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Your Health Matters

How Sleep Works

Understanding the Sleep Cycle

Your internal 24–hour sleep–wake cycle is regulated by processes in the brain that respond to how long you've been awake and the changes between light and dark. At night, your body responds to the loss of daylight by producing melatonin, a hormone that makes you sleepy. During the day, sunlight triggers the brain to inhibit melatonin production so you feel awake and alert. The production of melatonin can be thrown off when you're deprived of sunlight during the day or exposed to too much artificial light at night.

The Sleep Cycle

Stage 1 (Transition to sleep) – This stage lasts about 5 to 10 minutes. This is a light sleep during which you begin to lose muscle tone which may cause the feeling of falling, causing twitches and hypnic jerks (suddenly jumping awake from a doze). You may have hallucinations of swirling light and color patterns which hypnotize your mind into a restful sleep.

Stage 2 (Light sleep) – This is the first stage of true sleep, a light dreamless sleep, lasting from 10 to 25 minutes. Your eye movement stops, heart rate slows, and body temperature decreases. There is a loss of nearly all muscle tone so you can't act out your dreams. You spend around half of all your sleep in this stage.

Stage 3 (Deep sleep) – This is the beginning of a deep, dreamless sleep. If you are woken you may feel extremely dopey and confused for a couple of minutes. This stage is the most likely time for sleepwalking and sleep eating to occur.

Stage 4 (Deep sleep) – is the deepest kind of sleep. This stage replenishes your energy both physically and mentally. Without enough deep sleep you won't feel refreshed in the morning.

Stages 3 and 4 can last anywhere from 5 to 15 minutes each, but the first deep sleep of the night is more likely to be an hour or so. It's also when the body repairs and regenerates tissues, builds bone and muscle, and appears to strengthen the immune system. The most damaging effects of sleep deprivation are from inadequate deep sleep. In order to wake up energized and refreshed, getting quality deep sleep is essential.

Stage 5 (REM sleep) – About 70 to 90 minutes after falling asleep, you enter REM sleep, where dreaming occurs. If you are woken from REM sleep you'll dive back into this stage when you next return to sleep. REM sleep is important for healthy brain functioning. During REM sleep, your brain consolidates and processes the information you've learned during the day, forms neural connections that strengthen memory, and replenishes its supply of neurotransmitters, including feel-good chemicals like serotonin and dopamine that boost your mood during the day.

The first period of REM typically lasts 10 minutes, with each recurring REM stage lengthening, and the final one may last up to an hour. During this stage the eyes move rapidly in different directions which denotes dreaming.

Together, the stages of REM and non-REM sleep form a complete sleep cycle. Each cycle typically lasts about 90 minutes and repeats four to six times over the course of a night.

How Much Sleep Do You Need?

Newborn to 2 months old	12 - 18 hrs
3 months to 1 year old	14 - 15 hrs
1 to 3 years old	12 - 14 hrs
3 to 5 years old	11 - 13 hrs
5 to 12 years old	10 - 11 hrs
12 to 18 years old	8.5 - 10 hrs
Adults (18+)	7.5 - 9 hrs

Sleep Debt

Sleep debt is the difference between the amount of sleep you need and the hours you actually get. Every time you sacrifice on sleep, you add to the debt. The sleep debt won't go away on its own and will have to be repaid if you are to feel rested.

One or two solid nights of sleep aren't enough to pay off a long-term debt. While extra sleep can give you a temporary boost, your performance and energy will drop back down as the day goes on.

Tips for getting and staying out of sleep debt:

- Aim for at least seven and a half hours of sleep every night.
- Settle short-term sleep debt with an extra hour or two per night. If you lost 10 hours of sleep, pay the debt back in nightly one or two-hour installments.
- Keep a sleep diary. Record when you go to bed, when you get up, your total hours of sleep, and how you feel during the day. This will help you discover your natural patterns and get to know your sleep needs.
- Take a sleep vacation to pay off a long-term sleep debt. Pick a two-week period when you have a flexible schedule. Go to bed at the same time every night and let yourself sleep until you wake up naturally. By keeping the same bedtime and waking up naturally, you'll eventually pay back your debt and arrive at the sleep schedule that's best for you.
- Make sleep a priority. Instead of cutting back on sleep in order to tackle the rest of your daily tasks, put sleep at the top of your to-do list.

"I'll just hit snooze"

Hitting the snooze button makes getting out of bed more challenging than simply waking up with the first alarm, because a few more minutes of shuteye prompt the brain to enter a deeper sleep cycle, according to AsapSCIENCE.

According to an AsapSCIENCE YouTube video, the body begins preparing for the day in the hour before waking up by raising its internal temperature, and releasing dopamine and cortisol. After hitting the snooze button, the confused body will re-enter its sleep cycle and enter into deeper sleep stages than before.

"So, instead of your body prepping to wake up, it's going in the opposite direction," the video says. "As a result, the second alarm may cause you to feel even more tired."

Having a hard time getting up when your alarm goes off?

If you know you only have a limited time for sleep -- try setting a wake-up time that's a multiple of 90 minutes, the length of the average sleep cycle. For example, if you go to bed at 10 p.m., set your alarm for 5:30 (a total of 7 ½ hours of sleep) instead of 6:00 or 6:30. You may feel more refreshed at 5:30 than with another 30 to 60 minutes of sleep because you're getting up at the end of a sleep cycle when your body and brain are already close to wakefulness.

Myths and Facts about Sleep

Myth 1: Getting just one hour less sleep per night won't affect your daytime functioning. You may not be noticeably sleepy during the day, but losing even one hour of sleep can affect your ability to think properly and respond quickly. It also compromises your cardiovascular health, energy balance, and ability to fight infections.

Myth 2: Your body adjusts quickly to different sleep schedules. Most people can reset their biological clock, but only by appropriately timed cues—and even then, by one–two hours per day at best. Consequently, it can take more than a week to adjust after traveling across several time zones or switching to the night shift.

Myth 3: Extra sleep at night can cure you of problems with excessive daytime fatigue. The quantity of sleep you get is important, sure, but it's the quality of your sleep that you really have to pay attention to. Some people sleep eight or nine hours a night but don't feel well rested when they wake up because the quality of their sleep is poor.

Myth 4: You can make up for lost sleep during the week by sleeping more on the weekends. Although this sleeping pattern will help relieve part of a sleep debt, it will not completely make up for the lack of sleep. Furthermore, sleeping later on the weekends can affect your sleep-wake cycle so that it is much harder to go to sleep at the right time on Sunday nights and get up early on Monday mornings.

More to come....

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