

# Sleep: A Primer

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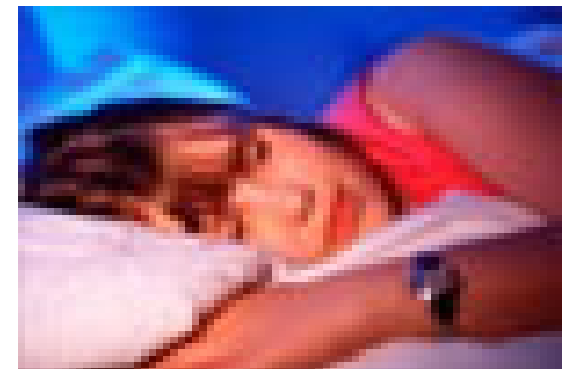


# Why do we sleep?

- Why do we sleep? This is a question that has had scientists puzzled for centuries. The answer: no one really knows for sure! Some believe that sleep gives the body a chance to gain strength from the day's activities but in reality, the amount of energy saved by sleeping for even eight hours is tiny - about 50 kilocalories, the same amount of energy in a piece of toast!
- We have to sleep because it is needed to sustain normal levels of cognitive skills such as speech, memory, and innovative and flexible thinking.

# What happens when we don't sleep?

- A good way to understand the role of sleep is to look at what would happen if we didn't sleep. Lack of sleep has serious effects on our brain's ability to function.
- With continued lack of sufficient sleep, the part of the brain that controls language, memory, planning and sense of time is severely affected, practically shutting down. In fact, 17 hours of continuous sleeplessness leads to a decrease in performance that is equivalent to a blood alcohol level of two glasses of wine(0.05%).



# What happens when we don't sleep?(2)

- Sleep deprivation not only has a major impact on cognitive functioning but also on emotional and physical health. Disorders such as sleep apnea, a temporary suspension of breathing, occurring in some newborns (infant apnea) and in some adults during sleep, which result in excessive daytime sleepiness that have been linked to stress and high blood pressure. Research has also suggested that sleep loss may increase the risk of obesity because chemicals and hormones that play a key role in controlling appetite and weight gain are released during sleep.



# What happens when we sleep?

- What happens every time we get a bit of shut eye? Sleep occurs in a recurring cycle of 90 to 110 minutes and is divided into two categories: non-REM (which is further split into three stages) and REM sleep.
- REM stands for rapid eye movement.

# Non-REM sleep



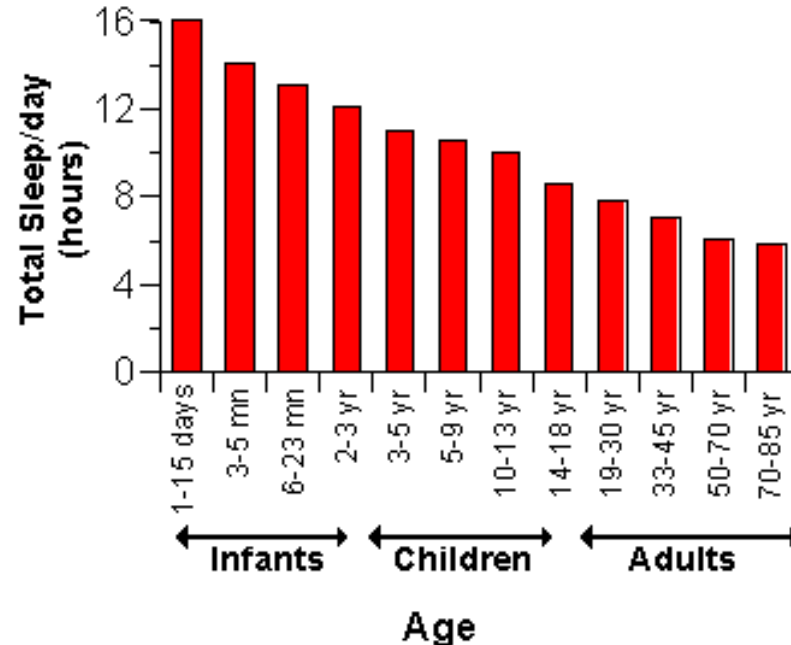
- During the first stage of sleep, we're half awake and half asleep. Our muscle activity slows down and slight twitching may occur. This is a period of light sleep, meaning we can be awakened easily at this stage.
- Within ten minutes of light sleep, we enter stage two, which lasts around 20 minutes. The breathing pattern and heart rate start to slow down. This period accounts for the largest part of human sleep.
- During stage delta, the brain begins to produce delta waves, a type of wave that is large (high amplitude) and slow (low frequency). Breathing and heart rate are at their lowest levels. If we are awakened during deep sleep we do not adjust immediately and often feel groggy and disoriented for several minutes after waking up. Some children experience bed-wetting, night terrors, or sleepwalking during this stage.

# REM Sleep

- The first Rapid Eye Movement (REM) period usually begins about 70 to 90 minutes after we fall asleep. We have around three to five REM occurrences a night.
- Although we are not conscious, the brain is very active - often more so than when we are awake. This is the period when most dreams occur. Our eyes dart around, and our breathing rate and blood pressure rise. However, our bodies are effectively paralyzed, which is said to be nature's way of preventing us from acting out our dreams.
- After REM sleep, the whole cycle begins again.

# How much sleep is required?

- There is no set amount of time that everyone needs to sleep, since it varies from person to person. Results from the sleep profiler indicate that people like to sleep anywhere between 5 and 11 hours, with the average being 7.75 hours
- How long people sleep a day on average:



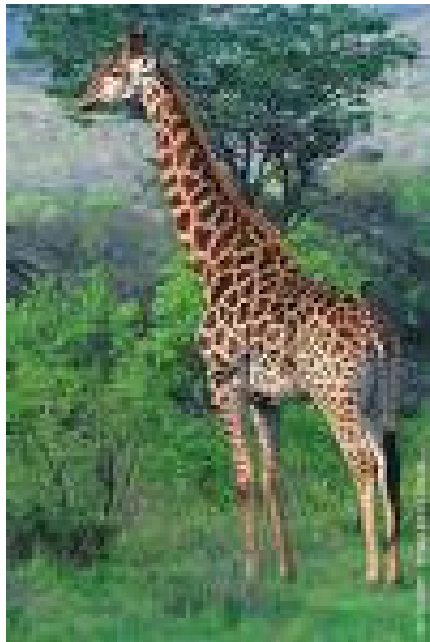




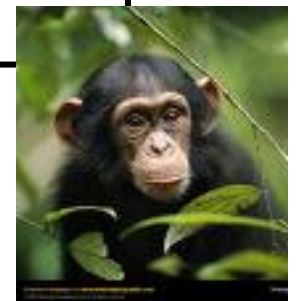
# Animal Sleep



- Animals, like humans also have a required certain amount of sleep:



SPECIES	Average total sleep time per day
Python	18 hours
Tiger	15.8 hours
Cat	12.1 hours
Chimpanzee	9.7 hours
Sheep	3.8 hours
African Elephant	3.3 hours
Giraffe	1.9 hours



# Sleep Facts

- We spend a third of our lives sleeping.
- Napoleon, Florence Nightingale and Margaret Thatcher slept four hours a day.
- Thomas Edison claimed that sleep was waste of time.



- Research also shows that sleep-deprived individuals often have difficulty in responding to rapidly changing situations and making rational judgments. In real life situations, the consequences are grave and lack of sleep is said to have been a contributory factor to a number of international disasters such as Exxon Valdez, Chernobyl, Three Mile Island and the Challenger shuttle explosion.
- <http://www.bbc.co.uk/science/humanbody/sleep/sheep> -  
->do the sheep dash to see how alert you are!

# References (sites used)

- [www.patrickautissier.org/downloads/sleep.ppt](http://www.patrickautissier.org/downloads/sleep.ppt)
- [www.bbc.co.uk/science/humanbody/sleep/articles/whatisleep.shtml](http://www.bbc.co.uk/science/humanbody/sleep/articles/whatisleep.shtml)
- <http://faculty.washington.edu/chudler/sleep.html>
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