

THE EFFECTS OF A VIBRATORY METRONOME ON ARM SWING DURING A TEN-METER WALK TEST. Jumper J, Herbel S, Johnson P, Kiser M, Yowell K, Stewart T. Hardin-Simmons University Department of Physical Therapy, Abilene, TX.

PURPOSE: (1) To assess the effect of a vibrating metronome on arm swing in people with Parkinson's Disease (PWP). (2) To assess the effect of the location of the vibrating metronome on arm swing in PWP. **SUBJECTS:** Subjects from the Big Country Parkinson's Support group were recruited to participate. All subjects needed to have a diagnosis of Parkinson's Disease, be able to ambulate without an assistive device, and attain a score ≤ 3 on the Hoehn and Yahr Scale. **METHODS:** Participants signed an informed consent form prior to beginning the study. Heart rate, blood pressure, and pulse oximetry were assessed, and an experienced researcher completed the Unified Parkinson's Disease Rating Scale (UPDRS). A gait belt and 7 Noraxon Myomotion (IMU) sensors were placed on each participant. To record upper extremity motion testing, bilateral IMU sensors were placed as follows: at the dorsum of hands, halfway between the olecranon and ulnar styloid processes, at the deltoid tuberosities, and at the spinous process of C7. The IMU sensors were then calibrated prior to gait analysis. Participants completed two 10-meter walk tests to confirm the proper function of the IMU sensors. During the initial walks, researchers set the SoundBrenner metronome to the proper cadence that matched each participant's self-selected step pattern. Researchers randomly assigned the order of control (no metronome device), chest-mounted, and wrist-mounted trials by allowing participants to draw cards labeled 1 (control), 2 (wrist-mounted), and 3 (chest-mounted). Each participant completed each trial twice. During each trial, researchers recorded upper extremity motion at each joint. One-way repeated-measures ANOVAs were performed to compare right and left upper extremity kinematic motions without the metronome, with the metronome on the most affected side, and with the metronome on the chest. After the sixth trial was completed, the Noraxon Myomotion sensors were removed, and skin was assessed. Alpha level was set at $p \leq 0.05$. **RESULTS:** Sixteen subjects (M=9, F=7) participated in the study (mean age: 66.8 ± 4.55 years; mean weight: 179.53 ± 28.52 pounds; mean height: 68.60 ± 4.79 inches). Right shoulder external rotation was significantly different between control trial and wrist trial, $F(1,14)=12.91$, $p=.003$. No other statistically significant differences were noted between control, chest-mounted, and wrist-mounted trials. **CONCLUSIONS:** The findings of this study suggest a vibratory metronome improves limited aspects of arm swing in PWP, however, further research using a larger sample size along with the inclusion of lower extremity kinematics is recommended to obtain a better representation of the overall gait cycle. **CLINICAL RELEVANCE:** This research is the first study evaluating the use of a small, vibratory metronome to improve arm swing in PWP. The findings of this study indicate a vibratory metronome is not recommended for improvements in arm swing for PWP.