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The Sleep Secret

Wednesday, September 3, 14
eating and sleeping in collective consciousness
I. Overview, purpose, outline

- A new frontier: scattered data, clinical anecdotes, cultural myths
- Purpose: increase awareness, sensitivity, review data, offer practical recommendations, encourage research
- Do our eating habits impact our sleep and dreams?
- Do our sleeping habits impact eating, metabolism, weight?
- It’s not just about what we eat, but also when: rhythmic factors
- Outline: I. An energy medicine model of sleep and nutrition
  II. A crash course in sleep and dreams
  III. How poor sleep impacts nutrition
  IV. How poor nutrition impacts our sleep
  V. Sleep and dream promoting nutrition
  VI. Circadian factors in nutrition
  VII. Closure
A Jewish mother’s health assessment ...

II. An energy medicine model of nutrition and sleep

A Jewish mother’s health assessment ...

~ Did you eat?


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A Jewish mother’s health assessment ...

~ Did you eat?

~ Did you poop?

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A Jewish mother’s health assessment …

~ Did you eat?
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II. An energy medicine model of nutrition and sleep

A Jewish mother’s health assessment …

- Did you eat?
- Did you poop?
- Did you sleep?

Consuming excessive energy is linked to chronic inflammation and hyperarousal

Voro ego sum: I consume, therefore I am
The human energy crisis

✧ an unconscious identification with machines
✧ we see sleepiness as a need for fuel, not rest
✧ we seek fuel in “counterfeit energies”
✧ we are dependent on high glycemic foods
✧ we are overly dependent on stimulants
✧ we confuse rest with stimulating recreation
✧ we confuse rest with inebriation
✧ we are literally rest-less

Nothing is so intolerable to man as being fully at rest.
-- Blaise Pascal
Hyperarousal

*Insomnia is strongly associated with chronic hyperarousal:*

1. increased body & brain metabolic rates
2. elevated heart rates
3. elevated core body temperature
4. increased high frequency EEG
5. elevated nighttime cortisol
6. decreased serum melatonin
7. nocturnal sympathetic activation
8. over-activation of the HPA

*Hyperarousal is essentially wakefulness gone awry; it overrides both normal sleep drive and the excessive daytime sleepiness.*

III. A crash course in sleep

- Insomnia – 70 million
  (prevalence ~ 10 - 30%)
- OSA – 23 million
  (1 in 4 men; 1 in 9 women)
- 64% symptomatic few noc/wk
- Significant rise in recent years

1. NI of Neurological Disorders and Stroke, 2007
2. NSF, Sleep in America Poll, 2009
Sleep loss, illness and inflammation

Short sleepers (≤/≥ 6h/night) are at increased risk for:

- infection
- insulin resistance
- obesity
- diabetes
- CVD
- cancer
- arthritis
- mood disorders

Angst J; Gamma A; Ajdacic V; Eich D; Rössler W. SLEEP 2008;31(4):473-480.
Taylor DJ; Mallory LJ; Lichstein KL et al. Comorbidity of chronic insomnia with medical problems. SLEEP 2007;30(2):213-218
We don’t get sleep because we don’t get sleep

- sleep is devalued, even denigrated
- defined negatively: not waking, non-REM
- valued in terms of waking world functions
- sleep is “highly processed”
- sleep is frequently “artificial”
- sleep requires cooling, energy dissipation

Naiman, R. *We Don’t Get Sleep Because We Don’t Get Sleep*, Huffington Post, 2011
Sleep is regulated through complex interactions among multiple brain regions and neurotransmitters through both homeostatic and circadian processes.

- Norepinephrine
- Serotonin
- Melatonin
- Dopamine
- GABA
- Acetylcholine
- Hypocretin/Orexin
Rhythms, energy dissipation drive sleep & dreams

- **Melatonin (dark)**
- **Temperature (cool)**

Diagram showing:
- Time in hours (0-8)
- Stages of sleep: Awake, REM, Stage 1, Stage 2, Stage 3, Stage 4
- Melatonin levels decrease with time
- Temperature changes with sleep stages
- Deep sleep / immune galvanization

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Dream deprivation

- Critical for information processing, assimilation, memory, learning, emotional healing; (the ‘brain belly’)

- REM suppression is common: ETOH, hypnotics, anticholinergic drugs, benzos, antidepressants, etc.

- REM deprivation results in a REM rebound: fatigue, depression;


IV. How poor sleep impacts nutrition

S Taheri. The link between short sleep duration and obesity Arch Dis Child 2006;91:881-884 doi:10.1136/adc.2005.093013
Epidemiological and lab studies suggest short sleep is associated with increased risks for metabolic disruption, including:

1) impaired glucose tolerance
2) impaired insulin resistance
3) increased ghrelin
4) decreased leptin
5) increased body mass index (BMI)

These changes likely mediate the increased mortality associated with short sleep duration

Changes in sleep architecture increase hunger and eating

1) Found a positive association between S2 sleep and RMR, and an inverse relation between S2 sleep and calories consumed -- i.e., the less S2 sleep, the lower RMR and more calories consumed.

2) There was an inverse relationship between REM sleep duration and hunger.

3) There was an inverse relationship between the amount of S2 sleep and desire for sweet and salty food.

4) Reduced percentage of sleep time spent in REM sleep, as well as SWS, was also associated with greater fat and carbohydrate intake.

A. Shechter, et al. Alterations in sleep architecture in response to experimental sleep curtailment are associated with signs of positive energy balance. AJP: Regulatory, Integrative and Comparative Physiology, 2012; DOI: 10.1152/ajpregu.00222.2012
V. How nutrition impacts our sleep

1. Nutritional factors in sleep disorders
2. Substances: caffeine, alcohol, THC
3. Gluten and sleep
4. Sleep inhibiting foods and diets
5. Common myths about food and sleep
Nutritional factors in specific sleep disorders

- Insomnia
- Primary snoring
- OSA - obstructive sleep apnea
- GERD
- narcolepsy
- PLMS & RLS
- NES - Night eating syndrome
- Nightmares
Substances and sleep

- alcohol
- caffeine
- marijuana
- other substances
Gluten and sleep

- Many celiac pts suffer from sleep disorders post tx
- Check B-12 levels
- Gluten and narcolepsy / hypersomnia
- Perpetuating factors may sustain insomnia

*Aliment Pharmacol Ther* 2010; **32**: 1031–1036

M. Breuss, HuffPost, 10/10.
Sleep inhibiting foods and diets

- food sensitivities, allergies and sleep
- tyrosine and sleep
- ketogenic diets and sleep
- calorie restriction and sleep
- other diets and sleep
Common myths about food and sleep

• Turkey as a sedative
• The sacred cow of warm milk
• The complications of coffee and caffeine
• Midnight snacks help us sleep
• Night caps: alcohol as a sedative
• Sleepy teas or pee pee teas
Alright ma'am, I know this is difficult, but I need you to cooperate with me here. How long were you aware of your husband's problem...
VI. Sleep and dream promoting nutrition

1. Essential clinical challenges
2. Limitations of conventional hypnotics
3. Specific soporific nutrients
4. The special case of melatonin
5. Dietary factors
6. Bedtime snacks
Special challenges around “taking something to sleep”

- explosion of sleep supplement market
- kitchen sink approach
- placebo effects
- undermining self-efficacy
- increases sleepiness
- always complement with

“letting go of something to sleep” (CBT-I)
Rx and OTC Sleeping Pills: A Wolf in Sleep’s Clothing?

- dependency
- alteration sleep architecture
- residual “hangover”
- rebound insomnia with d/c
- anterograde amnesia
- impact on self-efficacy
- limited effectiveness vs placebo
- increased mortality

“If you forget how long you lay in bed tossing and turning, in some ways that’s just as good as sleeping.”

-- NY Times Oct 23, 2007


Kripke, D. Sleep Medicine, 2009, (10)3:275-276
### Sleep and dream promoting nutrients & botanicals

- choline
- DMAE
- L-Theanine
- glycine
- tryptophan
- 5-HTP
- calcium
- magnesium
- potassium
- B-vitamins
- phosphotidylserine
- omega 3 fatty acids
- melatonin
- valerian
- hops
- lemon balm
- kava-kava
- skullcap
- lavender
- jasmine
Melatonin (MT)

- The queen of nocturnal physiology - Nyx
- Politics: MT enhanced milk-“nee moo”
- Light at night and cancer
- Tells the body and brain it is dark out
- Good safety profile
- Shown to be soporific in many studies
- Melatonin facilitates distal vasodilation
- Dosage: 3 mg vs. .3 mg; regular, sublingual, CR
- Higher levels associated with REM
- Marijuana increases endogenous MT
- Occurs in tart cherries and purslane (portulaca)
- Should we consider MT replacement therapy?

Reiter, Russell and Robinson, Jo: Melatonin: Bantam; 1996
Lynch, Eileen M: Melatonin and cancer treatment: Life Extension Magazine; January 2004
Dietary nutrient variables related to sleep

- Study of 459 post-menopausal women from Women’s Health Initiative
- Total sleep time was negatively associated with intake of fats.
- Subjective napping (a proxy for sleepiness?) was significantly related to fat intake as well as intake of meat
- Short sleepers consumed the most calories, followed by normal sleepers, followed by very short sleepers, followed by long sleepers.
- Food variety was highest in normal sleepers; lowest in very short sleepers
- People who sleep 7-8 hrs/night differ in their diets, compared to those who sleep less or more.
- Short and long sleep are associated with lower food variety.
- Don't know if altering one's diet would change one's overall sleep pattern

Bedtime snacks

- Can we eat our way to better sleep?
- Smaller log on the fire at bedtime
- “Best and worst bedtime snacks?” common misguidance
- Psychological factors
- Warm milk?
- High glycemic load
- The carb/tryptophan question

Influence of the glycemic load (GL) on subjective and objective measures of sleep quality in insomnia
Christopher Herrera, Patricia Ruell, Helen O’Connor, Chin Moi Chow: 13 December 2010
VII. Circadian factors in nutrition: the power of when

1) Eating and sleeping are opposite and complementary experiences. When we eat, we assimilate energy, in sleep, we release energy.

2) Biological rhythms are a key mechanism mediating the complex relationship between eating and sleeping. The role of life rhythms in nutrition doesn’t get attention it warrants.

3) Complex relationship among endocrine, neurological, sleep-wake and behavioral rhythms

4) Can a 'food clock' supersede the SCN?

5) Gut flora and natural rhythms

Rhythms are the infrastructure of everything

1. Ultradian Rhythms (BRAC)
2. Circadian Rhythms (sleep-wake)
3. Infradian Rhythms (menstruation)
4. Circannual Rhythms (breeding)
5. Synthetic / Cultural Rhythms

Endogenous and Exogenous Clocks
(lub dub vs tic tock)

Endogenous clocks include a central conductor, the SCN, and peripheral instruments in all cells. Exogenous clocks include light, darkness, temperature, social factors and food. Our ultimate timekeeper is our conscious conductor--the mind.
When you eat may be just as vital as what you eat

- Mice study finds the daily waxing and waning of thousands of genes in the liver -- the body's metabolic clearinghouse -- is primarily controlled by food intake and not by the body's circadian clock.

- Limiting carbs to dinner may increase satiety and reduce risk for diabetes and CVD

- “It's Not Just What You Eat, but When You Eat It: Link Between Fat Cell and Brain Clock Molecules”

- Eating too close to bedtime can raise core body temperature and metabolic rate, making it difficult to fall asleep.


Georgios K Paschos, et al.. Obesity in mice with adipocyte-specific deletion of clock component Arntl. Nature Medicine, 2012; DOI: 10.1038/nm.2979
~ Present sleep supplementation as an adjunct tx, a way to ‘remember’ sleep; don’t undermine self-efficacy

~ Emphasize that the secret of a good night’s sleep is a good day;’s waking: a ‘cool’ non-inflammatory lifestyle

~ Nutrition is critical to sleep, but only one component; emphasize additional biomedical, environmental, psychological factors