

Sleep

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Useful web sites:

- Wikipedia – search for “sleep” and “sleep hygiene”
- www.sleepnet.com
- www.users.cloud9.net/~thorpy/
- [Restless Leg Syndrome Foundation: www.rls.org](http://www.rls.org)
- [Apnea Patient's News, Education & Awareness Network: www.apneanet.org](http://www.apneanet.org)
- [American Fibromyalgia Syndrome Association: www.afsafund.org](http://www.afsafund.org)
- [American Academy of Sleep Medicine: www.aasmnet.org](http://www.aasmnet.org)
- [Sleep Research Society: www.sleepresearchsociety.org](http://www.sleepresearchsociety.org)
- [Sleep Well: www.stanford.edu/~dement](http://www.stanford.edu/~dement)
- [National Sleep Foundation: www.sleepfoundation.org](http://www.sleepfoundation.org)
- [National Center on Sleep Disorders Research: www.nhlbi.nih.gov/about/ncsdr/index.htm](http://www.nhlbi.nih.gov/about/ncsdr/index.htm)
- www.DrRayStrand.com

The Promise of Sleep by William C. Dement, M.D., Ph.D. And Christopher Vaughan (1999)

Dr. Dement founded the Sleep Research Center at Stanford University. His book is fascinating reading and although it covers the same information (and more) that is found in the above web sites, his book is much easier to read than the highly technical, condensed articles on the web sites.

The following notes are taken largely from Dr. Dement's book:

What does sleep have to do with wellness? In other words, why is sleep important?

- In the 1950s the American Cancer Society did a massive study of longevity. Volunteers surveyed over 1 million Americans representing every county and parish in the U.S. about their exercise, nutrition, smoking, sleep, and other health related habits. Six years later, the volunteers repeated the survey, clearly identifying all of the respondents who had died since the original survey. Out of all the factors in this gigantic study, stated habitual sleep time had the best correlation with mortality. The highest mortality rates at all age levels occurred for those who said they slept four hours or less, and for those who said they slept nine to ten hours or more. The lowest mortality rates were seen for those who said their habitual nightly sleep time was around eight hours.
- Sleep is one of many minor, but statistically significant, factors that affect someone's susceptibility to cold virus. The result stands even when factors such as stress are taken into account.

- Cells in the body are constantly replenishing themselves, repairing not only cuts and bruises, but also the wear and tear of daily living. Much of this repair is the job of growth hormone, which stimulates protein synthesis, helps break down the fats that supply energy for tissue repair, and stimulates cell division to replace old or malfunctioning cells. The concentration of growth hormone released during the night's first period of stage 4 sleep suggests that deep sleep is important for this repair process and that the disappearance of deep sleep may contribute to the physical decline we experience in old age.
- Healthy sleep prepares the brain for the next day and renews our mental balance. In contrast to this, people who are sleep deprived tend to be more violent, aggressive, and less able to deal with the stresses of ordinary life.

If sleep is so important, why do some people have trouble falling asleep?

- Perhaps you have done everything you can imagine to get a good night's sleep, but you cannot sleep. Or, perhaps, you think you are sleeping well, but you suffer from chronic fatigue when you are awake. It is quite possible that you have a sleep disorder. Find a sleep center accredited with the American Sleep Disorders Association to help diagnose and treat your condition.
- The biggest challenge to treating insomnia is persuading doctors and the people who have insomnia that it is a serious problem. Most doctors and lay people consider insomnia a nuisance condition even less important than the common cold or flu.
- We now know that insomnia can be a deadly problem.
- When it comes to sleep, you will very likely need to become more knowledgeable about sleep in general, and your sleep profile in particular, than your family physician.

What can busy people do to get more sleep?

Dr. Dement tells the following story: It seems that when Westerners went to Melanesia, especially during World War II, the natives noticed that soldiers would go into a radio shack and call for more supplies. Some days later a ship or airplane would come with goods. The natives themselves started to build similar shacks with bamboo “antennas,” and built “airstrips” for planes to land on, in the hope that new cargo would arrive on the island. This story is often used as an example of how trying to achieve a goal through ritualistic behavior can be futile if one doesn't understand the underlying reason that certain behaviors have certain effects.

The most successful treatment involves integrating the whole mind and body in “wellness”:

- nutrition
- exercise
- stress management
- adequate sleep

Key concepts about sleep:

Multiple Sleep Latency Test (MLST): This is a score from 0-20, with 20 being maximally alert.

To determine your sleep latency note how many minutes it takes you to fall asleep. If you do not fall asleep in 20 minutes, terminate the test and give yourself a score of 20. A score between 0 and 5 signifies an extreme sleep tendency. A score of 5 to 10 minutes is borderline, while a score of 10 to 15 indicates a manageable sleep load. A score of 15 to 20 represents excellent alertness. Test yourself at various times throughout the day to determine your sleep load, also referred to as sleep debt.

Sleep Debt: Most adults function optimally with 8 hours of sleep. If you start with a MLST score of 15-20 and you slept 6 hours last night your sleep debt would be two hours. Sleep debt is cumulative so that if you consistently get 6 hours of sleep 5 nights a week, you are functioning with a sleep debt of 10 hours during the work week. Sleep debt must be paid back, so if you function with a sleep debt during the week you will sleep longer on the weekend. Scientists who study sleep have not been able to study the long term health affects of a large sleep debt on individuals.

Biological alerting (circadian rhythms): Circadian rhythms are present in almost every function in the body, from basic cell processes to activities of the whole body. Various experiments have shown that our biological clock is not necessary for sleep but that it normally promotes wakefulness and actively opposes sleep. It appears that the role of our biological clock in our daily cycle is to promote and maintain alert wakefulness. This role is expressed only at certain times, and is known as clock-dependent alerting. At certain times each day, our brains are powerfully stimulated by our biological clocks. At the other times, the stimulation subsides or is turned off.

Homeostatic process: the brain in every human being possesses a process that is active 24 hours a day. Its sole function is to induce and maintain sleep. It does this by regulating sleep homeostatically: When an individual obtains less sleep than the needed amount, the homeostatic process increases the tendency to fall asleep; conversely, when extra sleep is obtained, the homeostatic process decreases the tendency to fall asleep. This ensures that an individual gets the same amount of sleep each day on average. Theoretically, since all wakefulness is sleep deprivation, sleep debt can be zero for only a brief time. As soon as sleep debt is zero, the sleeper awakens and starts accumulating sleep debt again. Opposing this sleep tendency is the alerting action of the biological clock. These two opposing forces allow humans to remain awake all during the day and sleep deeply at night.

Arousal – The Mask of Sleep Debt: Because the alertness-sleepiness continuum is a complex function of sleep debt, biological alerting, and environmental stimulation, we are generally very bad judges of our sleep tendency. How likely we are to fall asleep is the combination of two opposing forces: our sleep load minus our level of alerting. We may be so excited or stressed by external stimulation that we don't perceive a huge sleep debt. We can feel pretty good when our MSLT score is well into the twilight zone (score 0-5). Our automatic reaction to sleepiness is to fight it by seeking out stimulation – driving to the store, working harder, or taking a stretch. Many of us habitually make ourselves do something more active when we start to feel sleepy, which masks our underlying sleep debt. Only when we can't find something stimulating are we forced to confront our hidden sleep tendency. At these times the sleep debt that has been kept at bay comes flooding back through the body and mind.

There are many how-to-sleep-better books and web sites. They all contain tips for better sleep. Any suggestions or tips for better sleep should be regarded as options. Instead of following a recommendation blindly, you should be able to use the principles Dr. Dement teaches in his book (see reference above). Then decide whether the recommendations will work in your particular circumstance. Having said that, here are some of the recommendations he describes in his book.

- Improve sleep hygiene
 - The simple goal of good sleep hygiene is to do everything possible to foster good sleep at night.
 - Keeping a regular schedule is one of the most important behaviors for healthy sleep.
 - Set aside your bedroom as a sanctuary for sleep. Move the TV, computer, reading lamps, etc. out of your sleep sanctuary.
- Relaxation techniques
 - The most widely known technique is called progressive relaxation training. First tense and relax the feet, then the legs, then the hands, then the arms, and so on. Concentrate on controlling breathing and think about the pleasant sensations. When people practice this technique during the day and before bedtime, it can be very effective in removing anxiety that interferes with sleep both at the beginning and in the middle of the night.
- Stimulus Control
 - Abolish as much as possible stimulating activities or thoughts as bedtime approaches. Imagine how difficult it is to go to sleep after watching the evening news, seeing stories on rape, murder, fatal accidents, and corruption, and then wonder why you can't sleep.
 - Other pitfalls include doing homework, paying bills, or checking e-mail right before going to bed. People have the misguided belief that they are making good use of their time by getting a jump on tomorrow's headaches. But focusing on things that cause psychological arousal right before bed is more likely to disturb sleep and undermine productivity the next day.
- Cognitive Techniques
 - Techniques that engage the mind with some simple, repetitive problem. Counting sheep is the classic example. Some people use repeated calculations, such as starting with a number (say, 1000) and subtracting another number (say 17) again and again.
 - Another method is to make staying awake a goal. Trying to stay awake for as long as possible often counteracts the fear of not being able to sleep. Doing so, patients relax enough to let their sleep debt take over, and they drift off to sleep.
- Sleep State Restriction
 - This technique is for patients who exaggerate their symptoms or have honest misperceptions about their sleep but cannot accept the possibility that they might be able to sleep normally. They start out going to bed at 3 AM and getting up at 7 AM. After sleeping only four hours the patient usually has built up a lot of sleep debt and feels pretty sleepy. Then they add half an hour of sleep every night until a week later the patient is up to a solid seven and a half hours a night.

Alternative Therapies

- Hypnosis
 - A hypnotic trance is not the same thing as sleep, but it may be a good relaxation technique, similar to meditation. Self-hypnosis, meditation, and yoga can put the body and mind at ease and ready for sleep.
- Biofeedback
 - A technique whereby patients learn how to monitor and control physiological responses. Patients are hooked up to machines that monitor electrical resistance in the skin or brain waves. Through feedback from the machine, they can learn consciously to control physiological tension and relaxation.
- Acupuncture
 - There have been no good (scientific) studies of the benefits of treating insomnia with acupuncture or acupressure, although some practitioners claim they can treat insomnia successfully 90 percent of the time.
- Massage
 - Massage helps people relax physically and mentally, and as a result masseurs report that people often fall asleep on the massage table. Of course, to be most effective the massage would have to be given right at bedtime, in your own bed.
- Herbs and Home Remedies
 - Valerian, herbal teas, warm milk, etc. have not been well tested scientifically. If you try them and they help you, that's fine, especially if you have transient insomnia and don't want to take prescription sleeping pills. But for chronic insomnia, if you really want to get answers, talk to a sleep specialist.

Medicinals

- Melatonin
 - It is a hormone secreted by the pineal gland in the brain that lets the body know that it is dark outside. In humans it directs the body to prepare for sleep; for nocturnal animals like rats, its release is a sign to start waking up.
 - The sleep-inducing effect of melatonin works in counterpoint to the alerting effect of light. In very low doses (up to 0.5 milligrams for the average adult), melatonin can shift the phase of the biological clock when it is synchronized with changing light levels. For example, if you usually cannot get to sleep before 1:00 A.M., you may be able to get to sleep earlier by ingesting melatonin shortly after the sun sets.
 - Taking melatonin at night causes a phase-advance (earlier to bed and earlier to rise), whereas melatonin in the morning induces a phase-delay (later to rise and later to bed).
 - Melatonin delays the onset of puberty in adolescents – children should avoid taking melatonin unless directed by a physician.
- Sleeping pills
 - There are a lot of misconceptions about sleeping pills.
 - In the past, they were addictive and worked by depressing the central nervous system enough to cause unconsciousness and, at higher doses, death.
 - Modern formulations are safer and more effective. They tend to act as a hypnotic; they are short-acting and non-addicting.

- Many family physicians do not prescribe sleeping pills; if you have exhausted all other methods of getting to sleep, and cannot convince your family physician of the importance of your getting more sleep seek out a sleep specialist who can work with you.
- Over-the-Counter Medications
 - These tend to be antihistamines which were developed as allergy medications, affecting the immune system.
 - The body starts to become tolerant of the medications the longer they are taken, making you vulnerable to “rebound” insomnia when you stop taking the medication.
 - Sleep specialists generally recommend against taking over-the-counter sleeping pills for insomnia.

Common Sleep Disorders: It is beyond the scope of this workshop to discuss sleep disorders. Please refer to the resources listed above.