

Sleep Apnoea & Driving Risk



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Many drivers suffer from Obstructive Sleep Apnoea (OSA) and go through a large part of their lives unaware of the condition. Studies have shown that 20/25pc of motorway crashes are due to drivers falling asleep at the wheel and these crashes are likely to occur at certain times of the day. Accidents that involve sleepiness or Sleep Apnoea are often more serious because there is no attempt by the driver to brake or take avoiding action. Therefore, the fatality risk is greater. Research has shown that Sleep Apnoea sufferers have a seven times more chance of being involved in an RTA. Among the skills necessary for safe driving are concentration and alertness, ergo, it's essential that anyone with SA should seek medical assistance as early as possible. This article has an overall look at OSA, and its diagnosis and examines what sleep apnoea is. It also looks at drivers who are at risk and the Harmonization of National Rules is covered and finally, a conclusion is given.

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Most driver trainers will agree that driving is a complex task that can be impaired by a driver's physical, mental and emotional health - including fatigue. However, this demanding task can also be affected by a variety of illnesses and ailments including sleep apnoea. Irish and European legislation requires that a driver should notify their licensing authority of any long-term or permanent injury or illness that may affect their ability to drive safely and this includes sleep apnoea. There is considerable evidence that sleepiness is a major contributing factor to road traffic accidents, and also, that road accidents are far more frequent with Obstructive Sleep Apnoea Syndrome (OSAS) than in the general population. Studies of motorway accidents have indicated that 20pc to 25pc appear to be due to drivers falling asleep at the wheel, and are particularly likely to occur early morning or mid-afternoon. Accidents associated with the driver falling asleep tend to be particularly serious because of the lack of reaction of the sleepy driver to the impending collision. Furthermore, sleepy drivers report a high incidence of near-misses on the road while driving, which suggests that they have an awareness of the driving risks related to sleepiness short of being involved in an actual collision. This article looks at the diagnosis and causes of Sleep Apnoea and the increased risk of motor vehicle accidents. It also looks at where some European countries have made specific regulations concerning OSA. The Road Safety Authority's (RSA) campaign - "Stop - Sip - Sleep" will be examined. Finally, in the conclusion, advice is given on the 'Buddy' system where one of your passengers takes over the driving task which can help you avoid 'nodding off' whilst undertaking the sometimes monotonous driving task.

What is Sleep Apnoea?

There are two types of sleep apnoea - central sleep apnoea where people do not snore and OSA, the more common form that occurs when throat muscles relax. The CSA condition is typified by total or partial reduction of the nerve pulses to the breathing muscles. During the interruptions to breathing, which can last for 10 seconds, the breathing movement's first increase and they successively reduce to a central apnoea completely without chest movements. During an apnoea, the body makes no attempt to inhale air. The underlying reasons for central apnoea are fairly unknown, as are its consequences and how it can be treated. ¹ A layman's definition of OSAS is 'the cessation of breathing during sleep'. When breathing stops the levels of oxygen in the blood begins to drop and after a short time the lack of oxygen causes a reflex response.

This response forces open the airway with a loud snort, maybe gasping breaths and loud snoring. There may also be kicking and flailing of arms. Most people with sleep apnoea do not realize that they are awakening to breathe many times during the night. The arousal is slight, and people become accustomed to this, but it is enough to disrupt the pattern of sleep, and awake feeling sleepy. A great many apnoea sufferers go through a large part of their lives unaware of their condition. Likewise, regarding daytime sleepiness, people with OSAS are often not aware of feeling tired or unusually sleepy. The disorder develops over a number of years, and they are not aware of the increasing symptoms and believe they feel "normal". Only after treatment do they realize how much more alert and energetic "normal" feels. Drivers should not fear diagnosis. Once diagnosed, OSAS can be successfully managed and drivers can usually maintain their driving licence without any difficulty. Left untreated OSAS can be the cause of many traffic accidents. ²

OSA Diagnosis

When a diagnosis of OSA is made in a patient, it is reasonable to assume that the patient will be informed that he is at an increased risk of a motor vehicle accident (MVA), and that he should react in an appropriate way to this new information. The problem arises when the patient starts asking questions which will be very specific and very important for the patient, and for which doctors will not have precise, satisfactory and clear answers. Although, it should be acknowledged that drivers spend a lot of their time in traffic queues, driving a private car enables most of us to live far from

¹ Snoring – social snoring and sleep apnoea. IQoro. <https://www.iqoro.com>

² Health and Safety for the Professional Driver. Driver Certificate of Professional Competence Road Safety Authority/ Module No. 3.

where we work, from our children's school, from our families and friends or from shops and supermarkets. Being deprived from driving a car because one could have a MVA may be devastating. Having an actual MVA may be tragic. Doctors will not escape easily from the need to face these questions and try to honestly answer them despite uncertainties and lack of information. The matter is even more dramatic for someone making a living out of driving. It has been calculated that more than 10pc of the workforce in Western societies are drivers whether in personal transport vehicles, from taxis to busses, trains or planes or of small and large goods transport vehicles.³

Who is at Risk?

Many young people have lifestyles that involve frequent late-night activities, not getting enough sleep, taking risks and being on the road during night-time hours. Shift workers are more likely to have disrupted sleep patterns, which lead to fatigue more often. Night-shift workers have the greatest risk of sleep disruption.

Commercial pressures put goods vehicle drivers under huge time pressure, and they will often push themselves to the limit. A sedentary lifestyle and often poor diet also puts them in the high-risk group for driver fatigue

Keep a Driving Licence

Excessive daytime sleepiness has long been known to be associated with an increased risk of often particularly severe traffic accidents. Obstructive sleep apnoea (OSA) is among the most prevalent conditions leading to excessive daytime sleepiness, in addition to impaired cognitive function, both of which are likely to impair driving ability. An increased risk of traffic accidents has been demonstrated repeatedly, in association with OSA, as well its normalization with effective treatment. However, it seems that not all patients are at equal risk, but it is not clear how to identify when and how at-risk patients can be identified. Nevertheless, some European countries have made specific regulations concerning OSA and/or excessive daytime sleepiness and the capacity to obtain and keep a driving licence. Most countries have the general rule that "*a driving licence should not be given or renewed to any candidate or licence holder suffering from a disorder ... likely to compromise safety on the road*" without a specific mention of sleepiness and/or sleep apnoea. However, the way in which such a statement is applied and the measures taken to identify unfit drivers vary greatly from country to country. In addition, in those countries that have made specific regulations, no evaluation of their efficacy in reducing sleepiness-related accidents is available.⁴

OSA - Increase Risk of MVAs

Irrespective of the presence and intensity of the symptom 'sleepiness,' patients suffering from OSA are at increased risk of motor vehicle accidents when driving. The body of evidence on this issue is large and independent of cultural, topographic and traffic density backgrounds. Increased risks have been found in many countries including Ireland, the UK, France and Australia. Across all studies the risk of an MVA for patients, compared to the general population, is increased by about a factor of three. Work and home accidents have been much less studied, and only scarce data has been published. Though scant, these data point, again, to an increased risk for patients with OSA. The other concordant information coming from several countries is that the treatment of OSA with continuous positive airway pressure (CPAP) applied during sleep; if adequately used by patients reduces the increased risk of MVAs to the one seen in the general population.

Seen from a distance, the summary of this information leads to a seemingly simple solution: drivers with untreated OSA have about a threefold increased risk for MVAs, whereas drivers with CPAP treated OSA have no increased risk. To complicate matters, it has to be recalled that MVAs are generally the final consequence of multiple causes. From a simple decrease in attention, to adverse weather conditions, modifying braking distances, to bad road conditions, the vehicle maintenance level, to tyre pressure, to mood, medications and drugs, consumption of alcohol and circadian

³ *Ibid*

⁴ J. Krieger 2007. European Respiratory Review: *Sleep apnoea and driving: how can this be dealt with?* 16: 189-195. <https://err.ersjournals.com>

aspects, all these things will ultimately, alone or in combination, explain why an MVA has taken place.⁵

Various Studies

The link between Road Traffic Accidents (RTAs) and OSA has been described for nearly three decades. In 1988, *Findley*⁶ found OSA drivers had a 7 times greater rate of RTA than healthy counterparts and concluded that “*impaired drivers with sleep apnoea may cause many preventable auto accidents*”. More recent studies corroborate this increased risk, albeit to varying degrees. A recent meta-analysis of 18 such studies reported an increased risk of 2.43 among people with OSA compared to individuals without the condition.⁷ Rather importantly, many studies attribute the increase in RTA risk among OSA drivers to excessive daytime sleepiness (EDS) as opposed to the objective severity of the condition according to AHI^{8 9} Nevertheless; evidence suggests that EDS does indeed correlate to condition severity as measured by AHI and oxygen desaturation index (ODI).^{10 11} In fact, ODI and minimum sleeping SpO2 were found to be greater predictors of EDS than AHI. CPAP is an effective treatment for OSA and elimination of its daytime symptoms.¹² Many studies have successfully demonstrated a substantial reduction in RTA risk for OSA driver’s adherent to CPAP therapy. A 2001 report by George compared RTA rates among people with OSA 3 years before and after CPAP initiation with healthy controls. The results indicated RTA risk normalised to that of the control group on CPAP therapy. *Karimi et al* (2015)¹³ found that appropriate compliance with CPAP conferred a 70% reduction in the risk of RTA while conversely; non-compliance or no therapy resulted in a 54pc increase over a 5-year period.

“Stop, Sip, Sleep”

In 2008, *Alonders et al*¹⁴ published results of their survey of driving licence regulations in Europe relating to OSA. At that time, Irish guidelines did not hold specific provisions for EDS or OSA. Since then the Road Safety Authority’s (RSA) *Slainte agus Tiomaint*¹⁵ has had specific guidelines on OSA and driving included and the most recent edition from April 2015 reflects this. According to the RSA successfully reducing the rates of RTC’s caused by OSA and EDS hinges on public awareness of the condition and its risks to road safety. (*Also by medical personnel becoming acutely aware of this common medical problem affecting drivers Ed*). Recent RSA “Stop, Sip, Sleep” radio and TV campaigns highlighting the dangers of and appropriate countermeasures (e.g. naps and caffeine consumption) for fatigued driving are certainly invaluable in informing the public and improving road safety. While there is some evidence that supports the benefits of naps and coffee in reducing physiological sleepiness, drivers often not wanting to delay, still employ less effective in-car countermeasures (e.g. playing music and opening the window).¹⁶

Harmonize National Rules

There are legal questions linked to the MVA risk in OSA. One of the most important is the legal framework for driving licence regulations. In many European countries, OSA is specifically considered, in others it is not. European rules try to harmonize national rules and set minimum standards to which all European countries must comply. Unfortunately, OSA is not mentioned in the medical sector of the European Driving Licence Regulations of the European Directive 91/439 EEC.

⁵ Daniel Rodenstein. Thematic Review Series. 2009. SA. *Traffic Occupational Accidents – Individual Risks, Socioeconomic and Legal implications*. www.karger.com

⁶ Michael Fitzsimons University of Limerick. *OSA and Driving safety – Implications for Reduction in Road Traffic Accidents*. <https://rcpi-live-cdn.s3.amazonaws.com/>

⁷ *Ibid*

⁸ *Ibid*

⁹ *Ibid*

¹⁰ *Ibid*

¹¹ *Ibid*

¹² *Ibid*

¹³ Michael Fitzsimons University of Limerick. *OSA and Driving safety – Implications for Reduction in Road Traffic Accidents*. <https://rcpi-live-cdn.s3.amazonaws.com/>

¹⁴ *Slainte agus Tiomaint – Medical Fitness to Drive Guidelines*. RSA 2015. [cited 4 January 2017] <https://rsa.ie>

¹⁵ *Health and Driving*

¹⁶ Watling, C. *et al* *Continuing to drive while sleepy. The influence of sleepiness countermeasures, motivation for driving sleepy and risk perception. Accident analysis and prevention*. (2014) 73: 262-268

Physicians are usually not at ease with legal questions. Nevertheless, they may be the only ones that can advise a patient with OSA driving abroad about the fact that driving regulations may differ from one country to another, at least until the EU decides to harmonize rules concerning OSA and driving. It is worth mentioning that OSA is not the only medical condition leading to the greater risk increase, which makes it all the more necessary to homogenize driving licence regulations in a continent where crossing borders has become commonplace for millions of drivers.¹⁷

Conclusion

Driving is a complex task requiring integration of an array of skills to ensure competency and safety on the road.

Among these skills alertness and concentration are paramount. Obstructive Sleep Apnoea (OSA) causing excessive daytime sleepiness (EDS) is a significant contributor in many Road Traffic Accidents (RTAs). Its high prevalence, increasing incidence and substantial proportion of undiagnosed cases are important considerations for road safety policymakers and implementers. Importantly, its treatability offers great potential for reducing the number of RTAs. As a relatively recent addition to Irish and European medical fitness-to-drive guidelines, there is an apparent lack of awareness and knowledge regarding OSA among the general public. Similarly, the significance of OSA in terms of road safety seems underappreciated among some physicians.

In order to realise optimal road safety in relation to OSA, public awareness campaigns, doctor education and the provision of diagnostic and therapeutic services are not only essential but invaluable in achieving optimal road safety. In addition, current sleep specialist resources in Ireland are sparse. The establishment of dedicated and accessible sleep specialist services are paramount to achieving greater road safety. While there is some evidence that supports the benefits of naps and coffee in reducing physiological sleepiness, drivers often not wanting to delay, still employ less effective in-car countermeasures such as playing music and opening the window. Finally, when you have trouble keeping your head up, yawning repeatedly, rubbing your eyes or have heavy eyelids, it's definitely time to "Stop, Sip and Sleep" so as not to add to the already high number of KSIs on our roads. However, if you decide not to do so, then you could simply employ the "Buddy"¹⁸ system and take a well deserved break from driving and if necessary get 'forty winks' to help you recuperate.

¹⁷ Daniel Rodenstein. Thematic Review Series. 2009. SA. *Traffic Occupational Accidents – Individual Risks, Socioeconomic and Legal implications*. www.karger.com

¹⁸ A licensed passenger who can take over the driving task from you.