



STROKE SPECIAL INTEREST GROUP

Academy of Neurologic Physical Therapy

In this newsletter...

- New Article REVIEW. JAMA, Optimal Intensity and Duration of Walking
- Student Corner has great content. 2 new videos posted!
- Virtual Town Hall event for educators - If you missed it, recording available



STROKE SIG
ARTICLE REVIEW
Academy of Neurologic Physical Therapy



Thank you Daniel Dray for your review of this super exciting article.

Title: Optimal Intensity and Duration of Walking Rehabilitation in Patients with Chronic Stroke: A Randomized Clinical Trial

Article reference: Boyne P, Billinger SA, Reisman DS, et al. Optimal Intensity and Duration of Walking Rehabilitation in Patients With Chronic Stroke: A Randomized Clinical Trial. JAMA Neurol. 2023;80(4):342-351.
doi:10.1001/jamaneurol.2023.0033

Link to full article:

<https://jamanetwork.com/journals/jamaneurology/fullarticle/2801947>

Definitions: Moderate-intensity Aerobic Training (MAT): A type of locomotor exercise typically involving treadmill/overground walking at mean training heart rates between 40% -60% of the heart rate reserve (HRR). Studies have found that MAT is associated with significantly greater improvements in walking capacity (6-minute walk distance) and other outcomes when compared lower intensity walking practice or non-walking exercise.

High intensity interval training (HIIT): A type of locomotor exercise involving bursts of fast walking alternated with recovery periods. It is designed to enable sustained vigorous intensities (>60% HRR) Studies suggest that more vigorous training intensity could further improve outcomes, but a vigorous intensity can be difficult to achieve and sustain for many persons with stroke using continuous activity.

Purpose of article: This multicenter randomized clinical trial was used to assess the optimal training intensity (moderate vs vigorous) and the minimum training duration (4, 8, or 12 weeks) needed to maximize immediate improvement in walking capacity among stroke survivors with chronic walking limitations.

Methods of interest: Participants included were adult survivors of a single stroke who had persistent walking limitations > 6 months after the stroke. Subjects were randomized to either MAT or HIIT intervention groups. Target training volume for both groups was 45 minutes, 3 times per week, for 12 weeks. Each session involved task specific walking training on a treadmill and overground. The HIIT group used a protocol involving 30-second bursts of walking at maximum safe speed, alternated with 30- to 60- second passive recovery periods (standing or seated rest as tolerated), targeting a mean aerobic intensity > 60% HRR. The MAT group performed continuous walking practice with speed adjusted to maintain an initial target HR of 40% HRR, progressing by 5% HRR every 2 weeks up to 60% HRR as tolerated.

Outcomes were assessed at baseline and after 4, 8, and 12 weeks of training. The primary outcome measure was walking capacity, measured by distance walked during the 6-minute walk test. Secondary measures included self-selected and fastest speeds, (measured by the 10-m walk test); self-reported fatigue measured by the Patient Reported Outcomes Measurement Information System (PROMIS) Fatigue Scale; and aerobic capacity, measured by oxygen consumption rate (VO₂) at the ventilatory threshold during a treadmill-graded exercise test. Adverse events were recorded as well.

Results of interest: Fifty-five participants were randomized to either an MAT or HIIT intervention group. Baseline characteristics were similar between groups. After 4 weeks of training, there was no significant difference in the primary outcome of 6mWT change between groups. However, the HIIT group improved significantly more than the MAT group after 8 weeks and 12 weeks. Both groups exhibited significant increases in self-selected gait speed, fastest gait speed, and ventilatory threshold VO₂ at various time points relative to baseline, with the HIIT group showing significantly greater increases than the MAT group in self-selected and fastest gait speeds. Only the HIIT group had significantly decreased PROMIS Fatigue Scale scores compared with the MAT group and only at the 8-week time point.

Discussion, take home message: Results of this trial give proof of concept that vigorous training intensity is a crucial dosing parameter for locomotor exercise in patients with chronic stroke. Findings also indicated that locomotor HIIT can produce significant and meaningful gains in walking capacity in 4 weeks, but that a training duration of at least 12 weeks is needed to maximize immediate gains in walking capacity with this intervention. Clinically, 12-week outpatient therapy duration for a HIIT program may be an optimal standard to target. Adverse event monitoring in this study suggests HIIT is a safe intervention.

Additional references:

-ANPT: *Locomotor Training CPG Resource Page*: This page has an abundance of information/resources for clinicians interesting in implementing HIT in their clinic. <https://neuropt.org/practice-resources/anpt-clinical-practice-guidelines/locomotion>

-ANPT National Campaign: *Intensity Matters*: Includes clinical resources and a



From: **Optimal Intensity and Duration of Walking Rehabilitation in Patients With Chronic Stroke: A Randomized Clinical Trial**

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JAMA Neurology

RCT: Optimal Intensity and Duration of Walking Rehabilitation in Patients With Chronic Stroke

POPULATION

36 Men, 19 Women



Adults with chronic stroke and persistent walking limitations
Mean age, 63 y

INTERVENTION

55 Participants

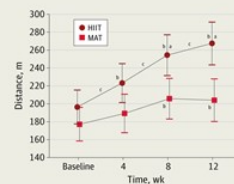


27 High-intensity interval training (HIIT)
Bursts of maximum speed walking alternated with recovery periods, targeting >60% heart rate reserve

28 Moderate-intensity aerobic training (MAT)
Continuous walking practice targeting 40% heart rate reserve initially, then progressing up to 60%

FINDINGS

There was no difference in 6-min walk distance between groups at 4 wk, but the HIIT group had significantly longer 6-min walk distance at 8 and 12 wk compared to MAT



SETTINGS / LOCATIONS



3 Exercise laboratories in the US

PRIMARY OUTCOME

Walking capacity was measured by 6-min walk distance in meters at baseline and after 4, 8, and 12 wk after training. Clinically important change thresholds for this test generally range between 20 and 50 meters.

12-wk Change in 6-min walk distance HIIT vs MAT
71 m vs 27 m
Absolute difference: 44 m (95% CI, 14-74 m; P = .005)

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Figure Legend: Optimal Intensity and Duration of Walking Rehabilitation in Patients With Chronic Stroke

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STROKE SIG

STUDENT CORNER

Academy of Neurologic Physical Therapy



NEW STUDENT CORNER VIDEOS!

2 part series

Student Corner Question:

“Is there evidence for or against the use of hemi-walkers for gait training acutely post stroke?”

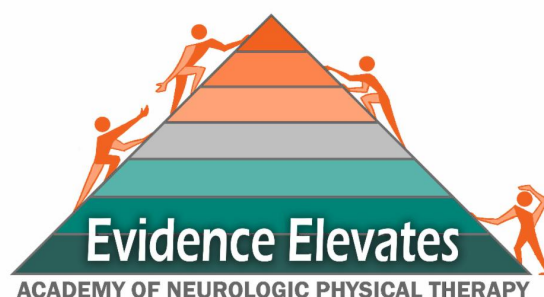
Hemi Walkers Acutely Post-Stroke-Part 1:

<https://www.youtube.com/watch?v=BFeEiQ2QkvY>

Hemi Walkers Post-Stroke Case Conclusion:
<https://www.youtube.com/watch?v=ZO1Yr-siYHg>

Anyone can ask a question (anonymously). The stroke SIG will answer.
<https://www.neuropt.org/special-interest-groups/stroke/student-corner>

Virtual town hall event for Educators



In case you missed this great conversation, you can still [listen here](#).



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