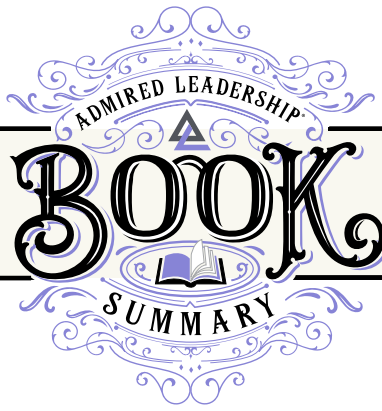




Eight Minutes, Not Eight Hours



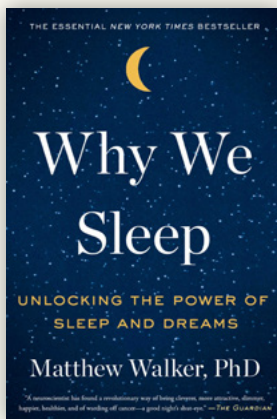
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Why We Sleep

Unlocking the Power of Sleep and Dreams

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After 20 years of sleep research, Matthew Walker illuminates the findings from hundreds of scientific studies, performed by him as well as colleagues around the world, in order to shed light on the importance of sleep. Walker answers some of the most imperative yet often unasked questions regarding why we sleep, how we sleep, why we dream, and the unruly consequences of sleep deprivation on our society and health.

He explains why sleep habits have changed and how a lack of sleep is the single leading determinant of poorer physical, psychological, and physiological health. Walker guides the reader through the biological mechanisms of how sleep happens and the scientific evidence behind how sleep facilitates our ability to learn and memorize, fosters creativity, restores our emotions, regulates our appetite, and replenishes our immune system. All of which aid in preventing diseases, slowing the effects of aging, boosting our productivity levels, and enhancing the lifespan of our children. If there is one lesson to learn from all 20 years of sleep research it is this: quit restricting sleep and give yourself a full seven to eight hours of quality sleep each night.

KEY QUOTE

“We sleep for a rich litany of functions, plural — an abundant constellation of nighttime benefits that service both our brains and our bodies.” — Matthew Walker

Key Concepts

Chapter 1: To Sleep. Sleep is necessary for life. No species has been studied which does not sleep. Sleep is “the single most effective thing we can do to reset our brain and body health each day” (p. 8).

Chapter 2: Caffeine, Jet Lag, and Melatonin. Humans have a rhythm for waking and sleeping hardwired within, which is usually slightly longer than 24 hours. Jet lag harms your biological rhythm. Melatonin doesn't generate sleep through the night, but it tells the body sleep should begin. Caffeine suppresses the need to sleep but leads to crashes.

Chapter 3: Defining and Generating Sleep. Sleep helps the brain with memory storage, and the brain cycles between REM sleep (dreaming) and NREM sleep (memory saving function of sleep) with NREM sleep dominating the beginning of the night and REM dominating the morning hours. Getting to bed too late shortchanges your much-needed REM sleep periods, which get cut short when your alarm goes off. Species vary widely in the amount of sleep needed and the way they sleep.

Chapter 4: Ape Beds, Dinosaurs, and Napping With Half a Brain. The way humans sleep has helped them societally and cognitively. All species sleep, but across species, sleep varies by amount, by composition (some species do not appear to have REM sleep), by the way in which we do it (in some species, only one hemisphere of the brain sleeps at a time), and the ways we can do without sleep. People in industrialized countries don't get enough sleep and would benefit from more sleep at night and also a 30 to 40-minute nap during the afternoon.


Chapter 5: Changes in Sleep Across the Lifespan.

A human infant in utero spends most of its time sleeping. REM sleep is vital for producing brain maturation and gestational development. Children sleep in a polyphasic way with multiple sleepings and wakings. Adolescent circadian rhythms run later in the morning than adult rhythms, but as adolescents age into middle and young adulthood, their circadian rhythm will "slide back in time" to match adults. Finding a good amount and quality of sleep in middle and old age becomes an increasing challenge, as circadian rhythms change and melatonin production changes and decreases.


Chapter 6: Your Mother and Shakespeare Knew. Sleep restores the brain, prepares it for learning, helps the memory of both knowledge of routines and skills (e.g. riding a bike), and clears out unhelpful memories.

Chapter 7: Too Extreme for the Guinness Book of World Records. Sleep loss has devastating effects on the brain and is linked to "numerous neurological and psychological conditions (e.g. Alzheimer's disease, anxiety, depression, bipolar disorder, suicide, stroke, and chronic pain)" (p. 133).

Chapter 8: Cancer, Heart Attacks, and a Shorter Life. The less you sleep, the more likely you are to have cardiovascular issues and have a depressed immunity system with fewer antibodies. Men are likely to have lower testosterone and women are likely to have sub-fertility. Lack of sleep increases the risk for things like Alzheimer's, cancer, and depression, and damage to genetic structures around your DNA.



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Chapter 9: Routinely Psychotic. Dreams are “flagrantly psychotic.” Dreams are not a “wholesale replay of our working lives,” but they do connect to the emotions we feel in our working lives (p. 204).

Chapter 10: Dreaming as Overnight Therapy. Dreams help us “nurture our emotional and mental health” (p. 207).

Chapter 11: Dream Creativity and Dream Control. Numerous studies over the years show that dreams help with problem-solving and creativity. People who have REM sleep after being mentally fed the “pieces” of a problem are better equipped to find novel connections and solutions in waking hours.

Chapter 12: Things That Go Bump in the Night.

The science of sleeping disorders, with over 100 of these known, teaches us more about the mysteries of sleeping and dreaming.

Chapter 13: iPads, Factory Whistles, and Nightcaps.

Factors that have negatively influenced our sleep amount and quality include “1) constant electric light as well as LED light, 2) regularized temperature, 3) caffeine, 4) alcohol, and 5) a legacy of punching time cards” (p. 265).

Chapter 14: Hurting and Helping Your Sleep.

Sleeping medications produce sleep that lacks deep brainwave activity, establish vicious cycles due to grogginess symptoms, and produce rebound insomnia and other bad effects while only bringing slight improvements. Cognitive Behavioral Therapy and establishing good sleep habits can better help improve sleep duration and quality.

Chapter 15: Sleep and Society. Insufficient sleep is negatively impacting society, including the workplace, education, and health care.


Chapter 16: A New Vision for Sleep in the Twenty-First Century. The problem of deficient sleep is persisting in our world, and we need a model to bring about broad change, from the individual level up to the broad societal level.

THE ANATOMY OF SLEEP


Circadian Rhythm: This is the internal, twenty-four-hour clock located deep within everyone's brain. It varies from person to person with his or her rhythm, resulting in morning and evening people. An individual's circadian rhythms latch on to repeating external signals, such as daylight, to establish a 24-hour cycle (p. 13-22).

Adenosine: The chemical adenosine gradually builds up throughout the day creating a “sleep pressure” resulting in you feeling sleepy after about twelve to sixteen hours of being awake (p. 27).

Types of Sleep: Happening in the first half of the night, Non-Rapid Eye Movement (NREM) sleep stores and strengthens new facts and skills acquired from the day and weeds out unnecessary neural connections. During the second half of the night, Rapid Eye Movement (REM) sleep or dream sleep connects these new facts and skills with each other and with past experiences to build innovative insights and problem-solving abilities, contributing to a more accurate model of how the world works (p. 53).



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Life Span of Sleep: Blocking or reducing REM sleep in a fetus or newborn hinders and distorts brain development, leading to an adult that is socially abnormal. Deep NREM sleep happens the most in adolescence when brain maturation is prominent. Rationality is one of the last things to form in teens because it is the last brain territory to receive sleep maturational treatment. As we age, we see reduced quantity and quality of sleep, reduced sleep efficiency from waking up more throughout the night, and disrupted the timing of sleep due to a regression of sleep time (p. 85-104).

How We Should Sleep: All humans regardless of culture or geographic location have a genetically hardwired dip in alertness that occurs in the mid-afternoon hours. Therefore, we should be having a biphasic sleep pattern consisting of one longer bout of continuous sleep at night followed by a shorter afternoon nap (p. 69).

WHY YOU SHOULD SLEEP

Memory & Learning: Sleep studies have proven that sleep is a memory aid both before learning, to prepare your brain for making new memories, and after learning, to strengthen those memories and prevent forgetting (p. 108-113). A lack of sleep deteriorates the memory-making region in your brain, preventing the construction of lasting memory traces (p. 155).

Concentration: Under even the smallest dose of sleep deprivation, our ability to concentrate drastically deteriorates. Specifically, after sixteen hours of being awake, the brain begins to fail (p. 140).


Emotional Stability & Mental Health:

Analysis of brain scans indicates that insufficient sleep makes the brain swing excessively to both emotional extremes. Hypersensitivity of pleasurable experiences can lead to risk-taking and addiction, and extremely negative emotions can lead to depression and suicidal thoughts/actions (p. 146-149). Various studies on Alzheimer's disease and sleep suggest that getting too little sleep across the adult life span will significantly raise the risk of developing the disease due to a build-up of amyloid plaque found on active sleep regions in the brain (p. 162).

Physiological Health: Deep NREM sleep calms the sympathetic branch of the nervous system preventing escalation in blood pressure, reducing the risk of a heart attack or heart failure. One night of modest sleep reduction will promptly increase the rate of a person's heart rate, significantly increasing the systolic blood pressure, thus increasing the risk of developing cardiovascular disease (p.165-169). Further, poor sleep quality has been found to increase the risk of cancer development and, if cancer is already present, fertilize its rapid and more rampant growth (p. 186).

Physical Health: Inadequate sleep decreased concentrations of the "feeling-full" hormone, leptin, and increased levels of the hunger-instigating hormone, ghrelin. Therefore, the less you sleep, the more you are likely to eat, to gain weight, and to develop type 2 diabetes (p. 170).

Dreams as Therapy: REM sleep or dream sleep fosters our emotional and mental health by (1) allowing us to remember the details of valuable experiences and integrating them with existing knowledge and (2) by forgetting the painful emotional charge that had previously been associated with those memories due to the anxiety-reducing benefits of REM sleep (p. 206-211).



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Dream to Decode: REM sleep recalibrates the essential brain regions that are used to decode the value and meaning of emotional signals that are used to communicate the emotional state and intent of an individual, such as facial expressions. MRI studies reveal that sleep deprivation leads to inaccurately decoding facial expressions and believing that gentle or somewhat friendly-looking faces are threatening (p. 215-216). Therefore, detecting inexplicit communication signals deteriorates with a lack of sleep, which could decrease interpersonal social bonding.

Dream Creativity: REM sleep fuses and blends new information with past experiences in an abstract, novel way, inspiring creativity and promoting problem-solving. Virtual reality studies revealed that the content of one's dreams – more so than just dreaming – determines problem-solving success. REM sleep takes what was learned in one experience setting and seeks to apply it to other settings which have been stored in memory, providing insight into new ways of problem-solving (p. 219-231).


DETERMINANTS OF SLEEP

Societal Changes: Constant electric light, as well as LED light, regularized temperature, caffeine, alcohol, and alarm clocks, have all powerfully changed how much and how well we sleep. iPad usage before bed resulted in individuals losing significant amounts of REM sleep. Alcohol fragments sleep by cluttering the night with brief awakenings and suppresses REM sleep. When we sleep, body temperature decreases; however, most households are too warm, resulting in the body's inability to cool down at night. School and work require forced awakenings, causing a spike in blood pressure from alarm clocks (p. 265-281).


Sleeping Pills: There has been a significant rise in the use of sleeping pills; however, scientific data on sleeping pills suggests that they do not significantly reduce the time to fall asleep. Further, sleeping pills target the same areas of the brain as alcohol does, weakening brain cell connections. In doing so, sleeping pills are essentially a memory eraser (p. 284).

Sleep and Education: Research suggests that increasing sleep by delaying school start times increases class attendance, reduces behavioral and psychological problems, and decreases substance and alcohol use. Therefore, Walker suggests schools should run from 9 am to 4 pm to foster childhood education (p. 311-312).

Sleep in the Workplace: Insufficient sleep is commonly tolerated and even sometimes encouraged in part because business leaders mistakenly believe that more time on a task results in greater task completion and production. However, research disproves this assumption. Shorter sleep predicts a lower work rate and slower completion speed. Insufficient sleep costs four large US companies almost \$2,000 per employee per year in lost productivity. As evidenced by numerous studies, sleep-deprived workers are less productive, less motivated, less creative, less happy, lazier, and are more unethical (p. 296-301). "Sound sleep is clearly sound business" (p. 304).



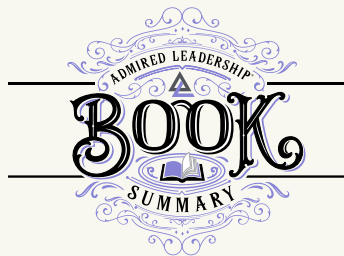
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Leaders: Differences in individual leadership performance fluctuate from one day to the next and performance is determined by the amount of sleep leaders receive. The lower the quality of sleep that supervisors reported getting from one night to the next predicted poor self-control and a more abusive nature towards employees. Interestingly, the effects of a lack of sleep in a supervisor can be transmitted down to employees, resulting in employee work disengagement and reduced productivity (p. 302).

Organizational Change: Organizations and leaders should allow and encourage employees, supervisors, and executives to arrive at work well-rested. Walker suggests a “sleep credit system” where sleep time is exchanged for either financial bonuses or extra vacation days. Sleep time should be calculated on the amount of sleep received each night, as well as sleep continuity. Further, businesses should adapt a more tapered vision of working hours. This would allow “morning lark” circadian rhythm people to come in early and leave early and “night owl” circadian rhythm people to arrive later and stay later (p. 333-334).

Walker, M. (2017). **Why We Sleep.** Unlocking the Power of Sleep and Dreams. New York, NY: Simon & Schuster.



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The Latest and Greatest Books for Leaders

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After reading a good summary, we believe leaders are able to make better choices as to what to ignore, what to peruse and what to make the time to read closely.