

I'll Sleep When I'm Dead

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Types of Fatigue

Task Related Fatigue Sleep Related Fatigue





Sleep Related Fatigue

- Results in a decreased capacity to perform mental or physical work due to inadequate restorative sleep
- Accumulates
- Direct effect on physical, mental and emotional health



Drowsiness

- Sleepiness accompanied by lack of energy
- Fluctuates; can be temporarily masked
- The more fatigue, the more drowsy episodes
- Real time effect on performance



The Science of Sleep



Sleep Wars

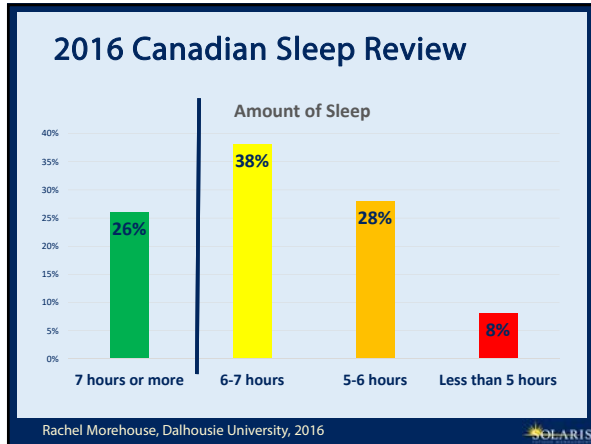
- A typical day:
 - sleep
 - work
 - family / recreation
- From over 9 hrs to less than 7 hrs today



NSF 2010

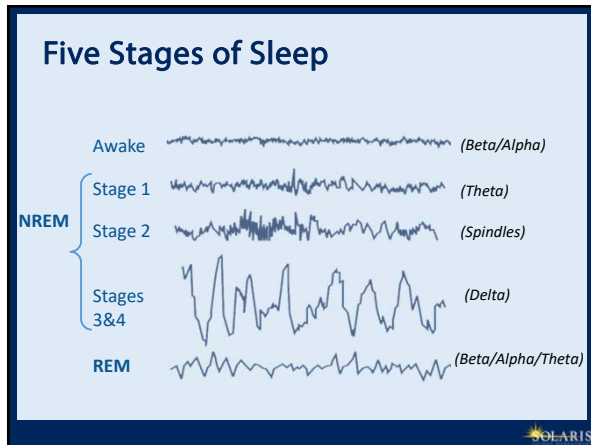


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Doesn't my body know better?

- NO! You cannot train yourself to need less sleep
- Accelerates aging of every cell at DNA level



Light Stages of Sleep

- Stages 1 & 2 NREM
 - brain waves slow
 - muscles relax, pulse and breathing slow down
 - snoring is initiated
 - motor skill consolidation
 - 30-40 min
 - easy to arouse from

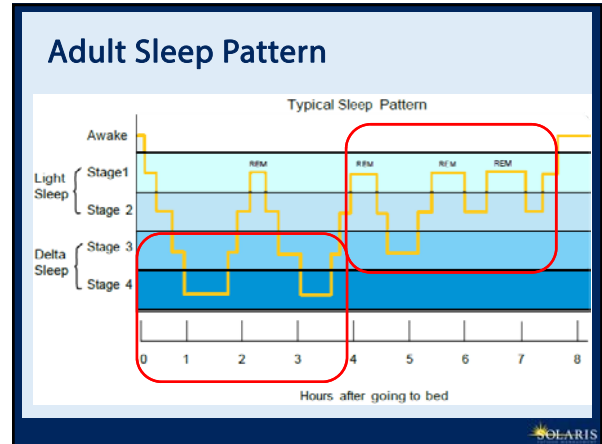
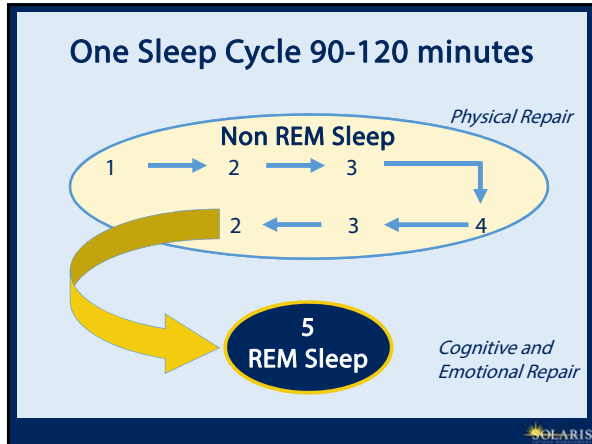
Deep Stages of Sleep

- Stages 3 & 4 NREM (Delta)
 - brain is quiet (long, slow brain waves)
 - HGH released
 - long term memory consolidation
 - snoring uncommon
 - hard to wake up from
 - ~1 hour

REM Sleep

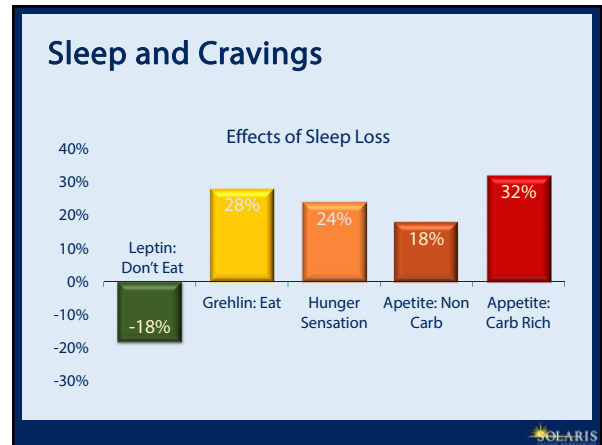
- Body is "paralyzed" while brain kicks into high gear
- Important for
 - psychological well-being
 - primary cognitive repair
 - Short term memory consolidation
- Lasts 15-30 min

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Physical Health

- Stroke and cardiovascular disorders
- Digestive disorders
- Kidney disease and scarring
- Rheumatoid arthritis
- Fertility problems
- Various cancers
- Migraines
- Obesity
- Hypertension and diabetes



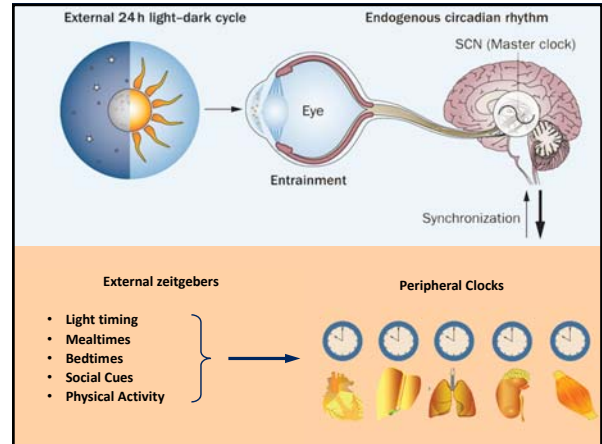
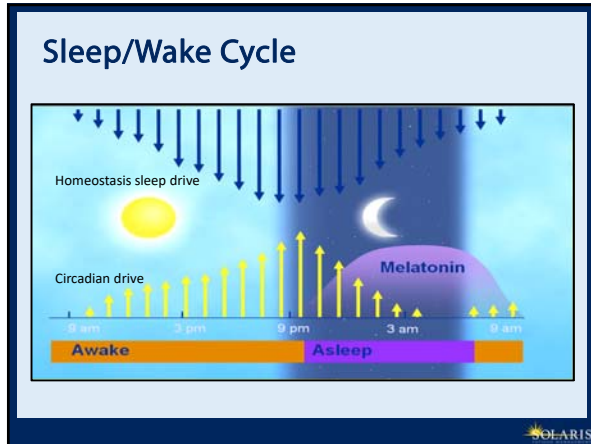
Emotional and Mental Health

- Aggressive and intolerant
- Impulsive
- Mood swings
- Irrational
- Decreased motivation
- Depression
- PTSD
- Dementias
- Alzheimer's Disease

Glymphatic System

- Fluid surrounds brain cells; littered with waste
- Glial cells arrive via blood, suck up waste, flush it to liver
- The more sleep, the more toxic waste removed
- Sleeping position influences efficiency

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The Reality of our Species

- Can never “fully” adapt to night shift (<3%)
- Any night shift adaptation gained doesn't last
- More consecutive night shifts, harder to synchronize

Light and Melatonin

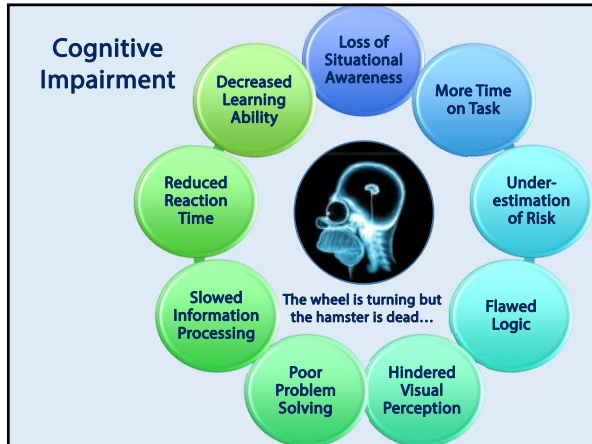
- Natural sleep hormone synthesized and secreted at night
- Light at inappropriate times can depress production
- Age reduces melatonin production
- Powerful anti-oxidant

Serotonin

- Melatonin synthesized from Serotonin
- Known as the “happiness” hormone
- Significantly reduced serotonin levels in rotating shift workers

From Food to Mood

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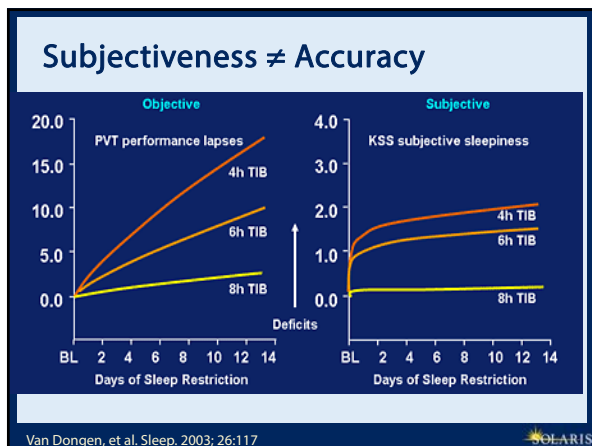
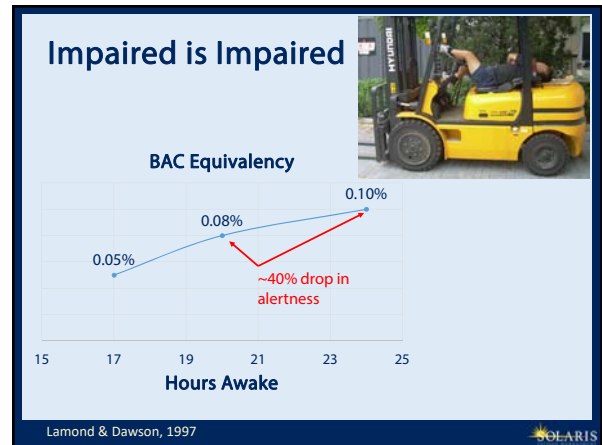


Fatigue and Driving Tasks

- Commuting is high risk when sleep deprived

Hours of Sleep	<4	4-4.9	5-5.9	6-6.9
Risk Level for MVC	11.5	5.4	1.9	1.3

AAA Foundation for Traffic Safety, 2016





- Regularity**: You consistently go to bed and wake up about the same times
- Timing**: Your midpoint of sleep is typically between 2 and 4 AM
- Sleep Quality**: Satisfied with quality vs tossing and turning most of the night
- Efficiency**: You fall asleep within 30 minutes and have few waking episodes
- Alertness**: You wake up alert and refreshed; maintain attentiveness during shift
- Duration**: You average between 7 and 9 hours of sleep consistently

Health ↓ 0 - Poor Sleep 6 Good Sleep - 12 ↑ Health

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Sleep Strategies



Increase the Quantity of Sleep

- Aim for 8-9 hours (rejoice if you get 7!)
- Every week, go to bed earlier by fifteen minutes to gradually adjust



Optimize Your Bedroom

Buy a good bed



Treat the bedroom as an oasis



Bedroom Science

- Select bedding that facilitates cooling
- Consider weighted blankets
 - Effective in alleviating anxiety and elevating serotonin



No Light at Night

- Remove or cover all sources of light


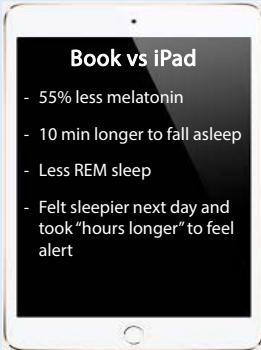


Book vs iPad


- 55% less melatonin
- 10 min longer to fall asleep
- Less REM sleep
- Felt sleepier next day and took "hours longer" to feel alert

Options?

- Stop viewing 3 hrs before bed
- Sunglasses with orange lenses
- Adjust blue light filter ins settings




PNAS Journal, Harvard Medical School, Dec 2014





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Lots of Light During Day

Daily exposure to sunlight or,



Consider a Sunlamp



Tunable Lighting

- Increases blue light during the day
- Reduces blue light during evening



No Disruptions Allowed!

Block out noise



White Noise



Eliminate disturbances



Stand Your Ground

Develop a pre-sleep routine



No pets in bedroom!



Regulating your Temperature

- Keep room temp between 16-17°
- Consider the basement
- Ensure good air circulation
- Keep your feet warm before you go to bed



Massage Therapy



=



Systematic review of research revealed

- 31% ↓ in cortisol levels (stress hormone)
- 31% ↑ in dopamine and 28% ↑ in serotonin (feel good hormones)

Field T, Hernandez-Reif M, et al., Int J Neurosci. 2005



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Hand Shiatsu




- ✓ Sleep latency
- ✓ Sleep duration



Routine, routine, routine





The Rules of Napping



- Naps can supplement sleep, not replace it
- Short naps reduce sleep inertia
- Most effective on first night of a sequence of shifts
- Lie down (50% faster)

Zhao, et al. Biol Psychol. 2010; Dr. Neil Kline, American Sleep Association, 2017



Sleep Medications

- 20 million sleep aids prescribed in 2015 (Canada)
 - Growing 2-3X faster than any other class of drug
 - Most are addictive or create tolerance
 - Do not replicate normal sleep
- 2017 Sleep Study on 20K Adults
 - 50% using a mix of two or more sleep aids per night
- Sleep meds treat the *symptoms*, not the problem



OTC Sleep Meds (non-narcotic)




Synthetic Melatonin

- Many side effects
- May worsen depression symptoms
- Try L-Tryptophan instead




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Natural Products

- Safer, gentler



Lavender

- Improved sleep quality, more stable mood, better concentration, and reduced anxiety

Valerian Root

- Fall asleep faster, better quality, fewer side effects
- May take up to 4 weeks before effects are felt



Aromatherapy for Relaxation

- Choose essential oils (plant extracts)
- Calming scents
 - lavender
 - chamomile
 - cedar wood
 - marjoram
 - patchouli



Not Sleep Aids!

- Cannabidiol – anti-inflammatory, not a sleep aid
- THC –higher rates of chronic insomnia for daily users



Thank you!



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