

20 SLEEP DISORDERS

20.1 RELEVANCE TO DRIVING TASK

- 20.1.1 Fatigue is a major cause of road accidents. Sleepiness and sleep disorders are one important aspect of managing the risks of fatigue (Fatigue Expert Group Options for Regulatory Approach to Fatigue in Drivers of Heavy Vehicles in Australia and New Zealand, February 2001, NRTC).
- 20.1.1 Studies have shown an increased rate of motor vehicle accidents, of between 2 to 7 times that of control subjects, in those with sleep apnoea⁸⁻¹². Studies have also demonstrated increased objectively measured sleepiness whilst driving (electro-encephalography and eye closure measurements) and impaired driving simulator performance in sleep apnoea patients^{2,13,14}. This performance impairment is similar to that seen due to illegal alcohol impairment or sleep deprivation¹⁵. Drivers with severe sleep disordered breathing (respiratory disturbance index greater than 34) may have a much higher rate of accidents than those with a less severe sleep disorder⁸. (LOE-III-2)
- 20.1.2 Motor vehicle accidents involving commercial vehicles are associated with higher fatality rates and costs²⁴. Some commercial vehicle drivers are exposed to periods of sleep deprivation, which may increase the severity of sleep disorders and result in more severe sleepiness in drivers with sleep disorders²⁵.
- 20.1.3 Treatment of obstructive sleep apnoea with nasal CPAP (continuous positive airways pressure) has been shown to reduce daytime sleepiness and reduce the risk of accidents back to control levels^{8,10,18,19}. CPAP has also been shown to improve driving simulator performance to control levels²⁰. Mandibular advancement splints have also been used to treat obstructive sleep apnoea. While they reduce daytime sleepiness and improve vigilance, studies have not been performed to assess whether they reduce motor vehicle accident rates²¹⁻²³. (LOE-III-2)
- 20.1.4 Those with narcolepsy perform worse on simulated driving tasks and are more likely to have accidents than control subjects^{27,28}. (LOE-III-2)

20.2 GENERAL MANAGEMENT GUIDELINES

- 20.2.1 Excessive sleepiness during the day, which manifests itself as a tendency to doze at inappropriate times when intending to stay awake, can arise from many causes and is associated with an increased risk of accidents. It is important to distinguish sleepiness (the tendency to fall asleep) from fatigue or tiredness which is not associated with a tendency to fall asleep. Many chronic illnesses cause fatigue without increased sleepiness.
- 20.2.2 Increased sleepiness during the daytime in otherwise normal people may be due to prior sleep deprivation (restricting the time for sleep), poor sleep hygiene habits, irregular sleep wake schedules or influence of sedative medications including alcohol. Insufficient sleep (less than 5 hours) prior to driving is strongly related to accident risk⁹. Excessive daytime sleepiness may also result from a number of medical sleep disorders including the sleep apnoea syndromes (obstructive sleep apnoea, central sleep apnoea and nocturnal hypoventilation), periodic limb movement disorder, circadian rhythm disturbances (eg. advanced or delayed sleep phase syndrome), some forms of insomnia and narcolepsy.
- 20.2.3 **Sleep apnoea definitions and prevalence.** Sleep apnoea is present on overnight monitoring in 9% of adult women and 24% of adult men^{3,4}. **Sleep apnoea syndrome** (excessive sleepiness in combination with sleep apnoea on overnight monitoring) is present in 2% of women and 4% of men. Some studies have suggested a higher prevalence in transport drivers^{5,6}. (LOE-III-2) Obstructive sleep apnoea involves repetitive obstruction to the upper airway during sleep, precipitated by relaxation of the dilator muscles of the pharynx and tongue, and/or narrowing of the upper airway, and resulting in cessation (apnoea) or reduction (hypopnoea) of breathing. Central sleep apnoea refers to a similar pattern of cyclic apnoea or hypopnoeas caused by oscillating instability of respiratory neural drive, and not due to upper airways factors. This condition is less common than obstructive sleep apnoea and is associated with cardiac or neurological conditions or may be idiopathic. Hypoventilation associated with chronic obstructive pulmonary disease or chronic neuromuscular conditions may also interfere with sleep quality causing excessive sleepiness.
- 20.2.4 **Sleep apnoea assessment.** Common indicators of the possibility of sleep apnoea include habitual snoring during sleep, witnessed apnoeic events, falling asleep inappropriately (particularly during non-stimulating activities) and feeling tired despite adequate time in bed⁷. Poor memory and concentration, morning headaches and insomnia may also be presenting features. The condition is more common in men and with increasing age.

Physical features commonly found in those with sleep apnoea include obesity, a thick neck and a narrow oedematous ('crowded') oropharynx. Sleep apnoea may be present without these features however. Specific questioning in relation to each of the clinical disorders (e.g. snoring, witnessed apnoeas, limb jerking, cataplexy) will focus on the likelihood of a specific sleep disorder.

Patients in whom sleep apnoea is suspected, chronic excessive sleepiness or another medical sleep disorder should be referred to a specialist medical sleep physician for further assessment, investigation with overnight polysomnography and management.

Determining sleepiness is a clinical decision. Subjective measures include tools such as the Epworth Sleepiness Scale*. A score of 0 to 10 is within the normal range. Mild to moderate self reported sleepiness (Epworth Sleepiness Scale score of 11 to 15) may be associated with a significant sleep disorder, although the degree of increased risk of sleepiness-related motor vehicle accidents is unknown. Scores of 16 to 24 are consistent with moderate to severe sleepiness and are associated with an increased risk of sleepiness related motor vehicle accidents (odds ratio 15.2)¹. (LOE-III-2) Modified or alternate 'driver-specific' sleepiness questionnaires are yet to be widely accepted.

Objective measures of sleepiness include the maintenance of wakefulness test (MWT) and multiple sleep latency test (MSLT). Excessive sleepiness on the maintenance of wakefulness test is related to impaired driving performance².

Screening tools, which combine questions and physical measurements (eg. The Multivariate Apnoea Prediction Questionnaire), have been evaluated for screening patients for sleep disorders in a clinic setting. Their efficacy for screening large general populations remains under evaluation^{16, 17, 6}.

20.2.5 **Narcolepsy**

- Narcolepsy is present in 0.05% of the population and usually starts in the second or third decade of life²⁶.
- Sufferers present with excessive sleepiness and can have periods of sleep with little or no warning of sleep onset. Other symptoms include cataplexy, sleep paralysis and vivid hypnogogic hallucinations^{27, 28}. The majority of sufferers are HLA-DR2 positive. There is a sub-group of individuals who are excessively sleepy, but do not have all the diagnostic features of narcolepsy. Inadequate warning of oncoming sleep, and cataplexy, put drivers at high risk.
- Diagnosis of narcolepsy is made on the combination of clinical features, HLA typing and multiple sleep latency test (MSLT) with a diagnostic sleep study on the prior night to exclude other sleep disorders and aid interpretation of the MSLT^{29, 30}.
- Subjects suspected of having narcolepsy should be referred to a sleep physician or neurologist for assessment (including a multiple sleep latency test) and management. They should have a review at least annually by their specialist.
- Sleepiness in narcolepsy can usually be managed effectively with scheduled naps and stimulant medication (amphetamines or modafinil)^{31, 32, 33}. Tricyclic antidepressants and MAO inhibitors are used to treat cataplexy³⁴. (LOE-II)

20.3 **MEDICAL STANDARDS FOR LICENSING**

20.3.1 **General Recommendations for Sleep Apnoea, Narcolepsy or Other Sleep Disorder**

All patients suspected of having sleep apnoea or other sleep disorders should be warned about potential impact on road safety. General advice may include: minimising unnecessary driving and driving at times when normally asleep, allowing adequate time for sleep, avoiding driving after having missed a large portion of their normal sleep, avoiding alcohol and sedative medications, resting if sleepy.

Patients should be advised to avoid or limit driving if they are sleepy, and, not to drive if they are at high risk (see below) until the disorder is investigated, treated effectively, and their licensing status determined, particularly in the case of commercial vehicle drivers.

High-risk patients include those with severe daytime sleepiness, a history of frequent self-reported sleepiness while driving, motor vehicle crashes caused by inattention or sleepiness, or an Epworth Sleepiness Scale Score of 16 to 24 (consistent with moderate to severe sleepiness).

- 20.3.2 Patients with high risk features have a significantly increased risk of sleepiness-related motor vehicle accidents (odds ratio 15.2)¹. (LOE-III-2) These patients should be referred to a sleep disorders specialist, particularly in the case of commercial vehicle drivers.
- 20.3.3 Any patient with unexplained daytime sleepiness whilst driving, or motor vehicle accident potentially caused by sleepiness should be considered for referral to a sleep disorders specialist for assessment.
- 20.3.4 It is the responsibility of the driver to avoid driving if they are sleepy, comply with treatment, maintain their treatment device, attend review appointments, and honestly report their condition to their treating physician
- 20.3.5 **Commercial vehicle drivers.** Commercial vehicle drivers who are diagnosed with obstructive sleep apnoea syndrome and require treatment are advised to have annual review by a sleep specialist to ensure that adequate treatment is maintained. For drivers who are treated with CPAP it is recommended that they should use CPAP machines with a usage meter to allow objective assessment and recording of treatment compliance³⁵. Assessment of sleepiness should be made and objective measurement of sleepiness should be considered (maintenance of wakefulness test and/or or multiple sleep latency test), particularly if there is concern regarding persisting sleepiness or treatment compliance.

*The Epworth Sleepiness Scale is under copyright to Dr Murray Johns 1991-1997. It may be used by individual doctors without permission, but its use on a commercial basis must be negotiated. It is included for use in the patient Questionnaire.

MEDICAL STANDARDS FOR LICENSING – SLEEP DISORDERS

CONDITION	PRIVATE STANDARDS	COMMERCIAL STANDARDS
	<p>(Drivers of cars, light rigid vehicles or motorcycles unless carrying public passengers or bulk dangerous goods - refer definition page 12)</p>	<p>(Drivers of heavy vehicles, public passenger vehicles or bulk dangerous goods vehicles - refer definition page 12)</p>
Sleep Apnoea	<p>The criteria for an unconditional licence are NOT met:</p> <ul style="list-style-type: none"> • syndrome (sleep apnoea on a diagnostic sleep study and excessive daytime sleepiness) who have at least moderately severe sleepiness, and : <ul style="list-style-type: none"> • represent a significant driving risk or • drowsiness while driving, or motor vehicle crashes caused by inattention or sleepiness^{36, 37, 1}. (LOE-III-2) • untreatable or is not amenable to expeditious treatment within 2 months or are unwilling to accept treatment or unwilling to restrict driving until effective treatment has been instituted, should not drive. (Expert opinion) <p>A conditional licence may be granted by the Driver Licensing Authority, taking into account the opinion of the treating doctor and/or GP, and the nature of the driving task, and subject to periodic review if:</p> <ul style="list-style-type: none"> • • (LOE-IV) 	<p>The criteria for an unconditional licence are NOT met:</p> <ul style="list-style-type: none"> • If the person has established sleep apnoea syndrome (sleep apnoea on a diagnostic sleep study and excessive daytime sleepiness), with moderate to severe sleepiness, until treatment is effective. Consideration should be given to how long-distance drivers will comply with treatment such as CPAP^{12, 10}. (LOE-III-2) • If there is a history suggestive of sleep apnoea in association with severe daytime sleepiness, until investigated and treated. Severe sleepiness is indicated by frequent self reported sleepiness while driving, motor vehicle crashes caused by inattention or sleepiness or an Epworth Sleepiness Scale Score of 16 to 24^{36, 37, 1}. (LOE-III-2) <p>A conditional licence may be granted by the Driver Licensing Authority, taking into account the opinion of a specialist in sleep disorders, and the nature of the driving task, and subject to annual review:</p> <ul style="list-style-type: none"> • For those with established sleep apnoea syndrome (sleep apnoea on a diagnostic sleep study and excessive daytime sleepiness) who are on satisfactory treatment⁹. (LOE-IV)
Narcolepsy	<p>The criteria for an unconditional licence are NOT met:</p> <ul style="list-style-type: none"> • <p>A conditional licence may be granted by the Driver Licensing Authority, taking into account the opinion of a specialist in sleep disorders, and the nature of the driving task, and subject to periodic review:</p> <ul style="list-style-type: none"> • (Expert opinion). 	<p>The criteria for an unconditional licence are NOT met:</p> <ul style="list-style-type: none"> • If narcolepsy is confirmed^{26, 27}. (LOE-III-3) <p>A conditional licence may be granted by the Driver Licensing Authority, taking into account the opinion of a specialist in sleep disorders, and the nature of the driving task, and subject to periodic (at least annual) review, after the following requirements are met:</p> <ul style="list-style-type: none"> • sleep physician, • • • months, • off medication). (Expert Opinion)

IMPORTANT – The medical standards and management guidelines contained in this chapter should be read in conjunction with the general information contained in Part A of this book. Practitioners should give consideration to the following:

Licensing responsibility

The responsibility for issuing, renewing or suspending or cancelling a person's driver licence (including a conditional licence) lies ultimately with the relevant State or Territory Driver Licensing Authority. Licensing decisions are based on a full consideration of relevant factors relating to health and driving performance.

Conditional licences

Where a conditional licence is recommended practitioners must provide to the Driver Licensing Authority details of the criteria not met as well as the proposed conditions and monitoring requirements.

The nature of the driving task

The Driver Licensing Authority will take into consideration the nature of the driving task as well as the medical condition, particularly when granting a conditional licence. For example, the licence status of a farmer requiring a commercial licence for the occasional use of a heavy vehicle on his own property may be quite different from that of an interstate multi-combination driver. The examining health professional should bear this in mind when examining a patient and when providing advice to the Driver Licensing Authority.

The presence of other medical conditions

Whilst a patient may meet individual disease criteria, concurrent medical conditions may combine to impact on fitness to drive, eg hearing and visual impairment (refer Multiple Disabilities page 27, Older Drivers, page 72).

Reporting responsibilities

Patients should be made aware of the effects of their condition on driving and should be advised of their legal obligation to notify the Driver Licensing Authority where driving is likely to be affected. The practitioner may themselves advise the Driver Licensing Authority as the situation requires (refer page 16, 21).

References

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Further reading

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