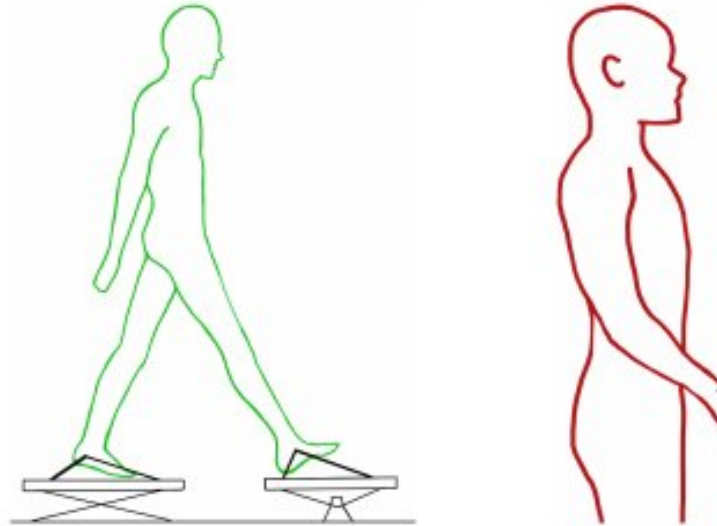
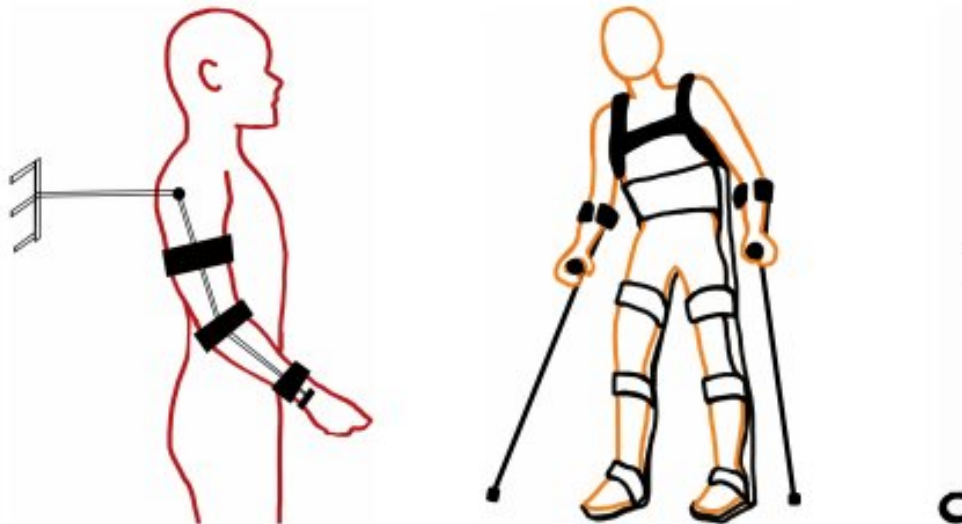


# Researchers test technological support functional electrical stimulation

By **Carl Nguyen** - April 19, 2021



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



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

Credit: Robotics and functional electrical stimulation for stroke rehabilitation. <https://eprints>  
Some robots can create an additional clinical benefit in the rehabilitation of stroke patients a method, the functional electrical stimulation of individual muscles or muscle groups, such as the results of a study based on scientific evidence that the Austrian Institute for Health Tech with a German guideline working group and has now published. After a critical analysis of a health economic evaluation before the use of these supplemental therapy options.

Every year in Austria alone, life changes abruptly for 25,000 people: they suffer a stroke, in the lower or upper extremities. Prompt [rehabilitation](#) measures, however, often help the patients with everyday activities being primary rehabilitation goals. However, good rehabilitation programs are therefore placed in a supplementation with robots or functional electrical stimulation of the muscles. These measures achieve a real additional clinical benefit, however, has now been investigated (ReMoS/ Rehabilitation of Mobility after Stroke—AG) of the Association of the Scientific Medical Societies.

The comprehensive analysis was based on a total of over 55 randomized clinical trials and a specific use of robot-assisted rehabilitation (RAR) and functional electrical stimulation (FES) in available devices is extremely wide for both RAR and FES," comments Priv. Doz. Dr. Claudia Ebner. "The results are correspondingly high, but unfortunately—as our study shows—they are only partially fulfilled. An additional benefit for some RAR interventions in combination with standard therapy compared to FES."

In fact, some types of RAR may benefit the therapeutic process, especially when RAR is used in combination with FES in stroke patients. However, the evidence of an additional benefit of RAR as a support to gait training may be caused by a more intensive and frequent training of patients, achieved without additional

therefore be very useful,” concludes Dr. Wild. “It can improve the therapy results and possibly of time and physical strain. However, we recommend evaluating the use also in health-economic contexts. However, the benefits of FES could not be proven for all robots and heterogeneity of the products can be observed. In this therapeutic context and conditions should also be included in the evaluation.”

The FES, on the other hand, disappointed the expectations of additional benefits. These expectations were that muscles affected by paralysis by means of external electrical stimulation as well as improved walking. To evaluate the benefits of FES, a total of 26 clinical studies were evaluated by AIHTA and German colleagues. The results showed that therapy with electrostimulation did rarely provide any additional benefit. However, there is evidence that FES (FES with surface electrodes during walking) is not inferior to a conventional ankle orthosis. FES is useful in this case. In addition, six further randomized control studies are underway that are evaluating FES. For Dr. Wild, this is a welcomed addition to the data base, which may also provide new insights.

Overall, the study, which is now available online, shows a mixed picture of the clinical benefits of FES compared to standard rehabilitation of stroke patients. Some interventions of the RAR offer additional benefits and are therefore recommended in any case before use in standard therapy.

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[Robotic exoskeleton training expands options for stroke rehabilitation](#)

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**More information:**

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