Electromechanical-assisted training for walking after stroke
(Review)

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This is a reprint of a Cochrane review, prepared and maintained by The Cochrane Collaboration and published in The Cochrane Library 2013, Issue 7

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Electromechanical-assisted training for walking after stroke

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Editorial group: Cochrane Stroke Group.

Publication status and date: New search for studies and content updated (conclusions changed), published in Issue 7, 2013.

Review content assessed as up-to-date: 23 January 2013.


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ABSTRACT

Background
Electromechanical and robotic-assisted gait training devices are used in rehabilitation and might help to improve walking after stroke. This is an update of a Cochrane Review first published in 2007.

Objectives
To investigate the effects of automated electromechanical and robotic-assisted gait training devices for improving walking after stroke.

Search methods
We searched the Cochrane Stroke Group Trials Register (last searched April 2012), the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2012, Issue 2), MEDLINE (1966 to November 2012), EMBASE (1980 to November 2012), CINAHL (1982 to November 2012), AMED (1985 to November 2012), SPORTDiscus (1949 to September 2012), the Physiotherapy Evidence Database (PEDro, searched November 2012) and the engineering databases COMPENDEX (1972 to November 2012) and INSPEC (1969 to November 2012). We handsearched relevant conference proceedings, searched trials and research registers, checked reference lists and contacted authors in an effort to identify further published, unpublished and ongoing trials.

Selection criteria
We included all randomised and randomised cross-over trials consisting of people over 18 years old diagnosed with stroke of any severity, at any stage, or in any setting, evaluating electromechanical and robotic-assisted gait training versus normal care.

Data collection and analysis
Two review authors independently selected trials for inclusion, assessed methodological quality and extracted the data. The primary outcome was the proportion of participants walking independently at follow-up.

Main results
In this update of our review, we included 23 trials involving 999 participants. Electromechanical-assisted gait training in combination with physiotherapy increased the odds of participants becoming independent in walking (odds ratio (OR) (random effects) 2.39, 95% confidence interval (CI) 1.67 to 3.43; P < 0.00001; I² = 0%) but did not significantly increase walking velocity (mean difference (MD) = 0.04 metres/s, 95% CI -0.03 to 0.11; P = 0.26; I² = 73%) or walking capacity (MD = 3 metres walked in six minutes, 95% CI -
The results must be interpreted with caution because (1) some trials investigated people who were independent in walking at the start of the study, (2) we found variations between the trials with respect to devices used and duration and frequency of treatment, and (3) some trials included devices with functional electrical stimulation. Our planned subgroup analysis suggests that people in the acute phase may benefit but people in the chronic phase may not benefit from electromechanical-assisted gait training. Post hoc analysis showed that people who are non-ambulatory at intervention onset may benefit but ambulatory people may not benefit from this type of training. Post hoc analysis showed no differences between the types of devices used in studies regarding ability to walk, but significant differences were found between devices in terms of walking velocity.

**Authors’ conclusions**

People who receive electromechanical-assisted gait training in combination with physiotherapy after stroke are more likely to achieve independent walking than people who receive gait training without these devices. Specifically, people in the first three months after stroke and those who are not able to walk seem to benefit most from this type of intervention. The role of the type of device is still not clear. Further research should consist of a large definitive, pragmatic, phase III trial undertaken to address specific questions such as the following: What frequency or duration of electromechanical-assisted gait training might be most effective? How long does the benefit last?

**Plain Language Summary**

**Electromechanical-assisted training for walking after stroke**

Many people who have had a stroke have difficulties with walking, and improving walking is one of the main goals of rehabilitation. Electromechanical-assisted gait training uses specialist machines to assist walking practice. This review of 23 trials, which included 999 participants, found evidence that electromechanical-assisted gait training combined with physiotherapy may improve recovery of independent walking in people after stroke. Specifically, people in the first three months after stroke and those who are not able to walk appear to benefit most from this type of intervention. The importance of the type of device is still not clear. Further research should address what frequency or duration of walking training might be most effective and how long the benefit can last. Also it is still not clear how such devices should be used in routine rehabilitation.