

BACKGROUND

Individuals with neurological impairments often have difficulty with dynamic balance and gait. Common measures of gait, such as speed, distance, sway, step and stride length, may not capture indices that reflect changes in dynamic balance during gait, particularly if the patient compensates in gait with a wide base of support. Challenging patients with tandem gait (heel to toe walking on a single line) may bring out impairments of postural control during gait. What is unclear is whether measures of tandem gait, such as speed, and the number of errors, are appropriate measures that can reflect change over a course of physical therapy.



PURPOSE

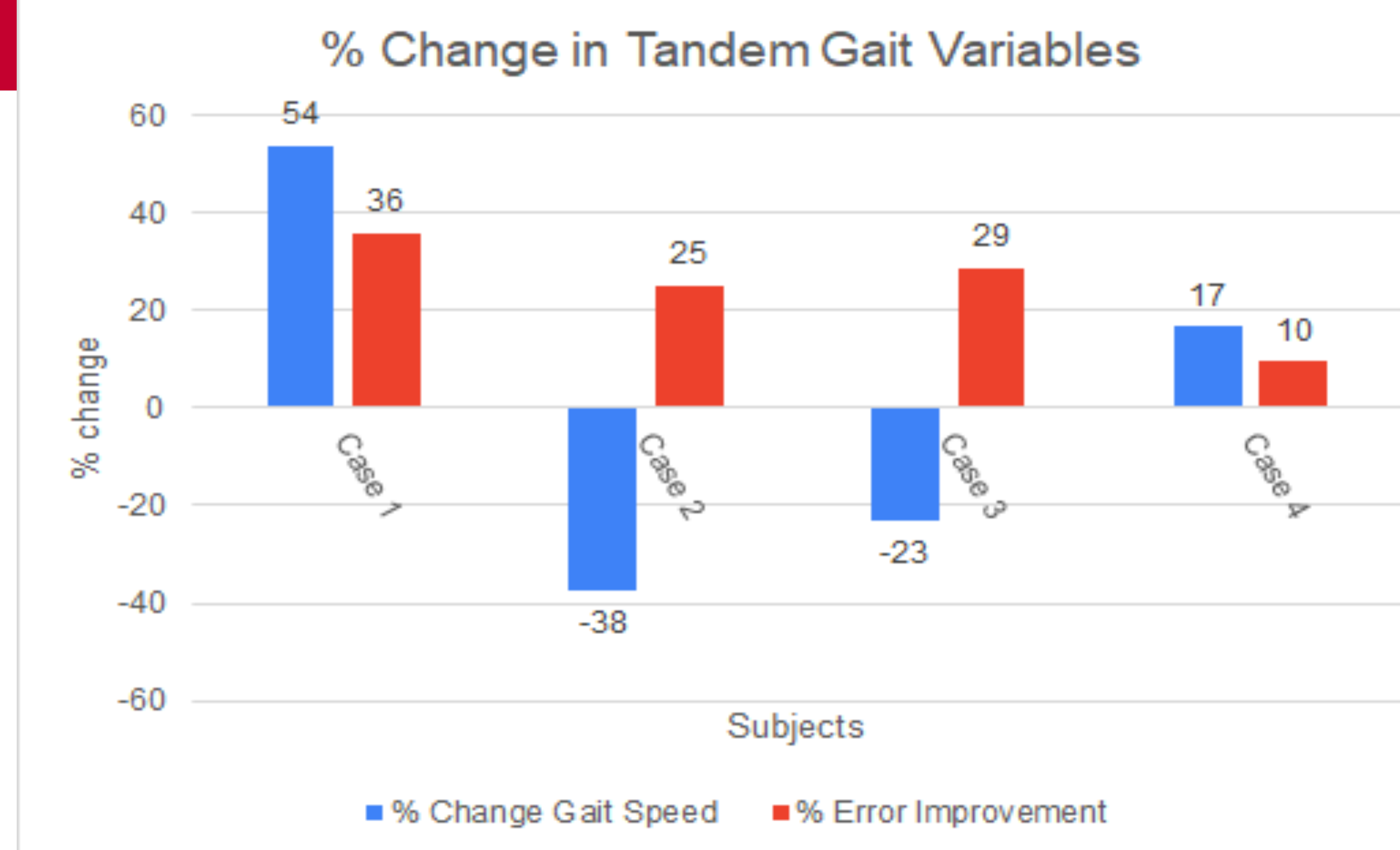
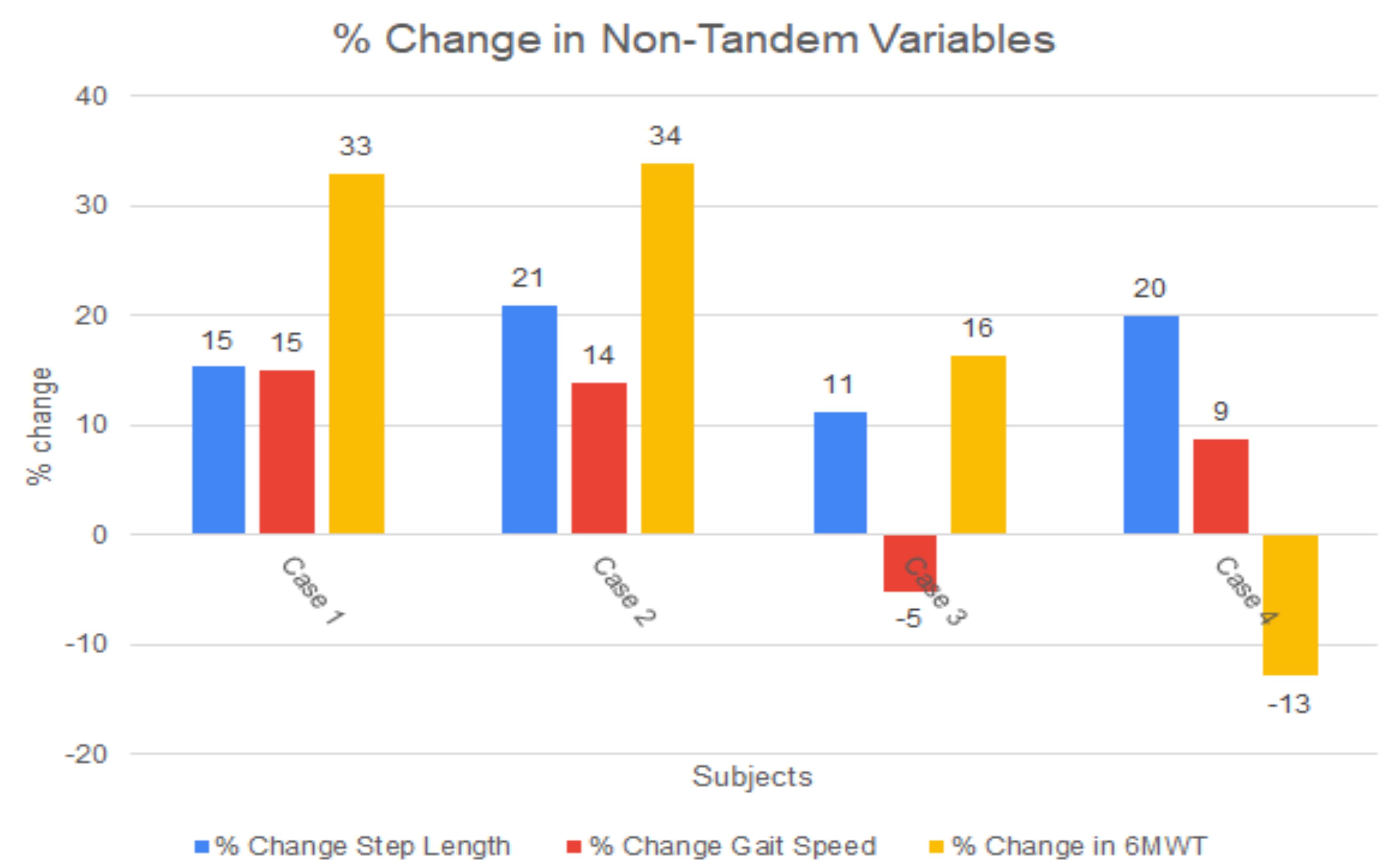
To explore whether measures of tandem gait (speed, step length, sway and errors) were appropriate to capture an overall change using VirtuSense® in dynamic gait ability after a course of physical therapy at Bradley University's pro bono clinic.

MATERIALS AND METHODS

Five patients (3 post CVA, 2 PD) from the Bradley University Clinic for Fitness and Function were recruited. Before and after 10 weeks of physical therapy, patients were asked to walk 12 feet through parallel bars. Patients walked twice in their normal gait pattern, and twice in a tandem gait pattern. A 2" wide piece of tape was placed on the ground through the parallel bars, as patients were instructed to walk heel to toe, for tandem trials. Data recorded through VirtuSense* in both tasks included gait speed, postural sway, lean, step length, and base width. Errors were recorded as a touch to the P bars or their foot coming off the tape. These changes were also compared with the changes shown in each subject's 6 minute walk test (6MWT).

RESULTS

One individual was excluded due to uncharacteristic difficulties during the post-treatment measurements. The results of the non-tandem and tandem gait variable are on the tables below. The sway data in some of the trials were collected as extremely high values (out of what could be conceived as physiologically possible) thus sway data was not included since it did not appear valid. Percent change values are shown in the following figures:



CONCLUSIONS

Generally normal gait improved over the course of 10 weeks as measured by speed (except for one subject) and step length indicating a positive impact from the physical therapy intervention. Tandem gait speed increased in 2 of the subjects whereas **in all 4 subjects less error was recorded in the post-therapy measures** again perhaps indicating a positive impact of the 10 weeks of therapy. Overall, tandem gait measures, especially **the number of errors, may be a conceptually valid tool of overall gait improvement in ambulatory individuals with neurological impairments.** This research suggests that a larger study may be warranted.

REFERENCES

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