TriHealth Sleep Centers

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TriHealth Sleep Centers
What is Sleep?

“Sleep is a natural state of rest during which energy is restored and the body heals its cells and tissues.”
What is Sleep?

Getting the right quality sleep is as essential to survival as food and water....
Cycle of Wellness

• DIET
• EXERCISE
• SLEEP
THREE KEYS

THE GOAL

- Physical Health
- Mental Health

DIET
- Regular Breakfast
- Avoid heavy meals before bedtime
- Moderate Alcohol Use
- No Smoking

SLEEP
- Regular Bedtime and Risetime
- Allow Enough Hours
- Avoid Daytime Napping
- Avoid Stimulants and/or Sedatives

EXERCISE
- Regular Exercise
- Maintain Proper Weight
Thomas Edison (1847-1931)

The first public demonstration of the Thomas Edison's incandescent lighting system was in December 1879, when the Menlo Park laboratory complex was electrically lighted.

Edison spent the next several years creating the electric industry.

The modern electric utility industry began in the 1880s. It evolved from gas and electric carbon-arc commercial and street lighting systems.

On **September 4, 1882**, the first commercial power station, located on Pearl Street in lower Manhattan, went into operation providing light and electricity power to customers in a one square mile area; the electric age had begun.
SLEEP DEPRIVATION (1)

• We need about 8.1 hours of sleep to restore brain function.

• Before Thomas Edison’s invention of the light bulb, people slept an average of 10 hours a night; today Americans average 6.9 hours of sleep on weeknights and 7.5 hours per night on weekends (NSF’s 2002 Sleep in America poll).
We need about 8.1 hours of sleep to restore brain function.

**Hours of Sleep**

<table>
<thead>
<tr>
<th></th>
<th>Sun Light</th>
<th>After Light Bulb</th>
<th>Weekends</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours</td>
<td>12</td>
<td>6</td>
<td>8</td>
</tr>
</tbody>
</table>

NSF’s 2002 Sleep in America poll
SLEEP DEPRIVATION (2)

- Human circadian rhythm has not changed at all - but the world has now become 24/7.

- Today 63 million of us are sleep deprived.
SLEEP CHANGES AS WE GROW OLDER

- Sleep architecture (or stages) changes with age.
- Nighttime sleep is more likely to be disturbed.
- The elderly tend to experience more conditions that adversely affect sleep quality and duration.
- Older people tend to nap more than younger adults.
Association Between Sleep Duration and Metabolic Function

- Inflammation
- Sleep Loss or Deprivation
- Altered Circadian Rhythm
- Altered Glucose Metabolism
- Reduced Energy Use
- Increased Appetite

- Insulin Resistance or Diabetes
- Obesity
- Hypertension
SLEEP PROBLEMS

• **Self-Induced**: Lifestyle choices (caffeine, alcohol, nicotine, shift work, sleep procrastination).

• **Environmental**: Light, noise, temperature, comfort.

• **Medical/Psychological Condition**: Pain, anxiety, depression, medication.

• **Sleep Disorders**: Conditions that disrupt the quality of sleep and affect your daytime function, safety, overall health and the quality of life.
COMMON SLEEP DISORDERS

1 Disorders of Initiating and Maintaining Sleep (*Insomnia*)

- Stress related.
- Multiple awakenings from breathing problems, pain, intestinal problems.
- Use of medications and/or alcohol.
"No wonder you have insomnia... lying there awake all night."
Common Sleep Disorders

2 Disorders of Sleep/Wake Schedule

• Shift Workers
• Jet Lag
• Phase Shift Disorders
• Irregular Sleep-Wake Rhythm (Non-24)
Common Sleep Disorders

Parasomnias and Disorders Associated with Sleep and Sleep Stages

- Sleep Walking
- Sleep Terrors
- Nightmare Disorder
- REM Behavior Disorder
- Bedwetting
Common Sleep Disorders

4 Disorders of Excessive Somnolence (EDS)

- Obstructive Sleep Apnea (OSA).
- Periodic Limb Movements
- Narcolepsy
- EDS from use/abuse of medications and/or alcohol.
Sleep Apnea
Sleep Apnea…what is it?

Apnea:

“A temporary cessation of breathing”

Sleep Apnea:

“A common disorder in which you have one or more pauses in breathing or shallow breaths while you sleep.”
Sleep Apnea...what occurs?

Sleep Apnea:
- Breathing stops or becomes very shallow for at least 10 sec.
- Blood oxygen levels drop.
- Individual awakens briefly, gasps for breath.

Repeat...
Sleep Apnea…what is it?

- Sleep Apnea is a serious, potentially life-threatening breathing disorder which affects 6 million adult Americans.
- Some studies indicate that it is associated with an increased risk of heart attack and stroke.
- More common in men than women.
- Experienced by sufferers as a lack of airflow throughout the night.
Comorbid Conditions

- Hypertension (40-60% of people with HTN have OSA)
- Diabetes (Up to 40% of people with OSA will have diabetes)
- Cardiac Disease (30% of patients with cardiac disease have OSA)
- Atrial Fibrillation
- Congestive Heart Failure
- Pulmonary Hypertension
- Obesity
Sleep Apnea...what occurs?

Non-Obstructed Airway

Obstructed Airway
Sleep Apnea…signs & symptoms

- Brief interruptions of air flow during sleep and loss of oxygen.
- Repetitive arousals, often unnoticed, during sleep.
- Falling asleep at inappropriate times during the day, such as while driving, working or when sedentary.
- Early morning headaches.
- Depression, irritability and sexual dysfunction.
- Difficulties with concentration and memory.
Sleep Apnea...diagnostic criteria

- **Sleep apnea syndrome:**
  - 5 or more apneas + hypopneas episodes per hour.
- **AHI – Apnea hypopnea index**
- **Hypopnea:** Abnormally slow or shallow breathing
  - 30% reduction of airflow lasting 10 seconds or more with oxygen desaturation of ≥ 4%.
- **The “gold standard” for diagnosing Sleep Apnea is the polysomnography (PSG).**
How can a Sleep Center Help?

• Sleep Specialists
• Questionnaires
• Psychological Profile
• Polysomnography

• Sleep Diary
• Physical Exam
• MSLT/MWT
• QOL Follow-up
## Epworth Sleepiness Scale

How likely are you to doze off or fall asleep in the following situations, in contrast to feeling just tired? This refers to your usual way of life in recent times. Even if you have not done some of these things recently, try to work out how they would have affected you. Use the following scale to choose the most appropriate number for each situation:

- 0 = would never doze
- 1 = slight chance of dozing
- 2 = moderate chance of dozing
- 3 = high chance of dozing

<table>
<thead>
<tr>
<th>Situation</th>
<th>Chance of Dozing</th>
</tr>
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<tbody>
<tr>
<td>Sitting and reading</td>
<td></td>
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<tr>
<td>Watching TV</td>
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<tr>
<td>Sitting, inactive in a public place (e.g., a theater or a meeting)</td>
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<tr>
<td>As a passenger in a car for an hour without break</td>
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<tr>
<td>Lying down to rest in the afternoon when circumstances permit</td>
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<tr>
<td>Sitting and talking to someone</td>
<td></td>
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<tr>
<td>Sitting quietly after a lunch without alcohol</td>
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<tr>
<td>In a car, while stopped for a few minutes in traffic</td>
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TOTAL ____________________

< 8: normal sleep
8-10: mild sleepiness
11-15: moderate sleepiness
16-20: severe sleepiness
21-24: excessive sleepiness
Goals of the Sleep Center

- Diagnose and treat the immediate problem
- Educate the patient, correct inappropriate behaviors and habits.
- Interact with other medical professionals to address the patient’s special needs.
- Improve the patient’s quality of life.
Refer to the Sleep Lab
<table>
<thead>
<tr>
<th>POLYSOMNOGRAPHY</th>
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<tbody>
<tr>
<td>• EYE MOVEMENT</td>
</tr>
<tr>
<td>• CHIN MUSCLE</td>
</tr>
<tr>
<td>• SNORE MIC</td>
</tr>
<tr>
<td>• BRAIN WAVES -</td>
</tr>
<tr>
<td>EEG</td>
</tr>
<tr>
<td>• HEART ACTIVITY -</td>
</tr>
<tr>
<td>EKG</td>
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<tr>
<td>• LEG MUSCLE -</td>
</tr>
<tr>
<td>EMG</td>
</tr>
<tr>
<td>• AIRFLOW</td>
</tr>
<tr>
<td>• CHEST EFFORT</td>
</tr>
<tr>
<td>• ABDOMINAL</td>
</tr>
<tr>
<td>EFFORT</td>
</tr>
<tr>
<td>• BLOOD OXYGEN</td>
</tr>
<tr>
<td>LEVEL</td>
</tr>
<tr>
<td>• BODY POSITION</td>
</tr>
<tr>
<td>• VIDEO MONITORING</td>
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</tbody>
</table>
Home Sleep Test

- SNORE MIC
- HEART RATE
- AIRFLOW
- CHEST EFFORT
- BLOOD OXYGEN LEVEL
- BODY POSITION
Polygraphosaurus Rex
(Ink Slinging Dinosaur)

- Grass Model 78
- Paper Tracings
Paper Trace - 30 sec pages
Computerized Polysomnography
Home Sleep Testing

• Now may be used instead of In-Lab testing
• Limitations:
  – not indicated if more than just sleep apnea
  – Reliability of data
Respiratory Disturbance – Obstructive Apnea (30 sec)
Series of Respiratory Disturbances - (240 sec)
Controlled Respiratory Disturbances Using CPAP (240 sec)
Sleep Study Report

Detailed report of:

• Sleep staging and architecture.
• Type and frequency of sleep disorder events.
• Oxygen levels
• ECG and heart rate
• Behavioral observations.
What is the rating of severity of Sleep Apnea?

- Mild: AHI 5-15 /hr
- Moderate: AHI 15-29 /hr
- Severe: AHI ≥ 30 /hr
What About Treatment?
**OSA Treatment Has a Major Impact on Comorbidities**

After one year, patients surveyed state OSA treatment delivers...

**Insomnia**
- 7x increase in good quality sleep
- Decline from 54% to 1% reporting “very bad” quality sleep

**Depression, Anxiety and Mental Health**
- 12x increase in “good quality” sleep
- 4x reduction in reported life threatening mental health condition
- 49% report improved mental health

**Heart Disease**
- 56% report reduced heart disease risk
- 5x decrease in self-reported life-threatening heart disease
- Decline from 50% to 3% reporting “very bad” quality sleep
- Increase from 0% to 26% reporting “very good” quality sleep
OSA Treatment Has a Major Impact on Comorbidities

After one year, patients surveyed state OSA treatment delivers...

**Hypertension**
- 41% report blood pressure improvement
- 17% report decrease in medication usage

**Diabetes**
- 31% report improved HbA1c
- 14x increase in “good quality” sleep

**Asthma & Breathing Conditions**
- 54% report improved respiratory function
- 70% increase in patients reporting symptoms as mild
- 8x increase in “good quality” sleep
Behavioral Therapy

• Weight Loss (A High Priority)
  – Decrease pharyngeal fat, increase upper airway size, reduce oxygen desaturations
  – Bariatric Surgery???

• Avoidance of the supine position.

• Avoidance of exacerbating substances (i.e., ETOH).
Inspire Therapy (Upper Airway Stimulation)

Monitors breathing during sleep and delivers mild stimulation to keep airway open.
Nasal CPAP

- Continuous Positive Airway Pressure
- Treatment of choice for sleep apnea
- Creates a “pneumatic splint”
- Improves ventilation and oxygenation
- Biggest Challenge:
  - Compliance/Adherence
PAP Devices

- Nasal continuous positive airway pressure (CPAP)
- Nasal Bilevel PAP
- Auto CPAP
- Adaptive Servoventilation (AVAPS)
- Bipap ASV
Figure 1  An Assortment of continuous positive airway pressure masks.
Positive Airway Pressure (PAP) Therapy

During Sleep Apnea area is completely blocked

With CPAP Mask
The CPAP Titration
Recommendations for Better Sleep

TIPS AND STRATEGIES

• Avoid caffeine, nicotine and alcohol in the late afternoon and evening.
• Exercise regularly, but do so at least three hours before bedtime.
• Establish a regular, relaxing bedtime routine that will allow you to unwind and send a "signal" to your brain that it's time to sleep.
• Avoid exposure to bright light before bedtime.
• Consider your sleep environment - make it as pleasant, comfortable, dark and quiet as you can.
Recommendations for Better Sleep (cont.)

TIPS AND STRATEGIES

• If you can't go to sleep after 30 minutes, don't stay in bed tossing and turning - get up and involve yourself in a relaxing activity such as listening to soothing music or reading.

• Associate your bedroom with sleep.

• A trip to the doctor is always a good first step if you think you have a sleep problem or are experiencing excessive daytime sleepiness or fatigue. A sleep specialist can determine whether you are suffering from a sleep disorder or if there are other underlying problems contributing to your lack of sleep.
WHAT'S AHEAD?

- The good news? Sleep knowledge is growing in leaps and bounds, and sleep research is expanding.
- Research into the use of melatonin and growth hormone continue; these approaches may prove promising for older adults with sleep problems.
- At this time, however, these hormones remain experimental and caution is in order.
- New medications for many sleep disorders are under study, with some nearing U.S. Food and Drug Administration (FDA) approval.
Cycle of Wellness

- DIET
- EXERCISE
- SLEEP
ACKNOWLEDGEMENTS:

- National Sleep Foundation
  www.sleepfoundation.org

- American Academy of Sleep Medicine
  www.aasmnet.org
Questions ?

got questions?

Questions are guaranteed in life; Answers aren't.