

SLEEP DEPRIVATION: THE SILENT KILLER

By Dr. James B. Maas

So maybe you nod off in meetings every now and then, doing the old head-bob-I'm-awake-boss! dance. Or perhaps your mind wanders when you're driving, sometimes to the point that you can't recall how you got to your destination. Or maybe you're so tired during the day that your monthly Starbucks outlay now rivals your utilities bill—and, frankly, is just as necessary.



But do you have a problem? How much of this debilitating state is the result of leading a busy life in today's rather frenetic, 24/7 world? It's a similar question that people who drink alcohol occasionally ask themselves: Am I flirting with something dangerous here, a condition for which I need help?

Chances are if you're wondering about this then, yes, you do have a problem with sleep deprivation. To find out for sure, let's explore all the facets of this sneaky and debilitating disease. And it is a disease. In fact, if it were an option on death certificates, it could be checked off as the source of many an untimely demise.

Scared? Good!

What does it mean to be "sleep-deprived"?

You are sleep-deprived if you're not meeting your personal sleep need, which for most adults is between 7.5 and 9 hours per night. You should feel energetic, wide awake, and alert all day, without a significant midday drop in alertness. And the term "sleep-deprived" certainly applies to anyone who has difficulty falling asleep or staying asleep, wakes up too early, and/or has poor sleep quality. Most Americans are at least modestly sleep-deprived. While the average person claims to get 7.1 hours

The Maas Robbins Alertness Questionnaire

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Please indicate true or false for the following statements:

- | True | False | |
|------|-------|---|
| T | F | 1. I often need an alarm clock in order to wake up at the appropriate time. |
| T | F | 2. It's often a struggle for me to get out of bed in the morning. |
| T | F | 3. Weekday mornings I often hit the snooze bar several times. |
| T | F | 4. I often feel tired and stressed out during the week. |
| T | F | 5. I often feel moody and irritable, and little things upset me. |
| T | F | 6. I often have trouble concentrating and remembering. |
| T | F | 7. I often feel slow with critical thinking, problem solving, and being creative. |
| T | F | 8. I need caffeine to get going in the morning or make it through the afternoon. |
| T | F | 9. I often wake up craving junk food, sugars, and carbohydrates. |
| T | F | 10. I often fall asleep watching TV. |
| T | F | 11. I often fall asleep in boring meetings or lectures or in warm rooms. |
| T | F | 12. I often fall asleep after heavy meals or after a low dose of alcohol. |
| T | F | 13. I often fall asleep while relaxing after dinner. |
| T | F | 14. I often fall asleep within five minutes of getting into bed. |
| T | F | 15. I often feel drowsy while driving. |
| T | F | 16. I often sleep extra hours on the weekends. |
| T | F | 17. I often need a nap to get through the day. |
| T | F | 18. I have dark circles around my eyes. |
| T | F | 19. I fall asleep easily when watching a movie |
| T | F | 20. I rely on energy drinks or over-the-counter medications to keep me awake. |

If you answered "True" to four or more of these statements, consider yourself seriously sleep-deprived.

of sleep per night, a study at the University of Chicago demonstrated that it's actually much less. Researchers attached small sleep-monitoring devices to subjects and found that those claiming 7 to 8 hours per night really slept closer to 6. It seems we're so sleep-deprived, we aren't even aware of how little we rest. And you can imagine what this means for the 55 percent of Americans who *think* they're getting 6 to 7 hours of sleep.

President Bill Clinton: "You have no idea how many Republican and Democratic members of the House and Senate are chronically sleep-deprived. It makes them more edgy, it makes them more irritable, it makes them more vulnerable to being pulled back and forth by interest groups ... sleep deprivation has a lot to do with some of the edginess in Washington today."

Who is sleep-deprived?

Most of us are moderately sleep-deprived; not just tired, but *deprived* of the very rest that is integral to health and competency in waking life. Pilots, doctors, nurses, teachers, students, politicians, executives, truck drivers, store clerks ... all are veritable zombies. In general, high school and college students are the most pathologically sleep-deprived segment of the population. Their alertness during the day is on par with that of untreated narcoleptics and those with untreated sleep apnea. Not surprisingly, teens are also 71 percent more likely to drive drowsy and/or fall asleep at the wheel compared to other age groups. (Males under the age of twenty-six are particularly at risk.)

Senior citizens and those in business and government are the next biggest group of yawners, with huge dips in alertness between 2:00 and 4:00 pm. Many of them brag about needing only five hours of sleep per night. Little do they know that it's undermining their job performance, putting them at risk for health problems, and even shortening their lives.

What are the signs of sleep deprivation?

Predictably, the most common symptom is fatigue. But as obvious as that seems, many people become so accustomed to feeling chronically tired that they accept it as normal. This same attitude is often applied to other symptoms such as mood swings, irritability, anxiety, and difficulty concentrating, remembering, learning, and interacting socially. You may feel you're a loner, a slow-learner, or just not a vibrant or ambitious person, when in fact your fatigue has created a shell around your true personality and abilities. People don't recognize that sleepiness is not "normal," and something must be done to break the cycle.

Signs of chronic sleep deprivation can also include frequent infections/illnesses, blurred vision, changes in appetite, and depression. While these symptoms may be relatively minor and seem unrelated at first, they can be the precursors of lifeshortening afflictions. Without proper treatment, they can grow to negatively impact your health and quality of life.

How do I know if I'm sleep-deprived?

The most thorough and reliable way to determine if you have a problem is to take a Multiple Sleep Latency Test (MSLT). The theory behind this test is that the faster you can fall asleep (when given the

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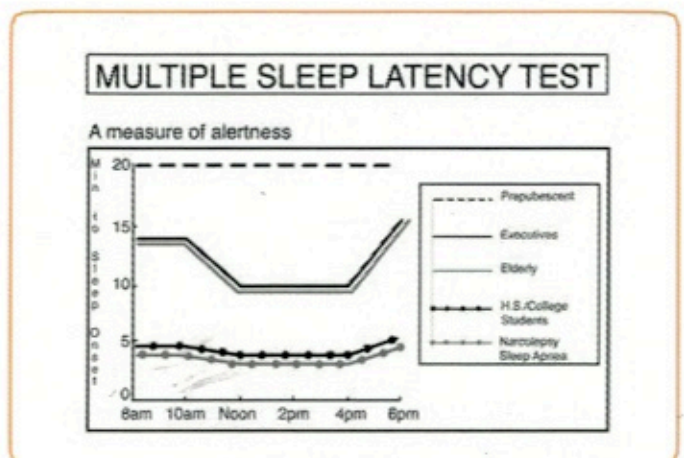


Fig. 1 indicates how quickly each group fell asleep when asked to try to fall asleep at six different time intervals throughout the day. It should take twenty minutes to fall asleep when fully rested.

opportunity to do so in a quiet, dark, cool bedroom at specified intervals throughout the day), the more sleep-deprived you are. This test should be administered at an accredited sleep disorder center. You can visit www.sleepcenters.org to find the sleep lab nearest you.

Six Biggest Sleep Thieves:

- Alcohol or caffeine after 2 pm
- Tobacco
- Strenuous exercise within three hours of bedtime
- A heavy meal within three hours of bedtime
- A poor bedroom environment
- Stress

What are the most common causes of sleep deprivation?

The biggest and most prevalent cause is our society's persistent belief that sleep is a luxury rather than a necessity. When it seems there just aren't enough hours in the day, sleep is the first thing we cut, though ironically if we slept more, we'd be more efficient and productive. The advent of the Internet, buzzing Blackberrys, and 24/7 entertainment has compounded the problem. Abusing sleep with blissful machismo is now deeply ingrained in our global society.

Beyond this general notion, there are many specific contributing factors to sleep deprivation. *Temporary sleep loss*, for instance, is often triggered by passing stressors, such as a headache, toothache, indigestion, back problems, cold, flu, or jetlag. While these causes are certainly real and frustrating, they're relatively easy to treat.

Anxiety is the most common cause of short-term sleep loss, and it can last for weeks. Nervousness about money, your marriage or relationship, losing or finding a job, your weight or other health concerns, and even boredom can all make you toss and turn.

Long-term sleep loss is occasionally caused by environmental factors—your job, if you're a night-shift worker; where you live, if it's in a noisy area—

"Why sleep? I might miss a party. I'll sleep when I am dead." —Janis Joplin, who died of a drug overdose at twenty-seven

PHYSICAL EFFECTS

but it more commonly stems from medical conditions such as arthritis, diabetes, epilepsy, ulcers, and heart disease (among others), as well as consistent drug (including caffeine) or alcohol use. There are also a number of sleep-specific medical conditions that can severely impact and disrupt rest. These include sleep apnea, narcolepsy, restless leg syndrome, and upwards of eighty-

six other distinguishable disorders, many of which are discussed in Chapter 17.

More than a third of people who suffer from chronic insomnia also have psychiatric conditions such as depression and schizophrenia, as well as obsessive-compulsive disorder, anxieties, or phobias. Sleep and psychiatric problems tend to go hand-in-hand—when you're not sleeping well, life appears grimmer; when life appears grim, it's harder to rest. Trouble sleeping can even be an early sign of forthcoming psychiatric problems, so it's important to talk to a doctor if symptoms arise or persist. For most patients, when an underlying mental condition is treated, sleep habits improve.

Does sleep deprivation affect me physically or behaviorally?

It affects you both ways. There's no escaping the debilitating effects of insidious sleepiness, no matter how motivated, responsible, or strong you are. Even in risky or potentially dangerous situations, nothing can override the powerful and inevitable results of extensive or cumulative sleep loss. If you think you're in good shape but aren't sleeping well, you're cheating yourself out of an even better sense of well-being, little to no extra effort required.

Not sleeping makes you prone to:

- **Daytime drowsiness.** This usually manifests itself as a temporary drop in energy and alertness around midafternoon. It's accompanied by

feelings of inattentiveness and grogginess, particularly when doing dull or repetitive tasks. It's more likely to occur after a heavy meal or a low dose of alcohol, or while sitting in a warm room, listening to a boring lecture, or participating in a dull meeting. These factors do not cause sleepiness; they simply unmask the physiological fatigue that's already present.

- **Microsleeps.** These are brief episodes of sleep that you're unaware of and that occur during waking hours. Lasting only a few seconds, microsleeps can produce inattention, resulting in accidents and injury.
- **Sleep seizures.** These are unintended longer episodes of sleep that come on as rapidly as a seizure, occurring without warning in a severely sleep-deprived person.
- **Colds and flu.** Dr. Jan Born at the University of Luebeck in Germany found that people who sleep less than six hours per night have 50 percent less resistance to viral infection than those getting eight hours of sleep. In addition, Dr. Sheldon Cohen of Carnegie Mellon University found that those sleeping less than seven hours per night are three times more likely to get a cold than longer-sleepers.
- **Weight gain.** You might think that spending more time in bed makes you lazy, but not spending enough time in bed can also make you fat. Lack of sleep lowers leptin levels in the brain and raises ghrelin levels in the stomach. These hormones are responsible for appetite regulation. So when you're sleep-deprived, you're more likely to overeat—craving carbs, sugars, and junk food.

Researchers at Columbia University as well as the University of Chicago have found people who sleep five hours per night have a 50 percent higher chance of being obese, while those who

sleep six hours have a 23 percent greater risk.

Professor Francesco Cappuccio at the University of Warwick Medical School found that less sleep is associated with an almost two-fold increase in obesity—a trend that he says is detectable in children as young as five. The research also linked short sleep with a higher body-mass index (BMI) and waist circumference over time.

- **Diabetes.** A study at the University of Chicago involving healthy young men with no risk factor for diabetes found that after just one week of inadequate sleep, they were in a pre-diabetic state. Researchers attributed the result to overactive central nervous systems (caused by not sleeping), which affected the ability of the pancreas to produce enough insulin to adequately regulate glucose levels. The current epidemic in diabetes may be connected to the epidemic in sleep deprivation. We now have an epidemic of early onset childhood diabetes, and it appears to be linked to obesity and lack of sleep.
- **Heart disease.** Not sleeping often causes the body to produce more stress hormones. Such an imbalance can lead to arteriosclerosis, which can cause heart attacks and strokes, in addition to hypertension, muscle loss, increased fat storage, loss of bone mass, and lower production of growth hormone and testosterone.

In addition, short-sleepers miss out on REM sleep (predominant between the seventh and eighth hours of the night), during which time the heart pumps more blood to the muscles. This helps it relax as blood pressure falls. So, by cutting back on sleep, we're preventing this innate regulating system from doing its job. Additionally, sleep apnea, if undiagnosed and/or untreated, significantly raises the risk of cardiovascular disease because the heart must work harder to oxygenate the blood.

“You don't realize how fatigued you can be. I went to sleep one time in the Marine Corps—walking—and I walked about a mile, as best I can recall, until I fell into a ditch.”
—Fred Smith, founder and chairman of the board, Federal Express

- **Cancer.** Women who exercise regularly and were generally healthy had a 47 percent higher risk of cancer if they were sleeping fewer than seven hours. Researchers at Stanford University also found that good sleep habits can be a valuable weapon in fighting cancers, citing melatonin (released during sleep) and cortisol production (involved in regulating immune system activity) as vital players in patient recovery.

Night-shift workers (both male and female) have a 35 percent higher risk of colorectal cancer. Why? According to the International Agency for Research on Cancer, shiftwork is not a “possible” but a “probable” carcinogen, due to too much light exposure and lack of melatonin secretion in your brain because you are not sleeping. Blind women have 50 percent less chance of breast cancer than sighted women. Why? Active, sighted women often stay up late, spending too much time in the light. Again, exposure to light and lack of sleep block the release of cancer-fighting melatonin and raise estrogen levels, which can cause breast cancer.

People who sleep well and are less stressed during traumatic times in their life due to illnesses like cancer live longer and are less affected by their illness than those who get easily stressed by these big life changes. Additionally, therapies like yoga have been proven to help cancer patients (who are often affected with chronic insomnia) sleep better and therefore feel better.

- **Skin.** Sleep is essential for rebuilding tissues and cells, including the skin. Sufficient sleep is required to maintain good skin texture and a healthy glow. The first area of skin to be affected by a lack of sleep is the eyelids. The skin is very thin here so lack of sleep causes puff y eye bags, fine lines, and dark circles. In the long term, lack of sleep causes skin to age faster leading

Sleep More, Drop Blood

Pressure: One extra hour of sleep per night decreases the risk of artery calcification by 33 percent. Plus, it’s accompanied by a 17-mm drop in systolic blood pressure. —Dr. Diane Lauderdale, University of Chicago

to wrinkles, poor texture, and discoloration much earlier in life than in the well-rested individual. During sleep, the body metabolizes free radicals, which accelerate aging and cancerous growths. Without sufficient sleep, there are more free radicals present in the skin leading to poor skin quality and even skin cancer. Sustained sleep

deprivation impairs host defense

so if the skin is exposed to bacteria or is healing from a lesion, lack of sleep will increase the amount of healing time required and may result in more severe bacterial skin infections.

- **Poor athletic performance.** Since sleepiness impairs reaction time, awareness, and motor skills, it should come as no surprise that well-rested athletes enjoy the best performance.

During sleep, the brain moves short-term muscle memory (of a tennis serve, a basketball shot, or a golf swing that you’ve been practicing) into long-term muscle memory, where you can more easily retrieve it later. So the adage “practice makes perfect” only works if it’s followed by adequate rest, meaning we should really be saying “practice with sleep makes perfect.”

In fact, research shows that athletes who forego early morning workouts to sleep in and train only in the afternoon are likely to perform better than those who do double sessions.

As you can see, if you thought that a little fatigue was the worst outcome of sleep deprivation, you were wrong.

BEHAVIORAL EFFECTS

Not sleeping makes you prone to:

- **Mood shifts, including depression and irritability.** Mood is one of the first traits to be affected by sleep loss. Miss even one night of

sound rest and your threshold for anger lowers. You can quickly lose friends, upset loved ones, foil negotiations, and make enemies.

- **Stress, anxiety, and loss of coping skills.** Sleep loss leads to amygdala activation, the area of your brain involved in rage and aggression. There's also decreased activity in your limbic system, which regulates anxiety. Feelings of not being able to cope, even with simple problems or moderate workloads, can become overwhelming and result in increased worry, frustration, and nervousness. You can lose your perspective and be unable to relax under even moderate pressure. Stress produces sleep loss, and sleep loss produces stress. It's a very vicious cycle. While the sleep-deprived are shuffling through life and have less control over emotions, the well-rested are more alert and less stressed.
- **Socializing less.** In short, you'd rather stay home than go out. It's not because you're anti-social; it's just that you're too tired.
- **Sub-par mental functioning/perception.** Whether you realize it or not, losing sleep makes you less efficient at just about every task and, in general, creates a dulled-down version of yourself, with a duller reaction to negative events, and even a drop in your taste sensitivity.
- **Concentration problems.** Since your mental faculties are not alert, sleep loss affects focus.
- **Difficulties with memory** (especially short-

term). Functional magnetic resonance imagery (fMRI) scans of brain activity in sleep-deprived individuals trying to perform even simple tasks show momentary lapses of functioning in several important regions. During sleep, the brain moves short-term muscle memory into long-term muscle memory, where you can more easily retrieve it later. It also affects your ability to think logically and critically, making it difficult to assimilate and analyze new information. When you're sleepy, your brain works in a completely different way from when it's well rested. In fact, some parts don't work much at all. fMRI images show that sleep-deprived brains have much less activity in the right hippocampus. Thus, losing sleep means losing memory, and not just for tomorrow- but for months afterwards.

- **Failing to analyze and assimilate new information.**
- **Reduced ability to communicate.** Speaking and writing skills deteriorate with sleep loss.
- **Lower creativity.** Lack of sleep severely disrupts many duties of the hippocampus, which means you'll have less ability to conceptualize.
- **Impaired motor skills and coordination.**

Would you hire a person with these characteristics? Next time you interview someone for a job, ask how many hours of sleep he or she gets per night. If it's six or less, call in the next candidate.

A Fatal Mistake

A five-month-old boy died of heat exhaustion after he was forgotten for nearly ten hours in the back seat of a car. His father, a computer programmer, was supposed to drop his son at day care at 7:30 am but forgot the baby was in the car and went to work. He didn't realize his mistake until 5:15 pm, when his wife went to the sitter, learned the baby was not there, and called her husband. According to the doctor who performed the autopsy, the boy appeared to have struggled furiously against his seat belt and died of extreme heat exhaustion and hyperthermia in the "enormously hot" car. Even after he had been dead for some time, the infant's temperature was 106 degrees. The father was described by a coworker as "a dedicated, driven employee who put in a lot of extra hours, and had probably overworked himself that week to the point of distraction. He was overtired, I guess."

How does sleepiness affect my ability to drive?

Sleep deprivation dampens your senses and impairs your perception, much like driving drunk or under the influence of drugs. One drink of alcohol on six hours of sleep is the equivalent of six drinks on eight hours of sleep in terms of your ability to drive. Never get into a car with anyone who is the least bit sleep-deprived and has been drinking alcohol. Driving drowsy has the same effect as driving drunk. Perhaps police should augment the breathalyzer with a sleepalyzer.

How can I “cure” my sleep deprivation?

It's simple: sleep better and sleep more. Most people need to rest just one extra hour per night to stay completely alert all day. It'll take a few weeks to effectively change your schedule to accommodate this, but eventually you should be waking up naturally without an alarm clock. After just a few nights of meeting your personal sleep quotient by improving your sleep strategies, you should feel a notable difference.

How do you change? We'll explain all of that in great detail in the next few chapters. Once you fix your sleep habits, you'll Sleep for Success!, and you'll say what everyone else does: “I never knew what it was like to be awake.” ■

Sleep Deprivation: The Silent Killer is an excerpt from *Sleep for Success! Everything You Must Know About Sleep but Are Too Tired to Ask* by Dr. James B. Maas and Rebecca S. Robbins.

Dr. Maas is one of the foremost experts and educators in sleep research in the world. Over the past 40 years Dr. Maas has taught the principles of sound sleep to over 65,000 college students and hundreds of Fortune 500 companies.

Learn more about Dr. Maas' award winning books and recommended sleep aid products at his website: www.sleepforsuccess.info