VTTI - Driving Transportation with Technology

Case Study on a Worksite Sleep Disorder Program for Commercial Motor Vehicle Drivers



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Presentation Overview

- My research focus is on truck driver behavior and performance
- The link between driver health and on-road safety
- What is OSA and why is it important?
- What can carriers do to address OSA?
- Case study
- Recommendations

Studying Truck Driver Behavior

- One approach used at the Virginia Tech Transportation Institute (VTTI) to study on-road behavior is through Naturalistic Driving Studies
- Unobtrusive cameras and data collection equipment installed in drivers' own vehicles
- Driver behavior in a real-world context

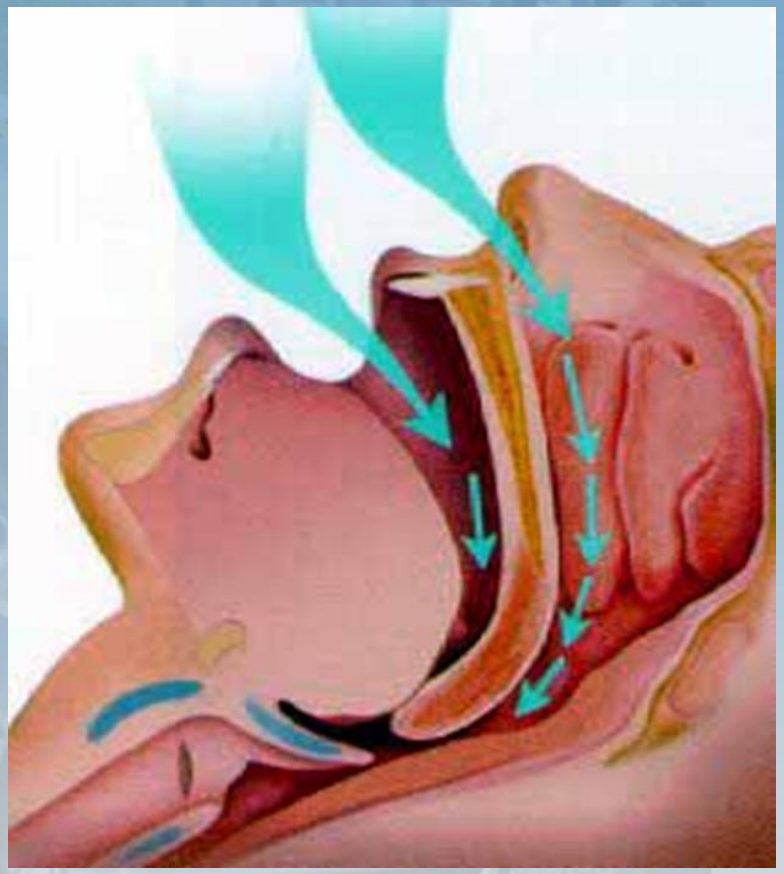


Identifying Risky Behaviors

- Driver distraction
  - Texting-while-driving associated with a 23 x risk of safety critical event
  - Eyes off of the forward roadway is associated with an increase in crashes and near-crashes
- Driver drowsiness
  - ~20% of all safety critical events
- Research findings have impacted hours-of-service regulations in the US

What is Obstructive Sleep Apnea (OSA)?

- Disorder characterized by repetitive upper airway collapse and obstruction during sleep
- Causes stressful arousals resulting in fragmented and insufficient restorative sleep
- Highly undiagnosed



OSA and Commercial Motor Vehicle (CMV) Drivers

- OSA is associated with overweight and obesity
- Prevalence of obesity among CMV drivers outpaces the general population
  - U.S. adults: ~34% (Flegal 2010)
  - CMV drivers: 50-70% (Wiegand 2009; Smith 2011)
- 28% of CMV drivers are anticipated have mild-severe OSA (Pack 2002)



Implications of OSA

- Health
  - Increases risk for diabetes, hypertension, and other cardiovascular complications
- Safety
  - Passenger car drivers with OSA are twice as likely to be involved in a crash (Sassani, Findley et al. 2004)
  - CMV drivers with OSA are likely to be at greater crash risk due to exposure
    - Risk may be exacerbated in long-haul CMV drivers due to poor sleeping conditions and irregular schedules



OSA Treatment

- Positive airway pressure (PAP)
  - Most prescribed and cost-effective
  - Splints airway to prevent collapse during sleep
  - Decreases OSA severity, improves sleep quality and reduces daytime sleepiness
- Automatic PAP
  - Adjusts to changes in airway pressure



OSA Mandates for CMV Drivers

- Federal Motor Carrier Safety Administration (FMCSA) has been urged (FMCSA Medical Review Board, NTSB, etc.) to mandate OSA screening and testing in all CMV drivers
  - Currently reviewing recommendations for OSA screening criteria
  - I$$UE$ with testing all drivers… $
- Until mandates are in place, carriers are responsible for initiating OSA programs to screen, test, treat and monitor OSA drivers
  - Schneider National Inc., J.B. Hunt, Prime Inc., Swift Transportation, among others

Case Study

- Schneider National Inc. (SNI) was among the earliest carriers to implement a sleep disorder program for CMV drivers
  - Precision Pulmonary Diagnostics (PPD®)
- Study Purpose:
  - Detail SNI's OSA program
  - Assess driver and staff opinions, perceptions, and program satisfaction
  - Develop recommendations for implementing an OSA program in CMV operations

METHODS

- Detail SNI OSA Program
  - Phone interviews and focus groups with executives and staff at SNI and PPD to accurately detail and describe their OSA program protocols
- Assessed driver and staff opinions and perceptions of OSA program
  - Driver and staff questionnaires
  - Focus group meetings with drivers

SNI OSA Program Summary

- Mandatory program initiated in 2006
- OSA provider: PPD
- Screening:
  - Somni-Sage® Questionnaire
    - Objective and subjective items divulge information re: OSA symptoms and coexisting conditions predictive for OSA
  - Driver referral
- Testing: Overnight laboratory polysomnography (PSG)
- Treatment: Automatic positive airway pressure (APAP)
- Drivers monitored for PAP compliance
  - Web-based compliance monitoring device
  - Data cards
- Long-term follow up and support
  - Phone/clinic support
  - PAP replacement supplies

Focus Group Summary: Drivers

- 88% reported satisfaction with OSA program

- ***Benefits***
  - Improved sleep quality
  - Increased energy
  - Feel well rested
  - Improved health
  - Less worry about falling asleep while driving

- ***Drawbacks***
  - Discomfort while sleeping
  - Mask discomfort
  - Being “tied to” PAP device
  - PAP complaints (home use, cleaning/care)
  - PAP compliance requirements
  - Sending in PAP data card

Focus Group Summary: Staff

- ***Program Supports***
  - Carrier support of program
    - Prioritize safety
    - Concern for driver health
  - Highest risk drivers prioritized for testing
  - Nationwide participating sleep laboratories
  - Quick turnaround from testing to treatment
  - OSA provider expertise and support
  - Consistent follow-up with drivers

- ***Program Challenges***
  - Driver acceptance
  - Time delays from screening to testing
  - Drivers struggle with PAP
  - Logistics (e.g., scheduling and accessing drivers)
  - Collection and organization of PAP compliance data-quantity
  - Technical limitations-PAP data cards
  - Improve OSA education for staff and drivers

Recommendations for Fleets Looking to Implement an OSA Program

- Evaluate program needs and parameters
- Establish a positive rapport with drivers
- Subjective and objective screening assessments
- Prioritize high-risk drivers for testing
- Compliance monitoring
- Educate carrier staff and form support groups



Project Take-aways

- Clear link between driver health and safety
- Worksite health interventions are ideal for CMV drivers
  - High risk group
  - Convenience of on-site care
  - Generally reduced costs
- Sleep disorder programs are a piece in the larger promotion of health & wellness
- Providing OSA screening, testing, treatment, and monitoring demonstrates carriers' commitment to driver health and roadway safety

Report and Best Practices

- Case Study Final Report published
  - Includes OSA program descriptions, focus group/phone interview results, and recommendations
  - http://vtechworks.lib.vt.edu/handle/10919/5529

Thank You!