Federal Motor Carrier Safety Administration
Office of Analysis, Research and Technology

Effects of a Fatigue Management Program on Fatigue in the Commercial Motor Vehicle Industry

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Development of a North American Fatigue Management Program

- Phase 1
  - Literature review and development of Fatigue Management Program (FMP) approach
- Phase 2
  - Development of educational materials and procedures for a field operational test
- Phase 3
  - Field operational test
- Phase 4
  - Finalization of recommended practice guidelines, tools, education and training materials

Sponsors

- Alberta Transportation (TRANS)
- Alberta Workers' Compensation Board (WCB)
- Commission de la santé et de la sécurité du travail du Québec (CSST)
- Société de l'assurance automobile du Québec (SAAQ)
- Transport Canada (TC)
- U.S. DOT, acting through FMCSA

In-kind, Operational, and Other Financial Support

- Alberta Motor Transport Association (AMTA)
- American Transportation Research Institute (ATRI), of the American Trucking Associations
- Association du camionnage du Québec (ACQ)
- Canadian Trucking Alliance (CTA)
- Respironics Inc.

Study Goals

1. To implement a comprehensive FMP, involving:
   - Educational sessions at all levels of company
   - Driver sleep disorder screening and treatment
2. To assess the implementation of the FMP through pre/post FMP comparisons of
   - Drivers' fatigue, sleep duration, satisfaction levels and performance
   - Corporate measures (e.g., absenteeism, claims) and perception of fatigue management practices and policies

Hypotheses

- A comprehensive FMP will:
  - Improve drivers' awareness of good sleep practices, result in better and longer sleep during work days
  - Lead to reduced fatigue and improved alertness, performance and road safety during work days
  - Lead to pronounced improvements for drivers treated for sleep disorders
  - Improve fatigue management practices in the company

Process

- Submit protocol to ethics committee
- Recruit companies
- Present overview to management
- Set up stakeholder committee
- Set up implementation committee
- Recruit drivers
- Collect pre-FMP driver and corporate data
- Present educational program at all levels in company
- Screen for sleep disorders and provide treatment
- Collect post-FMP driver and corporate data

Participating Companies

- Québec
  - Robert Transport based in Montréal
- Alberta
  - ECL Group based in Calgary and Edmonton
- California
  - J.B. Hunt Transport (headquarters based in Arkansas) and operating in 48 states
    - Locations used in northern and southern California: Fresno, Ontario, and Tracy

Participating CMV Drivers

- Inclusion criteria:
  - Minimum 3 yrs. driver's license, 1 yr. CMV license, 1 yr. with company
- Target:
  - 40 per site, expectation of 30 for post-FMP
- Final numbers:
  - 23 Alberta
  - 29 Québec
  - 25 California

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Pre- and Post-FMP Data Collection

Driver Data Collection

2 rest days	4–6 duty days	2 rest days
♦ Sleep-wake log ♦ Actigraphy ♦ Mood/fatigue assessment ♦ PVT	♦ Sleep-wake log ♦ Actigraphy ♦ Mood/fatigue assessment ♦ PVT ♦ Workload assessment ♦ Factors contributing to fatigue ♦ Critical incidents	♦ Sleep-wake log ♦ Actigraphy ♦ Mood/fatigue assessment ♦ PVT

Corporate Data Collection

- Company performance indicators
  - Examples: # Panic Brakes, Medical Claims
- Alertness Management Safety Evaluation
  - Completed by drivers, dispatchers, managers
  - Addressed perception of company fatigue policies and activities

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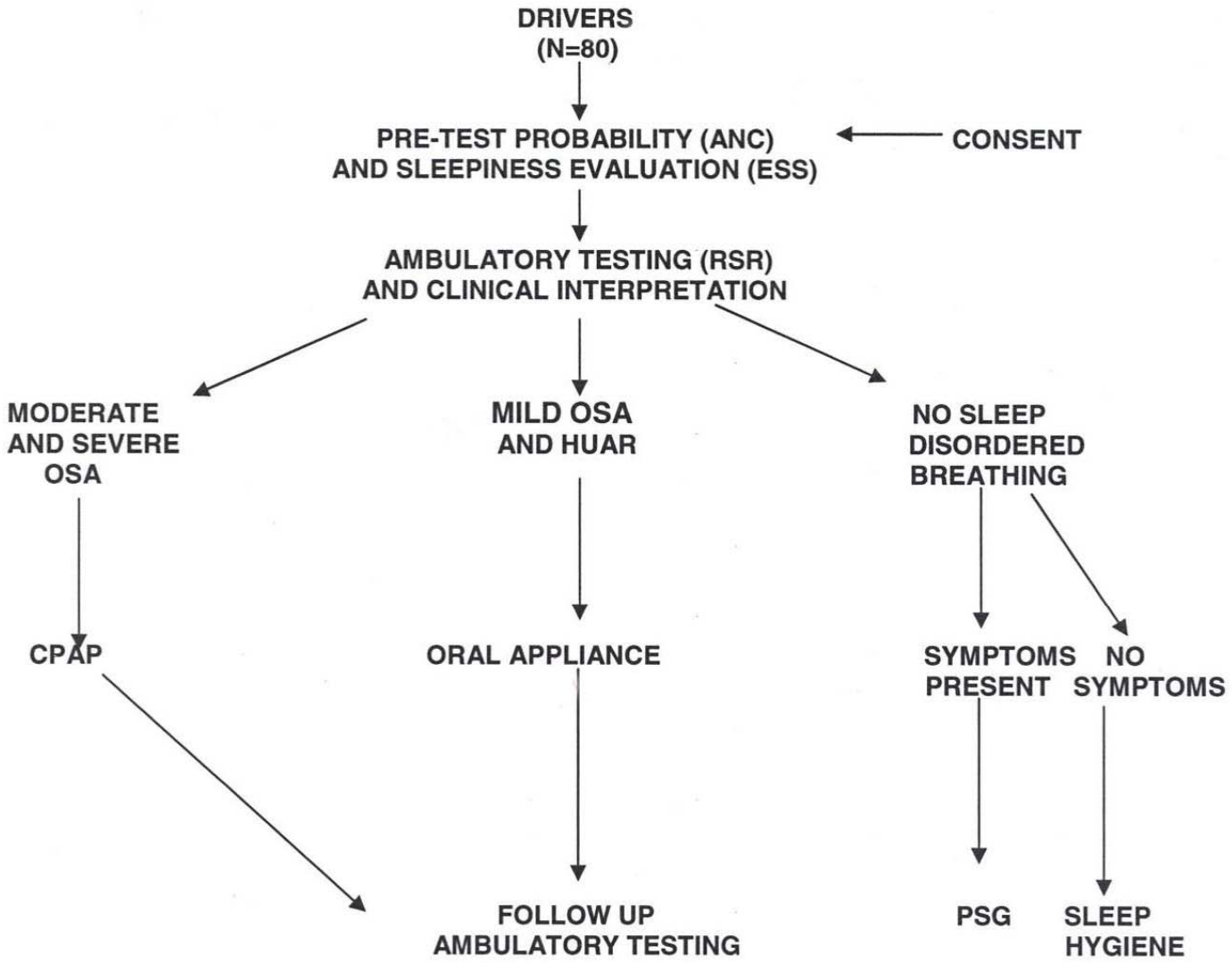
FMP Program

Education Program

- 4 modules
  - Core
  - Trip Planning
  - Wellness and Lifestyle
  - Sleep and Sleep Disorders
- Train-the-trainer
- Educational quizzes
- Bi-monthly newsletters



ANC: Adjusted Neck Circumference
CPAP: Continuous Positive Airway Pressure
ESS: Epworth Sleepiness Scale
HUAR: High Upper Airway Resistance
PSG: Polysomnogram
RSR: Remmers Sleep Recorder
SDB: Sleep Disordered Breathing

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Results of Sleep Disorder Screening and Treatment

Sleep Apnea Diagnosis n=94

Percentage	Diagnosis (RDI hr.$^{-1}$)
29%	No Abnormality (less than 5)
39%	Mild (5 to 14.9)
23%	Moderate (15 to 29.9)
9%	Severe (less than or equal to 30)
100%	Total

Sleep Apnea Prevalence

- 71% with sleep apnea is a higher-than-average prevalence
  - Pack et al (2002) found 28% in a similar population
- Treatment for sleep apnea ranked 2.3 on a scale of 0 to 3 re reason for treatment

Adherence to Treatment

- Defined as CPAP use >4 hours/70% of nights
- Site A 60%
- Site B 69%
- Site C 5%
- Standard treatment by independent sleep physicians at all sites

Adjusted Neck Circumference Predictor

- 95% moderate apneics and all severe apneics had ANC>43
- Caveat:
  - This population had higher-than-average prevalence (71% vs. 28% – Pack et al. 2002)
  - ANC may be a less effective predictor in a more typical population

FMP Challenges

Challenges: FMP Education

- Time commitment for FMP Education
  - Four 90-minute sessions had to be reduced
- Difficulty of bringing large groups of drivers together at the same time
  - Combined sessions; web training
- Difficulty of subject matter for trainers
- Train the trainer not possible at 2/3 sites

Challenges: Sleep Apnea Screening and Treatment

- Issues re: drivers, identified with sleep apnea, driving before treatment initiated
- Involvement of non-company insurers due to lack of availability of sleep clinics
- Reluctance of insurers to fully support treatment of sleep apnea in CMV drivers
- Adherence to treatment

Contact Information

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