide new insights.

Overall, this study, currently available online, presents a mixed picture of the clinical benefits of advanced adjuvant therapy in standard rehabilitation of stroke patients. Some interventions in RAR offer additional benefits, but FES does not. Therefore, it is advisable to make a critical evaluation in any case before using it with standard treatments.

Robotic exoskeleton training expands stroke rehabilitation options

For more information:

Goetz, G. et al. (2021): Robotics and functional electrical stimulation for

stroke rehabilitation. eprints.aihta.at/1302/

Provided by Austrian Institute for Health Technology Assessment (AIHTA)

Quote: Researchers have obtained robots and functional electrical stimulation from <https://medicalxpress.com/news/2021-04-technological-robots-functional-electrical.html> on April 19, 2021 (April 2021). 19th) to test technical support

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