April 29th, 2024

STROKE SPECIAL INTEREST GROUP

Academy of Neurologic Physical Therapy

In this newsletter...

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Thank you, Madisyn!

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Summary Topic Title: Daily steps are associated with walking ability in hospitalized patients with sub-acute stroke

Article Reference: Kubo H, Kanai M, Nozoe M, et al. Daily steps are associated with walking ability in hospitalized patients with sub-acute stroke [published correction appears in Sci Rep. 2022 Aug 23;12(1):14380]. Sci Rep. 2022;12(1):12217. Published 2022 Jul 17. doi:10.1038/s41598-022-16416-8

Purpose: To determine if there is an association between the daily number of steps and achievement of walking independence in individuals post-stroke admitted to an inpatient rehabilitation hospital. Additionally, the study aimed to identify the cutoff value of daily number of steps that predicts achievement of walking independence.

Methods of Interest: This cross-sectional, observational study included 85 patients. Participants were included in the study if they were admitted to the rehabilitation hospital within 30 days post-stroke onset, and were able to ambulate independently, or with intermittent and/or continuous light touch to assist. The exclusion criteria

included a pre-stroke modified Rankin Scale (mRS) score of > 2, presence of a subarachnoid hemorrhage, history of significant comorbidities (i.e., musculoskeletal disease, cardiopulmonary disease, other brain injuries, Parkinson's disease, and gastrointestinal disease), or the inability to provide consent due to a loss of consciousness, aphasia, dementia, or non-cooperation.

All participants were seen for 40-60 minute sessions of physical, occupational and/or speech-language-hearing therapy two to three times per day for seven days per week.

All physical activity was measured for six consecutive days using a Fitbit One on the non-paretic ankle, with and beginning at 30 days post-stroke. This study was conducted in Japan, where inpatient length of stay post-stroke appears to differ from the United States. Patients were instructed to wear their Fitbit One immediately after waking and to remove it while bathing and before going to bed. They did not receive additional feedback from physical therapists regarding steps per day.

A patient's level of walking independence was determined using the Functional Ambulation Category (FAC). The subjects were divided into two groups based on their FAC score. If the patient had a FAC score ≥ 4, they were assigned to the walking independence group. If a subject had a FAC score ≤ 3, they were assigned to the walking non-independence group. The 6-Minute Walk Test (6MWT) was used to determine walking endurance and the Fugl-Meyer Assessment (FMA) was used to assess lower extremity impairment. All outcomes were completed at 30 days post-stroke. Secondary demographic data was also recorded upon admission and discharge including age, sex, height, weight, stroke type, and pre-stroke mRS. Stroke severity was also assessed using the National Institutes of Health Stroke Scale (NIHSS).

Results of Interest: After adjusting for confounding variables, this study found that daily number of steps was associated with walking independence. This study also suggests that for every 1,000 steps per day increase in the patient's step count, the odds of becoming an independent ambulator increased between 1.398 and 5.734. Number of steps per-day decreased with increasing disability (measured by NIHSS score).

The cutoff value for the daily number of steps to promote walking independence was **4,286 steps** in the walking independence group.

Discussion: In order to facilitate/predict walking independence, physical therapists can combine the cutoff value of the number of steps found in this study with the cutoff values of other functional performance measures (6MWT, FMA). For patients that are not able to ambulate independently following a stroke, increasing the number of steps during therapy, and promoting light intensity PA during non-therapy time can aid in the recovery of ambulation ability. Of note, there were non-independent walking patients who achieved 4286 steps. For these types of patients, it may be necessary to consider other factors, such as cognitive function.
The limitations of this study included the inability of the Fitbit One to measure physical activities at slower velocities. Thus, patients that ambulated at a slower pace may not have had an accurate reporting of their PA. Additionally, the study was geared toward patients >30 days post-stroke, so the results may not be applicable to acute stroke or community-dwelling chronic stroke patients. There were several relationships that were not clarified within this study – the number of steps and long-term impact, causal relationship between number of steps and walking independence, and the number of steps and age and severity of stroke. The study did not take into account the level of PA level prior to the onset of stroke or rehabilitation contents of each patient. Both of these factors can affect level of PA following a

stroke.

Additional Resources:
Modified Rankin Scale (mRS)
https://www.sralab.org/rehabilitation-measures/modified-rankin-handicap-scale

Functional Ambulation Category (FAC)
https://www.sralab.org/rehabilitation-measures/functional-ambulation-category

6-Minute Walk Test (6MWT)
https://www.sralab.org/rehabilitation-measures/6-minute-walk-test

Fugl-Meyer Assessment (FMA)
https://www.sralab.org/rehabilitation-measures/fugl-meyer-assessment-motor-recovery-after-stroke

National Institutes of Health Stroke Scale (NIHSS)
https://www.ninds.nih.gov/sites/default/files/documents/NIH_Stroke_Scale_508C.pdf

NEW Podcast Episode!

STROKE SIG PODCAST

Pelvic Health across the Continuum of Care for Patients with Neurologic Conditions: Episode 24

In this episode, host Marissa Moran, PT, DPT is joined by Ariana Jones, PT, DPT, Board-Certified Clinical Specialist in Women's Health Physical Therapy, and Gillian McLean, PT, DPT, Board-Certified Clinical Specialist in Neurologic Physical Therapy, to discuss pelvic health therapy across the continuum of care for the neurologic population, particularly those following a stroke. In this podcast, you may expand your knowledge on the pelvic floor and normal urination/bowel movements. Listen to learn how pelvic health and neurologic physical therapists can collaborate to deliver the effective and holistic care to patients, as well as education you can provide to patients regarding pelvic health concerns/when to see a pelvic health specialist to promote optimal well-being.

Link: https://www.neuropt.org/education/anpt-podcasts

You can also listen across multiple podcast platforms - search for the ANPT Stroke Special Interest Group!

CONGRATULATIONS to our

Stroke SIG Research Award Winner!

Congratulations to **Pamela Rogers Bosch, PT, DPT, PhD**!

The Stroke SIG Research Award recognizes a member of the Stroke SIG who has demonstrated exemplary contributions to the body of research representative of the population the SIG serves.

CONGRATULATIONS to our Stroke SIG Service Award Winner!

Congratulations to **Heather Hayes PT, DPT, PhD**!

The Stroke SIG Service Award acknowledges a member of the SIG who goes above and beyond though volunteer contributions to the SIG and its efforts.

CONGRATULATIONS to our

CSM 2024 Stroke SIG Poster and Platform Winners!

- The best poster presentation award goes to the poster titled “Six-Minute Walk Distance Differentiates Respiratory Impairment in Chronic Stroke” that was presented by Gina Brunetti, Barbara Kellerman Smith and Dorian Kay Rose.

- The BEST platform presentation award goes to the platform titled “Improving Walking Performance in Individuals with Chronic Stroke: Prowalks Trial Results” that was presented by Elizabeth Diane Thompson.

APTA American Physical Therapy Association

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