Everything you must know about sleep but are too tired to ask

The Sleep Deprivation Crisis

- Most people are moderately to severely sleep deprived. 71% do not meet the recommended 8 hrs/nt. (7.1 or 6.1?)
- High school & college students are walking zombies.
- 75% of people experience sleep problems each week. 42,000,000 Rx; 60% > 2001
Sleep determines our waking success:

Mood, alertness, energy, thinking performance, productivity, safety, general health & longevity

Recent Research on Sleep

• The sleeping brain is highly active:
  1) Regulates immune, hormone & endocrine functions essential for general health

Univ. Chicago and Penn State University Studies
Young Ss restricted to 6 hrs./night for 6 nights developed “senior citizen” profiles...

> cortisol, > blood sugar levels, < leptin molecules

Leads to: Hypertension (heart attacks & strokes), Type II diabetes, Obesity
### Recent Research on Sleep

<table>
<thead>
<tr>
<th>Sleep Duration</th>
<th>Obeseness Risk</th>
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<tbody>
<tr>
<td>Less than 4 hrs</td>
<td>73% more likely to be obese than 7-9 hr sleepers</td>
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<tr>
<td>5 hrs sleep</td>
<td>50% more likely...</td>
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<tr>
<td>6 hrs sleep</td>
<td>23% more likely...</td>
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S. Heymsfield, J Gangwisch, Columbia Univ.

- **The sleeping brain is highly active:**
  1. Regulates immune, hormone & endocrine functions essential for general health

Dr. Jan Born-- Univ. of Luebeck, Germany found that people who sleep only 6 hours:

- Have lowered their resistance to viral infection by 50%
The sleeping brain is highly active:

1) Regulates immune, hormone & endocrine functions essential for general health

Blind women have 50% less breast cancer than sighted women.

Night workers have 35% > risk of colorectal cancer.

2) Replenishes brain neurotransmitters that organize new information and ideas into long term physical storage...

essential for memory, learning, performance, problem-solving, creativity and athletic excellence.

Do we sleep enough for this to occur?
Brain Waves (EEG) and Sleep Stages

- **Wake**: low voltage, fast, beta waves
- **Drowsy**: alpha waves (comb teeth)
- **Stage 1**: theta waves
- **Stage 2**: K complex, sleep spindles
- **Stage 3**: theta waves, delta waves
- **Stage 4**: high voltage, slow, delta waves
- **REM**: low voltage, fast, saw tooth waves

Architecture of a Good Night’s Sleep

- **Sleep Onset**: 9, 18, 30, 60
- **REM**: 9, 18, 30, 60

The symphony of the night
Are You Sleep Deprived?

1. Does a heavy meal, low dose of alcohol, warm room, boring meeting or lecture ever make you drowsy?

2. Do you fall asleep instantly at night?

3. Do you need an alarm clock to wake up?

4. Do you repeatedly hit the snooze button?

5. Do you sleep extra hours on weekends?
Everything you Should Know About Sleep, But are Too Tired to Ask.
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**Consequences of Sleep Deprivation**

- 2 weeks of 6 hr/nt sleep = .1% BAC
  “Presenteeism” – large economic toll
- Medical resident impairment > 3 to 4 drinks
- Automatic behavior: “microsleeps”
- Interaction of alcohol & sleep deprivation
- 80,000 fall asleep at the wheel every day

**Drowsiness is Red Alert**
**Driving drowsy is the same as driving drunk**

*No loud radio, air conditioning, coffee, or food will prevent falling asleep at the wheel*

*The Drive Cam*
Asleep in the Fast Lane

• Demand for 24-hour services
• “Work until you drop” syndrome
• Late night television, the Internet & IM
• Profound social changes:
  Two career families & single parents
We are operating beyond the design “specs”

“Not enough hours in the day!”

Golden Rules for Peak Performance

1) Determine and meet your sleep requirement every night. It's hard-wired, not adaptable!

Adolescents need 9.25 hours sleep
20% fall asleep in school
Internal clock bedtime 3am, wake time 11am

Most adults need 7.5 to 8.5 hours sleep
Individual differences, genetically determined
What % can get by on 5 hrs. or less?
Consequences of Shortened Sleep

- Increased heart disease, diabetes, obesity
- Drowsiness/microsleeps/unintended sleep seizures
- Increased irritability, anxiety, depression, weight
- Decreased socialization skills & sense of humor
- Decreased motor skills
- Decreased cognitive performance:
  - Reduced ability to process, concentrate & remember
  - Reduced ability to communicate
  - Reduced ability for complex/multi tasking & creativity
  - Poor decision skills and increased risk-taking
- In sum: Reduced health and performance

POWER SLEEP for peak performance

All mental events enter hippocampus. Sleep transfers information to the cerebral cortex, and makes new connections of concepts and ideas (memory traces).

Ss who sleep for 8 hours are 3 times more likely to gain insight
Effect of sleep deprivation on brain activation (math)

Golden Rules for Peak Performance

2) Establish a regular sleep schedule
   Synch the hours spent in bed with the sleepy phase of your biological clock

   If you’re up late, don’t sleep in!

   4 weeks to stabilize an effective cycle
Golden Rules for Peak Performance

3) Get continuous sleep

The penalty of interrupted sleep

Fragmented Sleep

Caused by:

- Caffeine (after 2 p.m.)
  
  Hint to stay awake -- 2 oz./hr.

- Chocolate (after 2 p.m.)

- Nicotine

- Liquor (within 3 hrs of bedtime)
4) Make up for lost sleep

Sleep loss doesn’t dissipate over time

The Sleep Debt Bank Account
“Carrying the Load”

If sleep deprived: Go to bed earlier or ...

Golden Rules for Peak Performance

Restorative Nap

The biphasic sleep pattern
No modern day siesta

The “Power Nap”

Duration of naps
Senior citizens-avoid; later bedtime
Good for stress reduction/heart
A stop-gap measure
Strategies for POWER SLEEP

Setting the bedroom stage
A relaxing atmosphere; limit TV; computers; clocks
A hot bath and easy stretching
“Worry Time”
Relaxation and mental imagery; meditation; music
Reading as a bedtime ritual
If you toss & turn...
Use of sleep aids