

Refresh

The science of sleep for optimal performance and well being



Unit 1: Introduction

For years scientists have been studying sleep and how it relates to quality of life. When your grandmother admonished you to get your “beauty sleep” she wasn’t kidding. Research has shown that good sleep doesn’t only lead to beauty, but also can have beneficial results like:

Better mood...

Improved academic performance...

Less trouble with weight management...

This program is all about helping you maximize the benefits of sleep. The strategies and skills this program teaches are part of cognitive behavioral therapy for insomnia. These skills, when taught by a trained therapist, are more effective than sleeping medications for improving sleep over time. While this program is not therapy to treat a clinical condition, with little effort, you can improve your own sleep using some of the same highly effective strategies. Give it a try and see what happens...

Like everything, good sleep takes practice. You don’t have to take cat naps every hour or go on one of those wellness retreats, you just need to spend a few minutes each day thinking about your sleep in the right way. To get the most out of the program, plan on doing both of the following:

1. Allow yourself 10 to 15 minutes every week to complete a new section of the program, for the next 8 weeks. This first unit teaches you some basic facts about sleep and introduces you to the 30 second sleep diary.
2. Between weekly units, practice the new healthy sleep habits and skills you’ll be learning.
3. Every morning when you wake up (or as early in the day as you can), fill out the 30 Second Sleep Diary. Recording your sleep habits on this form will help you track your progress.

If you are having a lot of trouble falling or staying asleep, the strategies in this program can be really helpful. However, this is not a substitute for medical care. If you are concerned about your sleep you should talk to your health care provider.

You can learn about insomnia and its treatment at the following article written by an expert in the field and posted on the following web-site:
<http://knol.google.com/k/rachel-manber/insomnia/uxU6QvKMt/zohsqt#>

Some of the biology of sleep can be pretty interesting, even to the non-scientists. Below is a brief description of sleep stages. For a more in-depth introduction, see the sleep foundation website:

http://www.sleepfoundation.org/atf/cf/%7BF6BF2668-A1B4-4FE8-8D1A-A5D39340D9CB%7D/Sleep-Wake_Cycle.pdf

There are two basic types of sleep: rapid eye movement (REM) sleep and non-rapid eye movement sleep (NREM). Sleep begins with NREM sleep, progressing through the three basic NREM sleep stages, sleep stages 1 and 2 and slow wave sleep (described below). NREM sleep is then followed by a relatively short REM sleep episode. The time between falling asleep and the end of the REM episode constitutes a sleep cycle.

NREM sleep

Stage 1: Stage 1 of NREM sleep is very light sleep and it occurs during transitions from awake to asleep. Your muscle tone begins to decrease during this stage but slow eye movement continues. You probably don't even notice you're sleeping at this stage. Hopefully your chemistry professor doesn't either.

Stage 2: During this stage of sleep, eye movements stop, and brain waves slow—with intermittent rapid wave bursts called "sleep spindles". Most people when woken-up from stage 2 sleep realize they were sleeping. You can probably see this when you wake up your roommate, as he slowly opens his eyes, realizes that you woke him, and begins to look for something to throw at you.

Stages 3 and 4 (slow-wave sleep): In these stages brain waves slow further to a pattern called "delta waves" mixed with occasional spurts of faster waves. Heart rate and body temperature continue to drop, along with blood pressure and muscle tone. Eye movements remain absent. Your friend that slept through the fire drill was probably in these stages. This is the deepest most restorative stage of sleep. If your alarm clock goes off during slow-wave sleep, you may feel confused and groggy for several minutes after waking up.

REM sleep

This is when you do most of your dreaming, and is a time when your brain is actively encoding lessons learned in class recently (but you have to be awake in class to actually learn the lessons). Some people have called this type of sleep paradoxical sleep because it involves relatively fast brain activity and irregular heart rate and blood pressure, as well as characteristic rapid eye movements. During REM sleep your limbs are temporarily paralyzed, perhaps to keep your body from acting out action packed dreams. Lucky, because your roommate is really not a Rambo fan, especially when elephants are involved.

Your sleep progress through these cycles of NREM and REM sleep-architecture components about every 90 minutes. Your brain engages in most slow wave sleep earlier in the night, which will ensure you get enough of this most restorative sleep state even if you cut your night short by an early morning exam.

Scientists don't fully understand the function(s) of sleep. They do know that you need sleep for optimal physical and mental well being. During sleep, cells manufacture more proteins, suggesting sleep is a time when the body

repairs itself. During childhood growth occurs primarily during sleep. Adequate sleep is necessary for healthy immune function, which is in part why so many students end up sick soon after a week of exams and sleep deprivation (the other part may or may not be due to the post-exam parties). Over a long term, not getting enough sleep may contribute to high blood pressure, obesity, and diabetes.

Insufficient sleep may also impact your psychological well-being, including: poor memory, poor judgment, fatigue, and increased risk of accidents. As sleep deprivation continues, feelings of sadness and exhaustion increase and bouts of irritability and anger are more frequent. So when you fail your exam after pulling four consecutive all-nighters, you're probably going to feel even worse about it than you would normally, if that's possible.

A small study recently published in Behavioral Sleep Medicine found that students who engage in all night study efforts actually end up with a worse GPA (Thatcher, 2008). Next time your suite mate brags about the all nighter she pulled, feel free to chuckle and volunteer this information.

Many college students do not sleep well. A recent study found that among a random sample of students at a public university:

- Most students reported later bedtimes and wake-up times on weekends than on weekdays (shocking, we know)
 - 33% took longer than 30 minutes to fall asleep
 - 43% woke more than once nightly
 - More than one third said they were tired during the day
- (Forquer et al, 2008)

In spite of all of the above...

“DON'T LOSE SLEEP OVER NOT BEING ABLE TO SLEEP.” (Statement credited to William Dement, the father of sleep medicine)

Sleep, like adequate nutrition, is necessary for optimal health. However, obsessing over the sleep you're not getting can actually keep you awake. On the other hand, adopting a few healthy sleep habits will allow your brain to get into the sleep groove. This program will teach you how to make good lifestyle choices to make sleep easy.

Practice suggestion:

For this week, begin using the following sleep log. Print and keep it in a place where you can fill it out quickly every morning, or as early as possible after getting up for the day. You'll be surprised how much of these details you forget as the day goes by. Save your sleep logs because you'll need them to successfully implement this program and to track your progress over the next several weeks.

Thirty Second Sleep Diary:

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Time you went to bed last night:							
Time you got out of bed this morning:							
Number of minutes you estimate it took you to fall asleep last night:							
Number of times you remember waking up in the middle of the night:							
Total number of minutes you estimate you were awake in during the night:							
Total amount of sleep you had last night:							
Number (none=0) alcoholic beverages you consumed before going to bed last night:							
Did you take any sleeping medication last night (record "yes" or "no")? If yes specify.							
How much did you enjoy sleeping last night? 0 1 2 3 Not at all Very much							
How refreshed do you feel this morning? 0 1 2 3 Not at all Very much							

Adapted from Morin, C.M., and Espie, C.A., *Insomnia: A Clinical Guide to Assessment and Treatment*, Springer 2004.