Sleeping Through the Ages
Disclosure

This is scientific information presented for your knowledge. This is not meant to be a substitute for your healthcare. Any treatment should be discussed with your healthcare provider(s).

This is the information available to us at this time. Because of the rapid changing in neuroscience, there will probably be some changes made in this information. The difference between theory and fact.
Class Overview

• Introduction
• Terminology
• Stages of Sleep
• Sleep and Health
• Dreams and ??? Why we Dream
• Disorders of Sleep and how Common These Disorders Are
• Sleep Deprivation and Why Stress Affects Sleep
• Medications
• Questions?
Terminology

- **Circadian Rhythm:**
  Basically a 24-hr internal clock that is running in the background of your brain and cycles between sleepiness and alertness at regular intervals. Also know as your sleep/wake cycle.
Stages of Sleep

Stage 1: Falling asleep
- Eye movements slow
- Overall loss in awareness, thought, responsiveness
- Easily awakened

Stage 2
- Deeper sleep than Stage 1
- High-voltage slow-waves begin appearing in EEG

Stage 3
- Deeper sleep than Stage 2
- More high-voltage slow-waves appear in EEG

Stage 4
- Deepest state of sleep
- A lot of high-voltage slow-waves in EEG

Stage 5
- Muscles cannot move
- Most people awakened from REM sleep report dreaming
# Stages of Sleep

<table>
<thead>
<tr>
<th>Age</th>
<th>Recommended</th>
<th>May be appropriate</th>
<th>Not recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborns 0-3 months</td>
<td>14 to 17 hours</td>
<td>11 to 13 hours 18 to 19 hours</td>
<td>Less than 11 hours More than 19 hours</td>
</tr>
<tr>
<td>Infants 4-11 months</td>
<td>12 to 15 hours</td>
<td>10 to 11 hours 16 to 18 hours</td>
<td>Less than 10 hours More than 18 hours</td>
</tr>
<tr>
<td>Toddlers 1-2 years</td>
<td>11 to 14 hours</td>
<td>9 to 10 hours 15 to 16 hours</td>
<td>Less than 9 hours More than 16 hours</td>
</tr>
<tr>
<td>Preschoolers 3-5 years</td>
<td>10 to 13 hours</td>
<td>8 to 9 hours 14 hours</td>
<td>Less than 8 hours More than 14 hours</td>
</tr>
<tr>
<td>School-aged Children 6-13 years</td>
<td>9 to 11 hours</td>
<td>7 to 8 hours 12 hours</td>
<td>Less than 7 hours More than 12 hours</td>
</tr>
<tr>
<td>Teenagers 14-17 years</td>
<td>8 to 10 hours</td>
<td>7 hours 11 hours</td>
<td>Less than 7 hours More than 11 hours</td>
</tr>
<tr>
<td>Young Adults 18-25 years</td>
<td>7 to 9 hours</td>
<td>6 hours 10 to 11 hours</td>
<td>Less than 6 hours More than 11 hours</td>
</tr>
<tr>
<td>Adults 26-64 years</td>
<td>7 to 9 hours</td>
<td>6 hours 10 hours</td>
<td>Less than 6 hours More than 10 hours</td>
</tr>
<tr>
<td>Older Adults ≥ 65 years</td>
<td>7 to 8 hours</td>
<td>5 to 6 hours 9 hours</td>
<td>Less than 5 hours More than 9 hours</td>
</tr>
</tbody>
</table>
Sleep & Health

National Sleep Foundation has created a list of 25 random facts about sleep. But we're not restricting this information to our 25 closest friends. Share it with everyone you know!

1. Man is the only mammal that willingly delays sleep.
2. The higher the altitude, the greater the sleep disruption. Generally, sleep disturbance becomes greater at altitudes of 13,200 feet or more. The disturbance is thought to be caused by diminished oxygen levels and accompanying changes in respiration. Most people adjust to new altitudes in approximately two to three weeks.
3. In general, exercising regularly makes it easier to fall asleep and contributes to sounder sleep. However, exercising sporadically or right before going to bed will make falling asleep more difficult.
4. Divorced, widowed and separated people report more insomnia.
5. Six in ten healthcare professionals do not feel that they have enough time to have a discussion with their patients about insomnia during regular office visits.
6. More than eight in ten survey respondents think that people often or sometimes misuse prescription sleep aids.
Sleep & Health

7. Caffeine has been called the most popular drug in the world. All over the world people consume caffeine on a daily basis in coffee, tea, cocoa, chocolate, some soft drinks, and some drugs.

8. In general, most healthy adults need seven to nine hours of sleep a night. However, some individuals are able to function without sleepiness or drowsiness after as little as six hours of sleep. Others can’t perform at their peak unless they’ve slept ten hours.

9. We naturally feel tired at two different times of the day: about 2:00 AM and 2:00 PM. It is this natural dip in alertness that is primarily responsible for the post-lunch dip.

10. Sleep is just as important as diet and exercise.

11. According to the International Classifications of Sleep Disorders, shift workers are at increased risk for a variety of chronic illnesses such as cardiovascular and gastrointestinal diseases.

12. Newborns sleep a total of 14 to 17 hours a day on an irregular schedule with periods of one to three hours spent awake.
Sleep & Health

13. When infants are put to bed drowsy but not asleep, they are more likely to become "self-soothers," which enables them to fall asleep independently at bedtime and put themselves back to sleep during the night.

14. Eighty-two percent of healthcare professionals believe that it is the responsibility of both the patient and the healthcare professional to bring up symptoms of insomnia during an appointment.

15. The body never adjusts to shift work!

16. There are individual differences in the need to nap. Some adults and children need to nap. However, the majority of teenagers probably nap in the afternoon because they are not sleeping enough at night.

17. Snoring is the primary cause of sleep disruption for approximately 90 million American adults; 37 million on a regular basis.

18. Scientists still don't know — and probably never will — if animals dream during REM sleep, as humans do.

19. Some studies show promise for the use of melatonin in shortening the time it takes to fall asleep and reducing the number of awakenings, but not necessarily total sleep time. Other studies show no benefit at all with melatonin.
Sleep & Health

20. One of the primary causes of excessive sleepiness among Americans is self-imposed sleep deprivation.

21. According to the results of NSF's 2008 Sleep in America poll, 36 percent of American drive drowsy or fall asleep while driving.

22. According to the results of NSF's 2008 Sleep in America poll, a surprising 34 percent of respondents reported their employer allows them to nap during breaks and 16 percent provide a place to do so.

23. People who don't get enough sleep are more likely to have bigger appetites due to the fact that their leptin levels (leptin is an appetite-regulating hormone) fall, promoting appetite increase.

24. Rates of insomnia increase as a function of age, but most often the sleep disturbance is attributable to some other medical condition.

25. And did you know seasonal affective disorder is believed to be influenced by the changing patterns of light and darkness that occur with the approach of winter?
Sleep & Health

Effects of
Sleep deprivation

- Irritability
- Cognitive impairment
- Memory lapses or loss
- Impaired moral judgement
- Severe yawning
- Hallucinations
- Symptoms similar to ADHD
- Impaired immune system
- Risk of diabetes Type 2

- Increased heart rate variability
- Risk of heart disease
- Increased reaction time
- Decreased accuracy
- Tremors
- Aches

Other:
- Growth suppression
- Risk of obesity
- Decreased temperature
Dreams & Why We Dream

• There is no one theory so science is unable to say just why we dream, however the following are some of the current suggestions:

A. Regular brain stimulation from REM sleep may help develop and preserve neural pathways. Memory moves from short term into long term memory.

B. Trying to organize all the different sensory inputs of the day and make some sense or connections
Disorders of Sleep and how Common These Disorders Are

Insomnia
Sleep Apnea
Narcolepsy
Restless Leg Syndrome
Sleep Deprivation and Why Stress Affects Sleep

1. Over 50% of American’s are missing enough sleep to triple their risk of an automobile accident.
2. Sleep is an important resource that keeps you healthy, mentally sharp and able to deal with stress more effectively.
3. Too much stress and too little stress both impact our brains in an negative way.
Medications

1. Medications that Cause Insomnia
2. Medications That Disrupt Sleep
3. Medications That Make You Drowsy

How to Improve Sleep:
The challenge with medication is that each person responds differently to its sleep-related side effects. If you suspect your prescriptions are impacting your sleep, speak with your doctor, who will be able to suggest a solution that works best for you. Potential options include switching medications, reducing dosage, or seeking alternative treatments. Following healthy lifestyle habits such as exercising, eating a wholesome diet, and managing stress can also help reduce sleep-related side effects.

https://www.sleepfoundation.org/articles/how-medications-can-affect-sleep
Thank you!

- Questions?