

Sleep deprivation can kill you — here's what sleeping less than 7 hours per night does to your body and brain

Kevin Loria Aug. 22, 2018, 7:42 AM



Evan Vucci/AP Images

About a third of US adults [don't get enough sleep](#).

And [sleep deprivation](#) has serious [consequences for your brain and body](#).

Many people [think they can get by on less](#) than seven to nine hours a night — the amount of sleep doctors recommend for most adults — or say they need to [sleep less because of work](#) or family obligations.

The Tesla and SpaceX CEO [Elon Musk recently acknowledged](#) in an [interview with The New York Times](#) that his long work hours were taking a toll on his well-being and raising concerns among his friends.

That prompted Arianna Huffington to [post an open letter to Musk](#) about his sleep schedule, telling him that he was "demonstrating a wildly outdated, anti-scientific and horribly inefficient way of using

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human energy."

Musk [posted his response on Twitter](#) at 2:30 a.m. ET. "I just got home from the factory," he said. "You think this is an option. It is not."

Musk seems to understand that working 120-hour weeks is harmful. As Matthew Walker, a neuroscientist who's an expert on sleep, [previously told Business Insider](#), "The shorter your sleep, the shorter your life."

Most adults need seven to nine hours of sleep, and kids have to get even more, though needs do vary from person to person. Some incredibly rare people can actually get by on a few hours of sleep per night, while others on the opposite end of the spectrum are sometimes called "long sleepers" because they need 11 hours nightly.

But regardless of your body's clock, [a lack of sleep](#) will cause your physical and mental health to suffer.

Here are 30 health consequences of sleep deprivation.

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Sleep deprivation is linked to a higher risk for certain cancers

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Sleep deprivation and disrupted sleep schedules have been [linked to increased risk](#) for several [cancers](#), most notably [colon](#) and [breast](#) cancers.

Skin doesn't heal as well from damage when you are tired, leading to skin aging



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Poor sleep quality is strongly correlated with chronic skin problems, according to [research from the University of Wisconsin](#). Studies [have also found](#) that when skin is damaged by the sun or other factors, it doesn't heal as well in poor sleepers, so those people wind up showing more signs of skin aging.

Tired people have a harder time controlling their impulses, potentially leading to unhealthy behavior and weight gain

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People who don't get enough sleep have more cravings for unhealthy meals, a harder time [resisting high-calorie foods](#), and difficulty controlling their impulses. Researchers think [hormonal](#)

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imbalances that result from sleep deprivation are responsible for this, since those imbalances are linked to a high body-mass index and obesity.

People feel lonelier after sleepless nights — and being lonely makes it harder to sleep well

Etienne Oliveau/Getty Images

Researchers have found that sleep-deprived young adults are less likely to connect socially with other people, and that people who report poor sleep also tend to say they're lonelier. To make things worse, people who feel lonely don't tend to sleep as well, which can lead to a sort of vicious cycle.

Being sleepy makes it harder to learn and disrupts short-term memory

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Sleepiness has long been a problem for students. Delaying school start times an hour for middle-school kids has been found to significantly increase standardized test scores, and it may have an even bigger effect on teens, who naturally tend to be night owls.

But it's not just kids — sleep deprivation also wrecks adults' short-term memory. Several studies have found that sleep-deprived adults have more difficulty remembering words they've learned and have a harder time improving newly learned skills.

Long-term sleep deprivation also seems to damage long-term memory

REUTERS/Han Jae-Ho

Sleep disruptions for elderly people can lead to structural changes in the brain associated with impaired long-term memory. Sleep-related memory deficits have been observed in the general adult

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population as well — as early as 1924, researchers noticed that people who slept more forgot less.

A growing body of evidence links bad sleep with signs of Alzheimer's in the brain

NIH

Several studies have found that [sleep helps cleanse the brain](#) of the beta-amyloid protein that can build up while you are awake. That protein is strongly associated with Alzheimer's disease. Researchers say that a lack of sleep can lead to a vicious cycle, since the more beta-amyloid protein there is in the brain, the harder it is to get to a cleansing deep-sleep state. People with more disrupted sleep schedules [tend to have more beta-amyloid protein](#) built up.

Heart disease risk rises with sleep deprivation

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There's plenty of evidence that sleep deprivation [has a negative effect on the heart](#). When researchers kept people awake for 88 hours, their blood pressure went up (no big surprise there). Even participants who were allowed to sleep for four hours a night [showed an elevated heart rate](#) when compared with those who got eight hours. Concentrations of C-reactive protein, a marker of heart-disease risk, also [increase in people who are fully or partially deprived of sleep](#).

Sleepiness leads to irritability

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People feel irritable after sleepless nights (as we've all experienced at some point), and research has also found that [people get more distressed by common circumstances](#) like interruptions at work when they are tired.

The longer people go without sleep, the harder it is for them to see clearly — people sometimes even experience hallucinations when they're sleep-deprived

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Sleep deprivation is associated with tunnel vision, double vision, and perceived dimness. The longer you are awake, [the more visual errors you'll encounter](#), and the more likely you are to experience outright hallucinations.

Sleep-deprived people have slower reactions

Ben Margot/AP

Your reaction time is severely impeded when you don't get enough sleep. Studies have found that [college athletes](#) and [West Point cadets](#) all did worse on decision-making tests and had slower reactions while tired.

So it's no surprise that sleepiness makes people clumsier

Thomson Reuters

Most people notice that when they're sleepy, they're not at the top of their game. One study found that one sleepless night contributed to a [20-32% increase in the number of errors made by surgeons](#). People playing [sports that require precision](#)— like shooting, sailing, or cycling — also make more mistakes when they've been awake for extended periods.

The immune system doesn't work as well when you're tired

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You know those great things your immune system does when you get a wound but don't immediately get an infection, or you come near a sick person but don't get ill yourself? [Prolonged sleep deprivation](#) and even [one night of sleeplessness](#) can impede your body's natural defenses against infection. Sleep deprivation also seems to [make newly received vaccines less effective](#).

Similarly, overtired people are more susceptible to colds

Domaskina/Shutterstock

If you're wondering why you're sick all the time and seem to pick up every bug that travels around the office, it's probably because you're not getting enough sleep. Sleep-deprived people are almost [three times as likely as well-rested people to catch a cold](#), according to one study.

Being tired drains your sex drive and makes it harder to perform

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Testosterone is an important component of sexual drive and desire in both women and men. Sleeping increases testosterone levels, while being awake decreases them.

[Sleep deprivation](#) and disturbed sleep, consequently, are associated with [reduced libido](#) and [sexual dysfunction](#). People with [sleep apnea](#) are particularly at risk.

Sleepy people express more unhappiness and signs of depression

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In a classic study led by the Nobel Prize-winning psychologist [Daniel Kahneman](#), a group of 909 working women kept detailed logs of their moods and day-to-day activities. While differences in income up to \$60,000 had little effect on happiness, the results found, a poor night's sleep was one of two factors that could ruin the following day's mood. (The other was tight deadlines at work.)

Another study [reported higher marital happiness](#) among women with more peaceful sleep, though it's hard to say whether happy people sleep better, or good sleep makes people happier. Most likely, it's some combination of the two.

Insomniacs are also [twice as likely to develop depression](#), and [research suggests](#) that treating sleep problems may help treat depressive symptoms.

Risk of type 2 diabetes rises when people are overtired, even for people who aren't overweight

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Being awake when your body wants you to be asleep messes with your metabolism, which in turn [increases your risk for insulin resistance](#) (often called "prediabetes") and type 2 diabetes.

[Several studies](#) in adults have found a strong association — though not a cause-effect relationship — between regular sleep loss and the risk of developing diabetes. More sleep may also help reduce diabetes risk for adolescents, [according to researchers](#).

Tiredness is associated with bad decision-making that can put lives and finances in danger

Reuters

Planning to make some changes to your portfolio? You might want to make sure you're well-rested.

"A single night of sleep deprivation evoked a strategy shift during risky decision making such that healthy human volunteers moved from defending against losses to seeking increased gains," [researchers said](#).

Other researchers have found that severe sleep deprivation [impairs people's ability to follow preestablished procedures](#) for making a "go" or "no-go" decision, something that researchers say contributed to the explosion of the space shuttle Challenger, the Chernobyl meltdown, and the Exxon Valdez disaster.

Sleepy people are more easily distracted

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"Attention tasks appear to be particularly sensitive to sleep loss," [researchers noted](#).

If you want to stay alert and attentive, [sleep is a requirement](#). Otherwise, you enter "an unstable state that fluctuates within seconds and that cannot be characterized as either fully awake or asleep," researchers said. In that state, your ability to pay attention is variable at best.

Tiredness makes it hard to speak normally

[Chris McGrath/Getty Images](#)

Severe sleep deprivation seems to [affect your ability to carry on a conversation](#)— much like having too much to drink.

"Volunteers kept awake for 36 hours showed a tendency to use word repetitions and clichés; they spoke monotonously, slowly, and indistinctly," [one study noted](#). "They were not able to properly express and verbalize their thoughts."

Like driving drunk, driving tired can lead to more car accidents

David McNew/Getty

Drowsy driving is often compared to drunk driving: You really shouldn't do either.

"Motor vehicle accidents related to fatigue, drowsy driving, and falling asleep at the wheel are particularly common, but often underestimated," [one review concluded](#).

Pilots, truck drivers, medical residents, and others required to stay awake for long periods "show an increased risk of crashes or near misses due to sleep deprivation," it said.

Tiredness is connected to urine overproduction

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When people sleep, the body slows down its normal urine production. But when someone is sleep-deprived, that doesn't happen, [leading to what researchers call](#) "excess nocturnal urine production."

This condition may be [linked to bed-wetting in children](#). In adults, it's tied to what's called nocturia, the need to use the bathroom many times during the night.

You need sleep for muscles to get stronger — without it, muscle atrophy occurs

Andrew Burton/Reuters

Lack of sleep causes hormonal changes that [make it harder for your body to build muscle](#) and heal. This makes it more difficult to recover from muscle damage caused by exercise, and it worsens conditions related to muscle atrophy.

Other research has found that the reverse is also true — that during sleep, your [body releases growth hormone and heals damage](#). That's why fitness advocates will always point out that sleep is an essential part of getting in shape.

Sleepiness makes pain harder to cope with

Dean Drobot/Shutterstock

People in pain — especially those who have chronic pain — tend to not get enough sleep. This makes sense, since pain can wake you up in the night and make it hard to fall asleep in the first place. But recently, researchers have begun to suspect that sleep deprivation [may actually cause pain](#) or at least [increase people's sensitivity to pain](#).

Tiredness leads to gastrointestinal issues

Adam Berry /Getty Images

Regular sleep loss [makes you more likely to develop](#) both inflammatory bowel disease and irritable bowel syndrome, which affects an estimated 10-15% of people in North America. Patients with Crohn's disease have been found to be twice as likely to experience a relapse when they don't get enough sleep.

Sleepiness is associated with headaches

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Scientists don't yet know exactly why sleep deprivation leads to headaches, but it's a connection doctors have [noticed for more than a century](#). Migraines can be triggered by sleepless nights, and one study found that [36-58% of people with sleep apnea reported waking up with "nondescript morning headaches."](#)

Disrupted sleep cycles lead to more inflammation, which could worsen asthma, arthritis, and cardiovascular disease

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Our sleep cycle or body clock doesn't just determine when we're tired or awake — it also affects the function of every cell in our body. Researchers have [started to figure out how disruptions in sleep schedules](#) prevent cells from fighting inflammation, which could explain why tired people often have many problems from inflammatory conditions, including asthma, arthritis, multiple sclerosis, and cardiovascular disease.

If snoring or sleep apnea is causing sleep disruption, it could lead to serious health problems

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Snoring can be an [indication that you are dealing with sleep apnea](#), a [sleep disorder that can cause other medical problems](#) over time. It's caused by decreased airflow, which can strain the heart and cause cardiovascular problems. The condition is also linked to weight gain.

Poor sleep disrupts genetic activity, which may explain some of the health risks of getting too little rest

Dragan Radovanovic/Business Insider

A [2013 study shed some light](#) on why sleep is tied to so many different aspects of our health and wellness: Poor sleep actually disrupts normal genetic activity.

Researchers found that among study participants who slept less than six hours a night for a week, more than 700 of their genes were not behaving normally, including some that help govern immune and stress responses.

Some genes that typically cycle according to a daily (circadian) pattern stopped doing so, while others that don't normally follow a daily pattern began to do that.

What does this mean? Just one week of less-than-ideal sleep is enough to make some of your genetic activity go haywire.

At any given time, people who haven't gotten the right amount of sleep are more likely to die

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Many [health problems](#) are associated with sleep deprivation and poor sleep, but here's the big one: People who consistently do not get seven or eight hours of sleep a night are more likely to die during a given period.

Put more simply: We all die eventually, but [sleeping too little](#)— or [even too much](#)— is associated with a higher risk of dying sooner than you might otherwise.

Lauren Friedman wrote an earlier version of this story.

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