

### **What happens when you sleep?**

When you sleep, your body rests and restores its energy levels. However, sleep is an active state that affects both your physical and mental well-being. A good night's sleep is often the best way to help you cope with stress, solve problems, or recover from illness. Sleep is prompted by natural cycles of activity in the brain and consists of two basic states: rapid eye movement (REM) sleep and non-REM (NREM) sleep, which consists of 4 stages.

During sleep, the body cycles between non-REM and REM sleep. Typically, people begin the sleep cycle with a period of non-REM sleep followed by a very short period of REM sleep. Vivid dreams tend to occur during REM sleep.

### **What is REM sleep?**

The period of REM sleep is marked by extensive physiological changes. These include:

- Accelerated respiration
- Increased brain activity
- Eye movement
- Muscle relaxation

Usually, REM sleep occurs 90 minutes after sleep onset. The first period of REM typically lasts 10 minutes, with each recurring REM stage lengthening, and the final one lasting an hour. Polysomnograms (sleep readings) show wave patterns in REM to be similar to stage 1 sleep. In people without sleep disorders, heart rate and respiration speed up and become erratic during REM sleep. The face, fingers, and legs might twitch. Intense dreaming occurs during REM sleep as a result of heightened cerebral activity, but paralysis occurs simultaneously in the major voluntary muscle groups. REM is a mixture of encephalic (brain) states of excitement and muscular immobility. For this reason, it is sometimes called paradoxical sleep.

The percentage of REM sleep is highest during infancy and early childhood. During adolescence and young adulthood, the percentage of REM sleep declines, and the percentage decreases further in older age. In many cases, older people enter REM sleep more quickly and remain in REM sleep longer.

### **What is NREM sleep?**

The period of NREM sleep is made up of stages 1 to 4. Each stage can last from five to 15 minutes. Stages 2 and 3 repeat backwards before REM sleep is attained.

#### **Stage 1**

Polysomnography shows a 50 percent reduction in activity between wakefulness and stage 1 sleep. The eyes are closed during stage 1 sleep. However, if aroused from this stage of sleep, a person might feel as if he or she has not slept. Stage 1 might last for five to 10 minutes.

## Stage 2

This is a period of light sleep during which polysomnographic readings show intermittent peaks and valleys, or positive and negative waves. These waves indicate spontaneous periods of muscle tone mixed with periods of muscle relaxation. The heart rate slows and the body temperature decreases. At this point, the body prepares to enter deep sleep.

## Stages 3 and 4

These are deep sleep stages, with stage 4 being more intense than stage 3. These stages are known as slow-wave, or delta, sleep.

During NREM sleep, the body repairs and regenerates tissues, builds bone and muscle, and appears to strengthen the immune system. As you get older, you get less NREM sleep. People under age 30 have about two hours of restorative sleep every night, while those over 65 might get only 30 minutes.

### What happens when a person does not get enough sleep?

Not getting the proper amount or quality of sleep leads to more than just feeling tired. Sleepiness interferes with cognitive function, which can lead to learning disabilities in children, memory impairment in people of all ages, personality changes, and depression.

People suffering from sleep deprivation experience difficulty making decisions, irritability, problems with performance, and slower reaction times, placing them at risk for automobile and work-related accidents. Sleep loss can also adversely affect life by contributing to the development of obesity, diabetes, and heart disease.

If you have difficulty falling asleep or staying asleep or if you feel sleepy or unrefreshed despite a seemingly adequate night of sleep, you may have a sleep disorder. There are over 80 disorders of sleep and wakefulness.

### What are some tips for getting a good night's sleep?

- **Create an optimal sleep environment** by making sure that your bedroom is comfortable, cool, quiet, and dark. If noise keeps you awake, try using background sounds like "white noise" or earplugs. If light interferes with your sleep, try a sleep mask or blackout curtains.
- **Think positive.** Avoid going to bed with a negative mind set, such as "If I don't get enough sleep tonight, how will I ever get through the day tomorrow?"
- **Avoid using your bed for anything other than sleep and intimate relations.** Do not watch television, eat, work, or use computers in your bedroom.
- **Try to clear your mind before bed time** by writing things down or making a to-do list earlier in the evening. This is helpful if you tend to worry and think too much in bed at night.
- **Establish a regular bedtime and a relaxing routine** each night by taking a warm bath, listening to soothing music, or reading. Try relaxation exercises, meditation, biofeedback or hypnosis. Wake up at the same time each morning, including days off and vacations.
- **Stop clock watching.** Turn the clock around and use only the alarm for waking up. Leave your bedroom if you can not fall asleep in 20 minutes. Read or engage in a relaxing activity in another room.
- **Avoid naps.** If you are extremely sleepy, take a nap. But limit naps to less than 30 minutes and no later than 3 pm.

- **Avoid stimulants** (coffee, teas, cola, cocoa and chocolate) and heavy meals for at least 4 hours before bedtime. Light carbohydrate snacks such as milk, yogurt, or crackers may help you fall asleep easier.
- **Avoid alcohol and tobacco** for at least 4 hours before bedtime and during the night.
- **Exercise regularly**, but not within 4 hours of bedtime if you have trouble sleeping.

## Drug and Alcohol Related Sleep Disorders

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Sleep disturbances have been associated with drug use, drug abuse, and withdrawal from drug abuse. Sleep disturbances also have been linked to the use of alcohol and to chronic alcoholism.

### Drugs and sleep

Many prescription and non-prescription medicines can cause sleep problems. The severity of sleep problems caused by a medicine will vary from person to person.

Prescription drugs that might cause sleep problems include:

- High blood pressure medicines
- Hormones such as oral contraceptives
- Steroids including prednisone
- Respiratory medicines
- Diet pills
- Attention deficit /hyperactivity disorder medicines
- Some antidepressants

The following non-prescription medicines can cause sleep problems:

- Pseudoephedrine, including the brand Sudafed®
- Medicines with caffeine (These include the brands Anacin®, Excedrin®, and No-Doz®, as well as cough and cold medicines.)
- Illegal (or illicit) drugs such as marijuana, heroin, cocaine, amphetamines, and methamphetamines
- Nicotine, which can disrupt sleep and reduce total sleep time. (Smokers report more daytime sleepiness and minor accidents than do non-smokers, especially in younger age groups.)

### Alcohol and sleep

Alcohol often is thought of as a sedative or calming drug. While alcohol might induce sleep, the quality of sleep is often fragmented during the second half of the sleep period. Alcohol increases the number of times you awaken in the later half of the night when the alcohol's relaxing effect wears off. Alcohol prevents you from getting the deep sleep and rapid eye movement (REM) sleep you need because alcohol keeps you in the lighter stages of sleep.

With continued consumption just before bedtime, alcohol's sleep-inducing effect might decrease but its disruptive effects continue or increase. The sleep disruption resulting from alcohol use might lead to daytime fatigue and sleepiness. The elderly are at particular risk for alcohol-related sleep disorders because they achieve higher levels of alcohol in the blood and brain than do younger adults after consuming an equivalent dose. Bedtime alcohol consumption among older adults might lead to unsteadiness if walking is attempted during the night, with increased risk of falls and injuries.

### Tips for a Good Nights Sleep

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- Minimize noise with earplugs and minimize light with window blinds, heavy curtains, or an eye mask. Do not turn on bright lights if you need to get up at night. Use a small night-light instead.
- Avoid eating within two hours of bedtime. If you are hungry, a glass of milk or a light snack is a good choice. Milk contains the amino acid L-tryptophan, which has been shown in research to help people go to sleep. Avoid consuming protein at bedtime.
- Get aerobic exercise during the day to reduce the level of stress hormones, but avoid anything too strenuous (aside from sex) within three hours of bedtime. Regular exercise might promote deeper sleep.
- Go to bed at a regular time and avoid napping late in the afternoon. If you need to nap, take a brief nap for 10 to 15 minutes about eight hours after you awake.
- Stop working at any task an hour before bedtime to calm mental activity.
- At bedtime, keep your mind off worries or things that upset you. Avoid discussing emotional issues in bed.
- Consider having pets stay outside of your sleeping area. Having a pet in bed with you might cause you to wake if you have allergies or if the pet moves around on the bed.
- Make sure your bedroom is well-ventilated and at a comfortable temperature (below 75°F and above 54°F).
- Keep your bedroom for sleeping. If you can't sleep or if you wake up, go into another room and read a book or watch television until you feel sleepy.
- Learn a relaxation technique, such as progressive muscle relaxation, and practice it in bed.
- Nicotine is a stimulant and should be avoided particularly near bedtime and upon night awakenings. Having a cigarette before bed might feel relaxing, but nicotine is a stimulant and might interfere with sleep.
- Caffeine should be discontinued at least four to six hours before bedtime. If you consume large amounts of caffeine and you cut yourself off too quickly, you might get headaches that could keep you awake. Caffeine is also a stimulant and is present in substances including coffee, cola, tea, chocolate, and various over-the-counter medicines.
- Alcohol is a depressant and might help you fall asleep, but the subsequent metabolism that clears it from your body when you are sleeping causes a withdrawal syndrome. This withdrawal causes awakenings and is often associated with nightmares and sweats.

### **Lifestyle and behavioural treatments for sleep disorders might include the following:**

- Relaxation training
- Cognitive therapy
- Stimulus control (SC)
- Sleep restriction therapy (SRT)
- Sleep hygiene

#### **Relaxation training**

Relaxation training methods such as progressive muscle relaxation (PMR), deep breathing techniques, imagery, and self-hypnosis might help some people deal with sleep disorders. PMR involves helping the individual to sequentially tense and relax the body's major muscle groups while concentrating on and contrasting sensations of tension and relaxation. Daily practice of relaxation techniques between therapy sessions is essential and tends to enhance the effectiveness of the treatment.

#### **Cognitive therapy**

Cognitive therapy for insomnia includes interventions that are meant to help people identify and correct inappropriate thoughts and beliefs that might contribute to insomnia. Cognitive therapy can give people the proper information about sleep norms, age-related sleep changes, reasonable sleep goals, and the influence of naps and exercise.

#### **Stimulus control (SC)**

Stimulus control derives from the belief that insomnia might be related to the bedroom having become associated with other things (stressful situations, for example) besides sleep and sex.

#### **Sleep restriction therapy (SRT)**

Sleep restriction therapy is based on the belief that excess time in bed makes sleep problems worse. SRT consists of limiting a person's time in bed to only that time when he or she is sleeping.

#### **Sleep hygiene**

The concept of sleep hygiene refers to practices, habits, and environmental factors that are important for getting sound sleep. The four general areas important to sleep hygiene are the circadian rhythm (24-hour cycle); aging; psychological stressors that cause mini-awakenings (in which the brain wakes up for just a few seconds); and substances such as nicotine, caffeine, and alcohol.

Circadian rhythms influence when, how much, and how well people sleep. These rhythms might be altered by the timing of various factors, including naps, bedtime, exercise, and especially exposure to light.

Aging also plays a role in sleep and sleep hygiene. Sleep patterns change after people reach the age of 40. There are many more nocturnal awakenings as people age. The awakenings affect sleep quality and can interact with any other condition that might cause arousals or awakenings. The more awakenings people experience at night, the more likely they will awaken with a feeling of not being rested.

Psychological stressors such as exams, deadlines, or job problems might interfere with sleep. It is beneficial for people to develop some kind of pre-sleep ritual to break the connection between stress and bedtime. Some people find it helpful to make a list of all the stressors of the day, along with a plan to deal with them. In addition, periods of relaxation (meditating or taking a hot bath) can help a person relax and get to sleep.

Caffeine can stay in the body as long as 14 hours and can increase the number of times you awaken at night, decreasing your total amount of sleep time. The effects of nicotine, when consumed in high doses, are similar to those of caffeine. Alcohol might initially sedate you, making it easier to fall asleep. The downside to alcohol is that as it is metabolized and cleared from your system during sleep, it causes arousals that can last as long as two to three hours after it has been eliminated.

Environmental factors such as temperature and noise are important to good sleep. The sleeping environment should be relatively cool, dark, and silent. Patients may be encouraged to buy blackout curtains to eliminate extra light and wear ear plugs. A partner who disturbs the patient while sleeping or other factors (such as noise/light from TV, etc.) should be addressed.

### **About getting enough sleep**

Getting enough sleep is vital for your mental, physical and emotional wellbeing.

If your sleeping habits have changed, you could try these techniques to help you sleep better and feel more rested.

- Get up at the same time every morning (even weekends).
- Avoid sleeping or snoozing during the day.
- Cut down on coffee and tea particularly in the evenings.
- Try not to sleep or doze off in your chair in the evening - try to wait until you go to bed.
- Wind down before bed. Avoid any energetic or strenuous activity 90 minutes before bedtime.
- Your bedroom and bed should be at a comfortable temperature - not too hot and not too cold.
- Go to bed when you feel sleepy and not before.
- Do not lie in bed awake for longer than 30 minutes. If you can't get to sleep, get up and find something relaxing to do before going back to your bed when you are tired.
- Try lavender oil on a tissue under your pillow. But don't use it if you are pregnant or sensitive to lavender oil.
- Take a warm bath before bed to relax. Again make sure it's not too hot or too cold.
- Try a warm milky drink before bedtime. It can relax you and help you sleep better.

For more information on sleep go to:

[www.nhsdirect.nhs.uk/MentalHealthSelfCare/Anxiety-Sleep](http://www.nhsdirect.nhs.uk/MentalHealthSelfCare/Anxiety-Sleep)