

*Continued from cover.*

Humans spend roughly a third of their lives sleeping. When schedules get busy and to-do lists get longer, it is easy for many to regret the amount of time wasted each night asleep. Sleep is the last thing we get around to at the end of the day and often the first thing to be sacrificed when a lack of time demands it. While putting off sleep has been a common reality living in a modern and fast-paced world, countless studies have shown that there are many serious consequences when humans are deprived of sleep.

Although the exact number of hours of sleep needed can vary from person to person based upon age and genetics, research shows that the average amount of sleep needed to avoid the adverse effects of sleep deprivation is eight hours and ten minutes. Yet, nearly a third of working adults in America get fewer than six hours of sleep per night, according to a recent study by the Centers for Disease Control and Prevention — a 25 percent increase in sleep deprived people from 1990.

### History of Sleep:

Before the age of electricity, human ancestors actually slept in two distinct segments each night. The first sleep began shortly after sunset and lasted until a little after midnight. Then, the sleeper awoke for a couple of hours and spent time praying, studying or having sex before having a second sleep. In his book, *At Day's Close: Night in Times*

Past, historian, Roger Ekirch describes more than 500 references throughout history and across the globe that point to a segmented sleeping pattern. A 15th-century medical book suggested that one should spend their “first sleep” on the right side and then switch to the left. Laurent Joubert, a well-known 16th-century French physician, theorized that laborers who worked with their hands were able to conceive more children because they waited until after their first sleep, when their energy was replenished, to make love. A priest in England wrote that the time between the first and second sleep was the best time for serious study. More modern anthropological studies of the Tiv culture in Nigeria in the 1960's point to the same “first sleep, second sleep” practice.

“It’s not just the number of references — it is the way they refer to it, as if it was common knowledge,” Ekirch says.

Modern studies have shown that this sleep pattern is so embedded in human nature that it will resurface if given the opportunity. Sleep study subjects who are not exposed to man-made light tend to fall back into this rhythm naturally.

However, this natural cycle was forever changed by Thomas Edison and the birth of modern electricity. Sunset no longer meant the end of fun, recreation or socializing. For businesses, it meant that darkness no longer hindered production. Factories could run all night long. By the 1920s, the idea of a first and second

sleep had entirely vanished. Today, the intrinsic tendency to follow a natural sleep rhythm is ignored or synthetically managed with the help of caffeine and prescription sleep aids. Getting the recommended seven or eight hours a night might not seem like a matter of life and death. But, being chronically sleep deprived can hold serious consequences.

### Weight Gain:

According to a study published in the *Journal of the Academy of Nutrition and Dietetics*, sleep deprivation can lead to an increase in the hormone ghrelin, which is associated with increased appetite and lead to a decrease in the hormone leptin which causes individuals to feel full. Furthermore, sleep-deprived people are more likely to experience changes in brain activity that can increase the urge to eat high-calorie foods. They may also eat more of them due to being awake for longer hours.

### Illness:

Inadequate sleep may also suppress immune function which increases vulnerability to the cold or flu and compromises the body’s ability to fight off infection. Individuals who do not get enough sleep are also more likely to complain of aches, pains, fatigue, upset stomach and diarrhea.

### Impaired Function:

Studies have shown that sleep deprivation has a profound effect on basic function. Attention, concentration,

hand-eye coordination, memory and vigilance can become significantly impaired when an individual does not get enough sleep. Therefore, the greatest danger related to chronic sleep deprivation may arguably be traffic accidents. According to a study from the National Highway Transportation Safety Administration, an average of 83,000 crashes a year could be attributed to sleepy driving between 2005 and 2009. Studies with driving simulators demonstrate impairment equivalent to being legally drunk. One such study depicted sleep-deprived subjects driving off the road every five minutes, which correlated to a blood alcohol level of 0.08 percent. Often people who are chronically sleep deprived may not recognize their level of impairment. Surprisingly, individuals who typically get less than seven hours per night can have reaction times that are similar to those who are completely sleep deprived for one or even two nights.

### Behavior, Brain Function and Development

A lack of sleep can also lead to mood changes and difficulties with thinking and behavior. Difficulty sleeping can lead to irritability, anxiety and depression. A lack of sleep has been shown to impair function of the frontal lobe of the brain, which may interfere with higher-level cognitive processes, including judgment, critical thinking, planning and organization. Memory is also affected by sleep deprivation



as immediate recall and short-term become impaired. Studies show that memory processing and consolidation occur during sleep, and this function plays a key role in learning and problem-solving. Thus, when we don't sleep, we can't effectively process and absorb information.

In more extreme situations, the mind may even begin to act in strange ways. A lack of sleep may lead to disorientation and confusion. Eighty percent of normal people will experience visual hallucinations if sleep deprived for long enough. In one study, a small percentage even began experiencing symptoms similar to acute paranoid schizophrenia when kept awake for 112 hours. Fortunately, all of these symptoms resolve with adequate rest.

A recent report in British Medical Journal explores the relationship of sleep to brain development in children. Children who had irregular bedtimes during their first three years demonstrated developmental lags in the areas of reading, math skills and spatial awareness. This delay continued even up until the age of seven, leading researchers to conclude that the first three years of life seem to be a particularly sensitive time for sleep and its relationship to brain development.

#### **Heart Problems**

According to research published in 2011 in the European Heart Journal, disrupted

sleep patterns and prolonged sleep deprivation can increase the risk of heart attacks and cardiovascular disorders. Specifically, the study suggests that getting at least seven hours of sleep per night is necessary to avoid long-term health problems. Those who sleep less than five hours per night have two to three times the risk of heart attack. This seems to be linked to a pro-inflammatory state that occurs with sleep deprivation, which increases the risk of chronic disease.

#### **Waking Up to the Sleeplessness Epidemic**

Sleeplessness has become one of the most common disorders of a modern society. With it has brought a growing industry as Americans spend billions of dollars on sleep labs, prescriptions, Tempurpedic mattresses and medical devices in hopes finding something to help them fall asleep. "Fatigue management consultants" now work with more than half of the current Fortune 500 companies to advise ways to maintain high-performing workforces and prevent workplace accidents.

Approximately 60 million prescriptions for sleeping pills were filled in the US last year. Yet a number of studies have shown that sleep-aid drugs may not offer a great improvement when it comes to the individual's quality of sleep. In one study sponsored by the National Institutes of Health and published in 2007, patients taking

popular prescription sleeping pills fell asleep just 13 minutes faster and slept for 11 minutes longer than those given a placebo.

While millions are attempting to fall asleep, countless others try to mitigate the lack of sleep with finding ways to stay awake and alert. Approximately 74% of Americans consume at least one caffeinated beverage per day while approximately 13% claim to consume at least six caffeinated beverages per day. Caffeine may work in the short-term, but eventually the body begins to build up a tolerance to it. Soon, higher and higher doses are required to get the same effect. Too much caffeine can lead to a host of ailments, including nervousness, restlessness, increased heartbeat, stomach upset, muscle tremors and insomnia.

#### **A Good Night's Sleep**

Research suggests that changing several behaviors and habits may help individuals attain a solid night of sleep naturally. Going to bed at the same time each night may help significantly. Also, our brains interpret the bluish light emitted by electronic devices as sunlight. So, avoiding gadgets like tablets, phones, TVs and computers for one hour before going to sleep may trigger our brain to know that it is time for sleep. Yoga and other relaxation techniques have been shown to dramatically improve both sleep quality and quantity.

Clearly, there can be no substitute for a good night's sleep. Countless studies have proven that sleep affects everything from our aptitude to learn a new skill to our ability to find a solution to a problem. Sleep is considered an essential part of a person's well-being and is one of the best forms of preventive medicine.

As Heraclitus wrote 2,500 years ago, "Even a soul submerged in sleep is hard at work and helps make something of the world."

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