



Sleep Changes Through Aging & Behavioral Approaches To Improve Sleep

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Overview

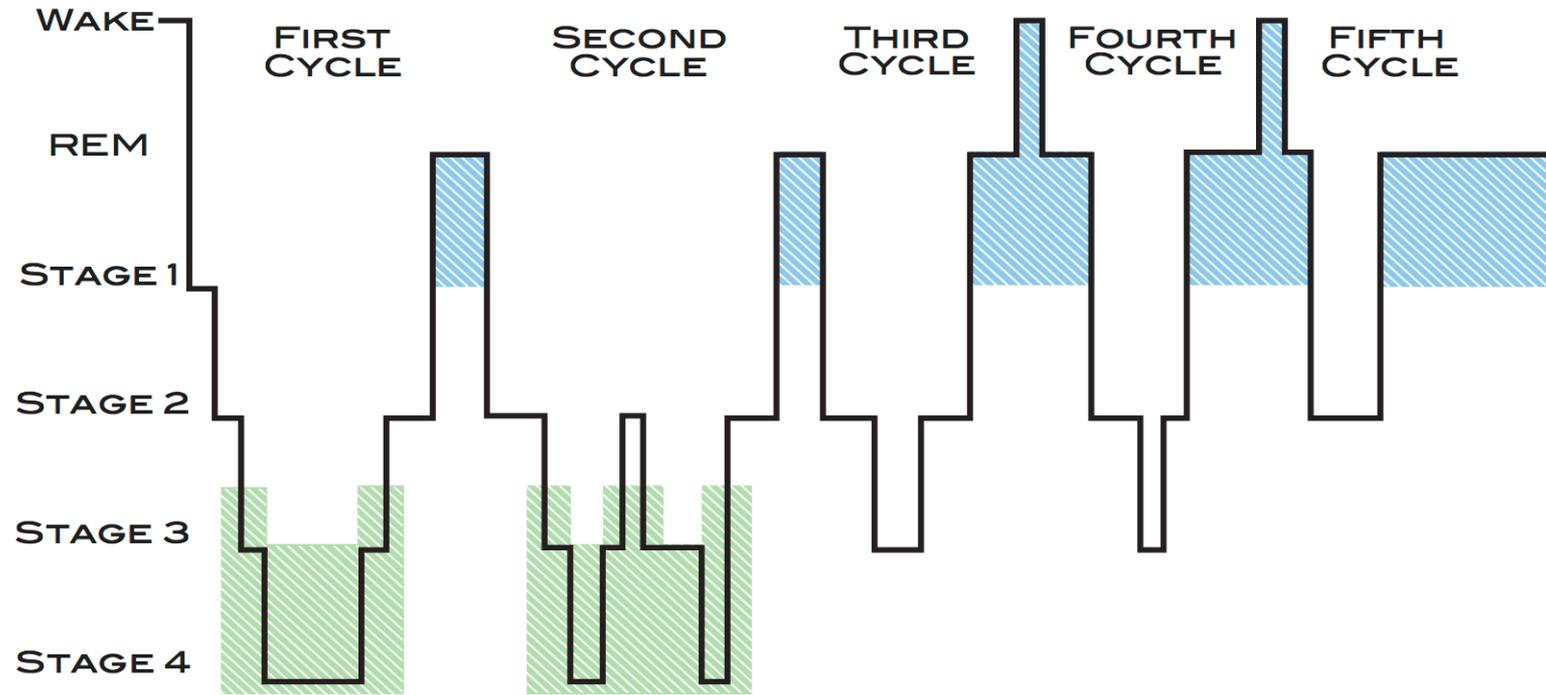
- Normal sleep & Why we sleep
- Sleep architecture – changes with aging
- Sleep disruptors
- Evidence based sleep interventions
- Taking control of your sleep-wake cycle



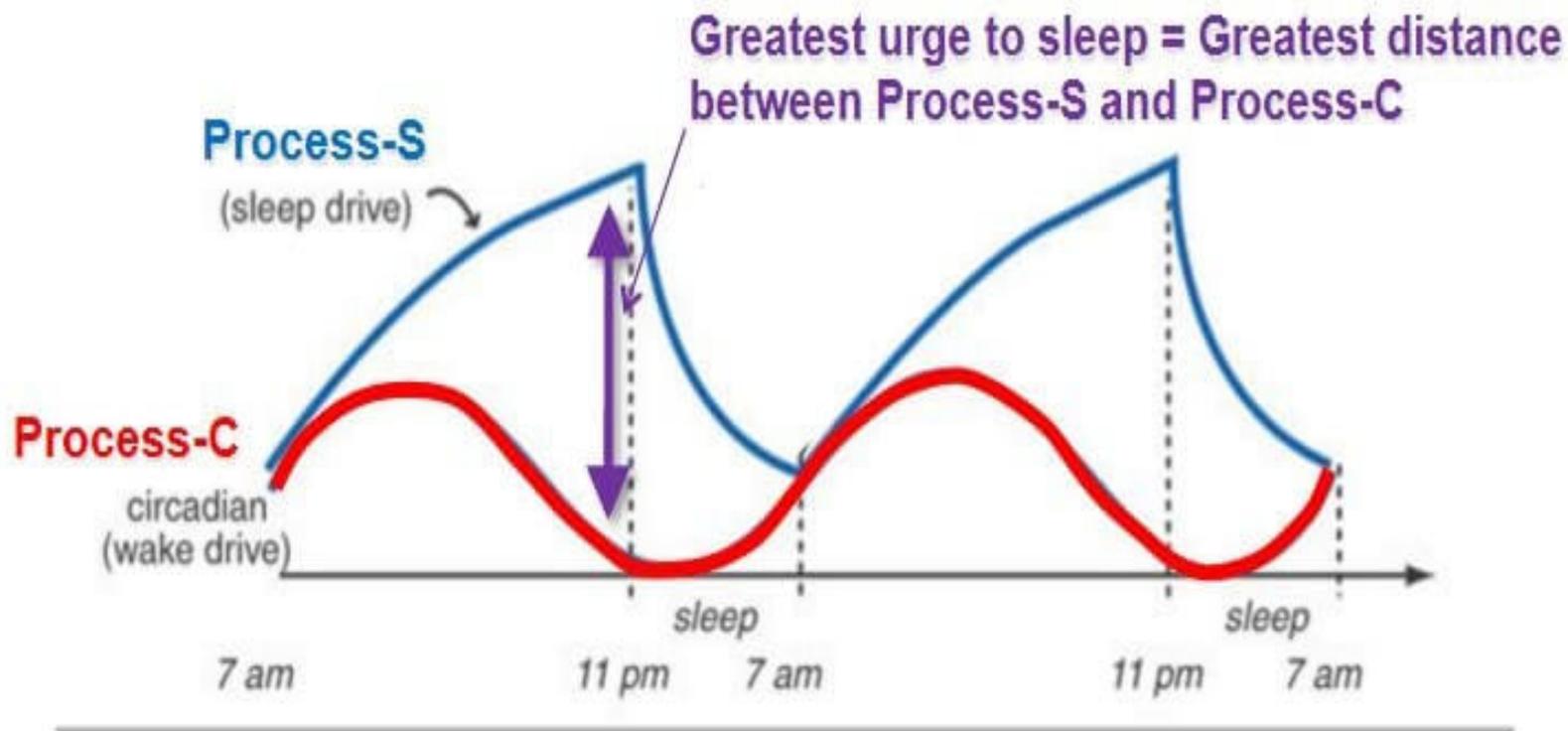
What is normal sleep & Why do we do it?



SLEEP STAGES

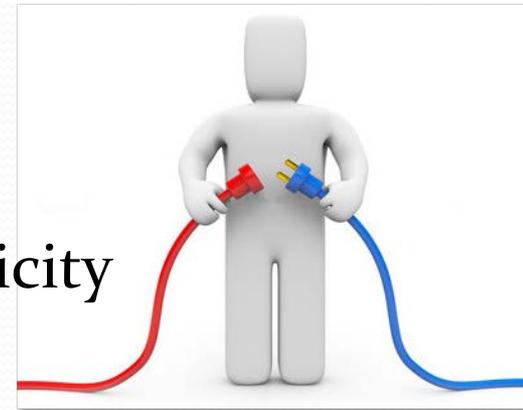
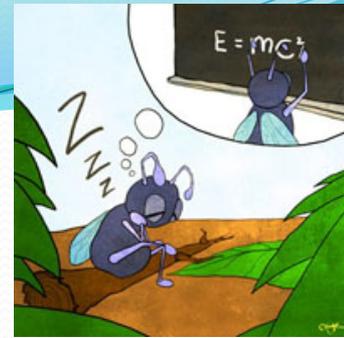


DEEP SLEEP {SWS} **DREAMING {REM}**
PHYSICAL RECOVERY *MENTAL RECOVERY*



What we know so far..

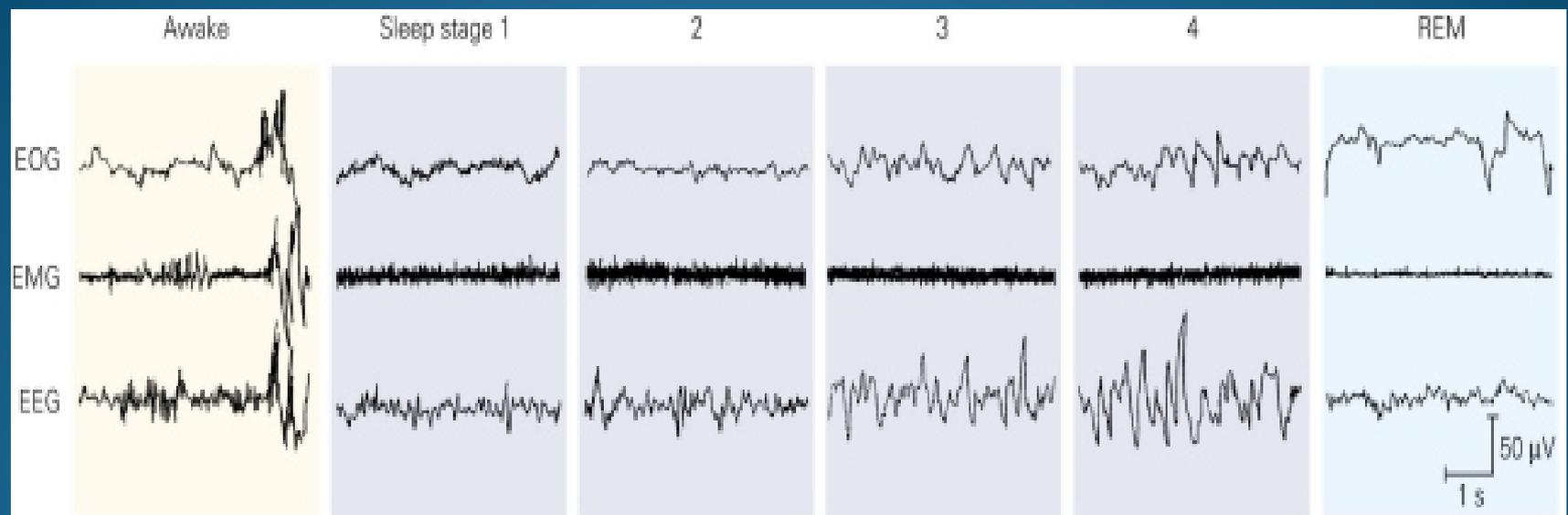
- Sleep is strictly regulated in all animal species
- Prolonged sleep deprivation is fatal
- Impossible to naturally deprive an animal of sleep for more than 24h – (sleep-wake occurs)
- Why do we sleep?
 - We need off-line time
 - Clean, Organize, Refresh
 - Preserve synaptic efficiency & brain plasticity



How does sleep change as
we age?

Sleep Architecture

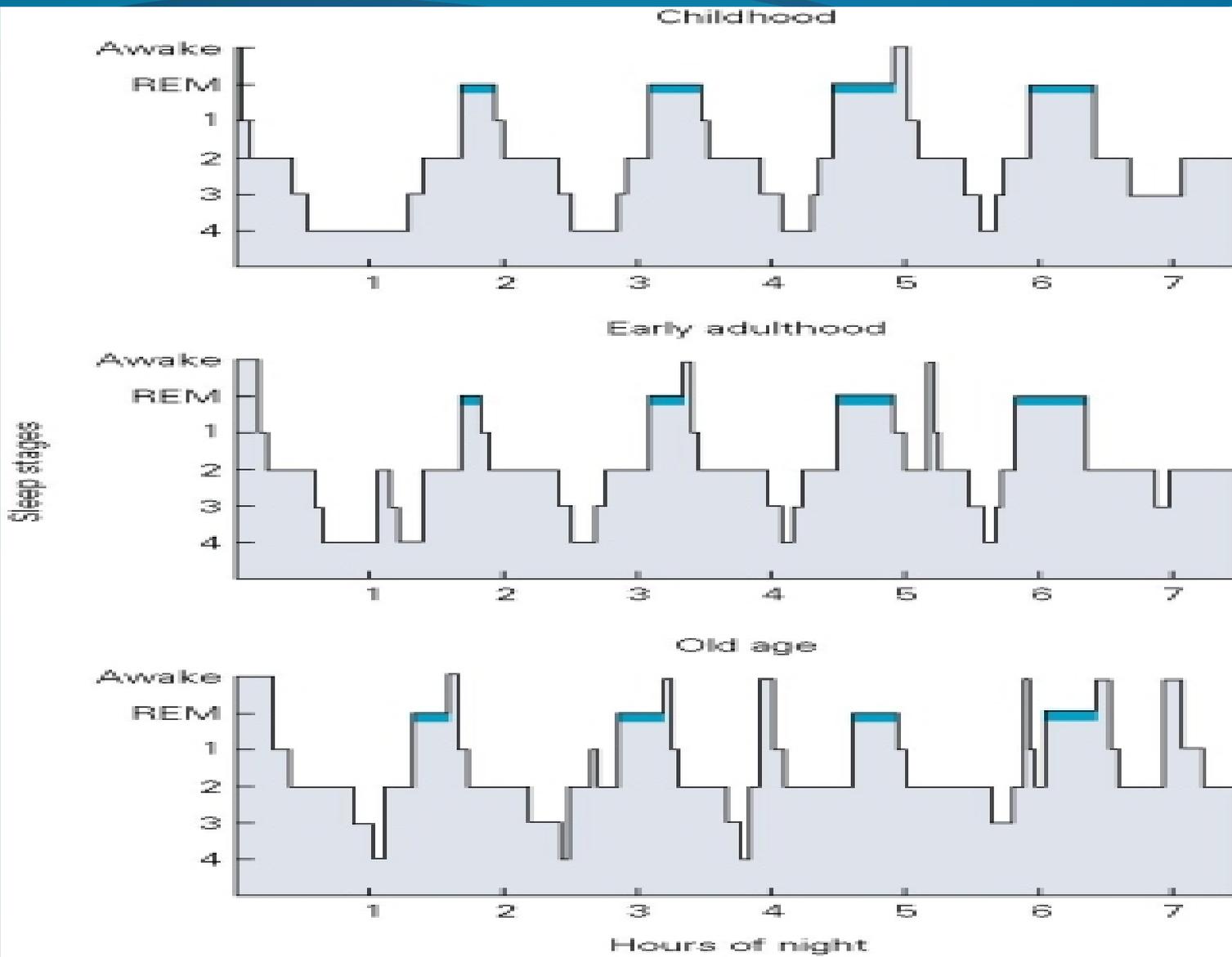
- NREM- 75% - 80% sleep time
 - Stage 1 – (3-8%) transition from wakefulness
 - Stage 2 – (45-55%) muscle activity decreases
 - Stages 3 & 4– (15-20%) slow wave sleep
- REM- 20-25% sleep time
- First episode occurs 60-90 min after onset of NREM



Appleton & Lange
 Kandel/Schwartz/Jessell
Principles of Neural Science
 Fig. 47.01

SLEEP CYCLES CHANGE WITH AGE

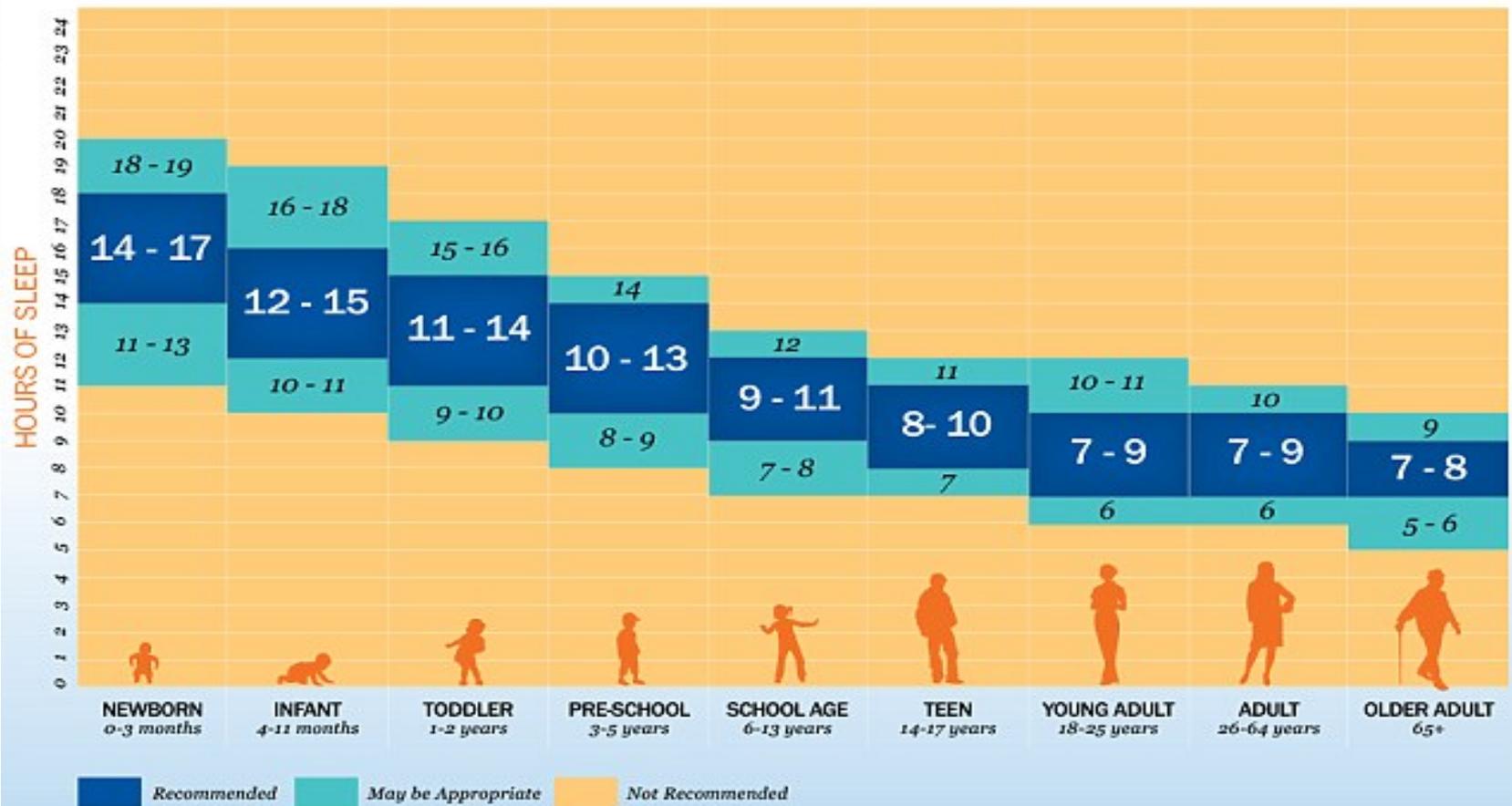
| | Age 20 | Age 40 | Age 60 | Age 70 | Age 80 |
|--------------------------|------------|------------|------------|--------------|------------|
| Time to fall asleep | 16 minutes | 17 minutes | 18 minutes | 18.5 minutes | 19 minutes |
| Total sleep time | 7.5 hours | 7 hours | 6.2 hours | 6 hours | 5.8 hours |
| Time in regular sleep | 47% | 51% | 53% | 55% | 57% |
| Time in slow wave sleep | 20% | 15% | 10% | 9% | 7.5% |
| Time in REM sleep | 22% | 21% | 20% | 19% | 17% |
| Time asleep while in bed | 95% | 88% | 84% | 82% | 79% |



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Principles of Neural Science
 Fig. 47.02

What are the
recommendations for
sleep as we age?

SLEEP DURATION RECOMMENDATIONS



Sleep in Infants/Babies

- Newborns – 3mo
 - sleep 16-18 hours/24
 - Polyphasic sleep
 - 50 – 300 minutes sleep
 - 90 – 180 minutes wake
- 1-2 months hunger drives wake/sleep
- 3 months cue to light/dark cycle
- 6 months consolidate sleep at night
 - need 14-15 hours / 24 hours
 - 9-12h/night + 2-4.5h/naps



Sleep in Adolescents

- 13 – 18 years need 9.5 to 11 hours
- Naps reappear to curtail sleep debt
- Sleep patterns shift to later sleep-wake cycle



Sleep in Adults & Older Adults



- Sleep patterns change through adulthood... the quantity remains the same
- 18 – 50+ years need 7.5 to 9 hours
- Sleep becomes more fragmented with age... may need naps to fill gaps

Sleep Disruptors

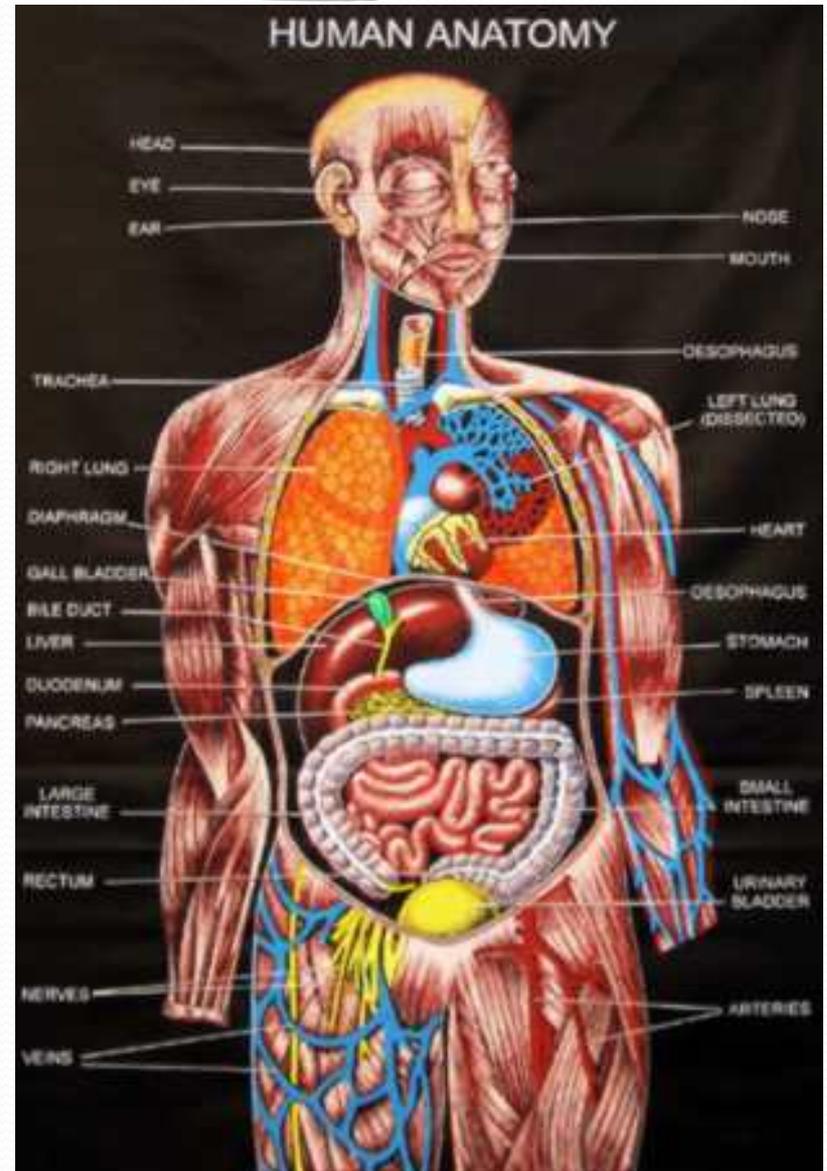
Physical

- Age
- Gender



Physical

- Illnesses
 - Cardiac
 - Respiratory
 - Musculoskeletal
 - Gastrointestinal



Mental/Emotional

- Depression
 - Schizophrenia
 - Bipolar (manic-depression)
-
- Every day stressors can be problems too



Lifestyle

- Timing
 - Jet lag
 - Exercise
 - Work
- Chemicals
 - Tobacco
 - Caffeine
 - Alcohol

Environment

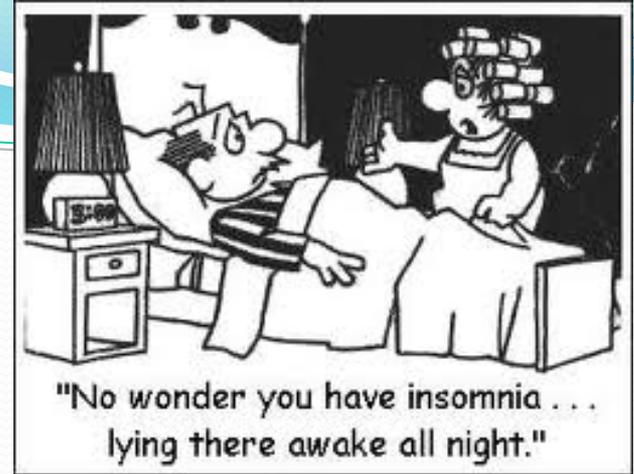
- Noise
- Light
- Temperature
- Mixed signals



Common Sleep Disorders

- Insomnia
- Sleep Movement Disorders (RLS)
 - Restless leg syndrome
- Sleep Disordered Breathing
 - Obstructive Sleep Apnea (OSA)

Insomnia



- Difficulty falling asleep, staying asleep, &/or non-restorative sleep a majority of nights for greater than 1 month duration
- Affect 35% of the general population & 69% of the medical population

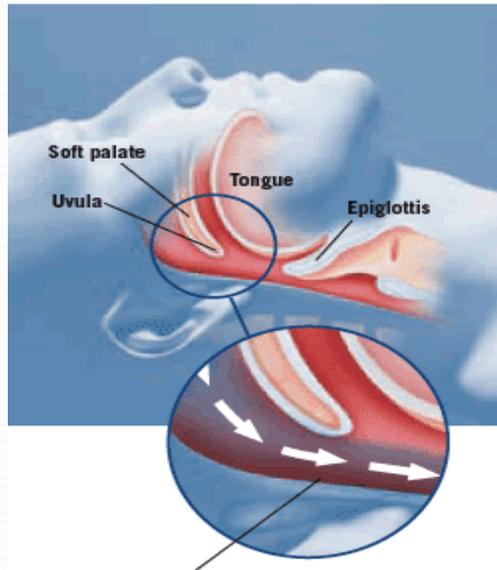
Sleep Movement Disorders

- **Restless leg syndrome (RLS)**
- Predisposing factors – pregnancy, anemia, rheumatoid arthritis
- Diagnosis – self report, PSG record movement @ sleep onset
- Treatment – Individualized
 - Vite B12, Folate, Iron
 - Healthy Sleep Habits
 - Prescriptions



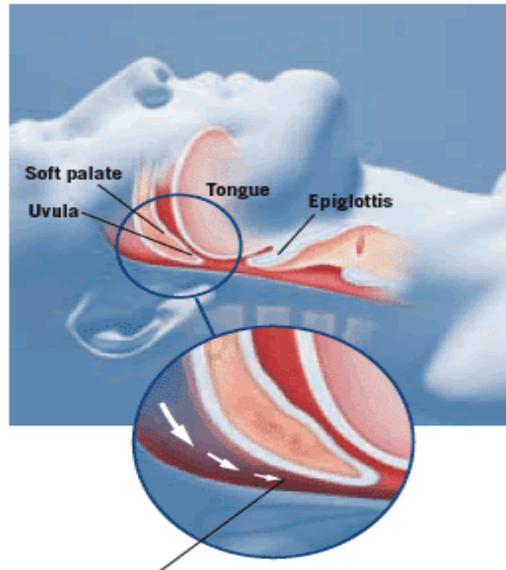
What does OSA look like?

Opened Upper Airway



Clear and open upper airway allows air to flow freely to and from the lungs.

Closed Upper Airway



Snoring and apnoeas (breathing pauses) are observed when the upper airway collapses.



[OSA video](#)

OSA and Memory

- Decreased oxygen to the brain
- Increased brain inflammation (oxidative stress)
- Structural changes
 - Amyloid plaque build up
 - White matter brain loss



Taking Control of your Sleep-Wake Cycle

Getting Good Sleep

- Pharmacotherapy/Devices
- Behavioral therapy
- Good sleep habits
 - Exercise in your AM
 - No caffeine 5-8 hrs of bed
 - Know your light sources
 - Quiet, Cool, Dark
 - Establish a 'bedtime' routine
 - Leave the stress outside the bedroom



<http://www.sleepeducation.org>

Application

- Setting goals for good sleep
- Activity
- Timing
- Frequency



Give it a try

- I will exercise for 30 minutes in the first half of my day 4 of 7 days of the week.
- **Activity** = exercise for 30 minutes
- **Timing** = first half of day
- **Frequency** = 4 of 7 days of the week

Now it is your turn

- Write down two goals you would like to try in the next few weeks to improve your sleep.
- Activity/Timing/Frequency
- Be realistic and kind to yourself

A watercolor splash graphic with a gradient of colors from light blue to magenta. The text "Thank you" is written in a white, cursive font over the splash.

Thank
you

A blue, cloud-like graphic with a white question mark icon inside a speech bubble. The text "Any Questions" is written in a white, bold, sans-serif font over the graphic.

Any
Questions