

# ` Quick Review of Model System Research

## Comparison of Diagnostic Sleep Studies

## in Hospitalized Neurorehabilitation Patients

## with Moderate to Severe Traumatic Brain Injury

### What is the study about?

Recent work has highlighted that people who have sustained moderate to severe traumatic brain injury often have sleep disturbance partially due to the presence of obstructive sleep apnea (OSA), a disorder resulting in the blockage of the airway while sleeping. People with OSA have disrupted sleep and oxygen levels drop while sleeping resulting in possible further brain damage. The best way to diagnose a person with OSA is using a test called Level 1 polysomnography (PSG), which is expensive and cumbersome to administer. It is conducted in a sleep laboratory with a technician monitoring the study overnight. As a result, it is not often used during hospital stays leaving persons with TBI going undiagnosed. The authors thought it would be useful to test whether a more accessible test, a portable Level 3 diagnostic test that can be conducted at the hospital bedside without a technicians monitoring overnight, would provide the same information about the presence of OSA as Level 1 polysomnography testing. This study aimed to evaluate the diagnostic accuracy of the portable sleep test in comparison to the gold standard test, Level 1 polysomnography. Earlier diagnosis (and successful treatment) of OSA during a time of critical neural repair following TBI may help improve neurologic outcome.

### What did the study find?

There was strong agreement between the two diagnostic tests. Many participants with moderate to severe sleep apnea were correctly identified. However, the Level 3 portable test underestimated OSA severity for participants with moderate to severe levels of OSA and did not identify its presence for those with mild OSA during early TBI neurorehabilitation. In other words, persons with moderate to severe OSA were sometimes misclassified as having mild OSA. Persons with mild OSA were misclassified as having no OSA.

### Who participated in the study?

Individuals with moderate to severe TBI who at six TBI Model System inpatient rehabilitation programs (n=214).

### How was the study conducted?

This study was a prospective clinical trial conducted at six TBI Model System study sites.

### How can people use the results?

### Individuals with TBI and their families can use the results of this study to better understand the differences between types of sleep studies and their reliability, and why they are important to use for early assessment of OSA. Practitioners can use the data provided to determine the diagnostic accuracy of a portable diagnostic sleep study and in which patients it can be used to support an earlier diagnosis of OSA. This could help reduce patient risk of developing other medical conditions and possibly improve neurologic outcome.

### Reference

Nakase-Richardson R**,** Schwartz D, Ketchum J, Drasher-Phillips L, Dahdah M, Monden K, Bell K, Hoffman J, Whyte J, Bogner J, Calero K, Magalang U. Comparison of diagnostic sleep studies in moderate to severe traumatic brain injury neurorehabilitation admissions. *Chest*, 2020; 158(4):1689-1700. PMID: 32387522 doi:10.1016/j.chest.2020.03.083

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