

IN THIS CHAPTER

- » Uncovering the states and stages of sleep
- » Seeing how sleep needs shift and change over your lifetime
- » Digging into how sleep impacts all body systems
- » Seeking help for your sleep problems

Chapter **1**

Exploring Sleep's Fundamental Nature

Every night, billions of people close their eyes, surrendering to a state that has puzzled and fascinated scientists, philosophers, and poets alike for centuries: sleep. For something so universal, sleep remains one of the most complex and poorly understood processes of the human body. Sleep is not just a nightly shutdown; it involves a complex dance of chemical messengers from the brain that interact with biological rhythms. Sleep is a vital activity that underpins all bodily processes — from memory to immunity.

This book unravels the questions of sleep by diving into its science, challenges, and solutions. As someone who has dedicated decades to studying this field, I've witnessed firsthand the profound impacts of both healthy and disordered sleep. Whether you examine the devastating consequences of chronic sleep deprivation or the life-changing effects of a good night's rest, one aspect is clear: Sleep matters. It matters for your health, your productivity, and your happiness.

Sleep's role in people's lives is more crucial now than ever. Modern life — with its constant barrage of screens, deadlines, and stress — has turned sleep into an elusive commodity. For many people, getting the recommended seven to nine hours of sleep feels like a distant dream that's been replaced by exhaustion and caffeine-fueled mornings.

In this chapter, I walk you through the fundamentals of sleep — what it is, why it's essential, and how it changes throughout our lives. I also touch on the fascinating world of sleep science, disorders, and optimization. This chapter helps you see sleep not as a passive downtime, but as a powerful tool for transformation.

Understanding the Composition of Sleep

Sleep may feel like a single continuous experience, but beneath the surface, sleep harbors an intricate symphony of biological activity. From the gentle transitions of light sleep to the vivid dreams of REM sleep, every stage plays a unique role in restoring your body and mind.

Stages and states of sleep

When you fall asleep, your brain doesn't simply turn off. Instead, it moves through two distinct states: Non-Rapid Eye Movement (NREM) sleep and Rapid Eye Movement (REM) sleep.

NREM sleep forms the foundation of restorative sleep and dominates most of the sleep cycle. It consists of three stages that serve unique purposes and repeat in cycles throughout the night:

- » **Stage N1:** This is the gateway to sleep — a light, transitional stage marked by slower brain waves (like theta waves at 5–7 Hz versus alpha waves at 8–12 Hz, which dominate the wake state). Your muscles relax and eye movements slow down. People often don't realize they're asleep during this stage.
- » **Stage N2:** Often called *intermediate sleep*, this stage makes up 40 to 55 percent of your nightly rest. It features hallmark brain wave patterns — including sleep spindles and K-complexes — which help consolidate memories and suppress external stimuli.
- » **Stage N3:** Also known as *slow-wave sleep* or *deep sleep*, this stage is essential for physical recovery. During the N3 stage, your body repairs tissues, clears brain toxins, and strengthens the immune system.

Turn to Chapter 2 for more information about each stage of NREM sleep.

After NREM, you enter the state of REM sleep, which occurs about 90 minutes after you fall asleep and recurs multiple times throughout the night. Each period of REM sleep grows longer. During REM, your brain activity mimics wakefulness,

but your body remains in a state of temporary paralysis. During this sleep stage, the majority of your dreams occur, and experiencing it is critical for emotional regulation and memory consolidation.



REMEMBER

Sleep specialists often refer to REM sleep as a *state* rather than a *stage* of sleep because it is so different from NREM stages of sleep.

Altogether, the states and stages of sleep form a roughly 90-minute cycle that repeats four to six times during an average night. Each cycle shifts in composition as the night progresses, with deep sleep (N3) dominating earlier cycles and REM sleep taking over later on. Visit Chapter 2 to read more about sleep stages and states.

While sleep stages are universal, the way people cycle through them can vary. For example,

- » **Genetics** may play a role in determining your natural sleep tendencies, including whether you're a morning lark or a night owl. See Chapters 7 and 8 for additional information on the role of genetics in sleep disorders.
- » **Lifestyle factors**, such as exercise, diet, and stress levels, also influence how easily your body transitions through sleep stages. A sedentary lifestyle may contribute to lighter, more fragmented sleep, and consistent physical activity promotes deeper slow-wave sleep. See Chapter 6 for information about how your lifestyle and habits affect your sleep.
- » **Aging** causes the way your body navigates through sleep stages to change naturally. Newborns need more sleep (of varying stages) than do older humans, who spend less time in deep sleep and more time in the lighter stages.
- » **External factors**, such as medications, stress situations, sleep disorders, or the makeup of your sleep environment all have an effect on the quality and quantity of your sleep.



REMEMBER

Sleep specialists and researchers don't really know which sleep states and stages are most critical to overall health. But from certain studies on animals and humans, they know that deeper stages of sleep and REM sleep are particularly important, and that sleep deprivation for lighter stages of sleep does not have as substantial an effect.

And although sleep specialists can identify the stages and states of sleep, they don't know why people sleep. But I do cover a few prevailing theories about the reason for sleep in Chapter 2.

Sleep components and characteristics

During sleep, your conscious mind takes a break, but your body and brain perform critical maintenance that supports your health and well-being. Sleep is marked by distinct neurophysiological and physical changes, all of which help restore your energy and optimize your body's functions. I cover these aspects of sleep in detail in Chapter 4, but here's a quick glance at them:

- » **Circadian system:** Your sleep-wake cycle is largely controlled by your sleep drive and by your circadian sleep-wake rhythm, which follows a roughly 24-hour cycle. One of the strongest influences on this rhythm is light. Exposure to light in the morning can allow you to wake up earlier, and evening light can delay the onset of sleep.
 - » **Dreams:** Most dreaming occurs during REM sleep, when the brain is highly active, particularly in the limbic system, which governs emotions. Dreams play a role in emotional processing, learning, and even simulating waking-life scenarios. Dreams also reflect the activity in regions of the brain associated with vision and emotion, which can make dreams richly sensory and often emotionally intense. Interestingly, dream recall happens primarily when you briefly wake during or after REM sleep, which is a natural part of nightly cycles. Flip to Chapter 5 for a breakdown of theories on dreaming.
 - » **Effects on body systems:** During the transition from wakefulness to light sleep, your breathing changes as it switches from conscious control to an autonomic mechanism, and during REM sleep, your breathing becomes shallower and irregular. Similarly, other body systems react, including
 - *Your heart rate and blood pressure* can fluctuate during REM sleep.
 - *Your digestive system* undergoes a change, with gastric acid secretion peaking in the early morning hours, and during REM sleep, your digestion is generally more active.
 - *Growth hormone secretion* surges during deep NREM sleep, promoting repair and growth of tissues.
 - *Body temperature* varies during sleep, and during REM sleep, your body can't regulate temperature as efficiently, leading to unpredictable swings in temperature.
- Head to Chapter 3 for all of the ways sleep impacts your body.
- » **Differences due to sex:** Women tend to sleep longer than men, and differences in EEG activity between women and men occur during the sleep stages. Additionally, sleep disturbances are common during pregnancy, postpartum, and menopause. Turn to Chapter 6 to discover more differences in sleep between men and women.

- » **Neurotransmitters:** These chemical messengers play a role in regulating NREM and REM sleep. For example, GABA (gamma-aminobutyric acid) is an inhibitory neurotransmitter that slows down brain activity and helps induce sleep, and orexin (hypocretin) stabilizes wakefulness and prevents transitions to sleep.
- » **Racial and ethnic differences:** Racial minorities are more likely to experience sleep disruptions and shorter sleep durations, and cultural practices vary among ethnic groups with respect to co-sleeping and napping. Turn to Chapter 6 for more details on how sleep differs across race and ethnicity.
- » **Wake-sleep and sleep-stage regulation:** A group of nuclei in the brainstem plays a major role in the promotion of sleep and wakefulness, and also in alternating NREM and REM sleep. If the balance of the neurotransmitters in the brainstem is off, you can experience disorders of excessive sleep (such as narcolepsy) or too little sleep (such as insomnia).

Changes in sleep, movement, and behavior during the night

Your body undergoes a dynamic array of changes as it transitions between sleep stages and cycles. These changes in heart rate, brain activity, and even physical movements are critical to your body's restorative processes:

- » **Body movements:** While you may shift positions or adjust your blanket during lighter stages of sleep (like N1 and N2), your body becomes more relaxed as you transition into deeper stages. This relaxation conserves energy and promotes recovery. On the other hand, disorders such as restless legs syndrome (RLS) or REM sleep behavior disorder (RBD) disrupt this stillness and can lead to excessive or even dangerous movements during the night. To learn more about these conditions, explore the detailed discussion in Chapter 8.
- » **Brain activity and dreaming:** Your brain stays busy while you sleep. Deep sleep (N3) is a time for synchronized delta waves, which help your brain strengthen memories and recover from the day's demands. As the night progresses and REM sleep takes over, dreaming is more likely to occur, and activity ramps up in brain areas tied to emotions and creativity. If you're curious about the fascinating science behind dreams, check out Chapter 5.
- » **Heart rate and breathing:** Your cardiovascular and respiratory systems respond to the demands of each sleep stage. In deep sleep (N3), your heart rate and breathing slow and become regular (when compared to the wake state), creating the perfect conditions for physical repair. Chapter 4 sheds light on how these systems function together and how sleep disruptions can impact your health.

» **Hormonal shifts:** Hormones work behind the scenes to keep your body in balance while you sleep. Growth hormone peaks during deep sleep, repairing tissues and supporting muscle recovery, while cortisol — your primary stress hormone — dips to its lowest levels early in the night. This delicate hormonal choreography prepares you for both physical restoration and the challenges of the next day. Flip to Chapter 4 for an in-depth look at how sleep influences your hormonal health.

» **Temperature regulation:** Sleep also impacts how your body handles its internal temperature. During NREM sleep, your core temperature naturally drops, which helps you stay comfortable and enter deeper stages of rest. During REM sleep, however, your body's temperature regulation turns off, leaving you more vulnerable to external factors like a hot or chilly room. A bedroom set to a cool 60–67 degrees F can help you maintain comfort throughout the night. For additional tips on creating the ultimate sleep sanctuary, turn to Chapter 3.



TIP

If you wake up frequently feeling overheated, try adjusting your room's temperature or swapping out heavy blankets for breathable, lightweight options. Small changes to your environment can make a big difference.

These nightly changes are part of the body's intricate design to promote health and restoration, but disruptions may throw these processes off balance, leaving you feeling groggy and unfocused the next day. Chapter 3 offers tips for managing environmental factors to create an optimal sleep setting. Also, Chapter 6 gives you the scoop on how lifestyle choices such as diet, stress management, and alcohol use affect your sleep quality.



REMEMBER

If you experience repeated disruptions to sleep cycles — whether because of lifestyle factors or medical conditions — you may see long-term impacts on your physical and mental health. If you experience persistent sleep difficulties, consult a healthcare professional for personalized advice and solutions. In Chapter 9, you can find out about seeking help for sleep issues, and Chapters 10 and 11 give you a look at how technology — in a sleep clinic or at home — can help with diagnosis and treatment of sleep problems.

Discovering Sleep as a Lifelong Activity

How people sleep — and how much sleep they need — changes dramatically as they grow and age. These shifts are not random; they reflect the evolving demands of our bodies and brains during different life stages. Understanding these changes can help you adjust your routines and expectations, ensuring that you get the best possible sleep at every age.

Sleep begins to shape human lives from the moment of birth, playing a vital role in growth, development, and overall well-being. In this section, you get a glimpse of how sleep evolves across the human lifespan, and what you can do to nurture sleep for yourself and other family members. For more information about sleep at various life stages, check out Chapter 6.

For babies and children

Few things are more associated with early life than the image of a peacefully sleeping baby. Sleep during infancy is critical for brain development because, while babies sleep, their brains form millions of new neural connections and begin to consolidate early experiences. Newborns need between 16 and 18 hours of sleep per day, but their sleep occurs in short bursts of two to four hours throughout the day and night due to their immature circadian rhythms.

By six months of age, most babies can sleep for longer stretches at night, with naps during the day becoming more structured. Preschoolers and school-aged children need around 9–12 hours of sleep nightly to support growth, memory, and emotional regulation. However, external factors like busy schedules, screen time, and environmental distractions often interfere. To foster healthy sleep habits:

- » **Create comfort.** Ensure your child's bedroom has a cozy, quiet environment with the right temperature and supportive bedding.
- » **Encourage consistency.** Set a regular bedtime and wake-up time to establish a routine.
- » **Limit screen time.** Avoid electronic devices at least an hour before bed, because mental activity is not conducive to sleep, and the blue light can interfere with melatonin production.
- » **Set a bedtime routine.** Calming activities like reading, bathing, or listening to soft music help signal that it's time for sleep.



WARNING

Children who don't get enough sleep often show symptoms like irritability, hyperactivity, or trouble concentrating. These behaviors can mimic ADHD, so it's crucial to rule out sleep deprivation as a contributing factor.

For adolescents

Teenagers face unique challenges related to sleeping. Biological changes during puberty delay the release of melatonin, the hormone that promotes sleep, which makes falling asleep early at night harder for teens to do. Although they still need eight to ten hours of sleep nightly, situations such as late-night screen use, social pressures, and early school start times often leave teenagers sleep-deprived.

The effects of sleep deprivation in teens are far-reaching and include difficulty focusing, mood swings, and even increased risk-taking behaviors. To help teens get better sleep, you can

- » **Advocate for a consistent schedule.** Encourage teens to maintain a regular bedtime and wake-up time, even on weekends.
- » **Encourage sleep-friendly environments.** Ensure their bedroom is cool, dark, and quiet.
- » **Establish screen boundaries.** Limit digital-device use at least an hour before bed.
- » **Promote a wind-down routine.** Help teens relax with calming activities like reading or journaling.



WARNING

Chronic sleep deprivation during adolescence can increase the risk of anxiety, depression, and even car accidents due to drowsy driving.

For adults

Life as an adult often feels like a juggling act. Between work, family, and personal responsibilities, sleep is often one of the first sacrifices. But adults need seven to nine hours of sleep per night to function optimally. Chronic sleep deprivation is linked to a host of health problems, including impaired memory, weight gain, and increased risk of heart disease. To claim better sleep, you can

- » **Establish boundaries with technology.** Avoid checking emails or scrolling social media close to bedtime.
- » **Invest in sleep-friendly spaces.** Optimize your bedroom with supportive bedding, blackout curtains, and a comfortable mattress.
- » **Make sleep a priority.** Treat rest as a nonnegotiable part of your health routine.
- » **Practice a bedtime routine.** Include activities like light stretching, meditation, or listening to calming music.



TIP

If you frequently wake up tired despite spending enough time in bed, you may need to adjust your sleep environment. See Chapter 15 for practical tips on optimizing your sleep space.

For older adults

As people age, sleep often becomes lighter and more fragmented. Seniors may find themselves waking more frequently during the night or needing naps during the day. These changes are partly due to shifts in circadian rhythms, as well as health conditions or medications that can interfere with rest. Despite these challenges, older adults still need seven to eight hours of sleep per night to maintain good health. To get better sleep in later life, try

- » **Addressing your health concerns.** Speak with a healthcare provider about conditions such as chronic pain or medications that may affect your sleep. Your provider can also help to identify serious sleep problems that might need a referral to a sleep specialist.
- » **Establishing a calming bedtime routine.** Gentle stretching, warm baths, or listening to soothing music can help signal your body to wind down.
- » **Staying active during the day.** Regular physical activity promotes deeper sleep at night.



WARNING

Many older adults believe poor sleep is just part of aging, but recognizing when an underlying issue might be at play is important. If left unaddressed, sleep problems can lead to an increased risk of falls, memory difficulties, and significant mood changes.

Focusing on Your Need for Sleep

Busy people in the modern world often dismiss sleep as a luxury in today's fast pace. But the need for sleep is as fundamental as the need for food or water. When you neglect healthy sleep, the effects ripple through every part of your life — your health, productivity, and even your safety. Understanding why sleep matters starts with recognizing its role in restoring your body and mind and distinguishing between related issues like sleepiness and fatigue.

Sleepiness versus fatigue

At first glance, sleepiness and fatigue might seem like the same thing, but they're distinct experiences with different causes. Sleepiness is your body's way of signaling that it needs rest, and it's often caused by insufficient sleep or disruptions in your sleep cycle. Sleepiness is the drowsy feeling you get when your eyelids feel heavy and your ability to focus diminishes.



REMEMBER

Individuals with sleepiness can't stay awake, especially in situations such as participating in a meeting or while reading. Fatigue, on the other hand, goes beyond the desire to sleep. It's a deeper, lingering exhaustion that can persist even after a full night's rest. Fatigue often stems from underlying medical conditions — chronic fatigue syndrome, for example — or lifestyle factors such as stress and poor nutrition. Addressing fatigue may require more than just improving your sleep; it often involves a holistic approach to health and well-being.

Distinguishing between sleepiness and fatigue is particularly important for managing your condition successfully, so always do your best to convey your symptoms accurately to your healthcare provider.



TIP

If you regularly feel tired despite sleeping enough, consider keeping a sleep log or sleep diary. (See Chapter 9 for details on keeping a sleep diary.) When you do, you can track your sleep patterns, energy levels, and lifestyle habits to identify potential triggers. Share anything that seems concerning with your doctor to see whether you may need a sleep study.

Sleepiness as an epidemic

Sleepiness has become a societal epidemic, fueled by modern habits and a culture that glorifies busyness. The rise of technology, with its endless stream of notifications and bright screens, has led to widespread sleep deprivation, according to several research studies, especially in young adults. Work schedules, commuting, and 24/7 connectivity have created a world in which many people simply don't get enough rest. The result? A population that is perpetually running on empty.



REMEMBER

Chronic sleepiness affects more than just individuals — it has a societal cost. Various research findings link sleep deprivation to increased rates of accidents, errors at work, and chronic illnesses such as heart disease and diabetes. In fact, drowsy driving contributes to thousands of traffic accidents each year — for example, approximately 91,000 annually according to in-depth crash investigations conducted for the National Highway Traffic Safety Administration (reported in the 2024 research brief “Drowsy Driving in Fatal Crashes, United States, 2017–2021”) by the American Automobile Association (AAA) Foundation for Traffic Safety at <https://aaafoundation.org>.

The National Transportation Safety Board (NTSB) has also reported an increase in traffic accidents associated with the shift in schedules for daylight savings time — both in the spring and fall — due to disturbed sleep patterns that lead to increased driver sleepiness.

Recognizing sleepiness as a public health issue is the first step toward addressing it. Employers, schools, and policymakers can play a role by promoting healthier work-life balance, encouraging flexible schedules, providing time and space for napping (especially for those diagnosed with narcolepsy), and educating the public about the importance of rest. (See Chapter 3 for more on how sleep impacts workplace performance and safety.)

Sleepiness in diverse occupations and environments

The consequences of sleepiness vary depending on your environment and work responsibilities, but certain professions are especially vulnerable. Healthcare workers, for example, often work long, irregular shifts, which makes them prone to burnout and errors. Professional drivers and transportation and safety workers face high stakes because even a momentary lapse in attention can result in tragedy. Creative professionals, meanwhile, may underestimate how critical rest is for sustaining innovative thinking and problem-solving skills.



REMEMBER

Regardless of your profession or setting, keep yourself and others safe by

- » **Optimizing your environment.** Ensure your workspace has good lighting, comfortable seating, and minimal distractions to support alertness.
- » **Prioritizing rest.** Build breaks and recovery periods into your schedule, especially during demanding work cycles.
- » **Recognizing limits.** Know when it's time to step away from tasks that require high concentration if you're feeling drowsy.

For those in high-risk professions such as healthcare or transportation and safety, advocate for institutional changes — such as reduced shift lengths or mandatory rest periods. These measures help create safer environments for everyone.

Knowing the Characteristics of Healthy Sleep

Healthy sleep isn't just about how long you sleep (the quantity), but it's also about the quality. Sleep that restores your body and mind has specific characteristics, and understanding these can help you assess whether you're truly getting both

the quantity and the quality of sleep you need. While everyone's sleep needs vary slightly, some universal markers of healthy sleep apply across all ages. Healthy sleep has three main components that together create the foundation for feeling refreshed and alert during the day:

- » **Continuity:** Having enough sleep is important, but so is having uninterrupted sleep. Healthy sleep should occur in one consolidated block, without frequent awakenings. Fragmented sleep — even if the total hours add up to a sufficient amount — reduces your time in restorative stages such as deep sleep and REM. (For more on sleep stages, you can refer to the section “Understanding the Composition of Sleep” earlier in the chapter and also to Chapter 2.)
- » **Depth:** The intensity of sleep, particularly during deep sleep (slow-wave sleep), is critical for physical recovery and memory consolidation. While you may not be able to measure sleep depth directly at home, you can assess it by how refreshed you feel upon waking. People who regularly experience shallow or disrupted sleep often wake up groggy, with lingering fatigue.
- » **Duration:** The National Sleep Foundation (at www.thensf.org) recommends seven to nine hours of sleep per night for adults, with slight variations depending on individual needs. Children and teens require more because their developing bodies and brains rely heavily on restorative rest. Sleeping consistently within your recommended range is one of the most important steps toward maintaining overall health.

The role of circadian rhythms

Healthy sleep is deeply tied to your *circadian rhythms* — the internal biologic clock that regulates your sleep-wake cycle. These rhythms are influenced by natural light and darkness, which signal your body to release sleep-promoting hormones like melatonin. Aligning your schedule with these rhythms can improve the quality of your life.

- » **Evening habits:** Dim the lights in your home as bedtime approaches, and avoid blue light from screens. These behaviors may impact melatonin signals to your body that it's time to wind down.
- » **Morning routines:** Expose yourself to natural light within the first hour of waking. This practice helps regulate your circadian rhythms and promotes alertness during the day.

For those who struggle with circadian misalignment — such as shift workers or frequent travelers (who cross time zones) — establishing consistent sleep

routines and using tools such as light therapy devices can help reset your internal clock. Flip to Chapter 8 for strategies tailored to circadian rhythm challenges.



TIP

Struggling to make changes? Start small. Focus on one aspect of your sleep, such as your bedtime routine, and gradually build from there. Consistency is more important than perfection.

Nutrition, exercise, and sleep

Getting good nutrition and regular exercise are essential for maintaining healthy sleep. Here are some general guidelines regarding eating and drinking:

- » **Eat foods rich in unsaturated fats and high in fiber** to help promote deeper, more restorative sleep.
- » **Avoid refined sugars, processed foods, and large amounts of carbohydrates**, which might leave you feeling groggy and less alert.
- » **Especially for children, start the day with a balanced breakfast** to improve not only sleep quality, but also motivation during morning routines.
- » **If you're a shift worker, steer clear of heavy meals during night shifts** to avoid disrupting your sleep later.
- » **Avoid alcohol and caffeine in the evening** to keep them from interfering with your ability to fall asleep or stay asleep.



TIP

Regular exercise can improve sleep quality and total sleep time (quantity). Sleep research shows that exercise can improve the symptoms and sleep quality in individuals who have sleep disorders such as insomnia, obstructive sleep apnea (OSA), restless legs syndrome (RLS), and periodic limb movements during sleep (PLMS). See Chapters 7 and 8 for more information about sleep disorders.

Recognizing Sleep Deprivation, Loss, and Disorders

Sleep deprivation is more than an occasional restless night — it's a state that affects your body, mind, and daily life. Whether caused by external factors, lifestyle habits, or underlying sleep disorders, the consequences of insufficient sleep can be profound. Recognizing the signs of sleep deprivation early is key to addressing the problem and restoring balance to your sleep-wake cycle.



REMEMBER

Avoid sleep debt — the accumulation of lost sleep over time — to prevent frequent *microsleeps*. These uncontrollable episodes of sleep can occur during the day and lead to life-threatening situations, especially when you're driving or operating hazardous machinery.

Types of sleep deprivation

Specific types of sleep deprivation can affect your sleep in various ways that curtail the amount of restful sleep you experience on a nightly basis.

- » **Acute sleep deprivation:** Not sleeping for one or more nights, either missing total or partial sleep during these nights. This may be caused, for example, by work deadlines, illness, or family situations.
- » **Chronic sleep loss and fragmentation:** Getting less sleep consistently over an extended timeframe either by a reduction in your total sleep time (voluntarily or involuntarily) or by fragmentation of your sleep.
- » **Partial and sleep-stage deprivation:** For partial sleep deprivation, your total sleep time is reduced so that you get less sleep than usual. In the case of sleep-stage deprivation, you may have a medical condition or be taking medications that reduce certain stages of sleep.

Chapter 3 guides you through recognizing and getting help for sleep deprivation.

Warning signs of sleep deprivation

Sleep deprivation can manifest in many ways, some more subtle than others:

- » **Cognitive impairments:** Difficulty concentrating, memory lapses, or slower decision-making. Sleep is essential for processing and retaining information, so even one night of poor rest can leave you feeling foggy.
- » **Emotional changes:** Increased irritability, anxiety, or mood swings. Without enough REM sleep, your brain struggles to regulate emotions effectively, and may result in or exacerbate anxiety and mood disorders, such as depression.
- » **Psychosocial changes:** Overreaction to minor annoyances, impaired social judgment, loneliness/social isolation, strained family and intimate relationships, and struggles in the workplace may be challenging effects of poor sleep.
- » **Physical symptoms:** Persistent fatigue, weakened immune function, or changes in appetite. Chronic sleep deprivation is linked to a higher risk of conditions like diabetes, heart disease, and obesity.

- » **Unintended sleep episodes:** Falling asleep during the day, even in inappropriate settings like meetings or while driving. This is a clear sign that your body is desperately trying to recover lost rest.



WARNING

If you notice any of these signs, take them seriously. Chronic sleep deprivation can have far-reaching consequences for your health and safety.

Long-term impacts of sleep loss

Prolonged sleep loss goes beyond day-to-day symptoms and increases the risk of severe health issues over time. Research shows that insufficient sleep disrupts nearly every system in the body:

- » **Cardiovascular disease:** Sleep deprivation raises blood pressure and increases inflammation, both of which contribute to heart disease and stroke.
- » **Endocrine effects:** Increased levels of cortisol and stress hormones may lead to a range of mental and physical issues.
- » **Gastrointestinal issues:** Research studies demonstrate that sleep disruption can affect the gut microbiome and lead to gastrointestinal issues such as bloating and constipation.
- » **Impaired mental health:** Chronic sleep loss is closely linked to conditions such as depression and anxiety, as well as reduced emotional resilience.
- » **Metabolic changes:** Lack of sleep disrupts the hormones that regulate hunger, leading to overeating and weight gain.
- » **Musculoskeletal effects:** Sleep loss can hamper muscle repair and growth, as well as bone density — all factors that can lead to slow recovery from injuries. And poor sleep in children can result in delayed milestones in growth patterns.
- » **Reproductive problems:** Sleep deprivation can reduce testosterone levels in men and can disrupt the menstrual cycle and affect fertility in women.
- » **Respiratory disorders:** Inadequate sleep can have an impact on preexisting respiratory conditions by exacerbating symptoms of these disorders — for example, shortness of breath and wheezing — which can contribute to even poorer sleep quality.
- » **Weakened immunity:** Your body produces infection-fighting antibodies during sleep, so poor rest leaves you more susceptible to illness.

Addressing sleep deprivation early can help reduce these risks and protect your long-term health. Chapter 6 offers strategies for improving your lifestyle to support better sleep.

Common sleep disorders

Not all sleep problems are caused by poor habits or external factors — many stem from underlying disorders that require targeted treatment. Some of the most common sleep disorders include

- » **Insomnia:** A condition in which you have difficulty falling asleep, staying asleep, or getting enough rest. This sleep disorder is one of the most common; it affects about one in six Americans. Stress, anxiety, and medical conditions are common triggers.
- » **Hypersomnias:** A group of disorders that cause symptoms such as excessive daytime sleepiness and sometimes sudden sleep attacks. Narcolepsy is a well-known hypersomnia that also features symptoms such as hallucinations when falling asleep or waking up that are frequently accompanied by temporary paralysis of voluntary muscles, and *cataplexy* (a sudden muscle weakness often triggered by strong emotions).
- » **Obstructive sleep apnea (OSA):** A common sleep-related breathing disorder that affects about 24 percent of men and 9 percent of women between the ages of 30 and 60. OSA is marked by pauses or decreases in your breathing during sleep.
- » **Restless legs syndrome (RLS):** A common condition that involves an uncontrollable urge to move the legs, especially at night, disrupting both falling asleep and staying asleep. You may also have unpleasant sensations (for example, feeling like bugs are crawling on your skin) or also experience periodic limb movements during sleep (PLMS), in which your legs kick or twitch during the night and wake you up (or, more commonly, wake up your bedpartner).
- » **Sleepwalking and sleep terrors:** Sleepwalking happens when you get up and walk around during deep sleep, even though you're not fully awake. If you've ever seen someone sleepwalking, they might seem alert, but they won't remember it the next morning. Sleep terrors, on the other hand, often happen to children. Instead of walking around, they scream or look terrified while still asleep; they are usually inconsolable and won't recall the episode the next day.
- » **Delayed sleep-wake phase disorder:** One of several circadian rhythm sleep disorders in which you struggle to fall asleep and wake up at the times you want. You might find yourself staying up late and having a hard time getting up early in the morning.

Recognizing the symptoms and signs of sleep disorders is the first step toward effective treatment. Flip to Chapters 7 and 8 for in-depth discussions of these and other sleep-related conditions.

Medical disorders and medications

Sleep disorders aren't the only causes of sleep loss. Many common medical disorders and medications — both prescription and over-the-counter (OTC) — frequently disrupt sleep. Conditions such as asthma, chronic obstructive pulmonary disease (COPD), diabetes, thyroid disease, and gastroesophageal reflux disease (GERD) can significantly impact both the quantity and quality of your sleep. Pain (physical, emotional, or psychological) is also a common cause of sleep loss.

Certain medications, including steroids, decongestants, cardiovascular drugs, and stimulants, can interfere with your ability to sleep at night. Additionally, substance abuse — particularly involving alcohol and nicotine — can severely disrupt sleep patterns. Turn to Chapter 3 to learn more about how preexisting conditions and medications can impact your sleep.

Knowing That Help Is Out There

If you've tried improving your sleep habits but continue to feel fatigued or struggle with disrupted rest, it's time to consult a professional. Sleep studies — which monitor brain activity, breathing, movement, heart rate, and blood oxygen and carbon dioxide levels — can provide valuable insights into what's happening during the night while you're sleeping (or trying to sleep). Treatment options range from behavioral therapies like cognitive behavioral therapy for insomnia (CBT-I) to medical interventions such as continuous positive airway pressure (CPAP) machines for sleep apnea.



TIP

Your primary care provider is a great place to start if you suspect a sleep disorder. They can refer you to a sleep specialist for further evaluation and treatment. Chapter 9 walks you through how to seek help for your particular concerns.

Struggling with sleep can feel isolating, but it's important to remember that you're not alone — and solutions are within reach. Sleep issues are incredibly common, affecting millions of people worldwide, and the good news is that there are effective treatments and resources available to help you reclaim restful nights.

Managing your sleep

To help improve your sleep, you can try

- » **Improving sleep hygiene/habits:** These habits include maintaining a consistent sleep-wake schedule, creating a comfortable bedroom

environment, managing light resources, establishing a sleep-supporting pre-bedtime behavior pattern, and avoiding staying in bed longer than 20 minutes if you can't fall asleep or fall back to sleep.

- » **Using medications:** Prescription or OTC medications are rarely a long-term answer to improving your sleep or daytime sleepiness, but they can be helpful in breaking the cycle of poor sleep before it becomes a chronic condition. In this context, medications such as melatonin may be beneficial under the supervision of a physician.
- » **Short-term countermeasures for occasional sleep loss:** Brief naps (10–20 minutes) can help improve your alertness without resulting in grogginess. Caffeine can also temporarily boost your alertness.

Visit Chapters 3, 6, and 15 for much more on how to maintain high-quality sleep.

Getting help from a sleep specialist

When you see a sleep specialist, they not only discuss your sleep problems, medical history, and daily habits with you, but also conduct a physical examination. The physician focuses on evaluating your sleep issues to decide on whether you need a sleep study or other specialized tests such as

- » **Actigraphy:** A method to monitor human rest and activity cycles by using a device (actigraph) that usually resembles a wristwatch and records movement through an accelerometer. The actigraphy data can provide information regarding sleep patterns and sleep-wake cycles of activity over extended periods, which is most helpful for circadian rhythm issues.
- » **Home sleep tests (HSTs):** Tests that typically help diagnose obstructive sleep apnea, and directly or indirectly measure your airflow, breathing effort, blood oxygen levels, heart rate, and body position.
- » **Maintenance of Wakefulness Test (MWT):** A daytime test that measures your ability to stay awake when seated in a semi-darkened room. This test includes four 40-minute trials — each spaced two hours apart. The goal is to demonstrate your ability to stay awake for the duration of the 40-minute trials, without environmental stimulation. This test has helped commercial drivers and pilots to return to duty after successful treatment.
- » **Multiple Sleep Latency Test (MSLT):** A daytime test consisting of a series of up to five scheduled naps designed to evaluate your propensity to fall asleep. If you need to take this test, it generally happens immediately following a night spent in a sleep lab to add upon the data produced during that overnight sleep test.

- » **Polysomnography (PSG):** A daytime or nighttime in-laboratory sleep study to measure the way your body functions during sleep. The data obtained is comprehensive and runs the gamut from measuring sleep efficiency (time spent asleep versus time in bed) to body positions, sleep stages, and abnormal breathing events.

To discover more about these sleep tests, turn to Chapter 10.

Exploring treatment options

Sleep problems vary widely, so the treatment you receive depends on your specific issue. If you see your doctor or a sleep specialist, they may recommend one or more common approaches:

- » **Behavioral therapies:** Cognitive behavioral therapy for insomnia (CBT-I) is a gold-standard treatment for those struggling to fall or stay asleep or change their sleep schedule. This therapy helps you identify and eliminate unhelpful thought patterns and behaviors that disrupt sleep. See Chapter 7 for more on managing insomnia and how CBT-I works.
- » **Lifestyle adjustments:** Improving your sleep hygiene (habits) — such as sticking to a regular sleep schedule, creating a calming bedtime routine and environment, and limiting caffeine intake — can make a significant difference for many people. Chapter 6 delves into actionable strategies for adopting healthier sleep habits, and Chapter 3 offers tips for setting up a sleep-friendly environment.
- » **Medical interventions:** Conditions such as sleep apnea or narcolepsy often require medical treatment. Continuous positive airway pressure (CPAP) machines, for example, are highly effective for managing sleep apnea and medications (stimulants or suppressants) may help with other disorders such as narcolepsy or restless legs syndrome. Chapters 7 and 8 have more information about medical interventions for specific sleep disorders.



REMEMBER

Don't hesitate to seek help for a sleep disorder. Whether your treatment involves therapy, medication, or a combination of approaches, you can find proven solutions to address even the most stubborn sleep challenges.

Finding resources for support

The process of improving your sleep might take time, but even small steps can lead to noticeable changes. Whether you incorporate relaxation techniques in your bedtime routine, adjust your sleep schedule, or seek professional help, every effort

brings you closer to the rest you deserve. And navigating sleep challenges doesn't have to be a solo journey. Many resources are available to guide you toward better sleep:

- » **Educational tools:** Books (like this one!) and reputable online resources, such as the American Academy of Sleep Medicine (AASM) at <https://sleepeducation.org> or the National Sleep Foundation at www.thensf.org, can empower you with knowledge and strategies to improve your sleep.
- » **Sleep specialists and clinics:** Accredited sleep centers offer diagnostic tests, like *polysomnography* (PSG, sleep studies), to pinpoint specific disorders. These tests monitor brain activity, breathing, and muscle movements to provide a comprehensive picture of important changes in your body during sleep. Learn more about what to expect during a sleep study in Chapter 10.
- » **Support groups:** Connecting with others who face similar sleep challenges can provide emotional support and practical tips. Online forums, local meetups, and patient advocacy organizations are great places to start.



TIP

If you're unsure where to start, ask your primary care provider for a referral to a sleep specialist for further evaluation and treatment. They can help you navigate the options and determine the best path forward. Chapter 9 walks you through how to seek help for your particular concerns.