**Supplementary Material**

**Methods**

**Cognitive Status**

**Neuropsychological Assessment.**

We substituted three neuropsychological tests for those recommended, as seen in Table S1. Objective cognitive impairment was defined using the cut-off scores (1.5 SD or 2.0 SD) below age- and, when available, education-adjusted norms (see Table S1).

**Prediction of MD-Diagnosed Dementia**

We elected to perform additional analyses in which each classification of PD-MCI predicted a common dementia outcome (e.g., as opposed to DRS-classified PD-MCI predicting DRS-classified PDD). Dementia classification at wave 3 was based on modified DSM-IV criteria and independent of neuropsychological testing as previously published (Camicioli et al. 2011). We performed these analyses for PD patients only.

**Results**

**Prediction of MD-Diagnosed Dementia**

The following results are summarized in Table S2.

First, we investigated if MDS 1.5 classification at wave 1 predicts clinician-diagnosed dementia at wave 3. Of the 27 classified as PD-CN with the MDS 1.5 at baseline, (a) 21 (77.8%) were classified as PD-CN and (b) 5 (18.5%) were classified as PDD by the MD at wave 3 (1 of those that converted to PDD was classified as PD-MCI with MDS 1.5 criteria at wave 2.). The remaining 1 (3.7%) dropped out of the study before wave 3. Of the 24 classified as PD-MCI with MDS 1.5 criteria at baseline, (a) 15 (62.5%) were classified as PDD and (b) 7 (29.2%) were classified as PD-CN by the MD at wave 3 (3 of those that reverted were classified as PD-CN by MDS 1.5 criteria at wave 2). The remaining 2 (8.3%) dropped out of the study before wave 3. In sum, a PD-CN diagnosis with MDS 1.5 criteria at wave 1 predicts future MD-diagnosed cognitive stability 77.8% of the time whereas a PD-MCI diagnosis with MDS 1.5 criteria at wave 1 predicts future MD diagnosis of PDD status or study drop out 70.8% of the time.

Second, we investigated if MDS 2.0 classification at wave 1 predicts clinician-diagnosed dementia at wave 3. Of the 35 classified as PD-CN with MDS 2.0 at baseline, (a) 28 (80.0%) were classified as PD-CN and (b) 6 (17.1%) were classified as PDD by the MD at wave 3. The remaining 1 (2.9%) dropped out of the study before wave 3. Of the 16 classified as PD-MCI with MDS 2.0 criteria at baseline, (a) 14 (87.5%) were classified as PDD and (b) 0 were classified as PD-CN by the MD at wave 3. The remaining 2 (12.5%) dropped out of the study before wave 3. In sum, a PD-CN diagnosis with MDS 2.0 criteria at wave 1 predicts future MD-diagnosed cognitive stability 80.0% of the time whereas a PD-MCI diagnosis with MDS 2.0 criteria at wave 1 predicts future MD diagnosis of PDD status or study drop out 100.0% of the time.

Third, we investigated if CDR classification at wave 1 would predict clinician-diagnosed dementia at wave 3. Of the 43 PD participants classified as PD-CN at baseline, (a) 26 (60.5%) were classified as PD-CN and (b) 15 (34.9%) were classified as PDD by the MD at wave 3 (6 of those that converted to PDD were diagnosed as PD-MCI or PDD with the CDR at wave 2.). The remaining 2 (4.7%) dropped out of the study before wave 3. Of the 8 classified as PD-MCI with the CDR at baseline, (a) 5 (62.5%) were classified as PDD and (b) 2 (25.0%) were classified as PD-CN by the MD at wave 3. The remaining 1 (12.5%) dropped out of the study before wave 3. In sum, PD-CN diagnosis with the CDR at wave 1 predicts future MD-diagnosed cognitive stability 60.5% of the time whereas a PD-MCI diagnosis with the CDR at wave 1 predicts future MD diagnosis of PDD status or attrition 75.0% of the time.

Fourth, we investigated if DRS classification at wave 1 predicts clinician-diagnosed dementia at wave 3. Of the 28 classified as PD-CN with the DRS at baseline, (a) 21 (75.0%) were classified as PD-CN and (b) 7 (25.0%) were classified as PDD by the MD at wave 3 (3 of those that converted to PDD were classified as PD-MCI with the DRS at wave 2). Of the 23 classified as PD-MCI with the DRS at baseline, (a) 13 (56.5%) were classified as PDD and (b) 7 (30.4%) were classified as PD-CN by the MD at wave 3 (3 of those that reverted to PD-CN were classified as PD-CN with the DRS at wave 2). The remaining 3 (13.0%) dropped out of the study before wave 3. In sum, a PD-CN diagnosis with the DRS at wave 1 predicts future MD-diagnosed cognitive stability 75.0% of the time whereas a PD-MCI diagnosis with the DRS at wave 1 predicts future MD diagnosis of PDD status or study drop out 69.5% of the time.

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**Table S1.** Neuropsychological tests used in each domain and the **r**eferences for the published normative data that were used to correct neuropsychological scores for age and, if available, education. Substituted tests (from the optimal battery) are listed and rationalized.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Domain** | **Test** | **Normative Data Reference** | **Substituted?** | **Rationalization for Substitution** |
| Attention and Working Memory | Trail Making Test Part A | Heaton, R. K., Miller, W., Taylor, M. J., & Grant, I. (2004). *Revised comprehensive norms for an expanded Halstead-Reitan battery: Demographically adjusted neuropsychological norms for African American and Caucasian adults*. Lutz, FL: Psychological Assessment Resources, Inc. | No | N/A |
| Attention and Working Memory | Digit Span test | Wechsler, D. (1981). *Manual for the Wechsler Adult Intelligence Scale - Revised*. New York, NY: Psychological Corporation. | Yes | Symbol Digit Modalities was not collected in our sample. Digit Span has been used in prior studies (e.g., Hildebrandt et al., 2013) |
| Executive Function | Trail Making Test Part B | Heaton, R. K., Miller, W., Taylor, M. J., & Grant, I. (2004). *Revised comprehensive norms for an expanded Halstead-Reitan battery: Demographically adjusted neuropsychological norms for African American and Caucasian adults*. Lutz, FL: Psychological Assessment Resources, Inc. | No | N/A |
| Executive Function | Digit Ordering Test | Werheid, K., Hoppe, C., Thone, A., Muller, U., Mungersdorf, M., & von Cramon, D. Y. (2002). The adaptive Digit Ordering test: Clinical application, reliability, and validity of a verbal working memory test. *Arch Clin Neuropsychol, 17*(6), 547-565. | Yes | Substituted for the Clock Drawing test due to circularity concerns as Clock Drawing was used in clinical diagnosis. We chose the DOT because it was successfully included in a composite measure of executive function in this sample (de Frias, Dixon, Fisher, and Camicioli, 2007) |
| Memory | California Verbal Learning Test II | Delis, D. C., Kramer, J. H., Kaplan, E., & Ober, B. A. (2002). *Manual for the California Verbal Learning Test 2.* San Antonio, TX: The Psychological Corporation. | Recommended measures - different tests | Captured verbal memory and used the same subcomponent measurements (free recall, long-delay recall) (Goldman et al., 2015; Litvan et al., 2012) |
| Memory | Brief Visuospatial Memory Test | Benedict, R. H. B. (1997). *Brief Visuospatial Memory Test—Revised: Professional Manual*. Odessa, FL: Psychological Assessment Resources, Inc. | Recommended measures - different tests | Captured figural memory and used the same subcomponent measurements (learning, delayed recall) (Goldman et al., 2015) |
| Language | Boston Naming Test | Welsh et al., (1994) The Consortium to Establish a Registry for Alzheimer’s disease. (CERAD) Part V. A normative study of the neuropsychological battery. Neurology, 44, 609-614. | No | N/A |
| Language | Category Verbal Fluency | Heaton, R. K., Miller, W., Taylor, M. J., & Grant, I. (2004). *Revised comprehensive norms for an expanded Halstead-Reitan battery: Demographically adjusted neuropsychological norms for African American and Caucasian adults*. Lutz, FL: Psychological Assessment Resources, Inc. | No | N/A |
| Visuospatial Function | Judgement of Line Orientation | Ivnik, R. J., Malec, J. F., Smith, G. E., Tangalos, E. G., & Petersen, R. C. (1996). Neuropsychological tests' norms above age 55: COWAT, BNT, MAE token, WRAT-R reading, AMNART, STROOP, TMT, and JLO. *Clin Neuropsychol, 10*(3), 262-278. doi:10.1080/13854049608406689 | No | N/A |
| Visuospatial Function | Picture Completion Test | Wechsler, D. (1981). *Manual for the Wechsler Adult Intelligence Scale - Revised*. New York, NY: Psychological Corporation. | Yes | Substituted for Intersecting Pentagons task due to circularity concerns. Picture Completion used in other studies (e.g. Wood et al., 2016) |

**Table S2.** Ability of cognitive status at wave 1 (defined using MDS, CDR, or DRS

criteria) to predict a global dementia outcome (MD-diagnosed) at wave 3 for PD

participants.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **MD diagnosed as PD-CN at Wave 3** | **MD Diagnosed as PDD at Wave 3** | **Dropped out by Wave 3** |
| **MDS 1.5**  PD-CN at W1  PD-MCI at W1  **MDS 2.0**  PD-CN at W1  PD-MCI at W1  **CDR**  PD-CN at W1  PD-MCI at W1  **DRS**  PD-CN at W1  PD-MCI at W1 | **21** (77.8%)  **7** (29.2%)  **28** (80.0%)  **0**  **26** (60.5%)  **2** (25%)  **21** (75.0%)  **7** (30.4%) | **5** (18.5%)  **15** (62.5%)  **6** (17.1%)  **14** (87.5%)  **15** (34.9%)  **5** (62.5%)  **7** (25.0%)  **13** (56.5%) | **1** (3.7%)  **2** (8.3%)  **1** (2.9%)  **2** (12.5%)  **2** (4.7%)  **1** (12.5%)  **0**  **3** (13.0%) |

*Note.* Green symbolizes a favorable predictive number and red symbolizes a

discrepancy between prediction and outcome. Abbreviations: MD, medical doctor;

MDS, Movement Disorders Society; SD, standard deviation; CDR, Clinical Dementia

Rating scale; DRS, Dementia Rating Scale; PD-MCI, Parkinson’s disease mild

cognitive impairment; PDD, Parkinson’s disease dementia; PD-CN, Parkinson’s

disease cognitively normal.