

# SLEEP, BIOLOGICAL RHYTHMS & THE BRAIN

## Why do we need to sleep?

Sleep is important for several functions of the human body.

1. Forming long-term memories.
2. Waste is removed from your brain during sleep by **cerebrospinal fluid**.
3. Long periods of sleep are needed for important functions, such as restoring the defensive (immune) cells, tissue repairs, muscle growth and making hormones.

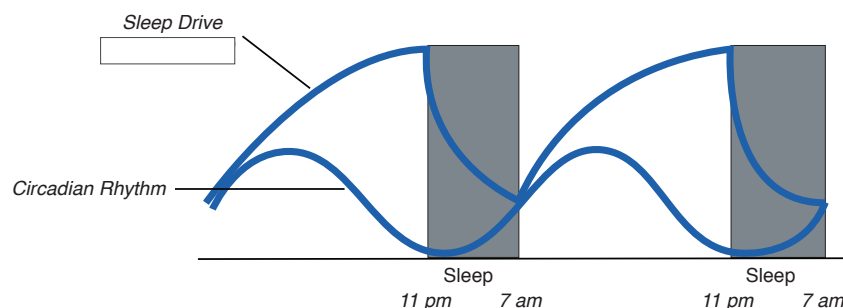
Scientists do not understand the whole picture yet! However, people with mental illnesses such as depression, experience changes in sleep, such as sleeping too much or sleeping too little.

## How does the body know when it needs to sleep?

The diagram below shows two processes which regulate when you need to sleep.

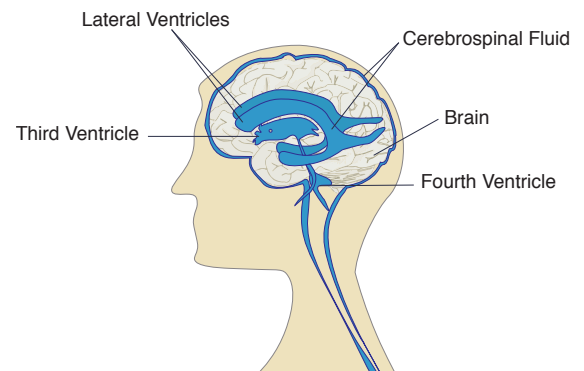
The **sleep drive**, which is caused by your daily activities, is at its lowest when you wake up and increases throughout the day. When you sleep, your sleep drive decreases.

Another process, called the **circadian rhythm** is your 24 hour biological clock, which synchronizes your body functions (e.g. your sleep) to the environment (e.g. how much light you are exposed to). This way, the timing of your light exposure also affects the timing of when you go to sleep.



## DEFINITIONS

**Cerebrospinal fluid** - a clear, colourless fluid that bathes the brain and spinal cord. Contained in a system of fluid-filled cavities within the brain called ventricles. Cushions and protects the brain within the skull, plays role in clearing waste.



**Circadian Rhythms** - approximately 24 hour cycles of biological processes in animals and plants - your internal body clock.

**Fun Fact:**  
 Dreaming happens during a sleep stage called Rapid Eye Movement (REM) sleep

## How many hours of sleep do I need?

Sleep and activity patterns are different from person to person, but on average, the American Academy of Sleep Medicine recommends:

Age	Recommended Daily Sleep
4-12 Months	12-16 hours, including naps
1-2 Years	11-14 hours, including naps
3-5 Years	10-13 hours, including naps
6-12 Years	9-12 hours
13-18 Years	8-10 hours
Adult	7+ hours

## How can I get better sleep?

Here are a few different steps you can take to make sure you get a good night's sleep.

### SLEEP HYGIENE: TIPS FOR GETTING BETTER SLEEP

1. Limit your naps to 30 minutes
2. Avoid drinking coffee close to bedtime
3. Exercise!
4. Sleep in the darkness - don't use electronic devices at night
5. Make your sleep environment comfortable
6. Don't eat heavy foods before sleep
7. Have a regular, relaxing bedtime routine
8. Spend time outside to expose yourself to natural light

## Word Search

C L O C K X S Y S T E M P S F	BIOLOGICAL	NAPS
E T V V O B S T I N P S M L Y	BRAIN	NIGHT
R I Z K V I S E O F T H G I L	CAFFEINE	REST
E N V I R O N M E N T V N D Z	CEREBROSPINAL	RHYTHMS
B O S M N L R P I Y E K R W C	CIRCADIAN	SEASON
R N H M F O K E H T L O Z X N	CLOCK	SLEEP
O G G U H G S R S N C W T K L	CORD	SPINAL
S S D N A I D A C R I C V V T	DARK	SUN
P O H E L C W T E E R G B L C	ENVIRONMENT	SYSTEM
I U A V N A V U H S T K H N K	FLUID	TEMPERATURE
N V D I U L F R L T N L R T G	HORMONE	VENTRICLE
A H J L S J P E N I E F F A C	IMMUNE	WASTE
L Q I C P K E W A D V W N Z D	LIGHT	
Q X C O E P T R P K E B G S F		
B Z P M A D B F S O D A G X E		