Robotic exoskeleton training expands options for stroke rehabilitation

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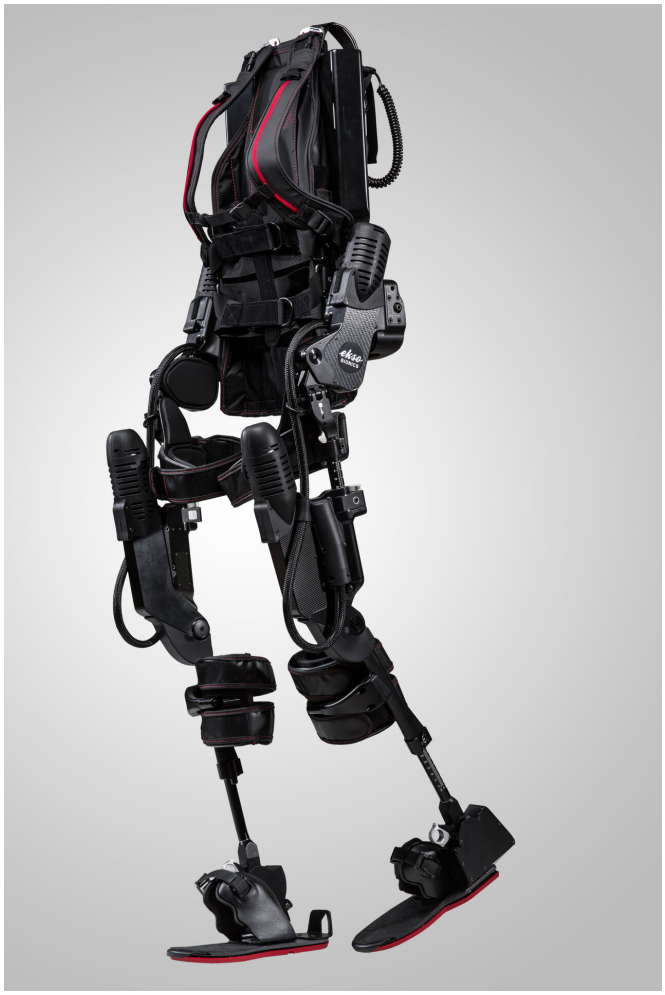

Researchers used the Ekso GT to deliver high-dose gait training during inpatient rehabilitation for acute stroke. Credit: With permission from Ekso Bionics, Inc.

A team of New Jersey researchers has demonstrated that high-dose therapy gait training using robotic exoskeletons may aid early rehabilitation for acute stroke. The article, "Robotic exoskeleton gait training during acute stroke inpatient rehabilitation," was published October 30, 2020 in *Frontiers in Neurorobotics*.

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The need for stroke rehabilitation is tremendous, given the large numbers of stroke survivors with deficits in mobility, balance and coordination that limit their activities of daily living. Advances in robotics and biomedical engineering are expanding the options for rehabilitative care. Researchers are applying new technologies to gait training that may offer advantages over traditional labor intensive physical therapy. This inpatient study of a robotic exoskeleton (Ekso GT, Ekso Bionics, Inc,) demonstrated the potential to improve gait training after acute stroke toward the goal of earlier recovery of motor function.

Participants included 44 individuals (ages 18 to 82 years) admitted to Kessler Institute for Rehabilitation for acute stroke. Half received conventional standard of care (SOC), and half received SOC with an option for overground gait training in the Ekso GT (RE+SOC). Both groups received the same amount of overall therapy time. Overground gait training in the exoskeleton was supervised by a licensed physical therapist who adjusted the variable bilateral assistance of the Ekso GT according to each individual's progress. Outcome measures were total distance walked during inpatient rehabilitation and functional independence measure (FIM) score. The RE-SOC group trained in the Ekso GT at least three times during their stay.

"We found that gait training in the exoskeleton allowed us to increase the dose of gait training without increasing the duration of inpatient rehabilitation," said Dr. Nolan, assistant director of the Center for Mobility and Rehabilitation Engineering Research at Kessler Foundation. "Because overground walking in the exoskeleton requires active effort on the part of the participant," she added, "early intervention with this type of gait training promotes brain plasticity that may lead to greater functional improvements and more lasting effects when combined with conventional training."

More information: Karen J. Nolan et al, Robotic Exoskeleton Gait Training During Acute Stroke Inpatient Rehabilitation, *Frontiers in Neurorobotics* (2020). DOI: 10.3389/fnbot.2020.581815

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