

# MS: How A Robotic Exoskeleton Could Aid Treatment

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## Introduction

• Exercise rehabilitation can help people with MS (MS) manage their symptoms, but it's not as useful for those whose condition is at a complicated stage.

• Experts have evaluated a replacement sort of rehabilitation during which a private exercises within a supporting robotic exoskeleton.

• Little trial of exoskeleton-based exercise produced significant benefits.

• If a bigger trial confirms the results, exoskeleton-based rehabilitation may, one day, become the new standard of look after MS.

MS may be a disease during which the body's system attacks the central systemic nervous, often resulting in a loss of mobility and cognitive function.

Research indicates that exercise rehabilitation, particularly that involving walking, is that the best means of improving mobility and cognition in people with MS. Even a brief course of walking-based exercise rehabilitation (ER) cans provide Trusted Source benefits.

Advanced disability can, however, preclude participation in ER. Several studies Trusted Source have shown that adaptive ER, like body-weight-supported treadmill training and robot-assisted gait training, has not been very effective in people with substantial MS disability or produced additional benefits compared with gait training.

Recently, researchers from the Kessler Institute for Rehabilitation in New Jersey published the results of a randomized controlled trial of robotic-exoskeleton assisted ER (REAER).

A 4-week trial of exoskeleton-assisted therapy produced significant improvements in functional mobility, cognitive processing speed, and brain connectivity.

## Walking in a robotic exoskeleton

With REAER, individuals wearing a supporting robotic exoskeleton walk on the bottom — not on a treadmill — with a physiotherapist who closely guides them through a progressive regimen. The exoskeleton that the team

utilized in the study was the EksoNR.

The researchers recruited 10 Kessler clients, all of whom were aged 18–75 years. All of these individuals had received a definitive MS diagnosis and had been relapse-free for 30 days and seizure-free for 90 days.

They participated in a randomized controlled trial comparing the effects of 4 weeks of REAER training with conventional gait training Trusted Source.

The study used four parameters to work out the effectiveness of the training:

1. **Functional mobility:** The researchers used a “timed up-and-go Trusted Source” measurement of the time it takes to go from sitting in a chair to walking to a target and to returning to a seated position.

2. **Walking endurance:** This parameter was based on the results of a 6-minute walk test on solid ground.

3. **Cognitive processing speed:** The participants underwent a Symbol Digit Modalities Test Trusted Source.

4. **Resting-state functional brain connectivity:** For this parameter, the team focused specifically on the connectivity between the thalamus and ventromedial prefrontal cortex, which functional MRI (fMRI) scans Trusted Source revealed.

## ‘Large improvements’

The results of REAER were significant compared with conventional training. The researchers saw “large improvements” in functional mobility, cognitive processing speed, and brain connectivity. The only factor that REAER didn't affect was walking endurance.

“Four weeks is comparatively short for an exercise training study. Seeing improvements within this point frame shows the potential for exercise to vary how we treat MS. Exercise is [a] really powerful behavior that involves many brain regions and networks which will improve over time and end in improved function.”

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