



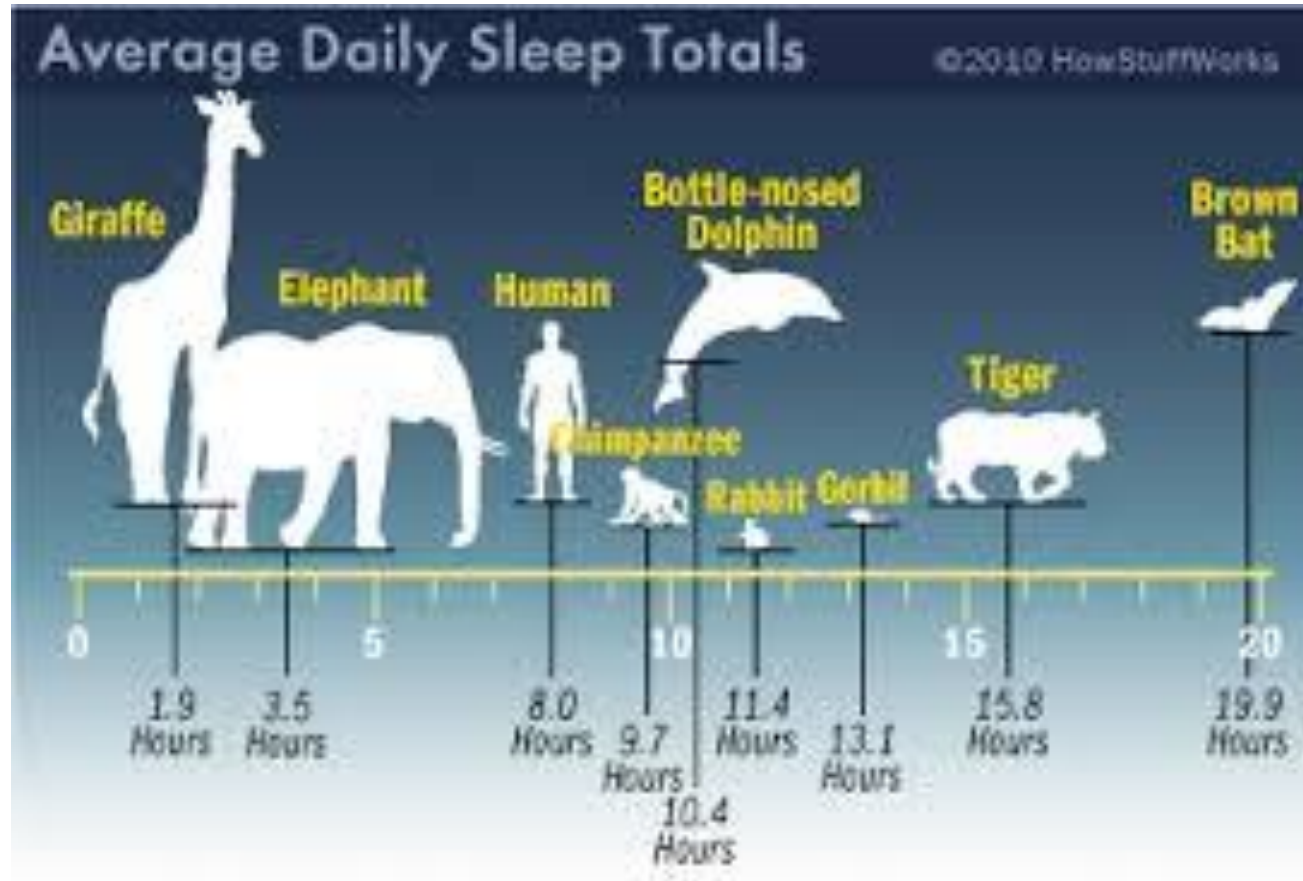
Lecture 18: Sleep

November 18, 2016

What is sleep?

- An active process in the brain and body
- A naturally recurring state of mind and body characterized by altered consciousness, relative inhibition of senses, and inhibition of voluntary muscles (wikipedia)
- Do all animals sleep?

Most animals sleep to some extent

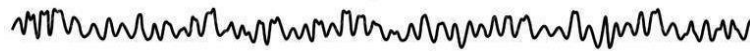


Half asleep brain

- Some animals have the ability to put only half of their brains to sleep at a time (dolphins)
- Thought that some animals have brains in which the cells sleep in columns

Type of Normal Adult Brain Waves Measured with EEG

Awake with
mental activity



Beta
14-30 Hz

Awake and
resting



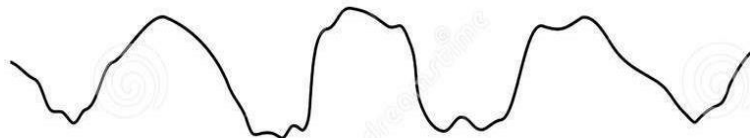
Alpha
8-13 Hz

Sleeping



Theta
4-7 Hz

Deep sleep



Delta
<3.5 Hz

Slow waves
are thought
to originate
from limbic
system,
particularly
thalamus



1 sec



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Sleep Stage Cycles During the Night

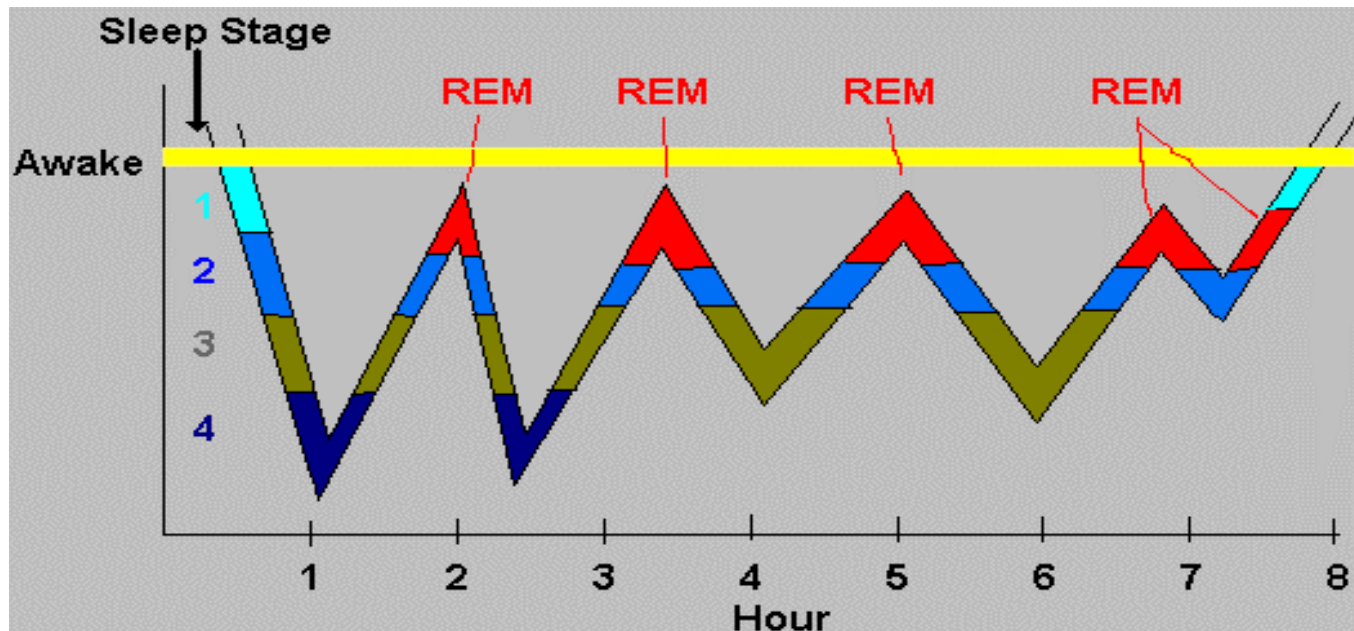


Figure from Dr. Eric Chudler

- Stage 1 and 2, followed by slow wave sleep
- Back up through stages 1 and 2, then rapid eye movement (REM) sleep
- Basic cycle is about 90 minutes
- Have less slow wave or deep sleep as the night goes on

Why Do We Sleep?

- Vital to survival
- Restoring of the body & brain
- Clearing out of toxins
- Processing of decisions & complex information
- Consolidating memories
- Creating neural connections
- “Rehearsing” and learning of physical activities

http://www.huffingtonpost.in/entry/brain-sleep-_n_5863736

Facts About Sleep

- We spend about 1/3 of our lives in sleep
- The amount of sleep needed varies with age
- Sleep deprivation has been used as a form of torture
- Healing of body tissue increases during sleep
- Much of society today is sleep deprived

Sleep Deprivation Effects

- Increased risk for accidental death
- Cognitive impairments/ dysfunction
- Memory problems
- Weight gain
- Weakened immune system
- Moodiness & depression
- Hallucinations
- Increased risk for high blood pressure, heart disease, type II diabetes

Sleep Health – Brief Behavioral Treatment (BBTI)

- Reduce time spent in bed
- Wake up at the same time everyday (no matter how poorly you slept the night before)
- Don't go to bed unless you are sleepy
- Don't stay in bed if you are not sleepy (if you can't sleep, get out of bed)
- Use the bed and bedroom only for sleep (train the brain to associate the bed with sleep, not tv watching, reading, etc.)