



Week 8





DISCLAIMER

- This presentation is about the basics of sleep.
- Will not be diagnosing sleep-related illnesses.
- Information will be general sleep knowledge as it pertains to health, wellness, and performance.

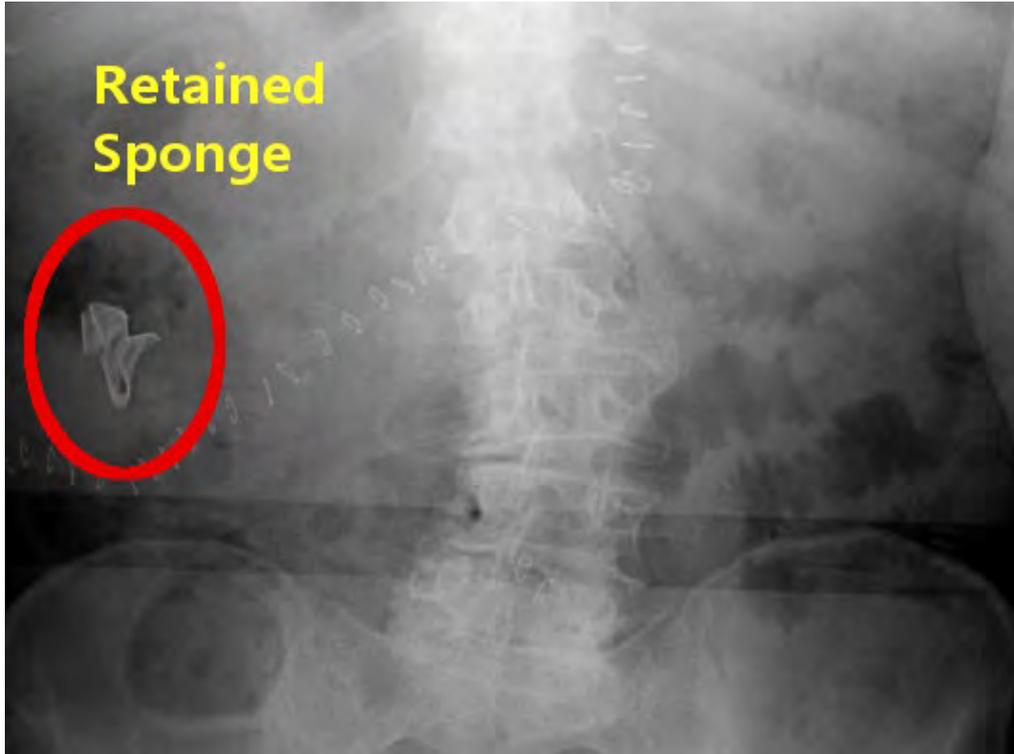
You have to coach sleep!



Sleep and nutrition are not recovery...
they are PREcovery.



**Retained
Sponge**



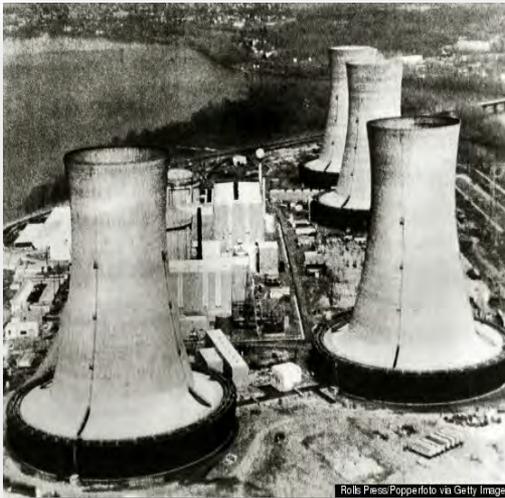
[SLEEP]

The most important area is the role of sleep in facilitating an optimal level of waking function.

SLEEP

FATIGUE

A major contributing factor to disasters.



MARCH 1979



APRIL 1986



JANUARY 1986

Human Performance Domains

Cognitive



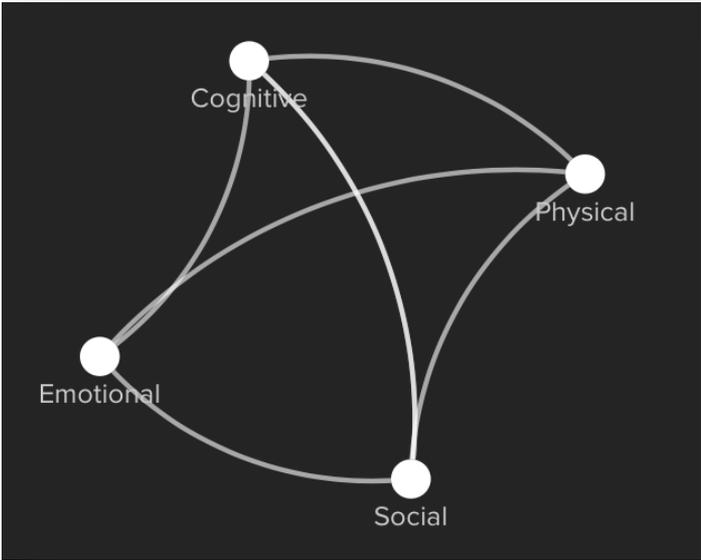
Physical



Social

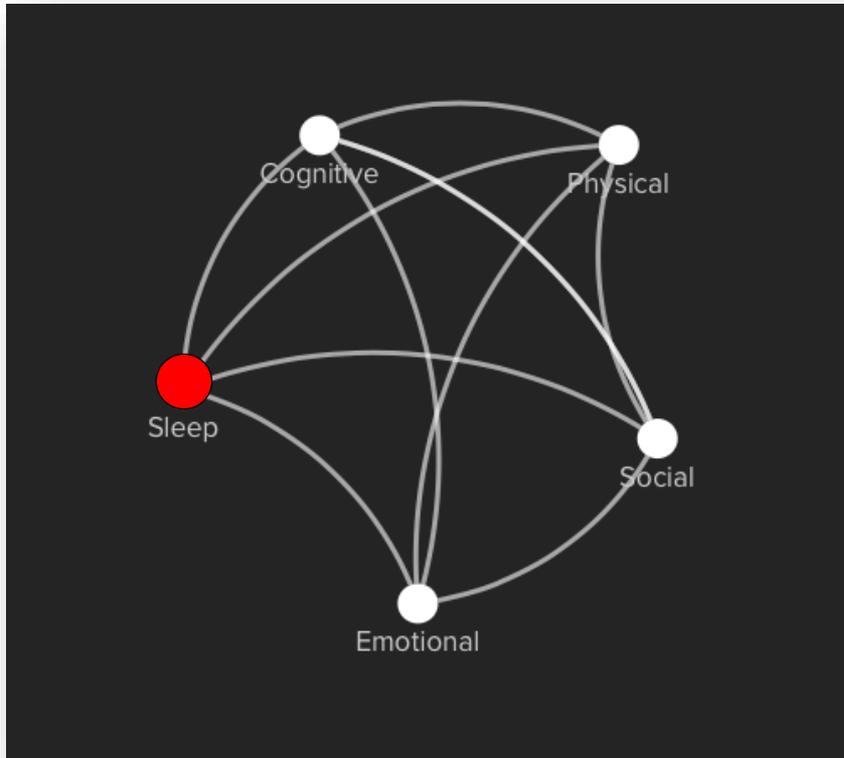


Emotional



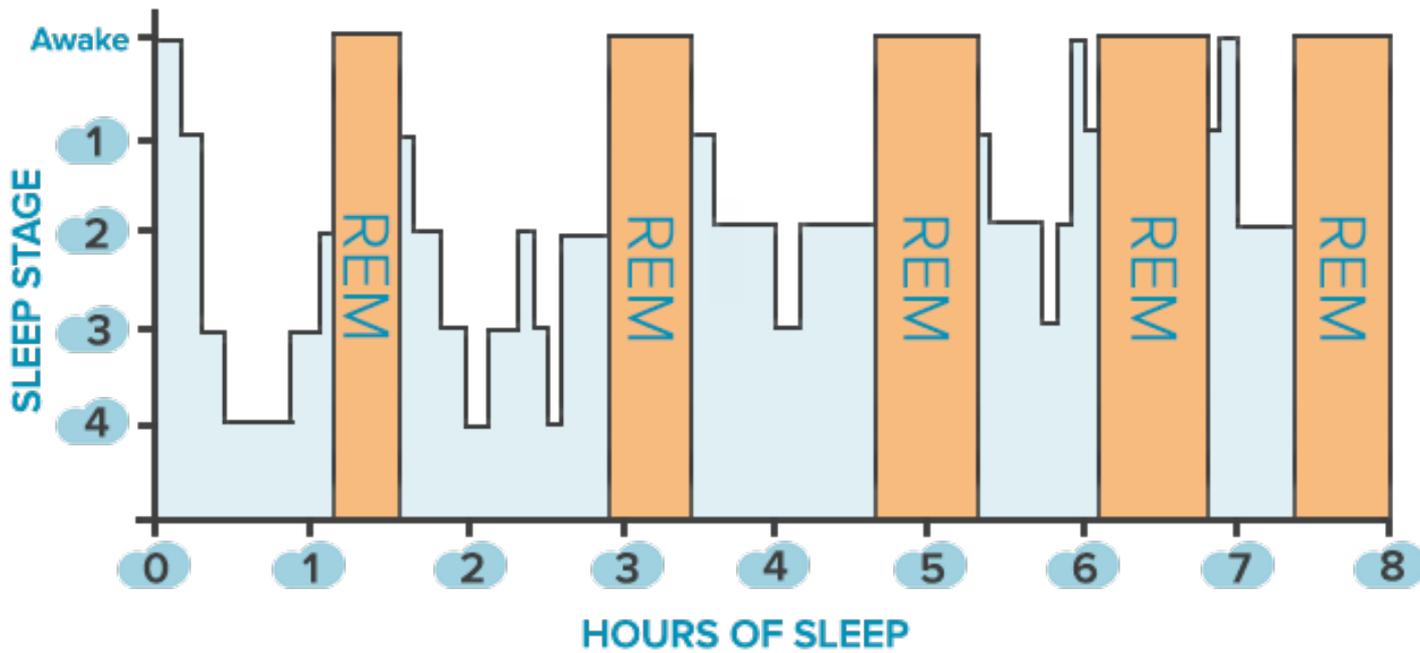
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1st-Order Connections



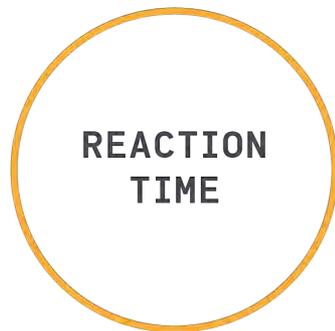
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Stages of Healthy Sleep



Sleep matters

Fatigue, resulting from inadequate sleep, has a direct and measurable impact on:



High-performance approach
Order of operations



Not getting enough of it leads to:

- increased risk of injury and reduced pain threshold
- greater susceptibility to sickness
- reduced physical and psychological performance
- reduced motivation, learning ability and memory
- increase in anxiety, irritability and mistakes
- increase in body fat percentage
- reverting to old habits
- poor judgement of distance, speed and/or time

Getting enough though, improves:

- motivation
- recovery of muscle strength
- sprint speeds
- muscle glycogen (stored energy in muscle)
- cortisol (stress) regulation
- motor skill (movement) development (sport specific mechanics)
- memory consolidation (retention of scouting reports)

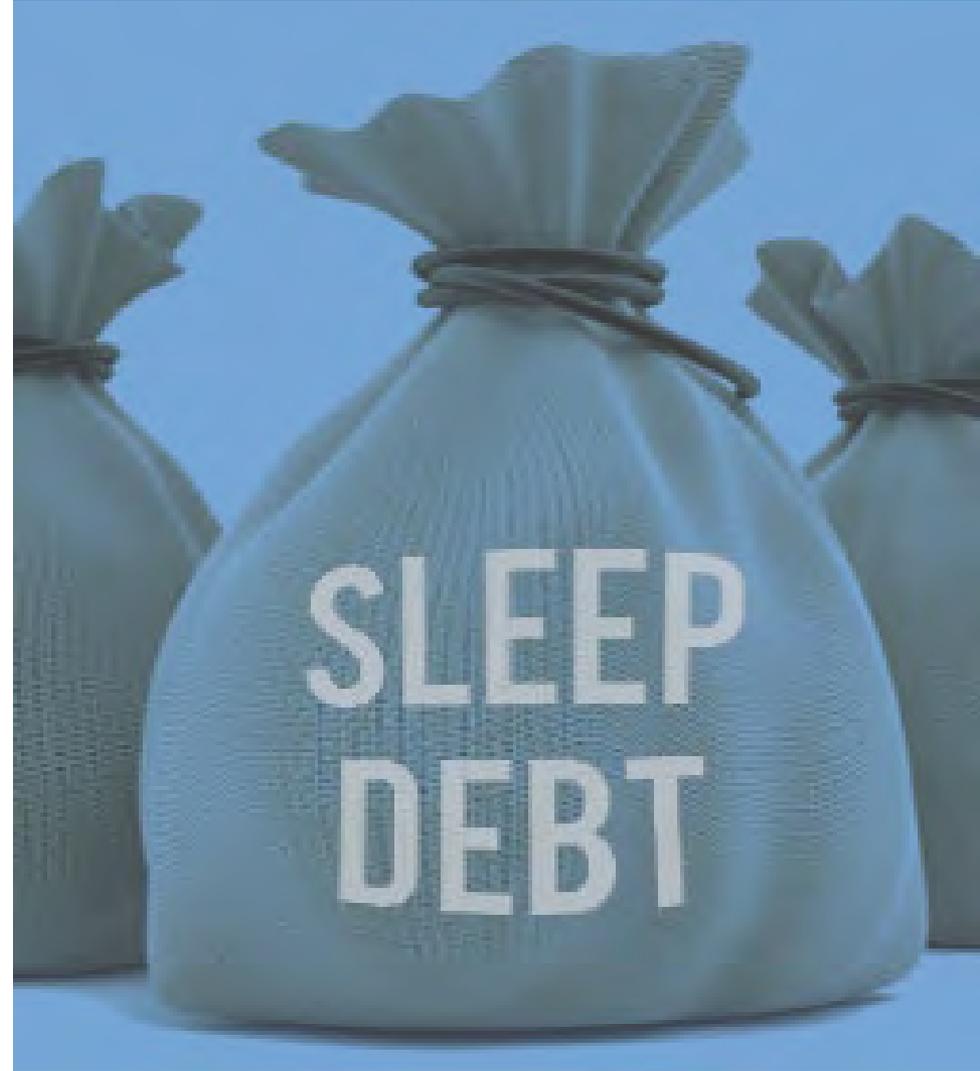
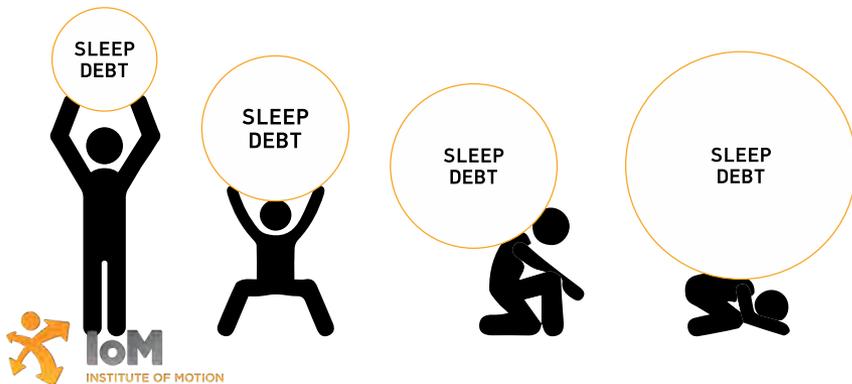
Paying back what you owe?

- sleep debt

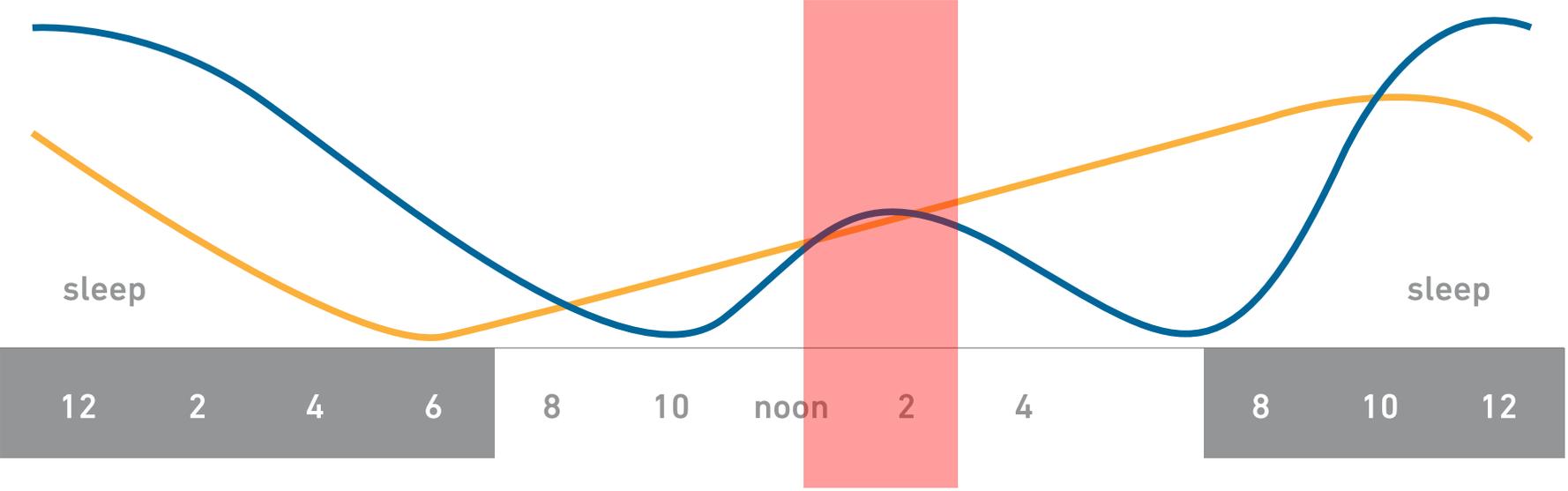
SLEEP DEBT

SIMPLIFIED

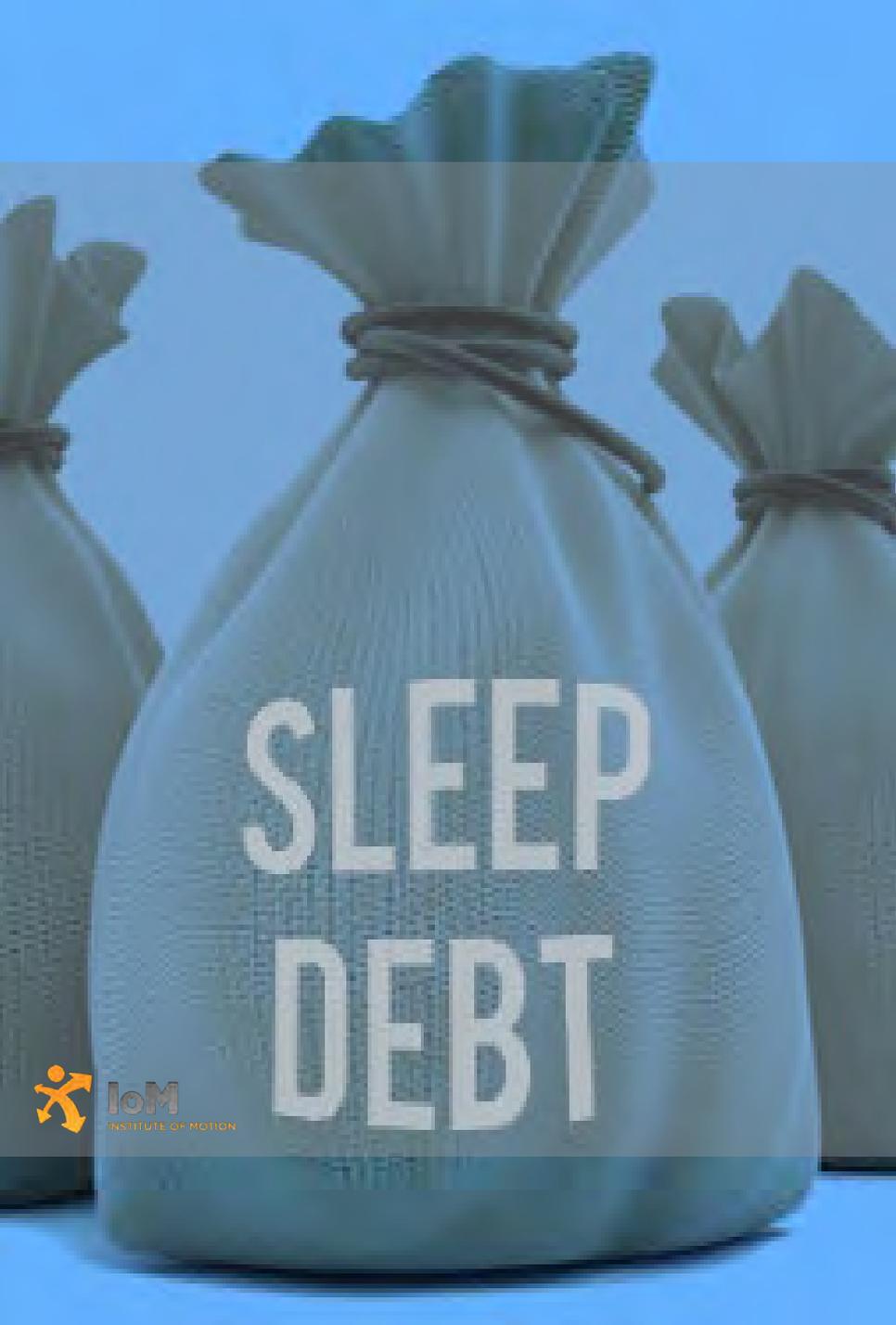
- ✓ Need 8 hours and got 7 hours = 1 hour of sleep debt
- ✓ Need to get 9 hours tonight to “repay” sleep debt
- ✓ How can I tell if I have sleep debt?
- ✓ “Drowsiness is red alert!”



Healthy Circadian Rhythm



— sleep urge — sleep need

The image shows three burlap sacks tied at the top, arranged in a row. The central sack is the largest and has the words "SLEEP DEBT" printed on it in large, white, sans-serif capital letters. The background is a solid blue color.

SLEEP DEBT

- ✓ Chronically obtaining less sleep than your body needs builds sleep debt over time
- ✓ Sleep debt is manageable at first, but over time, it becomes overwhelming
- ✓ For optimal functioning and performance, you should eliminate your sleep debt by gradually extending your sleep duration
- ✓ **Be patient:** Reducing sleep debt takes more than one night or weekend of good sleep!

Study: Sleep extension with swimmers

After extending time in bed to 10hr/night for several weeks collegiate swimmers showed improvements of

+8%

15m sprint
speed

+20%

reaction time
off the block

+10%

turn time
efficiency

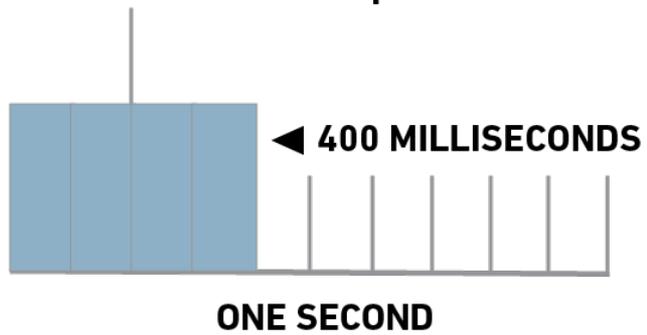
+19%

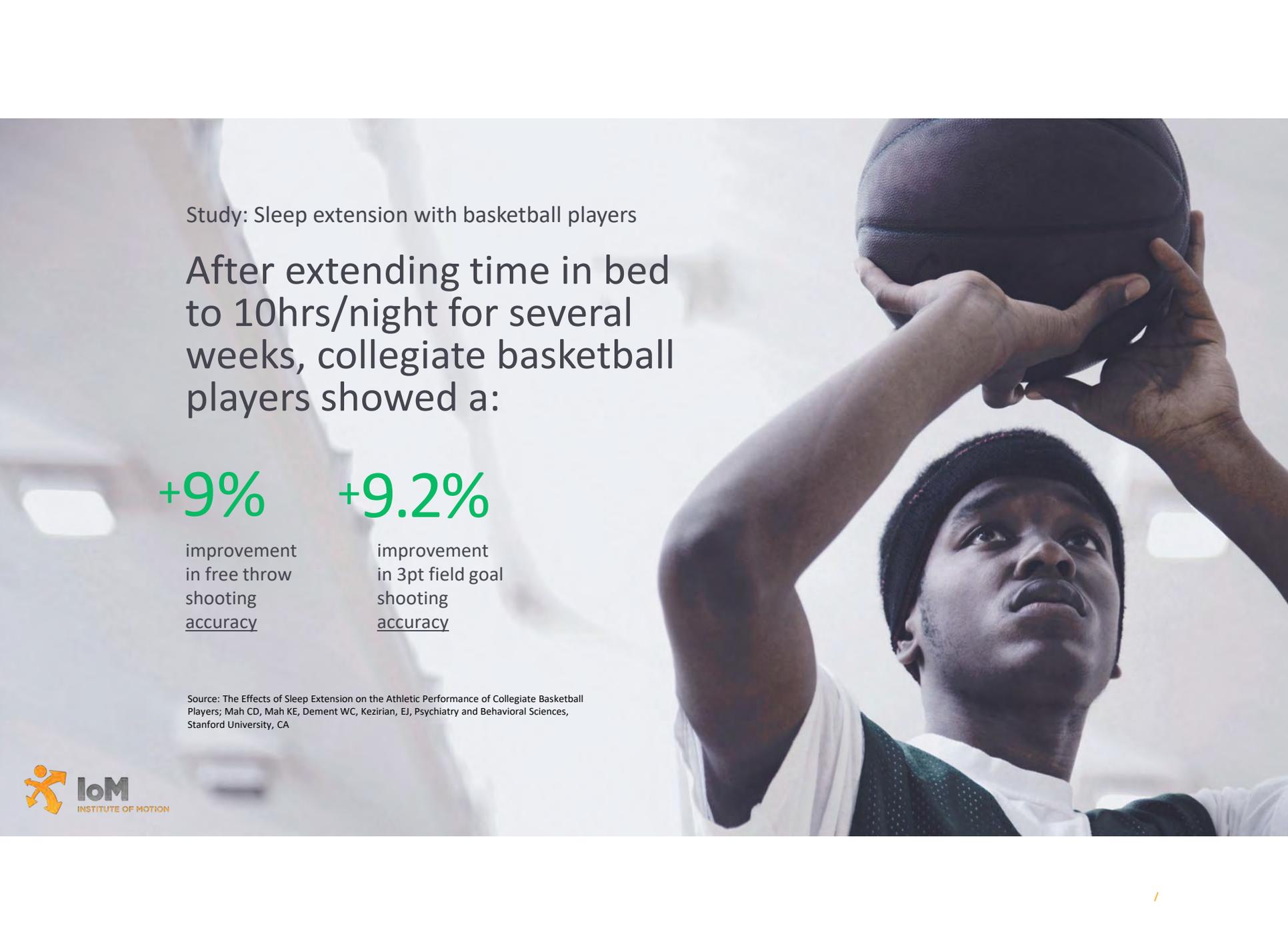
kickstrokes

Extended Sleep and the Effects on Mood and Athletic Performance in Collegiate Swimmers;
Mah CD, Mah KE, Dement WC, Psychiatry and Behavioural Sciences, Stanford University, CA



Time needed for 90 mph
fastball to reach homeplate





Study: Sleep extension with basketball players

After extending time in bed to 10hrs/night for several weeks, collegiate basketball players showed a:

+9%

improvement
in free throw
shooting
accuracy

+9.2%

improvement
in 3pt field goal
shooting
accuracy

Source: The Effects of Sleep Extension on the Athletic Performance of Collegiate Basketball Players; Mah CD, Mah KE, Dement WC, Kezirian, EJ, Psychiatry and Behavioral Sciences, Stanford University, CA

Study: Sleep extension with basketball players

They were faster too.

.7s

faster sprint
over 95 yards

8.5 hr sleep

6.5 hr sleep

In the outfield,
that's a difference
of
10' over 15s.

Source: The Effects of Sleep Extension on the Athletic Performance of Collegiate Basketball Players; Mah CD, Mah KE, Dement WC, Kezirian, EJ, Psychiatry and Behavioral Sciences, Stanford University, CA

Study: Sleepiness & predicting career longevity in baseball

Winter tracked 80 MLB players. After 3 years:

72%

of players with normal sleep traits were still playing

39%

of players with poor sleep traits were still playing

14%

of players with severe sleep issues were still playing



Source: Predicting Major League Baseball (MLB) Player Career Longevity via Sleepiness Measurements; Winter, W. Christopher



Study: Impact of fatigue on MLB strike-zone judgement

30 MLB teams were tracked from 2005-2011.

Performance in strike zone judgement consistently worsens over the course of each MLB season, despite the inputs of frequent practice and repetition. Researchers hypothesized that this decline is the result of fatigue.

Validation of a Statistical Model Predicting Possible Fatigue Effects in Major League Baseball; Kutscher, Scott.

Injuries have been shown to be related to sleep less than 6 hours the night before the injury occurred

1.7x

greater risk for injury compared to athletes that obtained ≥ 8 hours of sleep.

Source: Milewski MD, Skaggs DL, Bishop GA, et al. Chronic lack of sleep is associated with increased sports injuries in adolescent athletes. *J Pediatr Orthop* 2014;34(2):129-33. PMID: 25028798

Study: Sleep Restriction on Testosterone Levels

↓ sleep = ↓ testosterone

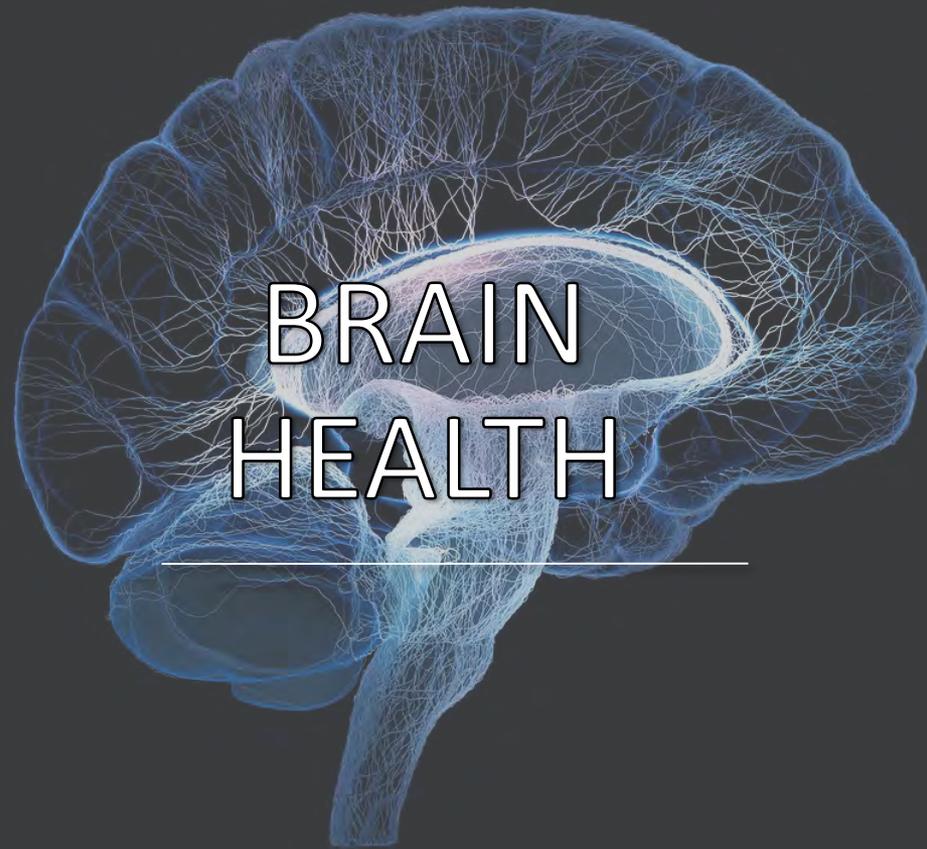
24yr old healthy men who slept less than 5hrs a night for a week, registered a 15% drop in testosterone. That's like aging 15yrs.

Key for: strength and muscle mass, energy and concentration, bone density, libido

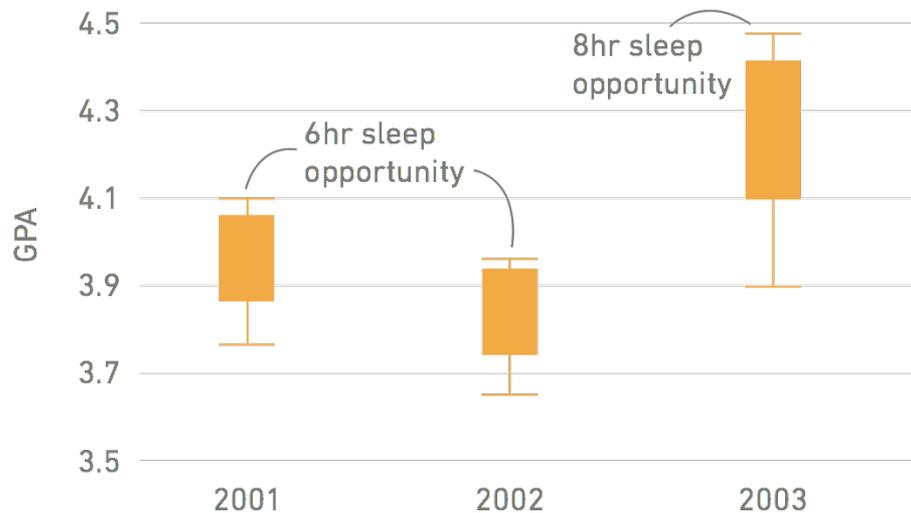
Effect of 1 Week of Sleep Restriction on Testosterone Levels in Young Healthy Men Rachel Leproult, PhD; Eve Van Cauter, PhD



- During sleep, the brain “bathes” itself in cerebrospinal fluid to get rid of waste products
- The brain will also clean out toxic proteins which can impair healthy aging of the brain, and cause brain-related diseases such as Alzheimer’s and other neurological disorders



Grade point averages improved 11% when cadets' sleep opportunity was expanded from 6hr/night to 8hr/night.





ADEQUATE
SLEEP

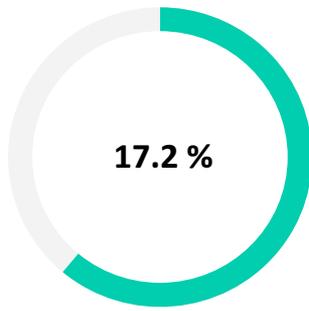
SLEEP
DEPRIVED



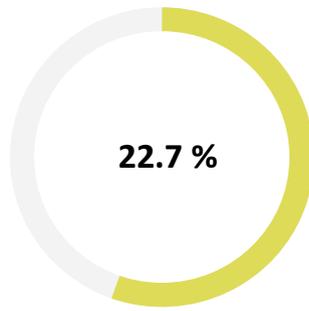
Modern Presentation

SHORT SLEEP = MORE COLDS

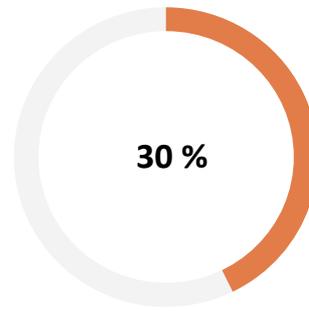
Chances (%) of catching a cold when exposed to the virus if you're not sleeping enough



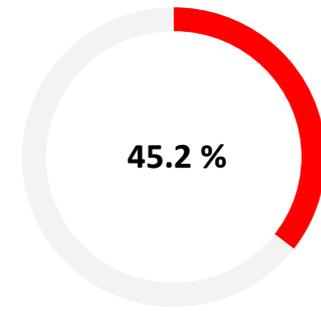
> 7 HOURS



6 – 7 HOURS



5 – 6 HOURS



< 5 HOURS

sleep mythology

SLEEP MYTHOLOGY

You can get too much sleep

Naps are bad

8 hours of sleep is ideal

Older people don't need as much sleep

Storing up sleep for the week ahead

Alcohol helps you sleep

POWER NAP

- ~20 MIN.
- SLEEP INERTIA (30-45 MIN PERIOD)
- STRATEGIC CAFFEINE PRE (NAPUCCINO)
- BOTTOM LINE >> GET IT WHEN YOU NEED IT

SLEEP MYTHOLOGY

You can get too much sleep

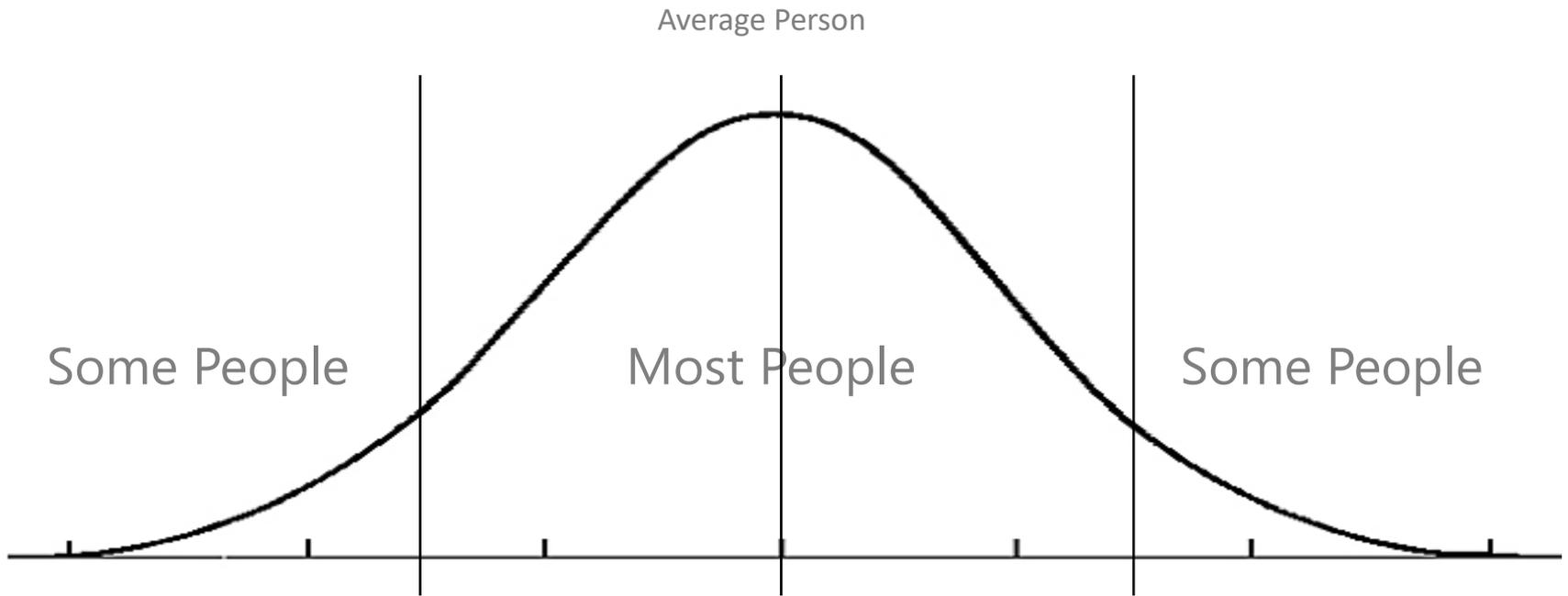
Naps are bad

8 hours of sleep is ideal

Older people don't need as much sleep

Storing up sleep for the week ahead

Alcohol helps you sleep



Athletes need a lot of sleep to perform their best

9-10

hr/night

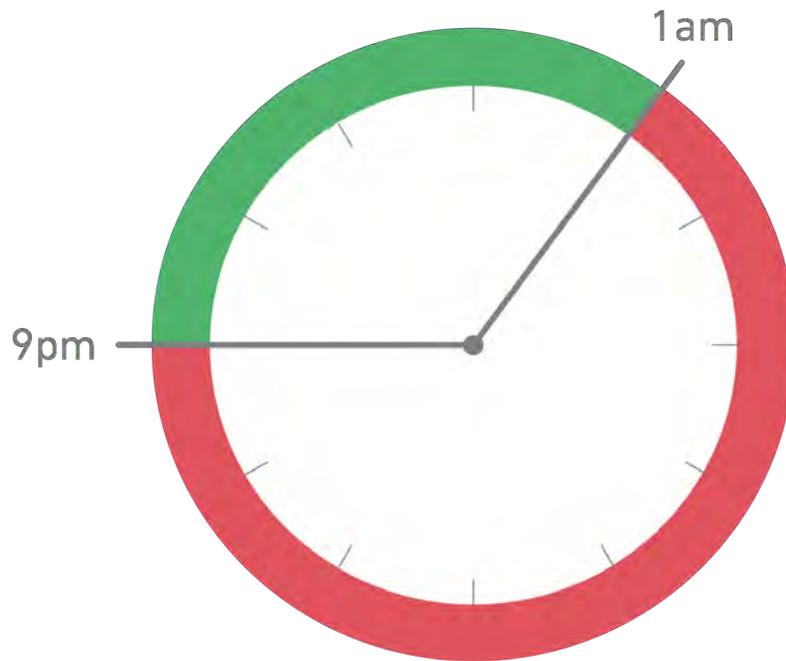
<24 yr old

8-10

hr/night

25+ yr old

When you go to sleep matters too



- When you go to bed affects the quantity, quality, and restorative value of your sleep.
- Falling asleep before 1am is best. After 3am almost always guarantees a poor sleep.

SLEEP MYTHOLOGY

You can get too much sleep

Naps are bad

8 hours of sleep is ideal

Older people don't need as much sleep

Storing up sleep for the week ahead

Alcohol helps you sleep

Stay calm after one bad-night's rest...



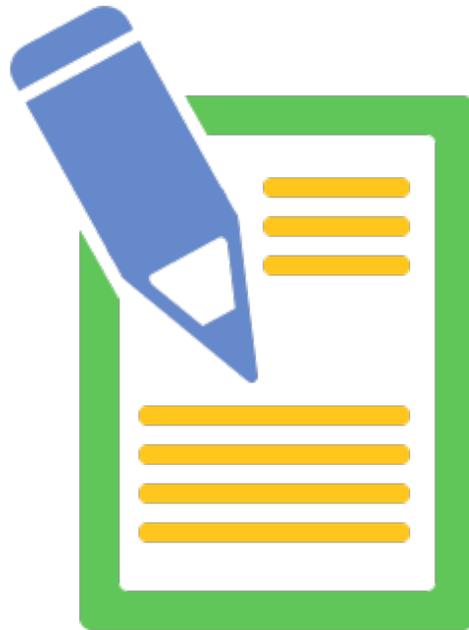
Sleep / Nutrition Interaction

- Your sleep can influence what you eat, and vice versa.
- The primary fuel source for athletes are carbohydrates.
- Sleep deprivation alters the ability of the body to metabolize and store carbohydrates for recovery, as well as use for a later time.
- Individuals who are sleep deprived tend to crave carbohydrates.
- Certain foods can have an adverse effect, keeping you awake at night.
- Large quantities of food consumed late at night can also contribute to a restless night.
- If your food is keeping you up at night, check in with an RD.

sleep strategies

Be sure you're asking the right questions...

Readiness Questionnaires and Training Monitors



Development of the athlete sleep behavior questionnaire: A tool for identifying maladaptive sleep practices in elite athletes

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² University of California, Human Performance Center - San Francisco - California - USA.

³ Australian Institute of Sport, Physiology - Canberra - ACT - Australian.

⁴ High Performance Sport New Zealand, Performance Physiology - Auckland - Auckland - New Zealand.

ABSTRACT

Introduction: Existing sleep questionnaires to assess sleep behaviors may not be sensitive in determining the unique sleep challenges faced by elite athletes. The purpose of the current study was to develop and validate the Athlete Sleep Behavior Questionnaire (ASBQ) to be used as a practical tool for support staff working with elite athletes. **Methods:** 564 participants (242 athletes, 322 non-athletes) completed the 18-item ASBQ and three previously validated questionnaires; the Sleep Hygiene Index (SHI), the Epworth Sleepiness Scale (ESS) and the Pittsburgh Sleep Quality Index (PSQI). A cohort of the studied population performed the ASBQ twice in one week to assess test-retest reliability, and also performed sleep monitoring via wrist-actigraphy. **Results:** Comparison of the ASBQ with existing sleep questionnaires resulted in *moderate to large* correlations ($r=0.32 - 0.69$). There was a significant difference between athletes and non-athletes for the ASBQ global score (44 ± 6 vs. 41 ± 6 , respectively, $p < 0.01$) and for the PSQI, but not for the SHI or the ESS. The reliability of the ASBQ was acceptable ($ICC=0.87$) when re-tested within 7 days. There was a *moderate* relationship between ASBQ and total sleep time ($r=-0.42$). **Conclusion:** The ASBQ is a valid and reliable tool that can differentiate the sleep practices between athletes and non-athletes, and offers a practical instrument for practitioners and/or researchers wanting to evaluate the sleep behaviors of elite athletes. The ASBQ may provide information on areas where improvements to individual athletes' sleep habits could be made.

Keywords: Surveys and Questionnaires; Actigraphy; Polysomnography; Sleep Hygiene; Athletes.

Lark or Owl?



Resolve Daily Dilemmas Outside of the Bedroom

- It is important to recognize whether or not you are a worrier
- Before going to bed, make a 'worry list,' and write a brief action item beside each concern
- This can bring a sense of closure, which sometimes can stop the process of re-thinking the same situation over and over, all night long

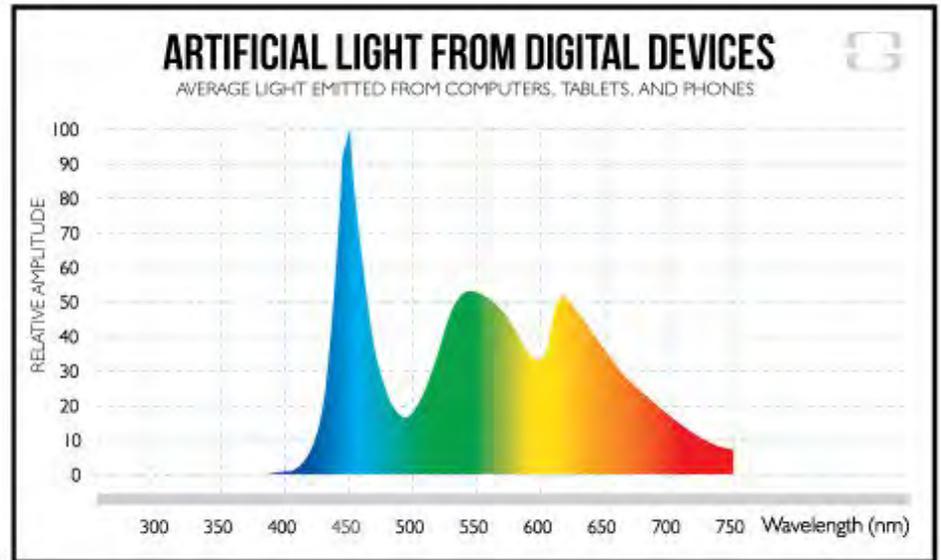
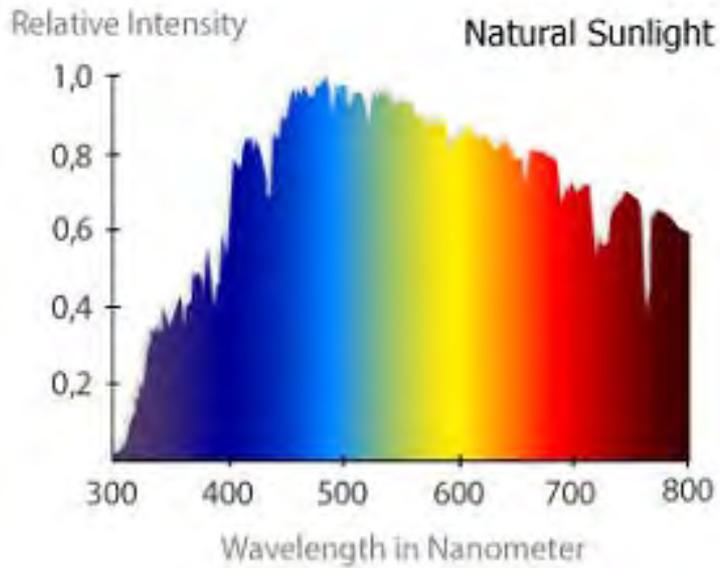


The Bedroom is not an office

Bright
light =  Melatonin levels

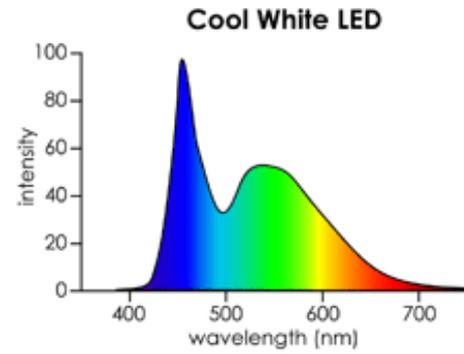
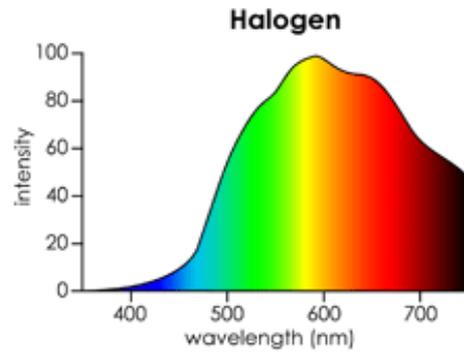
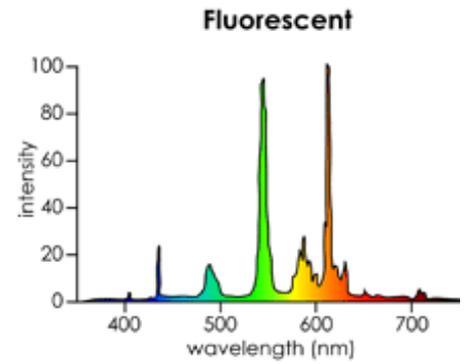
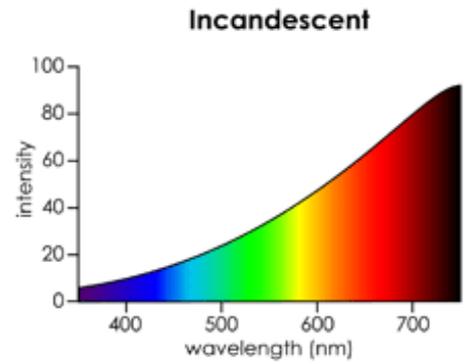
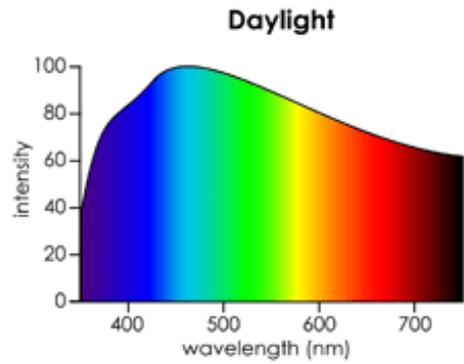
- Be wary of using technology in the bedroom, even an hour before going to bed.
- Alertness is enhanced either because the bright light emitted suppress melatonin levels and/or because the content presented on these devices is engaging and exciting

What is this thing called blue light?



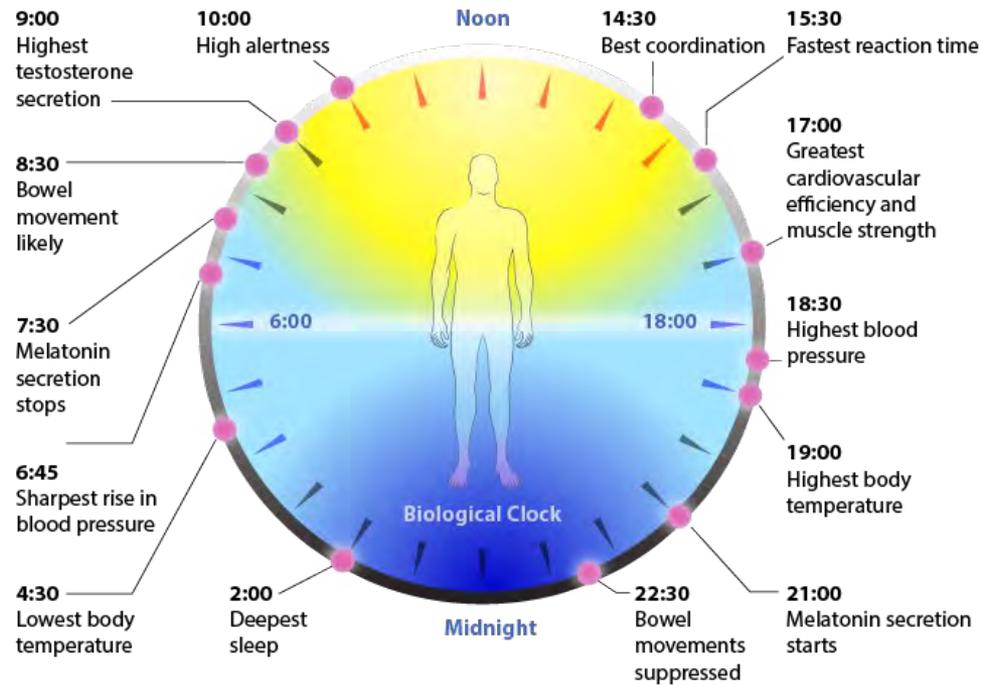






Other strategies

- Planning around biological clock



Reasons some athletes don't get enough sleep



Sleep disorders

- insomnia, sleep apnea



Scheduling

- practices, training and meetings
- games
- long distance travel, time zone shifting
- media or promotional commitments
- eating, commuting, time off

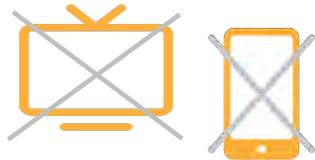


Lifestyle/Environmental

- sleep hygiene
- alcohol, drugs, caffeine
- noise, air quality, light exposure
- stress

Establish a Bedtime Routine

Strategies for winding down for a good nights sleep



Turn off
all screens



Take a hot
shower



Listen to relaxing
music



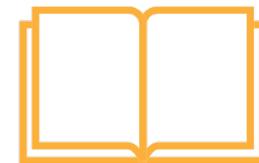
Stretch



Lay out clothes
for the next day



Go to bed by
10:30pm



Read a relaxing
book for 30-45
minutes

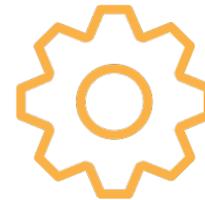
Create a Quiet and Comfortable Sleep Environment



Dark room, with
temperature around
67°F / 19°C



Mask unwanted
sounds with fan or
other white-noise



Ear plugs and
sleep mask can
aid sleep

supplementation | Rx drugs

SLEEP

SUPPLEMENTATION | Rx



ZMA



MELATONIN



TART CHERRY



BioZzz

These products can be beneficial for improving sleep and/or enhancing recovery while sleeping.

SLEEP

SUPPLEMENTATION | Rx



POWER OFF



SOM SLEEP



ADVIL PM



ZzzQuil



Ambien

These products may not be beneficial for improving sleep and/or enhancing recovery while sleeping.

sleep technologies



Brandon Marcello PhD

@bmarcello13

Simply because a technology is available, doesn't make it accurate. Therefore, one of the important questions you must ask yourself is how much error are you willing to accept. **#accurate #valid #reliable**

12:12 PM - 21 Nov 2017

FATIGUE
SCIENCE



Readiband



3-4 Week Battery

93% Accurate to PSM

WHOOOP



Whoop Band



1-2 Day Battery

fitbit



Charge 2



~ 5 Day Battery

OURA



Oura Ring



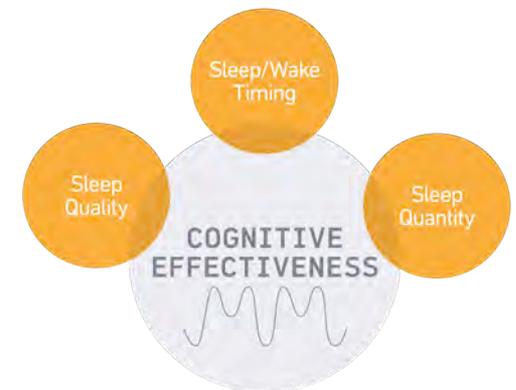
7 Day Battery

They tend to underestimate sleep disruptions and overestimate total sleep times and sleep efficiency in normal individuals.

takeaways



- Sleep is important to every human being: There is no exception.
- Sleep impacts the physical, cognitive, social, and emotional domains.
- Consistency is key – Routine, routine, routine.
- You have to coach sleep!



resources

What to watch....



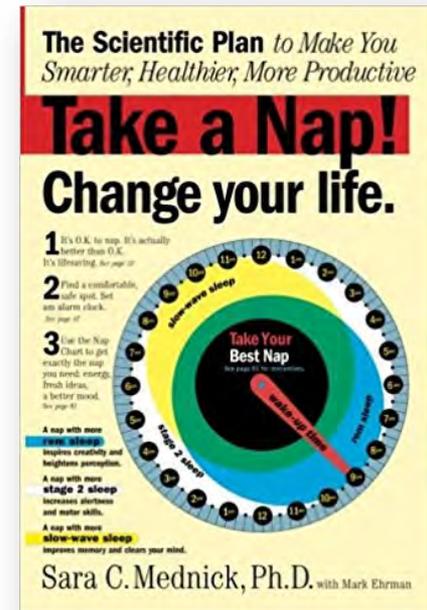
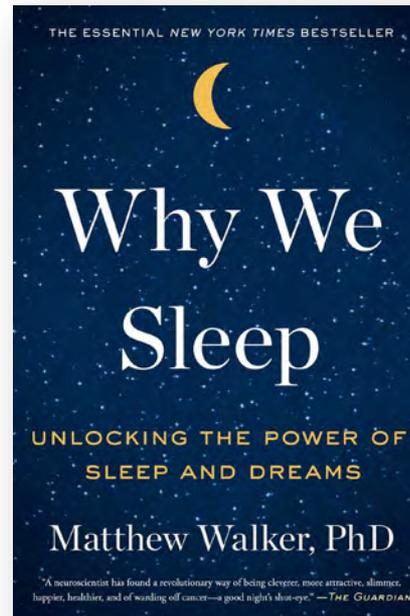
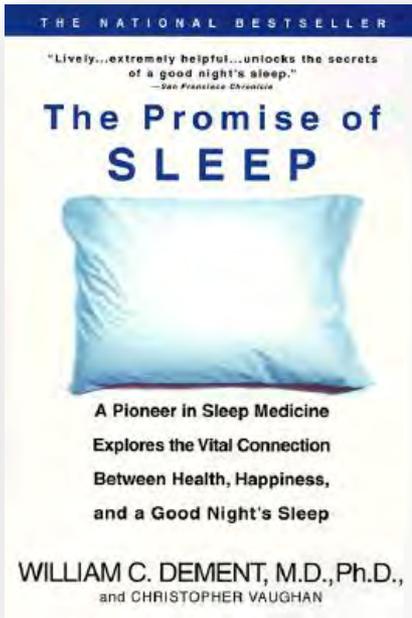
One More Reason to Get a Good Night's Sleep
Jeff Iliff

Sleep Is Your Superpower
Matthew Walker



Why Do We Sleep?
Russell Foster

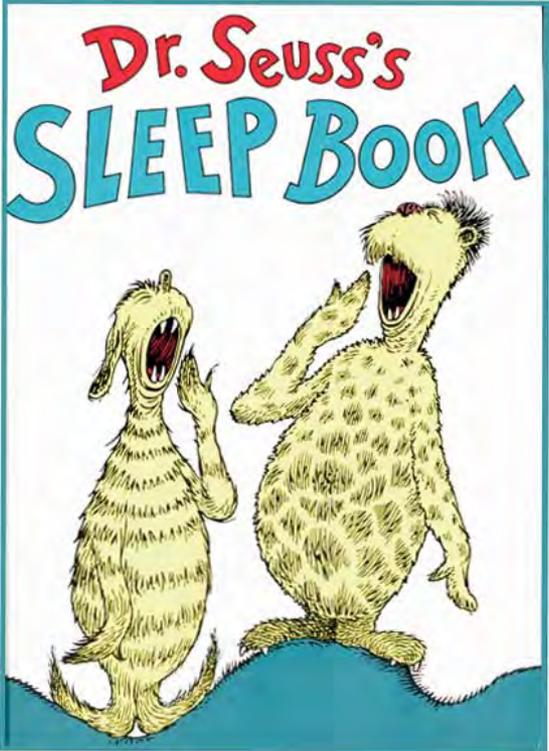
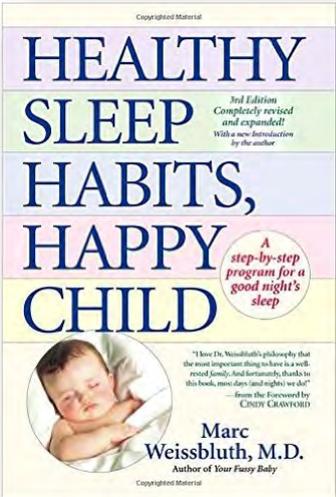
For you...



For your clients (and you)...



Have or having kids?...



“It is a common experience that a problem difficult at night is resolved in the morning after the committee of sleep has worked on it.”

- John Steinbeck

