

## A Clinician's Guide to Improving Sleep after TBI (LTC Jason Harris, MD)

All humans, including those who have had a TBI, require good sleep for optimal brain health. Optimizing sleep is foundational in the treatment of all TBI. Approximately 50% of individuals with TBI have sleep disorders, with insomnia, hypersomnia and sleep apnea being the most common. Sleep disorders after TBI are associated with worsening cognitive function. Thus, restorative sleep with 7-9 hours/day is vital for both overall brain health and to optimize therapeutic and prophylactic measures.

### Sleep Hygiene Guide

- Sleep at the same time each day.
- The sleep environment should be optimized.
  - Decreased light exposure before and during sleep is vital.
  - The use of televisions and screens in the bedroom should be avoided.
  - Excessive noise should be avoided.
  - Beds should only be behaviorally linked to sleep and intimacy.
- Diet is also important.
  - Limit eating before bedtime.
  - Caffeine, and excessive alcohol are common causes of impaired sleep.
- Regular exercise improves the quality of sleep but not immediately before bedtime.

### Behavioral Interventions

- Addressing abnormal thoughts and emotions frequently at play in insomnia can be very beneficial.
- Cognitive behavioral therapy (CBT) is a first-line treatment.
- Mindfulness and meditation exercises and activities, such as yoga, are also frequently helpful.
- Depression frequently contributes to hypersomnia, and both should be treated together.
  - CBT can be aimed at both sleep and depression.
  - Pharmacological agents, such as SNRIs (activating), can help both.

### Co-Morbid Medical Conditions

- Common concomitant medical conditions that contribute to insomnia, such as migraines, anxiety, and PTSD, should be treated in a manner that also helps optimize sleep.
  - Low dose amitriptyline before bedtime (sedating) for migraines and prazosin for PTSD (nightmares) may also help improve the quality of sleep.
- Medical conditions, such as hyperthyroidism, should be considered and ruled out as needed.
- Sleep aids, such as melatonin, may be considered if disordered circadian rhythms are suspected.
- In Hypersomnia (excessive sleep) medical conditions, such as hypothyroidism, should be ruled out.
- Narcolepsy (a hypersomnia) requires neurologist/sleep specialist-directed medication management.

### Sleep Apnea:

- A common cause of “hypersomnia” during the day is peripheral or obstructive sleep apnea (OSA)
- OSA limits oxygen to the brain, can be central or peripheral and is best diagnosed by a sleep study.
- Weight loss, breathing assistive devices and surgeries are all useful in the treatment of OSA.

### **Resources:**

Aoun R, Rawal H, Attarian H, Sahni A. Impact of traumatic brain injury on sleep: an overview. *Nat Sci Sleep*. 2019 Aug 19;11:131-140.

Baranwal N, Yu PK, Siegel NS. Sleep physiology, pathophysiology, and sleep hygiene. *Prog Cardiovasc Dis*. 2023 Feb 24:S0033-0620(23)00011-7.

Eugene AR, Masiak J. The Neuroprotective Aspects of Sleep. *MEDtube Sci*. 2015 Mar;3(1):35-40.

Viola-Saltzman M, Watson NF. Traumatic brain injury and sleep disorders. *Neurol Clin*. 2012 Nov;30(4):1299-312.

Wickwire EM. Why sleep matters after traumatic brain injury. *J Clin Sleep Med*. 2020 Dec 17;16(S1):5-6.

Worley SL. The Extraordinary Importance of Sleep: The Detrimental Effects of Inadequate Sleep on Health and Public Safety Drive an Explosion of Sleep Research. *P T*. 2018 Dec;43(12):758-763.

<https://health.mil/Reference-Center/Publications/2020/07/31/Management-of-Sleep-Disturbances-Following-ConcussionmTBI-Clinical-Recommendation>