

# LIFE

October 24, 2006

## Sleep: it's required

### Poor sleep habits can lead to obesity, diabetes, and even — eventually — a shorter life span

By Susan Brink  
Los Angeles Times

The alarm clock in Thom Stys' bedroom goes off at 4 a.m. every weekday, a scant four to five hours after his head hits the pillow. By 5 a.m., he's left his Chino Hills, Calif., home for the freeway, and before the sun is up, he's at his desk in Long Beach, making a round of phone calls to clients in Europe. "If I left later, it would take me an hour and a half to get to work," says the 57-year-old vice president of an aerospace forging company. "I simply can't afford to spend time caught up in freeway traffic."

Most working blokes know that the more they work, the less they sleep. What they may not know is that the more time they spend in their cars, the less they sleep. Drive time — not television viewing, computer addiction or exercise — is second only to hours on the job as a reason people don't get the shut-eye they need.

"The most deadly combination," says David F. Dinges, chief of the division of sleep and chronobiology at the University of Pennsylvania School of Medicine, "would be long commute time, long work hours and living in a place where you have to get in the car and drive to get anything."

The combination is deadly because a good night's sleep now appears to be every bit as important to good health and long life as a nutritious diet and regular exercise.

"Sleep is in the top three," says Dinges. "And I think it's No. 1. Sleep is a biological imperative and not getting enough has health-related costs."

In April, the Institute of Medicine issued a report confirming links between sleep deprivation and an increased risk of hypertension, diabetes, obesity, depression, heart attack and stroke.

Some scientists are exploring possible connections between inadequate sleep and a decline in immune function.

The Archives of Internal Medicine devoted its Sept. 18 issue to the relationship between sleep and health. An editorial called for assessment of sleep habits as a standard part of all medical checkups.

That's because short sleep can hasten the arrival of the inevitable long sleep. The largest study of sleep duration and mortality was published in February 2002 in the Archives of General Psychiatry. The Cancer Prevention Study II of the American Cancer Society followed more than a million participants for six years. The best survival was found among those who slept about seven hours a night, the worst among those who slept less than 4.5 hours. Too much sleep — nine hours or more — also was associated with a higher risk of mortality.

In the last decade, researchers have begun studying sleep based on today's reality: a country open for business virtually 24/7, and a populace increasingly unwilling or unable to call it a day. Sleep needs vary

slightly, but the vast majority of people, experts agree, need just about eight hours of sleep each night to fully recover from 16 hours of being awake.

Yet people in the United States are racking up sleep debt like a college kid with a credit card. About 40 percent of people in the U.S. say they get fewer than seven hours of sleep on weekdays, and most — 71 percent — get fewer than eight hours of sleep, according to a 2005 survey by the National Sleep Foundation. Even on weekends, they sleep about 7.4 hours — better, but not enough to pay back the week's loss. Every hour they fall behind is considered an hour of sleep debt, and they accumulate about two full weeks of personal sleep debt a year.

Sleep researchers have a name for the way the vast majority of people in this country sleep: volitional chronic sleep deprivation, and it is a lifestyle disorder.

Without enough sleep, the cost in reduced memory, focus, concentration and reaction time is well established. Incidents in the lore of sleep research include the Exxon Valdez oil spill and the Chernobyl nuclear power plant disaster. In each, key decisions were made by people who were sleep-deprived.

But it's only in the last half a dozen years that studies have begun to link chronic partial sleep deprivation to serious physical health consequences.

Sleep is essential to the workings of every organ. And it seems that the connection between sleep and health starts at the brain's central command post, the hypothalamus. There, sleep or lack of it can work to activate, or inhibit, hormone production. There, too, is where the body gets the signal to go to bed, to wake up and to adjust temperature, blood pressure, digestive secretions and immune activity.

Inadequate sleep works on hormone production in other areas as well. Without enough sleep, the central nervous system becomes more active, inhibiting the pancreas from producing adequate insulin, the hormone the body needs to digest glucose.

A groundbreaking study in 1999, led by Eve Van Cauter, a professor of medicine at the University of Chicago, showed that just six days of sleep restricted to four hours pushed 11 healthy young male volunteers into a pre-diabetic state. Those jaw-dropping results expanded the field of sleep research, and convinced scientists that chronic, partial sleep deprivation damaged the body, not just the mind.

The young men in the same study also had reduced levels of the stress hormone cortisol, which normally surges just before waking from a good night's sleep, energizing people for the day's demands. The study participants had the low morning levels of cortisol typical of their grandparents.

And these volunteers also showed that, with chronic inadequate sleep, young people might be accelerating the beer-belly, pear-bottom problems typically linked to middle age. They were producing lower levels of growth hormone after less than a week of four hours of sleep. Growth hormone is largely secreted during the night's first round of deep sleep. As adults age, they naturally spend less time in deep sleep, getting less of the hormone that, in addition to driving childhood growth, plays a role in controlling the body's proportions of fat and muscle.

The University of Chicago study's findings were the first solid evidence that chronic partial sleep deprivation could have physical health consequences. Since then, researchers have begun to look harder and deeper at the links between sleep and illness. A study published in the Dec. 7, 2004, *Annals of Internal Medicine* found that when 12 healthy, young men were restricted to four hours of sleep for just two nights, normal levels of leptin, a hormone that signals satiety, dropped, while levels of ghrelin, a hormone that prompts appetite, increased.

When the men awoke, following the sleep-deprived state, their hunger and appetite increased — especially for calorie-dense, high carbohydrate foods.

"Chronic short sleep is the royal road to diabetes and obesity," says Karine Spiegel, a sleep researcher from Brussels and author of the study. She spoke of her work last June at the annual meeting of the Associated Professional Sleep Societies.

It appears, some researchers believe, that the links between sleep deprivation and obesity are two interacting epidemics.

"A few years ago, I would look at obese people and see weakness of character," says Fred Turek, a sleep researcher at Northwestern University and director of the Center of Sleep & Circadian Biology. "Now I believe that if you interfere with sleep, you're interfering with weight. If you interfere with weight, you're interfering with sleep."

The Nurses' Health Study, an epidemiologic study begun in 1976 monitoring the health of more than 100,000 nurses, put poundage to sleep loss. In a study reported in the Aug. 16, 2006, issue of the American Journal of Epidemiology, researchers found that after 12 to 16 years, women who slept, on average, less than five hours per night were 5 1/2 pounds heavier than those who slept an average of seven hours nightly.

A good night's sleep also can stave off short-term illness such as colds and flu, as well as hasten the benefits of a flu shot.

In a study reported in the Sept. 25, 2002, Journal of the American Medical Association, 25 healthy young men, who normally slept 7.5 to 8.5 hours each night, received flu shots. Eleven of the men were vaccinated on the fourth of five days in which their sleep was restricted to four hours, while the others got their usual nights' sleep. Ten days later, blood tests showed that those who got the shots while sleep-deprived had less than half the protective benefits as those who slept normally.

The immune response to the vaccine of sleep-deprived volunteers didn't catch up with that of the well-rested subjects for more than three weeks.

Adequate sleep may be essential for good health but it's every bit as hard to pull off as eating a healthy, well-balanced diet or finding an hour a day to exercise.

"The most common sleep disorder is insufficient sleep," says Dr. Dennis Nicholson, director of the Pomona Valley Hospital Medical Center's Sleep Disorders Center in Pomona, Calif.. "People come in and say they're sleepy. It's because they're not getting enough sleep." The connection seems like a no-brainer, but many people don't see it, he says. They want a sleep study and a pill.

Sleeplessness in the United States is a safety issue and a health problem. "Sleep is as important as breathing, drinking and eating," says Dr. Meir Kryger, a sleep scientist at the University of Manitoba. "Animals who are deprived of sleep die, but they don't die because their memory is poor. They die a metabolic death: Their fur falls out, they lose weight. Things that happen are over and above just the brain being sleepy. It's critical to health, but it takes longer to notice."

So far, Thom Stys hasn't noticed any health consequences. As he wraps up his work day, the European clients he called in the morning are long asleep. He ends his day with a round of phone calls to his Asian clients, who are just getting to their offices. Then he's back on the highway to Chino Hills, to dinner, family and a bit of work before falling instantly asleep around midnight.

At 4 a.m., his alarm goes off.

OUT OF BED AND INTO THE CAR: LONG COMMUTES DEPRIVE PEOPLE OF SLEEP

&byline;The Los Angeles Times

Just as people in the United States can lay part of the blame for their eating patterns on the food processing industry, and part of the blame for their sedentary lifestyle on unwalkable suburbs and sprawling cities, part of the blame for not quite enough sleep lies with congested highways and homes located far from work.

David F. Dinges of the University of Pennsylvania's School of Medicine studied numbers from the U.S. Department of Labor's American Time Use Survey, conducted in 2003, to find what people were doing instead of sleeping. He thought that, after time spent working, the next biggest temptation would come from television, computers and entertainment. Not so.

"Here's the big surprise. The more time you spend in the car, for any reason, the less you sleep," Dinges said.

Someone who spends a total of 40 minutes in the car each day — that's a round-trip commute plus all daily car errands — gets a good seven to eight hours of sleep. He reported those unpublished findings at the June meeting of Associated Professional Sleep Societies. And he found that for each eight minutes in the car beyond that, sleep time drops by about 15 minutes.

So if a long commute, traffic congestion or a lot of short trips to pick up kids or take dogs to the vet adds just 15 minutes of travel time to that 40 minutes, it means half an hour less sleep.

The National Highway Traffic Safety Administration estimates that 100,000 accidents and 1,500 traffic fatalities annually are caused by drowsy driving, far more than those attributed to cell phone use.

#### OVERWHELMED? TAKE A NAP

&byline;The Los Angeles Times

No one says it's easy to get enough sleep, what with demands of job and family, a desire for some semblance of a social life and endless temptations of the night. But experts offer some tips:

- Take a nap to help catch up on missed sleep. There's a reason that 3 p.m. is international siesta time: People need the rest. But be mindful of the time you snooze. A short nap should be no longer than 45 minutes; any longer and you'll be in deep sleep, waking up groggy and feeling even worse than before you napped. A nap of around 90 minutes could put you in REM, and waking could be a startling, heart-pounding experience. If you nap longer than 45 minutes, go for two hours to get past the REM cycle.
- If you have a long commute, spring for a hotel room near the workplace one or two nights a week, and go to bed early, advises Ralph Downey III, director of the Loma Linda University Medical Center's Sleep Disorders Center.
- Sleep in on the weekend — both days. "Our early data show that after a week of four hours of sleep a night, you need nine to 10 hours on the weekend to have any hope of recovery," says David Dinges, chief of the division of sleep and chronobiology at the University of Pennsylvania School of Medicine. "And one night alone doesn't fully recover you."
- Prepare for bed by spending 15 minutes or so in dim light, in a quiet room. "You have to slow down before you stop," says Rubin R. Naiman, psychologist and author of "Healing Night: The Science and Spirit of Sleeping, Dreaming, and Awakening."
- Remember that milk can help you sleep, caffeine interferes with sleep, and alcohol, while it might help you fall asleep, can interfere with your ability to stay asleep.
- If you're not getting enough sleep because of an inability to fall asleep, talk to your doctor about a sleep study and treatments.
- Bite the bullet. Go to bed 45 minutes or an hour earlier.

## LATE, BRIGHT NIGHTS INTERFERE WITH HORMONES

&byline;The Los Angeles Times

Some cancers might be rooted in sleep deprivation — or, more precisely, to too many hours exposed to artificial light, according to Richard G. Stevens, cancer researcher at the University of Connecticut Health Center. His work is based on the theory that the increase in breast cancer in the industrialized world is linked to the disruption of hormone cycles.

Light, he says, suppresses production of the hormone melatonin, which allows levels of estrogen to rise. And, when lights are on long after dark, it confuses women's circadian clocks, the roughly 24-hour internal rhythm that keeps hormones and organs on their daily schedule. "Cells don't know when not to divide," he says.

His theory was bolstered by a 1991 Centers for Disease Control and Prevention report showing that blind women are about half as likely as sighted women to get breast cancer. An Oct. 15, 2005, study in Cancer Research looked at sleep patterns of more than 12,000 women. Although researchers found no statistically significant increase in cancer risk among short sleepers, says Stevens, an author of the study, the risk estimates were consistently lower in long sleepers.

"We don't know why breast cancer is increasing in industrialized societies," he says. He advises women to get adequate sleep — and to do it in a very dark room.

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