



TEXAS TECH UNIVERSITY  
HEALTH SCIENCES CENTER.  
EL PASO

Office of Faculty Affairs  
*Wellness Program*



# Chronophysiology and Sleep Hygiene

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# LEARNING OBJECTIVES



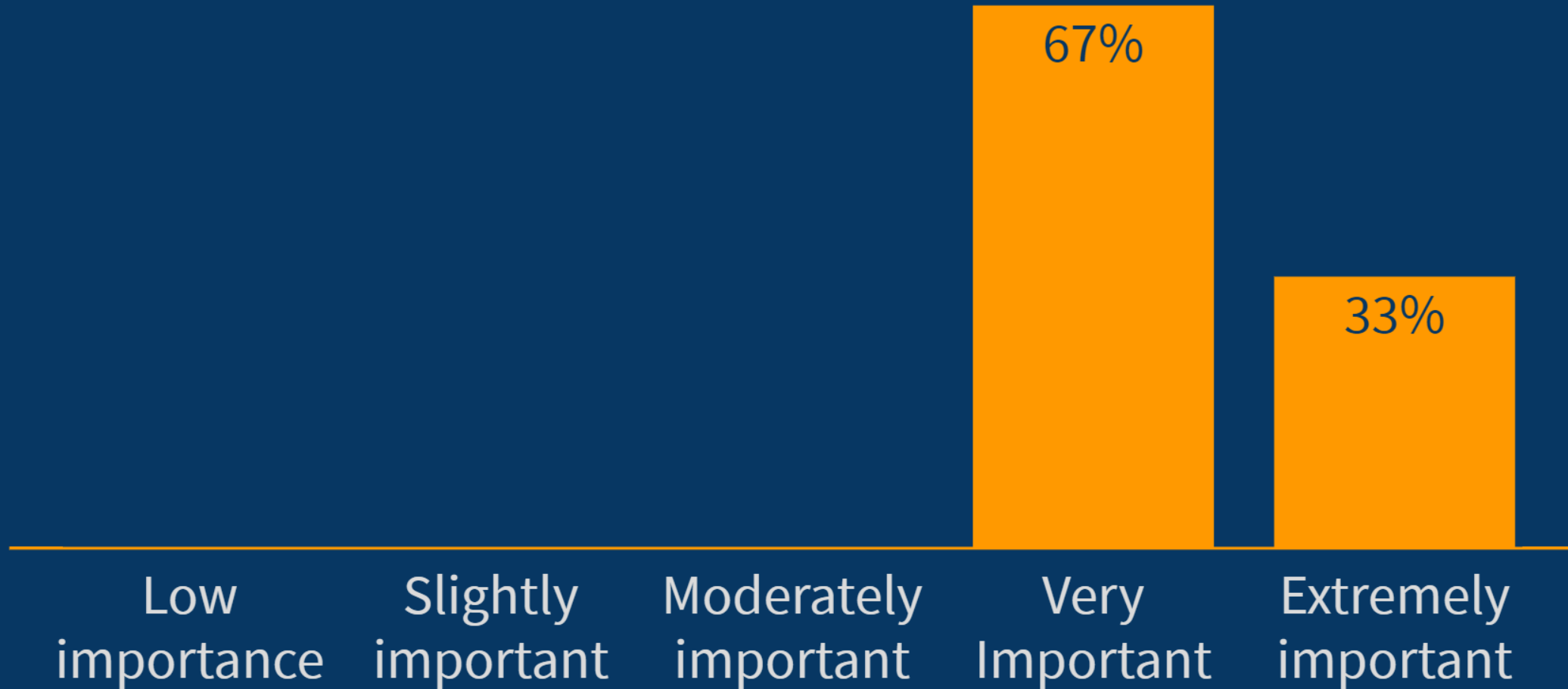
Identify the basic principles of chronophysiology.

Discuss the biology and psychosocial implications of sleep deprivation.

Recognize the biopsychosocial principles and practice of sleep hygiene.

 **Poll locked.** Responses not accepted.

## How important do you think your sleep hygiene is?



# SLEEP IS YOUR SUPERPOWER

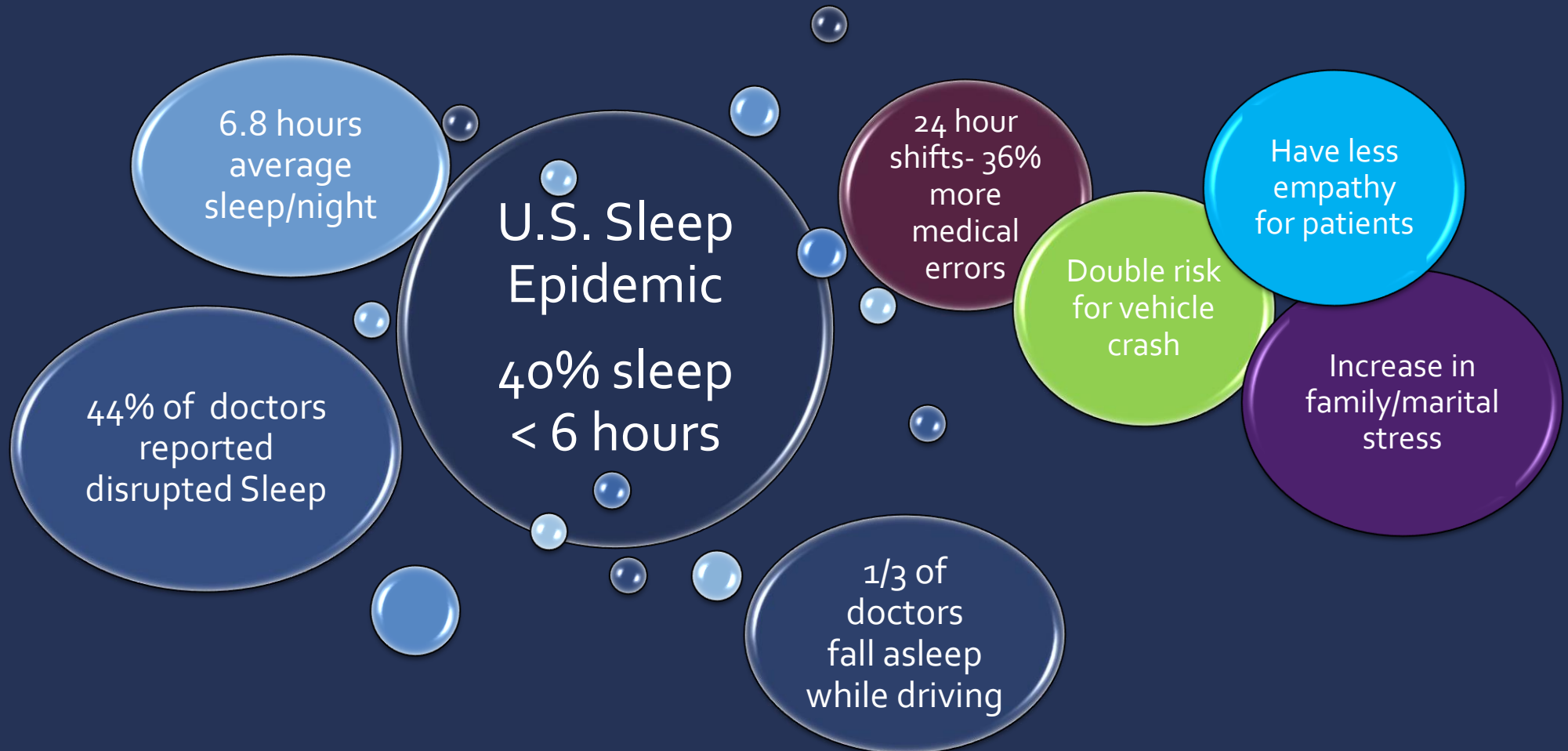
Matthew Paul Walker is an English scientist and professor of neuroscience and psychology at the University of California, Berkeley. As an academic, Walker has focused on the impact of sleep on human health.

[https://www.ted.com/talks/matt\\_walker\\_sleep\\_is\\_your\\_superpower](https://www.ted.com/talks/matt_walker_sleep_is_your_superpower)





# WHERE WE ARE WITH SLEEP



Gallup poll 2013  
Psycho-Oncology 2017  
BMA News 2017

Abrams, R.M. (2015). Sleep Deprivation. *Obstetrics and gynecology clinics of North America*, 42 3, 493-506 .

# HEALTH CONSEQUENCES

- Increased risk for stroke
- Obesity
- Elevated risk of diabetes
- Permanent cognitive deficits
- Mental status changes
- Quality of life is reported as worse
- Osteoporosis
- Increased risk for colorectal and breast cancer.
- Risk of cardiovascular disease
- Increase in mortality

## HEALTH CONSEQUENCES OF INSUFFICIENT SLEEP

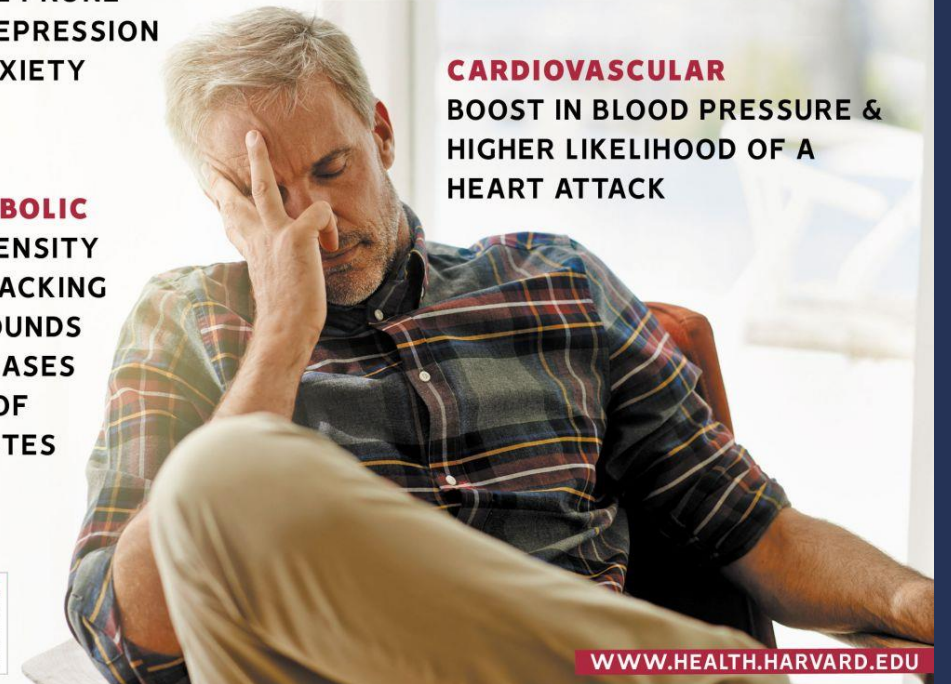
PEOPLE WHO SKIMP ON SLEEP FACE A HIGHER RISK OF NUMEROUS HEALTH PROBLEMS.

**MENTAL**  
MORE PRONE  
TO DEPRESSION  
& ANXIETY

**RESPIRATORY**  
MORE LIKELY TO  
CATCH A COLD

**METABOLIC**  
PROPENSITY  
FOR PACKING  
ON POUNDS  
INCREASES  
RISK OF  
DIABETES

**CARDIOVASCULAR**  
BOOST IN BLOOD PRESSURE &  
HIGHER LIKELIHOOD OF A  
HEART ATTACK



# SLEEP DEPRIVATION & CIRCADIAN MISALIGNMENT

Sleep Deprivation & Circadian Misalignment on Cortisol, inflammatory markers, & cytokine balance.

## Circadian Misalignment:

- Significantly increases:
  - Plasma tumor necrosis factor alpha (TNF- $\alpha$ )
  - Interleukin 10 (IL-10)
  - C-reactive protein (CRP)
- Increases plasma concentrations of pro- and anti-inflammatory proteins

**Sleep Deprivation and Chronic Misalignment modulate cortisol levels.**

# THE SLEEP DEPRIVED HUMAN BRAIN

Krause and colleagues (UC Berkely) studied sleep deprivation neural signatures on neuroimaging studies.

## Negative Impact:

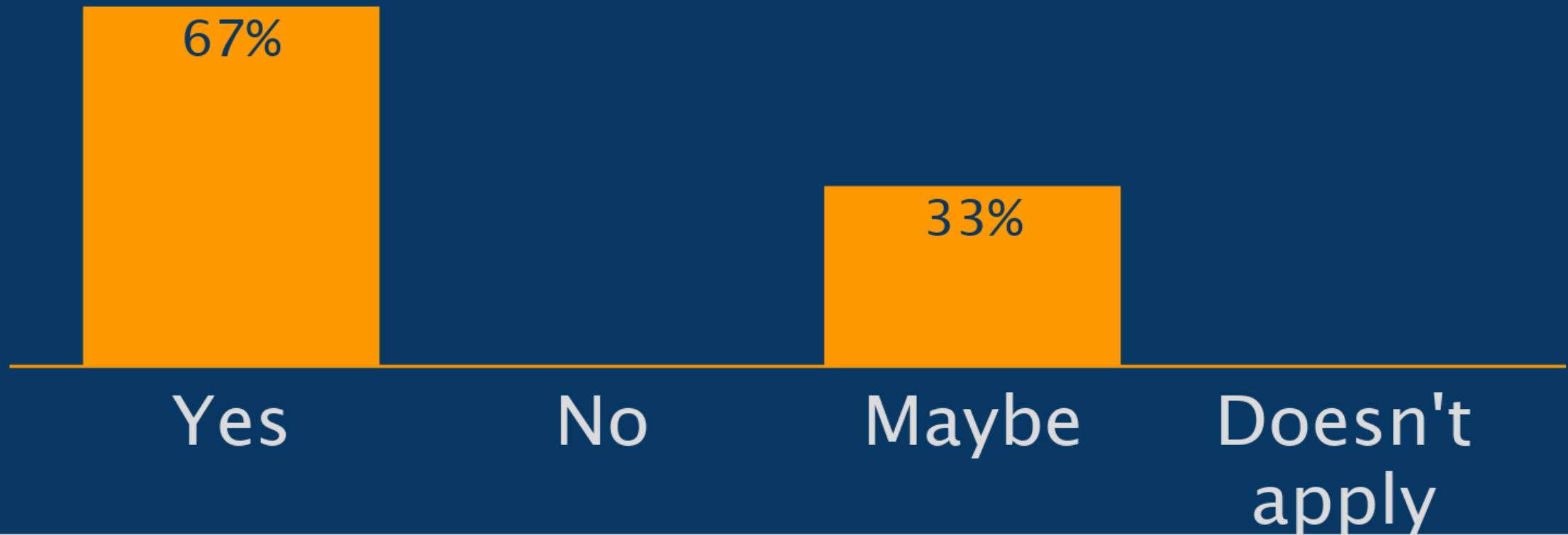
- Attention
- Working memory
- Positive, reward related affect
- Negative affect regulation
- Hippocampus-dependent memory



# SLEEPING IN DOESN'T MITIGATE METABOLIC CHANGES LINKED TO SLEEP DEFICIT

- Recent study in *Current Biology* compared 3 groups of healthy normal weight adults (18-39 yrs.).
- Control group slept up to 9 hours per night for 9 nights.
- Sleep restriction group without weekend recovery sleep had up to 5 hrs. sleep per 9 nights.
- Sleep restriction group with weekend recovery sleep had 5 hrs. of sleep per week night, unrestricted sleep on weekend, followed by another 2 week nights of sleep restriction.
- Notable findings included rapid diet and metabolic changes in the sleep deprived groups (decreased insulin sensitivity, increased caloric intake and weight gain).
- Assessment: Sleep debt consequences probably cannot be fully corrected by weekend compensation.

A surgeon in the OR is irritated and was disgruntled with his/her assistant. Is this a sign of sleep deprivation?

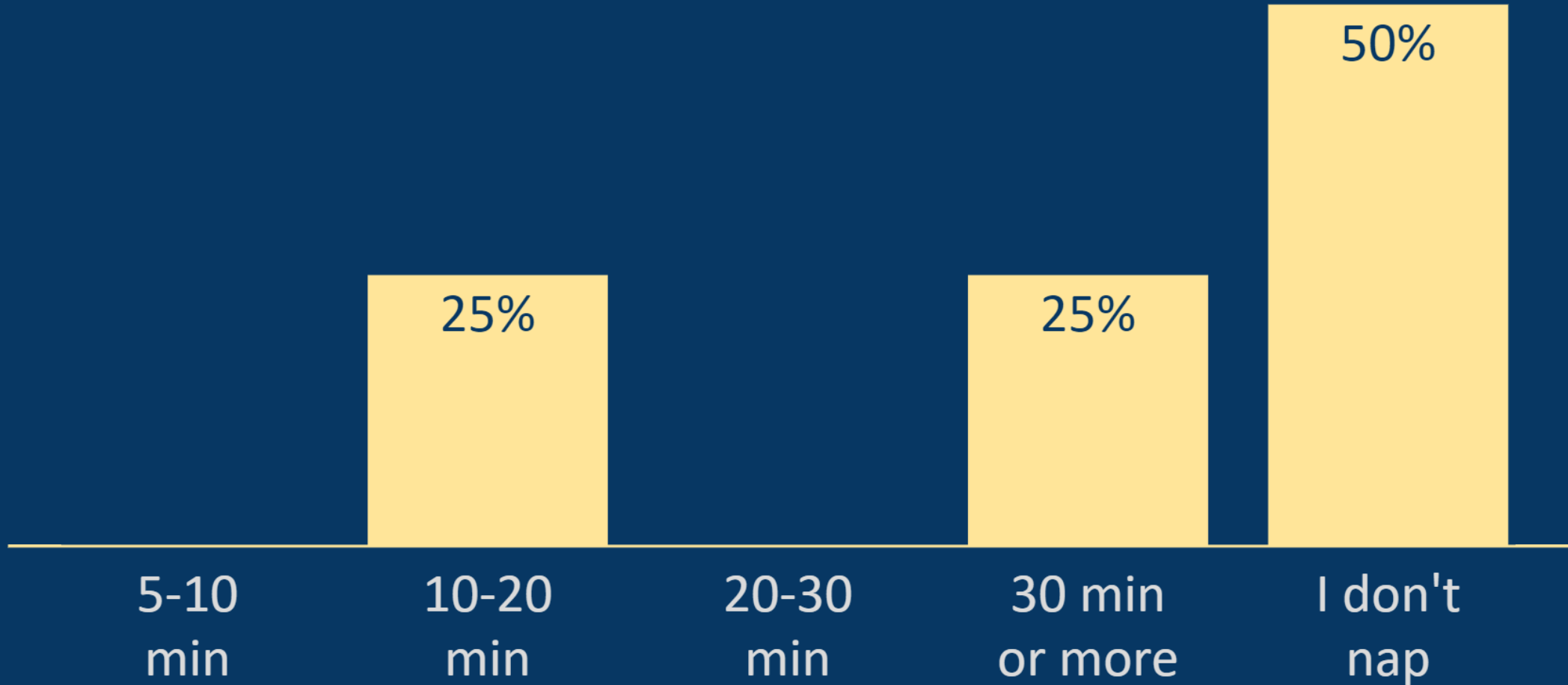


# POOR SLEEP HYGIENE



 Poll locked. Responses not accepted.

## How long are your naps?



# SIESTA TIME

- Naps longer than 30 minutes suggest...sleep deprivation.
- Short naps (10-30 minutes):
  - Restore wakefulness
  - Promote cognitive sharpness
    - With improved performance and learning
  - Body and mind can be entrained to awaken after a short nap.



© Medical News Today



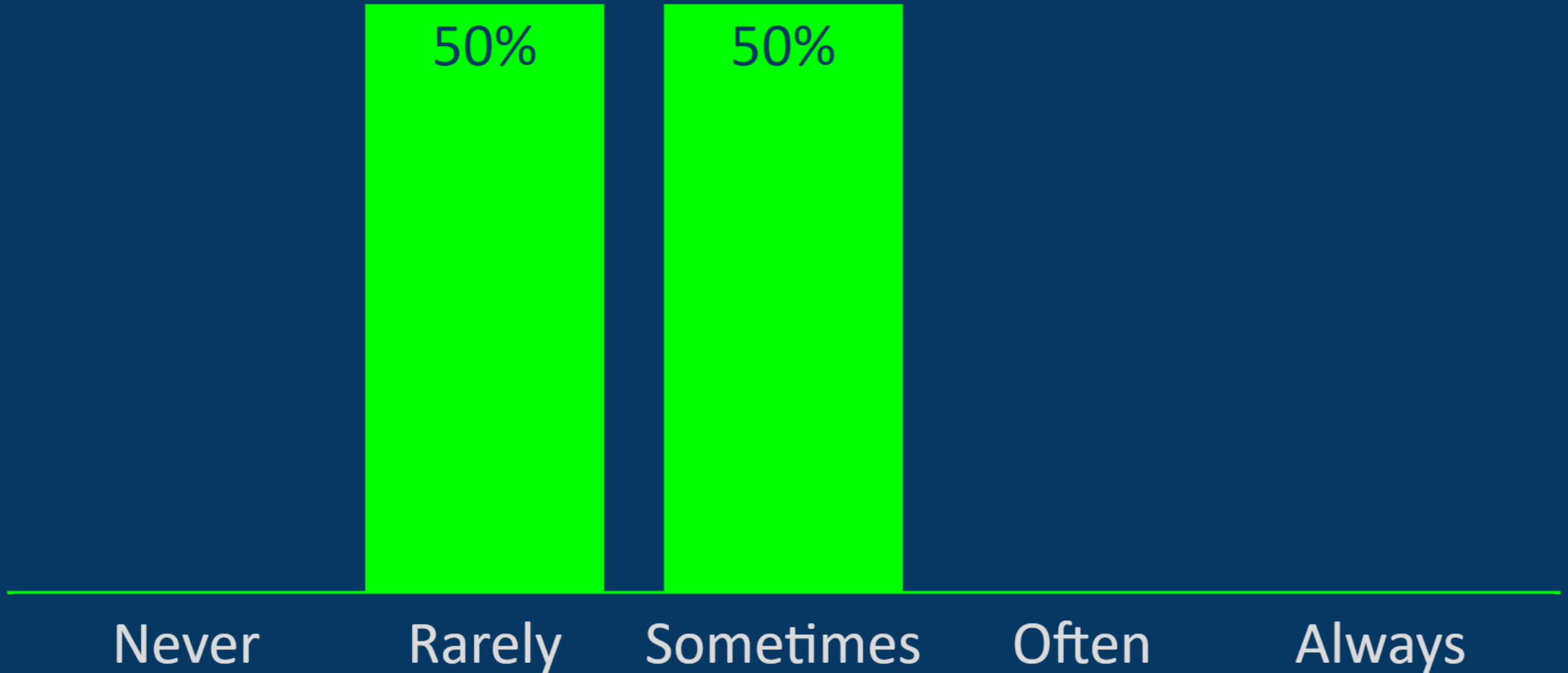
# WORK-LIFE-SLEEP BALANCE



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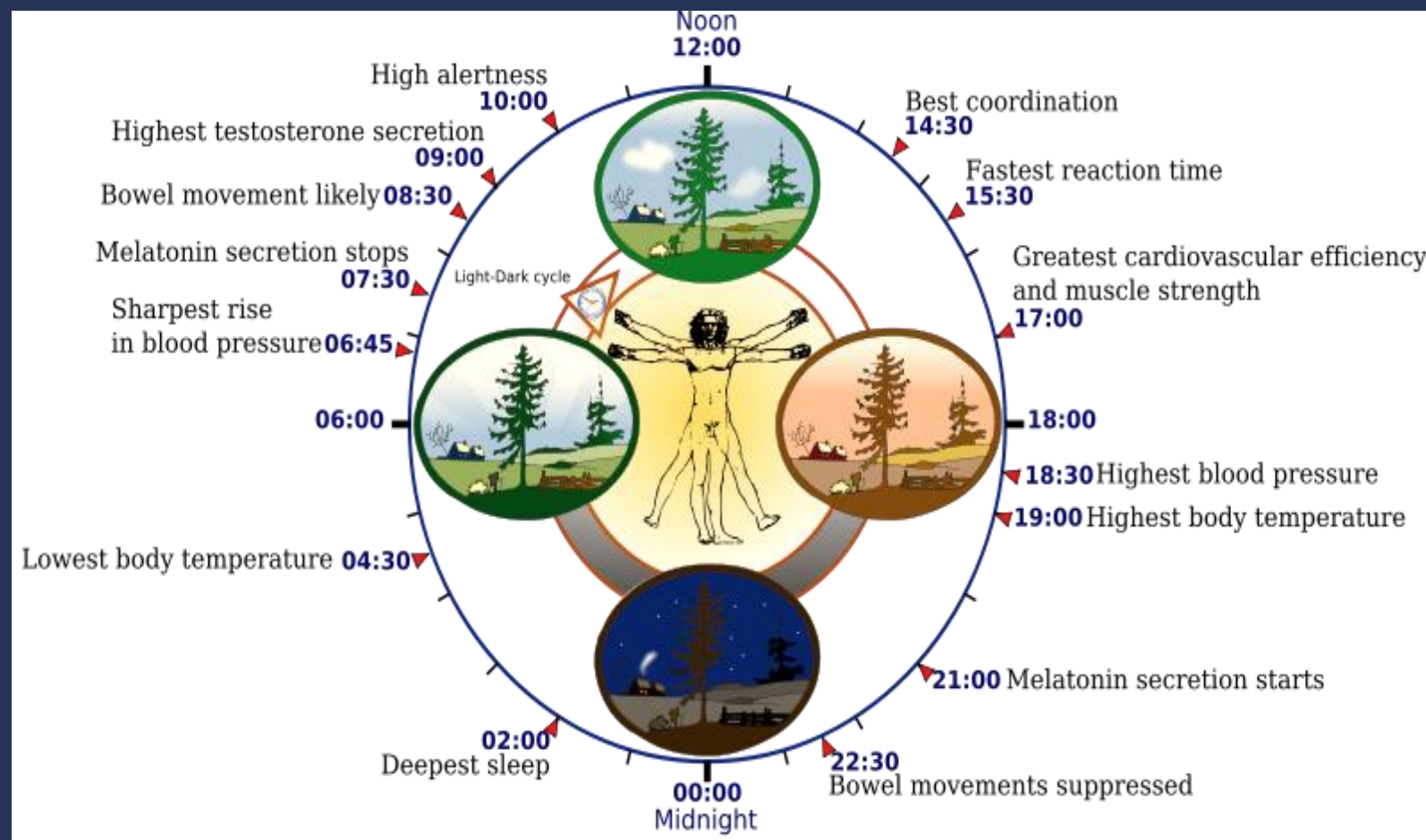
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## Is getting a good nights sleep achievable?



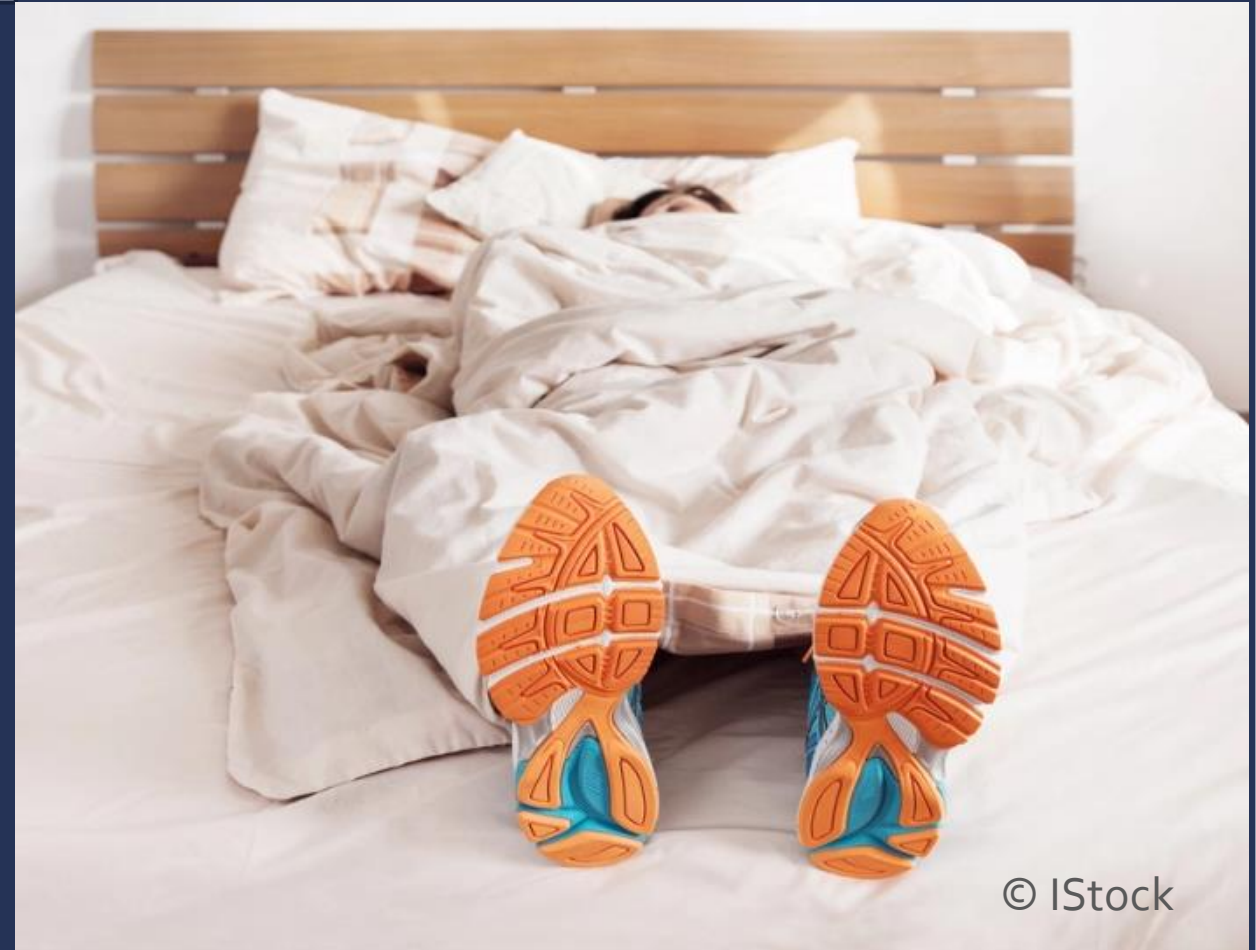
# KEY SLEEP PHYSIOLOGY FACTORS

- Temperature
- Light
- Hormones



# EXERCISE AND SLEEP

- Release of human growth hormone (GH) related to slow, synchronous sleep (slow wave sleep (SWS))
- SWS provides:
  - Restorative function
  - Repairing processes
  - Restoration of energy



Sassin JFR, et. al. Science 1969; Dijk DJ. World J Biol Psychiatry. 2010; Halson SL, Juliff LE. Prog Brain Res. 2017; Godfrey RJ, et. al. Sports Med. 2003

# GOOD SLEEP HYGIENE



Use relaxation exercises, meditation, and imagery

Designate a time 2 or more hours **before** sleep to write down your problems or solutions



 Poll locked. Responses not accepted.

## What works for you to get a good nights sleep?

“Meditation”

“read meditation right before to sleep + SleepyTime Tea(really works!)”

“Herbal tea”

“Relxing music”

“Read a bit”

“Go to bed”

“Stay off phone/devices”

“Nothing really works”

QUESTIONS

COMMENTS

DISCUSSION





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# THANK YOU FOR ATTENDING

## NEXT WELLNESS SESSION

❖ Stress and Substance Use – Nov. 17

