

# Newsletter

## VA TBI Model Systems/IMAP

Issue 14: Spring 2023



## OSA and TBI

Many people who survive brain injury have difficulty sleeping. Obstructive Sleep Apnea (OSA) is a common sleep disorder in persons with traumatic brain injury (TBI). In simple terms, OSA is a breathing related sleep disorder. During sleep, a person's airway (the narrow passage in the throat) collapses briefly. This prevents air from going to the lungs. The collapse is brief, but this causes oxygen to plummet. This is concerning because oxygen is vital the brain and body health. Indeed, OSA can cause numerous health problems and reduce one's lifespan.

Dr. Nakase-Richardson and other TBIMS researchers discovered that persons with TBI have high rates of OSA.<sup>1</sup> Over 200 patients with TBI were tested using gold-standard technology. Nearly two-thirds tested positive for OSA. Fortunately, there are effective treatments for OSA. Positive Airway Pressure (or PAP) Therapy is the front line OSA treatment. PAP is a device worn over the nose or mouth that delivers a continuous stream

of air into the throat.

This keeps the airway open instead of collapsing during sleep. Unfortunately, PAP therapy compliance is poor. Dr. Silva examined PAP compliance in hospitalized TBI patients who were diagnosed with OSA.<sup>2</sup> Of the 75 patients, 23% refused treatment, and an additional 44% failed to use PAP consistently.

In this issue of the TBIMS/IMAP newsletter, we present our latest research on OSA in persons with TBI. Two studies examined the impact of OSA on cognitive recovery after TBI. We also compared different OSA screening instruments to see which were the most accurate for persons with TBI. Finally, we describe a behavioral intervention to help improve OSA adherence.

<sup>1</sup>Nakase-Richardson R, et al. Concordance between current American Academy of Sleep Medicine and Centers for Medicare and Medicaid scoring criteria for obstructive sleep apnea in hospitalized persons with traumatic brain injury: a VA TBI Model System study. *J Clin Sleep Med.* 2020; 16(6):879-888. <https://doi.org/10.5664/jcs.m.8352>

<sup>2</sup>Silva MA, et al. Incidence and predictors of adherence to sleep apnea treatment in rehabilitation inpatients with acquired brain injury. *Sleep Med.* 2020;69:159-167. <https://doi.org/10.1016/j.sleep.2020.01.016>

## Exciting Update!

Now approved to complete partial follow-up interview via online survey link sent to your email! If interested, please mention this at your next follow-up!

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## TBIMS

Traumatic Brain Injury Model System

Since 1987

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# MEET OLIVIA McLAUGHLIN, MS

## Research Assistant for the VA TBIMS/IMAP Study



**When did you join the TBI Model Systems Study?**

I joined in March 2023.

**What inspired you to pursue a career in research?**

I love the pursuit of knowledge and research is a critical avenue to expand what we know, that is why I wanted to pursue a career in research. I have personally always been fascinated by why we, as humans, think and behave the way we do. What makes our consciousness so unique? Research gives us the opportunity to explore these questions and apply what we learn in beneficial ways.

**Where did you go to school?**

I earned my bachelor's degree in psychology from the University of South Florida in 2021, and I earned my master's degree in psychology from Arizona State University in 2022.

**What do you like to do in your free time?**

I spend time with my family and my dogs. I like to play video games and read. I also really like to garden when it isn't too hot outside.

## TBI AND OSA RESEARCH

### OSA and Cognition after TBI

OSA harms every organ in the human body including the brain. Brain damage often leads to cognitive impairment. Despite this, little is known about the impact of OSA on cognition after TBI. This question was explored by TBIMS researchers in two different studies. Dr. Steward and colleagues<sup>1</sup> examined cognition in the early recovery stage. These sixty hospitalized patients were about a month post-injury. All received Level 1 Polysomnography, which is the gold standard test for OSA.

Dr. Steward discovered that patients with more severe OSA performed worse on cognitive tests. Specifically, these individuals had poorer memory and executive functioning.

OSA was also found to impact cognition in a study by Dr. Silva and colleagues.<sup>2</sup> Dr. Silva examined 89 individuals who were between 2 and 7 years post-TBI. In this study, persons who reported a longer duration of living with OSA had worse memory performance. PAP therapy might reduce cognitive decline seen in persons with TBI who have OSA, but this has yet to be demonstrated empirically.

<sup>1</sup>Steward KA, et al. Obstructive sleep apnea associated with worse cognitive outcomes in acute moderate/severe traumatic brain injury: a TBI Model Systems study. *Sleep Med.*2022;100:454-461. doi: 10.1016/j.sleep.2022.09.012

<sup>2</sup>Silva MA, et al. Impact of obstructive sleep apnea disease duration on neuropsychological functioning after traumatic brain injury: A Veterans Affairs TBI Model Systems study. *J Head Trauma Rehabil.* 2022; 37(6): E496-E501. doi: 10.1097/HTR.0000000000000797

# TBI AND OSA RESEARCH

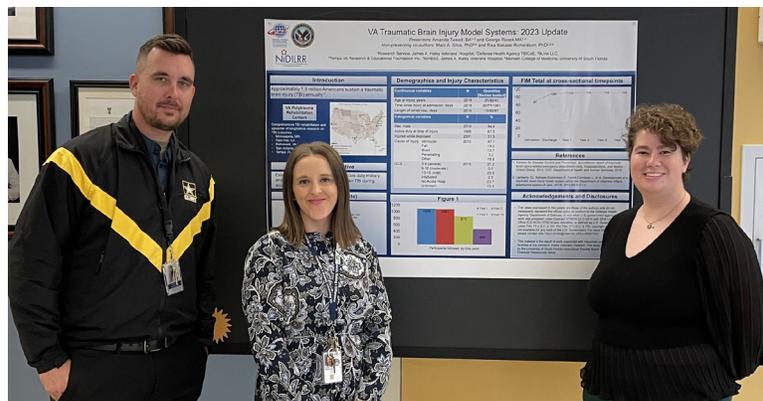
## Sleep Apnea Screening Tools for OSA and TBI

Although OSA is more common than previously believed, screening for OSA is not routine practice. Usually, screening and testing occur only after a patient reports sleep-related problems to their doctor. Polysomnography (or PSG) is the most accurate test for OSA. However, PSG is not always feasible. Other methods for detecting OSA include screening instruments. Although less accurate than PSG, screening instruments are more accessible and affordable. The accuracy of OSA screening instruments in persons with TBI was a question raised by Dr. Nakase-Richardson and colleagues. In their study, they examined three

screening tools: The STOP-BANG, the Berlin Questionnaire, and the Multivariable Apnea Prediction Index (or MAPI). Results of these OSA screening tools were compared in a group of 248 hospitalized patients with TBI. The STOP-BANG and MAPI were equivalent in detecting moderate-to-severe OSA, and both were more accurate than the Berlin. In contrast, all three screening tools were equivalent in detecting OSA when mild OSA disease was included.

Nakase-Richardson R, et al. Comparative Effectiveness of Sleep Apnea Screening Instruments During Inpatient Rehabilitation Following Moderate to Severe TBI. Arch Phys Med Rehabil. 2020;101(2):283-296. doi:10.1016/j.apmr.2019.09.019

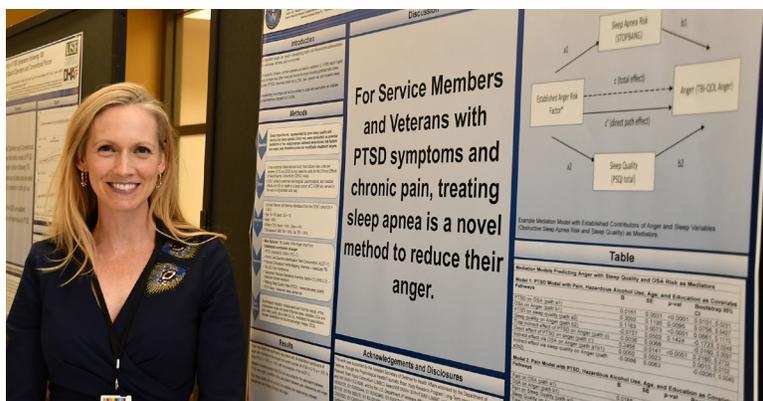
## JAMES A. HALEY VETERANS' HOSPITAL RESEARCH DAY 2023



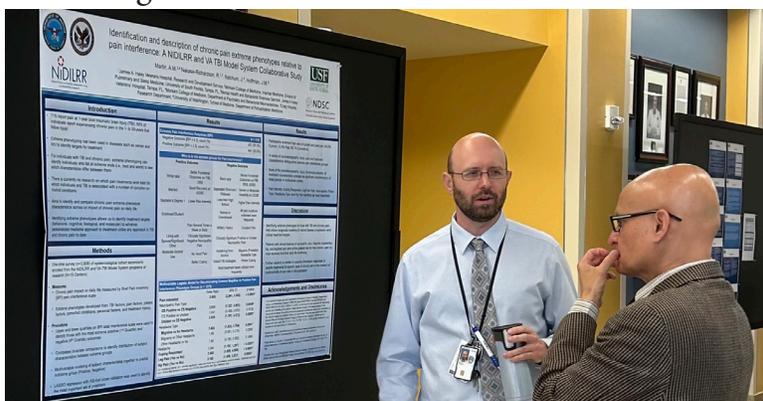
George Rocek, Amanda Tweed, and Olivia McLaughlin with their poster on VA TBIMS 2023 updates.



Sharing TBIMS research with the community. Pictured from left to right: Olivia McLaughlin, Amanda Tweed, and George Rocek.



Dr. Shanon Miles and her poster about her research that examined anger and aggression symptoms in persons with sleep disturbance.



Dr. Aaron Martin and his poster about his research on identifying chronic pain extreme phenotypes relative to pain interference.



# SLEEP APNEA RESOURCES



Scan Me!

## Veterans Affairs/Department of Defense

Clinical Practice Guidelines: The Management of Chronic Insomnia Disorder and Obstructive Sleep Apnea

[healthquality.va.gov/guidelines/CD/insomnia/index.asp](http://healthquality.va.gov/guidelines/CD/insomnia/index.asp)



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## American Academy of Sleep Medicine

Sleep Disorder Guides

[aasm.org/clinical-resources/patient-info/patient-friendly-guidelines/](http://aasm.org/clinical-resources/patient-info/patient-friendly-guidelines/)



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## Centers for Disease Control and Prevention

Sleep and Sleep Disorders Resources

[cdc.gov/sleep/resources.html](http://cdc.gov/sleep/resources.html)



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## Model Systems Knowledge Translation Center

Obstructive Sleep Apnea after TBI Factsheet

<https://msktc.org/tbi/factsheets/obstructive-sleep-apnea-after-tbi>

# CONTACT INFORMATION

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Photos courtesy of James A. Haley Veterans' Hospital and TBI Model Systems Staff.

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