Evaluation of Research on Commercial Motor Vehicle Drivers with Moderate-to-Severe Obstructive Sleep Apnea: A Literature Review to Inform Industry Regulations

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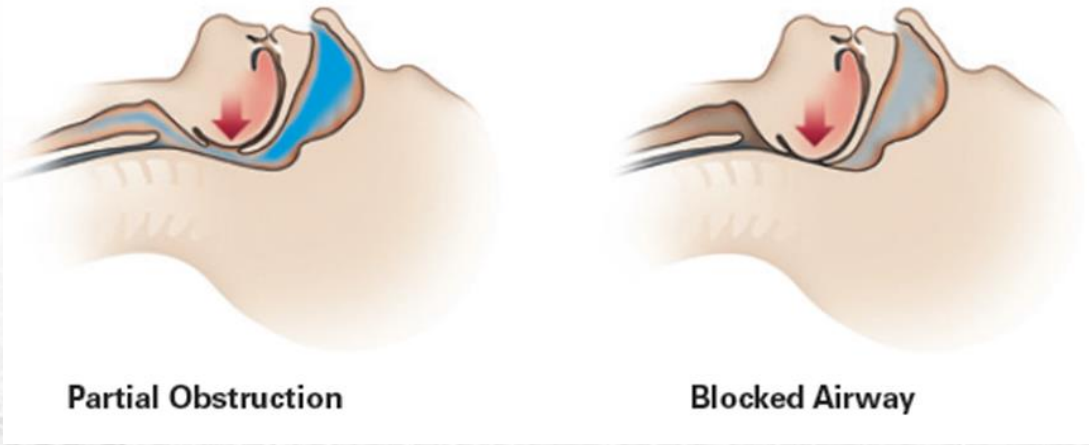
Problem

- Obstructive sleep apnea (OSA)
  - Excessive daytime sleepiness
  - Concern for safety-sensitive workers
  - Primary risk factors prevalent among CMV drivers
- OSA research questions that would guide federal rulemaking have been difficult to elucidate
  - Industry prevalence
  - Impact on safety
  - Cost/benefit



Objectives

- Summarized literature and data for CMV and other safety-sensitive industries:
  - Prevalence
  - Safety risks
  - Screening and testing
  - Treatment and effectiveness
  - Safety outcomes and benefits
  - Cost/benefit information
- Support and inform the rulemaking process for OSA regulations for the CMV industry
- Identify gaps to prioritize future research and data collection.

Methods

- Database searches
  - PubMed MEDLINE
  - Transportation Research Information Service
  - Occupational health literature
  - Sleep literature
  - Traffic safety research literature
- Publically available documents
  - Government reports and documents
  - Public comment documents

Results and Discussion

- OSA Prevalence
  - Models and existing data are available to estimate (Peppard 2013; Berger 2012)
    - Diagnostic industry data
    - Epidemiological population data
- Safety Risks of OSA
  - Consider OSA-related sleepiness and fatigue, independent of AHI
    (Howard 2004; Meuleners 2015; Chu 2014; Razmpa 2011; Akkoyunlu 2013; Pack 2006)
- Screening
  - STOP-Bang (Firat 2012; Minarowski 2015)
  - Rail and aviation practices may provide guidance for the CMV industry
    (Federal Aviation Administration 2016; Colquhoun 2016)
    - Lacking efficacy studies

Results and Discussion Cont'd

- Treatment and Effectiveness
  - *Health:* Factors beyond reduction in AHI should be considered
    - O2 desaturation, EDS, sleep latency, subjective sleep quality and quality of life
  - *Safety:* Additional evaluations needed (Burks et al., 2016)
- Criteria for Evaluating Effective Treatment
  - What AHI severity and symptomology indicates a need for effective treatment that produces positive outcomes
    - Mild OSA?
  - What level of severity of OSA predicts an increase in crash risk
    - Symptomology vs. AHI severity?

Results and Discussion Cont'd

- Costs and Benefits
  - Existing models favor long-term cost savings and benefits
    (Hoffman et al., 2010; Frost & Sullivan, 2016)
  - Costs imposed on drivers MUST be considered when drafting regulations
  - Barriers to CMV driver acceptance of OSA programs and regulations
    (Mabry et al., 2012; Boris et al., 2016)
    - Significant out-of-pocket costs
    - Lack of carrier financial assistance
    - Inadequate or lacking medical insurance benefits
    - Repeated sleep test referrals

Summary

- Gaps identified which may prioritize future research and data collection
  - OSA in transportation operations and the impact on CMV safety
- Support and inform the OSA rulemaking process

- Synthesis of current practices and perspectives from carriers and medical examiners
  - Insights gleaned from carrier on the feasibility, practicality, and acceptance of potential future rulemaking
  - Interviews with medical examiners to determine current OSA practices identified gaps that may inform future research, education, and practice of medical examiners

Questions?

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