

## Sleep: The Indispensable Weapon

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It's free and has no side effects! A natural therapy that improves memory, increases the ability to concentrate, strengthens the immune system, and decreases the risk of being killed in accidents. It is often taken for granted, except of course on those long nights when it refuses to arrive. Sleep, the remarkable, essential element for quality of life, health, and safety.

As Americans, we are getting much less sleep than previous generations. Modern society is shifting to a global, 24-hour-a-day, seven-day-a-week workforce, and 20 percent of Americans report getting less than six hours of sleep per day. According to the National Sleep Foundation, additional distractions such as the Internet, email, and late-night cable further contribute to less sleep.<sup>1</sup> In addition, the National Sleep Foundation's 2009 poll stated that one-third of Americans report losing sleep over the state of the U.S. economy and other personal financial concerns.

A growing body of scientific evidence suggests that too little or irregular sleep may be taking a toll on our health. Sleep is crucial to health, well-being, and social functioning. Sleep disorders have been associated with numerous diseases as well as an increase in overall morbidity and mortality. Several reports from the Harvard Nurses' Health Study have linked insufficient and irregular sleep to increased risk of breast cancer, colon cancer, heart disease, diabetes, and obesity.<sup>2, 3, 4</sup>

All of us experience the everyday stress associated with family life, health, and finances. Most of us also feel work-related stress associated with difficult colleagues, heavy workloads, long commutes, and difficult assignments. But sleep loss is a major occupational hazard of the healthcare industry and practitioners who also must deal with the stresses of call schedules, inadequate equipment, and managing critical, traumatic situations. High levels of stress and fatigue cause reduced productivity and an increased risk of adverse events. Further, the 24/7 schedule exposes healthcare practitioners to chronic stress and sleep deprivation incorporating its negative effects such as absenteeism, accidents, decreased productivity, poor health, and medical errors.<sup>5, 6</sup>

### How Much Sleep is Enough?

Individuals differ in their optimal sleep requirements. Most sleep experts agree that adults typically need between six and 10 hours of sleep per 24-hour period, with most people requiring approximately eight hours of sleep per day. When adults get less than five hours of sleep over a 24-hour period, peak mental abilities begin to decline. For short periods of time (two to three days), adult who get four hours of sleep can function reasonably well, but below peak levels. However, even with sleep deprivation of just a couple of days, slower



response times and decreased initiatives are observed. After one night of missed sleep, cognitive performance may decrease 25 percent from baseline. After the second night of missed sleep, cognitive performance can fall to nearly 40 percent of baseline.<sup>1,3,6</sup>

Nerve-signaling chemicals called neurotransmitters control whether we are asleep or awake by acting on different groups of nerve cells, or neurons, in the brain. Neurons in the brainstem, which connects the brain with the spinal cord, produce neurotransmitters such as serotonin and norepinephrine that keep some parts of the brain active while we are awake. Other neurons at the base of the brain begin signaling when we fall asleep. These neurons appear to "switch off" the signals that keep us awake.<sup>1, 6</sup>

Fatigue is the inability or unwillingness to continue effective performance of a mental or physical task. Fatigue affects a substantial component of a nurse anesthetist's workload, complex monitoring tasks, and critical thinking. Causes of fatigue include sleep deprivation, boredom, work overload, physical exhaustion, excessive hours, and changes to circadian rhythms. Environmental distractions such as noise, room temperature, and stress further contribute to fatigue. To compound this issue, most healthcare professionals, including nurses, receive little or no formal education about normal sleep and circadian rhythms, or the essential role of sleep in maintaining adequate health and performance either during or after their training.<sup>5</sup>

### Sleep Deprivation = Danger

It is difficult to find scientific studies demonstrating that fatigue is directly responsible for anesthesia accidents and mistakes in anesthesia and obstetrical settings. Many of the studies focus on self-assessment or self reported errors in clinical decision-making. Research has shown that subjective self-assessment of fatigue is generally underesti-

mated. However, since fatigue affects performance and decision-making processes, it is a likely contributor. Controlled experiments as well as simulated exercises have demonstrated deficiencies in decision-making, vigilance, reaction time, memory, psychomotor coordination, and information processing among flight crews and long-haul operations.<sup>6,7</sup>

Sleep deprivation is dangerous. Although, most nurse anesthetists would not think about going to work after having a couple of alcoholic drinks, they might not think twice about pulling a double shift or going without sleep for as long as 24 hours. This is a common practice on the first shift of a night rotation or when a CRNA works a busy 24-hour shift without getting any sleep. Researchers have shown that being awake for 19 hours produces impairments that are comparable to having a blood alcohol concentration of 0.05 percent.<sup>8</sup>

We know that the rate of these accidents increases with lack of sleep and time of day. Researchers have shown that the risk increases considerably after a person has been on duty nine hours or more. After 10 hours on duty, the risk increases by approximately 90 percent; after 12 hours, 110 percent. The night shift has the greatest risk for accidents; they are almost three times more likely to happen during the night shift than the morning shift.<sup>7</sup>

Gaba<sup>7</sup> and others also link fatigue to higher levels of depression, anxiety, confusion, and anger. One of the most uniform findings of fatigue studies of healthcare personnel is that tired clinicians have a negatively altered mood, a potential disruptive factor in colleague interactions and communication.

### Sleeping Well

Sleep is an essential life process. It is as important to our well-being as the food we eat, the water we drink, and the air we breathe. Unfortunately, people sometimes regard sleep as a waste of time. Part of the blame can be attributed to a cultural shift where doing more and more is valued above all else, usually at the expense of rest, sleep, and meaningful recreation.

Effective sleep is a necessity. In addition to the multiple strategies developed by experts (see Table), it is vital to also put your thoughts to bed so that you can get a restful sleep. We all need time to process our day, but bed is not the place to do it if you want to sleep well. At least two to three hours before bed, take a few minutes to relax your mind or record your thoughts in a journal, so you don't lie awake thinking.

Sleep deprivation leads to changes in the body chemicals that regulate appetite and weight in a way that promotes weight gain. A nationally representative sample of nearly 10,000 adults found that

## Tips for a Good Night's Sleep

-  **Stay physically fit. Get enough exercise. Maintain a healthy body weight and a nutritious diet.**
-  **Learn to use caffeine effectively. When you need to combat drowsiness, drink only one cup every hour or two; stop well before bedtime.**
-  **Establish a schedule. Do everything possible to get seven or more hours of sleep every day. For example, go to sleep at the same time every day as much as possible; avoid alcohol just before bedtime; use room darkening curtains.**
-  **If you have not been able to get enough sleep, try to take a nap before your shift. Done properly, a 20-minute catnap is proven to improve performance, elevate mood and increase creativity.**
-  **Relax before bed. A warm bath, reading, or another relaxing routine can make it easier to fall sleep. Learn to associate certain restful activities with sleep and make them part of your bedtime ritual.**
-  **Maintain a comfortable temperature in the bedroom. Extreme temperatures may disrupt sleep or prevent you from falling asleep.**

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those between the ages of 32 and 49 who sleep less than seven hours a night are significantly more likely to be obese. The study suggests that sleep deprivation increases levels of a hunger hormone (ghrelin) and decreases levels of a hormone (leptin) that makes you feel full. Researchers found that those who slept an average of eight hours a night had a lower body mass index (BMI) than those who slept less. The effects may lead to overeating and weight gain.<sup>2</sup>

Finally, scientists have long known that sleep disorders, such as sleep apnea, narcolepsy, and chronic insomnia, can lead to serious health problems, and that difficulty sleeping may be a red flag for a serious illness. Prolonged insomnia, significant snoring or breathing pauses, restlessness or kicking at night, are all problems that may require a referral to a sleep specialist.

*Sleep is the golden chain that ties  
health and our bodies together.*

*Thomas Dekker  
1572–1632*

### The Long Drive Home

Countless studies have found a direct correspondence between lack of sleep and a decline in cognitive ability; the less sleep, the worse individuals fared in terms of performance, productivity, and functionality. The military has conducted studies to determine how lack of sleep can affect the productivity of soldiers during waking hours. During total sleep deprivation, the soldiers' cognitive performance on a task requiring decision making, short-term memory, and mathematical processing declined by about 25 percent for every 24 hours of wakefulness. Further, fatigue has an eroding effect on the interaction between teams.<sup>9</sup>

One of the most insidious aspects of fatigue is the inability of the individual to recognize his or her own level of impairment and take appropriate action, such as reconsidering the long drive home after a busy 24-hour call or the common practice of "moonlighting." Regardless of what is known scientifically and operationally, the personal behavior of others cannot be controlled, even when schedule and work hours are regulated. Thus, each of us has to take personal responsibility to come to work prepared and rested, not impaired.

Unfortunately, the culture of the medical workplace, with its

perception that equates the number of hours on the job and hours without sleep with professionalism and dedication to patient care, is one of the most powerful barriers to reducing sleep loss and fatigue.

There is no question that the problem of sleep loss and fatigue has a significant impact on the professional and personal lives of health-care professionals and of their patients. The good news is that the ability to sleep soundly is something that we were all born with, and in most cases sleep problems are learned behaviors. This means that even though these behaviors are often unconscious, they can be unlearned and reshaped to healthier patterns.

Sleep, like living well, is an art. Many people take sleep for granted, but skimming on sleep stymies essential cognitive processes. How we feel, think, and perform depends on being alert and well-rested. Beneficial sleep restores the mind and body and is indispensable for the health and safety of both practitioners and patients. ■

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