

OBSTRUCTIVE SLEEP APNEA

Driver sleepiness is a major cause of motor vehicle crashes. Most crashes due to drowsy driving likely occur in healthy but sleep deprived individuals, but drivers with obstructive sleep apnea (OSA) are at increased risk for car accidents.

OSA (and possibly central sleep apnea) can cause impairment in daytime performance. It is associated with increased risk of motor vehicle crashes, with estimates ranging from 2% to 7% in those with OSA compared to those without.^{A B} The condition is common (2-8% in older literature, with more recent estimates suggesting that 25% of adult men in the US are affected), and the frequency of occurrence increases with age, BMI (body mass index) and comorbid conditions such as diabetes.

People with sleep apnea may have delayed reaction times and inattentiveness in addition to frank sleepiness. Some are unaware of their sleepiness and cognitive impairment. It is important to recognize that excessive daytime sleepiness and crash risk may not correlate with the severity of the sleep apnea. A recent study demonstrated that increased risk of motor vehicle crashes is present in those with mild OSA as well as those with severe disease.^C The diagnosis of OSA is made through polysomnography (PSG), with insurers increasingly insisting upon Home Sleep Studies (HST) although the gold standard is still in lab polysomnography.

Treatment of OSA generally improves daytime sleepiness. Use of continuous positive airway pressure (CPAP) is a highly effective treatment with studies suggesting that daytime symptoms improve within two weeks of positive airway pressure (PAP) treatment.^D It is the only treatment modality demonstrated to reduce crash risk.^E Not using CPAP for as little as one night may cause daytime impairment.^F

Other treatment options for OSA include bariatric surgery for morbid obesity, use of oral mandibular advancement devices, upper airway surgery and craniofacial surgery. Hypoglossal nerve stimulators have been approved by the FDA for treatment of OSA.^G Assessment of treatment efficacy with PSG after surgery or with use of an oral device is recommended.

It is difficult for clinicians to assess sleepiness (and possible impairment while driving) in a patient with OSA. Sleepiness cannot be measured easily by objective testing. Maintenance of Wakefulness Tests (MWT) and Multiple Sleep Latency Tests (MSLT) are the best objective measures of daytime sleepiness in those with OSA, but are performed only in Sleep Centers, are expensive and time consuming. They are not routinely used to assess daytime sleepiness in drivers. The clinician must use subjective reports as well as objective data from CPAP downloads to assess adherence to treatment and level of daytime sleepiness.

The diagnosis of obstructive sleep apnea should only be made by a physician or NP/PA with specialized training in Sleep Medicine. Those with OSA are frequently followed by a sleep specialist or a neurologist.

The Epworth Sleepiness Scale^I is a widely used measure of subjective daytime sleepiness although the sensitivity and specificity of the scale is less than ideal. A score of 7 or less out of 24 is considered normal (not sleepy).^H The acceptable range cutoff value is subject to debate, with some researchers suggesting that 7 or less is normal (not sleepy); others suggesting 12 or less).

Patients on PAP therapy should have data downloaded from their device to measure adherence with therapy. Medicare guidelines^I are the standard for adherence to treatment and require an average of 4 hours PAP use per night 70% of the time.

PAP devices also calculate an AHI (apnea/hypopnea index). The AHI determines the severity of OSA: an AHI of 15 or fewer obstructive events per hour is considered mild.

The clinician must educate patients that driving safety is ultimately the individual's responsibility. Insufficient sleep time, medications, shift work and illness may affect one's ability to drive safely despite consistent use of PAP therapy.

Footnotes:

¹Epworth Sleepiness Scale: A validated sleep questionnaire containing eight items that ask for self-reported disclosure of expectation of "dozing" in a variety of situations. Dozing probability ratings are none (0), slight (1), moderate (2), or high (3) in eight hypothetical situations. A scale of 0 to 7 is normal, 8-12 is mild, 13-16 is moderate, and greater than 16 is severe. (*Hirshkowitz M, Gokcebayu N, Iqbal S, et al: Epworth Sleepiness Scale and sleep disordered breathing: Replication and extension. Sleep Res 1995; 24:249*)

FOR REFERENCES, SEE BIBLIOGRAPHY AT END OF DOCUMENT.

FUNCTIONAL ABILITY PROFILE
Obstructive Sleep Apnea¹

Profile Levels	Degree of Impairment²/ Potential for At Risk Driving	Condition Definition / Example	Interval for Review and Other Actions
1.	No diagnosed condition	No known disorder	N/A
2.	Condition fully recovered	Recovered after Treatment(s) other than CPAP, such as surgical intervention, weight loss or dental device ³ . Polysomnogram (PSG) demonstrates an AHI ⁴ (apnea/ hypopnea index) of less than 15. ESS (Epworth Sleepiness Scale) ⁵ score of less than 8. No report of accident or near miss.	N/A
3.	Active impairment	See footnote regarding PAP therapy. ⁶ This diagnosis should be made only after a sleep study. Neurology or sleep med specialists are often the clinicians to provide follow-up.	
	a. Mild	AHI ⁴ < 15 on diagnostic PSG and not sleepy, ESS less than 8. Not on treatment.	Three years
	b. Moderate	PAP download demonstrates adherence to treatment. ^{6,7} AHI ⁴ less than 15 on download. ESS less than 8. No crashes or near misses.	Yearly
	c. Severe	History of falling asleep while driving or near miss, or strong suspicion of OSA with concern for unsafe driving; and/or Non-responsive or non-adherent ⁷ to therapy.	No driving

¹ For further discussion regarding OBSTRUCTIVE SLEEP APNEA, please refer to NARRATIVE found at beginning of this section.

² For further explanation of degree of impairment, please refer to SECTION 3.

³ For those with dental device, repeat PSG must be done with device in place.

⁴ AHI: apnea/hypopnea index: number of obstructive events per hour of sleep.

⁵ Epworth Sleepiness Scale: validated sleep questionnaire containing eight items that ask for self-reported disclosure of expectation of “dozing” in a variety of situations. Dozing probability ratings are none (0), slight (1), moderate (2), or high (3) in eight hypothetical situations. A scale of 0 to 7 is normal, 8-12 is mild, 13-16 is moderate, and 17 or greater is severe. (Hirshkowitz M, Gokcebayu N, Iqbal S, et al: Epworth Sleepiness Scale and sleep disordered breathing: Replication and extension. Sleep Res 1995; 24:249).

⁶ Treatment with positive airway pressure therapy. PAP devices include but are not limited to, CPAP (continuous positive airway pressure), BiPAP (bi-level positive airway pressure), and ASV (adaptive servo-ventilation).

⁷ Adherence to or compliance with CPAP treatment derived from Medicare guidelines: use of PAP an average of four or more hours per night at least 70% of the time.