Dealing with Sleep Problems
Going for the 3 Increases: Increase in Health, Increase in Happiness & Increase in Energy

Strategies for Success in Health Management
By: James J. Messina, Ph.D.
Sleep is a Major Health Issue

We will review:
1. The Sleep Cycle
2. Sleep Architecture
3. Sleep Wake Disorders
4. Insomnia
5. Obstructive Sleep Apnea
6. Shift Work Sleep Disorder
7. Sleep Hygiene
## Five Stages of the Sleep Cycle

<table>
<thead>
<tr>
<th>Stage</th>
<th>Percentage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4-5%</td>
<td>Light sleep. Muscle activity slows down. Occasional muscle twitching.</td>
</tr>
<tr>
<td>2</td>
<td>45-55%</td>
<td>Breathing pattern and heart rate slows. Slight decrease in body temperature.</td>
</tr>
<tr>
<td>3</td>
<td>4-6%</td>
<td>Deep sleep begins. Brain begins to generate slow delta waves.</td>
</tr>
<tr>
<td>5</td>
<td>20-25%</td>
<td>Rapid eye movement. Brainwaves speed up and dreaming occurs. Muscles relax and heart rate increases. Breathing becomes rapid and shallow.</td>
</tr>
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</table>
Sleep Architecture

Ultradian Rhythm Cycle – Last 90-110 minutes

- N1 (5%) – 5 minutes transitional Phase- low arousal threshold
- N2 (50-55%) – 10-15 minutes
- N3 (20%) – lasts 20-40 minutes “delta sleep” “slow-wave sleep”
- REM (20%) – Tonic (hypotonic muscles) and Phasic (eye movement) stages
Normal Sleep Hypnogram
There are two main types of sleep:

- **Non-REM (NREM) sleep** consists of four stages of sleep, each deeper than the last.
- **REM (Rapid Eye Movement) sleep** is when you do most active dreaming. Your eyes actually move back and forth during this stage, which is why it is called Rapid Eye Movement sleep.

### The Stages of Sleep

#### Non-REM sleep

**Stage N1 (Transition to sleep)** – This stage lasts about five minutes. Your eyes move slowly under the eyelids, muscle activity slows down, and you are easily awakened.

**Stage N2 (Light sleep)** – This is the first stage of true sleep, lasting from 10 to 25 minutes. Your eye movement stops, heart rate slows, and body temperature decreases.

**Stage N3 (Deep sleep)** – You’re difficult to awaken, and if you are awakened, you do not adjust immediately and often feel groggy and disoriented for several minutes. In this deepest stage of sleep, your brain waves are extremely slow. Blood flow is directed away from your brain and towards your muscles, restoring physical energy.

#### REM sleep

**REM sleep (Dream sleep)** – About 70 to 90 minutes after falling asleep, you enter REM sleep, where dreaming occurs. Your eyes move rapidly, your breathing shallows, and your heart rate and blood pressure increase. Also during this stage, your arm and leg muscles are paralyzed.
Let’s Look at Comparisons of Various Sleep Models

To get a better picture of sleep patterns go to Harvard’s Sleep Lab at:
http://healthysleep.med.harvard.edu/interactive/sleep_lab

Sleep patterns compared:
1. Normal
2. Infant
3. Elderly
4. Shift work
5. Insomnia
6. Sleep Apnea
SLEEP WAKE DISORDERS

- Substance/Medication induced sleep disorder
- Insomnia Disorder
- Hyper-somnolence Disorder
- Narcolepsy
- Breathing-related sleep disorders
- REM sleep behavior disorder
- Nightmare disorder
- Non-REM sleep arousal disorders
- Circadian Rhythm sleep-wake disorders
- Restless Leg Syndrome
Symptoms Related to Sleep Disorders

**Nighttime symptoms**
- Loud persistent snoring
- Witnessed pauses in breathing
- Choking or gasping for air
- Restless sleep
- Frequent visits to the bathroom

**Daytime symptoms**
- Early morning headaches
- Daytime sleepiness
- Poor concentration
- Irritability
- Falling asleep during routine activities
Insomnia

"No wonder you have insomnia... lying there awake all night."

MY INSOMNIA WOULDN'T BE SO BAD IF I DIDN'T LIE AWAKE WORRYING ABOUT IT!
Impact of Insomnia

- Mood & Motivational Changes
- Increased risk taking
- Decreased threat detection
- Impaired attention/concentration
- Memory loss of recent events
- Variable & slowed response
- Illusions/Hallucinations

- Failures of routines/Impaired task performance
- Exaggerated feeling of physical exertion
- Lack of insight to impairment
- Failed verbal communication
- Social discomfort
- Increase health problems
Interacting of Factors Impacting Insomnia

- Negative Self-talk
  - Excessive worrying in bed
  - Ruminating & thinking the worst
  - Feeling bad about yourself
  - Unrealistic expectations
  - Feeling no control over problem

- Lifestyle
  - Caffeine/tobacco
  - Medications
  - Diet
  - Low activity
  - Environmental Factors

- Insomnia

- Sleep Habits
  - Excessive time in bed
  - Lack of sleep routine
  - Napping
  - Trying too hard to sleep

- Consequences
  - Fatigue
  - Bad mood
  - Physical limitations
  - More pain
  - Muscle tension & arousal
Fragmented Sleep
Deoxygenated Blood

- Daytime Drowsiness
- Hypertension
- Heart Attack
- Stroke
- Memory Loss
- Diabetes
- Depression
- Insomnia
- Early Death
Impact of Sleep Apnea
Sleep Apnea Risk Factors
People with medical Conditions likely to have Sleep Apnea

<table>
<thead>
<tr>
<th>Condition</th>
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<tbody>
<tr>
<td>Hypertension</td>
</tr>
<tr>
<td>Type 2 Diabetes</td>
</tr>
<tr>
<td>Heart Failure</td>
</tr>
<tr>
<td>Stroke</td>
</tr>
<tr>
<td>Obesity</td>
</tr>
<tr>
<td>Coronary Artery Disease</td>
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<tr>
<td>Resistant Hypertension</td>
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</tbody>
</table>
CPAP Most Effective Treatment for Obstructive Sleep Apnea
Impact of Shift Work Sleep Disorder

Circadian rhythm disruptions:
- Body temperature
- Respiratory rate
- Hormonal production
- Menstrual cycle
- Urinary excretion
- Cell division

Mental Health:
- Stress
- Anxiety
- Depression
- Neuroticism
- Reduced vigilance
- 'Burnout syndrome'

Brain effects:
- Sleep loss
- REM sleep reduction
- Stage 2 sleep reduction
- Fatigue
- Reduced brain volume

Cardiovascular disorders:
- 40% increased risk for:
  - Angina pectoris
  - Hypertension
  - Myocardial infarction

Gastrointestinal disorders:
- Dyspepsia
- Heartburn
- Abdominal pains
- Flatulence

Reproductive effects:
- Spontaneous abortion
- Low birth weight
- Prematurity

Increased cancer:
- Breast cancer
- Colorectal cancer

Nature Reviews | Neuroscience
Symptoms of Insomnia

- Difficulty falling asleep
- Interrupted sleep
- Waking up early
- Light Sleep
- Poor quality of sleep - not refreshed after sleeping
Predisposing Factors to Insomnia

1. Genetic predisposition
   - Arousal level
   - Weak sleep generation system
2. Worry or rumination tendency
3. Sleep Schedule
4. Environment
5. Previous episodes of insomnia
Other Factors Involved in Insomnia

Precipitating Factors:
- Situation stressors
- Illness/Injury
- Acute Stress reaction
- Environmental changes

Perpetuating Factors:
- Maladaptive habits
- Dysfunctional/Alarming beliefs, attitudes & Cognitions
Checklist For Better Sleep

Good sleep is influenced by many factors. Record how many of these things you have done in the last week and consider making changes to your routine.

Things that are known to make sleep worse

- Napping during the day
- Watching television in bed
- Using a device with a bright screen in the hour before bedtime (e.g. a smartphone, a laptop)
- Consuming drinks containing caffeine (includes tea, coffee, cola, energy drinks, hot chocolate)
  - How many each day?
  - What time of the day was your last caffeinated drink? (try to avoid caffeine after 6pm)
- Drinking alcohol (alcohol typically leads to interrupted sleep)
- Eating a heavy meal less than 3 hours before bedtime
- Staying in bed even if you can’t fall asleep (it’s better to get up and do something relaxing, then try again later)

Things that are known to improve sleep

- Regular exercise
1. **Set a schedule**-Establish a regular sleep schedule every day of the week. Don’t sleep in more than an hour, even on your days off.

2. **Don’t force yourself to sleep**-If you haven’t fallen asleep after 20 minutes in bed, get up and do something calming. Read a boring book, draw or write in a journal. Avoid bright lights, bright screens, or anything else that might activate your body and wake you up more.

3. **Avoid caffeine, alcohol and nicotine**-Consuming caffeine, alcohol, and nicotine can affect your ability to fall asleep and the quality of your sleep, even if they’re used many hours earlier in the day.

4. **Avoid napping**-Don’t nap during the day to ensure you are tired by the time night rolls around. Naps that are over an hour long or those that are later in the day are especially harmful to sleep hygiene.
5. **Only use your bed for sleeping** - Using your bed for reading, watching TV, or other activities will lead your body to associate your bed with these activities. If you reserve your time in bed for sleeping, your body will begin to associate your bed with sleep.

6. **Exercise and eat well** - Eating healthy and exercising can lead to better sleep. However, you should avoid strenuous exercise and big meals in the 2 hours before going to bed.

7. **Sleep in a comfortable environment** - It’s important to sleep in an area that’s adequately quiet, comfortable, and dark. Try using an eye mask, ear plugs, and fans if this step causes problems.
<table>
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<th>Do:</th>
<th>Don't:</th>
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<tr>
<td>Establish a regular bedtime and rise time</td>
<td>Take daytime naps</td>
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<tr>
<td>Exercise in the late afternoon or early evening</td>
<td>Use stimulants such as caffeine and nicotine</td>
</tr>
<tr>
<td>Take a hot bath a couple of hours before bedtime</td>
<td>Drink alcohol before bedtime</td>
</tr>
<tr>
<td>Establish a comfortable sleep environment (e.g., bed, and bedding)</td>
<td>Go to bed too hungry or too full</td>
</tr>
<tr>
<td>Sleep in a dark, quiet area that is temperature and humidity controlled</td>
<td>Eat offensive foods, such as spicy or acidic foods (e.g., orange juice) before bed</td>
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<tr>
<td>Establish a relaxing pre-sleep routine that you use every night before sleep, such as</td>
<td>Try too hard to fall asleep</td>
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<td>washing your face, getting into pajamas, reading or listening to soft music before</td>
<td>“Watch the clock”</td>
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<tr>
<td>turning the lights out.</td>
<td>Take prescription and over-the-counter medications that might be stimulating (check with</td>
</tr>
<tr>
<td></td>
<td>your doctor)</td>
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So Are You Ready to Get a Good Night’s Sleep

- Our hope is that in reviewing these issues you are motivated to work on improving your sleep hygiene.
- We hope you will be willing to work on your sleep issues within the Support Services we offer here in your clinic.
- We look forward to working with you on your sleep issues.