



STROKE SPECIAL INTEREST GROUP

Academy of Neurologic Physical Therapy

In this newsletter...

- Article Review. Increasing Intensity improves locomotor and non-locomotor outcomes!
- Networking MIXER this week. October 5
- ANPT Annual Conference - See you there!!
- Student Corner - Ask the expert!!



STROKE SIG ARTICLE REVIEW

Academy of Neurologic Physical Therapy



Stroke SIG weekly article review summary.

Completed by: Daniel Dray, PT, DPT NCS

Summary topic title: Increasing the Amount and Intensity of Stepping Training During Inpatient Stroke Rehabilitation Improves Locomotor and Non-Locomotor Outcomes

Article reference: Henderson CE, Plawecki A, Lucas E, Lotter JK, Scofield M, Carbone A, Jang JH, Hornby TG. Increasing the Amount and Intensity of Stepping Training During Inpatient Stroke Rehabilitation Improves Locomotor and Non-Locomotor Outcomes. *Neurorehabil Neural Repair*. 2022 Sep;36(9):621-632. doi: 10.1177/15459683221119759. Epub 2022 Aug 25. PMID: 36004813

Link to abstract: <https://pubmed.ncbi.nlm.nih.gov/36004813/#:~:text=Non%2DLocomotor%20Outcomes-,Increasing%20the%20Amount%20and%20Intensity%20of%20Stepping%20Training%20During%20Inpatient,Neurorehabil%20Neural%20Repair>

[FULL TEXT](#)

Definition(s): High Intensity Gait Training (HIT): A treatment paradigm to improve walking function following acute CNS injury, based on the principles of neuroplasticity. Sessions prioritize repetitive, task specific walking at high aerobic intensities (75-85% HRmax/RPE 15-18) with aerobic zones targeted for as much time as possible per session. Variability is provided by walking in different directions, over obstacles or on uneven/ compliant surfaces. Training is completed on a treadmill, overground, and on stairs.

Background and Purpose of article: Traditional strategies to improve locomotion that include incrementally challenging patients above their current functional level and attention towards impairments have demonstrated limited success. Rather, applied findings suggest maximizing the amount of task-specific practice, particularly at higher cardiovascular intensities, may result in superior gains in locomotor capacity and performance. This study was designed to evaluate the effectiveness of HIT compared to usual care during inpatient rehabilitation post-stroke.

Methods: This study utilized a quasi-experimental pre-post design in which functional outcomes and therapy interventions were monitored *prior to* and *following* attempts to implement HIT as a standard of care during

inpatient rehabilitation (two units at a single facility).

Changes in stepping activity and functional outcomes were compared over 9 months during usual-care phase (n = 131 patients), during an 18-month transition phase with attempts to implement HIT (n = 317), and over 12 months following implementation (HIT phase) (n = 208).

Prior to the usual care phase, therapists were trained and encouraged to collect outcome measures including the 10-m walk test (10MWT), 6-minute walk test (6MWT) and Berg Balance Scale (BBS) at admission, weekly, and discharge. Secondary measures include the individual FIM scores for bed to chair transfers (FIM-bed), toilet transfers (FIM-transfers), walking (FIM-walk) and stairs (FIMstairs). Paretic extremity strength, stepping activity, fidelity metrics, and adverse events were also recorded.

The transition phase began with didactic and hands-on education, and continued with meetings, mentoring, and audit and feedback. Implementation of HIT was undertaken using an established implementation framework (i.e., Knowledge to Action cycle) utilized in similar quality improvement efforts in inpatient rehabilitation.

While HIT was attempted for all patients post-stroke beginning with the transition phase, only selected patients were included. Individuals were only excluded if they were >2 months post stroke, outside the age range of 18-89 years old, had restrictions in lower extremity weight bearing (e.g., amputation or lower limb fracture), were unable to ambulate >50 m prior to their most recent stroke, or were discharged from rehabilitation to home after <1 week.

Results of interest: Admit and discharge 10MWT, 6MWT, and BBS were collected with 92%, 88%, and 88% compliance, respective to phases. Patient demographics included a longer length of stay during the HIT phase and a greater admission BBS during the usual-care phase.

Within the HIT phase, all stepping and intensity metrics were significantly different from usual-care and transition phases. Specifically, greater steps/day and steps/PT session were observed. Improvements were observed in both the amount and rate of stepping, with greater frequency of stepping performed and prioritized. Intensity was also documented more consistently, with targeted intensities achieved in 38% of sessions.

For primary walking outcomes, modest improvements in 10MWT were observed during usual-care [0.07 m/s (0-0.24)] and transition phases [0.08 m/s (0-0.30)] at discharge, with larger median gains during HIT [0.13 m/s (0-0.35)]. More substantial improvements were observed for the 6MWT during HIT [50 m (9.2-116)] as compared to usual-care [2.1 m (0-56)] or transition phases [9.1 m (0-80)].

For non-walking outcomes, changes in BBS across the length of stay were relatively similar across all phases (9-12 point median gains), and not significantly different between groups. However, 1-point greater median gains in FIM-bed, FIM-transfers, and FIM-stairs were observed during HIT as compared to usual-care or transition phases, with inconsistent differences in FIM-walk.

Associations between steps/day and changes in 10MWT and 6MWT were analyzed and indicated greater amounts of stepping practice during HIT were associated with proportionally greater outcomes.

There was no difference between the number of significant adverse events between phases.

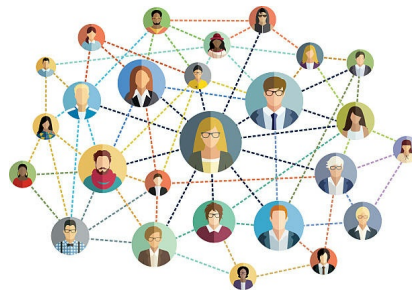
Discussion, take home message: Over the course of 30 months following initial attempts to implement HIT, therapists in inpatient rehabilitation increased prioritization of walking interventions and cardiovascular demands during PT sessions, resulting in greater amounts of stepping practice as compared to usual care. In turn, increased stepping practice contributed to greater gains in locomotor outcomes (10mWT, 6MWT). As for non-locomotor outcomes, greater gains in FIM-bed and FIM-transfers were observed during HIT, with no detriment BBS scores despite practice of these tasks not being prioritized. This combination of greater walking gains with HIT while simultaneously improving non-walking tasks, and without increasing the incidence of significant adverse events, may minimize the concerns of therapists and improve the efficiency of PT services.

Although conventional rehabilitation strategies are still being widely utilized, this present study suggests that sustained implementation efforts can effectively shift inpatient PT practice patterns, which in turn can improve patient outcomes.

Additional references:

-*Institute for Knowledge Translation*: Offers a comprehensive online course focused on implementing high intensity gait training (includes Q&A and mentoring sessions). <https://www.knowledgetranslation.org/>

-*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->



ANPT Hosts Virtual Networking Mixer

THIS WEEK: Weds Oct 5th

Expand your PT and PTA network!

The ANPT Membership and PR Committee would like to kick off PT month with a virtual networking mixer on **Wednesday, October 5th at 7 pm ET**. Come to meet with ANPT leaders to discuss a variety of topics. **[Click here to register.](#)**

Residency Faculty

Heather Knight (Practice Committee Chair)

Mary Beth Osborne (Residency and Fellowship Committee member)

Residents/Fellows and prospective residents/fellows

Ali Elder (Residency and Fellowship Committee member)

Meredith Smith (Residency and Fellowship Committee member)

NCS Resources

Lisa Brown (Neurological Specialty Council Member)

Bonnie Pancoast (Specialization and Advanced Proficiency Committee)

Specialization Topics

Heather Hayes – Stroke SIG

Rachel Wellons – Vestibular SIG

Allison Fracchia - AT/SWIM SIG

Jennifer Nash - Balance and Falls SIG

Christina Burke - Degenerative Diseases SIG

Research

Patrick Sparto (Director of Research)

Allison Hynstrom (Chair of Research Committee)

Eric Anson (Research Committee Member)

Leadership/Volunteering for ANPT/Getting to know ANPT

Irene Ward (Director of Knowledge and Synthesis)

Kate Kugler (Secretary)

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2nd ANNUAL CONFERENCE **ANPT 2022**

October 13-15 Minneapolis, MN

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STUDENT CORNER
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<https://www.neuropt.org/special-interest-groups/stroke/student-corner>

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