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Stroke survivors walk better after human-assisted rehab

Walking therapy for stroke survivors is significantly more effective when conducted by a physical therapist instead of a robot, according a small study reported in Stroke: Journal of the American Heart Association.

Research suggests that, for a patient who has neurological damage from stroke or spinal cord injury, moving the legs in a way that mimics walking on a treadmill can facilitate walking recovery.

Physical therapists often assist stroke patients too weak to walk on their own by fitting them in a harness, putting them on a treadmill and helping them move as they would when walking. But this can be physically demanding on a therapist, and robotic devices have been developed as an alterative to relieve the therapist.

Some research has shown that robotic devices could improve walking ability, but recent animal studies have indicated that providing strict guidance during training could reduce the recovery achieved.

We wanted to know whether using a robotic device that guides the limb in a symmetrical walking pattern would facilitate greater improvements in walking speed and symmetry than more traditional walking interventions with a physical therapist,″ said T. George Hornby, Ph.D., M.P.T., the study′s lead author.

Hornby and colleagues studied 48 stroke survivors who had suffered strokes at least six months earlier and still had moderate to severe trouble walking because of weakness on one side of their bodies. Patients were randomly divided between robotic-assisted locomotor training, or traditional physical therapist-assisted locomotor therapy. During locomotor training, patients are fitted with a harness and suspended from a frame over the treadmill. All patients received 12 30-minute therapy sessions during the four to five weeks of the study.

We found that stroke patients improved their walking whether they had the robotic device or the therapist helping them," said Hornby, an assistant professor in the physical therapy department at the University of Illinois in Chicago. However, the amount of improvement was greater in the therapist-assisted group.

The researchers noted greater improvements in the therapist-assisted group in walking speed and patients' amount of time spent on the weak leg during walking. Patients in the therapist-assisted group who had severe walking deficits also perceived that their quality of life improved after therapy because they had fewer physical limitations. The same was not true for the robotic therapy group.

The researchers hypothesize that the greater improvement in the therapist-assisted group was because physical therapists allow for human error, while the robotic device used in this study restricted movement and minimized errors.

When learning to walk again, if people can make mistakes and realize their errors and change their behavior based on those errors, they may learn better, Hornby said. We also think that patients work harder and therefore improve more with therapists because the robotic device moved patients' legs for them throughout the therapy. Therapists only help as needed.'

The results of the study are limited by the small size and because researchers and patients were aware of which therapy patients received (non-blinded).

The researchers suggest that the effectiveness of robotic devices may be best reserved for acute stroke patients who have no ability to walk on their own, while those who can walk independently even at very slow speeds ', may be better served by human-assisted therapy.

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Editor's note: May is American Stroke Month. For more information on stroke, visit the American Stroke Association Web site: strokeassociation.org.

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