



# OBESITY AND SLEEP

- **Not getting enough sleep increases the risk for obesity by altering processes that promote weight gain**
- **Weight loss is more difficult to achieve in individuals who report short sleep times**
- **Sleep loss combined with inappropriate timing of eating prevents weight loss**
- **Shift work, involving rotating night work, causes disturbances in your sleep and internal body clock which increases the risk for obesity**
- **Obesity is the main risk factor for Obstructive Sleep Apnoea (OSA)**
- **OSA may also increase risk of obesity, hinder weight loss efforts in people with obesity and may promote cardio-metabolic disease**

Note: All words that are underlined relate to topics in the Sleep Health Foundation Information Library at [www.sleephealthfoundation.org.au](http://www.sleephealthfoundation.org.au)

## 1. Introduction

Sleep that is of good quality, adequate duration and in tune with the body clock is vital for human health. In contrast, poor sleep and body clock disturbance both contribute to an increased risk for adverse health conditions including cancers, dementia and cardio-metabolic disease (a group of interrelated conditions that includes diabetes and high blood pressure). Sleep disturbance and cardio-metabolic disease are also both strongly coupled with obesity, which is a condition associated with elevated body weight due to excess accumulation of fatty tissue.

## 2. Not getting enough sleep and obesity

It's believed that we are sleeping less. Sleep duration has decreased in recent decades around the world, due in part to changing work schedules and increasing sedentary work, which is work involving little or no physical activity. There is good evidence to show, from many studies, that self-reported short sleep duration (less than 7 hours daily)

is associated with an increased risk for obesity. Shortened sleep disrupts hormones that regulate food intake – ghrelin and leptin – and changes in sleep can also affect areas in the brain responsible for reward-processing, which could lead to food seeking as a reward behaviour. Additionally, short sleep duration and greater time awake allows more time to eat, including eating late into the night. Food is metabolised by the body less effectively at night. Sleep loss also increases fatigue which promotes a sedentary lifestyle, reducing the motivation to exercise and make healthy food choices.

## 3. Shift work and obesity

Just over 15% of Australians are engaged in shift work. Shift work increases the risk for obesity and type 2 diabetes. Cardiovascular risk factors such as obesity around the stomach and abdomen, high blood pressure, high levels of blood fats and sugars and low levels of “good” (HDL) cholesterol are also increased amongst shift workers. Workers who rotate to night work suffer fragmented and often shortened daytime sleep as well as disruption to their sleep/wake body clock. Such changes in the sleep/wake schedule have been shown to



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increase food/energy intake, impair regulation of blood sugar levels, as well as cause damage to blood vessels. These effects can be worsened when sleep restriction is combined with irregular timing of food consumption, such as eating at night when the body is normally asleep. Interventions which alter the timing of meals or reduce the window of food consumption time during the day have successfully improved glucose metabolism and weight loss. Time restricted eating is a meal pattern which involves restricting food intake to a short period of time typically 8 or 10 hours during the day. There is evidence to show that avoiding eating in the night may be useful strategies to help prevent cardio-metabolic disease in those exposed to circadian and sleep disruption, such as shift workers.

#### 4. Obstructive sleep apnoea (OSA) and obesity

OSA is a common disorder characterised by repetitive periods of obstructed breathing during sleep, causing sleep fragmentation and often, daytime sleepiness. Studies show that OSA is an independent risk factor for cardiovascular disease. OSA is also linked to type 2 diabetes, high blood pressure and abnormal cholesterol levels. (See our OSA fact sheet for further information on this sleep disorder.)

Continuous Positive Airway Pressure (CPAP) has been the gold standard treatment for OSA for more than 25 years. CPAP therapy, which requires breathing pressurised air through a nose mask, is highly effective at preventing airway obstruction during sleep. CPAP reduces sleepiness, improves sleep-related quality of life and modestly reduces blood pressure. (See our CPAP fact sheet for more information on this treatment.)

Along with age and male gender, obesity is a primary risk factor for OSA. There are several underlying factors that link obesity to OSA. Obesity can cause excess deposits of fatty tissue within the upper airway walls (in the throat or pharynx) and tongue, which acts to narrow the airway making it more prone to collapse during sleep. Additionally, central obesity (around the stomach and abdomen) alters breathing that effects airway diameter, predisposing to upper airway collapse. Obesity may also alter the hormone leptin which may alter control of breathing and promote OSA.

Weight reduction may also serve as a possible treatment option for OSA. Studies show that the more weight individuals lose the more OSA and related symptoms can be eased. Weight loss in people with OSA also results in improvements in metabolism of glucose and cholesterol and a lowering of blood pressure. It should be noted however, that there is a great deal of variability between individuals with OSA in response to weight loss, and further research is required to identify individuals who will benefit the most from weight loss.

There is also some evidence that OSA itself may actually contribute to obesity and associated cardio-metabolic disease. For example, OSA may promote *weight gain* through imbalances in hormones that control hunger and the body's metabolism, as well as through reduced motivation to exercise. These factors act to reduce the burning of fat and increase food consumption. OSA may also slow down *weight loss* with some studies showing individuals with OSA, when undergoing long-term weight loss programs, lose less weight compared to those without OSA.

It is therefore important that weight management be used together with CPAP and other OSA therapies, to reduce the severity of OSA. In particular, weight loss that is tailored to individual patient preferences is now recommended in practice guidelines as part of the OSA treatment strategy for those who are overweight or obese.

#### Where can I find more information about obesity and sleep?

[www.sleephealthfoundation.org.au/understanding-and-helping-better-sleep.html](http://www.sleephealthfoundation.org.au/understanding-and-helping-better-sleep.html)

<https://foodandmoodcentre.com.au>

[www.sleepfoundation.org/physical-health/obesity-and-sleep](http://www.sleepfoundation.org/physical-health/obesity-and-sleep)

For information on over 70 different sleep related topics, written by professionals, visit the Sleep Health Foundation Information Library at [www.sleephealthfoundation.org.au](http://www.sleephealthfoundation.org.au). The underlined topics in this article are covered in detail there.



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A national organisation devoted to education, advocacy and supporting research into sleep and its disorders.

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