

Brewer JF, Lewis AD, Lucas KJ, McCright J, Mitchell JL. Reliability of the Alter-G Anti-Gravity Treadmill Two-Minute Walk Test and its Effect on Balance in the Elderly (poster). Combined Sections Meeting of the American Physical Therapy Association. San Antonio, TX, 2017.

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Purpose: (1) (1) To determine the reliability and cardiopulmonary effects of the Two-Minute Walk Test (2MWT) among older adults using the Alter-G anti-gravity treadmill; (2) to determine the effects on functional balance after the use of the Alter-G. **Number of Subjects:** Eleven (M=5, F=6) elderly residents (mean age=84.7 + 4.32 yrs) from an assisted living facility. **Materials/Methods:** Subjects provided informed consent, completed a cognitive exam, medical history, Par-Q risk, and physician approval. Baseline over-ground 2MWT, Four Square Step Test (FSST), and Frailty and Injuries: Cooperative Studies of Intervention Techniques (FICSIT) were administered on each subject with systolic blood pressure (SBP), heart rate (HR), and oxygen saturation (SaO₂) levels obtained prior to, during, and after each 2MWT. Subjects were assisted into the Alter-G for a familiarization session of treadmill ambulation with progressively increased body weight support to 60%. Participants then completed randomized Trials 1 and 2 on two separate days. Trial 1 consisted of completion of two Alter-G 2MWTs, FSST, and the FICSIT. Trial 2 consisted of two over-ground 2MWTs, FSST, and the FICSIT. An Intraclass Correlation Coefficient (ICC) was computed to determine the reliability of the 2MWT on the Alter-G and over-ground. Repeated measures ANOVA analyze differences in distance walked, HR, SBP, and SaO₂ on the Alter-G and over-ground 2MWTs. **Results:** Two-minute walk over-ground distance averages were 266.8' vs. 216.5' on the Alter-G treadmill. ICCs indicated a higher test-retest reliability for the 2MWT when performed over-ground (0.971, p<0.001) versus on the Alter-G treadmill (0.686, p<0.050). No significant changes in either the FSST or FICSIT were found following either the over-ground or the Alter-G 2MWTs. Results of the repeated measures ANOVA revealed a significant increase in HR within trials for the 2MWT performed over-ground on day one (p<0.001) and day two (p<0.048). Significant differences in SaO₂ were also found on day one (p<0.005) and day two (p<0.012), but no changes in SBP were noted. No significant changes in HR, SBP, or oxygen saturation were found between trials for the 2MWT when performed on the Alter-G. **Conclusions:** Physiological and distance walked results of the 2MWT performed over-ground versus the Alter-G are not comparable. Greater distances were recorded more consistently on the over-ground test and produced more physiological changes in subjects' HR and SaO₂ levels. Neither test significantly affected static or dynamic balance outcomes. **Clinical Relevance:** The over-ground 2MWT may be easier to administer in the clinic because it requires less time, less equipment, and results in better reliability than the same test performed on the Alter-G. However, this data also shows that there was no significant change in balance post Alter-G 2MWT among those in assisted living facilities. From this, we infer that in the elderly, fall risk neither increases or decreases after a 2-minute Alter-G locomotion session and appears safe regarding the subject's measured balance.