

## Sleep Abstract

**TITLE:** The Utility of a Computerized Test Battery for Measurement of Cognitive Performance in Obstructive Sleep Apnea: Preliminary Normative Values

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**Introduction:** Neurocognitive impairment is a well documented consequence of obstructive sleep apnea (OSA) but cognitive testing of OSA patients is rarely performed. This is partially due to the costly and laborious nature of traditional testing methods and an absence of test batteries with normative data on OSA patients. This study uses a validated and reliable computerized battery of standardized neurocognitive tests, which can be self-administered in approximately 30 minutes, to assess OSA patients.

**Methods:** We studied 47 OSA patients diagnosed by polysomnography (Apnea Hypopnea Index [AHI]  $\geq$  5 or Respiratory Distress Index [RDI]  $\geq$  15 scored using current AASM guidelines). Each patient completed the Central Nervous System-Vital Signs (CNS-VS) test battery prior to OSA treatment. The CNS-VS battery includes tests of immediate and delayed verbal and visual memory; finger tapping; symbol digit coding; Stroop test; shifting attention; and continuous performance. Results of the CNS-VS are reported as Standard Scores in which the normative sample has a mean of 100 with a standard deviation of 15.

**Results:** The sample was 44% male. The mean age was 47.8 years old. The mean BMI was 32.5. The mean AHI and RDI were 31.5 and 42.6 respectively.

Mean Standard Scores for each neurocognitive domain are: Neurocognitive Index 87.6, Composite Memory 95.6, Verbal Memory 93.0, Visual Memory 99.9, Psychomotor Speed 85.3, Reaction Time 91.0, Complex Attention 82.6, Cognitive Flexibility 85.9, Processing Speed 91.0, and Executive Function 85.0.

**Conclusion:** OSA patients in this study scored an average of 10.4 points (0.69 standard deviations) below the normative population mean. This is consistent with previous research on cognitive function using traditional testing methods and suggests that computerized neurocognitive tests may be an accessible method of evaluating cognitive performance associated with OSA. These values may provide a preliminary reference point for clinical interpretation of neurocognitive scores in OSA patients.

Citation 1: Decary, A., Rouleau, I., and Montplaisir, J. (2000). Cognitive deficits associated with Sleep Apnea Syndrome: A Proposed Neuropsychological Test Battery. *SLEEP*, 23, 1-13.

Citation 2: Nowak, M., Kornhuber, J., and Meyrer, R. (2006). *SLEEP*, 29, 1521-1530.

Citation 3: Gualtieri, C. and Johnson, L. (2006). Reliability and validity of a computerized neurocognitive test battery, CNS Vital Signs. *Archives of Clinical Neuropsychology*, 21, 623-643.