Sleep: Everything You Need To Know On Sleep

Introduction: What is sleep and why do we sleep?

Sleep is essential to your everyday life. Living things need sleep to rest and restore their bodies. Sleep is important to both mental and physical health. A lack of sleep can lead to multiple health problems. There are multiple structures of the brain that are associated with sleep.There are two different stages of sleep; Rapid eye movement also known as REM and Non-Rapid eye movement known as Non-REM.

How much sleep do you need?

Newborns that are 0-3 months old need 14-17 hours of sleep

Infants that are 4-11 months old need 12-15 hours of sleep

Toddlers that are 1-2 years of age need 11-14 hours of sleep

Preschool children that are 3-5 years of age need 10-13 hours of sleep

School-age children that are 6-13 years of age need 9-11 hours of sleep

Teenagers that are 14-17 years of age need 8-10 hours of sleep

Young adults that are 18-25 years of age need 7-9 hours of sleep

Adults that are 26-64 years of age need 7-9 hours of sleep

Older adults 65+ years of age need 7-8 hours of sleep

As you age, it is clear to see that the amount of sleep your body needs changes. In order to function best on daily performances and maintain good health, a sufficient amount of sleep is crucial.

What parts of the brain are associated with sleep?

"The **hypothalamus**, a peanut-sized structure deep inside the brain, contains groups of nerve cells that act as control centers affecting sleep and arousal.

The **brain stem**, at the base of the brain, communicates with the hypothalamus to control the transitions between wake and sleep.

The **thalamus** acts as a relay for information from the senses to the **cerebral cortex** (the covering of the brain that interprets and processes information from short- to long-term memory).

The **pineal gland**, located within the brain's two hemispheres, receives signals from the SCN and increases production of the hormone *melatonin*, which helps put you to sleep once the lights go down.

The **basal forebrain**, near the front and bottom of the brain, also promotes sleep and wakefulness, while part of the **midbrain** acts as an arousal system.
The **amygdala**, an almond-shaped structure involved in processing emotions, becomes increasingly active during REM sleep." (ninds.nih.gov,1)

Sleep Stages

The are two different types of sleep; Rapid eye movement also known as REM and Non-Rapid eye movement known as Non-REM.There are three stages of sleep. They consist of light sleep, REM sleep, and deep sleep.

"Stage 1 non-REM sleep is the changeover from wakefulness to sleep. During this short period (lasting several minutes) of relatively light sleep, your heartbeat, breathing, and eye movements slow, and your muscles relax with occasional twitches. Your brain waves begin to slow from their daytime wakefulness patterns.

Stage 2 non-REM sleep is a period of light sleep before you enter deeper sleep. Your heartbeat and breathing slow, and muscles relax even further. Your body temperature drops and eye movements stop. Brain wave activity slows but is marked by brief bursts of electrical activity. You spend more of your repeated sleep cycles in stage 2 sleep than in other sleep stages.

Stage 3 non-REM sleep is the period of deep sleep that you need to feel refreshed in the morning. It occurs in longer periods during the first half of the night. Your heartbeat and breathing slow to their lowest levels during sleep. Your muscles are relaxed and it may be difficult to awaken you. Brain waves become even slower. REM sleep first occurs about 90 minutes after falling asleep. Your eyes move rapidly from side to side behind closed eyelids. Mixed frequency brain wave activity becomes closer to that seen in wakefulness. Your breathing becomes faster and irregular, and your heart rate and blood pressure increase to near waking levels. Most of your

dreaming occurs during REM sleep, although some can also occur in non-REM sleep. Your arm and leg muscles become temporarily paralyzed, which prevents you from acting out your dreams. As you age, you sleep less of your time in REM sleep. Memory consolidation most likely requires both non-REM and REM sleep."(ninds.nih.gov,2).

Dan Gartenberg is a sleep scientist who was on TED Talk. He spoke about the brain benefits of sleep and how to get more sleep. Gartenberg stated, "My research focuses on what many scientists believe is the most regenerative stage of sleep: deep sleep." (2:14-2:19). Deep sleep is when all of the restoration occurs throughout the body. Deep sleep can be controlled by certain sounds and would make sleep more efficient.

Sleep Deprivation and Sleep Disorders

Being sleep deprived for long periods of time can lead to potential serious health problems. "Some of the most serious potential problems associated with chronic sleep deprivation are high blood pressure, diabetes, heart attack, heart failure or stroke." (Cleavelandclinic,3). It can also lead to a change of appearance such as under eye bags or wrinkles at an early age. A lack of sleep can also affect memory, alertness, and your mood. "Sleep disorders involve problems with the quality, timing and amount of sleep, which cause problems with functioning and distress during the daytime. There are a number of different types of sleep disorders, of which insomnia is the most common. Other sleep disorders are narcolepsy, obstructive sleep apnea and restless leg syndrome."(psychiatry,1). Sleep disorders go hand-in-hand with physical health problems as well as mental health problems. Without sleep your brain wouldn't function properly.

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