Comparison of Responses in Proactive vs. Reactive Balance Control

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Abstract

Even though recent research suggests reactive balance training (unexpected, external perturbations) has more effective, long term results than proactive training (self-initiated actions), the latter is used most often in a clinical setting due to its affordability and convenience. This pilot study sought to develop a safe, affordable, and easily portable perturbation-inducing device to be used for reactive balance training. In addition, this device was used to determine how well skills gained under proactive conditions transferred to reactive conditions. A comparison was also made to determine whether proactive training skills were comparable to skills gained under reactive conditions. METHODS: A non-electric perturbation inducing device called the Slip-Trainer was developed by MASS Rehab in Dayton, Ohio. A stopper, harness, and weight stack were also designed and used in concurrence with the Slip-Trainer to safely induce subjects to slip. PROCEDURE: Thus far, four subjects have participated in this study. Three subjects completed two Slip-Trainer exercises of up to 30 slips which were divided by a one hour break. The other subject completed one half hour of Xbox with Kinect video game play and one Slip-Trainer exercise also divided by a one hour break. Kinematic data was collected by the 8-camera motion capture system in the Motion Lab. RESULTS: The Slip-Trainer device allows for safe and cost effective reactive balance training. We also finalized a workable protocol by improving some aspects of the procedure. CONCLUSION: Due to the positive results obtained from the subjects tested thus far, we intend to assess the effectiveness of the Slip Trainer and revised protocol on older adults in the future.