Fatigue Management: Cheaper than Therapy

1. Task Related (Exertion)
   - Depleting our body's resources either physically, or mentally
   - The more exertion, the more rest and recovery required throughout and after shift

2. Sleep Related
   - Inadequate restorative sleep, resulting in ongoing decrements in physical and mental capabilities

Drowsiness/Sleepiness
   - Fluctuates; can be temporarily masked
   - More fatigue, more drowsy episodes
   - Real time effect on performance

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

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How much is enough?

7 to 9 hrs every 24

Irregular/erratic schedules reduces TST by an average of 2 hours (chronic sleep deprivation)

2016 Canadian Sleep Review

<table>
<thead>
<tr>
<th>Amount of Sleep</th>
<th>7 hours or more</th>
<th>6-7 hours</th>
<th>5-6 hours</th>
<th>Less than 5 hours</th>
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<tbody>
<tr>
<td></td>
<td>26%</td>
<td>38%</td>
<td>28%</td>
<td>8%</td>
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</table>

Rachel Morehouse, Dalhousie University, 2016

Doesn’t my body know better?

• NO! You cannot train yourself to need less sleep

• Accelerates aging of every cell at DNA level

The Science of Sleep

Sleep/Wake Cycle

Homeostatic sleep drive
Circadian drive
Melatonin

Awake
Asleep

External zeitgebers
• Light timing
• Mealtimes
• Bedtimes
• Social cues
• Physical activity

Peripheral Clocks

External 24h light-dark cycle
Endogenous circadian rhythm
SCN (Master clock)
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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

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

- Sunlight promotes synthesis of serotonin from tryptophan
- Melatonin synthesized from serotonin

Stages of Sleep

- Stages 1 & 2 NREM
  - brain waves slow
  - snoring is initiated
  - motor skill consolidation
  - easier to arouse from

Light Stages of Sleep

- Stages 3 & 4 NREM
  - deep sleep
  - difficult to arouse from

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Deep Sleep
- Stage 3 NREM
  - Brain is quiet (long, slow Delta brain waves)
  - HGH released
  - Long term memory consolidation
  - Recharged immune system
  - Hard to wake up from

REM Sleep
- Body is “paralyzed” while brain kicks into high gear
- Important for
  - Psychological well-being
  - Primary cognitive repair
  - Short term memory consolidation

Healthy Adult Sleep Pattern

Older Adults (45+)

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

- Emotional and Mental Health
  - Aggressive and intolerant
  - Impulsive
  - Mood swings
  - Irrational
  - Decreased motivation
  - Depression
  - PTSD
  - Dementias
  - Alzheimer’s Disease
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Fatigue and Monotonous Tasks
• Commuting is high risk when sleep deprived

<table>
<thead>
<tr>
<th>Hours of Sleep</th>
<th>&lt;4</th>
<th>4-4.9</th>
<th>5-5.9</th>
<th>6-6.9</th>
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<tr>
<td>Risk Level for MVC</td>
<td>11.5</td>
<td>5.4</td>
<td>1.9</td>
<td>1.3</td>
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</table>


Fatigue is Dangerous

Impaired is Impaired

BAC Equivalency

Subjectiveness ≠ Accuracy

Manage Your Sleep
• Aim for 8-9 hours (rejoice if you get 7!)
• Stick to a routine
• Get daily exposure to sunlight
• Keep your room pitch black
• Use white noise to mask pets, snorers, etc.
• Reduce blue light exposure at night

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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)

Consumer Sleep Study (20,000)

- 50% of Americans regularly use a mix of two or more sleep aids per night
- Sleep meds treat the SYMPTOMS not the problem!

Non-Prescription Sleep Aids

- Melatonin NOT for those with depression; try L-tryptophan instead
- OTC and Antihistamines = dementia?
- Cannabidiol – anti-inflammatory, not a sleep aid
- THC – higher rates of chronic insomnia for daily users

Turn off your brain!

Thank you!

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