LIFESAVERS ● April 23, 2018 ● San Antonio, TX
2:15 – 3:45 PM
Room 214 D

Asleep at the Wheel
Understanding and Preventing Drowsy Driving

aasm.org

Conflict of Interest Disclosures for Speakers

1. I do not have any potential conflicts to disclose.
2. I wish to disclose the following potential conflicts of interest:

<table>
<thead>
<tr>
<th>Type of Potential Conflict</th>
<th>Details of Potential Conflict</th>
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<tbody>
<tr>
<td>Grant/Research Support</td>
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<td>Consultant</td>
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<td>Speakers' Bureau</td>
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<td>Financial support</td>
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<td>Other</td>
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3. The material presented in this lecture has no relationship with any of these potential conflicts, OR
4. This task presents material that is related to one or more of these potential conflicts, and the following objective references are provided as support for this lecture:
   1. 
   2. 
   3.

American Academy of Sleep Medicine (AASM)

- 11,000 physicians, scientists, allied health professionals, accredited sleep centers
- leader in setting standards and promoting excellence in sleep medicine health care
- 2014 – Sleep and Transportation Safety Awareness Task Force (STSAFF)
- 2017 – Occupational Sleep Health and Wellness Presidential Committee

Mission

- Engage occupations and populations at risk for sleep deprivation
- Provide education
  - Effects of sleep deprivation
  - Fatigue management strategies
- Monitor regulatory agencies’ actions related to sleep health and safety risks in employees
  - safety-sensitive positions, have sleep disorders

Healthy sleep, sleepiness and sleep disorders: role in motor vehicle accidents

Sleepiness and Accidents: A Crash Course

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Director, Sleep Disorders Clinic
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Healthy sleep, sleepiness and sleep disorders: role in motor vehicle accidents

Shift work and crash risk (25 min)

Sleep deprivation and crash risk (25 min)

Occupational Sleep Health and Wellness Presidential Committee
Some of our activities

Position statement about addressing sleepiness and accidents in EMS and ride hailing industry
Educational materials on sleep apnea, shift work, insomnia, sleep hygiene, drowsy driving, fatigue management
Response to withdrawal of Notice of Proposed Rulemaking on sleep apnea

Outline

• What is the difference between healthy sleep and disordered sleep?
• What determines alertness?
• What are some sleep disorders that can impact driving safety?
  – Obstructive sleep apnea
  – Shift work
  – Sleep deprivation

What determines alertness?

HOMEOSTATIC DRIVE FOR SLEEP
- Internal Factors
  - Stress/anxiety
  - Urgency
  - Motivation
- External Factors
  - Alcohol, caffeine
  - Medications
  - Noise
  - Physical activity

CIRCADIAN DRIVE FOR WAKEFULNESS
- Increased behavioral capability
- Reduced behavioral capability

Normal sleep architecture

Disorders that cause sleepiness

- Length of time awake
- Duration of sleep
- Quality of sleep
- Time of day

Conditions associated with daytime sleepiness

- Sleep disorders
  - Obstructive sleep apnea
  - Other sleep disorders (e.g., periodic limb movements, restless legs syndrome, narcolepsy)
- Some medical disorders
- Some psychiatric disorders
- Some medications
- Some behaviors (sleep hygiene)
Obstructive Sleep Apnea

• What is obstructive sleep apnea?
• Who is likely to have it?
• How common is it?
• What are the usual symptoms?
• What are the consequences?
• Can we diagnose it quickly and at low cost?
• Can it be treated?
  – Does treatment help?
  – Does treatment make sense economically?

Sleep apnea: what actually happens?

EXEMPLARY OF AN APNEA

OSA AND OXYGEN LEVEL DURING SLEEP

Why are some people at risk for sleep apnea?

• OBESITY
• OBESITY
• OBESITY
  • Airway crowding
    – Large tonsils
    – Large tongue
    – Small jaw
  • Heredity
• Middle age/older
• Male gender
• Female gender, after menopause
• Nasal congestion
• Alcohol, sedatives, narcotics
As obesity becomes more common, so does sleep apnea
prevalence data from 1994 was used to model current prevalence rates, based on recent age, sex, BMI data from NHANES

<table>
<thead>
<tr>
<th>Year</th>
<th>Men</th>
<th>Women</th>
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<tbody>
<tr>
<td>1994 (Young et al) (state employees, age 30-60 years)</td>
<td>9%</td>
<td>4%</td>
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<tr>
<td>2007-2010 (Peppard et al)</td>
<td></td>
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<tr>
<td>30-49 years</td>
<td>10%</td>
<td>3%</td>
</tr>
<tr>
<td>50-70 years</td>
<td>17%</td>
<td>9%</td>
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Studies have linked OSA to crashes
Research studies that were evaluated

<table>
<thead>
<tr>
<th>Research studies that were evaluated</th>
<th>Odds of crash</th>
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<tr>
<td>18 studies in car drivers; 2 in truck drivers</td>
<td>1.21-4.89</td>
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In-lab sleep study
- Brain waves
- Eye movement
- Chin, leg muscles
- Chest and abdomen effort
- Airflow, snoring
- Oxygen level
85% of cases remain undiagnosed

Life with sleep apnea
worse with weight gain

Nighttime
- Apneas, Hypopneas (observed by others)
- Snoring
- Choking, Gasping
- Frequent urination

Daytime
- Sleepiness
  - ↑ Crash risk
  - ↓ mood, memory, concentration, attention, decision-making
- Reaction time
- Morning headache
- Impotence
- ↑ productivity
- Absenteeism

Long-term
- Hypertension
- Heart disease
- Stroke
- Pre-diabetes
- Death

Costs of crashes due to undiagnosed OSA
(2015, U.S.)

Portable sleep study
- Chest and abdomen effort
- Airflow, snoring
- Oxygen level
Is sleep apnea treatable?

Continuous positive airway pressure (CPAP)

In addition to improving oxygen level and sleep quality, what are the benefits of CPAP?

- CPAP lowers crash risk
- blood pressure
- heart disease, stroke
- mortality
- health care costs

Continuous positive airway pressure (CPAP)

How do we know if patients are using CPAP?

Monitoring therapy

- Did they wear it?
- Did the mask leak?
- Is apnea still present?

1. Tregear, Sleep, 2010
5. Buchner, AJRCCM, 2007
7. Yaggi, NEJM, 2005
8. Martinez-Garcia, AJRCCM, 2009
9. Albarrak, Sleep, 2005
Summary

Sleep apnea
  – is common
  – causes sleepiness
  – is linked to crashes, as well as major economic and health outcomes
  – can be diagnosed in the home/berth

CPAP treatment
  • is inexpensive
  • is accessible
  • lowers crash risk
  • improves many health conditions
  • lowers health care costs
  • can be tracked in real-time

Occupational Sleep Health and Wellness: Dream Team

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Questions?