Better in Bed

Guide to a good night's sleep (from Readers Digest)

http://rdhealth.com/internal/sleep/need.asp

How much do you need?

The amount of sleep each person needs depends on many factors, including age. Infants generally require about 16 hours a day, while teenagers need about 9 hours on average. For most adults, 7 to 8 hours a night appears to be the best amount of sleep, although some people may need as few as 5 hours or as many as 10 hours of sleep each day. Women in the first 3 months of pregnancy often need several more hours of sleep than usual. The amount of sleep a person needs also increases if he or she has been deprived of sleep in previous days. Getting too little sleep creates a "sleep debt," which is much like being overdrawn at a bank. Eventually, your body will demand that the debt be repaid. We don't seem to adapt to getting less sleep than we need; while we may get used to a sleep-depriving schedule, our judgment, reaction time, and other functions are still impaired.

People tend to sleep more lightly and for shorter time spans as they get older, although they generally need about the same amount of sleep as they needed in early adulthood. About half of all people over 65 have frequent sleeping problems, such as insomnia, and deep sleep stages in many elderly people often become very short or stop completely. This change may be a normal part of aging, or it may result from medical problems that are common in elderly people and from the medications and other treatments for those problems.

Experts say that if you feel drowsy during the day, even during boring activities, you haven't had enough sleep. If you routinely fall asleep within 5 minutes of lying down, you probably have severe sleep deprivation, possibly even a sleep disorder. Microsleeps, or very brief episodes of sleep in an otherwise awake person, are another mark of sleep deprivation. In many cases, people are not aware that they are experiencing microsleeps. The widespread practice of "burning the candle at both ends" in western industrialized societies has created so much sleep deprivation that what is really abnormal sleepiness is now almost the norm.

Many studies make it clear that sleep deprivation is dangerous. Sleep-deprived people who are tested by using a driving simulator or by performing a hand-eye coordination task perform as badly as or worse than those who are intoxicated. Sleep deprivation also magnifies alcohol's effects on the body, so a fatigued person who drinks will become much more impaired than someone who is well rested. Driver fatigue is responsible for an estimated 100,000 motor vehicle accidents and 1,500 deaths each year, according to the National Highway Traffic Safety Administration. Since drowsiness is the brain's last step before falling asleep, driving while drowsy can—and often does—lead to disaster. Caffeine and other stimulants cannot overcome the effects of severe sleep deprivation. The National Sleep Foundation says that if you have trouble keeping your eyes focused, if you can't stop yawning, or if you can't remember driving the last few miles, you are probably too drowsy to drive safely.

Tips for a restful night

Many times simple home treatment can relieve your sleep problems. Establish a sleep routine

- Set a bedtime and time to get up and stick to them even on weekends. This will help your body get used to a regular sleep time.
- Get some exercise during the day. Avoid strenuous exercise within 2 hours of bedtime.
- Do not take naps during the day, especially in the evening.
- Do not drink or eat caffeine after 3:00 p.m. This includes coffee, tea, cola drinks, and chocolate.
- Avoid drinking alcohol. It may make you sleepy but will probably also wake you up after a short time.
- Wind down toward the end of the day. Don't take on problem-solving conversations or challenging activities in the evening.
- Remove distractions (such as a clock, telephone, or radio) from your bedroom.
- Block out background noise in your bedroom throughout the night.
- Try using a sleep mask and ear plugs at night.
- Keep your bedroom dark, cool, and quiet.
- If you take medication that may be stimulating, such as antihistamines or asthma medications, take them as long before bedtime as possible.
- Reserve the bedroom for sleeping and sexual activities so you come to associate it with sleep. Go to another room to read, watch television, eat, and so forth.
- After getting into bed, make a conscious effort to let your muscles relax. Imagine yourself in a peaceful, pleasant scene. See the topic Stress, Distress, and Relaxation Skills in Related Information.
- If you are still awake after 15 or 20 minutes, get up and read in dim light or do a boring task until you feel drowsy. Don't lie in bed and think about how much sleep you're missing or watch TV.
- Review all of your prescription and non-prescription medications with your health professional or pharmacist to determine if the medications you take could be the cause of your sleep problem.
- Use non-prescription medications for sleep wisely for a sleep problem. Non-prescription medications for sleep can cause daytime confusion, memory loss, and dizziness. Continued use of sleeping pills may actually increase your sleeplessness.

Melatonin has recently become popular as a herbal remedy for sleep problems. Before using any treatment for a sleep problem it is important to consider the risks and benefits of the treatment.

Dreaming and REM Sleep

We typically spend more than 2 hours each night dreaming. Scientists do not know much about how or why we dream. Sigmund Freud, who greatly influenced the field

of psychology, believed dreaming was a "safety valve" for unconscious desires. Only after 1953, when researchers first described REM in sleeping infants, did scientists begin to carefully study sleep and dreaming. They soon realized that the strange, illogical experiences we call dreams almost always occur during REM sleep. While most mammals and birds show signs of REM sleep, reptiles and other cold-blooded animals do not.

REM sleep begins with signals from an area at the base of the brain called the *pons*. These signals travel to a brain region called the *thalamus*, which relays them to the *cerebral cortex*—the outer layer of the brain that is responsible for learning, thinking, and organizing information. The pons also sends signals that shut off neurons in the spinal cord, causing temporary paralysis of the limb muscles. If something interferes with this paralysis, people will begin to physically "act out" their dreams—a rare, dangerous problem called *REM sleep behavior disorder*. A person dreaming about a ball game, for example, may run headlong into furniture or blindly strike someone sleeping nearby while trying to catch a ball in the dream.

REM sleep stimulates the brain regions used in learning. This may be important for normal brain development during infancy, which would explain why infants spend much more time in REM sleep than adults. Like deep sleep, REM sleep is associated with increased production of proteins. One study found that REM sleep affects learning of certain mental skills. People taught a skill and then deprived of non-REM sleep could recall what they had learned after sleeping, while people deprived of REM sleep could not.

Some scientists believe dreams are the cortex's attempt to find meaning in the random signals that it receives during REM sleep. The cortex is the part of the brain that interprets and organizes information from the environment during consciousness. It may be that, given random signals from the pons during REM sleep, the cortex tries to interpret these signals as well, creating a "story" out of fragmented brain activity.

Your Circadian Rhythms

Circadian rhythms are regular changes in mental and physical characteristics that occur in the course of a day (*circadian* is Latin for "around a day"). Most circadian rhythms are controlled by the body's biological "clock." This clock, called the *suprachiasmatic nucleus* (or SCN), is actually a pair of pinhead-size brain structures that together contain about 20,000 neurons. The SCN rests in a part of the brain called the *hypothalamus*, just above the point where the optic nerves cross. Light that reaches photoreceptors in the *retina* (a tissue at the back of the eye) creates signals that travel along the optic nerve to the SCN.

Signals from the SCN travel to several brain regions, including the *pineal gland*, which responds to light-induced signals by switching off production of the hormone melatonin. The body's level of melatonin normally increases after darkness falls, making people feel drowsy. The SCN also governs functions that are synchronized with the sleep/wake cycle, including body temperature, hormone secretion, urine production, and changes in blood pressure.

By depriving people of light and other external time cues, scientists have learned that most people's biological clocks work on a 25-hour cycle rather than a 24-hour one. But because sunlight or other bright lights can reset the SCN, our biological cycles normally follow the 24-hour cycle of the sun, rather than our innate cycle. Circadian rhythms can be affected to some degree by almost any kind of external time cue, such as the beeping of your alarm clock, the clatter of a garbage truck, or the timing of your meals. Scientists call external time cues *zeitgebers* (German for "time givers").

When travelers pass from one time zone to another, they suffer from disrupted circadian rhythms, an uncomfortable feeling known as *jet lag*. For instance, if you travel from California to New York, you "lose" 3 hours according to your body's clock. You will feel tired when the alarm rings at 8 a.m. the next morning because, according to your body's clock, it is still 5 a.m. It usually takes several days for your body's cycles to adjust to the new time.

To reduce the effects of jet lag, some doctors try to manipulate the biological clock with a technique called light therapy. They expose people to special lights, many times brighter than ordinary household light, for several hours near the time the subjects want to wake up. This helps them reset their biological clocks and adjust to a new time zone.

Symptoms much like jet lag are common in people who work nights or who perform shift work. Because these people's work schedules are at odds with powerful sleep-regulating cues like sunlight, they often become uncontrollably drowsy during work, and they may suffer insomnia or other problems when they try to sleep. Shift workers have an increased risk of heart problems, digestive disturbances, and emotional and mental problems, all of which may be related to their sleeping problems. The number and severity of workplace accidents also tend to increase during the night shift. Major industrial accidents attributed partly to errors made by fatigued night-shift workers include the Exxon Valdez oil spill and the Three Mile Island and Chernobyl nuclear power plant accidents. One study also found that medical interns working on the night shift are twice as likely as others to misinterpret hospital test records, which could endanger their patients. It may be possible to reduce shift-related fatigue by using bright lights in the workplace, minimizing shift changes, and taking scheduled naps.

Many people with total blindness experience lifelong sleeping problems because their retinas are unable to detect light. These people have a kind of permanent jet lag and periodic insomnia because their circadian rhythms follow their innate cycle rather than a 24-hour one. Daily supplements of melatonin may improve nighttime sleep for such patients. However, since the high doses of melatonin found in most supplements can build up in the body, long-term use of this substance may create new problems. Because the potential side effects of melatonin supplements are still largely unknown, most experts discourage melatonin use by the general public.

Sleep and Disease

Sleep and sleep-related problems play a role in a large number of human disorders and affect almost every field

of medicine. For example, problems like stroke and asthma attacks tend to occur more frequently during the night and early morning, perhaps due to changes in hormones, heart rate, and other characteristics associated with sleep. Sleep also affects some kinds of epilepsy in complex ways. REM sleep seems to help prevent seizures that begin in one part of the brain from spreading to other brain regions, while deep sleep may promote the spread of these seizures. Sleep deprivation also triggers seizures in people with some types of epilepsy.

Neurons that control sleep interact closely with the immune system. As anyone who has had the flu knows, infectious diseases tend to make us feel sleepy. This probably happens because *cytokines*, chemicals our immune systems produce while fighting an infection, are powerful sleep-inducing chemicals. Sleep may help the body conserve energy and other resources that the immune system needs to mount an attack.

Sleeping problems occur in almost all people with mental disorders, including those with depression and schizophrenia. People with depression, for example, often awaken in the early hours of the morning and find themselves unable to get back to sleep. The amount of sleep a person gets also strongly influences the symptoms of mental disorders. Sleep deprivation is an effective therapy for people with certain types of depression, while it can actually cause depression in other people. Extreme sleep deprivation can lead to a seemingly psychotic state of paranoia and hallucinations in otherwise healthy people, and disrupted sleep can trigger episodes of mania (agitation and hyperactivity) in people with manic depression.

Sleeping problems are common in many other disorders as well, including Alzheimer's disease, stroke, cancer, and head injury. These sleeping problems may arise from changes in the brain regions and neurotransmitters that control sleep, or from the drugs used to control symptoms of other disorders. In patients who are hospitalized or who receive round-the-clock care, treatment schedules or hospital routines also may disrupt sleep. The old joke about a patient being awakened by a nurse so he could take a sleeping pill contains a grain of truth. Once sleeping problems develop, they can add to a person's impairment and cause confusion, frustration, or depression. Patients who are unable to sleep also notice pain more and may increase their requests for pain medication. Better management of sleeping problems in people who have other disorders could improve these patients' health and quality of life.

Napping Know-how

The body's natural rhythms have two peak times for sleeping: nighttime and midafternoon. Even if you're not chronically sleep deprived, that post-lunch urge to nap can sometimes be overpowering. Should you succumb? The answer is yes—if it doesn't interfere with your nighttime sleeping. Brief naps improve productivity, creativity, and problem-solving skills, and they may reduce accidents at work. Studies show that people have more active brains after a nap, so they pay closer attention to detail and are better able to make critical decisions.

The optimal nap length is 20 to 30 minutes. If you sleep longer, you'll pass into deeper, slow-brain-wave sleep that will make it hard for you to awaken and leave you feeling groggy for about half an hour afterward. Napping for more than an hour will probably interfere with your sleep that night. A longer nap may also diminish the total amount of sleep you need at night, making you wake up earlier than usual, or making it difficult to stay asleep.