

SLEEP APNEA & OTHER SLEEP DISORDERS

An Information Resource Guide

Provided by the National Private Truck Council

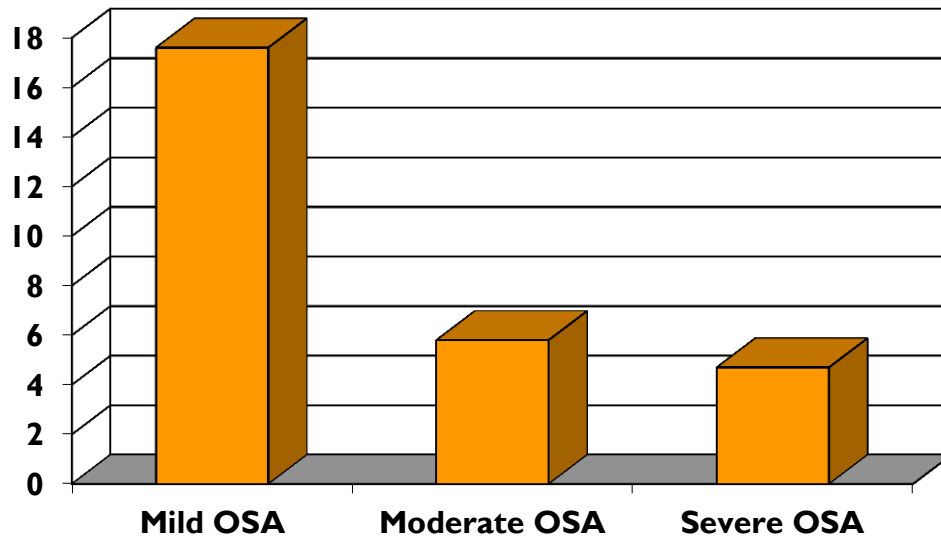


The content of this document is intended for information purposes only and should not be construed as providing legal or medical advice. NPTC is not recommending that companies use any particular screening, diagnosis or treatment program and accepts no liability for any person's acts or omissions taken in reliance on the information presented herein. This is an introductory resource and is intended to highlight a critical safety and compliance topic. Company management should consult with your own legal, medical and human resources advisors to develop appropriate programs for your company.

NPTC makes no recommendation as to whether, or how, any motor carrier should address the issue of sleep disorders within their company. Nor does NPTC endorse any provider of services related to the screening, diagnosis or treatment of such disorders.

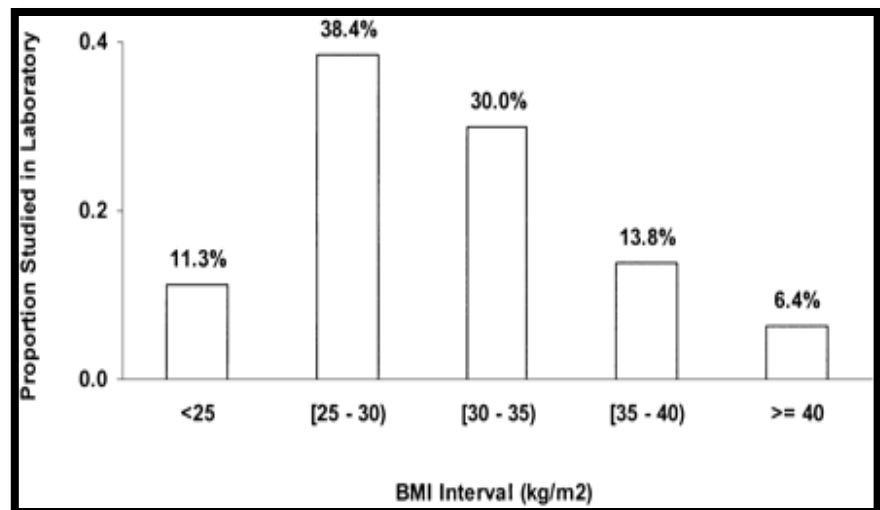
INTRODUCTION

Sleep disorders¹, especially Obstructive Sleep Apnea (OSA) is one of the most serious safety issues facing the trucking industry today. Investigators from the University of Pennsylvania found that the prevalence of OSA in commercial truck drivers was about 30% and over 10% had moderate to severe OSA.



The prevalence of OSA is high in the commercial truck driver population, in large part due to the characteristics of the drivers:

- Male
- Average age 51
- Sedentary
- Smoker
- Poor eating habits
- Less healthy than average citizen
- More than two medical conditions
- Cardiovascular disease prevalent
- Body Mass Index (BMI) (see chart)



Gurubhagavatula et al. AJRCCM 2004;170 (4): 371

¹ Information on additional sleep problems, based on health plan medical necessity criteria, is attached as

Left untreated, OSA is associated with a variety of adverse consequences, including daytime sleepiness, increased cardiovascular morbidity and mortality, impairment of cognitive function, motor vehicle collisions, and reduced quality of life" (Pietzsch, Linehan, SLEEP, VOL 34, June 2011). This disease has other adverse health effects: it is now recognized as a cause of hypertension, is a significant risk factor for heart disease and stroke and is associated with diabetes. The consequences of untreated OSA clearly extend well beyond excessive sleepiness and disruption of rest periods, two areas that can have a significant impact on safety in their own right. This is further compounded by the lack of consistent guidance from FMCSA and results in a variety of evaluation, treatment and compliance protocols without clear direction.

Untreated sleep apnea is common in the general population and more frequent in truck drivers, which presents a new challenge for private motor carrier management. FMCSA recently posted non-binding recommendations, "Spotlight on Sleep Apnea," (<http://www.fmcsa.dot.gov/safety-security/sleep-apnea/sleep-apnea.aspx>) on the subject of commercial drivers and sleep apnea, yet formal regulations are not expected from the agency for several months or even years.

In the absence of such regulations, perhaps in fear that doing something may be worse than doing nothing, most private fleets (according to NPTC's survey) have elected the latter course. The result is that many fleets, acting in good faith and within current FMCSA regulatory requirements, dispatch drivers with an unknown but treatable health impairment that might pose a safety risk for their companies and a health risk to the drivers themselves. Because of this potential risk, however, some NPTC Fleet Member companies are not waiting for the FMCSA to issue regulations. They are implementing sleep apnea protocols and management programs either currently or in the near future, and in addition, a few large for-hire carriers have implemented such programs within their driver populations. The experience of these companies may also provide models for private fleets to consider.

In light of the foregoing developments, NPTC has assembled a Task Force on Sleep Apnea, to provide private fleet members with educational information about this subject, to create a heightened state of awareness of why sleep apnea should command management attention and action; to identify and recommend (where appropriate) best practices and standards in managing a sleep apnea program for drivers without NPTC endorsing or promoting any Allied/Supplier members; and to potentially help shape FMCSA regulations on sleep apnea by sharing with the agency the successful programs voluntarily put in place by private fleet companies.

THE SCIENCE AND HEALTH OF SLEEP APNEA

"Obstructive Sleep Apnea (OSA) is a chronic, significantly underdiagnosed and undertreated condition characterized by re-current collapse of the upper airway during sleep." (Pietzsch, Linehan, SLEEP, VOL 34, June 2011). Apnea literally means "no breath."

Put simply, sleep apnea occurs when the upper airway closes off or becomes blocked during sleep. People move their diaphragm and chest in an attempt to breathe, but their throat has become obstructed, which stops any air from reaching the lungs. After a few seconds, the oxygen in the blood falls to critical levels, increasing the person's efforts to breathe, resulting in a gasping or sometimes choking response as the person struggles to start breathing again. Reduced oxygen wakes the sleeper just enough to start breathing again but not enough to remember the action.

These events last 10 seconds or longer, and may occur hundreds of times during a night. A few people with sleep apnea may be aware of snoring, gasping, or waking up short of breath. However, because they are asleep, most people with OSA are not aware of these repeated episodes and do not wake up gasping for breath. The result is a person who is as fatigued in the morning as when he or she retired for the night — and doesn't know why. Often persons with untreated OSA report that they wake up more tired than when they went to bed.

During apneic events, there is a drop in blood oxygen levels, an increase in heart rate, a burst of stress hormones, and disrupted sleep when the body awakens slightly so that breathing will resume, sometimes with a gasp. Some of the risk factors for developing sleep apnea include being overweight (a Body Mass Index (BMI) in excess of 30), and having a neck circumference of 17" or greater for men, and 15-1/2 inches for women. Typical symptoms caused by sleep apnea include:

- Heavy snoring,
- Headaches upon waking,
- Need to urinate twice or more per night, 2 or more nights per week.
- Erectile dysfunction,
- Daytime sleepiness
- Memory or learning problems
- Irritability
- Poor Concentration and attention
- Mood changes, such as depression.

The consequences of untreated sleep apnea include, twice the healthcare cost, 50% increase in hospital stays, an elevated risk of cardiovascular disease, heart attack, stroke, and much more.

An estimated 25-33% of the current commercial driving population is estimated to suffer from untreated sleep apnea which can have a direct and detrimental impact on public safety – those drivers have a 2-7 times increased risk for accidents (Sassani). Obstructive sleep apnea syndrome (OSAS) is now recognized as a risk factor for motor-vehicle collisions and causes sleep fragmentation, nocturnal hypoxia, and hypersomnia, which impair daytime functioning and driving performance. As a result, drivers with OSAS have a higher rate of collisions than do control subjects. A number of studies comparing alcohol-impaired subjects to subjects with untreated OSAS show that subjects with untreated OSAS perform as poorly on simulated driving and psychomotor reaction time tests as legally intoxicated control subjects.

The consequences are great, both in terms of monetary costs and lives disrupted, according to a 2004 study, "Reducing Motor-Vehicle Collisions, Costs, and Fatalities by Treating Obstructive Sleep Apnea Syndrome," conducted by Alex Sassani, MD; Larry J. Findley, MD; Meir Kryger, MD, FRCPC; Eric Goldlust, PhD; Charles George, MD, FRCPC; Terence M. Davidson, MD. The authors found the

minimum estimates of annual OSA-related collision costs, collisions, and fatalities are \$15.9 billion, 810,000 collisions, and 1,400 fatalities. Further, they found CPAP treatment can reduce collision costs by \$11.1 billion, prevent more than 500,000 collisions, and save nearly 1,000 lives each year. In other words, for every \$1 spent on CPAP treatment, \$3.49 will be saved in reduced collision costs.

A recent study published in the journal SLEEP in June 2011 analyzed the health-economic costs for untreated sleep apnea in the areas of stroke, cardiovascular events, motor vehicle collisions, lifetime costs, life expectancy, and quality adjusted life expectancy. Treatment of sleep apnea resulted in a cost savings of \$24,222 annually per life year gained, as well as, \$15,915 annual per quality-adjusted life year gained. Perhaps more importantly, treatment of OSA with CPAP reduced the 10-year risk of both fatal and non-fatal motor vehicle collisions by 52%. (Pietzsch, Linehan, SLEEP, VOL 34, June 2011).

Former FMCSA Administrator John Hill, writing in the April 25 edition of *Transport Topics* stated, "Estimates vary, but based on one 2006 study used by the FMCSA Medical Review Board (MRB), which provides the agency with recommendations regarding medical requirements for commercial vehicle drivers, between 24% and 41.9% of all commercial drivers could qualify for OSA screening."

Companies such as Schneider National and J.B. Hunt have proactively addressed this issue among their driver population, he continued. "Interestingly, they not only have had significant safety benefits from their self-initiated OSA treatment programs, but they also have saved considerable company money in the form of reduced medical and insurance payments."

"Savvy industry executives realize that drivers are essential to their business and treating OSA where needed is an investment in those drivers, their families and the company's viability. Data clearly show that with effective management of OSA, individuals experience improved quality of life and fewer catastrophic illnesses and diseases."

"Motor carriers have a unique opportunity to address potential safety liabilities within their companies by establishing OSA programs. When this has been accomplished, they will be rewarded with healthier, happier and more productive employees with fewer health claims as well as reduced crash numbers and workplace injuries."

After being tested and treated for sleep apnea, one of J.B. Hunt's two million mile drivers lost 110 pounds and his chronic fatigue, and said, "I believe this program literally saved my life."

REGULATORY REQUIREMENTS

Although sleep apnea has not yet been specifically listed in the Federal Motor Carrier Safety Regulations, Section 391.41(b)(5)(8) considers a commercial driver physically qualified if he/she "Has no established medical history or clinical diagnosis of a respiratory dysfunction likely to interfere with his/her ability to control and drive a commercial motor vehicle safely...." Indeed, the recently revised FMCSA Medical Examination Report for Commercial Driver Fitness Determination now includes a specific question regarding "Sleep disorders, pauses in breathing while asleep, daytime sleepiness, loud snoring." Unfortunately, many affected individuals are unaware of their condition or they may consciously conceal or deny symptoms attributable to this disorder.

Currently, at the time of the DOT exam, most drivers complete the medical form shown below, which includes one self-reported question on sleep disorders.

**Medical Examination Report
FOR COMMERCIAL DRIVER FITNESS DETERMINATION**

Interstate - mostly compliant
649-F (6045)

1. DRIVER'S INFORMATION Driver completes this section

Driver's Name (Last, First, Middle)	Social Security No.	Birthdate M / D / Y	Age	Sex <input type="checkbox"/> M <input type="checkbox"/> F	New Certification <input type="checkbox"/> Recertification <input type="checkbox"/> Follow-up	Date of Exam
Address	City, State, Zip Code	Work Tel: ()	Driver License No.	License Class <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> Other	State of Issue	

2. HEALTH HISTORY Driver completes this section, but medical examiner is encouraged to discuss with driver.

Yes	No	Yes	No	Yes	No
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Any illness or injury in the last 5 years?		Lung disease, emphysema, asthma, chronic bronchitis		Fainting, dizziness	
<input type="checkbox"/> Head/Brain injuries, disorders or illnesses		<input type="checkbox"/> Kidney disease, dialysis		<input type="checkbox"/> Sleep disorders, pauses in breathing while asleep, daytime sleepiness, loud snoring	
<input type="checkbox"/> Seizures, epilepsy		<input type="checkbox"/> Liver disease		<input type="checkbox"/> Stroke or paralysis	
<input type="checkbox"/> medication		<input type="checkbox"/> Digestive problems		<input type="checkbox"/> Missing or impaired hand, arm, foot, leg, finger, toe	
<input type="checkbox"/> Eye disorders or impaired vision (except corrective lenses)		<input type="checkbox"/> Diabetes or elevated blood sugar controlled by:		<input type="checkbox"/> Spinal injury or disease	
<input type="checkbox"/> Ear disorders, loss of hearing or balance		<input type="checkbox"/> diet		<input type="checkbox"/> Chronic low back pain	
<input type="checkbox"/> Heart disease or heart attack; other cardiovascular condition		<input type="checkbox"/> pills		<input type="checkbox"/> Regular, frequent alcohol use	
<input type="checkbox"/> medication		<input type="checkbox"/> insulin		<input type="checkbox"/> Narcotic or habit forming drug use	
<input type="checkbox"/> Heart surgery (valve replacement/bypass, angioplasty, pacemaker)		<input type="checkbox"/> Nervous or psychiatric disorders, e.g., severe depression			
<input type="checkbox"/> High blood pressure		<input type="checkbox"/> medication			
<input type="checkbox"/> Muscular disease		<input type="checkbox"/> Loss of, or altered consciousness			
<input type="checkbox"/> Shortness of breath					

For any YES answer, indicate onset date, diagnosis, treating physician's name and address, and any current limitation. List all medications (including over-the-counter medications) used regularly or recently.

I certify that the above information is complete and true. I understand that inaccurate, false or missing information may invalidate the examination and my Medical Examiner's Certificate.

Driver's Signature _____ Date _____

Medical Examiner's Comments on Health History (The medical examiner must review and discuss with the driver any "yes" answers and potential hazards of medications, including over-the-counter medications, while driving. This discussion must be documented below.)

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>
Fainting, dizziness	
Sleep disorders, pauses in breathing while asleep, daytime sleepiness, loud snoring	
<input type="checkbox"/>	<input type="checkbox"/>
Stroke or paralysis	
<input type="checkbox"/>	<input type="checkbox"/>
Missing or impaired hand, arm, foot, leg, finger, toe	
<input type="checkbox"/>	<input type="checkbox"/>
Spinal injury or disease	
<input type="checkbox"/>	<input type="checkbox"/>
Chronic low back pain	
<input type="checkbox"/>	<input type="checkbox"/>
Regular, frequent alcohol use	
<input type="checkbox"/>	<input type="checkbox"/>
Narcotic or habit forming drug use	

Over the years the issue of driver fatigue has been tackled from three different angles:

- In response to congressional mandates, there have been two changes to the hours-of-service regulations issued since 2003 and a third regulation is under way, due for release later in 2011.
- The National Transportation Safety Board has issued a series of recommendations to FMCSA for changes to existing rules touching on driver fatigue while calling for new regulations. One example has been to screen truck drivers for obstructive sleep apnea (OSA) as part of an overall fatigue-management program. So pervasive is the OSA problem that the NTSB has issued similar warnings to the aviation, maritime and rail industries for their employees.
- Most significantly, FMCSA's new Compliance, Safety, Accountability program, or CSA, attempts to expand the scope of regulatory oversight of motor carriers and drivers. The program will add tools to the conscientious safety manager's toolbox and identify trends in driver behavior — including fatigue — before they cause crashes.

The MRB recommended in January 2008 that FMCSA make substantial changes to the current guidelines pertaining to OSA. However, the FMCSA has currently done nothing further than to post the aforementioned "Spotlight on Sleep Apnea."

However, despite the threat of regulatory mandate and the growing case law record being compiled in litigation (described elsewhere in this document), it is the enlightened leadership by a few carriers that holds more promise than any regulations or laws.

Much debate surrounds the hours-of-service rule and its effect on driver health, but reducing the hours a driver can work or drive will not remedy the health problems caused by obstructive sleep apnea. Studies show that people with untreated sleep apnea face a long list of increased health risks, including hypertension, Type 2 diabetes, memory loss, chronic fatigue, obesity and a doubling in the chance of heart attack and stroke.

THE LEGAL ENVIRONMENT

Although the courts have not acted consistently with regard to treatment of sleep apnea by commercial vehicle drivers, there is a growing body of case law in which a diagnosis of the disorder may play a major role in establishing liability for catastrophic collisions. Even if the plaintiffs are ultimately unsuccessful, an allegation that the driver was fatigued as a result of sleep apnea requires the defendant to make additional defensive arguments related to medical diagnoses and causation of the collision.

However, increasing amounts of case law are building up over the area of sleep apnea. Typical is the following story that appeared in the October 8, 2010 Fleet Owner on-line edition.

Fatal truck-accident suit ends with \$62.7-million settlement

Oct 8, 2010 11:54 AM, By Brian Straight, managing editor

A \$62.7-million settlement was reached this week in a civil court suit brought by the relatives of eight victims of a horrendous crash in Oklahoma caused by an [Associated Wholesale Grocers](#) (AWG) driver. Defendants AWG and driver Donald Creed, who was 76 years old at the time of the crash, are responsible for \$62 million of the settlement, said AWG attorney Jim Secrest. The remaining \$700,000 was agreed to by two drivers who were involved in a minor traffic accident that preceded the crash.

"It was horrific, you can't possibly overemphasize the impact [of the situation that day]," Secrest told [Fleet Owner](#). "These people, the victims in this, had no warning, no nothing." In all, 10 persons were killed and five more injured by the accident. AWG and Creed had previously reached a settlement with family members of the other two persons killed.

"Money is just money," attorney Preston Trimble, who represented the families, told the [Tulsa World](#). "We have grandparents, parents and lost brothers and mothers in this. It's hard to equate with money. ... It's like you have a loved one missing in action whose body is recovered and returned home. It's a kind of closing." Creed, who pleaded guilty to 10 counts of negligent homicide, a misdemeanor in Oklahoma, in a plea deal, was sentenced to a year of probation on each count. He must serve 30 days in a county jail and wear an electronic monitoring device in his first year of probation. He is also barred from obtaining a commercial driver's license.

AWG attorney Secrest added that the settlement, which occurred one day before a jury trial was set to begin, was the right thing for AWG and Creed to do. "These people were totally innocent," he said. "We are sorry and there was no reason for us to make those family members go through a trial."

AWG is a retailer-owned grocery cooperative based in Kansas City, KS, that serves 1,900 members. Secrest said the company was facing an additional claim of independent negligence for allowing Creed on the road. The company was prepared to fight that claim, he said, adding that AWG had "state-of-the-art" equipment in the truck and that witnesses who had seen Creed throughout his shift would have testified that Creed appeared "normal" that day.

"To this moment, we know what happened, but we don't know why," Secrest said. "This guy [Creed] had five-million miles without one personal injury accident."

Secrest said that AWG's fatigue management program was not as strong as it could have been. The company has improved the program since the accident, he said. "It was not as intense as it should have been and I think AWG acknowledged that," Secrest said.

According to the National Transportation Safety Board (NTSB), the cause of the crash was the result of Creed's fatigue due to acute sleep loss, mild sleep apnea and circadian disruption associated with his shift schedule.

Creed had just returned from a vacation and was still adjusting to the shift, which began shortly after 3 a.m., NTSB said. The Board said that Creed never reacted to the backup of traffic due to an earlier accident along Interstate 44 near Miami, OK. Creed drove his truck, traveling at 69 mph in a 75-mph zone, into the back of a stopped sport utility vehicle. The truck continued forward and hit three additional vehicles, pushing the third vehicle into the rear of a livestock trailer being towed by a pickup truck. That vehicle then collided with yet another vehicle.

The accident occurred at 1:19 p.m., roughly 10 hours after Creed had started his shift. NTSB said that Creed failed to apply brakes or take any evasive measures before the collision. NTSB's report cited the lack of updated and comprehensive fatigue education materials and programs along with a lack of federal requirements for data and vehicle event recorders and forward collision warning systems on commercial vehicles as contributing factors.

"This crash points out the need for three important actions by federal regulators that would go a long way to reducing this type of accident on our roadways: a fatigue management system would have helped the driver get the rest he needed to perform well behind the wheel, event recorders would have provided our investigators with the details about the crash once it occurred, and a collision warning system would have significantly reduced the likelihood that this accident could have ever happened," said NTSB chairman Deborah A.P. Hersman. "The time to act on all three of these safety fundamentals is now so that this kind of horrific tragedy will not occur again."

NTSB also has called upon FMCSA to require all heavy commercial vehicles to be equipped with video event recorders, to improve its fatigue educational materials and to require all motor carriers to adopt a fatigue management program based on the North American Fatigue Management Program.

Following are summaries of recent court decisions:

Magnitude of Settlements/Awards

Simmons and Lindig Construction and Trucking, Inc. v. Bisland, (No. 03-08-00141-CV), Court of Appeals of Texas, Third District, Austin, April 9, 2009.

A driver for Lindig Construction and Trucking, Inc. was operating an 18-wheeler full of limestone when he rear-ended a pickup truck that was stopped while its driver was waiting to turn left. The 18-wheeler did not slow down and the driver did not apply his brakes before the impact, and the pickup's driver suffered substantial injuries.

The defendants stipulated to negligence, causation and vicarious liability of the employer for the truck driver's actions. The plaintiffs presented evidence that the truck driver was later fired from the company after another accident in which he had fallen asleep at the wheel, and the driver's post-accident medical records indicated a possibility that he suffers from sleep apnea.

A jury trial on damages resulted in an award to the plaintiffs of \$2,557,000, which was upheld on appeal except for \$17,580 in prejudgment interest.

DOT Physicals as a Shield Against Negligence

Dunlap v. W.L. Logan Trucking Co., 829 N.E. 2d 356 (Ohio Ct. App. 2005)

A driver for Logan Trucking Co. crossed a highway's dividing line in a construction zone and forced an automobile off the road, which then struck another vehicle. One person was killed and two sustained injuries. The trucking company and its driver (Munnal) and their insurer settled with plaintiffs (\$1.4 million for deceased, of which Logan paid a \$10,000 deductible, and \$7,500 for the injured).

The trial court dismissed driver's defense of having been suddenly stricken by unconsciousness, finding that he knew or should have known that he had a propensity to fall asleep at unpredictable times.

The Court of Appeals upheld a ruling that driver knew or should have known he had a risk of falling asleep while driving. The "sudden-medical-emergency" defense could not apply to Munnal because he knew he had some sort of medical issue that led to his unconsciousness at unusual times (while standing up or playing cards, e.g.). He was not diagnosed with sleep apnea until after the accident. The trucking company was also liable under respondeat superior. (The Court did not reach the negligent entrustment claim as liability under respondeat superior was already established.)

"Sudden Medical Emergency" Defense

Slone v. Ibert, (unpublished opinion) (Court of Appeals of Kentucky, No. 2008-CA-001919-MR)

Ibert was driving a Ford Expedition for his employer, Oldham's Truck and Car Source, to show a potential buyer. He struck Slone's vehicle from behind while Slone was stopped at a traffic light. Ibert admitted he caused the accident, but claimed he lost consciousness as he approached the red light. The jury returned a verdict for Ibert and Oldham's, and the Court confirmed. Court credited this "blackout defense," noting that Ibert had been diagnosed after the accident with sleep apnea. There apparently was no evidence Ibert had been diagnosed with sleep apnea prior to the accident. But the court stated that had the diagnosis of sleep apnea been made prior to the collision and disregarded by the driver, it would have been admissible to demonstrate that the sudden incapacity was not foreseeable.

Criminal Cases

Gleim v. Roberts, 919 N.E. 2d 367 (App. Ct. Ill. 2009)

Roberts was driving a double-rig truck for Yellow Transportation when he collided with a vehicle, killing all four occupants. Roberts suffered from sleep apnea and used a CPAP machine, but had neglected to take it on this trip (from Illinois to New York – the accident occurred in Indiana on the return trip). The Indiana State Police found fatigue to be a factor, as well as driving too fast for conditions. These factors forced the defendant to settle regarding the issue of liability for the injuries, and the appeal was merely over the applicable state law related to damages.

People v. Wilson, 572 N.E.2d 937 (Ill. 1991)

In criminal case, Supreme Court of Illinois upheld conviction for reckless homicide of defendant who lost consciousness behind wheel of his passenger car and collided with another vehicle head on. The defendant had been aware that he had a sleep disorder that caused him to fall asleep at inappropriate times, and presented evidence at trial that he had previously been diagnosed with sleep apnea. The court noted several other jurisdictions which have found that driving with knowledge of such a disorder was criminally reckless. In this case, too, the defendant chose to operate a vehicle with knowledge that he suffered from a condition that made it dangerous to drive. (The defendant also had been drinking before the accident, which made this situation worse. But the court stated that his driving with knowledge of his sleep disorder was enough to support a finding of recklessness.)

Negligent Entrustment

Achey v. Crete Carrier Corp., 2009 U.S. Dist. LEXIS 44353 (E.D. Pa. Mar. 30, 2009)

The driver (Gallman), while acting within the scope of his employment, fell asleep at the wheel of the tractor-trailer in a construction zone and struck a vehicle driven by Tricia Achey. Three persons were killed and ten injured in the accident. The driver acknowledged being tired when he was driving and planned to stop. But he dozed off and upon awaking saw that traffic had stopped in front of him. He had no time to apply the brakes before striking Achey's car.

The Court granted partial summary judgment for Crete on plaintiff's claims for negligent/reckless entrustment. Court concluded Crete could not be liable for punitive damages on those claims because its conduct in hiring and retaining Gallman was not outrageous by reason of evil motive or reckless indifference.

In finding Crete did not act with reckless indifference, the court found that Gallman had been diagnosed with sleep apnea in 1992, after which he underwent surgery to correct the issue. While it was hotly

contested whether he continued to suffer from sleep apnea after the surgery and at the time of the 2007 accident, the only evidence proffered was Gallman's testimony that the sleep apnea never affected his ability to drive. The only symptom was snoring, and he only admitted to the normal drowsiness any driver experiences in the morning. He never nodded out while driving. The court stated that even if Gallman suffered from sleep apnea in 2007, and that there was evidence that fatigue and drowsiness are symptoms of sleep apnea, there was no evidence that Gallman ever suffered from the symptoms of fatigue or drowsiness as a result of sleep apnea. Just because he suffered from snoring from sleep apnea at some point, and at some point also experienced drowsiness, does not mean the drowsiness was because of the sleep apnea.

SCREENING

According to a study on the sleep apnea program in place at Schneider National, Inc., "A Corporate Driven Sleep Apnea Detection And Treatment Program: Results And Challenges," by Mark B. Berger, MD FCCP, Wendy Sullivan, RN, Ross Owen, MPA, and Charlotte Wu, MS, Precision Pulmonary Diagnostics, Inc., Schneider National, Inc., and Definity Health Corp. Houston, Texas USA, "Certain symptoms carry a near 100% accuracy in predicting a diagnosis of sleep apnea and should prompt a sleep study, such as witnessed apnea by a bed-partner. Other symptoms, when volunteered by the driver or discovered through appropriate survey responses, justify testing for a sleep disorder. One example is daytime sleepiness, with or without a history of snoring. On the other hand, snoring alone may not be sufficient to warrant obtaining the more expensive polysomnography."

Trucking companies require a valid and relatively inexpensive tool allowing identification of those individuals with a high likelihood of having SDB and therefore requiring In-Lab polysomnography, or are candidates for ambulatory testing. Such an ideal screening tool should be sufficiently sensitive to pick up all truckers with clinically relevant sleep apnea.

The screening tool should incorporate relevant subjective response data useful in identifying high risk groups while not completely bound by a respondent's answers to exclude a high risk individual. This latter point is important because some drivers may try to conceal their symptoms of daytime sleepiness out of fear it may jeopardize their employment. Attached, as Appendix 2, are two sample screening tools.

Therefore a screening tool should also include reliable, objective data in formulating a prediction for sleep apnea in any given person. From a review of the available medical literature, a number of sleep providers have developed simple screening tools to augment the aforementioned subjective responses of the drivers. This tool incorporates weighted values for body mass index (BMI), presence of hypertension, and presence or absence of heavy snoring. The tool also includes other objective criteria for a screener to consider in deciding whether or not to refer a driver for testing.

Before initiating screening options fleets must evaluate

- Driver Consent and Driver's Right to Privacy (HIPPA)
- DOT Examiner Scope of Practice
- Access/Availability of Sleep Testing and Treatment Services
- Reimbursement of Sleep Services: Driver vs. Employer Costs
- Fit For Duty and Re-Turn Fit for Duty Exams: Short Card vs. Long Card
- CPAP Usage Compliance Tracking, Reporting, and Results
- Turnaround Time (time from screening to treatment sign-off)
- Policy for Non-Compliance Driver retention rate, treated drivers
- Health Plan Coverage for Sleep Testing and Treatment
- Chain of Custody Procedures and Protection Against Fraudulent Testing

The key messages are:

- Choose vendors who are fully accredited and qualified to help you.
- Don't focus solely on "testing", focus on long term "treatment compliance".
- Make sure your program has multiple support tools for your drivers as they learn to live with, and control, their sleep apnea.

DIAGNOSING SLEEP DISORDERS

Sleep apnea occurs in all age groups and both sexes, but there are a number of factors that may put someone at higher risk:

- A family history of sleep apnea
- Having a small upper airway
- Being overweight
- Having a recessed chin, small jaw, or a large overbite
- A large neck size (17 inches or greater for men, 15.5 inches or greater for women)
- Smoking and alcohol use
- Being age 40 or older
- Ethnicity

Symptoms of Sleep Apnea

- Loud snoring
- Morning headaches and nausea
- Gasping or choking while sleeping
- Loss of sex drive/impotence
- Excessive daytime sleepiness
- Irritability and/or feelings of depression
- Disturbed sleep
- Concentration and memory problems
- Frequent nighttime urination

In order to comprehensively diagnose sleep disorders, the doctor can send the driver to a local sleep disorders center for testing. A sleep study test (polysomnography) will monitor his/her sleep and will determine if he/she has a sleep disorder, including sleep apnea, and how severe it is.

For sleep apnea, study test options include a take-home test in addition to, or as an alternative to, an overnight stay at a sleep clinic.

A sleep study test will determine if he/she has sleep apnea and how severe it is. If the driver is diagnosed with sleep apnea, he/she may benefit from both lifestyle changes and specific medical treatment. OSA testing and treatment options are varied. Most sleep centers will require a face to face consult with the sleep physician, and follow-up office visits after each sleep study.

Ambulatory testing is designed for drivers who meet screening criteria for simple obstructive sleep apnea. Such portable monitoring or testing, can be used in a variety of settings, such as the driver's home, in a hotel or even in his cab's sleeper berth.

Portable monitoring is considered medically necessary and is allowed as an alternative to full in-lab sleep testing by both federal and commercial health plans, for persons with a high suspicion (greater than 50% likelihood) for sleep apnea. Auto-titrating CPAP devices are also considered to meet medical necessity guidelines for the treatment of sleep apnea, and have success rates comparable to in-lab titration tests. (SLEEP, Vol.34, June 2011)

Testing in a sleep clinic will first test for the presence of OSA, and, if detected, the patient will return for a second overnight sleep study, to determine if the patient will benefit from a Continuous Positive Airway Pressure (CPAP) device.

Assuming a positive diagnosis in either ambulatory or in-lab testing, the sleep physician then writes a prescription for the CPAP device, and a Durable Medical Equipment company will provide the driver with the CPAP device and related supplies.

If the driver is diagnosed with sleep apnea, he/she may benefit from both lifestyle changes and specific medical treatment.

There are other tests for drivers related to wakefulness and reaction-time that measure fatigue and sleep conditions.

TREATMENT ALTERNATIVES

Once diagnosed with sleep apnea, an individual can make lifestyle changes that may help to address the condition:

- **Lose weight** — Overweight persons can help treat their sleep apnea with even moderate weight loss. For instance, a 200-pound man can lose 20 pounds and greatly reduce the number of breathing pauses.
- **Avoid alcohol and sleeping pills** — Both alcohol and sleeping pills relax airway muscles and may make sleep apnea symptoms worse.
- **Avoid sleeping on back** — Some people suffer from sleep apnea only when lying on their backs. Try using pillows to avoid sleeping on your back.
- **Quit smoking** — Cigarette smoking increases both the risk and the severity of sleep apnea, by causing swelling and excess mucus in the airways and by damaging the lungs.

There are several proven treatment alternatives:

- **Continuous positive airway pressure (CPAP)** — This is a highly effective form of treatment. CPAP treatment involves wearing a mask over the nose during sleep while gentle air pressure from a blower prevents the throat from collapsing during sleep. A CPAP device is portable, so it can be taken on the road. There are several manufacturers who sell positive airway pressure (PAP) devices, and the technology is closely regulated by the FDA.

The engineering inside the device can differ greatly. The most simple is a continuous PAP (CPAP) device. This blows a constant stream of air through a tube into a mask which sits snugly over the patient's nose and sometimes mouth too.

For patients that require particularly high PAP pressures, there are more complicated devices that have two levels of air flow (Bilevel PAP) which match the amount of pressure needed to keep the airway open to the different parts of the breathing cycle; inhalation (higher pressure) and exhalation (lower pressure).

The APAP / Auto-Adjusting PAP is a more sophisticated device that automatically changes its pressure breath-by-breath as the patient's needs change throughout the night, or on a night by night basis. APAP also adjusts the pressure as needed over the long term, when the patient gains or losses weight over time. These devices may be more comfortable for the patient as there is never 'too much' unnecessary air pressure on the delicate nasal membranes.

Masks for a PAP device can vary greatly in size, shape, material, comfort, and position on the face. Some have just tiny nose pillows that fit gently against the opening of the nostrils, some cover the entire nose, while some cover the entire nose and mouth.

A fleet's program should provide a large range of treatment technologies to your drivers to maximize their chances of successful treatment compliance.

- **Oral appliances** — Some sleep apnea patients are helped by devices that open the airway by bringing the lower jaw or tongue forward. However the FMCSA in 2008 said Oral Appliances should not be used because there is no verification of compliance.
- **Surgery** — Some patients may choose surgery for their sleep apnea. Although several procedures are used to increase the size of the airway, none of them are completely successful in all patients or without risks. More than one procedure may need to be tried before the patient realizes any benefits.

There are two schools of thought on testing and treatment plans. A large part of the controversy stems from insurance plan limitations. Some insurance plans do not pay for the “portable testing process” approach and require a polysomnogram sleep study to be conducted in a sleep clinic to confirm diagnosis before they will cover the CPAP machine and supplies.

QUESTIONS FOR SLEEP HEALTH SERVICE PROVIDERS

Sleep apnea programs need to be flexible because every fleet and every group of drivers is different. Decide what you want to include in your program. It’s good advice to avoid programs that give you no options.

- 1. What sleep health education, awareness and wellness support and resources are available to drivers to help them understand and manage the policies, fears, risks, benefits and options available for improving their sleep health?”**
- 2. What are the components of the program?**
Screening programs should always have four distinct steps: (1) screening, (2) diagnosis, (3) treatment and (4) long-term support. The most important and most difficult part to manage is the long term support of drivers using PAP. Ask your vendor exactly what they can offer you for each step in your program. Don’t be left stranded with drivers who are struggling to use their PAP devices and have nobody to turn to for help.
- 3. Are the physicians and sleep centers appropriately certified?** All sleep centers offering services to your drivers should be accredited by the American Academy of Sleep Medicine (AASM) or by The Joint Commission (formerly the Joint Commission on Accreditation of Healthcare Organizations – JCAHO). All physicians reading the sleep test results and overseeing the care of your drivers should be either a Diplomate of the American Board of Sleep Medicine (ABSM) or a Diplomate in Sleep Medicine of the American Board of Medical Specialties (ABMS).
- 4. If sleep studies are required, how will they be performed?**
Neither home studies nor in-patient PSG studies are appropriate for all patients, so your provider should be able to do both. About 10% - 20% of people have complications in diagnosis which will require a complete polysomnogram study (PSG) in a sleep lab. The home sleep testing devices are very accurate, but there are some people who will need more detailed diagnosis for particular medical reasons. A qualified sleep specialist will know who needs which test.

5. If home sleep testing will be a component of the program, what quality assurance checks are made?

Don't be persuaded that all home sleep testing devices are the same; they are not. If home sleep testing is part of your program, follow the advice of the AASM or the Center for Medicare and Medicaid Services (CMS). Your home sleep testing device should be classified as either:

- a. Type II device – Monitors and records a minimum of seven (7) channels: EEG, EOG, EMG, ECG/heart rate, airflow, respiratory effort and oxygen saturation
- b. Type III device – Monitors and records a minimum of four (4) channels: 2 respiratory movement/airflow, ECG/heart rate and oxygen saturation
- c. Type IV device – Monitors and records a minimum of three (3) channels that must include respiratory effort, airflow and oxygen saturation

6. Does the program incorporate face-to-face clinical evaluations?

Any driver who shows risk factors for sleep apnea should have a face-to-face clinical evaluation with a credentialed sleep specialist either before the test, or during the acclimation period when the patient is working to get used to APAP/CPAP therapy.

7. How is employee instruction for home sleep testing handled?

The AASM and CMS have determined that patients must receive face-to-face instruction on how to use any home sleep testing device. The devices look pretty simple, until you've just come off a 500 mile drive, it's late, you're grumpy and exhausted and can't think straight, much less attach all the sensors, etc.

8. What is the likelihood of a driver needing PAP device after their sleep test?

About 75% of drivers who are screened as being at risk for sleep apnea and thus referred for a diagnostic test (Per the FMCSA/MRB Recommendations) will be positive for sleep apnea, and need PAP treatment. The research literature (listed earlier) suggests that about 40% of drivers will require testing, and about 75% of those, or 28%, will be positive for sleep apnea. This may be higher or lower depending on the level of obesity in the driver force.

9. What type of PAP devices will be provided to your employees?

As discussed, PAP machines vary greatly in technology. Your vendor should provide a specially fitted mask, a heated humidifier and a large range of PAP devices for the program participants. Top quality treatment equipment greatly increases the likelihood that the driver will use the PAP device.

10. What is the follow-up program administered by the vendor?

Making sure that the drivers are using their PAP device is crucial. The Medicare PAP compliance requirements are so strict that they won't even pay for a PAP device that is not continually used. A good quality sleep vendor will be able to describe exactly how they intend to monitor PAP usage patterns and offer support. Just having a phone-line for drivers to call when they have a question isn't enough. They need to be using the PAP device a minimum of 70% of nights (5 nights a week), at a minimum of 4 hours of sleep per night to meet current FMCSA compliance guidelines. CPAP Compliance guidelines as directed by the AASM, suggest that optimal compliance usage level is 7 nights/week, 7-8 hours/night.

11. How will drivers with other sleep disorders be supported?

Fatigue-related accidents and drowsy driving are caused by lack of restorative sleep. What support will be provided to drivers with advanced or delayed sleep phase syndrome, insomnia, narcolepsy, restless legs syndrome (RLS), or other sleep disorders? Drivers fall asleep at the wheel because they're tired from lack of restful sleep. Sleep apnea is only one cause.

COMPLIANCE WITH PRESCRIBED TREATMENT

While treatment can have an almost immediate impact, it is only effective to the degree that the individual maintains compliance with the prescribed treatment. Towards this end, many companies are monitoring their drivers' compliance on a regular basis for as long as that driver is employed.

These compliance programs should begin with what constitutes compliance. To meet current FMCSA compliance levels, the driver needs to be using the PAP device a minimum of 70% of nights (5 nights a week), at a minimum of 4 hours of sleep per night. CPAP Compliance guidelines as directed by the AASM, suggest that optimal compliance usage level is 7 nights/week, 7-8 hours/night.

Solid compliance programs should also cover the benefits of objective measurement and methods to improve compliance.

INSURANCE ISSUES

It is important to understand how health insurance programs will reimburse the employee (and the company) for out of pocket expenses such as testing and treatment options.

BENEFITS TO DRIVER AND COMPANY

One of the most dramatic and significant results of the Schneider study is the documented reduction in global health care costs derived from the treatment of drivers diagnosed with obstructive sleep apnea. After CPAP intervention, affected drivers experienced roughly one fourth as many hospital admissions and spent about one half the health care dollars compared with the period prior to intervention. "These per member per month (PMPM) savings are large, ranging from \$433.59 to \$666.53 per month," the authors claim. "When coupled with the fact that at least 10%, and perhaps closer to 28% of a commercial carrier's drivers have [sleep apnea], annual savings in health care costs alone become staggering. For example, using the most conservative figures of a 10% prevalence for [sleep apnea] and a \$433.59 per month per [sleep apnea]-treated driver, a company employing 1000 drivers can expect annual health cost savings of over \$500,000."

These results are consistent with the few previous studies published in this regard. From Canada, a study published by Kryger, et al (1996) showed that severe sleep apnea patients generated twice the expenditures from physician claims than a comparable matched group of controls without sleep apnea.

Significant reductions in health care utilization and costs gained from CPAP treatment of [sleep apnea] highlights the increasingly recognized interplay between this condition and the major health risk concerns encountered in commercial drivers. First and foremost is cardiovascular disease which remains the number one killer in America. It is estimated by the American Heart Association (2004) that 70 million Americans have some form of cardiovascular disease. Hypertension is a major risk factor for heart disease and afflicts 65 million Americans. Both of these conditions, as well as diabetes and

obesity, represent major health expenditures for the commercial carrier. Appropriate treatment of sleep apnea has been shown to ameliorate these conditions.

Further, the Schneider study suggests that most drivers treated for sleep apnea with CPAP are compliant and they generally rate their quality of life as improved with therapy. The company's finding of a 73% reduction in preventable accidents highlights the societal, as well as the financial value of identifying and treating commercial drivers with SDB. In addition, sleep-apnea-treated drivers at SNI are demonstrating high retention rates, perhaps reflecting a heightened level of satisfaction with their employer.

Major categories of savings include:

- Medical expense reduction
- Accident reduction expense
- Employee turnover reduction
- Reduced workers compensation claims
- Increased productivity

A 2010 study conducted by Waste Management, Inc. concluded that effective treatment of obstructive sleep apnea in drivers is associated with lower health care and disability costs and fewer missed work days.

COSTS OF ESTABLISHING SLEEP APNEA PROGRAM

At the same time, a company must weigh the costs of establishing and maintaining a sleep apnea program. Prior to undertaking such an analysis, the company should determine the rate of reimbursement from its health insurance provider. Potential components of program cost include:

- Health plan reimbursement options
- Cost of a complete process (screening through treatment). Cost ranges will typically range from \$3,000 to \$5,000, depending on the individual components of a driver's sleep apnea treatment. Each fleet should receive a complete list of pricing services as part of the service provider evaluation process.
- Turnaround time (down time for drivers)
- Compliance programs
- Turnover

OVERCOMING DRIVER PERCEPTIONS AND FEAR

Drivers' concern over possible loss of income and job security remained as significant impediments in implementing programs and gaining widespread driver cooperation. Carriers need to understand the time it takes from diagnosis to treatment and recovery.

Other firms help protect driver earnings through wage continuation policies.

PRIVATE FLEET PROGRAM IMPLEMENTATION GUIDELINES

The following information is meant to act as a *guideline document only* and does not represent a complete operational plan (specificity as to employer needs, state requirements, etc.). It must be carefully reviewed and approved as needed by independent legal counsel. Ideally, the employer representative for each department would work through the questions and/or items suggested below, with a representative from its sleep services provider, to create an expanded and customized operational plan.

Example Goals of a Program:

- Increase Safety and Health of Commercial Drivers
- Meet pending FMCSA Guidelines for Sleep Disorders
- Meet Federal and State Guidelines for the provision and billing of medical and clinical services
- Meet AASM Guidelines for the provision of sleep medicine services
- Meet Federal Guidelines for Privacy Rights (HIPAA)
- Create Sleep Apnea Program that is based on clearly defined criteria in the areas of screening, diagnosis, treatment, and usage compliance.
- Create Driver, DOT Examiner, Sleep Specialist, and Employer (HR/Safety/Compliance) protocols which are as seamless as possible for drivers, and are consistent, repeatable, and provide known optimal standards of care.
- Create and Monitor both Clinical and Industry based Performance Metrics:

Human Resources, Health Plan Administration:

- Human Resources reviews the "group" that is desired to be screened, and determines the feasibility of providing specific sleep services to this group, or does it need to be a employees, and considers how will this be paid? (example: private budget, health plan dollars-either additional or existing)
- What process will be put in place to protect employees from feeling singled out, or treated unfairly?
- What will be the key Messaging from Employers (HR, Safety Managers, and Fleet Managers)?
- Benefit group considers the financial costs to employees, and reviews employer supported programs to offset potential costs of deductible/co-pays.
- Provide periodic data comparisons of pre and post-treatment health expense rates (key metrics).
- Benefit group facilitates meeting with Sleep Service provider to review health plan claims items for medical claims review, as needed: including billing codes, medical credentialing, and standard fee structure.
- Discussion and Creation of Employee Policies: Examples:
 - Screening Criteria
 - Fit for Duty Guidelines
 - Re-Certification Requirements
 - Compliance Reporting and Support
 - Chain of Custody
 - Driver Flow Pathway and Sleep Center Clinical Protocols

Safety and Management Team Action Steps

- Safety management. reviews and co-approves all protocols, pathways, etc., in alignment with HR and sleep provider team.
- Safety management team provides communication to drivers regarding program, with HR.
- Safety management reviews and approves locations, phased rollout plan
- Safety management provides key communication support, as needed, between drivers, Examiners, and sleep service provider
- Consider roll-out plan: one key location, or multiples?
- Work with service provider to assure flow is smooth and accurate, and then continue/accelerate roll out based on agreed pace and proven outcomes.
- Consider submitting results for publication or Safety Awards at NPTC, ATA, NPTC , ACOEM
- Safety and HR together review and discuss the following Sleep Provider questions: to make determination as to level of sleep medicine program desired:
- Basic Information needed from Sleep Provider: (example)
 - List of specific sleep services, codes, and pricing for clinical line items
 - List of specific management services and pricing
 - Setup and Initiation pricing
 - List of sleep providers: locations and access to remote areas if needed.
 - Detailed review of clinical sleep services
 - Experience of Sleep Team
 - Chain of custody process for portable tests which answers the question of...Who really wore the portable test?"

Driver Actions:

- Education about the sleep program is provided to all employees who will be affected by the sleep program
- Driver is screened by DOT Examiner or other delegated clinical representative.
- Driver sign consents for treatment, financial understanding, HIPPA Patient Rights, Release of Medical Records, and understanding of sleep screening to treatment process (if driver receives referral for sleep services)
- Driver is provided services with either portable sleep test in their normal sleeping location, or IN-Lab test conducted within a sleep center for those drivers who have special needs, complicated medical history, or as directed by sleep physician. (to be determined based on protocols)
- Consider having drivers sign employer understanding document that outlines employer expectations and any recourse that is related to compliance.
- Driver should be receiving supporting during all steps in the process, to be determined by clinical protocols.

APPENDIX 1

The following are the 2011 medical necessity guidelines for the diagnosis and treatment of sleep disorders according to Regence Blue Cross Blue Shield. Most commercial health plans are very similar in terms of medical criteria inclusion and exclusion, please note that self-insured plans are able to adapt the below criteria in some situations. Diagnosis and procedure codes are included.

Medically Necessary: Supervised Type I Polysomnography (PSG) in Adults

PSG for adults is considered medically necessary in the diagnosis of the following conditions:

- Sleep-related breathing disorders such as obstructive sleep apnea, upper airway resistance syndrome; **or**
- Narcolepsy or idiopathic hypersomnia (performed in conjunction with a multiple sleep latency test); **or**
- Sleep-related violent or injurious behavior, e.g., REM behavior disorder or suspected nocturnal seizures; **or**
- Periodic limb movements of sleep.

PSG for **adults** is indicated when one or more of the following clinical indications are present:

1. Witnessed apnea during sleep greater than 10 seconds in duration; **OR**
2. Any combination of **two or more** of the following symptoms of sleep apnea {a. through e.}:
 - a. Excessive daytime sleepiness as evidenced by inappropriate daytime napping (e.g., during driving, conversation, or eating); sleepiness that interferes with daily activities not explained by other conditions, e.g., poor sleep hygiene, medication, drugs, alcohol, psychiatric or psychological disorders, or an Epworth Sleepiness Scale score greater than 10; **or**
 - b. Persistent or frequent socially disruptive snoring **or** choking or gasping episodes associated with awakenings; **or**
 - c. Obesity (BMI greater than 30 kg/m²); **or**
 - d. Unexplained hypertension; **or**
 - e. Craniofacial or upper airway soft tissue abnormalities; **OR**
3. Symptoms suggesting narcolepsy, e.g., sleep paralysis, hypnagogic hallucinations, cataplexy; **OR**
4. Violent or injurious behavior during sleep; **OR**
5. Nocturnal oxygen desaturation with unexplained right heart failure, polycythemia, cardiac arrhythmias during sleep or pulmonary hypertension.; **OR**
6. Excessive daytime sleepiness together with witnessed periodic limb movements of sleep; **OR**
7. Unusual or atypical parasomnias based on age, frequency, or duration of behavior; **OR**
8. Individuals with moderate or severe congestive heart failure, stroke/TIA, coronary artery disease, or significant tachycardic or bradycardic arrhythmias who have nocturnal symptoms suggestive of a sleep related breathing disorder or otherwise suspected of having sleep apnea.

Split-Night PSG for **adults** is considered **medically necessary** when the apnea hypopnea index (AHI) or respiratory disturbance index (RDI) is expected to be greater than or equal to 20/hour based on at least 2 hours of PSG study.

Repeat PSG for **adults** is considered **medically necessary** under the following circumstances:

- To re-evaluate an individual with failure of resolution of symptoms or recurrence of symptoms during treatment; **OR**
- To evaluate the impact of uvulopalatopharyngoplasty (UPPP) or other corrective surgeries for obstructive sleep apnea (OSA) after appropriate recovery from surgery; **OR**
- To evaluate the impact of an oral appliance when the AHI or RDI was greater than 15 pre-treatment; **OR**
- To titrate continuous positive airway pressure (CPAP) following an initial PSG where OSA was demonstrated and a split night study was not feasible; **OR**
- To reevaluate the diagnosis of OSA and need for continued CPAP in a person previously diagnosed by PSG and currently using CPAP, if a significant weight loss has occurred since the initial study; **OR**
- To titrate CPAP prescription when half night or "split night" PSG with titration of CPAP performed in the second part of the study is not possible due to AHI or RDI less than 20 or when initial PSG was not diagnostic in time to allow for at least 3 hours of CPAP titration including both REM and non-REM sleep.

Not Medically Necessary Supervised Type I Polysomnography (PSG) in Adults:

Split-Night PSG

A split-night PSG for **adults** (to titrate CPAP in the second half of the study) is considered **not medically necessary** when the criteria above have not been met.

Repeat Standard PSG

Repeat PSG for **adults** is considered **not medically necessary** when the criteria above have not been met **OR** in the follow-up of individuals with OSA treated with CPAP when symptoms attributable to sleep apnea have resolved.

Standard PSG

PSG for **adults** is considered **not medically necessary** for the following symptoms or conditions existing **alone** in the absence of other features suggestive of OSA:

- Snoring;
- Obesity;
- Hypertension;
- Morning headaches;
- Decrease in intellectual functions;
- Memory loss;
- Frequent nighttime awakenings;
- Other sleep disturbances, such as insomnia (acute or chronic), night terrors, sleep walking, epilepsy where nocturnal seizures are not suspected;
- Common uncomplicated non-injurious parasomnias.

Not Medically Necessary: Repeat Standard PSG

Repeat PSG is considered **not medically necessary** in the follow-up of individuals with OSA treated with CPAP when symptoms attributable to sleep apnea have resolved.

Coding

CPT

95810	Polysomnography; sleep staging with 4 or more additional parameters of sleep, attended by a technologist
95811	Polysomnography; sleep staging with 4 or more additional parameters of sleep, with initiation of continuous positive airway pressure therapy or bilevel ventilation, attended by a technologist

ICD-9 Procedure

89.17	Polysomnogram
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ICD-9 Diagnosis

Including but not limited to, the following:

278.00-278.03	Overweight and obesity, obesity hypoventilation syndrome
307.40-307.49	Specific disorders of sleep of non-organic origin
327.00-327.8	Organic sleep disorders
333.94	Restless legs syndrome (RLS)
347.00-347.11	Cataplexy and narcolepsy

Sleep disturbances

780.50-780.59

786.09	Other dyspnea and respiratory abnormalities
78050	Sleep disturbance, unspecified
78051	Insomnia with sleep apnea, unspecified
78052	Insomnia, unspecified
78053	Hypersomnia with sleep apnea, unspecified
78054	Hypersomnia, unspecified
78055	Disruption of 24 hour sleep wake cycle, unspecified

78056	Dysfunctions associated with sleep stages or arousal from sleep
78057	Unspecified sleep apnea
78058	Sleep related movement disorder, unspecified
78059	Other sleep disturbances

Medically Necessary: Home/Portable Sleep Studies:

Home/portable sleep studies with Type III test devices [minimum of 4 parameters, including ventilation or airflow (at least 2 channels of respiratory movement, or respiratory movement and airflow), heart rate or ECG, and oxygen saturation] for **adults** are considered **medically necessary** as an alternative to standard polysomnography in **ANY** of the following four situations:

- To confirm a diagnosis of obstructive sleep apnea in individuals with a high pre-test probability of moderate to severe obstructive sleep apnea based on the presence of **ALL** of the following criteria:
 - habitual snoring; **and**
 - Epworth sleepiness scale score greater than 10; **and**
 - obesity (BMI greater than 30); **and**
 - witnessed apnea; **and**
 - who are without evidence of a significant medical comorbidity (e.g., CHF, chronic pulmonary disease, or neuromuscular disease) or suspicion of other sleep disorder (e.g., narcolepsy, central sleep apnea, or periodic limb movement disorder).
- or**
- Individuals with severe clinical symptoms highly suspicious for obstructive sleep apnea, where initiation of treatment is felt to be urgent and standard polysomnography is not readily available; **or**
- Individual is unable to be studied with polysomnography in the sleep laboratory; **or**
- For follow-up after the diagnosis has already been established by standard polysomnography and therapy initiated. For example, to evaluate the need for continuing nasal continuous positive airway pressure (CPAP) treatment in the individual who it is thought may no longer require therapy as a result of other lifestyle modifications, including significant weight reduction.

Not Medically Necessary Home Portable Sleep Studies:

Home/portable sleep studies for **adults** are considered **not medically necessary** unless the criteria in the medically necessary section above relating to the use of Type III test devices are met.

Coding: When services are deemed Medically Necessary by a board-certified sleep specialist, AND when criteria are met:

CPT

95806: Sleep study, unattended, simultaneous recording of heart rate, oxygen saturation, respiratory airflow, and respiratory effort

ICD-9 Diagnosis All diagnosis for adults: same as listed above.

Multiple Sleep Latency Testing (MSLT) and Maintenance of Wakefulness Testing (MWT)

Medically Necessary: Multiple sleep latency testing (MSLT) is considered **medically necessary** for the evaluation of the following two conditions:

- Narcolepsy; **or**
- Suspected idiopathic hypersomnia.

Not Medically Necessary: MSLT is considered **not medically necessary** in the following four situations:

- When performed for routine diagnosis of obstructive sleep apnea; **or**
- For routine follow-up after treatment of sleep related disorders; **or**
- For evaluation of sleepiness in medical or neurological disorders (other than narcolepsy or idiopathic hypersomnia), including, but not limited to, insomnia, circadian rhythm disorders, and Shift Work Sleep Disorder (SWSD); **or**
- Portable MSLT performed in the home setting.
- ***Multiple Sleep Latency (MSLT) and Maintenance of Wakefulness (MWT) Testing:***
When services are deemed Medically Necessary by a board-certified sleep specialist (for MSLT):

Coding:

CPT

95805 Multiple sleep latency testing (MSLT) or maintenance of wakefulness testing, recording, analysis, and interpretation of physiological measurements of sleep during multiple trials to assess sleepiness (when specified as MSLT):

ICD-9 Diagnosis

327.10-327.19 Organic disorder of excessive somnolence (organic hypersomnia)

347.00-347.11 Narcolepsy, with or without cataplexy

780.54 Hypersomnia, unspecified

Obstructive Sleep Apnea: Treatment of:

Medically Necessary: The treatment of OSA **in adults** is considered **medically necessary** for individuals who meet either of the following criteria on polysomnography:

1. Apnea Hypopnea Index (AHI) or a Respiratory Disturbance Index (RDI) greater than or equal to 15 events per hour;
2. AHI (or RDI) greater than or equal to 5, and less than 15 events per hour with documentation demonstrating **any** of the following symptoms:
 - Excessive daytime sleepiness, as documented by either a score of greater than **10** on the Epworth Sleepiness scale or inappropriate daytime napping, (e.g., during driving, conversation or eating) or sleepiness that interferes with daily activities; **or**
 - Impaired cognition or mood disorders; **or**
 - Hypertension; **or**
 - Ischemic heart disease or history of stroke; **or**
 - Cardiac arrhythmias, **or**
 - Pulmonary hypertension.

The AHI is equal to the average number of episodes of apnea and hypopnea per hour and must be based on a minimum of two hours of sleep recorded by polysomnography using actual recorded hours of sleep, (i.e., the AHI may not be extrapolated or projected).

FOR ADULTS: Medically Necessary CPAP Criteria:

Continuous positive airway pressure (CPAP) for the treatment of obstructive sleep apnea (OSA) is considered **medically necessary** for individuals who meet either of the following criteria on polysomnography:

1. Apnea Hypopnea Index (AHI) or a Respiratory Disturbance Index (RDI) greater than or equal to 15 events per hour; **OR**
2. AHI (or RDI) greater than or equal to 5, and less than 15 events per hour with documentation demonstrating **any** of the following symptoms:
 - Excessive daytime sleepiness, as documented by either a score of greater than **10** on the Epworth Sleepiness scale or inappropriate daytime napping, (e.g., during driving, conversation or eating) or sleepiness that interferes with daily activities; or
 - Impaired cognition or mood disorders; or
 - Hypertension; or
 - Ischemic heart disease or history of stroke; or
 - Cardiac arrhythmias; or
 - Pulmonary hypertension.

Note: The AHI is equal to the average number of episodes of apnea and hypopnea per hour and must be based on a minimum of two hours of sleep recorded by polysomnography using actual recorded hours of sleep, (i.e., the AHI may not be extrapolated or projected).

Continuous Positive Airway Pressure (CPAP) is considered medically necessary for the treatment of:

- obstructive sleep apnea meeting the above criteria; **or**
- upper airway resistance syndrome (UARS) as defined by AHI (or RDI) less than 5/hr but with more than 10 EEG arousals/hr associated with increased respiratory efforts (with or without concomitant observed snoring) and increased negative esophageal pressure (more negative than -10cms H2O).

Bilevel Positive Airway Pressure (BiPAP®) is considered medically necessary when used by individuals diagnosed with obstructive sleep apnea (OSA) or upper airway resistance syndrome (UARS) when CPAP has failed.

Failed CPAP is defined as any of the following criteria documented in the medical record:

- Claustrophobia; or
- Inability to breathe through the nose; or
- Pain or discomfort; or
- User intolerance; or
- Individuals at high pressures of CPAP (greater than 10 cm H2O) complaining of pressure discomfort.

Auto-CPAP (APAP) is considered medically necessary when used as an alternative to technician titrated CPAP to determine a fixed level of CPAP in individuals with documented moderate to severe obstructive sleep apnea, (AHI greater than or equal to 15) without significant medical co morbidities (CHF, COPD, central sleep apnea, hypoventilation syndromes).

Auto-CPAP (APAP) is considered medically necessary as a second or third line alternative therapy for obstructive sleep apnea when documentation of the following is available:

1. The level of fixed CPAP required is at least 10cms H2O as evidenced by an in-laboratory, technician-attended CPAP titration during polysomnography; **AND**

2. The individual is intolerant of high fixed CPAP pressures (greater than 10cms H2O) despite appropriate education and interventions to improve comfort and compliance. These interventions should include:
 - The use of a topical nasal corticosteroid spray or anticholinergic spray if nasal complaints are significant; and
 - Changes made by a nurse or technician, in consultation with the attending physician, to the CPAP circuit or mask, using different nose masks, face masks, nasal pillows or head harnesses as appropriate to achieve maximum user comfort.

FOR ADULTS: Not Medically Necessary: The use of CPAP is considered not medically necessary when the criteria listed above are not met.

The use of Auto-CPAP as an alternative to technician-titrated CPAP to determine a fixed level of CPAP is considered **not medically necessary** if the individual **does not snore** (naturally or resulting from palate surgery) **or** when the conditions indicated above for the use of Auto-CPAP to determine a fixed level of CPAP are not met.

Auto-CPAP (APAP) is considered not medically necessary for the treatment of individuals with the following conditions:

- Central apnea; or
- Congestive heart failure; or
- Lung disease (e.g., chronic obstructive pulmonary disease); or
- Nocturnal O2 desaturation due to conditions other than obstructive sleep apnea; or
- OSA in the absence of snoring (either natural or secondary to palatal surgery). [In these cases, APAP devices relying on vibration or sound in the device's algorithm should not be used.]

Medically Necessary: CPAP for the treatment of obstructive sleep apnea (OSA) is considered medically necessary when the following criteria are met:

- There is a documented diagnosis of obstructive sleep apnea (OSA) and polysomnography demonstrates an apnea index (AI) or apnea-hypopnea index (AHI) equal to or greater than one (1); **AND**
- Adenotonsillectomy has been unsuccessful in relieving OSA; **OR**
- Adenotonsillar tissue is minimal; **OR**
- Adenotonsillectomy is inappropriate based on OSA being attributable to another underlying cause (e.g., craniofacial anomaly) or adenotonsillectomy is contraindicated.

Coding

HCPCS

E0561	Humidifier, non-heated, used with positive airway pressure device
E0562	Humidifier, heated, used with positive airway pressure device
E0601	Continuous airway pressure (CPAP) device
	No specific code for Auto-CPAP (APAP) or flexible devices (C-Flex)

ICD-9 Diagnosis

Including, but not limited to, the following:

278.03	Obesity hypoventilation syndrome
307.40-307.49	Specific disorders of sleep of non-organic origin
327.00-327.8	Organic sleep disorders
333.94	Restless legs syndrome (RLS)
347.00-347.11	Cataplexy and narcolepsy
780.50-780.59	Sleep disturbances
786.09	Other dyspnea and respiratory abnormalities

Definitions:

Type III Test Devices: Testing that monitors and records a minimum of 4 parameters: respiratory movement/effort, airflow, ECG/heart rate, and oxygen saturation. These test devices essentially provide an assessment of cardiorespiratory parameters but do not provide data on sleep staging.

Actigraphy: This is a method used to study sleep-wake patterns and circadian rhythms by assessing the subject's movement over a period of time. Measurements usually involve the detection of wrist movements.

Apnea-Hypopnea Index (AHI) or Respiratory Disturbance Index (RDI): A measure of apnea severity defined by the total number of episodes of apnea or hypopnea during a full period of sleep divided by the number of hours asleep. For the purposes of this document, the terms AHI and RDI are interchangeable, although they may differ slightly in clinical use. An AHI/RDI greater than 30 is consistent with severe obstructive sleep apnea. In some cases, respiratory effort-related arousals (or RERAS) are included in the RDI value. These RERA episodes represent EEG arousals associated with

increased respiratory efforts but do not qualify as apneic or hypopneic episodes because of the absence of their defining air flow changes and/or levels of oxygen desaturation.

Excessive daytime sleepiness: This refers to a condition where a person feels very drowsy during the day, even after getting adequate night time rest, and has a tendency to fall asleep or requires extra effort to avoid sleeping in inappropriate situations, such as at work or driving. This condition is also defined as a score greater than or equal to 10 on the Epworth Sleepiness Scale.

Multiple Sleep Latency Test (MSLT): This is a test used in conjunction with polysomnography to determine the presence and severity of sleepiness. During this test, the subject is given the opportunity to take naps at specified time intervals. The test consists of four or five nap opportunities at two hour intervals. Each nap opportunity is 20 minutes in duration. Individuals with excessive daytime sleepiness may fall asleep almost immediately, while those without excessive sleepiness may not fall asleep at all. Severe sleepiness is usually associated with an MSLT mean sleep latency of less than 5 minutes. The presence of sleep onset rapid eye movement (REM) and the number of naps in which sleep REM occurs are also determined.

Narcolepsy: This refers to a neurological condition, where individuals experience profound daytime sleepiness, which may also include sudden, periodic, and transient loss of muscle tone associated with extreme emotions, such as laughter or anger (cataplexy).

Obstructive Sleep Apnea (OSA): This is a form of sleep disturbance, which occurs as the result of a physical occlusion of the upper airway during sleep, which interferes with normal breathing. The occlusion is usually in the back of the tongue and/or flabby tissue in the upper airway. This condition is associated with frequent awakening and often with daytime sleepiness.

Shift Work Sleep Disorder (SWSD): A sleep disorder that is related to unusual or constantly changing work schedules and results in symptoms of insomnia or excessive sleepiness.

Sleep disorder: A disruptive pattern of sleep that may include difficulty falling or staying asleep, falling asleep at inappropriate times, excessive total sleep time, or abnormal behaviors associated with sleep.

Split-night study: This refers to a combination sleep study where the first half of the night is a polysomnography study. If the study indicates obstructive sleep apnea, the second half of the study is used for a CPAP evaluation and titration.

Upper airway: The area of the upper respiratory system including the nose, mouth and throat.

APPENDIX 2: SCREENING PROTOCOLS

Following are two examples from NPTC provider members.

Sleep Apnea Referral Form:

Driver Information (Driver Fills Out):

Full Name:	Address:		
<hr/>			
Primary Contact Phone:	Alternate Phone:	Driver Alpha Code:	
<hr/>			
Date of Birth:	Gender: <input type="checkbox"/> Male <input type="checkbox"/> Female		
<hr/>			
Insurance Plan:	Group Coverage:	Y	N
<hr/>			
*Date Insurance Starts:	Location of Terminal/Distribution Center:		
<hr/>			

☐ Presence of snoring, witnessed apneas, disrupted sleep, feeling of choking during sleep (circle any that apply)

☐ Presence of daytime sleepiness, inadvertent naps, nighttime awakenings, fatigue (circle any that apply)

DOT Provider Information

DOT:	Date of Sleep Apnea Screen:	Due Date for Return Exam:
<hr/>		
City:	State:	Zip:
<hr/>		
Office Ph:	Office Fax:	
<hr/>		

History and Physical Screening: (send for sleep apnea evaluation if any 2 of the red items are checked or circled, including Symptoms listed under Driver Information Section.)

Section One: Past Medical History: Please check any of the following if present:

<input type="checkbox"/> High Blood Pressure:	Managed well:	Y	N
<input type="checkbox"/> History of Cardiac Disease:	Type:	<hr/>	
<input type="checkbox"/> History of Pulmonary Disease:	Type:	<hr/>	
<input type="checkbox"/> History of Depression:	Managed well:	Y	N.
<input type="checkbox"/> History of Diabetes:	Type:	<hr/>	
<input type="checkbox"/> Other PMH: <hr/> (Neurology, ENT, Shift Worker, Unknown Other-please specify)			

Section Two: Exam:

HT: <hr/>	WT: <hr/>	Neck Size (in): <hr/>
BMI: <hr/>	Above 30: Y N	Neck Size Above 17" for men: Y N
		Neck Size above 15 1/2" for women: Y N

Location for OSA Evaluation:

- | | | |
|---|--|---|
| <input type="checkbox"/> Dallas, TX | <input type="checkbox"/> Chicago, IL | <input type="checkbox"/> Atlanta, GA |
| <input type="checkbox"/> E. Brunswick, NJ | <input type="checkbox"/> Columbus, OH | <input type="checkbox"/> Louisville, KY |
| <input type="checkbox"/> Los Angeles, CA | <input type="checkbox"/> <hr/> (write-in preferred location) | |

DOT Provider Signature:

 Date:

The following questions have been designed to help identify problems with your sleep. Please answer them as best you can. After completing the questionnaire, you will be provided information about your risk of having a sleep disorder.

Name: _____

Date: _____

Sex: ☐ Female ☐ Male

Age: _____

SECTION 1

1. When you try to relax in the evening or sleep at night, do you ever have unpleasant, restless feelings in your legs that can be relieved by walking or movement?
- | | |
|----------------------------|----------------------------|
| No | Yes |
| <input type="checkbox"/> 0 | <input type="checkbox"/> 1 |

SECTION 1 SCORE

SECTION 2

1. During the last two weeks, please rate the severity of your sleep problem(s).

	<u>None</u>	<u>Mild</u>	<u>Moderate</u>	<u>Severe</u>	<u>Very severe</u>
a. Difficulty falling asleep	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
b. Difficulty staying asleep	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
c. Problem waking up too early	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4

2. How satisfied or dissatisfied are you with your current sleep pattern?
- | | | | | |
|----------------------------|----------------------------|-----------------------------|----------------------------|----------------------------|
| <u>Very satisfied</u> | <u>Satisfied</u> | <u>Moderately satisfied</u> | <u>Dissatisfied</u> | <u>Very dissatisfied</u> |
| <input type="checkbox"/> 0 | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 |

3. How noticeable to others do you think your sleep problem is in terms of impairing the quality of your life?
- | | | | | |
|------------------------------|----------------------------|----------------------------|----------------------------|-----------------------------|
| <u>Not at all noticeable</u> | <u>A little</u> | <u>Somewhat</u> | <u>Much</u> | <u>Very much noticeable</u> |
| <input type="checkbox"/> 0 | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 |

4. How worried or distressed are you about your current sleep problem?
- | | | | | |
|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| <u>Not at all worried</u> | <u>A little</u> | <u>Somewhat</u> | <u>Much</u> | <u>Very much worried</u> |
| <input type="checkbox"/> 0 | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 |

5. To what extent do you consider your sleep problem to currently interfere with your daily functioning (e.g., daytime fatigue, mood, ability to function at work, daily chores, concentration, memory, etc.)
- | | | | | |
|-------------------------------|----------------------------|----------------------------|----------------------------|------------------------------|
| <u>Not at all interfering</u> | <u>A little</u> | <u>Somewhat</u> | <u>Much</u> | <u>Very much interfering</u> |
| <input type="checkbox"/> 0 | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 |

SECTION 2 SCORE

SECTION 3

1. How likely are you to doze off or fall asleep in the following situations, in contrast to feeling just tired? This refers to your usual way of life in recent times. Even if you have not done some of these things recently, try to work out how they would have affected you. Use the following scale to choose the most appropriate number for each situation.

	<u>Would never doze</u>	<u>Slight chance of dozing</u>	<u>Moderate chance of dozing</u>	<u>High chance of dozing</u>
a. Sitting and reading	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
b. Watching TV	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
c. Sitting inactive in a public place (e.g., a theater or a meeting)	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
d. As a passenger in a car for an hour without a break	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
e. Lying down to rest in the afternoon when circumstances permit	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
f. Sitting and talking to someone	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
g. Sitting quietly after lunch without alcohol	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
h. In a car while stopped for a few minutes in traffic	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3

SECTION 3 SCORE

Name: _____

Date: _____

SECTION 4-A

- | | | | | |
|--|---|---|--|---|
| | <u>No</u>
<input type="checkbox"/> 0 | <u>Yes</u>
<input type="checkbox"/> 1 | <u>Don't know</u>
<input type="checkbox"/> 0 | |
| 1. Do you snore? | | | | |
| | <u>Slightly louder than breathing</u>
<input type="checkbox"/> 0 | <u>As loud as talking</u>
<input type="checkbox"/> 0 | <u>Louder than talking</u>
<input type="checkbox"/> 0 | <u>Very loud – can be heard in adjacent rooms</u>
<input type="checkbox"/> 1 |
| 2. If you snore, your snoring is... | | | | |
| | <u>Never/nearly never</u>
<input type="checkbox"/> 0 | <u>1–2 times a month</u>
<input type="checkbox"/> 0 | <u>1–2 times a week</u>
<input type="checkbox"/> 0 | <u>3–4 times a week</u>
<input type="checkbox"/> 1 |
| 3. How often do you snore? | | | | <u>Nearly every day</u>
<input type="checkbox"/> 1 |
| | <u>No</u>
<input type="checkbox"/> 0 | <u>Yes</u>
<input type="checkbox"/> 1 | <u>Don't know</u>
<input type="checkbox"/> 0 | |
| 4. Has your snoring ever bothered other people? | | | | |
| | <u>Never/nearly never</u>
<input type="checkbox"/> 0 | <u>1–2 times a month</u>
<input type="checkbox"/> 0 | <u>1–2 times a week</u>
<input type="checkbox"/> 0 | <u>3–4 times a week</u>
<input type="checkbox"/> 2 |
| 5. Has anyone noticed that you quit breathing during your sleep? | | | | <u>Nearly every day</u>
<input type="checkbox"/> 2 |

SECTION 4-A SCORE

SECTION 4-B

- | | | | | | |
|--|---|--|---|---|---|
| | <u>Never/nearly never</u>
<input type="checkbox"/> 0 | <u>1–2 times a month</u>
<input type="checkbox"/> 0 | <u>1–2 times a week</u>
<input type="checkbox"/> 0 | <u>3–4 times a week</u>
<input type="checkbox"/> 1 | <u>Nearly every day</u>
<input type="checkbox"/> 1 |
| 6. How often do you feel tired or fatigued after your sleep? | | | | | |
| 7. During your waking time, do you feel tired, fatigued, or not up to par? | | | | | |
| | <u>No</u>
<input type="checkbox"/> 0 | <u>Yes</u>
<input type="checkbox"/> 1 | <u>Don't know</u>
<input type="checkbox"/> 0 | | |
| 8. Have you ever nodded off or fallen asleep while driving a vehicle? | | | | | |
| | <u>Never/nearly never</u>
<input type="checkbox"/> 0 | <u>1–2 times a month</u>
<input type="checkbox"/> 0 | <u>1–2 times a week</u>
<input type="checkbox"/> 0 | <u>3–4 times a week</u>
<input type="checkbox"/> 1 | <u>Nearly every day</u>
<input type="checkbox"/> 1 |
| 9. If yes, how often does it occur? | | | | | |

SECTION 4-B SCORE

SECTION 4-C

- | | | | |
|---|---|--|---|
| | <u>No</u>
<input type="checkbox"/> 0 | <u>Yes</u>
<input type="checkbox"/> 1 | <u>Don't know</u>
<input type="checkbox"/> 0 |
| 10. Do you have high blood pressure? | | | |
| 11. What is your height in inches? | _____ | inches | |
| 12. What is your weight? | _____ | lbs | |
| | <u>No</u>
<input type="checkbox"/> 0 | <u>Yes</u>
<input type="checkbox"/> 1 | <u>BMI</u>
_____ |
| 13. Is BMI higher than 30? (to be completed by staff) | | | |

Note: BMI = 703 x pounds / inches x inches

SECTION 4-C SCORE

Thank you for completing the Sleep Disorder Screening Tool.

Name: _____

Date: _____

The risk assessment is based on validated questionnaires; however, this is not a substitute for an assessment by a physician.

SECTIONS 1 - 3		
RESTLESS LEGS SYNDROME	Section 1 Score: <input type="text"/>	<input type="checkbox"/> HIGH RISK = 1 point <input type="checkbox"/> LOW RISK = 0 points
INSOMNIA	Section 2 Score: <input type="text"/>	<input type="checkbox"/> HIGH RISK = 15 – 28 points <input type="checkbox"/> LOW RISK = 0 – 14 points
EXCESSIVE SLEEPINESS	Section 3 Score: <input type="text"/>	<input type="checkbox"/> HIGH RISK = 11 or more points <input type="checkbox"/> LOW RISK = 0 – 10 points
SECTION 4		
	Section 4-A Score: <input type="text"/>	If score is 2 or more, check here <input type="checkbox"/>
	Section 4-B Score: <input type="text"/>	If score is 2 or more, check here <input type="checkbox"/>
	Section 4-C Score: <input type="text"/>	If score is 1 or more, check here <input type="checkbox"/>
OBSTRUCTIVE SLEEP APNEA		<input type="checkbox"/> HIGH RISK = 2 – 3 checked boxes <input type="checkbox"/> LOW RISK = 0 – 1 checked boxes

If you scored **HIGH RISK** for a sleep disorder, it is recommended that you follow up with your primary care physician or a sleep physician regarding your symptoms to determine whether you might have a sleep disorder.

If you scored **LOW RISK** for a sleep disorder, although your risk is low, a sleep disorder cannot be ruled out by this questionnaire, so follow up with your primary care physician or a sleep specialist if you are still concerned about your sleep or alertness.

Caution is recommended with driving or during other activities requiring alertness for safety if you have problems with sleep or sleepiness.

For more information on sleep or sleep disorders, visit www.sleepandyou.com. If you would like a sleep evaluation at Sleep HealthCenters, please contact us at 877-SLEEP-HC (877-753-3742) or visit our website at www.sleephealth.com.

Risk determination based on use of the following, validated questionnaires:

Restless Legs Syndrome: RLS Rapid Screening Test. Ferr R et al. A single question for the rapid screening of restless legs syndrome in the neurological clinical practice. European Journal of Neurology 2007. 14:1016–1021.

Insomnia: Insomnia Severity Index. Bastien C et al. Validation of the Insomnia Severity Index as an outcome measure for insomnia research. Sleep Med 2001. 2:297-307.

Excessive Sleepiness: Epworth Sleepiness Scale. Johns MW. A new method for measuring daytime sleepiness: the Epworth Sleepiness Scale. Sleep 1991. 14:540-545.

Obstructive Sleep Apnea: Berlin Questionnaire. Chung F et al. Validation of the Berlin Questionnaire and American Society of Anesthesiologists checklist as screening tools for obstructive sleep apnea in surgical patients. Anesthesiology 2008. May;108(5):822-30.

APPENDIX 3: MEMBERS OF THE TASK FORCE ON SLEEP APNEA

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LITERATURE REVIEW

There is solid information about sleep apnea pathology, risk factors and prevalence at government websites like the CDC (www.cdc.gov/sleep/disorders.htm) or the NIH (www.nhlbi.nih.gov/about/ncsdr/ or <http://health.nih.gov/topic/SleepDisorders>). There are also some great resources from the National Sleep Foundation (www.sleepfoundation.org) or universities like Harvard Medical School (www.understandingsleep.org). Other valuable studies/research includes:

1. Time course of changes in driving simulator performance with and without treatment in patients with sleep apnea hypopnea syndrome.

Turkington PM, Sircar M, Saralaya D, Elliott MW.

Department of Respiratory Medicine, St James's University Hospital, Leeds LS9 7TF, UK.

pete.turkington@dial.pipex.com

Thorax. 2004 Jan;59(1):56-9.

CONCLUSION: Driving simulator performance in patients with severe SAHS improves within the first few days of starting CPAP and these improvements appear to be sustained for up to 1 week after withdrawal. Further data about the usefulness of driving simulators in predicting safe driving are needed before these results can be used in advising patients on driving. However, the data appear to suggest that driving can be safely resumed after a few days of effective CPAP treatment.

2. Reduction in motor vehicle collisions following treatment of sleep apnea with nasal CPAP.

George CF.

University of Western Ontario, London Health Sciences Centre, 375 South Street, London, Ontario N6A 4G5, Canada. cgeorge@uwo.ca

Thorax 2001;56:508-512.

CONCLUSIONS: The risk of motor vehicle collisions (MVCs) due to OSA is removed when patients are treated with CPAP. As such, any restrictions on driving because of OSA could be safely removed after treatment.

3. Treatment with nasal CPAP decreases automobile accidents in patients with sleep apnea.

Findley L, Smith C, Hooper J, Dineen M, Suratt PM.

Sleep Disorders Center of Northern Colorado, Loveland, Colorado 80538, USA.

Am J Respir Crit Care Med. 2000 Mar;161(3 Pt 1):857-9.

The patients with sleep apnea in this study had a higher automobile crash rate than all drivers in the state of Colorado (0.07 versus 0.01 crash per driver per year, $p < 0.02$). Patients who were treated with nasal CPAP had a lower crash rate while being treated than before treatment (0.07 versus 0 crashes per driver per year, $p < 0.03$). Untreated patients with sleep apnea continued to have a high crash rate (0.07 crashes per driver before and

after diagnosis). Drivers with sleep apnea were reluctant to report their automobile crashes, for the drivers in this study reported only one-third of the crashes in which they were involved. This is the first study to confirm with traffic records that patients with sleep apnea have fewer automobile crashes while being treated with nasal CPAP.

4. Sleepiness, sleep-disordered breathing, and accident risk factors in commercial vehicle drivers.

Howard ME, Desai AV, Grunstein RR, Hukins C, Armstrong JG, Joffe D, Swann P, Campbell DA, Pierce RJ.

Institute of Breathing and Sleep, Bowen Centre, Austin Health and University of Melbourne, Heidelberg, Victoria, Australia. mark.howard@austin.org.au

Am J Respir Crit Care Med. 2004 Nov 1;170(9):1014-21. Epub 2004 Aug 18.

In conclusion, we have found a high prevalence of sleep-disordered breathing and excessive sleepiness among commercial vehicle drivers. Obesity was common, which at least partially explains the high prevalence of sleep-disordered breathing. Sleep apnea and sleep duration were the main factors related to excessive sleepiness. There was an increased accident risk in those with excessive sleepiness, and in those who used narcotic analgesics or antihistamines. Interventions to reduce sleepiness among professional drivers may reduce accident risk. Physicians and drivers also need to be aware of medications that may increase accident risk.

5. Reducing motor-vehicle collisions, costs, and fatalities by treating obstructive sleep apnea syndrome.

Sassani A, Findley LJ, Kryger M, Goldlust E, George C, Davidson TM.

University of California, San Diego, School of Medicine Department of Radiology, 92103-8765, USA. asassani@ucsd.edu

Sleep 2004;27(3):453-458.

CONCLUSION: Annually, a small but significant portion of motor-vehicle collisions, costs, and deaths are related to OSAS. With CPAP treatment, most of these collisions, costs, and deaths can be prevented. Treatment of OSAS benefits both the patient and the public.

6. Sleep and sleep-disordered breathing in commercial long-haul truck drivers

RA Stoohs, LA Bingham, A Itoi, C Guilleminault and WC Dement

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Chest 1995;107:1275-1282.

Long-haul truck drivers have very irregular sleep/wake schedules and a high prevalence of sleep-disordered breathing. Chronic sleep/wake disruption and partial, prolonged sleep deprivation may worsen sleep-disordered breathing. This combination of problems may impact significantly on the daytime alertness of truckers.

8. Sleepiness-related accidents in sleep apnea patients.

Horstmann S, Hess CW, Bassetti C, Gugger M, Mathis J.
Department of Neurology, University Hospital, Bern, Switzerland.
Sleep 2000 May 1;23(3):383-9.

During treatment with nasal continuous airway pressure (nCPAP) in 85 SAS patients, the motor vehicle accident rate dropped from 10.6 to 2.7 per million km ($p < 0.05$). We conclude that patients with moderate to severe SAS have an up to fifteen-fold risk increase of motor vehicle accidents that constitutes a serious and often underestimated hazard on the roads, which can be reduced by adequate treatment.

9. [Sleepy drivers have a high frequency of traffic accidents related to respiratory effort-related arousals]

[Article in Spanish]

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Arch Bronconeumol. 2003 Apr;39(4):153-8.

CONCLUSIONS: The high risk of traffic accidents among sleepy drivers is mainly determined by the presence of RERA rather than the presence of apneas and hypopneas. These findings verify the importance of identifying RERA in routine sleep laboratory studies.

10. Occupational screening for obstructive sleep apnea in commercial drivers.

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Am J Respir Crit Care Med. 2004 Aug 15;170(4):371-6. Epub 2004 May 13.

We conclude that two-stage screening is likely to be a viable means of excluding severe sleep apnea among commercial drivers.

11. Prevalence of snoring and sleep-disordered breathing in a group of commercial bus drivers in Hong Kong.

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Intern Med J. 2002 Apr;32(4):149-57.

CONCLUSIONS: This study showed a high prevalence of objective snoring and SDB in a group of commercial bus drivers. Neither self-reported sleepiness nor the ESS could identify subjects with SDB.

12. Habitually sleepy drivers have a high frequency of automobile crashes associated with respiratory disorders during sleep.

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Am J Respir Crit Care Med. 2000 Oct;162(4 Pt 1):1407-12.

Habitually sleepy drivers are a large group of drivers (1 of 30 drivers) who are involved in several fold more automobile crashes than control subjects. As these excess auto crashes can be explained in part by the presence of respiratory disorders during sleep, which are treatable, many automobile crashes in these sleepy drivers may be preventable. Our findings suggest that asking about excessive sleepiness while driving may better predict which subjects with breathing disorders during sleep have crashes than asking about overall sleepiness.

13. Sleepiness, driving, and motor vehicle crashes. Council on Scientific Affairs, American Medical Association.

Lyznicki JM, Doege TC, Davis RM, Williams MA.

Council on Scientific Affairs, American Medical Association, Chicago, IL 60610, USA.

JAMA. 1998 Jun 17;279(23):1908-13.

CONCLUSIONS: Increased awareness of the relationship between sleepiness and motor vehicle crashes will promote the health and safety of drivers and highway users. Physicians can contribute by encouraging good sleep habits, recognizing and treating sleep-related problems, and counseling patients about the risks of driving while sleepy. To protect public health and safety, the American Medical Association recommends continued research on devices and technologies to detect the signs of sleepiness and prevent the deterioration of driver alertness and performance. Educational programs about the risks of falling asleep while driving are needed for physicians, the public, and commercial truck drivers.

14. Sleep-disordered breathing and motor vehicle accidents in a population-based sample of employed adults.

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Department of Preventive Medicine, University of Wisconsin, Madison 53705, USA.

Sleep. 1997 Aug;20(8):608-13.

These results, free of clinic selection bias, indicate that unrecognized sleep-disordered breathing in the general population is linked to motor vehicle accident occurrence. If the association is causal, unrecognized sleep-disordered breathing may account for a significant proportion of motor vehicle accidents.

Sleepiness at work among commercial truck drivers.

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Sleep. 2000 Feb 1;23(1):49-57.

Two separate groups consisting of both long-haul (N=184) and short-haul (N=133) truck drivers were surveyed to examine the frequency of driver sleepiness-related problems at work during the previous three months and to assess the incidence of sleep apnea syndrome symptoms. We also aimed to identify factors likely to predict self-reported difficulties in staying alert in work driving, dozing off (sometimes referred to as microsleeps) at the wheel and near misses. The responses suggest that for approximately 13% of the long-haul drivers the mean driving time per shift exceeded the EEC regulation. About 40% of the long-haul drivers and 21% of the short-haul drivers reported having problems in staying alert on at least 20% of their drives. Over 20% of the long-haul drivers also reported having dozed off at least twice while driving. Near misses due to dozing off had occurred in 17% of these drivers. Factors indicating sleep apnea syndrome occurred in only about 4% of the long-haul drivers and in only two short-haul drivers. Work and individual related factors as well as factors indicating sleep apnea syndrome contributed only slightly to predicting driver sleepiness-related problems. This suggests that driver sleepiness-related problems tend to be shared by many of the professional drivers, rather than being a "specific" and permanent problem for a smaller portion of drivers. However, difficulties in sleep patterns, such as having difficulty falling asleep, were infrequent.

15. The association between sleep apnea and the risk of traffic accidents.

Cooperative Group Burgos-Santander.

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N Engl J Med. 1999 Mar 18;340(11):847-51.

RESULTS: The mean age of the participants was 44 years; 77 percent were men. As compared with those without sleep apnea, patients with an apnea-hypopnea index of 10 or higher had an odds ratio of 6.3 (95 percent confidence interval, 2.4 to 16.2) for having a traffic accident. This relation remained significant after adjustment for potential confounders, such as alcohol consumption, visual-refraction disorders, body-mass index, years of driving, age, history with respect to traffic accidents, use of medications causing drowsiness, and sleep schedule. Among subjects with an apnea-hypopnea index of 10 or more, the risk of an accident was higher among those who had consumed alcohol on the day of the accident than among those who had not. **CONCLUSIONS:** There is a strong association between sleep apnea, as measured by the apnea-hypopnea index, and the risk of traffic accidents.

16. Risk of traffic accidents in patients with sleep-disordered breathing: reduction with nasal CPAP.

Cassel W, Ploch T, Becker C, Dugnus D, Peter JH, von Wichert P.
Klinikum der Philipps-Universität, Abteilung Poliklinik, Marburg, Germany.
Eur Respir J. 1996 Dec;9(12):2606-11.

We conclude that treatment of sleep-disordered breathing by nasal continuous positive airway pressure is related to reduction in patient motor vehicle accident rates, probably due to the reversal of excessive daytime sleepiness.