

Sleep for Your Health

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You might be eating right and exercising, but if you're not getting enough sleep, you're still putting your health at risk. Studies show that lack of sleep not only affects concentration and alertness, it also increases risk for diabetes and obesity and impairs immune system function.

According to a 2003 poll conducted by the National Sleep Foundation, two-thirds of Americans report frequent sleep problems, which means the majority of Americans may be suffering from the deleterious health effects of sleep deprivation. Below, Dr. Eve Van Cauter, a professor of endocrinology at the University of Chicago School of Medicine, discusses the impact of chronic sleep deficits on health, and how to improve sleep habits.

What is considered "adequate sleep"?

Researchers are not in agreement as to what "adequate sleep" means. What we like to think about it as the amount of sleep that will make you function at your best, and will make you feel physically and mentally at your best.

There is no set amount of sleep that everyone needs, though three independent studies have found that young adults, on average, need about eight hours and 15 minutes a night.

What is the definition of sleep loss?

I think sleep loss is best defined individually in relation to what the person's sleep need is. We often ask the volunteers at the sleep lab how much would they like to sleep and how much sleep they obtain. That, in a way, could be a measure of sleep loss.

A more scientific measure would be to clearly define for a given person the amount of sleep that that person can achieve, their sleep capacity. And then define sleep loss as the difference between the sleep achieved in daily life and the sleep capacity of the person.

The first symptoms of sleep loss are decreased alertness, decreased attention, often a little bit of depressed mood.

Does sleep loss accumulate over time?

The current concept is that sleep loss definitely accumulates. With consecutive days of having too little sleep, you get worse and worse. Your sleep debt increases and your sleepiness increases, your alertness decreases and your performance decreases as well.

One certainly can make up for sleep loss by extending sleep and recovering the sleep, but it takes a while. For example, if you have too-short sleep for a week or two, it may take a whole week of extended sleep to recover all the sleep loss.

How does sleep loss affect quality of life in work and in our relationships?

The impact of sleep loss on quality of life is highly subjective, as quality of life itself is highly subjective. Interestingly, there are very large differences from one person to another in the

psychological response to sleep loss. Some people when they are sleep-restricted, tolerate it relatively well and others really suffer a lot more.

Individuals who tolerate sleep loss well are likely to restrict their sleep to the maximum amount tolerable. So these subjects who tolerate sleep loss well subjectively may put themselves at risk for really adverse health effects of sleep loss, because they don't have a safeguard to say, "Stop, I need to sleep now."

How does it affect our everyday health?

There is no animal, other than the human, that deprives itself of sleep. We can't adapt to sleeping too little because it's not part of our biology.

Studies suggest that chronic sleep loss is a risk factor for diabetes. In recent years, several laboratories including our own have begun to study markers of health in volunteers in whom sleep was restricted experimentally. What these studies have shown so far is that sleep loss has an adverse effect on our ability to metabolize sugar. In one week of severe sleep deprivation—such as four hours per night—a healthy, lean, fit volunteer will be in a prediabetic state.

With sleep loss, we have also noticed an increase in hunger and appetite and profound alterations in hormones that regulate hunger and appetite. When you're sleep-deprived, you may overeat well in excess of the caloric demands and, therefore sleep loss is probably also a risk factor for weight gain and obesity.

Which hormones sleep loss affect?

Sleep loss affects the stress hormones. For example, cortisol, which is a stress hormone, is very low in the evening, because it prepares us for a relaxed state to go to sleep. But in a state of sleep debt, cortisol levels are elevated in the evening.

Sleep loss also has a profound effect on hormones that control appetite, such as leptin. It also has a profound effect on hormones that control the thyroid axis, which is primarily controlling metabolism.

Does sleep loss have any impact on our immune system?

The immune system is markedly affected by sleep loss. We have shown that the response to the flu vaccine is affected by the amount of sleep that you had during the days prior to vaccination. The amount of antibody that you build against the flu may be affected by as much as 50 percent if you have not had enough sleep when you are immunized.

What are the consequences of chronic sleep deprivation on younger people?

The possibility that sleep loss may impair growth and development in children, particularly in adolescence, is only beginning to be the focus of research.

There's no question that children and particularly high school children are amongst the most sleep-deprived segment of the population. Once adolescents are in the pubertal transition, it is normal for them to have a delay in their sleep-onset time. They will tend to have their lively time of the day later and not go to sleep until maybe midnight. But the school hours haven't changed, and they have to be up at 5:30 and 6 to get the school bus.

There is no question that school performance is probably affected by the fact that these high school kids generally haven't had enough sleep to really be at their best cognitively to absorb the material.

Does sleep loss affect adults' work performance?

Oh, yes, definitely. It has been best shown in people who operate vehicles, such as commercial vehicle drivers, truck drivers. Also, in laboratory studies where people have had to work on a driving simulator, performance is severely affected by sleep loss.

In an Australian study, an investigator measured the amount of sleep loss that compares to the amount of impairment that you obtain from alcohol. A number of people are on the road having a significant sleep debt that puts them at the same level of impairment as if they had had more than the allowed amount of alcohol in the blood.

What are the behavioral strategies that are used these days for improving sleep?

I think the first strategy is to know for yourself how much sleep you need and to try to obtain that sleep night after night. Or at least, to make up for the sleep lost when you haven't slept enough. I think it's very important that people know how much they need to sleep in order to maintain good function for themselves.

For people who have difficulty sleeping, there are a variety of recommendations. These include sleeping in a cool, dark room, not using the bedroom for work activities or for watching television, and avoiding exciting activities right before going to sleep, such as checking e-mail and getting involved in very active behaviors. People should also avoid exercising and heavy foods late at night.

Regular exercise during the daytime will promote sleep. Trying to put your stress to sleep at the same time as you go to sleep is a good strategy. And some have recommended making a list of the things that need to be dealt with the next day, in order to have that list and not have to think about it during sleep. Regular sleep times are also recommended.

How important is sleep in general for good health?

Sleep is very important for mental function and bodily function. It appears that sleep plays a role in our metabolism, and lack of sleep could lead to weight gain, obesity and diabetes.



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“From everyone who has been given much, much will be demanded.” Luke 12:48