

Development and Protocol for the Utilization and Setup of a Low-Cost Slip Trainer for Fall Prevention

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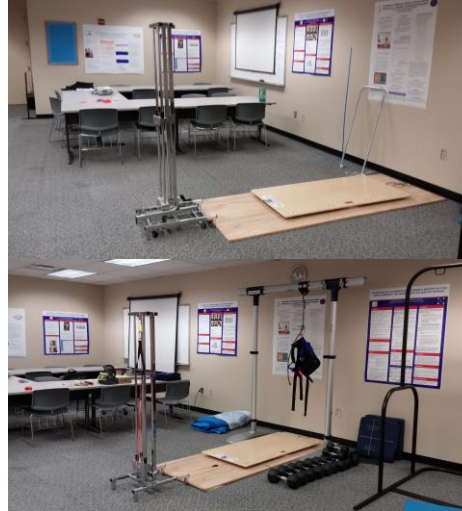
Introduction to Slip Trainers

- The idea of a “fall vaccine” has been studied as a way to proactively treat falls and possibly prevent falls for older adults
- Locomotion-balance skills gained are useful for resisting everyday slips and falls [1]
- Findings indicate that after a series of slips in a controlled environment, both older and younger adults began to adapt to the unexpected slips and fell less after only a several hour session [1]
- However, the facilities to perform this kind of slip training are only accessible in certain labs and are very expensive

Research Objective

Design, build, and test a low cost slip trainer which can mimic the effect the current lab slip trainers provide in addition to working on developing a protocol for physical therapists to utilize this new device effectively in a clinical setting

Prototypes

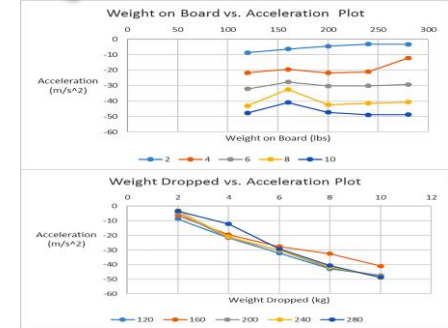


- Finalized design-new board, safety tape on edges of board, magnetic braking system, and improvement to weight stack

Methods

- Data was measured between three trials of varying weight on board and weight dropped, then averaged and graphed.
- Acceleration data was collected with APDM Opal IMUs

Results



- Acceleration is not significantly influenced by weight on board, but rather by weight dropped-clinical importance
- The range of 6-8 kg dropped seemed to produce what will be a moderate acceleration that destabilizes people

Discussion

- Clinical importance, continuation to future work

Next Steps

- Finish final design
 - Conduct study procedure with young and old adults
 - Determine acceleration threshold for reactive step for both populations
 - Conduct study on recovery methods
1. Pai Y, et al. Inoculation Against Falls: Rapid Adaptation by Young and Older Adults to Slips During Daily Activities.. Archives of Physical Medicine and Rehabilitation, 2010