

People with chronic ankle instability (CAI) demonstrate altered gait or walking mechanics which cause people to walk on the outside of their foot and increases the risk of additional ankle sprains, abnormal cartilage strain, and early joint degeneration. Evidence indicates that common treatments for CAI do not impact gait, leaving unresolved impairments that can lead to lifelong disability. Recent lab-based gait retraining with visual and auditory feedback has immediately improved walking mechanics. However, *real-world training is hypothesized to generate long-term changes* by incorporating short, frequent training sessions over a variety of surfaces. These are key training parameters to produce lasting change. Our pilot data using real-world vibration feedback (RW-VF) suggest that a single session immediately improves walking mechanics with changes lasting for up to 5 minutes. Despite promising initial results, there remains a *critical need* to determine the impact of multiple RW-VF sessions as an initial step to developing a protocol capable of long-term improvements. The purpose of this proposal is to determine the extent to which 2-weeks of RW-VF restores gait biomechanics in those with CAI. We will enroll 20 people with CAI (10 male, 10 female) and compare their walking mechanics before, immediately after, and 1 week and 4 weeks following RW-VF training. These contributions can be significant as positive results will support a paradigm shift in treatments for people with CAI and lay the foundation for large scale clinical trials aimed at optimizing long term gains. The outcomes of future research have the potential to advance evidenced based rehabilitation interventions not only for people with CAI but also for people who have sustained a variety of musculoskeletal injuries as there is strong evidence that other lower extremity pathologies cause lifelong limitations, including changes in walking mechanics which lead to degenerative changes to other joints.