

SLEEP

ARE YOU WASTING 1/3 OF YOUR LIFE?



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We are Are Tired!

2018 Gallup/Newsweek Survey

- 37% very tired more than 3 days per week!
- 25% tired all the time!



Almost 2/3 of population are tired most of the time!



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THE HIGH ORDER MENTAL FUNCTIONS

- Discernment
- Judgment
- Initiative
- Creativity
- Forethought



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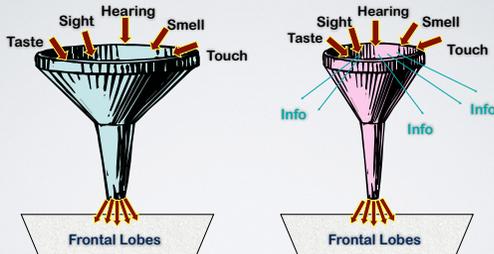
Fatigue Primarily Affects Two Areas of the Brain

- Thalamus: gates (passes) sensory information to the higher centers of brain
- Frontal lobes: processes info to make decisions
 - current information from senses
 - previously learned information
 - experience



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Fatigue "Chokes" the Thalamus



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Risks of Short Sleeping

- Sleep debt decreases the entire brain's ability to function, most significantly impairing areas of the brain responsible for
 - attention,
 - complex planning,
 - complex mental operations, and
 - judgement.

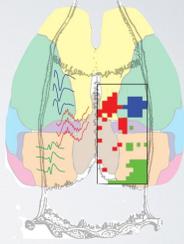
Belenky, et al. J Sleep Res. 2000;9(4):335-52. J Sleep Res. 1999;8(4): 237-45. Review.



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SLEEP CONSOLIDATES MEMORY

nREM sleep induces EEG “ripples” in the hippocampus and association cortex that play a key role in consolidating memories



Dion Khodagholy, Jennifer N. Gellinas, György Buzsáki. Learning-enhanced coupling between ripple oscillations in association cortices and hippocampus. *Science*, 2017; 358 (6361):369



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Impact of Sleep Extension and Restriction in Children

- Study duration: 5 nights
- Less than 30 minutes increase in sleep time
- Improved restlessness, impulsivity, and emotional lability
- Improved academic performance
- Daniel and his friends in Babylon? **10 days!**



Gruber, et. al., Impact of Sleep Extension and Restriction on Children's Emotional Lability and Impulsivity, *Pediatrics*, Nov 2012, Vol 130



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But I Don't Feel Like I Need Much Sleep!

- Because we are so sleepy we don't recognize the need of it.
- Sleep deprivation decreases objective measures of performance
- Sleep deprived college students subjectively rated their alertness higher than did their well-rested colleagues.

Pfister, et al. Effects of sleep deprivation on performance: a meta-analysis. *Sleep* 1996 May;19(4):318-26.



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WHICH IS BETTER:
BEING TIRED OR DRUNK?

16-18 hours of wakefulness

COMPARABLE TO

legal alcohol intoxication (BAC >0.08%)

Dionson, et al. *Nature* 1997;388:235.
Williamson AM, et al. *Occup Environ Med* 2000;57:649-655.



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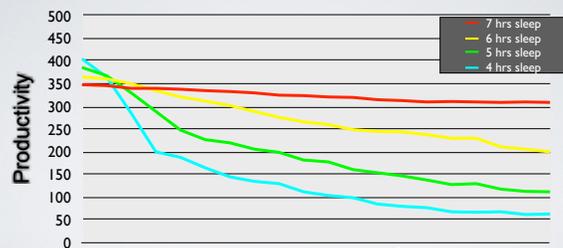


A tired person is inefficient, slower, less safe and makes more mistakes.



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THE IMPACT OF SLEEP DEBT ON PRODUCTIVITY

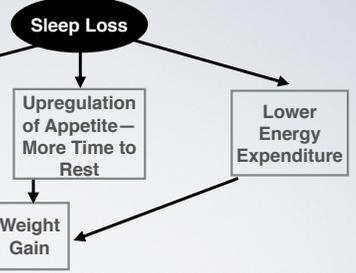


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Major Health Risks

- Obesity
- Type 2 Diabetes
- Metabolic Syndrome
- Long-term sleep deprivation:
 - Cardiovascular disease
 - Cancer
- Depression and other mental health problems

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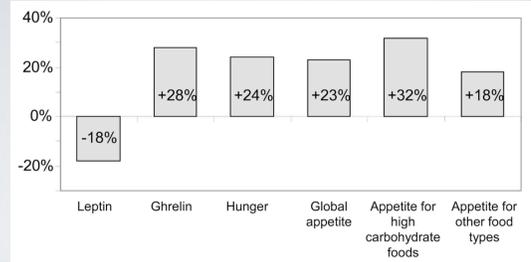
FATIGUE INFLUENCES OBESITY



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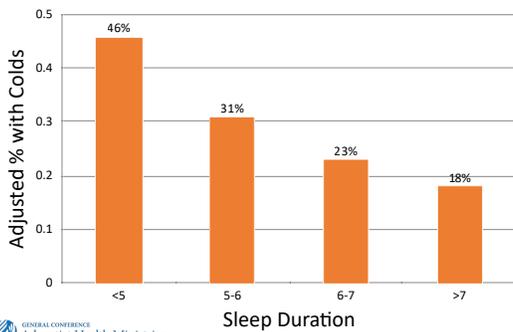
CHANGE AFTER TWO DAYS OF SLEEP LOSS

12 SUBJECTS, 8 TO 4 HOURS SLEEP



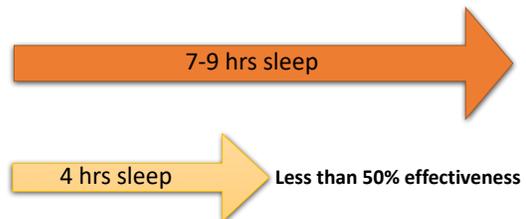
Sleep Med Rev. 2007 June ; 11(3): 163-178

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Sleep Deprivation and Response to Immunizations



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WHY AM I SLEEPY?



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Causes of Excessive Sleepiness

- Too little sleep
- Fragmented sleep
- Circadian rhythm disturbance: jet lag, shift work, social jet lag
- Medications or other substances
- Blue spectrum light
- Primary sleep disorders: Obstructive sleep apnea



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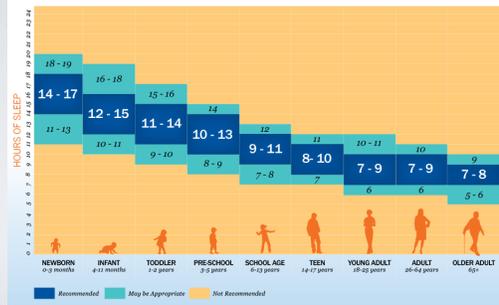
Electronic Screens and Sleep

- Blue spectrum light decreases melatonin production and hence decreases sleepiness
- Especially in children and adolescents
- Gadgets themselves can disrupt sleep
- Content is stimulating



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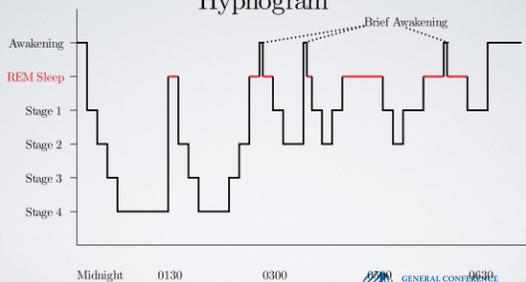
SLEEP DURATION RECOMMENDATIONS



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“SLEEP CYCLES” NOT HOURS

Hypnogram



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Just Being Asleep is not Beneficial

- Restorative sleep must include **complete sleep cycles** (including REM)
- All OTC sleep aids inhibit REM sleep:
 - alcohol,
 - barbiturates,
 - most benzodiazepines,
 - narcotics and
 - anesthetics inhibit REM sleep
- Results in “hung over” or groggy feeling afterwards



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General Health

- Exercise daily
 - Most people do better if strenuous exercise is not just before bedtime
 - As little as 10 minutes of moderate exercise helps
- Expose yourself to sunlight during the day
- Address mood disorders
- Naps
 - 30 to 90 minutes okay if that is part of your routine
 - Not close to bedtime



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Listen to your circadian rhythm

- Go to bed when you are tired
- Go to bed and wake up at the same time every day, even after a bad night's sleep or on the weekend.
- Relaxing bedtime routine
- Plan for sleep based on 90 minute sleep cycles
- Never "toss and turn" for longer than 20 minutes. If you can't sleep, get out of bed and do something quiet and relaxing until the urge to sleep returns. Then go back to bed.



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Avoid drugs

- Cigarettes
- Alcohol
- Sleeping pills
- Caffeinated drinks

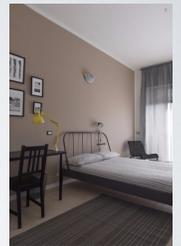
- Also avoid large meals close to bedtime



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Make Bedrooms Pleasant

- Dark
- Comfortable temperature
- Well-ventilated
- Quiet
- Comfortable bed
- Use bedroom only for sleeping and sexual intimacy
- Do not treat the bedroom as a lounge



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Bedtime Routine

- Think of three things you are thankful for
 - And thank God for them
- Set aside problems
 - Turn them over to God
- Contemplate
 - God's wonderfulness



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How to Prevent Fatigue Things NOT to Do!

- Exercise late in the afternoon or evening
- Eat late, heavy meals
- Snack before bedtime
- Exposure to blue light (esp. children and adolescents)
- Watch exciting/depressing TV or movies
- Engage in vigorous discussions/arguments before retiring
- Make big decisions before going to bed
- Use alcohol or caffeinated beverages



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How to Prevent Fatigue
Things to Do!



- Learn to value sleep
- Unplug from the electronic life early
- Establish a regular routine—including time for going to bed and rising!
- Use a comfortable, firm bed in a cool, dark room
- Exercise appropriately every day
- Develop bedtime rituals
- Get adequate sleep every night
- Take one day of rest every week

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“Sleep is the single most effective thing you can do to reset your brain and body for health!” **Matthew Walker**, professor of neuroscience, University of California, Berkeley

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Humans are the only ones to deliberately deprive themselves of sleep for no sound reason. The silent sleep loss epidemic is one of the greatest public health challenges faced in the 21st century!

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SPIRITUAL CONSEQUENCES OF FATIGUE

Increases Susceptibility to Temptation.

“Anything that lessens physical strength enfeebles the mind and makes it less capable of discriminating between right and wrong. We become less capable of choosing the good and have less strength of will to do that which we know to be right.” COL 346

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SPIRITUAL CONSEQUENCES OF FATIGUE

Reduces our Spiritual Vigilance

“And if he should come in the second watch, or come in the third watch, and find them so [watching], blessed are those servants. . . Therefore you also be ready, for the Son of Man is coming at an hour you do not expect.” Luke 12:38-40

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SPIRITUAL CONSEQUENCES OF FATIGUE

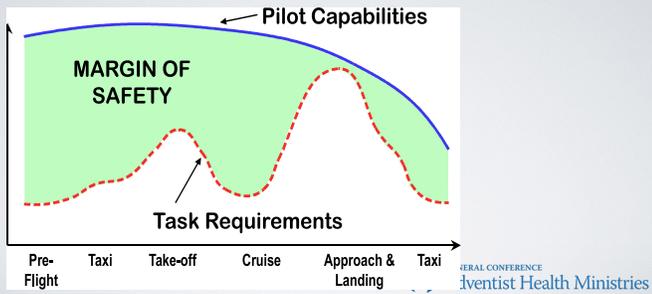
Diminishes Insight into God’s Word.

“Hearing you will hear and shall not understand, and seeing you will see and not perceive; for the heart of this people has grown dull. Their ears are hard of hearing, and their eyes they have closed, lest they should see with their eyes and hear with their ears.” Isaiah 6:9-10



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Task Requirement Vs. Pilot Capability



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SPIRITUAL CONSEQUENCES OF FATIGUE

Lessens desire to communicate with God



“Sometimes when fatigued by labor or oppressed with care, parents do not maintain a calm spirit, but manifest a lack of forbearance that displeases God, and brings a cloud over the family.” ST April 17, 1884

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Sleep:
As Important as
Diet and
Exercise
(Only Easier!)

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QUESTIONS?

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