Sleep Mechanisms Phases And Disorders

We as humans require sleep to function, and we actually spend one-third of our time performing the function of sleep. Sleep is way more complex than just hitting the pillow and closing your eyes. Sleep is important to a number of brain functions, including how nerve cells, or neurons communicate with each other. The brain and body actually stay active during sleep which may be surprising. Sleep affects almost every type of tissue and system in the body from the brain, heart, and lungs to metabolism, immune function, mood, and disease resistance. Research shows that a chronic lack of sleep, or getting poor quality sleep, increases the risk of disorders including high blood pressure, cardiovascular disease, diabetes, depression, and obesity. Sleep works in phases. As your body falls asleep and performs sleep functions your body moves from stage one of the sleep cycle all the way through to the 4th phase which is called REM. Sleep disorders can also occur and it’s very important we research them and are aware of how to treat them and stay healthy. There are many aspects of sleep, some of those aspects include the phases of sleep, mechanisms of sleep, and sleep disorders.

There are 4 stages or phases of sleep. There is stage 1,2,3, and REM sleep. Understanding the phases of sleep creates a better knowledge of sleep and can help you maintain healthy sleep patterns. In the first stage of non-REM sleep is the change from wakefulness to sleep. During this time that lasts several minutes in a light sleep, heartbeat, breathing, and eye movements slow down and your muscles begin to relax and sometimes twitch. Your brain waves also start to decrease and slow down. Stage 2 of non-REM sleep is defined as light sleep right before deeper sleep. During non rem sleep everything begins to slow down. Your body temperature also decreases and eye movements come to a stop. Brain wave activity also slows.

As for stage three, which is the stage your body spends most of its time in, this non-REM sleep is the period of deep sleep that is necessary for a refreshed energized morning. It occurs in longer periods and your heartbeat and breathing decrease all the way to their lowest levels. Your muscles also relax which makes it hard to awaken. Brain waves also decrease even slower. The last phase is called REM sleep, which first occurs about 90 minutes after falling asleep. Your eyes move from side to side behind your closed eyelids and your brain wave activity becomes closer to the activity when you are awake. Your breathing also increases and becomes faster and irregular, and your heart rate and blood pressure increase to levels that match near waking levels. When you dream, it mostly occurs during REM sleep, although for some people, it is also common for you to dream during non-REM sleep. Your arm and leg muscle movement also become temporarily paralyzed, which prevents you from acting out when you dream, which is a good thing and a REM sleep safety feature if you want to call it that. As you get older and older you sleep less of your time in REM sleep. Memory consolidation is also necessary for both non-REM and REM sleep.

There are many mechanisms of sleep, or systems that allow sleep to carry out the functions it does. One mechanism of sleep is called circadian rhythms, and their role in the function of sleep is to direct a diverse variety of functions, such as daily fluctuations in wakefulness and even body temperature, metabolism, and the release of hormones. Circadian rhythms also control your timing of sleep and cause you to be tired during the night time as well as allowing your body to wake up in the morning on its own without relying on and using an alarm clock to wake

you up. Scientists and researchers call circadian rhythms your body's biological clock, and it is primarily based on about a 24-hour day. Circadian rhythms also synchronize with environmental cues such as light, as well as temperature during the actual time of day, but they actually continue when no cues are available. Another mechanism of sleep or system that allows sleep to work is called sleep-wake homeostasis. You are most likely familiar with the term homeostasis if you have ever taken a biology class, and you know this function is very important and necessary for the body to work and function in a healthy way. Sleep-wake homeostasis keeps track of your need for sleep. What is called the homeostatic sleep drive reminds the body to fall asleep after a certain amount of time and it also regulates and controls your sleep intensity. The homeostatic sleep drive in fact becomes stronger as each hour passes that you are awake and it causes you to sleep for longer periods at a time and more deep sleep periods which occur after a period of sleep deprivation.

Sleep disorders are very common for people to get and you are probably familiar with some of them or might even relate to one. One particular sleep disorder that is the most common and most people are familiar with is called insomnia. Insomnia is defined as difficulty falling asleep and staying asleep, even when a person is given the chance to do so. Insomnia is typically characterized based on its duration. Acute insomnia is defined as brief and predominantly happens because of certain life circumstances. Chronic insomnia is disrupted sleep and it occurs at least three nights during each week and often lasts up to at least three months. Chronic insomnia disorders can be linked to several causes. Some of those causes include but are not limited to: changes in the environment, unhealthy sleep habits, shift in work, other clinical disorders, and also specific medications have been tied to long-term pattern of insufficient or the lack of healthy sleep. Sleep apnea is another common sleep disorder in the United States. Sleep apnea can occur when the upper airway gets blocked repeatedly during sleep, and it reduces or even stops your airflow entirely, which is very problematic and dangerous for your health. Central sleep apnea is when the brain does not send the signals needed to breathe. Sleep apnea can be caused by various factors that relate to ones'sphysical structure or medical conditions such as: obesity, large tonsils, endocrine disorders, neuromuscular disorders, heart or kidney failure, certain genetic syndromes, and premature birth. There are also a wid evariety of risk factors that cause sleep apnea, which also include: unhealthy lifestyle habits and environments, family history and genetics, race and ethnicity, and sex. You can prevent sleep apnea by making healthy life choices and eating a balanced diet. . Restless legs syndrome is another sleep disorder and it causes unpleasant and uncomfortable urges to move one's legs. The Symptoms of restless leg syndrome often occur during the late afternoon or evening hours, and happen worse at night when a person sleeping and sitting or lying in bed. Research shows that roughly 7-10 per cent of the U.S. population can have restless leg syndrome. Restless leg syndrome can occur in both men and women, however it is more common for women to get and have restless leg syndrome. The final sleep disorder I am going to discuss is called narcolepsy, and it is a neurological sleep disorder that is defined by chronic and excessive attacks of drowsiness during the day. "It is sometimes called excessive daytime sleepiness (EDS)Many individuals with narcolepsy experience weakness and the sudden loss of voluntary muscle tone (cataplexy). Narcolepsy with cataplexy (type 1) has been linked to low levels of a specific brain chemical called hypocretin (also known as orexin). The treatment of narcolepsy is directed toward the specific symptoms that are present in each individual," as said by the National Heart, Lung, and Blood Institute.

In conclusion, sleep is a very complex function and there are many branches of sleep such as the phases of sleep, mechanisms of sleep, and disorders of sleep. The phases of sleep include

stage 1, stage 2, stage 3, and REM sleep. Some mechanisms of sleep include but are not limited to Circadian rhythms and Sleep-wake homeostasis. Sleep disorders are very common and can be harmful to the body and some of those disorders include: SleepApnea, Restless Leg Syndrome(RLS), Insomnia, And Narcolepsy. It’s very important we are well informed about all of these aspects so that we can maintain our health and perform the functions of sleep efficiency and in a healthy way. It is very important and essential to one’s survival to the body to receive enough healthy and quality and sleep at the right times Without sleep your body can’t form or maintain the pathways in your brain that allow you to learn and create new memories, which makes it harder and more difficult to concentrate and respond in a quick manner. Sleep also affects about every type of tissue and system in the body, such as the brain, heart, and lungs to metabolism, immune function, mood, and disease resistance. An unhealthy lack of good quality sleep can be very dangerous to the body and increases the risk of various sleep disorders as discussed earlier and above and can also increase the risk of high blood pressure, cardiovascular disease, diabetes, depression, and obesity. Sleep is very complex and is way more than just laying down and shutting your eyes, and now you know how sleep really works.