

The Brilliant Brain

Week 7 - Sleep and Dreaming



Question:

- Why do humans need to sleep?
- What would happen if you went without sleep for an extended period of time?



Sleep is an essential part of life

There are many important functions of sleep, such as:

1. Allowing our brain to process information
2. Repairing our body
3. Improving our immune system
4. Keeping our mood regulated

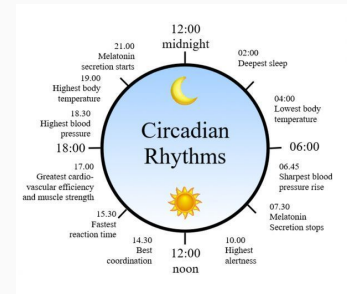


Why do we feel tired?

In healthy people, our bodies follow a schedule known as a **circadian rhythm**.

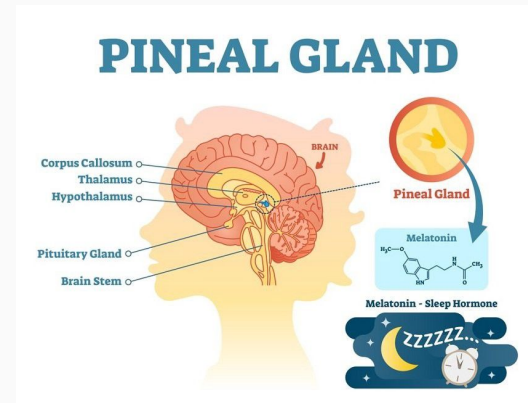
This allows us to feel most awake during the day, and more drowsy at night to promote sleeping.

One of the main chemicals that controls this is called **Melatonin**.



Melatonin

- Melatonin is a natural hormone made by a part of your brain called the pineal gland.
- This is a pea-sized gland located just above the middle of the brain.
- During the day the pineal gland is inactive. When the sun goes down the pineal begins to produce melatonin, which is released into the blood. Usually, this occurs around 9 in the evening.
- As a result, melatonin levels in the blood rise sharply and you begin to feel less alert. Sleep becomes more inviting.



There are a number of different phases of sleep:

- NREM Stage 1
- NREM Stage 2
- NREM Stage 3
- REM Sleep

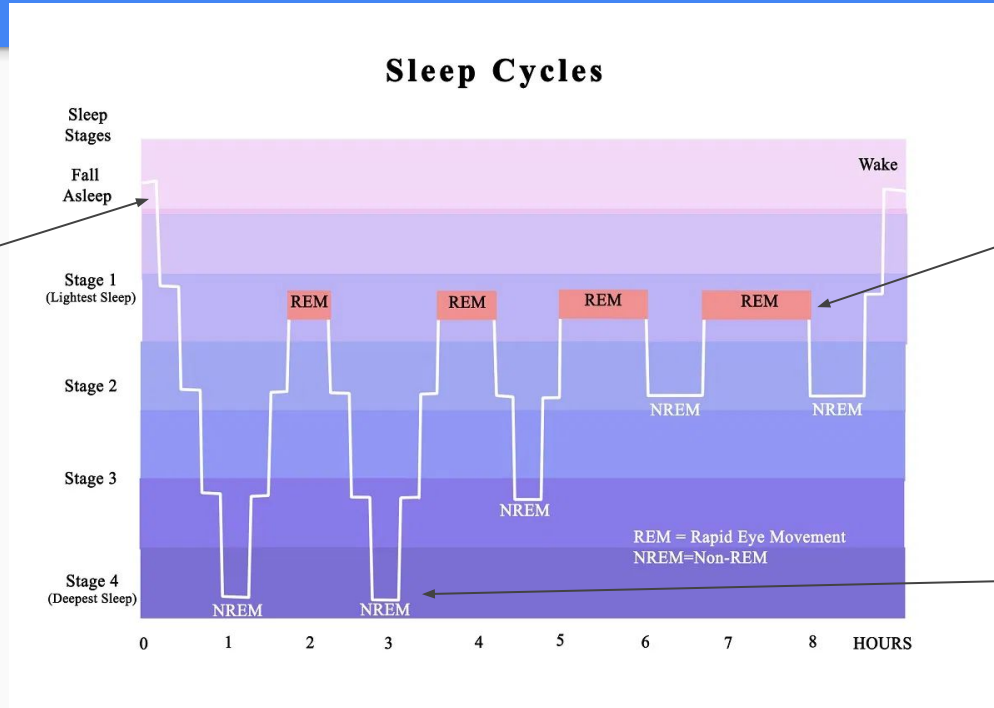


- NREM stands for **Non-Rapid Eye Movement**. These phases of sleep take up the majority of the time someone is asleep
- REM stands for **Rapid Eye Movement**. This is the period of sleep where dreaming happens



This is what a sleep cycle looks like:

This is when someone is trying to fall asleep



This is REM sleep, when the person is dreaming

This is the deepest point of sleep

- **NREM Stage 1** sleep is known as a drowsy sleep stage and can be easily disrupted causing awakenings or arousals. People can feel like they are falling as they slip into this stage, have you ever felt that before?
- In **NREM Stage 2** it is not as easy to wave someone up as it is in stage 1. In this stage body temperature begins to decrease and heart rate begins to slow.
- In **NREM Stage 3** it is often difficult to awaken someone in Stage 3 sleep. Sleepwalking, sleep talking and nightmares occur during this stage of sleep.
- **REM Sleep** is most commonly known as the dreaming stage. Eye movements are rapid, moving from side to side. If someone is woken during a REM period they often feel very groggy and more tired than when they went asleep



How did they discover the different stages of sleep?

By using a test called

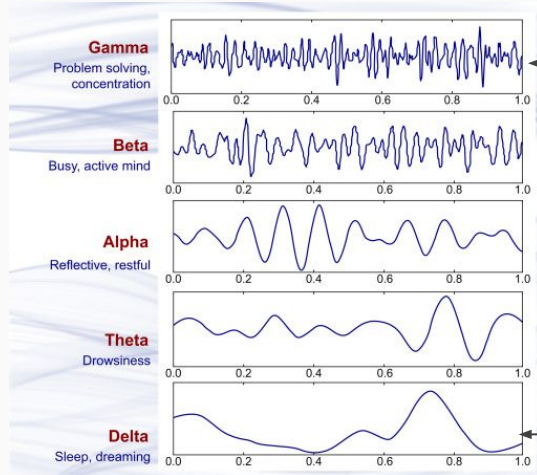
An **EEG**

These patches are known as electrodes, they detect electrical activity in the brain



An electroencephalogram (EEG) is a test used to evaluate the electrical activity in the brain.

Different phases of activity and alertness produce different waves on an EEG



The most active waves are called Gamma waves, which appear when someone is concentrating very hard

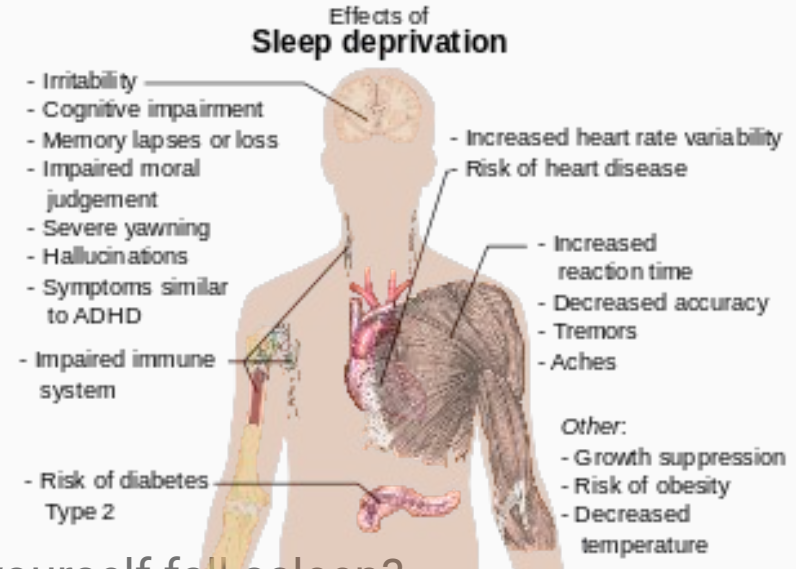
Delta waves are the slowest waves, which are seen when someone is asleep!

What do you think happens if someone doesn't get enough sleep?

Sleep deprivation means not getting enough sleep



There are a huge amount of consequences of sleep deprivation



Can you think of anything you do to help yourself fall asleep?

Why do we dream?

Can you think of any dreams/nightmares you have had recently?

What exactly is a dream?



- Dreams are sequence images, sounds and feelings experienced during sleeping
- Did you know that by the age of 65 the average person will sleep 175,200 hours, dream 87,000 hours with an average of 197,000 dreams!

- No one really knows for sure why we dream
- Some theories suggest that dreaming is the brain's way of processing information that it has acquired over the course of the day
- Other theories suggest that dreams display our desires and wishes

Did you know:



You forget about 50% of your dream within only five minutes of waking up.

12% of the people of the world have dreams in black and white.

On average, a person can have four to seven dreams within a night.

Why do we dream: <https://www.youtube.com/watch?v=jYu966AONZI>

There are a number of common problems that can occur with sleep:

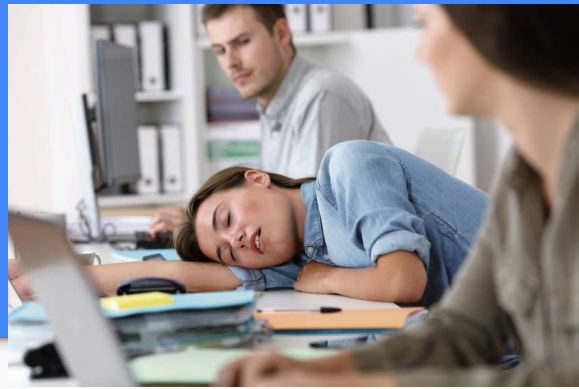
Nightmares

Most people have nightmares once in a while. But frequent nightmares can disrupt sleep patterns by waking someone during the night. If someone is anxious or stressed, they might be more likely to have frequent nightmares. Certain medicines can also trigger nightmares

Thankfully there are some medicines and therapies that can help people who suffer from nightmares



Narcolepsy

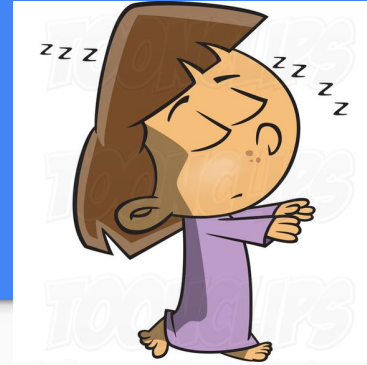


Narcolepsy is a sleep problem where people feel overwhelming drowsiness during the day and can suffer from sudden attacks of sleep. People with narcolepsy often find it difficult to stay awake for long periods of time.

Narcolepsy can be disturbing because people fall asleep without warning, making it hazardous to do things like drive. A person's school, work, or social life can be affected by the unusual sleep patterns.

Doctors usually treat narcolepsy with medicines and lifestyle changes.

Sleepwalking



- Sleepwalking can happen quite commonly for kids, but as you get older you are less likely to sleepwalk
- Sleepwalking happens most frequently in NREM Stage 3
- The most common things that people do when they're sleep walking include **have a shower, brush their teeth and even walk their dog!**

Insomnia



Insomnia is a common sleep disorder that can make it hard to fall asleep, hard to stay asleep, or cause you to wake up too early and not be able to get back to sleep.

Thankfully, it isn't as common in children but can become more common in adulthood.

Insomnia can produce all of the same effects as sleep deprivation, such as daytime tiredness, headaches and low mood.

Activity: Keeping a sleep log

One way to keep track of your sleep is by keeping a **sleep log**

A sleep log tracks the number of hours you slept each night, and also looks at what you did throughout the day to see if there's any way you can improve your sleep schedule.

There is an example of a sleep log on the next slide:



Name: _____

Date: _____

Instructions: Complete this log for 2 weeks. If you're feeling tired during the day, see if you're getting the number of hours of sleep recommended for your age. Consider adjusting your sleep environment or habits if necessary. Make it a goal to reduce the number of days you feel tired by week 2.

Sleep Log

	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
Yesterday, I exercised for this many minutes:							
Yesterday, I: (check all that apply)							
Ate too much	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Didn't eat enough	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Had a drink with caffeine, like soda or tea	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Yesterday, I: (check one)							
Had lots of energy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Was tired all day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt sleepy in the afternoon	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Yesterday, I took a nap. (check one)							
True	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
False	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Last night, I went to bed at this time:							
Last night, I fell asleep at this time:							
Today, I woke up at this time:							
Last night, I slept for this many hours:							



- If you want you can keep track of your sleep using this sleep log, and see whether factors such as exercise or your diet has an effect on how you sleep!
- Another similar activity you can do is to keep a **DREAM JOURNAL**.
- This is where you keep a journal beside your bed to write down any dreams that you had before you forget them
- You can discuss **where the dream was, who was in it, how it made you feel and how you feel now that you're awake.**