

Blessing or a curse? Exoskeletons in rehabilitating paraplegic patients

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Abstract

Locomotion is a central part of rehabilitation mostly in patients with an incomplete spinal cord injury (SCI). For a long time, locomotion therapy was performed by using body weight supporting systems on treadmills, combined with walkers or a crane trolley. Locomotion therapy was low-intensity and exhausting for physiotherapists and patients. In the last two decades several robotic devices such as the Lokomat were introduced to improve the locomotion therapy in SCI patients. Advances in technology have enabled the patients to undergo therapy using mobile devices with automated programmes and on different surfaces. Furthermore, some manufacturers have tried to develop exoskeletons as medical aids. Despite their similar design, the devices differ greatly in terms of indications and use due to various control functions and the level of assistance they provide. Nevertheless, especially in the chronic phase, SCI patients are vulnerable to osteoporotic fractures and low arterial blood flow in the plegic extremities. The aim of this report is to give an overview of the most commonly used exoskeletons in regard to therapeutic aspects and their possible use as an assistive device. This has to be interpreted in view of the specific health conditions of SCI patients.

Keywords: spinal cord injury, locomotion therapy, exoskeleton

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