

Treadmill exercise training shows promise for managing cognitive effects of multiple sclerosis

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Dr. Sandroff is a senior research scientist in the Center for Neuropsychology and Neuroscience and director of the Exercise Neurorehabilitation Research Laboratory at Kessler Foundation. Credit: Kessler Foundation

A pilot study by a team of multiple sclerosis (MS) researchers showed that treadmill walking exercise training may be an effective approach to managing the debilitating cognitive effects of the disease. Their article, titled, "Effects of walking exercise training on learning and memory and hippocampal neuroimaging outcomes in MS: A targeted, piloted randomized controlled trial," was published in *Contemporary Clinical Trials*.

Participants in the single-blind randomized control trial included 11 ambulatory individuals with relapsing-remitting MS and demonstrated MS-related impairments in new learning. They were randomized to either 12-weeks of supervised treadmill walking [exercise \(intervention group\)](#), or 12 weeks of low-intensity resistive exercise (control group). All participants underwent neuropsychological tests of learning and [memory](#) and hippocampal neuroimaging before and after their 12-weeks of exercise.

Researchers saw improvements in verbal learning and memory in the intervention group, and preservation of hippocampal volume. Non-significant effects were found on functional connectivity. These results provide initial proof-of-concept data for the use of treadmill training for walking exercise as a possible behavioral approach for managing the deleterious effects of MS on learning and memory.

The participants had preexisting impairments in learning and memory, an important factor in the study's design, according to lead author Brian Sandroff, Ph.D., senior research scientist in the Center for Neuropsychology and Neuroscience Research at Kessler Foundation. "This study is an important first step in the development of an intervention targeted at the specific cognitive domains affected by MS," said Dr. Sandroff.

"Exercise interventions should be a focus for MS research," added co-

author John DeLuca, Ph.D., Senior Vice President for Research and Training at Kessler Foundation. "Showing efficacy for low-cost, noninvasive, widely available interventions will help us manage the effects of MS, supporting individuals striving to maintain their participation at home, at work, and in their communities. To pursue our findings, larger scale studies are needed to explore the relationships between exercise [training](#) and functional and structural changes in the brain, and the optimal protocols for clinical implementation."

More information: Brian M. Sandroff et al, Effects of walking exercise training on learning and memory and hippocampal neuroimaging outcomes in MS: A targeted, pilot randomized controlled trial, *Contemporary Clinical Trials* (2021). [DOI: 10.1016/j.cct.2021.106563](#)

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