

## **THE EFFECTS OF BODY-WEIGHT SUPPORTED TREADMILL TRAINING ON GAIT AND BALANCE FOR TWO INDIVIDUALS WITH CHRONIC**

**TRAUMATIC BRAIN INJURY.** Brewer JF, Truong C, Jesko L, Shepherd J, Vargas J, Davis E. Hardin-Simmons University Department of Physical Therapy, Abilene, TX.

**PURPOSE:** (1) Assess the effects of body-weight supported treadmill training (BWSTT) on gait and balance, via the, Biodex Gait Trainer 3®, Dynamic Gait Index and 6-Minute Walk Test in two individuals with chronic traumatic brain injury (TBI), and (2) Assess longevity effects of BWSTT on gait. **SUBJECTS:** Two male single-subject case studies (S1 = 24 yo/8 yrs post TBI; S2 = 51 yo/29 yrs post TBI), were evaluated and trained by five Physical Therapy students. **METHODS:** Intervention consisted of eight weeks of training utilizing BWSTT and Conventional Overground Gait Training (COGT) two times a week for a total of 16 sessions with outcomes tested at weeks four, six, end of training, and 2 months post-training. An agreed goal range regarding time on the treadmill (from 6 to 20 minutes) and body weight support (from 20% to 5%) changed every two weeks to increase intensity of training. The amount of time in COGT remained consistent at 6 minutes and followed BWSTT each treatment session. A COVID-19 screen was completed prior to treatment, and baseline vitals were collected before the treatment session, following BWSTT, and following COGT. Rest periods of at least 5 minutes were given between each training modality. Distance, speed, stride length, cadence, and time on each foot was recorded following BWSTT; distance was recorded following COGT. **RESULTS:** A two-band standard deviation method of analysis determined statistically significant changes for distance on 6MWT. S2 had a significant change in 6MWT distance from 231.4 to 346.2 feet after 4 weeks of intervention. Minimal clinically important difference was revealed in S1 on the DGI with a 6-point improvement from 15-21 on a scale of 0-24. On the DGI, <19 is considered a fall risk, so the subject successfully moved out of the fall risk category within 8 weeks of intervention. Minimal clinically important difference was noted in gait speed and minimal detectable change was noted in stride length for both subjects. S1 increased gait speed from 1.1 mph to 2.2 mph and bilateral stride length (R: 45 cm to 74 cm; L: 42 cm to 67 cm) in 8 weeks of training. S2 increased gait speed from 0.5 mph to 1.0 mph and bilateral stride length (R: 40 cm to 62 cm; L: 37 cm to 69 cm) in 6 weeks of training. **DISCUSSION:** Findings suggest that training on the Biodex Gait Trainer 3® with the Biodex NxStep Unweighting System® in combination with COGT is a safe and practical method of exercise for individuals with chronic TBI that can be successfully used to increase gait endurance, distance, limits of stability, and functional balance. **CLINICAL RELEVANCE:** Our results demonstrated clinically meaningful improvements (MDC and MCID) in gait and balance in just 16 training sessions which correlated with a decreased fall risk in subjects with chronic TBI. Further research may be needed with larger sample sizes and longer durations of training.