



ARE SLEEP AND HEALTH SYNONYMOUS?



Throughout the world and across all age groups, **insufficient sleep** is considered a public health epidemic.¹ In the United States, reduced sleep duration has been linked to seven of the 15 leading causes of death.² **Lack of sleep** interferes with attention, motivation, mental concentration, moderation of emotional stress, physical coordination and response time. Sleep also influences the risk of developing **chronic diseases** — too little or too much affects blood pressure, heart health, diabetes, obesity and overall immune function.

Sleep affects blood pressure and heart disease

Sufficient sleep helps regulate blood pressure such that even a slight, short-term reduction in sleep increases systolic blood pressure and heart rate.³ High blood pressure, or hypertension, is strongly associated with heart disease.

Blood pressure naturally decreases by 10% to 20% during deep sleep.

This drop, known as “nocturnal blood pressure,” allows the heart and blood vessels an opportunity to relax and rejuvenate.³ A long-term study of over 6,000 individuals demonstrated that nocturnal blood pressure is a much stronger predictor of cardiovascular mortality than is daytime blood pressure.⁴ This has been confirmed by other studies, one of which specifically noted that each 5% decrease in the nocturnal decline is associated with a 20% increased risk in cardiovascular mortality.⁵

Inadequate or fragmented sleep disrupts the nocturnal blood pressure drop. This diminishes the period during which blood vessels normally recover from the strain and

erosion of the day. Sleeping seven to eight hours per day and achieving deep stages of sleep is optimal to support cardiovascular health.

Sleep affects blood sugar and diabetes

Sleep deprivation is recognized as a major risk factor for Type 2 diabetes. While the exact mechanism is not fully understood, many studies have demonstrated the importance of sleep for regulation of blood sugar and insulin sensitivity. Together, these studies present a U-shaped relationship between sleep duration and Type 2 diabetes risk, with significantly increased risk for both too much or too little sleep, and an optimal sleep time of seven to eight hours a day.⁶ In fact, depriving mice of six hours of sleep, even for a single night, results in glucose intolerance and insulin resistance.⁷

Inadequate sleep can be particularly problematic for pregnant women. A recent study with over 48,000 participants found that those who sleep fewer than five hours or more than 10 hours a day have significantly elevated blood glucose levels and increased risk of gestational diabetes.⁸ Furthermore, this has a ripple effect, as children born to women with gestational diabetes are

more likely to have obesity and diabetes later in life.⁹

Prediabetes is a precursor to diabetes and affects more than 88 million American adults. Prediabetes is reversible with lifestyle changes, such as diet, exercise and adequate sleep, which is now recognized as a critical factor for delaying or preventing prediabetes and Type 2 diabetes.¹⁰

Sleep affects body weight and obesity

Both sleep deprivation and obesity have been on the rise in the U.S. since the 1980s. The relationship between the two is complex and involves many different factors. In epidemiological studies, sleeping fewer than seven hours per night is associated with a higher level of obesity and higher body mass index (BMI).¹¹

Weight gain results when energy intake is greater than energy expenditure. Hormones such as ghrelin and leptin are important in regulating hunger and fullness, thereby influencing energy intake. Lack of sleep alters the concentration of these hormones, resulting in increased hunger and reduced satiety and, ultimately, over-consumption of energy. Some energy is needed to maintain the period of increased wakefulness, but this tends to be much less than the energy consumed because of the increased wakefulness (150 versus 600 calories). So, weight gain ensues. Simultaneously, fatigue resulting from inadequate sleep tends to reduce physical activity, which further reduces energy expenditure and promotes weight gain.¹¹

Sleep also alters the effectiveness of weight loss diets. For example, one bariatric study compared weight loss and body composition of individuals who slept five and a half hours or fewer per night to those who slept eight to eight and a half hours. The weight lost among those with the shorter (inadequate) sleep duration was approximately 70% lean body mass, whereas the weight lost among those with the longer (sufficient) sleep period was primarily fat mass.¹² For weight management, getting enough sleep may be just as important as what you put on your plate.

Sleep affects the immune system and inflammation

Sleep is intricately connected to the central nervous system and the immune system, playing a dynamic role in the regulation of both. When sleep is disturbed, the immune and nervous systems are impacted and vice versa.

The central nervous system uses sleep to regulate immune and inflammatory responses. During normal sleep, there is a measurable shift from the sympathetic “fight or flight”

HOW MUCH SHOULD YOU SLEEP?

Sleep recommendations from the National Sleep Foundation:*

AGE RANGE	ADEQUATE SLEEP
Newborns (0-3 months)	14-17 hours
Infant (4-11 months)	12-15 hours
Toddler (1-2 years)	11-14 hours
Preschool (3-5 years)	10-13 hours
School age (6-13 years)	9-11 hours
Teen (14-17 years)	8-10 hours
Healthy adults (18-64 years)	7-9 hours
Adults over 65 years	7-8 hours

*These are general guidelines; individual recommendations could vary with specific needs and circumstances.

to the parasympathetic “rest and digest” nervous system. With lack of sleep, the “fight or flight” response is more active. This is observed by increases in inflammatory markers and stress hormones. Inflammation is a key marker of immune function and an important step in fighting infection and initiating healing. However, sleep deprivation prompts a low grade, inappropriate, persistent inflammation that increases risk of chronic diseases.¹³

Studies, including an analysis of over 50,000 adults, have linked sleep deprivation to excessive levels of inflammation.¹³ As one sleep researcher put it, “When you haven’t slept enough, it is harder for the body to fight off illnesses ranging from the common cold to cancer.”¹⁴ Adequate sleep gives your body the chance to relax, rejuvenate and rebuild and plays an important role in chronic disease prevention.

The bottom line

Despite overwhelming evidence of the importance of sleep, it is often neglected. The Centers for Disease Control and Prevention estimates that one in three of American adults is not getting enough sleep on a regular basis.¹⁵ Currently, 60% of adults in the U.S. are suffering from at least one chronic disease.¹⁶ As the incidence of inadequate sleep continues to rise, so does the prevalence of chronic illnesses.

The implications of missing a good night’s sleep go beyond that extra cup of coffee to make it through the day. Sleep that is inadequate in duration or quality affects how we feel and how our bodies can function. Surrendering to sleep, even by just a few extra minutes a day, could make a big difference in your health, today and for decades to come.

SLEEP HYGIENE TIPS*

Developing healthy sleep habits can improve your quality of sleep and, in turn, play an important role in disease prevention.

1. Optimize your sleep environment

Create a space conducive to sleep by minimizing disruptive sounds and lights, especially from screens and devices. A cool room temperature (around 65 degrees Fahrenheit) has also been shown to promote restful sleep.

2. Align your circadian rhythm

Circadian rhythms are a part of the body's internal 24-hour clock that regulates your wake-sleep cycle. Adequate sunlight exposure (especially early in the day), avoiding exercising and/or napping late in the day, and following a consistent sleep schedule can help maintain a healthy circadian rhythm.

3. Avoid stimulants

Be mindful of what you consume and when. Alcohol, large meals and beverages before bed can disrupt sleep. Some stimulants, such as caffeine and nicotine, can stay in the bloodstream up to eight hours. Some common prescriptions (for heart, blood pressure or asthma) and over-the-counter drugs (for cough, cold or allergies) can also impact quality of sleep.

4. Establish a night routine

Incorporate bedtime rituals, such as reading, listening to music or taking a warm bath, that help you relax before bed.

5. Manage stress

Stress and anxiety are frequently connected to sleep problems. Techniques such as deep breathing, mindfulness meditation and other relaxation exercises can help reduce anxiety and help you fall asleep.

6. Seek a professional

If you continue to have trouble sleeping, seek a professional for help.

** Adapted from "Your Guide to Healthy Sleep," National Heart, Lung, and Blood Institute, NIH.*

Want to read more about sleep?
Read **"Why We Sleep: Unlocking the Power of Sleep and Dreams"** by Matthew Walker.

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