



SLEEP – WE NEED MORE OF IT!

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A survey by the American College of Chest Physicians in March 2008 indicated that most physicians say they need 7 hours of sleep each night, but they only get 6.5 hours. The “practice” of medicine desensitizes one to the importance of sleep – many of us feel sleep is optional, dispensable, or detracts from our self-sacrifice. About 43% of physicians stated they could not get adequate sleep because of their work schedule. We all remember the New York ER death that “caused” the start of the 80-hour work week for our residents. The mistake was purported to be by a sleep-deprived resident.

But sleep deprivation has deeper health concerns for us and our patients. An article in the *Archives of Internal Medicine* (1/27/03) found that sleeping 5 hours or less per night over a prolonged period was associated with a 30% increase in risk of coronary heart disease (CHD) in women. Sleeping only 6 hours per night was associated with an 18% increased risk. (The National Sleep Foundation says about 1/3 of Americans sleep 6.5 hours or less per night.) Women who slept 8 hours per night had the lowest recorded rate of CHD. (CHD is the number 1 killer of women and men in this country.) An unexpected finding was that 9 or more hours of sleep was also associated with an increased risk of CHD (38% more than those sleeping 8 hours per night). Yet, how often do we ask our patients to tell us how many hours of uninterrupted sleep they get each night? We probably should be doing so.

More research is needed to understand the biological reason(s) and to reproduce these findings. Previous research showed reduced sleep had negative short-term effects, including increased blood pressure (activation of the sympathetic nervous system), heart-rate variability, decreased glucose tolerance, and increased cortisol levels. We are starting to untangle the complex relationship between chronic sleep deprivation and long-term health risks.

Sleep scientists have long known that sleep disorders like sleep apnea, narcolepsy, and chronic insomnia can cause

significant health problems, as was documented in the excellent article in the last issue of *JLGH* by Rossini.¹ But evidence is also emerging that simply failing to allow oneself enough time to sleep can have consequences for health, even without a true sleep disorder.

Physiologic evidence shows that a sleep deficit may cause a high alert state, increasing hormones and blood pressure, and the risk for coronary attacks and stroke. Studies have also found a heightened state of inflammation (higher cytokines), which also is a risk for heart disease, stroke, cancer and diabetes. Dr. Alex Vgontzas of Penn State presented data that less sleep is associated with more chronic production of low grade inflammatory markers, and that naps can counter some of the negative effects. (Bring back the siesta!) Other studies show that lack of sleep creates abnormalities of the endothelial lining of blood vessels, perhaps one of the explanations why the highest incidence of heart attack and stroke occurs in the early morning hours.

Several studies discovered that night workers were more prone to breast and colon cancer. This tendency may be related to the finding that exposure to light at night reduces levels of the hormone melatonin. It's believed that melatonin protects against cancer by affecting levels of other hormones such as estrogen. Dr. Scott Davis of the University of Washington states there's no reason that other cancers eventually won't be linked to sleep loss and this phenomenon need not be restricted to those working night shifts.

Other research has found that mild sleep loss disrupts other hormones, by raising ghrelin and lowering leptin, which regulate appetite. Long-held theories exist that we are “wired” to be awake at night only when we need to search for food or fend off danger (in which case we need to eat to have enough energy). Many now suggest that the recent surge in obesity and diabetes is somehow related to lack of sleep; those receiving less sleep tend to develop glucose intolerance and diabetes more easily.

Certainly, if one is sleep-deprived, the body needs more insulin. Elevated insulin levels and poor sugar control contribute to vascular and cardiac disease. Multiple factors contribute to poor sleep quality in diabetics. There are higher rates of insomnia and excess daytime sleepiness. Restless leg syndrome, periodic limb movements, or neuropathic leg symptoms all disturb sleep. Diabetics have more obesity-associated sleep problems, such as sleep apnea (estimated to affect over 12 million people in the US). The severity of sleep apnea correlates with the severity of diabetes. (*Am. J. Epidemiol*, 2004;160:521-530.) New research shows that sleep deprivation can lead to memory lapses (elevated cortisol damages the hippocampus), depression, and immune system problems.

What can we do about our sleep deprivation? Before Tom Edison invented the light bulb, people slept an average of 10 hours/night; today Americans average 6.5 hours on weeknights and 7.5 hours on weekends. We're not going to shut off electricity, but consider the following:

- Sleep experts consider 65° - 68° the ideal temperature range for sleeping.
- Dimming the lights 1 hour before bedtime to mimic sunset releases melatonin from the pineal gland, readying the body for sleep.
- If you're still awake 15-30 minutes after lying down, get up and do something quiet – like reading. Don't watch TV, go on the internet, or exercise.
- Wake at the same time each day. An extra hour on the weekends is fine but more hours effectively act like jet lag.
- Sex can be a powerful hypnotic if one sticks with a monogamous sex life. Otherwise, endorphins and catecholamines can be disruptive.
- Evidence about warm milk is inconclusive. It has tryptophan (a protein), but insulin-producing sugars help absorb the tryptophan.
- Magnesium may induce sleep while relieving restless leg syndrome and muscle cramps. Evidence is anecdotal.
- Melatonin can be used but is not regulated in the U.S., so *caveat emptor!* It can cause insomnia in some people. It can also decrease the effect of many blood pressure medications, as well as have other interactions with antidepressants, steroids, coumadin, as well as others. Some say the best "physiologic" dose is 0.3 mg taken 30-60 minutes before bedtime. (*J. Clin. Endocrinol Metab* 2001;86:4727-4730.)
- Alcohol interferes with the normal sleep cycle. It may help one get to sleep but increases awakening later on.
- Exercise should be done at least 3-4 hours before laying down.
- Avoid sleeping pills unless sleep is medically vital and can't be achieved by other means.
- Naps are highly beneficial to intellectual performance unless taken too late in the day. The best time for your siesta is around the 5th to 8th hour of your waking day.
- Silence and darkness can be helpful but according to some experts are not vital; earplugs (with an NRR rating 30dB or higher) can be tried if noise is an issue.

Well, I don't know about you, but with all this talk about sleep (and how a deficit of it is unhealthy), I'm ready for a nap.

REFERENCE

1. Rossini G. The Sleepy Patient. *Journal of Lancaster General Hospital* 2008;3(1):9-14.

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