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Optimizing Sleep

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About Me

Retired Captain and 23-year veteran of the Indianapolis Fire Department where I served as the Coordinator of Firefighter Wellness & Support. International Association of Fire Fighters (IAFF) Peer Support & Resilience Master Instructor and member of the IAFF's Disaster Response Team. Certifications include Cognitive Behavioral Therapy for Insomnia Clinician, Certified Sleep Science Coach, Certified Peer Support Professional, and Yoga Teacher.



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Brandon Dreiman JD,

CPRC, CBT-I

Behavior Health Specialist

ProTeam Wellness

Sleep Deprivation

Sleep deprivation tied to impairment of extinction recall.

Medpage Today.

60%-70% of firefighters report poor sleep quality.

Mehrdad, R., et al. Int J Prev Med. 2013 Sep;4(9):1095-100.

40% of firefighters suffer from a sleep disorder.

Toomey, J. Addicted to Awake.

Study of 6,933 firefighters from 66 US fire departments



- 40% of firefighters found with sleep apnea, insomnia and work shift disorder
- 80 % undiaanosed and unaware of their disorder

Impact of Sleep Disorders on Health

Those who screened positive vs. not:

- Twice as likely (200%) to report a motor vehicle crash
- More than twice as likely (241%) to report falling asleep while driving
- More than twice as likely to report CVD (237%)
- Double risk of diabetes (191%)
- Three times as likely to report depression (310%) and anxiety (381%)
- Ghrelin levels increase and leptin levels decrease.

Sleep & Cancer

IARC MONOGRAPHS CLASSIFICATION OF NIGHT SHIFT WORK

Night shift work is **PROBABLY CARCINOGENIC TO HUMANS (Group 2A)**

Limited evidence in humans. Sufficient evidence in experimental animals.



The IARC Monographs classification indicates the level of certainty that an agent can cause cancer (*hazard identification*).



Positive associations have been observed between night shift work and cancers of the:

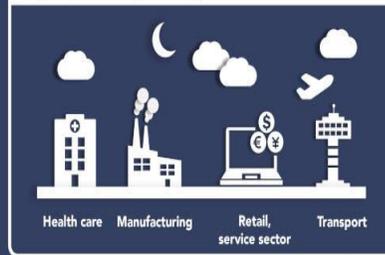


Night shift work includes both working at night and working in a job that involves rapidly crossing many time zones.

Specific types of workers



Higher percentages of night shift workers are seen in



IARC MONOGRAPHS VOL. 132: OCCUPATIONAL EXPOSURE AS A FIREFIGHTER

Occupational exposure as a firefighter is **carcinogenic to humans (Group 1)** on the basis of *sufficient evidence for cancer in humans*



The IARC Monographs classification indicates the level of certainty that an agent can cause cancer (*hazard identification*)



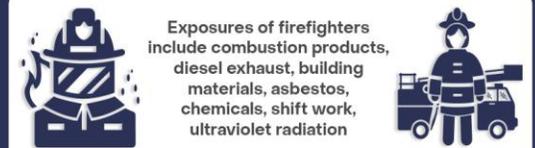
Cancer types with *sufficient evidence for cancer in humans*:



Cancer types with *limited evidence for cancer in humans*:



Strong mechanistic evidence in exposed firefighters



Firefighters respond to various types of fire



Sleep & Cancer

- Irwin et al.
- Healthy young men
- Single night of 4-hour sleep
- **70% decrease in natural killer cells in immune system**
- Shift work found to increase risk of breast cancer, prostate cancer, cancer of the uterus, colon cancer
- Sympathetic nervous system turned on leads to inflammation
- Who routinely sleeps less than 6 hours a night?
- Diminishes immune system
- Doubles risk of cancer

Four Key Elements of Healthy Sleep

Consistent

Happens at the same time each day, forming a steady routine

Continuous

Free from disruptions or awakenings

Refreshing

Leaves you feeling recharged—both mentally and physically

Adequate

Focused on sleep quality, not just the number of hours

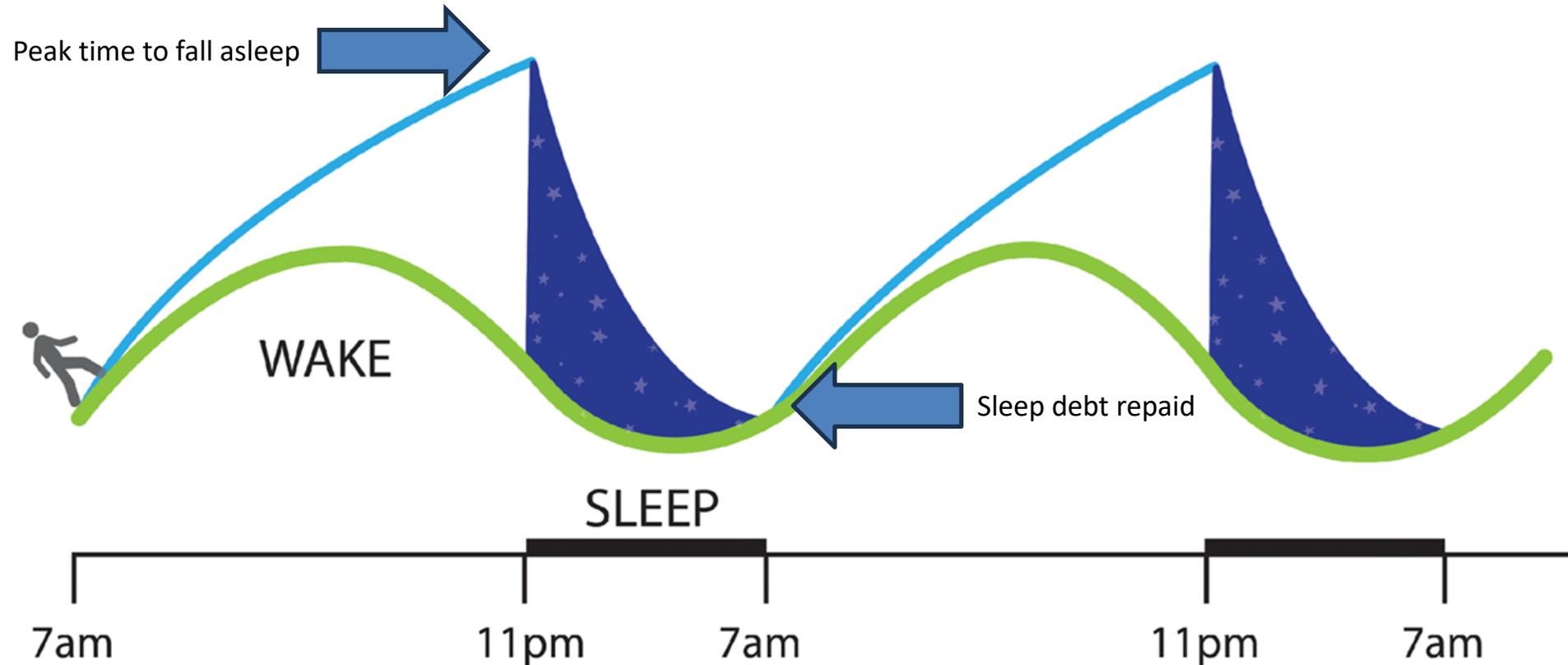
Promoting and Sustaining Optimal Sleep:

Align the 2 Brain Mechanisms that Control Sleep

Sleep Drive: The longer you are awake, the sleepier you get, the more likely you are to fall sleep (homeostatic drive).

Biological Clock: There is a biological time to sleep and a biological time to be awake (circadian rhythms).

Homeostatic Sleep Drive

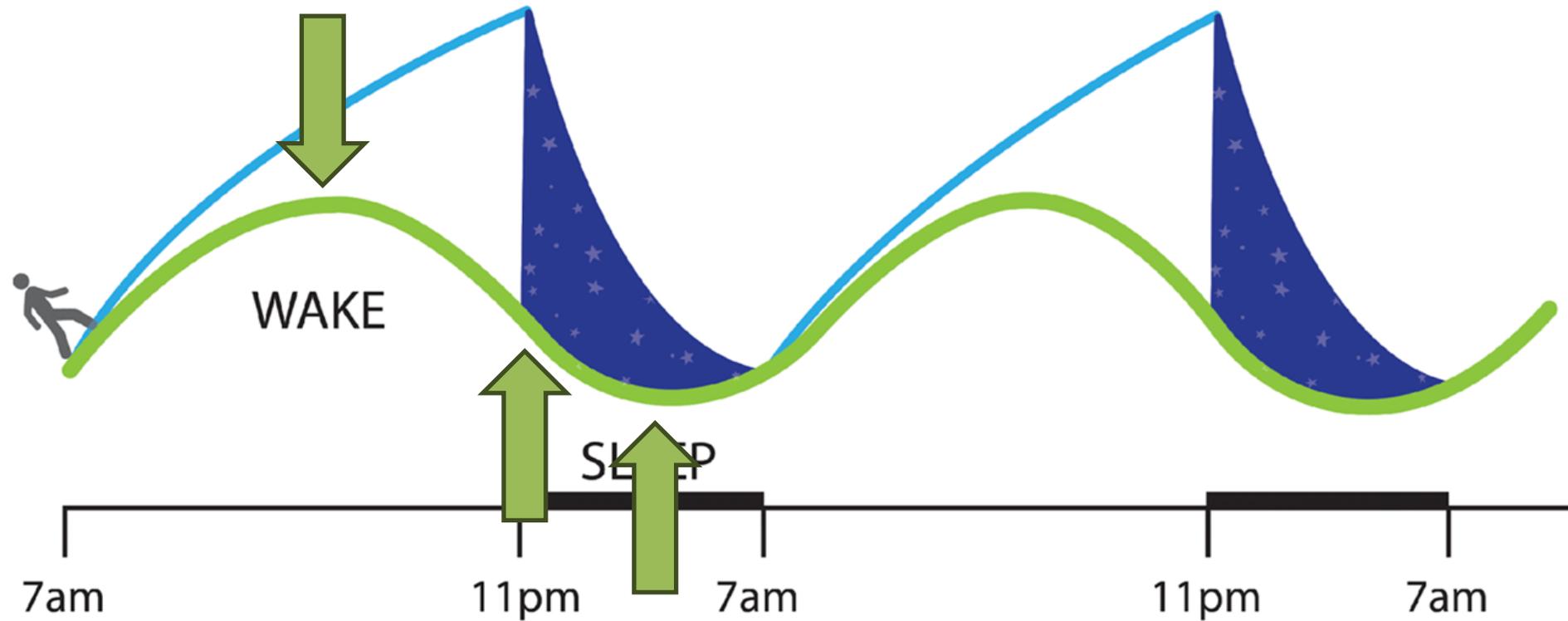


Driven by adenosine.

Borbely AA (1982). A two process model of sleep regulation. Human Neurobiology

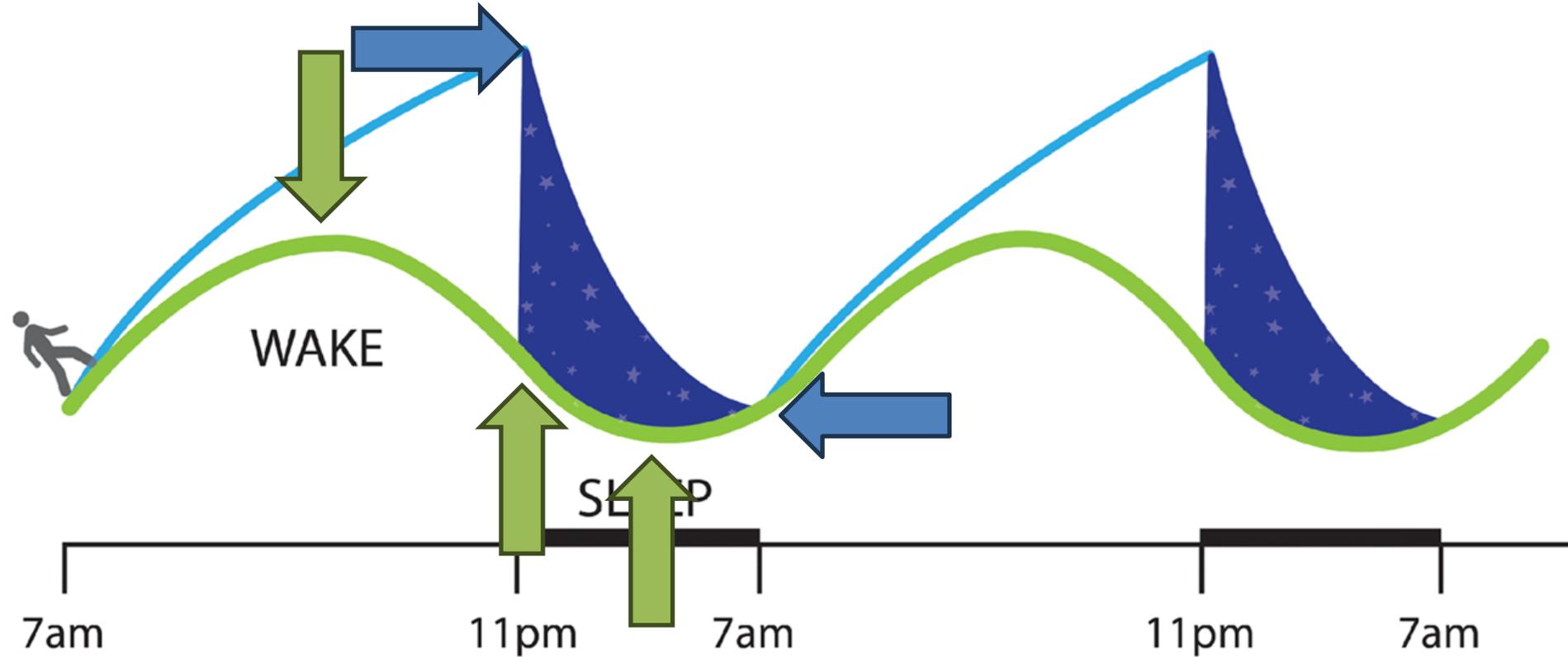
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Circadian Sleep Drive

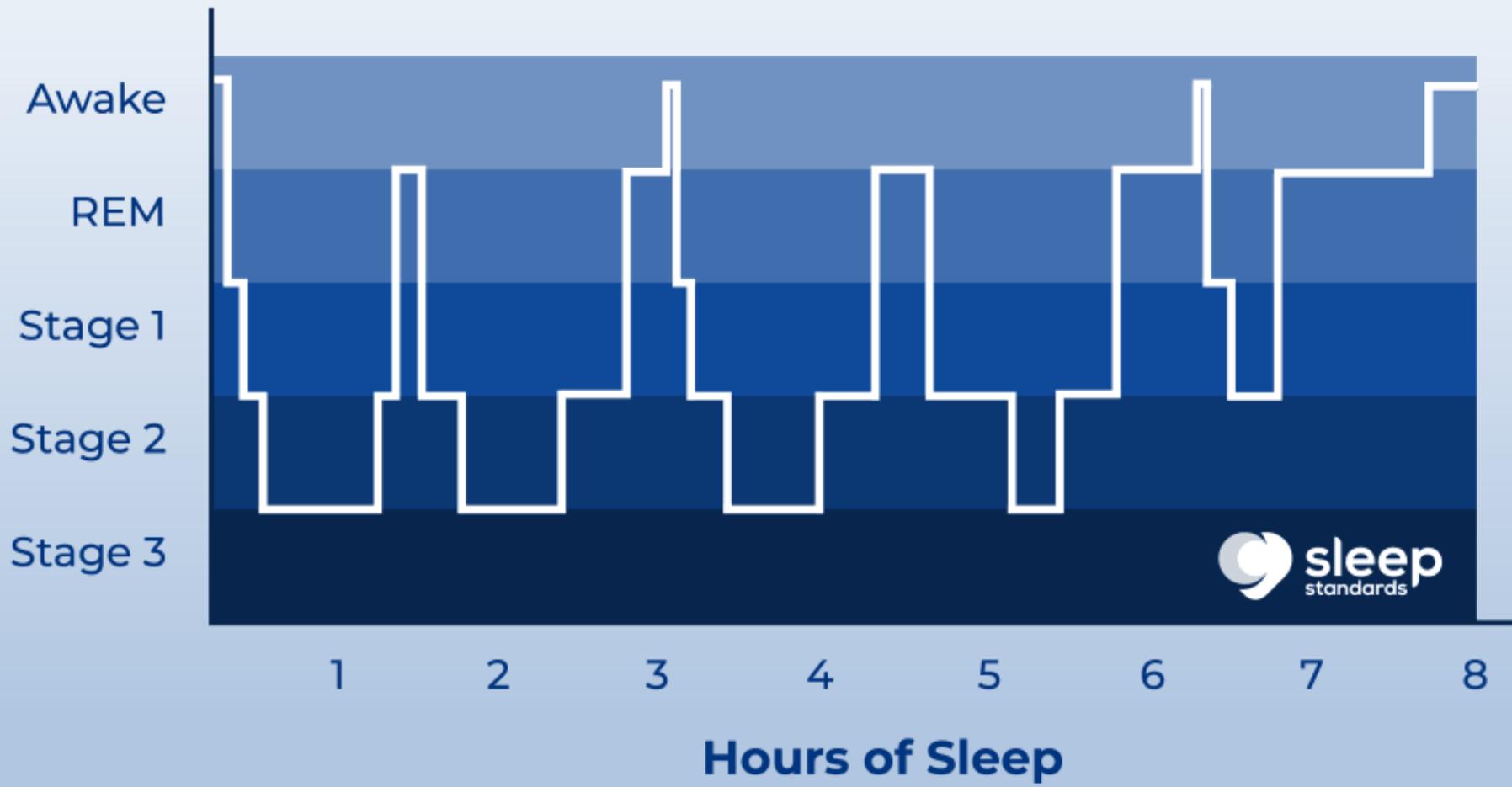


Driven by melatonin.

The Key to Optimal Sleep: Alignment of Sleep Drive and Biological Clock



Sleep Stages



Sleep Hacks

Noise

Temperature

Light

Naps

Electronics

30/30 Rule

Caffeine/Nicotine

Exercise

OTC Sleep Aids

- Melatonin
- Diphenhydramine/
Doxylamine
- Magnesium
- Theanine
- ETOH
- THC
- CBD
- GABA



Food/Drinks

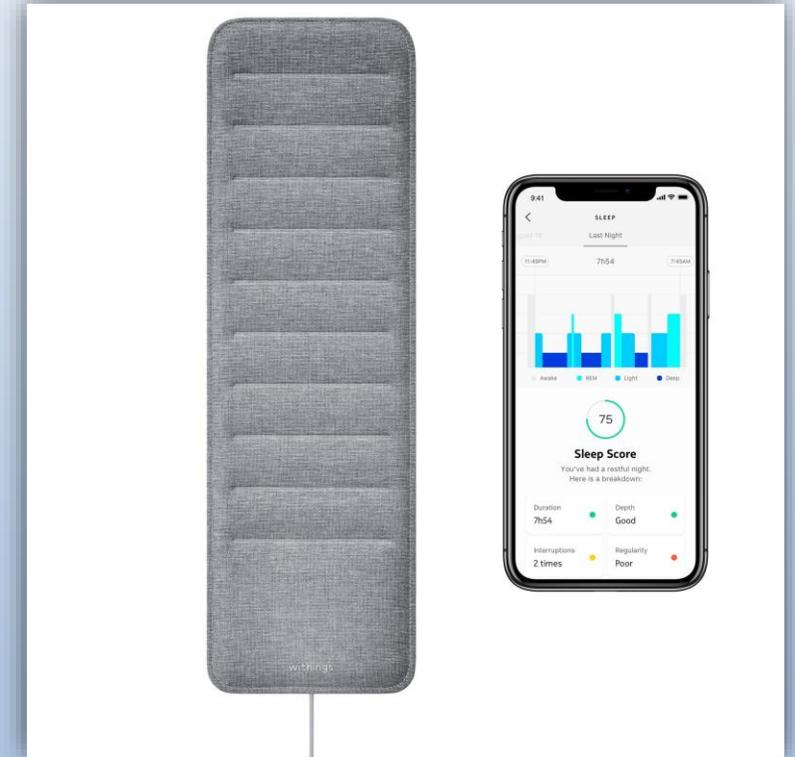
*Lin HH., Effect of Kiwifruit Consumption on Sleep Quality in Adults with Sleep Problems

**Howatson G., Effect of tart cherry juice (Prunus cerasus) on melatonin levels and enhanced sleep quality

*** Shinjyu R., Valerian Root in Treating Sleep Problems and Associated Disorders-A Systematic Review and Meta-Analysis

Shift Schedules

Sleep Trackers



Sleep Measurements

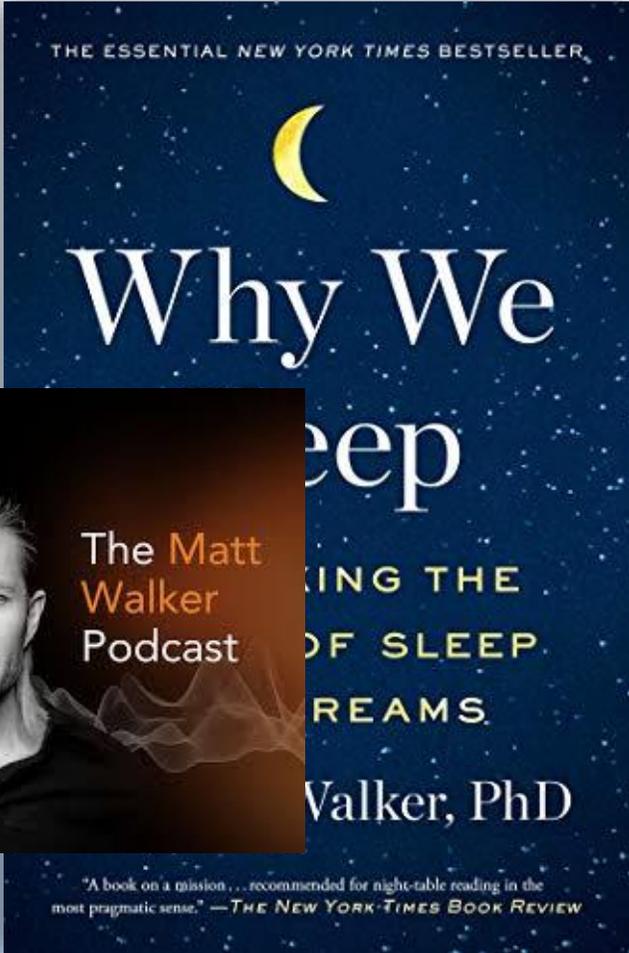
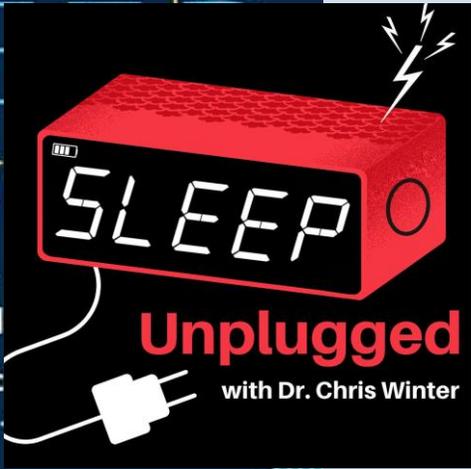
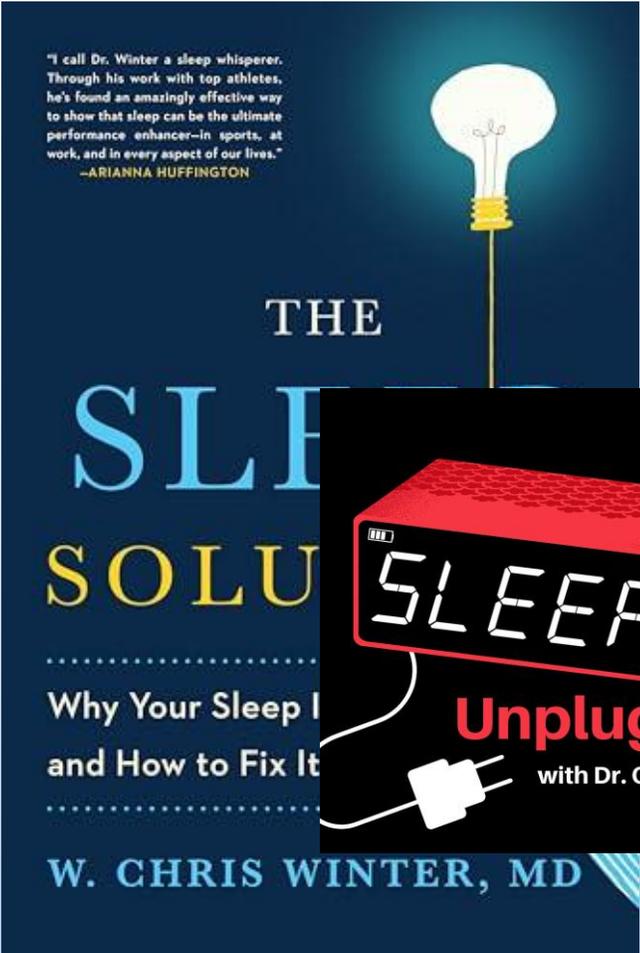
- Polysomnography is the gold standard.
Measures brain waves, heartrate, breathing, O2 saturation, body movement, and eye movement.
- Sleep mats measure heart rate, breathing, and body movement.
- Wearables measure heartrate, O2 saturation, and body movement.

Sleep Data Quality

- **Awake vs. Asleep**
 - About 78% accurate
 - Worse for insomniacs
- **Sleep latency**
 - Around 38% accurate
- **Stages of sleep**
 - Low quality measure of REM and NREM sleep

To Wear, Or Not to Wear

- **Should we use them?**
 - Good for estimates
 - Useful for recognizing trends
 - Consistent use provides a broad picture
- **Sleep Anxiety**
 - Monitoring sleep can make it worse
 - People perceive problems due to bad data
 - Wearing a clock to bed encourages checking it



A large, stylized shield icon in shades of gray, serving as a background for the 'THANK YOU' text.

THANK YOU



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