

Untreated Obstructive Sleep Apnea: Patient Risks/Economic Impact

Obstructive Sleep Apnea (OSA) is the most common sleep disorder. Although OSA prevalence has increased substantially over the past two decades¹ and OSA diagnosis is linked to serious health consequences^{2,3,4,5} the majority of OSA sufferers in North America go undiagnosed⁶.

In British Columbia, population-based studies estimate 24.5 percent of adults between the ages 30 to 69 suffer from some level of OSA (629,865 persons in a population of 2,570,880), and the prevalence of moderate to severe OSA in the same population is estimated at 4.8 percent (123,402 persons)⁷. This contrasts with the three percent of Canadian adults who report being diagnosed with OSA⁸. Taken together, these data illustrate that OSA is highly prevalent and significantly under-diagnosed.

Data indicate that OSA sufferers are often unaware of their condition. Nocturnal respiratory pauses associated with OSA cause a person to wake and fall asleep again repeatedly throughout the night, often without their knowledge. Severe OSA is defined when respiratory pauses number greater than 30 per hour, however, patients reporting more than 70 pauses in breathing per hour have been noted⁹. This sleep disruption leads to chronic sleep deprivation, periods of reduced blood oxygen level¹⁰, and excessive daytime sleepiness – a major symptom OSA.

A review by Kakkar et al. identifies four major risk categories for those with undiagnosed OSA¹¹:

- 1) Cardiovascular disease, neurocognitive degeneration, or OSA-related mortality
- 2) Motor vehicle accidents
- 3) Symptoms of daytime sleepiness, disturbed sleep, and impaired quality of life or cognition
- 4) Bed partner sleep disturbance and reduced quality of life

Numerous clinical studies show that OSA impacts cardiovascular health. This includes an increased incidence of cardiovascular disease^{12,13,14}, fatal and nonfatal cardiovascular events¹⁵, and mortality¹⁶.

Daytime sleepiness occurring at times when a person is expected to be awake and alert can lead to several negative consequences, including drowsy driving and workplace accidents. **Drivers with untreated OSA have a seven-fold increased risk of injury when compared to healthy drivers**¹⁷ and, independent of alcohol effects, almost 20 percent of all serious car crash injuries in the general population are associated with driver sleepiness¹⁸. In BC, patients diagnosed with severe OSA may not drive unless they are receiving effective treatment as verified by a respiratory therapist¹⁹.

Chronic sleep deprivation is associated with difficulty concentrating, memory lapses, low energy, fatigue, lethargy, and emotional instability²⁰. Although a mechanism linking OSA to cognitive function has not been established, impacts on a group of neuropsychological measures has been illustrated²¹.

Positive Airway Pressure (PAP) is the most successful method for treating patients with moderate-to-severe OSA. PAP is highly effective at improving sleep quality and quality of life for both patient and bed-partner, and patient risks may be largely mitigated through early OSA diagnosis and PAP treatment.

Cost is a barrier to expanding capacity for publicly-funded diagnostic sleep studies, however, the costs of leaving OSA untreated have been shown to far outweigh treatment costs. In the United States, the rising prevalence of OSA prompted the American Academy of Sleep Medicine to commission an analysis into the economic impact of undiagnosed OSA through the global research firm Frost and Sullivan. In the Frost and Sullivan report, estimates indicate that only 20 percent of OSA sufferers have been properly diagnosed, and the report describes OSA as a “hidden health crisis” in North America²². Furthermore, the report estimates that undiagnosed OSA sufferers placed an economic burden of \$150 billion on the 2015 U.S. economy (Figure 1), and that diagnosis and treatment, while costing an estimated \$12.4 billion, could largely mitigate this economic burden²³.

Figure 1: In the U.S. the estimated economic cost of undiagnosed obstructive sleep apnea was nearly \$150 billion in 2015²⁴.

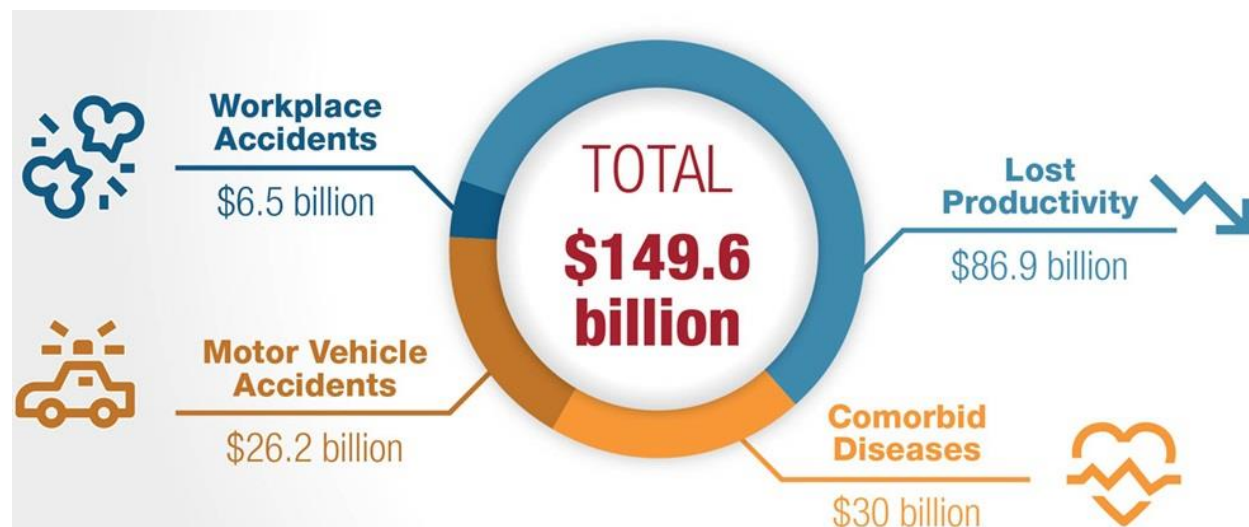


Table 1: Cost burden of OSA in undiagnosed versus diagnosis and treatment costs in the United States (2015)²⁵

Undiagnosed		Diagnosed	
# People with OSA	23,500,000		5,900,000
	Cost of Undiagnosed OSA (\$US Bil)		Cost of Diagnosed OSA (\$US Bil)
Comorbidities & Mental Health	\$30.0	Diagnosis, Testing and Follow-up	\$0.8
Motor Vehicle Accidents	\$26.2	Non-surgical Treatment (PAP and Oral Appliances)	\$6.2
Workplace Accidents	\$6.5	Surgical Treatment	\$5.4
Lost Productivity	\$86.9		
Total Costs (\$US Bil)	\$149.6		\$12.4
Cost per Person	\$6,366		\$2,105

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