



## **Short-term Influences of the Physioacoustic Method on Symptoms in Parkinson's Disease**

**By Dr. Quincy Almeida & Lauren King**

**Movement Disorders Research & Rehabilitation Research Centre & LCMTR  
Wilfrid Laurier University**

Our objective was to complete a thorough, quantitative analysis of the effectiveness of whole body vibration as a potential treatment for motor symptoms of Parkinson's Disease. Although previous investigations have supported the idea that vibration therapy is an effective mode of symptom relief, the thoroughness in gait and functional upper limb assessments of the current study is unmatched.

40 individuals diagnosed with idiopathic Parkinson's disease participated in this study with their informed consent. Participants were subdivided into groups according to primary symptom. Hence, there were 20 slow/rigid dominant participants, and 20 tremor dominant participants. The mean ( $\pm$  standard deviation) age was  $65.4 \pm 9.9$  years, and the mean duration of the disease was  $6.8 \pm 4.8$  years. Diagnosis was established by the primary care neurologist. Participants with dementia or other diseases impairing gait or coordination were not admitted to the study, and all subjects had normal or corrected-to-normal vision. To represent their typical day-to-day state, subjects were not withdrawn from their medication. Vibration treatments were administered in 5 series lasting one minute each with one minute rest periods between each series.

When sitting in the chair, participants were instructed to close their eyes and relax as much as possible with their legs reclined and uncrossed. Lower legs, thighs, buttocks, lower back, and upper back were to be in contact with the surface of the chair at all times.

Participants were first assessed using the motor section of the Unified Parkinson's Disease Rating Scale (UPDRS). The UPDRS is a standardized diagnostic tool that gauges the nature of the disease progression and effectiveness of treatment plan. Videotaping the assessments allowed the rater to be completely blinded to the treatment status of each participant, with no cues as to which experimental group the individual belonged. For the videotaped assessment, participants were rated for tremor, finger tapping, leg agility, posture, and ability to arise from a seated position. The only subset that could not be rated with videotapes was the rigidity component which was also completed by the same blinded rater for each assessment. Also, each participant was required to walk in a straight line at a normal pace down a pressure-sensitive carpet that measured several parameters regarding the gait of the individual. The measures of interest were velocity and step length for both right and left feet. The second final assessment was the timing in a grooved pegboard task to indicate the severity of slowness in execution of movement. This grooved pegboard is a manipulative dexterity test consisting of 25 holes with randomly positioned key-hole slots, in which participants have to place 25 pegs. The experimental design we employed allowed us to counterbalance the effects of fatigue and practice in our assessments, and also determined if there was a difference between vibrating in the chair and simply sitting in the chair.

In summarizing the results, no major symptom category is left untouched. UPDRS scores for tremor and rigidity both improved. The other subsets of the UPDRS scales namely posture, sitting to standing scores, and leg agility did not reach a level of significant improvement. However, this is likely due the fact that these scores were naturally less severe initially. Therefore, unlike tremor and rigidity, there was little room for improvement in the first place. The GAITRite carpet was able to provide the study with accurate and unbiased parameters indicating the improvement in step length but no significant change in velocity. Results of this initial investigation provide support for vibration therapy as a non-pharmacological treatment alternative. Long-term effects of vibration therapy would require further research.

Physio-acoustic therapy and placebo effect in muscle recovery.

By Dr. Peter M. Tiidus, Roula Markoulakis, Drew Murray, Marco Karkkainen and Dr. Heidi Ahonen-Eerikainen.  
Departments of Kinesiology & PE and Music Therapy, Wilfrid Laurier University