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Clinical Research

**ABSTRACT TITLE**
Characterizing Hand Function in Parkinson’s disease patients via an Electronic Manual Dexterity Task

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**OBJECTIVE**

Determine the capability to evaluate manual dexterity using an electronic adaptation of the 9-Hole Peg Test.

**BACKGROUND**

Parkinson’s disease (PD) is characterized by basal ganglia dysfunction and resultant motor impairments including altered coordination of grasping forces during dexterous tasks. Dexterous dysfunction is one of the most bothersome patient-reported symptoms of PD; however, current clinical assessments do not adequately evaluate fine motor function. The aim of this project was to determine the capability of the iPad-based Manual Dexterity Test (MDT) to characterize hand function across a broad range of PD patients.

**METHODS**

Two hundred and forty-four PD patients (age 63.9 ± 8.41, 66.8% male, MDS-UPDRS III 37.4 ± 14.6 Off Medication) completed the MDT while On and Off antiparkinsonian medications as part of a larger randomized clinical trial. Differences in MDT trial duration as a function of
medication state and more or less affected side were evaluated using a repeated measures ANOVA. Spearman’s correlations were calculated to determine the relationship between MDT duration and MDS-UPDRS II patient quality of life (QoL) questions for eating, dressing and hygiene.

**RESULTS**

MDT duration was significantly faster On medication 26.24 ± 5.25 sec compared to Off medication 27.15 ± 6.12 sec (p<0.001). Similarly, MDT duration was significantly lower for less (25.8±SD sec) compared to more (27.59±SD sec) affected limb (p<0.001). A positive relationship between MDT trial duration was present with UPDRS II QoL questions for eating, dressing, and hygiene, rho=0.28, 0.35, and 0.27 respectively (p<0.001).

**CONCLUSION**

The use of an electronic evaluation of manual dexterity was sensitive in characterizing fine motor losses in PD. A positive relationship between MDT duration and patient self-reported QoL measures suggest it provides objective insights into daily activity performance impairments. The MDT has a relatively low patient test burden and has potential to be utilized in precise tracking of dexterous function over the disease course.