



## Physiology of Sleep & Wakefulness

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### Abstract

Sleep is an important part of your overall health and quality of life. Sleep affects how well you feel when you are awake. Both the time and quality of your sleep are important. Most people spend only a third of their lives sleeping, which is necessary for the good productivity and health.

Too little or too much sleep can cause health problems and lower your quality of life. Furthermore, some chronic diseases that cause the sleep patterns may get worse from lack of sleep and result in a shortened life.

Sleep is important. When you are asleep, your body replenishes and repairs itself. It needs this time to repair muscles, consolidate memories, and release hormones that maintain growth and digestion. Good-quality of sleep helps control your appetite, support your immune system, and promote good overall health.

Many adults are chronically sleep-deprived from going to bed too late or waking up too early. Getting little high-quality sleep can leave you feeling fatigued, unable to concentrate, and mentally foggy. It can raise your risk of accidental injury and certain health conditions.

The time of sleep you need depends on your age. Children and teens mainly need more sleep than adults. For most adults recommends getting seven to eight hours of sleep per night. Getting too little or too more like more than 10 hours per night on most nights can be problematic.

### Stages of Sleep

Your sleep cycle can be differentiated into two main types of sleep: Non Rapid Eye Movement (NREM) and Rapid Eye Movement (REM) stages.

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NREM stages should typically make up 75 percent of the sleep time. There are four NREM stages:

- Stage 1 occurs when you have just gone to bed. You are in transition between wakefulness and sleep.
- Stage 2 occurs when you fall asleep and become unaware of your things around you. Your body temperature drops down and your breathing and heart rate fall into a natural rhythm.
- Stages 3 and 4 occur during “deep sleep,” when your breathing slows, blood pressure decreases, and muscles will become completely relaxed. During these restorative stages of sleep, blood flows to your muscles increases, growth hormones are released, and tissues can repair by themselves.

REM stages typically takes up 25 percent of your sleep time. A REM stage can typically occur about 90 minutes after you fall asleep and approximately every 90 minutes after that. During these stages of sleep, your eyes move around, brain is active, and body is relaxed. This is when dreams occur. This type of sleep energizes your body and brain and helps you feel alert and focused.

Sleeping well is necessary for good health. But for many people, it’s hard to sleep. Try these simple strategies to enjoy better quality sleep.

### Treatment

If you suspect you have insomnia, sleep apnea, or another sleep disorder, talk to your doctor. Many sleep disorders can be managed through lifestyle changes or other treatments.

For example, to change your sleep environment or habits, practice meditation or other relaxation strategies, or take prescription medications. They may also suggest you to undergo a sleep study, known as a polysomnogram, to further evaluate the cause of your sleep disturbance. Sleep apnea can be treated with a continuous positive airway pressure (CPAP). This is a ventilator that helps keep your airways open when you sleep

### Healthy Sleep Hygiene

Healthy sleep habits can help you fall asleep, stay asleep, or enjoy better quality sleep.

For example, a consistent sleep schedule is important. Try to go to bed and wake up at the same times each day, even on weekends and holidays.

Making your room more sleep-appropriate and comfortable. Take steps to keep it dark, cool, and quiet. Consider limiting indoor sources of light, buying dark curtains, and using earplugs. Update your mattress, pillows, and bedding as needed. Limit use of screens 30 minutes before sleep.

Developing a presleep routine can help prepare your body and mind for sleep. This routine should include relaxing activities, such as taking a warm bath, drinking herbal tea, reading a calming book, listening to calming music, writing in a journal, practicing restorative yoga, or meditating. Avoid loud noises, bright lights, glowing computer screens, and other stimulating things before bedtime.

## Prevention.

Since stress often causes sleep deprivation, efforts to reduce stress is also important. For example, consider simplifying your lifestyle, setting priorities, delegating tasks, and taking regular breaks. Prioritize self-care by eating a well-balanced and healthy diet, getting regular exercise, and making time for activities you enjoy.

- Avoid caffeine, especially late in the day.
- Avoid alcohol, which can disrupt the sleep stages.
- Don't drink too much fluid at night to lessen your bathroom trips.
- Avoid exercise late in the day.
- Avoid daytime naps or limit them to 30 minutes.

## Conclusion

Sleep & Wakefulness, collectively refer to the daily rhythms in physiology and behaviour. They control the sleep-wake cycle, modulate physical activity and food consumption, and over the course of the day regulate body temperature, heart rate, muscle tone, and hormone secretion.

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[Top](#)

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