



# SLEEP DISORDERS & RELATED RISK

Sleep disorders have been implicated as risk factors in a number of other health problems. Sleep deprivation, whether due to a reduced quantity of sleep or a disturbed quality of sleep, affects a variety of essential functions and hormone balances, and contributes to an increased risk of heart disease, high blood pressure, obesity and diabetes. It affects general mental functioning, in particular, daytime alertness, mood, memory functions, and decreased learning ability. There is some recent evidence that sleep deprivation also depresses the immune system which means the body is less able to fight off viruses and infections.

## OBESITY

Obesity contributes to sleep apnea, and sleep apnea contributes to obesity. In fact, most sleep disorders can contribute to obesity. Researchers have found that people who don't get enough sleep can develop increases in appetite and kilojoule intake. In a university study, they found that in the group getting less than 6 hours sleep per night, their levels of the hormone leptin fell, leading to a greater appetite. The same group also produced approximately 30% more insulin to maintain their normal blood sugar levels. Higher insulin levels are associated with higher levels of fat storage. As lack of sleep also results in tiredness and lowered activity rates, so obesity is encouraged on three fronts: higher kilojoules taken in, lower energy given out, and insulin stimulating fat storage. In the case of sleep apnea, the weight gain affects the fat in the neck, and the air passage collapses more easily, leading to a worsening of the sleep apnea, which leads to further increases in obesity, and a vicious cycle ensues.

## HEART DISEASE

Sleep apnea starves the body's organs of oxygen throughout the night. This puts a strain on the heart as it tries to compensate. Researchers have found sleep apnea to be an independent risk for a variety of cardiovascular diseases, and an exacerbating factor in nocturnal angina in patients with coronary artery disease. When breathing recommences after an apnea, the heart muscles are called on for greater exertion, just at a time when their own oxygen supply has been compromised. Research is ongoing,



but it seems clear that people with moderate to severe sleep apnea have an increased risk for heart attack, vascular disease and pulmonary hypertension.

## HYPERTENSION (HIGH BLOOD PRESSURE)

Hypertension is a major cause of atherosclerosis (thickened artery walls) and may lead to blood clots and strokes. Hypertension can also lead to heart attacks, kidney disease, peripheral vascular disease and retinopathy. Research has shown that those who regularly get less than 5 hours of sleep per night are at a high risk for hypertension, probably due to changes in hormone activity. People with untreated sleep apnea are also at risk for hypertension. This may be due to the overall lack of proper sleep, or it may be as a result of the extra blood flow needed after an apnea to compensate for low oxygen levels. Research has shown that when sleep apnea patients are effectively treated, their high blood pressure goes down, not only at night, but also during the day.

## BRAIN FUNCTIONING

Studies have shown that normal humans require between 7 and 9 hours of sleep per night. There has been a lot of research looking at the effects of sleep deprivation on various brain functions. People asked to perform tasks after spending a night without sleep, had impaired abilities comparable to people under the influence of alcohol. A lack of sleep most notably impacts on attention and working memory, which can have disastrous consequences in road accidents, operating machinery, forgetting about fire hazards, etc. People who are sleep deprived have impaired learning abilities, slower reaction times and poorer judgment. Severe sleep deprivation can lead to low mood, psychosis and hallucinations.

## DIABETES

Research has shown that short sleep duration directly affects diabetes risk, independent of its

influence upon body weight and blood pressure. Body weight and hypertension also act as partial contributors to diabetes. A study by scientists at the University of Chicago found that after restricting 11 healthy young adults to only four hours sleep for six consecutive nights, that their ability to process glucose had declined – in some cases to the level of diabetics. Other studies have shown that subjects who regularly slept 5 hours or less were twice as likely to develop diabetes over the 10-year follow-up, than those who slept 7 hours or more. Research statistics indicate that approximately 50% of men living with diabetes also have sleep apnea, and 50% of sleep apnea patients tested when attending a sleep clinic, were shown to have impaired glucose tolerance. Recent studies of young healthy males showed that sleep deprivation for only two nights increased insulin, increased ghrelin and decreased leptin, translating into decreased glucose tolerance and an increased appetite for carbohydrate-rich foods. One research article concluded that “If short sleep duration increases insulin resistance and decreases glucose tolerance, then interventions that increase the amount and improve the quality of sleep could serve as treatments and primary preventative measures for diabetes”.

## SEXUAL FUNCTION

Sleep apnea has been shown to be associated with impaired sexual function for both men and women. Excessive tiredness can contribute to a low libido, as can a reduction in hormone levels such as testosterone, which can occur as a result of sleep apnea. Many factors can contribute to declining erectile function, one of which is untreated sleep apnea. This can be due to blood vessel walls not expanding as well as they should to allow for increased blood flow, or a decline in testosterone, or impaired nighttime erections due to broken sleep associated with sleep apnea. Treatment of sleep apnea has been shown to improve erectile function in about half of men with both sleep apnea and erectile dysfunction.

## NOCTURIA AND OVERACTIVE BLADDER

Nocturia (frequent nighttime urination) can be caused by a variety of factors including inadequate functioning of the heart muscle, benign prostate hyperplasia and overactive bladder. Increased nocturia in patients with sleep apnea is believed to be caused by elevated nighttime excretion of a protein secreted by heart muscle cells in response to high blood pressure.

Treatment of sleep apnea results in improvements in nocturia. Researchers found that the overall prevalence of overactive bladder in patients with obstructive sleep apnea was 39%, which is considerably higher than the average. Patients with moderate and severe sleep apnea are more likely to present with symptoms of overactive bladder compared with the average population.

## WHAT CAUSES SLEEP APNEA?

There are two types of apnea: obstructive apnea and central apnea. **Obstructive apnea** is much more common. It occurs when the muscles around your airway relax during sleep and partially or fully block the air passage between your nose or mouth and your lungs. **Central apnea** is rarer and occurs when the brain signals regulating your breathing are disrupted.

## ABOUT US

*Sleep Disorders Australia (SDA)* is a voluntary not-for-profit organisation that provides information and support to people affected by sleep disorders throughout Australia. SDA advocates the needs of people with sleep disorders by raising awareness of sleep disorders and their impact on our lives. We also offer support and education with regards to preventing and treating sleep disorders.

We would be delighted if you joined us. Membership is open to sufferers, family members, medical professionals, and the general public. You can join via our website or email our membership officer for more information.

If you would like to support us financially, you can donate via our website or send a cheque to our address.

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