Practical Aspects of Sleep Disorders in Occupational Medicine

(FOR HANDOUT ONLY)

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Disclosure information
Western Occupational Health Conference 2011

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• I have the following financial relationships to disclose:
  – I have noting to disclose
  – I will not discuss off label use and or investigational use in my presentation.
Practical information: “What you can use tomorrow”

• Regularly perform commercial driver medical examinations

• Accountable for company health safety policy and performance

• Care for a company that has employees working “non-standard” hours or public safety sensitive occupations
  • Trucking  Marine Aviation Railroad
  • Military

• “Executive health” responsibilities
Agenda

• **Clinical**
  – Sleep basics
  – Relevant sleep disorders:
    • Ten questions.

• **Public Health**
  – Commercial driver examination

• **Policy**
  – Organizational resources

• Further information resources
“How can I stay awake”
“Why am I sleepy”

• Sleepy vs. Tired

• Two process:
  – Homeostatic
  – Circadian
    Time of day > Time on task

• Workload (time on task)
Causes of Fatigue
Core and Modulating Risk Factors

• **Core Risk Factors**
  – Insufficient Sleep
  – Poor Sleep Quality
  – Fragmented Sleep
  – Main Sleep During Day (Circadian)
  – Changing work/rest schedule
  – Long work days
  – No opportunity to make up sleep

• **Modulating Risk Factors**
  – High Workload
  – Lack of control of work environment
  – Exposure to extreme environments
  – Poor Diet
  – Exercise
  – High Stress: Work, Family, Isolation
How to diagnose:
History  Physical
Laboratory confirmation

• STRUCTURED SLEEP INTERVIEW

• Ten questions:

• “You sleepin’ okay”?
# Basic Sleep History

<table>
<thead>
<tr>
<th>1. Bed time</th>
<th>3. Sleep Latency</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Sleep hygiene]</td>
<td>“How long does it take you to fall asleep” [Upper limit of normal: 30 minutes]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Wake time (Out-of-Bed)</th>
<th>4. Wake After Sleep Onset (WASO-Number)</th>
</tr>
</thead>
<tbody>
<tr>
<td>[“Are you refreshed?”] [Total time in bed: 7 hours] [Alarm clock]</td>
<td>(“Do you know what wakes you up?”)</td>
</tr>
</tbody>
</table>
Keep the “F” in **SHIFTWORK**

- 5. When do you work?
  - Shifts rotate?

- 6. How long is your commute?
Obstructive Sleep Apnea

• 7. “Do you snore”,
• 8. “Stop breathing in your sleep”,
• 9. “When you awaken, are you refreshed”? 
• 10. “Sleepy during the day”? 
Sleep Disorders: Risks and Findings

• **Obstructive Sleep Apnea: (Risks)**
  1. Body Mass index (central obesity),
  2. Oropharyngeal lumen: Mallampati score
  3. Craniofacial abnormalities:
     • (Dolichocephalic): maxillary narrowing, ogival palate, regressed chin
     • (Brachycephalic): retrusive maxilla

• **Insomnia:**
  – Anxiety, depression, bipolar spectrum disorder, autism spectrum disorder, PTSD

• **Narcolepsy:**
  – Sleep attacks, cataplexy, hypnic hallucinations, sleep paralysis, HLA narcolepsy antigens

• **Central Sleep Apnea:**
  – Heart Failure, opiate medications, Intercranial lesions (stoke, trauma, tumor)

• **Restless legs/Periodic limb movements**
  – Iron deficiency, SSRI, Dialysis, neuropathy...

• **Parasomnias:**
  – Sleep behavior: bruxing, eating, wandering, dream enactment;
   Parkinsons, Medications, Psych issues, brain lesions
The Medical Certification Examination for Commercial Drivers

• Is more complex than it appears
  – Many conditions affect driving ability
  – Certification relies heavily on examiner judgment

• Our clients depend on us to “Do It Right”

• It’s different than any other exam that we are taught in medical school and residency

• This training is important both for content as well as context
“Form”
Link Medical Condition and Driver Function

• “Identify conditions that would affect the drivers ability to operate a commercial motor vehicle safely”

• “According to the requirements of [Federal Standards] 49 CFR 391.41-49”

• The physical should be “at least as complete as is indicated...on the form”

49CFR 391.41 “Instructions to the Medical Examiner, General Information”

• Who can do them: ILHCP’s
(MD’s/DO’s; N.P’s P.A.’s; Chiropractors)
Regulation vs Guideline

• Regulation: “Has no ______ likely to interfere with safe operation of a commercial motor vehicle” (vague)

• Guideline: What aspects of the medical condition are likely to interfere:

• Interpretive guidance formulated by medical subject matter experts

• Guidelines are not law, they are standard of practice. If not followed, you are “on your own” to explain.
“Likely”

- **FORWARD** (Certification)
  - RISK ASSESSMENT - medical condition - likelihood of accident -
  - DUTY, PUBLIC SAFETY - other drivers

- **BACK**, (accident)
  - Held to account for decisions
  - Is there a different standard?

- Ecologic fallacy

- “Dispassionate approach” seems against our training as a physicians but is REQUIRED of people who perform DOT exams

- Can not predict the future - follow published guidelines
Pathological Fatigue and Sleep Apnea

• Risk of crash relates to fatigue:
  • Sleep debt: Insufficient sleep time OR Sleep disturbance
  • Circadian issues (Hours of Service regulations)
  • Time on task

• Sleep Apnea: Those affected with this condition are frequently unaware that they have it

• Drivers with sleep apnea have a 2-7 fold higher risk of accident involvement

• Studies of Sleep Apnea in drivers
  • 28.1 to 78% prevalence in total
  • Severe Sleep Apnea between 4.7 and 10%
Screening for Sleep Disorders in Clinic

Positive predictive value depends on prevalence of condition within the population

• Varying driver prevalence estimates:
  • Stooohs: 10-78%
    – (High prevalence condition)
  • Pack: 5-18%
    – (Prevalence like that of general population)
DOT Guidelines for Medical Certification and Sleep Disorders Range from the Categorical to the Conditional

- “Individuals with suspected (emphasis mine) or untreated Sleep Apnea should be considered medically unqualified...” — Pulmonary Consensus conference

- “Patients with sleep apnea syndrome having symptoms of excessive daytime somnolence cannot take part in interstate driving...” — Neurology Consensus Conference
• IN SERVICE
  – CONTINUE WORKING

• OUT OF SERVICE
  – NO DRIVING

• EVALUATION REQUIRED (3 months)
  – Criteria:
    – History
    – BMI > 35, Neck > 17, HTN (new uncontr., 2 or more meds)
    – Epworth > 10
    – Known sleep disorder
      Compliance claimed but unknown
    – Mild-Moderate OSA (PSG) not sleepy (ESS), No MVA, HTN simple controlled

  – Criteria:
    – Witnessed Sleeping or confessed sleepiness
    – Fall asleep accident
    – Epworth > 16 *
    – Known sleep apnea non-compliant, no recent f/u, surgery no f/u test
Conflicting recommendations:

• Consensus Document: Chest 2006
• Expert Panel Recommendations: FMCSA MRB
• FMCSA Medical Examiner Handbook
  – (between and within)
• FMCSA Pulmonary Guideline
• FMCSA Neurology Guideline
DOC-Don’t waste my time...

Diagnostic referral issues

• “I DON’T HAVE A PROBLEM !”
  – “Driving many years without accident”
  – “I’m not tired or sleepy!”

• THIS IS GOING TO COST ME...My job, Money I don’t have,

• “SHOW ME”
  – Driver must perceive the need

  – Questionnaires or risk scales:
    Subjective and context dependent
    • Epworth
    • Berlin (Snoring, Apneas, non-refreshing sleep, daytime fatigue, driving, hypertension, BMI)
    • Flemmons (adjusted neck circumference)
    • Maislin (BMI based - 35 kg/m$^2$)

• Ambulatory monitoring for “risk assessment”: oximetry, airflow, sleep

• CPAP-Auto: Documentation of treatment efficacy *
When we refer a Driver to sleep docs, we get the following:

- Statement from the sleep specialist:
- Accurate diagnosis
- Meets FMCSA (Published) Guidelines for operation of a Commercial Motor Vehicle
- Driver must agree to monitoring and treatment compliance
Summary: Sleep Apnea

• Don’t rely on questionnaires or other clinical tests to diagnose sleep apnea. They are context dependent.

• (Identify RISK)

• Develop a relationship with a sleep specialist.

• Follow the FMCSA guidelines in qualifying drivers. (consider other published sources)

• Document everything.
“Problematic Areas”

• What we are NOT told by the drivers in the health history...
• Federal guidelines are not always current or clear-examiners judgment in certifying
• Economic issues:
• (Don’t ask) Employer: Needs Driver
• (Don’t tell) Driver: Needs job
• -Opt out- ”Walk down the street and try again”
• Doctor: Public safety duty v. Duty to patient
What’s the solution?

• Get more information
• Don’t be afraid to defer qualification (even if temporarily)
• Don’t be afraid to limit duration of medical card (2 years is the MAXIMUM duration)
• Sleep apnea gets one year
• Know what you’re signing
I certify that I have examined

1. In accordance with the Federal Motor Carrier Safety Regulations (49 CFR 391.41-391.49) and

2. With knowledge of the driving duties,

I find this person is qualified; and, if applicable,

- only when: wearing corrective lenses
- driving within an exempt intracity zone (49 CFR 391.62)
- wearing hearing aid
- accompanied by a Skill Performance Evaluation Certificate (SPE)
- accompanied by a ____________ waiver exemption
- Qualified by operation of 49 CFR 391.64

CONTINUED NEXT SLIDE
The information I have provided regarding this physical examination is true and complete.

A complete examination form with any attachment embodies my findings completely and correctly, and is on file in my office.

________________________________  __________    _____
SIGNATURE OF MEDICAL EXAMINER  TELEPHONE   DATE

MEDICAL EXAMINER’S NAME (PRINT)

MEDICAL EXAMINER’S LICENSE OR CERTIFICATE NO./ISSUING STATE

SIGNATURE OF DRIVER ADDRESS OF DRIVER

MEDICAL CERTIFICATE EXPIRATION DATE  _____________
My Recommendations 1

• Careful attention to:
  – Sleep Apnea Risk and diagnosis/treatment
  – Medication issues
• Follow the rules
• Document—Document--Document
• Remember who you’re working for
My Recommendations 2

• Tell your drivers to see their own doc three months in advance of expiration of their card: no surprises on DOT exam day
• Otherwise
• Drivers lack of planning becomes
  – HIS financial problem and
  – YOUR headache if he can not work
“The Future”

• National Registry Of Certified Medical Examiners (NRCME )
• New MRB: planned updates on Guidelines
Employer issues

• We don’t have a problem with fatigue
  • How do you know if you haven’t looked
• That’s THEIR PROBLEM
  • Employee problems BECOME your problem
• I’ve got freight or passengers to move
  • You’ve got to train, attract and retain drivers/employees
• That’s why we pay for insurance
  • Punitive damages are NOT covered by insurance
• Won’t this be expensive
  • Pay me now, or pay me later
• You’re causing me labor problems
  • Multistate employers
• Training: We’re paying you to identify medical issues so we don’t have to.
Recognizing Fatigue in Accident Causation
Transportation Safety Board of Canada

Roles and responsibilities:

• Employee responsibility: fit for duty (HR Policies)
  – Fatigue as acute and chronic cognitive and intellectual deterioration
  – “Delirium” → “Dementia”

• Employer responsibility: safe workplace (OSHA)
  – Free from recognized hazards, or
  – Hazards controlled by recognized/proven techniques
    • Work practices- training
    • Engineering- substitution
    • Personal protective equipment

• Fatigue does not mitigate workers compensation liability
  – Contributory negligence, Fellow Servant, Assumption of risk

• Employer liability: Third parties
Competing Accountabilities

**Risk/Insurance**
- Workers Comp
- Prop/Casualty

**Human Resources**
- Driver Qualified?
  - Medical Qualification criteria
- Sleep Disorder Screening
  - “Witch hunt”

**Benefits**
- Cost reduction
  - Sleep disorder diagnosis and treatment

**Questions**
- What did you know?
- When did you know it?
- What did you do about it?
References

Clinical and Overall Sleep Medicine:
Principals and Practice of Sleep Medicine, Fifth edition, Kryger, Roth, Dement, Elsevier Press 2011.; cf. Chapter 9 “Occupational Sleep Medicine”

Commercial Drivers:
SLEEP APNEA CHECKER FOR COMMERCIAL TRUCK DRIVERS:  http://awake.truckersforacause.com/survey.html


Sleep Apnea Crash Risk Study: FMCSA TECH BRIEF available at:
http://www.fmcsa.dot.gov/facts-research/briefs/SleepApneaCrash-RiskStudy-TechBrief.htm

The “High Risk” commercial driver FMCSA Tech Brief, Available at:

Sleep Apnea FMCSA expert panel recommendations:

Sleep Apnea and Commercial Drivers: FMCSA

Company programs:


Public health:

Thank You

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