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Identification of Mild Cognitive Impairment Among Black and White Community Dwelling Older Adults Using NIH-Toolbox Cognition Tablet Battery

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Abstract

Background: NIH Toolbox-Cognition Battery (NIHTB-CB) is a computerized cognitive assessment battery frequently used in clinical research. However, the utility of the tablet adaptation has not been well established for clinical characterization, nor have possible racial differences been examined. We aim to identify which of the NIHTB-CB subtests best differentiate healthy controls (HC) from those with mild cognitive impairment (MCI), as well as examine possible differences in diagnostic identification between Black/African-American (B/AA) and white older adults.

Method: Participants were community-dwelling adults 65 years and up (HC = 96; MCI = 63), recruited through affiliated studies within the Michigan Alzheimer's Disease Research Center (NIA/NIH-P30AG053760) and diagnosed by consensus conference through National Alzheimer's Coordinating Center criteria. They then completed the NIHTB-CB tablet version for iPad. Discriminant function analysis was used to determine which cognitive tests best differentiated clinical diagnoses in the total sample and separately for B/AA (n = 81) and white participants (n = 78).

Result: In the total sample, 78% of cases were correctly identified with Picture Sequence Memory (PSM; Standardized Coefficient (SC) = -.73) being the strongest predictor. The cross-validated model correctly identified 79.2% of HCs and 60.3% of MCIs. Analyses were then stratified by race. In the B/AA sample, the model was able to correctly identify 60% of HCs and 68.4% of MCIs, with PSM (SC = .68) being the strongest predictor followed by List Sorting Working Memory (LSWM; SC = .42). In the white sample, 83% of HCs and 44% of MCIs were correctly identified and PSM (SC = .84) was the strongest predictor.

Conclusion: As more treatments become available for Alzheimer's disease, it is increasingly important to identify preclinical stages, such as MCI, so that we may intervene as early as possible in the disease process. NIHTB-CB is one tool that may aid in identification. The memory subtest PSM was the best predictor of diagnosis in each model. While the overall model was fairly accurate at predicting clinical diagnosis, the models proved less accurate when cross validated and stratified by race. Thus, our results

suggest that it may be important to consider race and other aspects in identifying specific diagnostic groups.