

Body Weight Supported Treadmill Training and Overground Gait Training in the In-Patient



Setting for and Individual with Chronic Stroke: a Case Report

Stephanie Bordignon, DPT Student
University of New England, Portland, ME



Background

- 795,000 people in USA have a new or recurrent stroke each year, leaving them with spatiotemporal gait abnormalities¹
- Following D/C from in-patient rehab, many patients continue to experience activity limitations & participation restrictions secondary to limited walking ability.²
- The use of BWSTT & overground GT has been shown to improve bilateral coordination and gait symmetry for patients with chronic stroke.³
- Evidence for BWSTT rather than overground GT is mixed and does not include representation for the young stroke population.⁴

Purpose

- To describe the outcomes of gait speed, efficiency of gait, and fall risk in a young individual following a chronic stroke managed with intense BWSTT and overground GT

Case Description

- 44 y/o veteran.
- Right hemorrhagic CVA due to malignant hypertension four months prior to intervention (considered chronic).
- Patient presentation: left hemiparesis, spasticity of left upper and lower extremities, decreased sensation on the left, decreased gait speed, functional strength, and range of motion (ROM), impaired balance in bilateral stance, visual field deficits, & flat affect.
- RH was considered a severe fall risk.
- BWSTT and GT 5x/week for 12 weeks.

Interventions



Figure 1: Posterior view of Therastride Body Weight Supportive Treadmill System.

- Intervention progression was based on patient tolerance and included increased duration, intensity, frequency, and decreased rest breaks.

	Week 1	Week 4	Week 7	Week 10	Week 12
BWSTT	70% BWS; 2 sets of 5'; @ 0.6-0.8 MPH	50% BWS; 3 sets of 6'; @ 0.8- 1.1 MPH	40% BWS; 3 sets of 10'; 1.1- 1.3 MPH	25% BWS; 3 sets of 10'; 1.3- 1.5 MPH	15%BWS; 2 sets of 15'; 1.5- 2.5 MPH
GT	No AD; with CGA, ModA x1 for balance & safety; self-selected pace	No AD; with CGA, ModA x1 for balance & safety; increased speed	No AD; with CGA; use of metronome & music for increased cadence	No AD; with supervision; use of metronome & music for increased cadence	No AD; with supervision
NMR	Fit, skin checks, and ambulation with traditional AFO	Bioness L300 cuff with procedural interventions	Static balance; LE functional strengthening	Independent with FES device	Static and dynamic balance; perturbations; obstacle courses

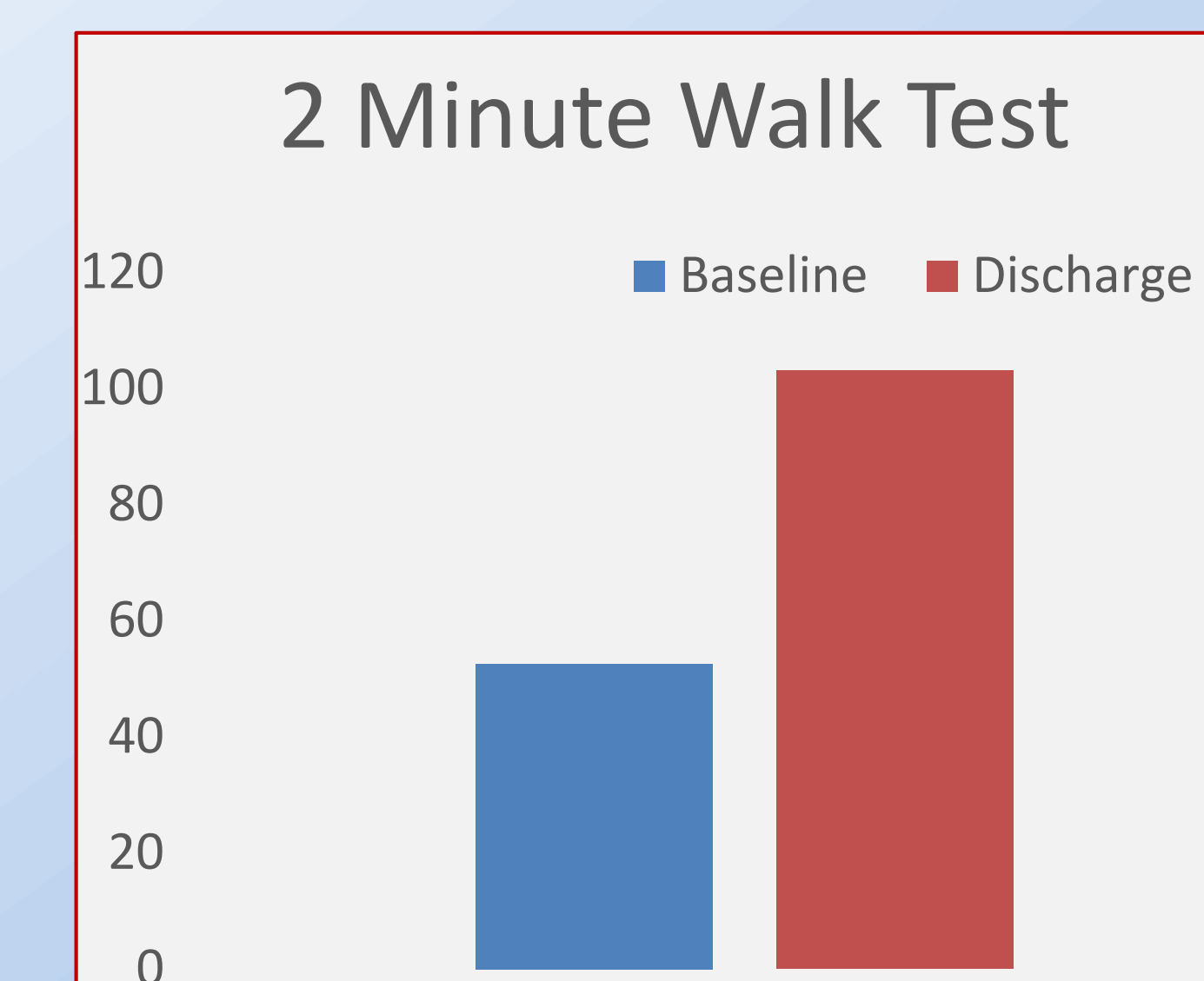
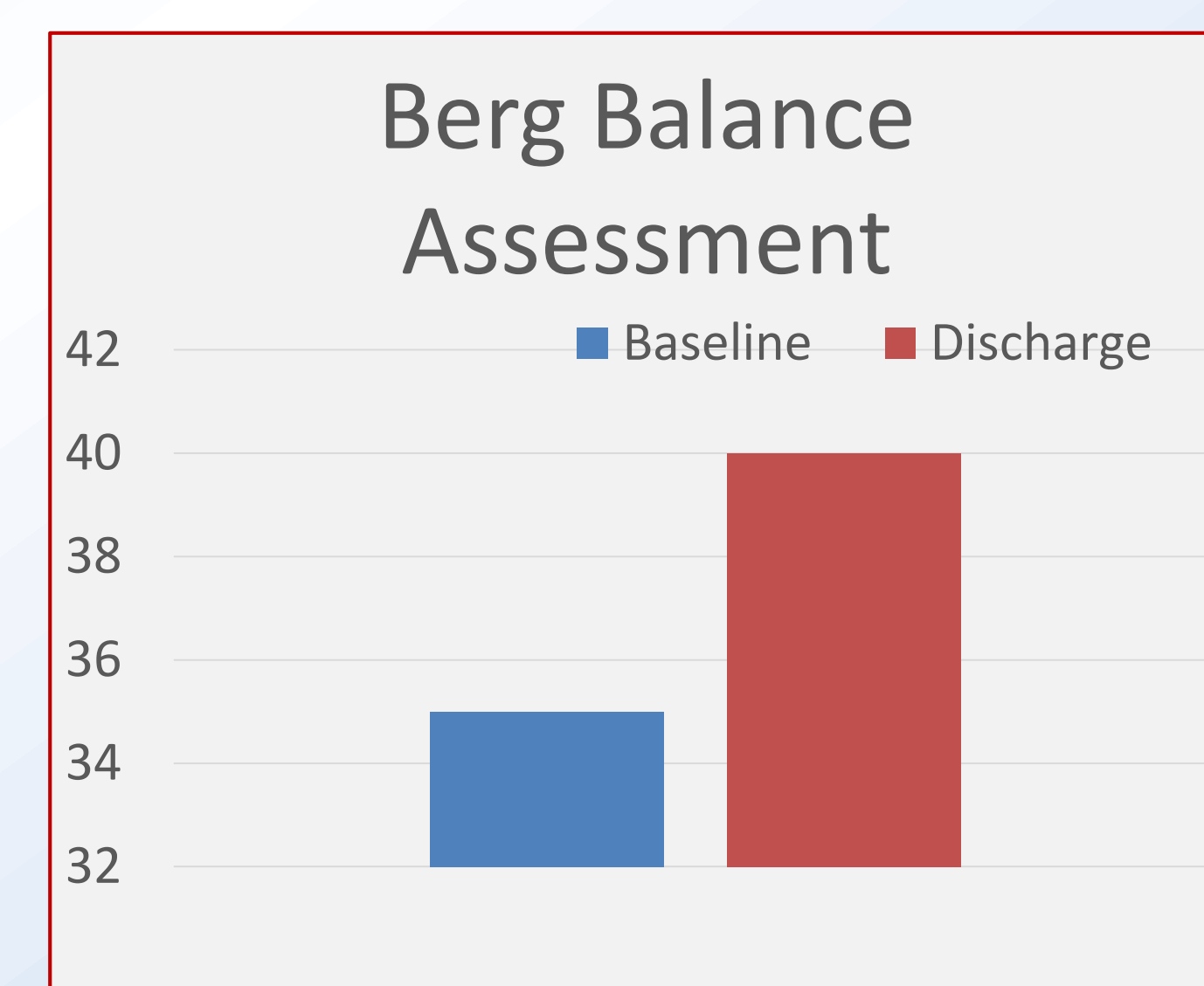


Figure 2: Lateral view of Therastride Body Weight Supportive Treadmill System with use of left Bioness L300 stimulation cuff.

Outcomes

- Tests and measures were performed at baseline and discharge to obtain objective measures of RH's progress.
- At D/C, RH met 1/4 of the PT goals for D/C planning.
- However, RH met his self-reported goals of: walking without the use of an AD, improved balance, and no reported falls.

Outcome Measure:	Baseline	Discharge
Timed Up & Go	1:23" (with the use of SPC, left AFO & CGA) 1:55" (with the use of QC, CGA, no AFO) 1:52" (with CGA, no use of orthotics or AD)	1:09" (with use of left FES for DF stimulation & supervision; No AD)
5x Sit to Stand	42.72" (with the use of right upper extremity support from sit to stand, CGA, & AFO)	1:10" (with the use of right upper extremity support from sit to stand & supervision)
10 Meter Walk Test	Unable to obtain accurate result due to patient's slow speed and inability to complete test	0.37 m/s (no AD, with supervision & left Bioness anterior tibialis stimulation)



Discussion

- RH demonstrated mixed overall gains with management. This is similar to previous publications reporting mixed outcomes.
- Possible attributable factors to mixed outcomes include:
 - Variation of individual stroke severity/ symptoms.
 - Sample cohorts consisting of heterogeneous populations of patients that have had a stroke.
- Further research is warranted in the area of BWSTT among a homogeneous patient population. This should include, but not limited to:
 - Trials utilizing BWSTT among patients with similar severity of strokes and symptoms.
 - Trials utilizing BWSTT for patients experiencing chronic stroke symptoms of various origins.
 - Trials utilizing quality of life outcome measures & cost to help determine cost effective management.

References

1. Mozaffarian D, et al; on behalf of the American Heart Association Statistics Committee and Stroke Statistics Subcommittee. Heart disease and stroke statistics—2015 update: a report from the American Heart Association [published online ahead of print December 17, 2014]. *Circulation*. doi: 10.1161/CIR.000000000000152.
2. Nadeau SE, Wu SS, Dobkin BH, et al. Effects of task-specific and impairment-based training compared with usual care on functional walking ability after inpatient stroke rehabilitation: LEAPS Trial. *Neurorehabil Neural Repair*. 2013;27(4):370-80.
3. Combs SA, Dugan EL, Ozimek EN, Curtis AB. Bilateral coordination and gait symmetry after body-weight supported treadmill training for persons with chronic stroke. *Clin Biomech (Bristol, Avon)*. 2013;28(4):448-53.
4. Depaul VG, Wishart LR, Richardson J, Thabane L, Ma J, Lee TD. Varied overground walking training versus body-weight-supported treadmill training in adults within 1 year of stroke: a randomized controlled trial. *Neurorehabil Neural Repair*. 2015;29(4):329-40.