

Sleep!

The Basics and Other Tidbits

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Objectives

- Describe “normal” sleep (Quantity and Quality)
 - Identify contributors to insufficient sleep
 - Review health conditions and chronic diseases related to insufficient sleep
 - Name three sleep disorders that contribute to poor sleep
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Sleep - Why is it important?

- Key to our health, performance, safety and quality of life
 - As essential a component as good nutrition and exercise to optimal health
 - As necessary as the water we drink, the air we breathe and the food we eat to function and live at our best.
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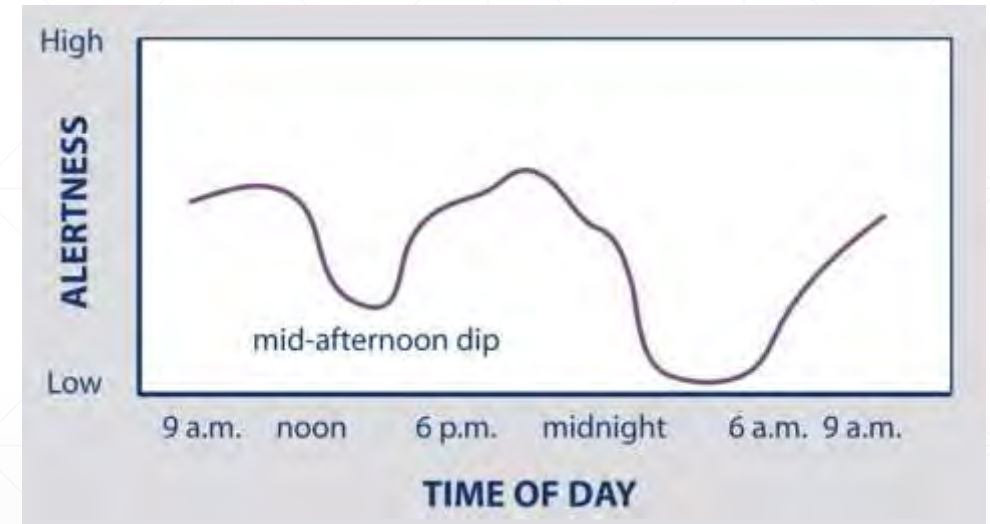
Sleep is Regulated by Two Body Systems

Sleep/Wake Restorative Process

Balances Sleep and Wakefulness

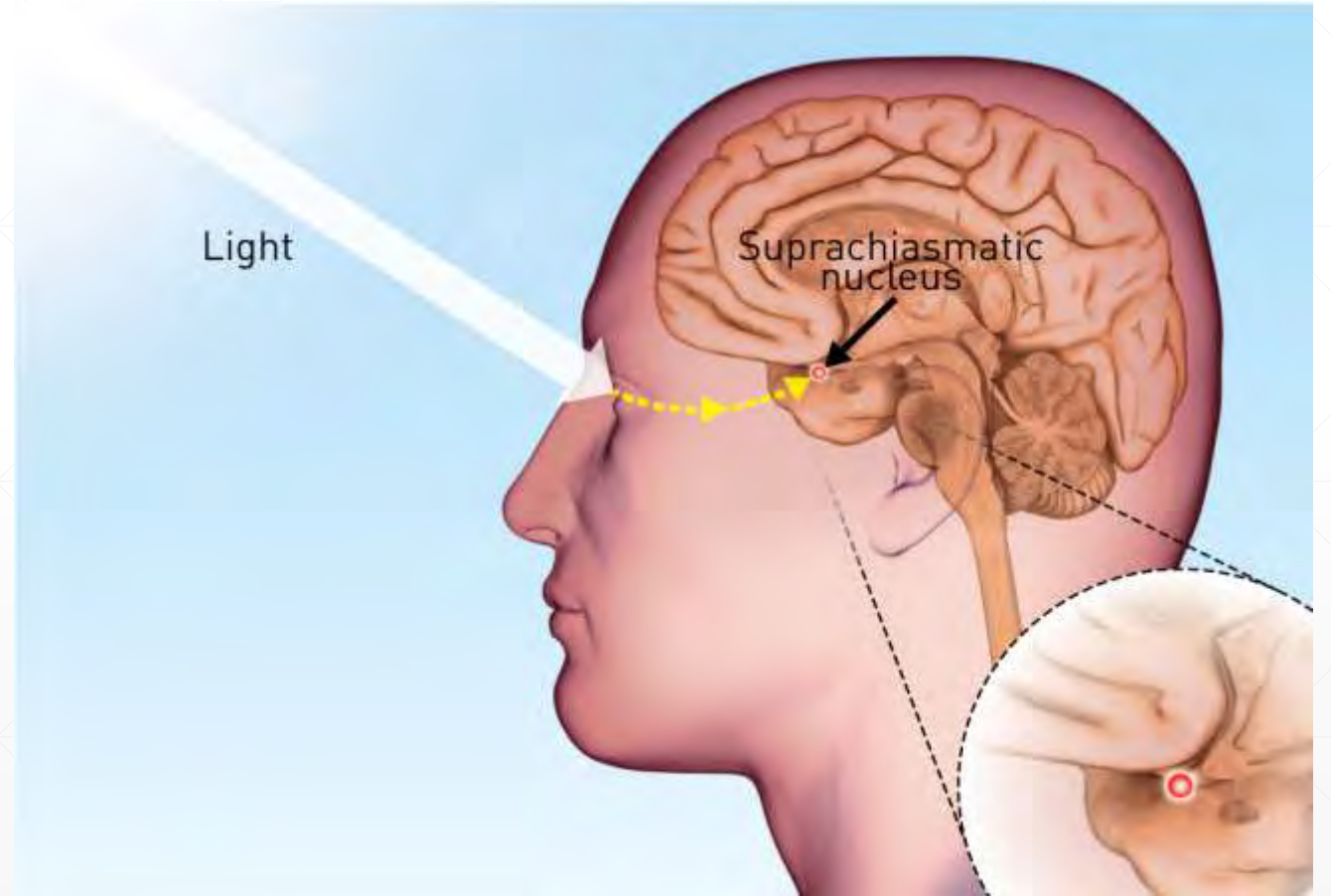
Circadian Biological Clock

Regulates Timing of Sleep and Wakefulness

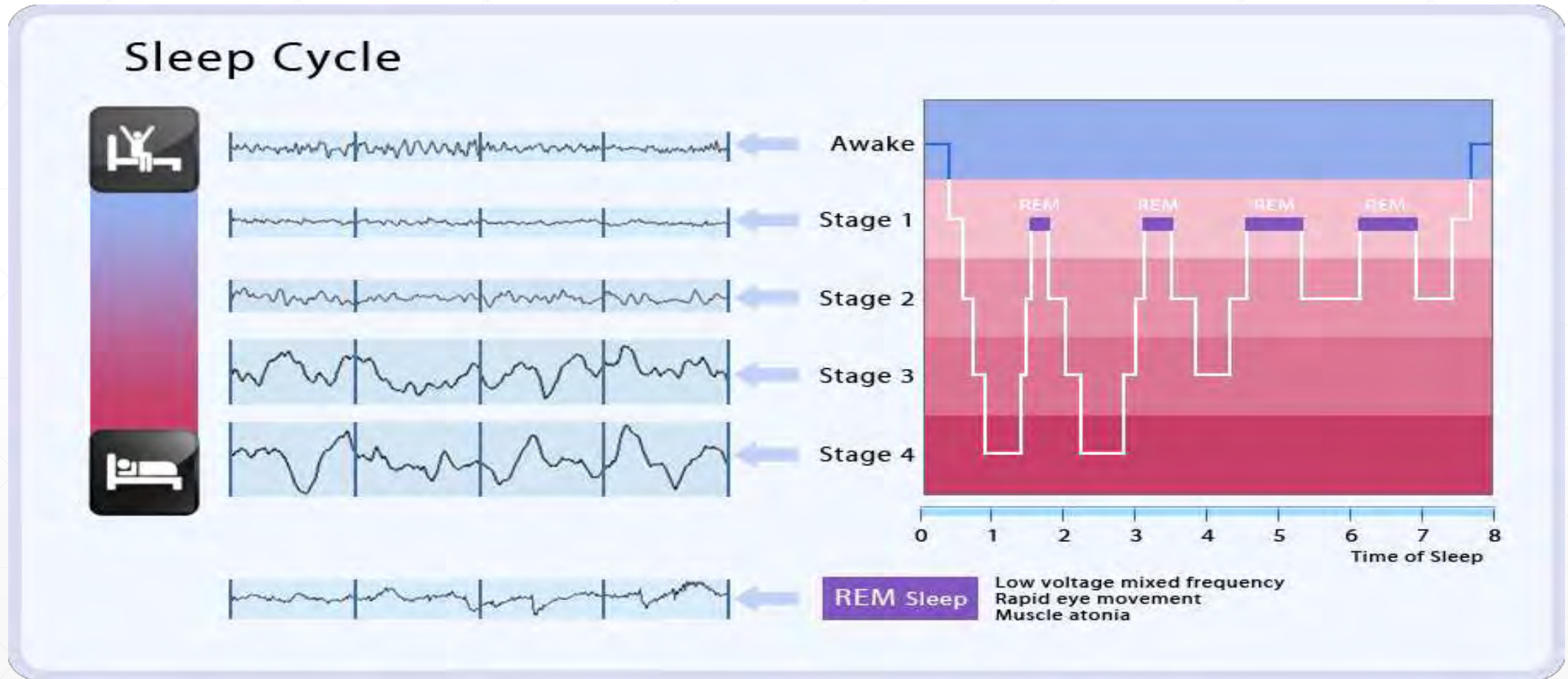


Circadian Biological Clock

- The internal mechanism that regulates when we feel sleepy and when we feel alert
- Resides in the brain and is affected by light and dark



The Sleep Cycle



The Sleep Cycle – What's Going On?

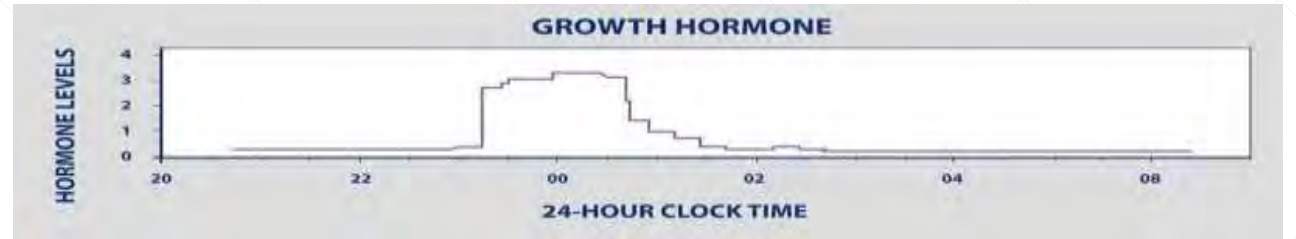
- Body temperature lowers

Circadian Rhythm (Body-Temperature Cycle)

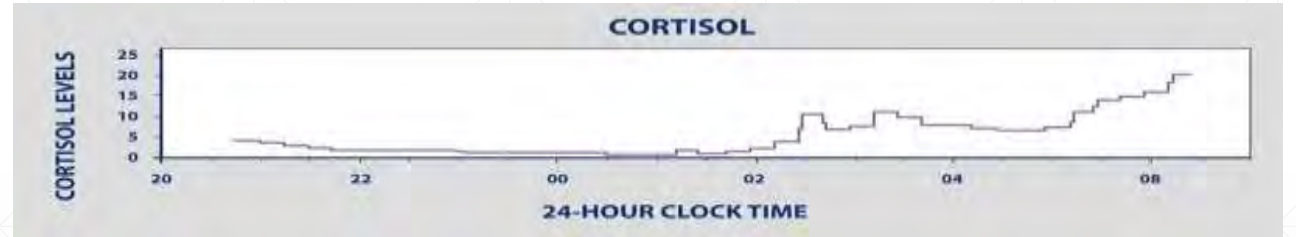


Hormones During the Sleep Cycle

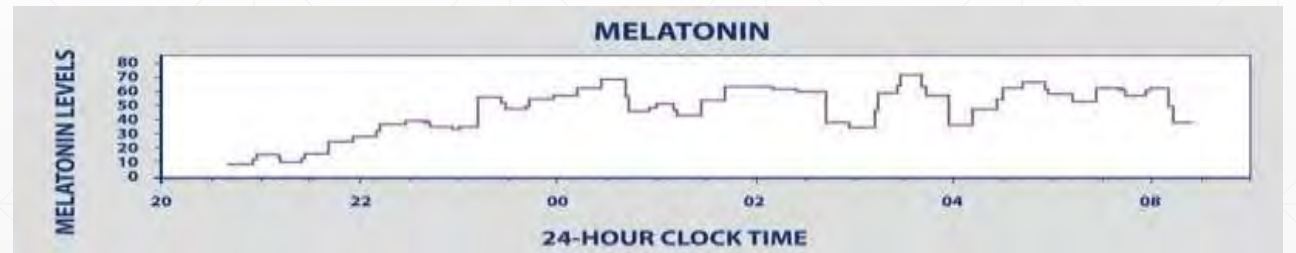
- Growth Hormone



- Cortisol



- Melatonin



Hormones Continued

- Ghrelin - an enzyme produced by stomach lining cells that stimulates appetite
- Leptin - a hormone made by adipose cells that helps to regulate energy balance by inhibiting hunger

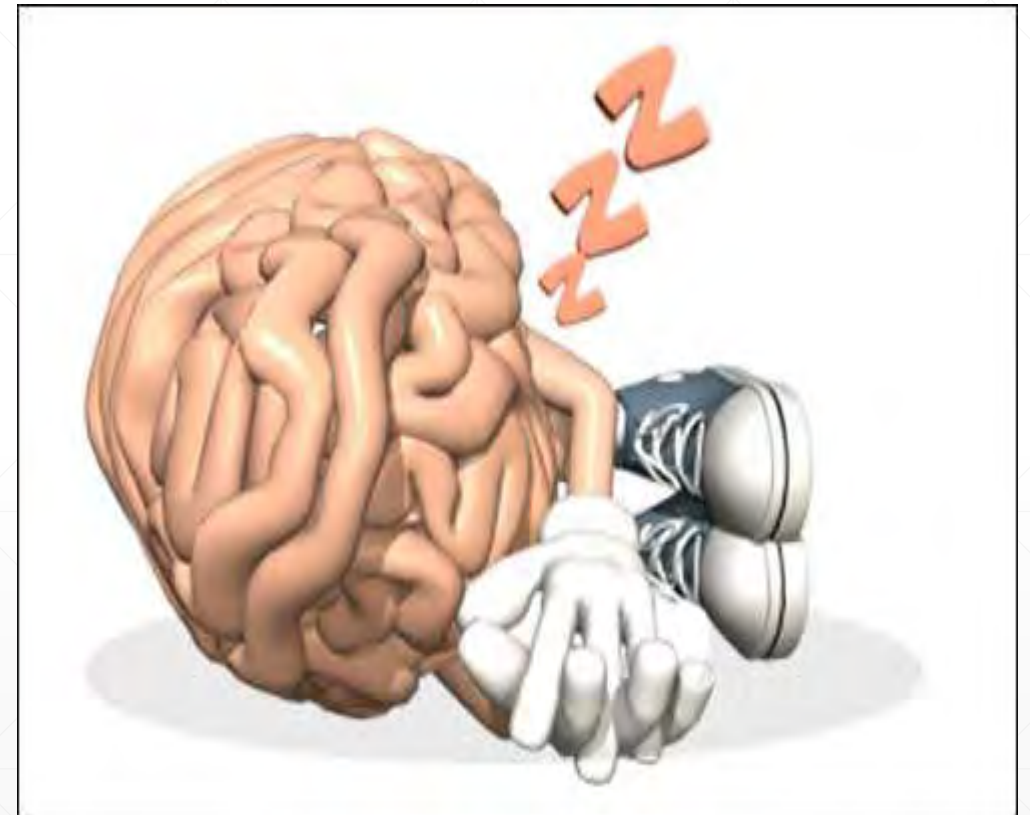


Taheri S, Lin L, Austin D, Young T, Mignot E (2004) Short Sleep Duration Is Associated with Reduced Leptin, Elevated Ghrelin, and Increased Body Mass Index. PLoS Med 1(3): e62. doi:10.1371/journal.pmed.0010062

Sleep Cycle – Your Brain!

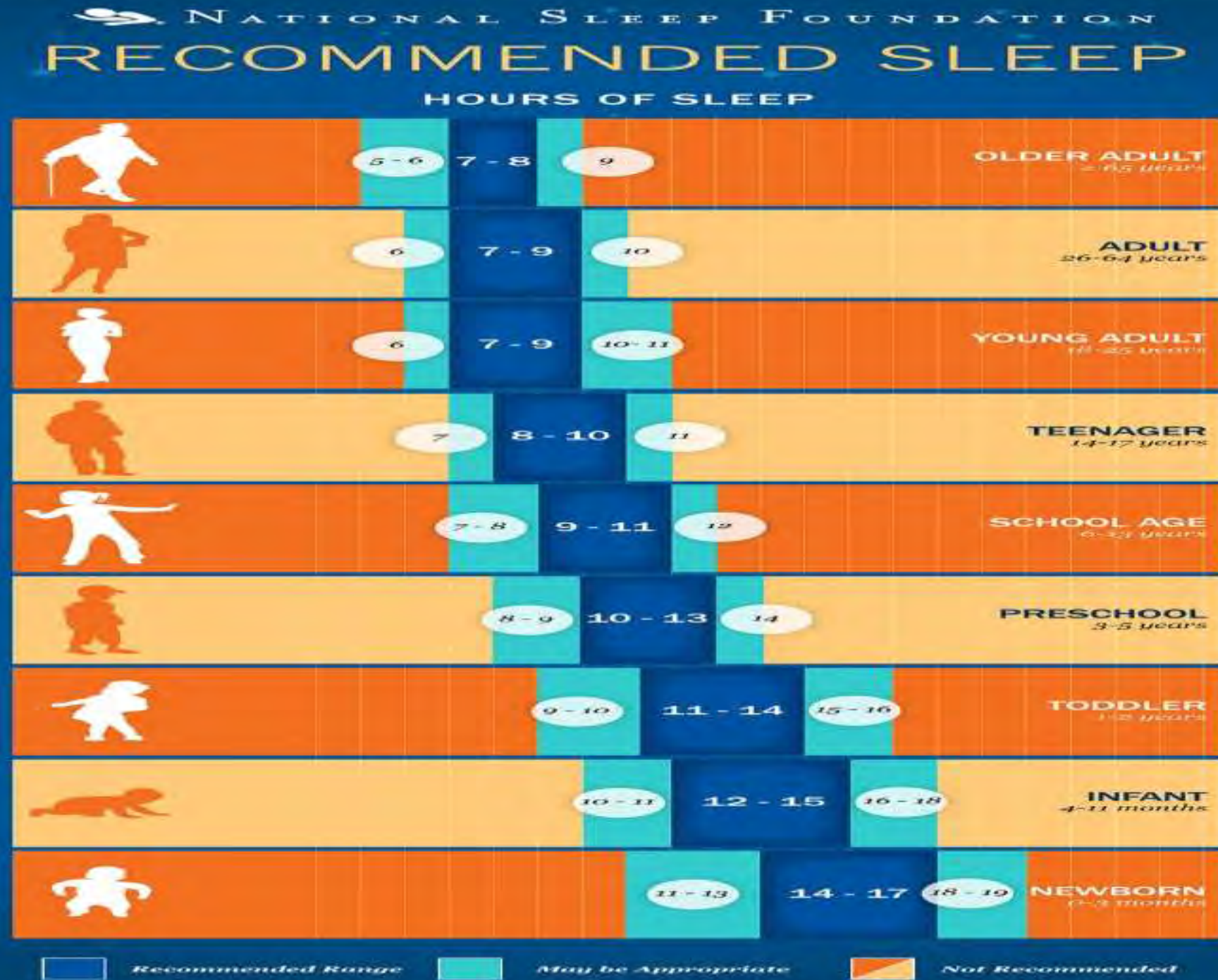
5 Things your brain does while you sleep:

- **1) Makes decisions**
- **2) Creates and consolidates memories**
- **3) Makes creative connections**
- **4) Clears out toxins**
- **5) Learns and remembers how to perform physical tasks**



Sleep – How Much?

Now we know what happens when you sleep, how much do you need?



Sleep Deprivation – UGH! How are we really doing?



By the Numbers

- 35% of adults report getting fewer than 7 hours sleep in a 24 hour period (29% report getting 6 hours or less)
- 70% of high school students report getting fewer than 8 hours sleep on an average weeknight
- 40 Million - Number of people in the U.S. who have a chronic sleep disorder
- \$18 Billion - Estimated cost to U.S. employers in lost productivity due to sleep loss issues

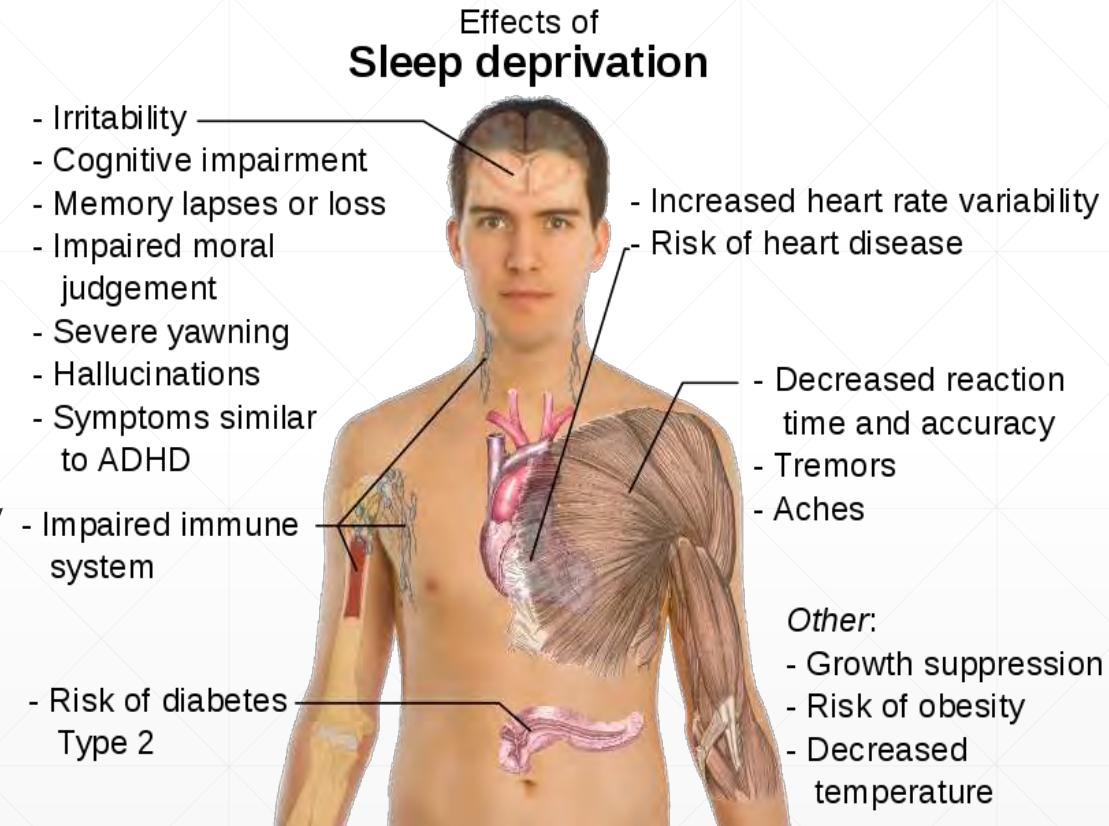


Why are we so sleep deprived?

- Sleep times have become later but wake times haven't changed
 - ELECTRONICS! – Laptops, television, smart phones, tablets are all sleep wreckers. Exposure to blue light can suppress melatonin, which allows you to transition to sleep.
 - We are a 24/7 society. We are busier and instead of scheduling sleep, we schedule everything else and worry about sleep last.
 - Sleep disorders – Insomnia, Restless Legs, Narcolepsy, Sleep Apnea
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Health Consequences

- Short sleep duration of <7 hours/night and poor sleep quality are associated with cardiovascular morbidity and metabolic disorders such as glucose intolerance
- This may lead to obesity, heart disease, diabetes and hypertension
- People with short sleep are 1.48 times greater risk of developing and dying of CAD and 1.15 times more likely to have a stroke
- Insufficient sleep affects immunologic function and development of mood disorders and is associated with depression, deficits in cognition, memory and learning and reduced quality of life



Safety is Compromised

- 37.9 % - Unintentionally fell asleep during the day at least once in the past month
- 4.5 % - Nodded off or fell asleep while driving in the past month
- 1,550 - Annual number of car crash fatalities attributed to falling asleep
- 40,000 - Annual number of nonfatal car crash injuries attributed to falling asleep





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He Lived!!

- If the internet can be trusted, he is now gainfully employed driving a school bus!



Sleep Hygiene-

Giving yourself the best chance for quality sleep

- Avoid napping during the day.
 - Avoid stimulants such as caffeine, nicotine, and alcohol too close to bedtime..
 - Exercise can promote good sleep.
 - Food can be disruptive right before sleep.
 - Ensure adequate exposure to natural light.
 - Establish a regular relaxing bedtime routine.
 - Associate your bed with sleep.
 - Maintain a regular bed and wake time
 - Get electronics out of your room!
 - Talk to your physician, you may have a sleep disorder
-

Insomnia

- Inadequate or poor quality sleep:
 - Difficulty falling asleep
 - Frequent awakenings during the night
 - Waking too early and can not go back to sleep
 - Unrefreshed or non-restorative sleep
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Prevalence of Insomnia

- Approximately 40% of American adults experience occasional insomnia; 10-15% on a chronic basis
- Those most at risk:
 - Women
 - Older Adults
 - Depressed Persons



Treatment of Insomnia

- **Pharmacological Treatment:**
 - Over-the-Counter (OTC's)
 - Prescription Medications
- **Behavioral Management:**
 - Stimulus Response
 - Sleep Restriction
 - Cognitive Behavioral Therapy
 - Relaxation Training



Restless Legs Syndrome

- Unpleasant, tingling, creeping feelings or nervousness in legs during inactivity and sleep with an irresistible urge to move; 80% may have involuntary jerking of limbs
- 12 million persons; can be genetic
- A neurological movement disorder leading to daytime sleepiness; can be associated with other medical conditions/problems



Narcolepsy

- Involuntary excessive daytime sleepiness; may include sudden loss of muscle tone in response to strong emotion, hallucinations and sleep paralysis
- 125-200,000 or 1/2000 persons; often diagnosed in 2nd decade of life
- Chronic neurological and disabling disorder that impairs ability to engage in daily activities; can lead to injuries if not treated



Sleep Apnea

- Pauses in breathing due to obstruction in airway that causes gasps and arousals during sleep
- 18 million; mostly males, those who are overweight and/or have high blood pressure and persons with upper airway physical abnormality
- Lowers blood-oxygen levels, puts a strain on the heart and is associated with cardiovascular problems and daytime sleepiness



Treatment of Sleep Apnea

- **Behavioral Therapy:**
- Avoid alcohol, nicotine and sleep medications
- Lose weight if overweight
- **Physical or Mechanical Treatment:**
- CPAP (Continuous Positive Airway Pressure)
- Dental appliance
- **Surgery:**

Nasal surgery: Correction of nasal problems such as a deviated septum.

Uvulopalatopharyngoplasty (UPPP): A procedure that removes soft tissue on the back of the throat and palate, increasing the width of the airway at the opening of throat.

Mandibular maxillar advancement surgery: Surgery to correct certain facial problems or throat obstructions that contribute to sleep apnea.



OSA – Some Stats

- Prevalence of sleep apnea:
 - Approximately 42 million American adults have SDB
 - 1 in 5 adults has mild OSA
 - 1 in 15 has moderate to severe OSA
 - 9% of middle-aged women and 25% of middle-aged men suffer from OSA
 - Prevalence similar to asthma (20 million) and diabetes (23.6 million of US population)
 - 75% of severe SDB cases remain undiagnosed
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Prevalence of Sleep Apnea in Comorbidities



Mortality Links

- SDB is associated with a 3-fold increase in mortality risk
 - There is an independent association of moderate to severe OSA with increased mortality risk
 - Severe sleep apnea raises death risk by 46%
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Are You Recognizing These Patients?

81% of hospitalized patients are at high risk for OSA!!

How do we screen our patients for osa?

S (Snoring)

Do you snore loudly (louder than talking or loud enough to be heard through closed doors?)

YES NO

T (Tired)

Do you often feel tired, fatigued, or sleepy during the daytime?

YES NO

O (Observed)

Has anyone observed you stop breathing during your sleep?

YES NO

P (Blood Pressure)

Do you have or are you being treated for high blood pressure?

YES NO

B (BMI)

BMI more than 35 kg/m²?

YES NO

A (Age)

Age over 50 year old?

YES NO

N (Neck Circumference)

Neck circumference greater than 40 cm (16 in)?

YES NO

G (Gender)

Gender male?

YES NO

Stop Bang Indicates Risk for OSA

If the STOPBang score is 3 vs. 0-2, the risk of obstructive sleep apnea is 2.5 fold.

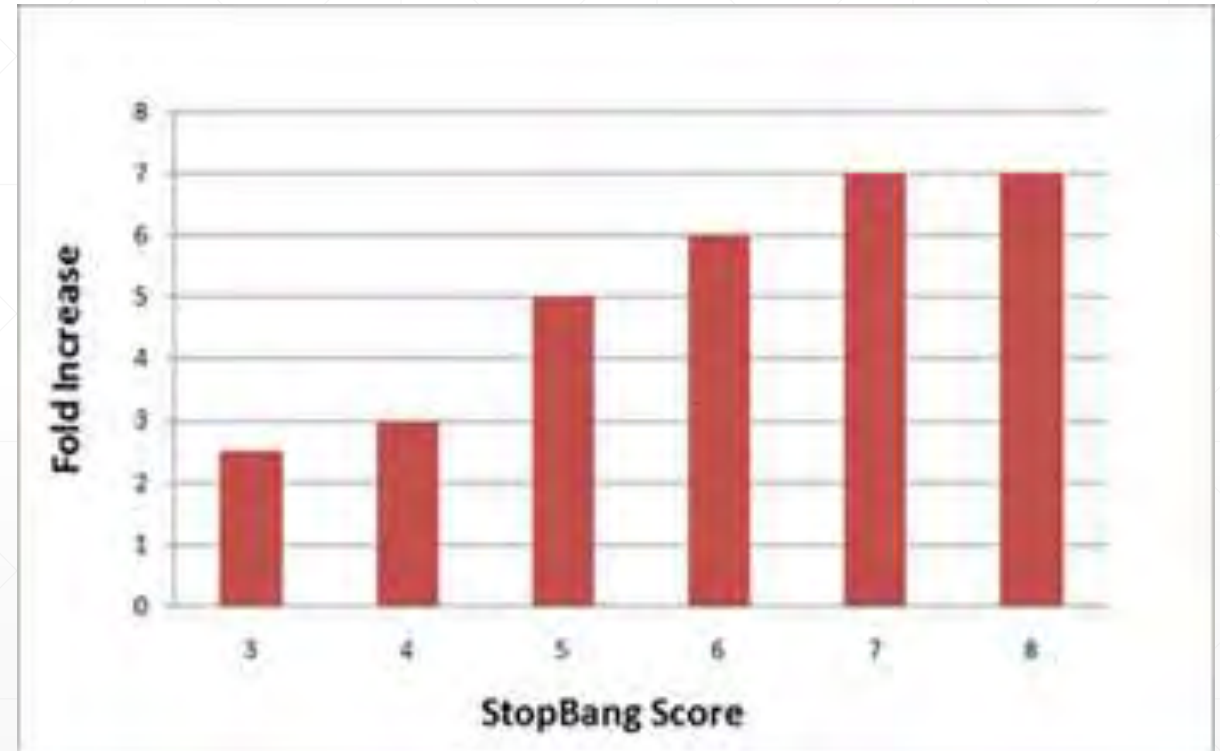
If the STOPBang score is 4 vs. 0-2, the risk of obstructive sleep apnea is 3 fold.

If the STOPBang score is 5 vs. 0-2, the risk of obstructive sleep apnea is 5 fold.

If the STOPBang score is 6 vs. 0-2, the risk of obstructive sleep apnea is 6 fold.

If the STOPBang score is 7 or 8 vs. vs. 0-2, the risk of obstructive sleep apnea is 7 fold.

- OSA - Low Risk : Yes to 0 - 2 questions
- OSA - Intermediate Risk : Yes to 3 - 4 questions
- OSA - High Risk : Yes to 5 - 8 questions



Summary

- Sleep is a basic biological need that is essential to our health, performance, safety and quality of life.
 - Sleep deprivation has serious negative consequences.
 - Establishing healthy sleep practices prevents sleep problems and promotes optimal sleep.
 - Signs and symptoms of sleep difficulties need to be identified and discussed with a doctor.
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I don't want to sleep like a
baby.

I just want to sleep
like my husband.



Questions?

