

## Sleep apnea and workplace safety

### Case 1

A 40-year-old shipmate fell asleep while watchkeeping. His tugboat was towing a barge full of oil. The collision resulted in half a million dollars in damage to the tugboat but no resultant oil leaks or injuries to the workers on board. The worker had admittedly fallen asleep during his watchkeeping duties and was not able to pilot the ship as required.

Since the incident the mate has been diagnosed with severe obstructive sleep apnea and has begun continuous positive airway pressure (CPAP) treatment. This patient has a history of being extremely compliant and has used CPAP downloads for monitoring.

### Case 2

Two airline pilots fell asleep while cruising over Hawaii. They flew past their destination toward open ocean for 18 minutes before waking up and returning for a safe landing. During this time air traffic controllers were frantically radioing the flight from Honolulu to Hilo for 18 minutes but receiving no response from the pilots. Since this incident the airline captain has been diagnosed with severe obstructive sleep apnea.

### Obstructive sleep apnea

These two vignettes are real-life occurrences of obstructive sleep apnea (OSA) in mission-critical positions in the workplace. OSA is the most common medical disorder to cause excessive daytime sleepiness. It is also a risk factor for both drowsy driving and motor vehicle collisions associated with drivers falling asleep.

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*This article is the opinion of WorkSafeBC and has not been peer reviewed by the BCMJ Editorial Board.*

Other causes for excessive daytime sleepiness include narcolepsy, central sleep apnea, alcohol use, severe restrictive lung disease, insufficient sleep time, neuromuscular disease, medication and drug use, periodic leg movement disorder, shift work, chronic pain, and neurological disease. Insufficient sleep time is an extremely common problem and it can be addressed, but the challenge is to change patients' sleep-related behavior over the long term.

In WorkSafeBC claims, OSA is a condition often related to facial injuries from trauma at work. While the condition is not commonly assessed as a claim-related condition, its diagnosis and treatment is front and centre in preventing workplace injuries. In safety-sensitive positions, sleep apnea is a chronic medical condition—it needs to be under control before that worker returns to work. (Note: Safety-sensitive jobs are ones where impaired performance, for whatever reason, could result in a significant incident affecting the health or safety of employees, customers, customers' employees, property, or the environment.)

The risk factors for OSA include advancing age, male gender, obesity, craniofacial abnormalities, and upper-airway soft-tissue abnormalities. Other possible risk factors include menopause, family history, smoking, and nasal congestion. OSA is increasingly seen in association with pregnancy, end-stage renal disease, heart failure, chronic lung disease, and stroke. It is associated with insulin resistance, diabetes, and metabolic syndrome.

The clinical manifestations of OSA are commonly daytime sleepiness and snoring. Additional symptoms and signs can include restless sleep periods, fatigue, poor concentration, morning headaches, and

awakening with a choking sensation. Physical exam findings can be normal or can include obesity (body mass index greater than 30 kg per m<sup>2</sup>), elevated blood pressure, a narrow airway, a large neck circumference (for men, a collar size greater than 43 cm; for women, a collar size greater than 40 cm), and signs of pulmonary hypertension.

Medical consequences of sleep apnea include a three- to sixfold increased risk of all causes of mortality: hypertension, pulmonary hypertension, stroke, coronary artery disease, cardiac arrhythmias, and depression.

### Diagnosing and attending to OSA

Objective diagnostic testing is necessary to diagnose OSA because the clinical features are nonspecific and the diagnostic accuracy of clinical impression alone is poor.<sup>1</sup> Polysomnography is the gold standard in diagnostic testing for OSA. Portable monitoring can be an alternative for diagnosing patients with a high pre-test probability of moderate to severe OSA. But portable monitoring should not be used in patients who have comorbid medical conditions that predispose them to non-OSA sleep-related breathing disorders (e.g., heart failure), or if another sleep disorder is suspected. Portable monitoring may also lead to underestimation or under-recognition of sleep apnea: it cannot differentiate arousals from sleep because there is no EEG monitoring.

It is critical to provide optimal treatment for sleep apnea because sleep-disordered breathing is associated with the increased risk of vehicular collisions and cardiovascular morbidity and mortality.<sup>2</sup> CPAP is the treatment of choice for sleep apnea.<sup>2</sup> Increased CPAP adherence has been

shown to improve outcomes, such as daytime sleepiness, quality of life, and mortality.<sup>2</sup> Alternative therapies include weight loss, sleep positioning, avoidance of evening respirator depressants, oral appliances, and, in select cases, surgery.

Over the past few years the US Federal Motor Carrier Safety Administration (FMCSA), which regulates the trucking industry, has implemented many new safety initiatives aimed at improving the way trucking companies operate on the nation's roadways. Truck drivers and trucking companies are now being held much more responsible when their actions place others in harm's way. Recently, US legislators passed a bill calling on the FMCSA to create rules for drivers with sleep apnea. Since driver fatigue is one of the major causes of trucking collisions, officials hope these changes will lead to fewer incidents and near misses. This new law requires the agency to specify the types of testing required for truck driver safety, rather than simply issuing guidelines for employers. The rules could require the agency to list treatment methods that truck drivers with sleep apnea must undergo before getting back on the road.

### Addressing patients with sleep apnea

Once you have diagnosed a patient with OSA, it is important to assess that patient's driving safety (commercial and own vehicle) and occupational safety.

The current American Thoracic Society guideline states that patients being evaluated for suspected or confirmed OSA should be asked about daytime sleepiness (i.e., falling asleep unintentionally and inappropriately during daily activities), as well as recent, unintended motor vehicle collisions or near misses attributable to sleepiness, fatigue, or inattention. Patients with these characteristics are deemed high-risk drivers and physi-

cians should immediately warn them about the risks of driving until an effective therapy is instituted.<sup>3</sup>

According to the Canadian Medical Association's *Driver's Guide*, patients with moderate to severe OSA, documented by a sleep study, who are not compliant with treatment, and who are considered by the treating physician to be at increased risk

with CPAP treatment for a minimum of 4 hours of use on at least 70% of nights, with objective documentation.<sup>5</sup>

In BC physicians must report to the motor vehicle licensing authority if a driver has been warned of the danger of driving, yet continues to drive. When reporting, the physician should inform the patient that a report

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for motor vehicle collisions, should not drive any type of motor vehicle.<sup>4</sup> Patients with a high apnea-hypopnea index, especially if it is associated with right-heart failure or excessive daytime somnolence, should be considered at high risk for motor vehicle incidents.<sup>4</sup> Patients with OSA who are believed to be compliant with treatment but are subsequently involved in an at-fault motor vehicle incident should not drive for at least 1 month.<sup>4</sup> During this period, physicians should reassess their compliance with therapy. After 1 month, they may or may not be able to drive, depending on the results of the reassessment.<sup>4</sup>

The *BC Driver Fitness Handbook for Medical Professionals* provides guidance for determining driving fitness for individuals who have a sleep disorder. For those with OSA, it offers guidelines for private and commercial drivers, both with untreated OSA and treated OSA. It indicates that drivers with treated OSA should be compliant

is being made and that there are processes for appeal and reinstatement.

In assessing your patient's occupational safety, it is best to review your patient's work activities to determine whether those activities are safety-sensitive. Ascertain if your patient's role in workplace operations poses the risks of substantial harm to their health and safety or that of others (e.g., employees, the public, property, or the environment), should their performance be impaired. If the hazards and risks are high, or the consequences of a workplace incident are catastrophic, higher standards of management are expected.

In the aviation industry physicians are required by law to report to Transport Canada's regional aviation medical officers any pilots, air traffic controllers, or flight engineers with a medical condition, including sleep apnea, which could affect flight safety. When pilots are informed that they

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have a condition (or are prescribed treatment) that might make it unsafe for them to perform their duties, they must “ground” themselves temporarily.<sup>4</sup>

For safety-sensitive positions in rail, physicians are required by law to notify the railway company’s chief medical officer.<sup>4</sup>

In the marine industry the working environment is challenging, with safety-sensitive responsibilities and the presence of many hazards, including a strenuous workplace, unique living conditions, unpredictable weather, and potential emergency duties. Seafarers must be able to live and work in close contact with each other for long periods. The difficulties of this environment can be magnified when needed medical care is not immediately accessible. For this

and other reasons, the Canada Shipping Act requires physicians to report to Transport Canada Marine Safety and Security without delay when they believe that a seafarer has a medical condition that is likely to constitute a hazard to maritime safety. This same law requires certified seafarers to inform their caregivers of their safety-sensitive role at the time of diagnosis of the medical condition.<sup>4</sup>

**Conclusion**

Sleep apnea is a chronic medical condition that is associated with excessive daytime sleepiness, inattention, and fatigue. It may impair daily function, induce or exacerbate cognitive deficits, and increase the likelihood of errors and injuries. While you’ll need to consider the patient’s personal history and safety for noncom-

mercial driving, you should also be aware of the patient’s work activities and whether a lack of control over this disorder can lead to cognitive impairment, which would impact your patient’s safety and public safety in the workplace.

**For more information**

The information contained in this article is based on a review of literature available up to and including November 2013. Information on sleep-related disorders continues to change. If you would like more information about sleep apnea, or would like to discuss a worker who has sleep apnea, please contact a medical advisor in your nearest WorkSafeBC office.

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