

Introduction to Sleep

We usually think of **sleep** as a block of time in which our body relaxes and rests. In fact, it happens in stages, and many body processes occur when we sleep. When we do not sleep enough, or when the timing of our sleep stages is altered, our health and quality of life suffer. Fortunately, we can improve our sleep.

What Happens When We Sleep

- Sleep is a time of reduced activities, and we usually do not respond to the environment when we sleep.
- Sleep come in different stages (see box on the right).
- When we sleep, many body processes happen:
 - Our cells stock up on resources to prepare for the next day's activities
 - Our body grows and repair tissues
 - Our body produces various compounds with different functions, e.g. help fight infections, manage energy use, control blood sugar
 - Our heart and blood vessels get a rest, since we do not need to use as much energy
 - Our brain organizes the information that we learned so that we can access and remember it more easily.

How much sleep is enough?

Some children need more sleep than others. How much sleep we need depends on our personal situation. For example, we need more sleep when we are sick, injured, or recovering from a medical procedure.

The sleep duration listed in the table below is just a guide. It is important to ask: **“How much sleep does my child need to feel well-rested?”** To find out, let the child sleep until he/she wakes up on his/her own for at least 3 days. You can also use this [bedtime calculator](#) to find the right bedtime.

Age	Recommended # hours of sleep
Birth – 3 months	14 – 17 hours
4 – 12 months	12 – 16 hours (including nap time)
1 – 5 years	10 – 14 hours (including nap time)
6 – 12 years	9 – 12 hours
13 – 18 years	8 – 10 hours
18+ years	7 – 9 hours

Stages of Sleep

There are 3 main states of sleep: **wake**, Non-rapid eye movement (**NREM**) sleep, and rapid eye movement (**REM**) sleep.

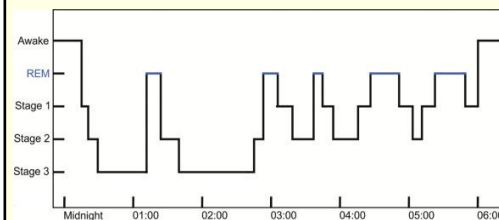
NREM 1 – light sleep; easily awakened; muscles relax with some twitches; slow eye movements

NREM 2 – eyes do not move; slower brain waves with some bursts of rapid brain waves

NREM 3 – deep sleep; hard to awaken; large slow brain waves; heart and breathing rates are slow; muscles are relaxed

REM – first happens ~90 minutes after we fall asleep; rapid eye movements; irregular breathing, heart rate, & blood pressure; dreaming happens; arm and leg muscles are temporarily unable to move

Here is a **hypnogram** that shows the distribution of sleep stages for an adult.



Source: Figure 1.3, [The Basics of Sleep Physiology and Behavior](#), available on [sciencedirect.com](#).

For information about the stages of sleep and for hypnograms of children, young adults, and elderly, see Figure 1.1 in **A Clinical Guide to Pediatric Sleep: Diagnosis and Management of Sleep Problems** ([Chapter 1 is available on Google Books](#))

If the timing of the sleep stages are changed, we may not feel rested and/or may have a sleep disorder.

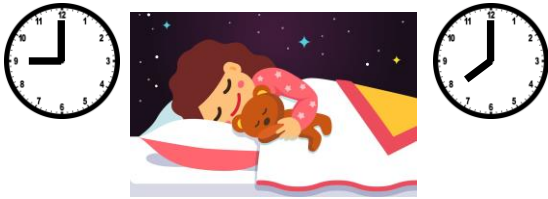
Introduction to Sleep (continued)

What Happens When We Don't Sleep Enough

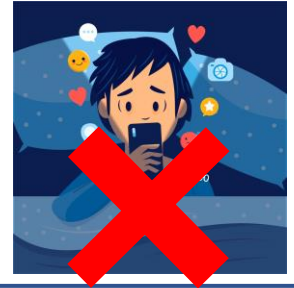
People who do not sleep enough have trouble thinking, focussing, and reacting. They may be cranky, moody, or anxious. They may get headaches and get sick easily. The lack of sleep can also contribute to long-term health problems including heart disease and type 2 diabetes. Therefore, it is important to develop good sleep hygiene and get enough good quality sleep.

Tips for Getting Enough Good Quality Sleep

1. Wake up and go to sleep at the same time every day in a quiet and darkened room.



2. Avoid using electronic screens before bedtime, as the bright light will disrupt our body's sleep-wake functions.



3. Stay active during the day. It can help with the quality of sleep.



4. Avoid taking naps late in the day.



5. Avoid eating or drinking before bedtime. Avoid caffeine and alcohol in general.



6. Avoid using sleep medications unless they are prescribed by your healthcare provider.



Illustrations from [Freepik.com](https://www.freepik.com)

Resources

- [Sleep](#) – Cleveland Clinic, USA
- [Sleep: An Essential Element of Success for Children](#) – Mayo Clinic, USA
- [Sleep for Children and Youth](#) – Children's Hospital of Eastern Ontario, Canada
- [American Academy of Sleep Medicine \(AASM\)](#)
- [Sleep is Good Medicine \[Videos\]](#)– American Academy of Sleep Medicine
- [How Sleep Works | Your Guide to Healthy Sleep](#) – National Heart, Lung, and Blood Institute, USA
- [A Clinical Guide to Pediatric Sleep: Diagnosis and Management of Sleep Problems](#) – Text book, [partially available on Google Books](#). The appendices (which are not available on Google Books) provide sleeping tips for newborns all the way to teenagers.