# INPLASY PROTOCOL

To cite: Nascimento et al. Mechanically-assisted walking training for improving walking speed, walking distance and social participation after stroke: a systematic review protocol. Inplasy protocol 202030007. doi: 10.37766/inplasy2020.3.0007

Received: 24 March 2020

Published: 24 March 2020

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**Support:** **NA**

**Review Stage at time of this submission:** **Formal screening of search results against eligibility criteria.**

**Conflicts of interest:**
**None.**

# Mechanically-assisted walking training for improving walking speed, walking distance and social participation after stroke: a systematic review protocol

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## ABSTRACT

**Rationale:** **Most individuals after stroke have reduced ability to walk fast and cover long distances. Poor walking ability is associated with restrictions in participation. While the goal of inpatient rehabilitation is independent and safe ambulation, once individuals return home, rehabilitation aims to enhance community ambulation skills by increasing walking speed and endurance. One approach to improving walking is the use of mechanically assisted walking devices, such as treadmills or gait trainers.**

**Review question:** **The aim of this systematic review was to examine the efficacy of mechanically-assisted walking for improving walking speed, walking distance, and social participation after stroke. The specific research questions were: 1. In people who had a stroke, does mechanically assisted walking improve walking speed and distance compared with no intervention/placebo or non-walking intervention? Are any benefits maintained beyond the intervention period? 2. Is mechanically assisted walking more effective than overground walking? 3. Are any benefits carried over to social participation?**

**INPLASY registration number:** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 24 March 2020 and was last updated on 24 March 2020 (registration number INPLASY202030007.

## INTRODUCTION

**Condition being studied:** **The World Health Organization defines stroke as a rapidly developing clinical signs of focal (or global) disturbance of cerebral function, with symptoms lasting 24 hours or longer or leading to death, with no apparent cause other than of vascular origin. Most individuals after stroke have long-term**

disabilities, which include muscle weakness and walking limitations that restrict social participation.

## METHODS

**Participant or population:** Ambulatory individuals, who had a stroke. Ambulatory was defined as having a walking speed of at least 0.2 m/s at baseline or when the participants were able to walk without help, with or without walking aids.

**Intervention:** Mechanically assisted walking provided either by treadmills or gait trainers.

**Comparator:** The control intervention was defined according to each research question: (1) to examine the efficacy of mechanically-assisted walking training, the control intervention could be nothing, placebo or non-walking intervention; (2) to examine the superiority of mechanically-assisted walking training, the control intervention could be overground walking training.

**Study designs to be included:** Randomized clinical trials.

**Eligibility criteria:** Design • Randomized controlled trials; Participants • Adults (>18 year) • Diagnosis of stroke • Ambulatory (Functional Ambulatory Category ≥ 3, walking speed ≥ 0.2 m/s at baseline or when the inclusion criteria stated 'able to walk without help, with or without walking aids'); Intervention • Experimental intervention is mechanically assisted walking (e.g., treadmill training or gait trainer) without body-weight support. Outcomes measures • Walking speed • Walking distance • Social participation.

**Information sources:** Searches were conducted on MEDLINE (1946 to april 2019), EMBASE (1947 to april 2019), Cochrane (2005 to april 2019), PsycINFO (1806 to april 2019), and PEDro (to may 2019) databases for relevant studies without date or language restrictions. The search strategy was registered at Pubmed/Medline, so the authors received monthly notifications with potential papers related to this systematic review.

**Main outcome(s):** Three outcomes are of interest: walking speed, walking distance and social participation. The measurement of walking speed has to be reported as a relation between distance and time (typically measured using a timed walk test, e.g., 10-m Walk Test). The measurement of walking distance has to be reported as the covered distance to complete a timed test (typically measured using the 6-min Walk Test). The measurement of social participation has to be reported by questionnaires, which included questions regarding the individuals' ability to perform activities in real life situations (REF / ICF) (e.g., Stroke Impact Scale or Assessment of Life Habits – LIFE-H). The timing of the measurements and the procedure used to measure the outcomes will be recorded to assess the appropriateness of combining studies in a meta-analysis.

**Additional outcome(s):** NA.

**Data management:** Information about the method (i.e., design, participants, intervention, measures) and results (i.e., number of participants, and means (SD) of outcomes related to walking speed, distance, and social participation) will be extracted by two reviewers, and checked by a third reviewer . Where information is not available in the published trials, details will be requested from the corresponding author.

**Quality assessment / Risk of bias analysis:** The quality of the included trials will be assessed by extracting the PEDro scores from the Physiotherapy Evidence Database (www.pedro.org.au) The Grading of Recommendations Assessment, Development and Evaluation (GRADE) system will be used to summarize the overall quality of evidence for each outcome. The GRADE system ranges from high to very low quality.

**Strategy of data synthesis:** A random-effects model, which assumes that the

studies were drawn from populations that differ from each other in ways that could impact on the treatment effect, will be used to obtain the pooled estimate of the effect of the intervention. Change or post-intervention scores will be used to calculate the weighted mean difference, when the outcomes were measured in the same scale (i.e., walking speed and distance). Post-intervention scores will be used to calculate the standardized mean difference, when the outcomes were measured in different scales (i.e., social participation). The pooled data for each outcome will be reported as difference between experimental and control groups and their 95% confidence intervals (95% CIs). Search terms included words related to stroke and to walking interventions (such as walk, walking, gait trainer, locomotion, treadmill). 1 Stroke/ or stroke.mp. (709051) 2 Cerebrovascular disorders/ or Cerebrovascular disorders.mp. (81229) 3 Cerebrovascular disorders/ or cerebral vascular.mp. or Cerebral Hemorrhage/ (154297) 4 (cerebral or cerebellar or brain$ or vertebrobasilar).mp. (1253391) 5 (infarct$ or isch?emi$ or thrombo$ or emboli$ or apoplexy).mp. (3133262) 6 4 and 5 (311000) 7 (cerebral or brain$ or subarachnoid).mp. (4263363) 8 (haemorrhage or hemorrhage or haematoma or hematoma or bleeding).mp. (1309053) 9 7 and 8 (296618) 10 Hemiplegia.mp. or hemiplegia/ (41104) 11 (hemipleg$ or hemipar$ or poststroke or post-stroke).mp. (118352) 12 Gait Disorders, Neurologic/ (6300) 13 1 or 2 or 3 or 6 or 9 or 10 or 11 or 12 (1195062) 14 (electromechanical or electro-mechanical or mechanized).mp. (18068) 15 Body-weight.mp. or Body Weight/ (822404) 16 (body and weight and (support$ or relief)).mp. (243760) 17 (orthos$ or orthotic).mp. (95296) 18 Treadmill.mp. (80106) 19 (fitness and train$).tw. (20809) 20 (lokomat or locomat).mp. (632) 21 Gait Trainer.mp. (291) 22 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 (1078748) 23 Walking/ or Walking.mp. (215690) 24 Gait.mp. or Gait/ (150113) 25 Locomotion.mp. or Locomotion/ (139693) 26 (walk$ or gait$ or ambulat$ or mobil$ or locomotor$ or balanc$ or stride or distance).mp. (2843406) 27 (social participation or community participation).mp. (37630) 28 23 or 24 or 25 or 26 or 27 (2940726) 29 13 and 22 and 28 (7569) 30 limit 29 to humans; records were retained] (6538)

**Subgroup analysis:** None planned.

**Sensibility analysis:** None planned.

**Language:** English.

**Keywords:** Stroke; gait; rehabilitation; physiotherapy.

**Dissemination plans:** Conference abstracts and peer-reviewed journal.

**Contributions of each author:**
Author 1 - Study design, data collection, statistical analysis, writing of manuscript.
Author 2 - Study design, data collection, statistical analysis, writing of manuscript.
Author 3 - Study design, data collection, statistical analysis, writing of manuscript.
Author 4 - Study design, data collection, statistical analysis, writing of manuscript.
Author 5 - Study design, data collection, statistical analysis, writing of manuscript.