

Sleep 101: There's no substitute for it

Although our understanding of sleep is ever growing, many fundamental questions about sleep remain. Sleep is a naturally recurring state of reduced consciousness in which voluntary muscles become inactive and sensory mechanisms diminish. Although many of us associate sleep with a sense of quietude, our brain and body are in fact quite active during sleep. The exact purpose of sleep is uncertain, but it may be a combination of bodily and brain repair and growth, conservation and restoration of energy, memory encoding and consolidation, and other functions. We know that sleep is essential to all mammals and birds, and likely all fish and amphibians. We know that chronic sleep deprivation has many detrimental effects, such as impaired cognition and weight gain. We cannot avoid sleep, and the only way to pay off the need to sleep is sleep itself. Sleep disorders often impair this fundamental biological need. Approximately one-fourth of Americans suffer from an impairment of sleep or wakefulness, and most of these disorders are not properly addressed.

Recent studies have elucidated the role of sleep and memory. Slow-wave sleep is thought to be a time when short-term memory is encoded to long-term memory. Studies have shown that spatial navigation may be impaired when slow-wave sleep is reduced. Slow-wave sleep is commonly referred to as “deep sleep” and predominates in the first half of the night. REM sleep, or rapid-eye movement sleep, is associated with enhancement of procedural memory, such as learning to ride a bike. REM sleep is characterized by darting eye movements and muscle flaccidity. Although we dream throughout the night, we are much more likely to remember dreams when we are



Fit to Practice

awaken from REM sleep, in which dreams tend to be vivid, animated and emotionally charged. There is good evidence that learning is impaired when sleep is poor. In addition, although many studies are ongoing, insufficient and fragmented sleep may be risk factors for dementia such as Alzheimer's. One recent study found that middle-aged adults with insufficient sleep may experience a decline in cognitive function comparable to four to seven years of aging.

Insomnia consists of difficulty falling or staying asleep that results in daytime impairment. Approximately 40 percent of people report occasional insomnia, and 10 percent of people report moderate-to-severe or chronic insomnia. Insomnia has many potential causes, including medical conditions like reflux or pain, frequent urination, psychological causes, medication side effect, disrupted circadian rhythms, etc. In many cases, there is genetic predisposition. Although only a small number of patients seek treatment, 70-80 percent of those who do can be successfully treated through a proper combination of behavioral modification, cognitive therapy and medication adjustments.

While insomnia is the most common sleep disorder, it is not the most common cause of daytime sleepiness. In our modern society, we simply do not devote enough quality time for sleep. The average adult needs 7-8 hours of sleep, although only about two-thirds

of adults report that they actually achieve this. With the advent of late night TV and email, 24/7 work and play schedules, overindulgence in caffeine, and many other factors, our current society pulls us away from our fundamental need for sleep. Sleep deprivation can exacerbate or create many conditions, including heart disease, obesity, diabetes, depression and anxiety, chronic pain syndromes, etc. Many workplace errors can be attributed to sleep deprivation. Notable examples are Three Mile Island, Chernobyl and the Exxon Valdez oil spill.

Sleep is similar to exercise in that it requires sacrifice and commitment. To improve sleep, maintain a regular sleep schedule. Unwind before going to sleep. Avoid activities before bed that cause tension. Limit caffeine at least 6 hours prior to bedtime. Limit light exposure (including your smartphone) at least one hour before bed. Exercise regularly, but avoid exercise within three hours of bedtime. Create a conducive sleeping environment – make the room dark, cool and comfortable. Do not watch TV or use a computer in bed; keep the bedroom for sleep and sex only. If you are regularly sleeping in or napping more than one hour on days off work, you are probably not allowing yourself enough sleep throughout the week. Other sleep advice and information can be found on a website maintained by the American Academy of Sleep Medicine, www.sleepeducation.com. Finally, if you are concerned about a sleep disorder disrupting your regular sleep, see your physician or a sleep specialist about optimizing each opportunity to sleep. 🛏️

Dr. Samuel M. Horton is board certified in Sleep Medicine. He is with the American Health Network and has several office locations in central Indiana.