# Everything you need to know about sleep, but are too tired to ask

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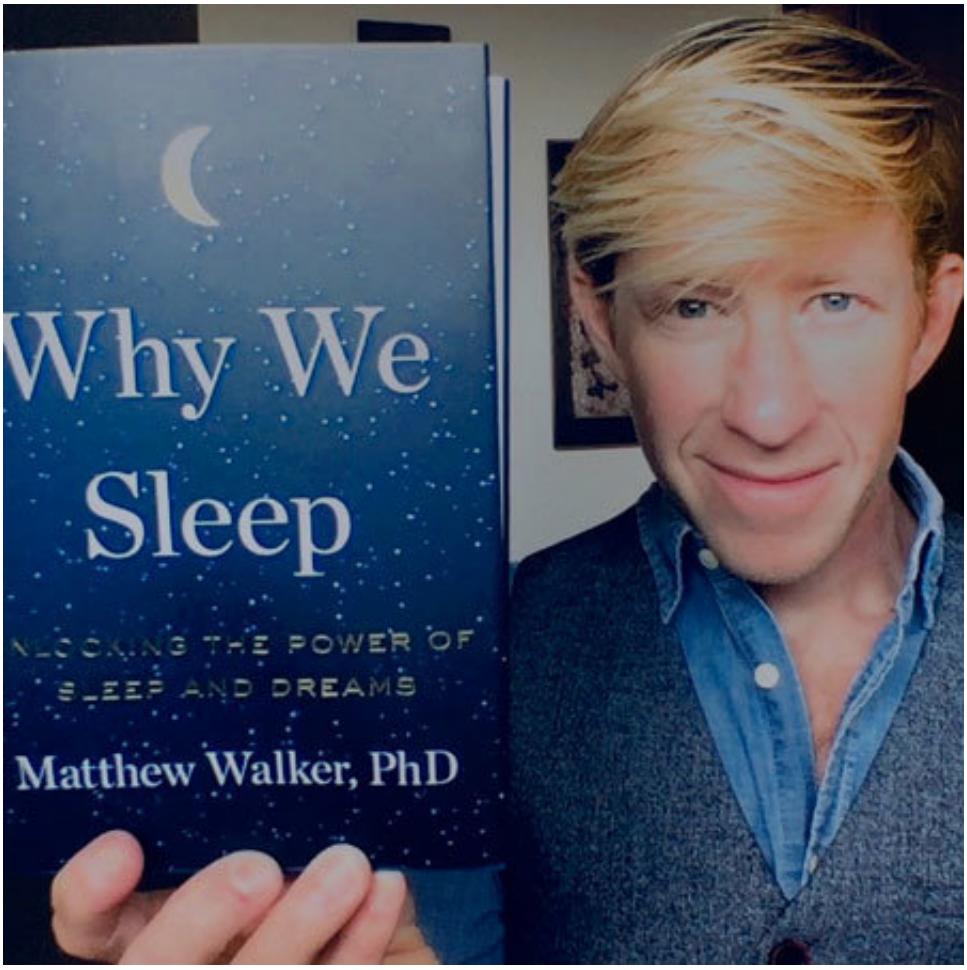


UC Berkeley neuroscientist Matthew Walker and his new book, Why We Sleep. Credit: Matthew Walker

Ask neuroscientist Matthew Walker, author of the new book, Why We

Sleep, about the downside of pulling an all-nighter, and he'll rattle off a list of ill effects that range from memory loss and a compromised immune system to junk food cravings and wild mood swings.

There was that time, for instance, when two straitlaced football players stayed up all night in his campus lab for a memory experiment. By morning, the two were grinning maniacally with lipstick and mascara smeared across their faces. Their makeup had been slapped on by two similarly sleep-deprived female students.

"It was a striking demonstration of the emotional and personality impact of insufficient sleep," marvels Walker, a UC Berkeley professor of neuroscience and psychology and leading sleep evangelist.

Walker, 43, a native of Liverpool, U.K., is dead serious about the dangers of sleep deprivation—now more than ever, perhaps, as bedrooms everywhere glow from the screens of round-the-clock technology consumption.

"The silent sleep loss epidemic is one of the greatest public health challenges we face in the 21st century," says Walker, who has served as a sleep consultant to the NBA, NFL and Pixar Animation Studios, among other Fortune 500 enterprises.

## A sleep evangelist

In *Why We Sleep: Unlocking the Power of Sleep and Dreams*, published by Scribner and released earlier this month, Walker guides readers through decades of sleep research. He describes how the overtired brain and body make us vulnerable to cancer, Alzheimer's, depression, anxiety, obesity, stroke, chronic pain, diabetes and heart attacks, among other medical conditions.

The book also explains the power of circadian rhythms, the therapeutic importance of Rapid Eye Movement (REM) dream sleep, and how alcohol, caffeine, pharmaceutical stimulants and sedatives disrupt sleep cycles and degrade the quality of brain waves that promote the rich slumber that wards off illness.

Cumulatively, he argues, the cognitive, emotional and physiological stresses of too few hours of sleep take a toll on such frontline personnel as military fighters, first responders, commercial airline pilots and long-haul truck drivers, leading to vehicular accidents, botched surgeries and fatalities, and, in the case of exhausted parents, child neglect and abuse.

" 'I just snapped and '… those words are often part of an unfolding tragedy as a soldier irrationally responds to a provocative civilian, a physician to an entitled patient or a parent to a misbehaving child," Walker writes. "All of these situations are ones in which inappropriate anger and hostility are dealt out by tired, sleep-deprived individuals."

Using functional Magnetic Resonance Imaging (fMRI) to measure neural blood-flow activity, as well as electroencephalogram (EEG) tests to monitor neural electrical activity, Walker and his research team have peered into the brains of adults of all ages to test memory and learning, decision-making, emotional processing and reactivity, stress and evidence of proteins believed to trigger Alzheimer's disease.

Their discoveries have been published in numerous peer-reviewed journals, and made headlines, contributing to a growing body of scientific evidence showing that a solid seven to nine hours of sleep a night serves functions beyond our wildest imaginations.

## Animals more sleep-smart than humans

Of all the creatures in the animal kingdom, the book argues, humans are

the only ones to "deliberately deprive themselves of sleep for no sound reason," Walker says.

Lions and tigers typically snooze 15 hours a day while brown bats sleep for a whole 19 hours. Dolphins, Walker says, "can even sleep with half a brain," meaning that one hemisphere of the brain remains awake at all times while the other falls, off and on, into a deep slumber.

If, as research shows, sleep functions like a fountain of youth, why aren't humans getting more of it? Walker asks.

"There does not seem to be one major organ within the body, or process within the brain, that isn't optimally enhanced by sleep (and detrimentally impaired when we don't get enough). That we receive such a bounty of health benefits each night should not be surprising," Walker writes.

A whiz kid of sorts, Walker entered Queen's Medical School in the U.K. at 18, but quickly discovered that brain science appealed to him more than the prospect of becoming a medical doctor. As a Ph.D. student in neurophysiology, he noted an unusual pattern of brain waves during sleep in older patients with dementia.

"I wanted to know if sleep carried within it a distress call, a warning beacon that spoke out which type of dementia a patient was in the early stages of," he says. "If I could find that disease clue in the electrical brainwaves of sleep, I could begin diagnosing these patients years or even decades in advance."

## A sequel in the works

That mission took him to Harvard Medical School as professor of psychiatry, and then, in 2007, to UC Berkeley, where he continues his

work today as a professor of neuroscience and psychology and serves as director of the Center for Human Sleep Science.

Keenly aware of how sleep consolidates fact-based learning and memories, Walker is flattered when students snooze during his lectures.

As for his own sleep profile, Walker is dedicated to getting his nightly eight hours despite a busy work and public speaking schedule that involves occasional travel and jetlag.

Meanwhile, he has no plans whatsoever to veer from his mission to make more discoveries about the panacea that is sleep, including a sequel to Why We Sleep.

"I am in love with finding any and all methods for reuniting humanity with the sleep it so desperately needs," Walker says. "Ever and always I will be a sleep researcher."

## Walker's tips for improving your sleep

- Go to bed and wake up at the same time every day, even after a bad night's sleep or on the weekend.
- Keep your bedroom temperature cool; about 65 degrees Fahrenheit is optimal for cooling your body towards sleep. Wear socks if your feet are cold.
- An hour before bedtime, dim the lights and turn off all screens. Blackout curtains are helpful.
- If you can't sleep, get out of bed and do something quiet and relaxing until the urge to sleep returns. Then go back to bed.
- Avoid caffeine after 1 p.m. and never go to bed tipsy. Alcohol is a sedative and sedation is not sleep. It also blocks your REM dream sleep, an important part of the sleep cycle.