**Objective Measurement of Upper Extremity Motor Function in de novo Parkinson’s Disease**

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### Background/Objectives

Objective measures of motor function in Parkinson’s disease (PD) are needed. Portable measures would allow for office visits. Useful clinical care and trials Validation of objective tests against clinical measures and putative biomarkers is key

The “Objective Parkinson’s Disease Measurement” (OPDM) System was piloted among de novo PD patients participating in the PPMI study. We aimed to examine the association between OPDM measures and clinical features

### Methods

PPMI inclusion criteria (i) diagnosis of PD based on established criteria (ii) a dopamine transporter imaging deficit on dopamine transporter SPECT scan (iii) no treatment for PD (iv) absence of dementia based on the clinical assessment of the site investigator

Clinical assessments: MDS-UPDRS and Hoehn and Yahr at 3 month, 6, 9 month, and 1 year visits. MOCA and screening and 1 year

Biomarker: DATscan and CSF collected at screening/baseline

OPDM measures (figure 1): (i) digitography task (ii) repetitive hand (iii) eight peg pegboard test

OMS = -13.45X1 + 16.87X2 + 5.485X3 + 82.2

Where

X1 Log of the mean of the downstroke velocities from both keys, right and left hands combined by mean value from the keyboard test

X2 Log of the mean of the cycle duration, right and left hands combined by mean value from the pegboard test

X3 Log of the mean of the transition durations, right and left hands combined by mean impairment value from the keyboard test

### Results

27 PD patients participated in baseline visit, and 24 in 12 month visit

Baseline OMS score not significantly associated with demographic/clinical variables (table 2)

Baseline OMS correlated with baseline OFF MDS-UPDRS III scores and at each follow-up visit after adjusting for age, gender, and disease duration (table 3) but not with MoCA or S&E

OMS not significantly different at 6 month (p=0.07) or 1 year (p=0.10) assessment compared to baseline (baseline to 1 year difference: 2.22 (SE 1.32, range -0.45 to 4.88) points)

Mean change in OFF medication MDS-UPDRS from baseline to 6 months was 3.39 and from baseline to 1-year was 4.61 (p=0.020). Baseline OMS was not significantly associated with change in OFF MDS-UPDRS part II score from baseline to 6 months (p=0.98) or baseline to 1 year (p=0.64)

No association between baseline OMS scores and baseline CSF total tau, total/phospho tau ratio, synuclein, or amyloid

No association between OMS score and baseline or 1-year striatal binding ratios on DATscan SPECT

### Discussion/Conclusions

OMS is likely a valid surrogate measure of motor function in early/de novo PD

OMS did not have prognostic value in predicting rate of change in MDS-UPDRS and was not significantly associated with CSF biomarkers nor dopamine transporter binding

Based on this preliminary data, the OPDM device is a useful tool to objectively assess motor function. Its utility for remote motor testing in clinical trials warrants study

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