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Sleep: It Matters!

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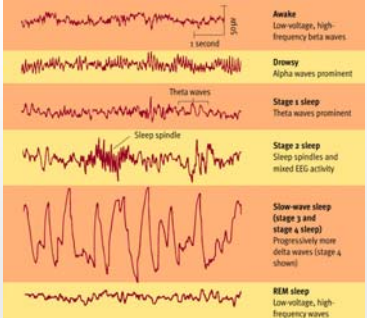
What is sleep?

- The short answer? We don't know for sure
- If an average person sleeps 8 hours per night, by the time you reach 75, you will have slept approximately 219,000 hours
1/3 of your life is spent in bed!
- Sleep has many stages, typically differentiated by NREM (non rapid eye movement) and REM (rapid eye movement) sleep
- Everyone and everything sleeps, some just more than others
- Some benefits:
 - Rest
 - Growth and Repair
 - Energy Conservation
 - Memory Consolidation
 - Discharge of Emotions
 - Safety



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Brain Activity During Sleep



Awake
Low-voltage, high-frequency beta waves

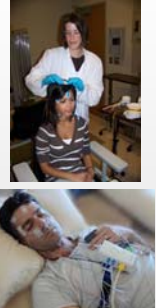
Drowsy
Alpha waves prominent

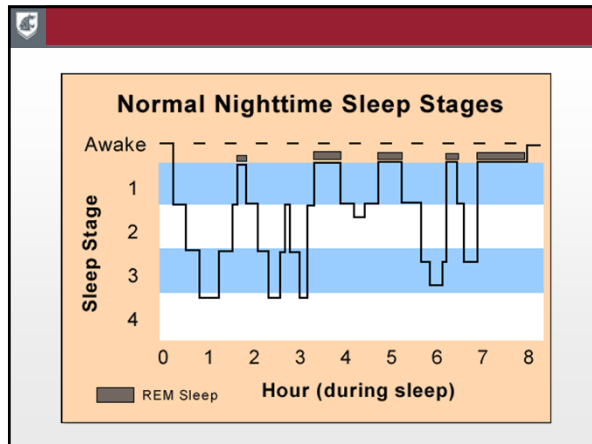
Stage 1 sleep
Theta waves prominent

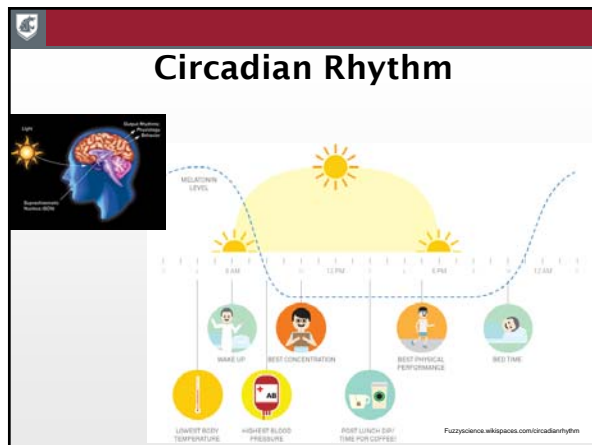
Stage 2 sleep
Sleep spindles and mixed EEG activity

Slow-wave sleep (Stage 3 and stage 4 sleep)
Progressively more delta waves (Stage 4 shows)

REM sleep
Low-voltage, high-frequency waves









Sobering Statistics

- According to the 2009 National Sleep Foundation Poll, 20% of Americans sleep less than 6 hours per night on average
- 64% of people reported difficulty sleeping at least a few nights a week with 41% reporting difficult sleeping every night or nearly every night
- 31% reported snoring at least a few nights per week
- More than one-half of adults (54%) reported driving at least once while drowsy in the past year, with almost a third (28%) reporting doing so at least once per month
- The National Highway Traffic Safety Administration conservatively estimates that 100,000 police-reported crashes are the direct result of driver fatigue each year
 - This results in an estimated 1,550 deaths and 71,000 injuries




Effects of Aging on Sleep

- As an infant, 50% of total sleep time is spent in REM sleep.
- REM declines until adolescence and stabilizes into adult years
- After adolescence, deep sleep begins to decline and may eventually disappear
- As the total sleep time decreases throughout our life spans, middle age is marked by wakefulness and increased sleep fragmentation
- These nightly disturbances can be caused by medical disorders, medication side effects, specific sleep disorders, or environmental factors
- Elderly people commonly report insomnia, sleep disordered breathing, and sleep related movement disorders



When Things Go Wrong.....


- **10% of the US population has a sleep disorder**
- **Dyssomnias:**
Disorders that produce either difficulty initiating or maintaining sleep or excessive sleepiness
-Insomnia, Narcolepsy, Hypersomnia, OSA, PLMS, RLS, Circadian Rhythm Disorders
- **Parasomnias:**
Disorders of arousal, partial arousal and sleep stages
-Sleep Walking, Sleep Terrors, Nightmares, REM Behavior Disorder



Economic Costs


- Excessive sleepiness related productivity losses estimated at \$1967 per employee annually in the US¹
 - Insomnia: \$3,156 per employee
 - OSA: \$2,105(diagnosed)/\$6,366(undiagnosed) per employee²
 - Insufficient Sleep Syndrome: \$2796 per employee
 - At-Risk: \$2319 per employee
 - Good Sleeper: \$1293 per employee
- Lost work performance estimated to cost \$63 billion annually³
- \$71-193 billion annually due to road and workplace accidents related to excessive sleepiness and shift work⁴

1. Rosekind et al. J Occup Environ Med 2010; 52:91-98.
2. Frost & Sullivan Am Acad Sleep Med 2016
3. Kessler et al. Sleep 2011; 9:1161-1171.
4. Rajaratnam et al. MJA 2013; 8:S11-S15.




Some Common Sleep Disorders

- **Restless Leg Syndrome (RLS):** Disorder characterized by a irresistible urge to move legs. Patients may describe feeling like their legs are falling asleep, usually at night
- Prevalence: conservative estimate of **10%** of the population
- Treatment: Medication
- **Obstructive Sleep Apnea (OSA):** repeated episodes of upper airway obstruction which occurs during sleep
- Prevalence: **40%** of population with **20%** being clinically significant
- **Insomnia:** Disorder characterized by difficulty falling and/or staying asleep and/or waking too early
- Prevalence: **25%** of the US population has chronic insomnia



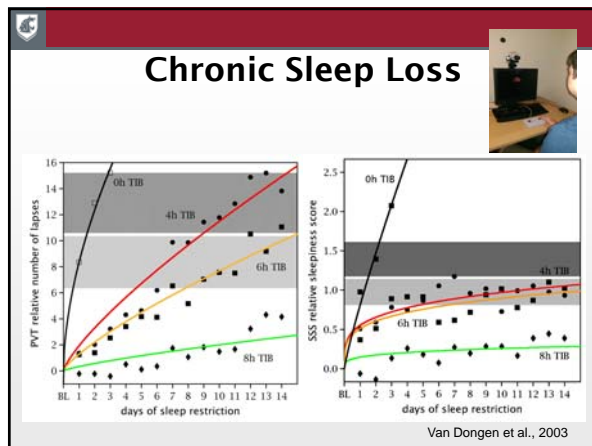
What Increases Your Risk of Developing a Sleep Disorder?

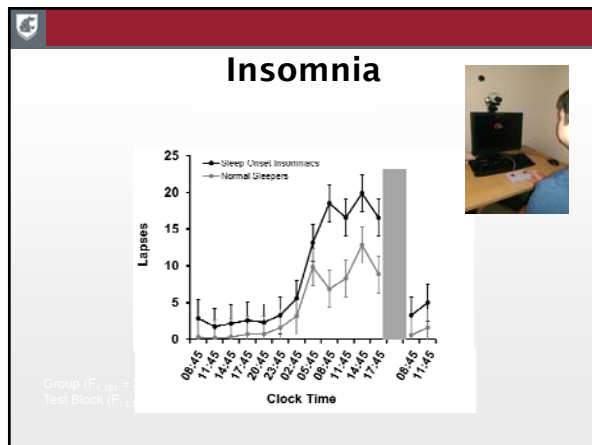
- RLS:
 - Unknown
- OSA
 - Being male
 - Being overweight
 - Neck circumference (>17 inches)
 - Narrow airway
 - Family history
 - Smoking
- Insomnia
 - Being female
 - Increased age (>60 year)
 - Psychiatric disorder
 - Stress
 - Shift worker
 - Co-morbid medical condition



Associated Risks of Having a Sleep Disorder


- OSA:
 - Obesity
 - High blood pressure
 - Type 2 diabetes
 - Cardiovascular Events
 - Stroke
 - Increased risk of accidents
- Insomnia:
 - Impaired cognitive functioning
 - Decreased general health
 - Increased risk of accidents
 - Increased risk of psychiatric disorders, particularly depression
 - Absenteeism from work






When to See a Doctor


- You have an uncomfortable (creepy crawl) sensation in your legs at night
- Your bed partner reports you have loud snoring that disrupts their sleep and may have periods of not breathing (gasping for air)
- You feel sleepy the next day, even after enough time in bed (fatigue, cognitive impairment, changes in mood)
- You have fallen asleep while driving
- You have trouble falling asleep, or wake often in the night and can't get back to sleep on regular basis



Continuous Positive Airway Pressure

- Continuous Positive Airway Pressure (CPAP)
- Air is pumped into airway to keep airway open and eliminate any obstructions.





Sleep Hygiene

- Limit time in bed
- Get up at the same time each day
- Don't look at the clock if you wake in the night
- Avoid caffeine, alcohol, smoking, drug use
- Adjust bedtime habits/problems (light, noise, TV, reading in bed)
- Do not worry in bed!



Reducing Stress and Anxiety



- Deep Breathing
- Progressive Muscle Relaxation
- Meditation
- Daily Exercise
- Light Therapy
- Behavioral Therapy
- Individual Therapy



Deep Breathing Exercise

- Deep breathing from the stomach is used to promote relaxation.

Square Breathing Technique


- 1.) Take in deep breath to fill stomach for 4 counts
- 2.) Hold for 4 counts
- 3.) Blow out for 4 counts
- 4.) Rest for 4 counts
- 5.) Repeat

Behavioral Techniques

- Track your sleep using a sleep diary.
- Stay in bed only the amount of time that you are sleeping
- Do not go to bed until you are sleepy
- Get out of bed if you cannot fall asleep within ~20 minutes, or wake in the middle of the night and cannot fall back asleep
- Do not watch the clock!
- Get out of bed if you become frustrated or anxious and engage in relaxing, quiet activities outside of the bedroom until you feel sleepy
- Your bed is for sleep/sex only—no reading, listening to music, or watching TV in bed

Sleep Diary

How long did you nap yesterday?
Did you take any sleep medications?
What time did you get in bed?
What time did you turn off the light intending to go to bed?
How long did it take you to fall asleep?
What time did you wake up?
What time did you get out of bed?
How many times did you wake up during the night?
How long do you think you were awake during the night?
How much sleep did you get?
Rate the quality of your sleep last night (1=poor—10=excellent)
Rate how sleepy overall you felt yesterday (1=not sleepy—10=extremely sleepy)
Rate how tired/fatigued overall you felt yesterday (1=not tired—10=extremely tired)



Questions?

- Contact info:
 - devongrant@wsu.edu
- Area Sleep Clinics:
 - Deaconess Sleep Disorder Center: 509-473-7750
 - Holy Family Hospital Sleep Center: 509-482-2116
 - Kootenai Medical Center Sleep Disorders Center: 208-666-2894
 - Sleep Institute of Spokane: 509-474-4895
