

# Adaptive theory and the restorative theory of sleep



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Sleep is known as the circadian rhythms it's mean sleep-wake cycle. One cycle is one day and controlled by the hypothalamus. Sleep is very important to each person. There are 2 theories about sleep which is the adaptive theory and the restorative theory. The adaptive theory of sleep explaining about when we need sleep otherwise sleep at night to keep out of danger and converse the energy. The restorative theory explaining about why we need sleep otherwise sleep can growth and repair occurs in the deep sleep stage.

In spite of sleep may give people advantages, but some people might get disadvantages of it. Sleep might offer disorders to other people. There are common disorders that other people should know such as insomnia, sleep walking, sleep apnea, narcolepsy, night terrors, enuresis, circadian rhythms disorder, restless leg syndrome, nocturnal leg cramps. Insomnia is when someone has inability to get asleep for 4 month to 6 month, or difficulty to feel sleepy. Sleep walking is more common in childhood and more boys than girls. Night terrors is state of panic while sleeping and people who has night

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terrors syndrome will not remember what was happened once woken up. Sleep apnea is when people stop breathing for nearly half a minute while sleeping. Enuresis is urinating while asleep in bed. Restless leg syndrome is uncomfortable sensations in legs causing loss of sleep and movement. Nocturnal leg cramps is painful cramps in foot muscles. Circadian rhythms disorders is instability of the sleep-wake cycle such as jet lag and shift work. And narcolepsy is a sleep seizure and occurs without warning. The aim for this assignment is to know further information only about narcolepsy disorder, what causes of narcolepsy, what are the symptoms of narcolepsy, how is narcolepsy diagnosed and how is narcolepsy treated.

Further more about definition of narcolepsy is a chronic sleep disorder characterized by overwhelming daytime tiredness and sudden attacks of sleep and it is a chronic disease of the central nervous system. Narcoleptic can occur at many times during a day. People may involuntarily fall asleep while at school, when having conversation, when eating, play games or the most dangerously is while driving and those are uncontrollable. Usually narcolepsy will take asleep just for a minute but in rare cases people may take asleep for an hour or may be longer. Narcolepsy generally manifest during early adulthood from 10-20 years old or late adolescence. Narcolepsy appears to occur more often men then women. The commonness of narcolepsy is related to that multiple sclerosis and parkinson's disease. In the United States, The National Institute of Neurological and Stroke estimate narcolepsy affect one in every 2000 people. However, in some countries, the commonness of narcolepsy is much lower (one per 500. 000) while in other countries, it is much higher (one per 600). The American Sleep Association

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estimates that approximately 125. 000 to 200. 000 Americans suffer from narcolepsy, but only fewer than 50. 000 are properly diagnosed.

The cause of narcolepsy it's very not clear which mean the exact cause of narcolepsy is not known but through the past decade, scientists have made important progress in perceptive it is pathogenesis and in identifying genes strongly related by the disorder. Scientists have also discovered abnormalities in various parts of the brain involved in regulating REM sleep that appear to contribute to symptom development. To be a condition where normal elements of sleep specifically elements of REM or dream sleep suddenly occur during a person's wakeful state it is appears in narcolepsy. The latest discovery has been the discovery of abnormalities in function and structure of a particular group of nerve cells and it called hypocretin neurons, in the brain who sufferer of narcolepsy. Location of those cells is in the part of brain called hypothalamus and they normally secrete neurotransmitter substances ( chemicals released by nerve cells to transmit messages to other cells ) and it called hypocretins. Hypocretin is an important chemical in your brain and people with narcolepsy will have low levels of this neurochemical in their spinal fluid and it is for the most part low in those who experience cataplexy. You may suddenly enter into Rapid Eye Movement sleep without first experiencing in non Rapid Eye Movement both at a day and during at night. Some of the characteristic of Rapid Eye Movement sleep, such as sleep paralysis, vivid dreams and sudden lack of muscle tone, will occur during other sleep stages in people with narcolepsy. Other factor appears to play important roles in the development of narcolepsy. Some cases are known to result from shocking <https://assignbuster.com/adaptive-theory-and-the-restorative-theory-of-sleep/>

injuries to parts of the brain involved in Rapid Eye Movement sleep or for tumor growth or other disease processes in the same region. Dietary factors, infections, exposure to toxins, hormonal changes such as menopause or puberty, and alterations in a person's sleep schedule are just a few of the many factors that may make use of direct or indirect effects on the brain, thus possibly contributing to disease development. The role of heredity in humans who suffer from narcolepsy isn't completely understood. So far no steady pattern of heredity has been known in families. It is expected that relatives of sufferer with narcolepsy may have a higher tendency to develop narcolepsy or sleep associated abnormalities, such as increased Rapid Eye Movement and increased daytime sleepiness.

Narcolepsy tends to start in adolescence and the symptoms are often mistakenly put down to behavior associated with this stage in life. There are many symptoms of narcolepsy are cataplexy, hallucinations, excessive daytime sleepiness, sleep paralysis but the main symptom is excessive daytime sleepiness or EDS in a short form. Excessive daytime sleepiness become the main symptom is because suffer from narcolepsy is tend to fall asleep easily. This can happen in many times and without warning and they have difficulty maintaining their concentration. The patient of narcolepsy may sleep for a few minutes or nearly hour or might feeling refreshed but eventually will fall asleep again. Excessive daytime sleepiness is present throughout the day and the sufferer with extreme effort might be able to refuse the sleepiness for some time. Finally it becomes irresistible and results in a sleep episode in a varied duration. Cataplexy is suddenly a loss voluntary muscle control and loss of muscles tone that leads to feeling

weakness. That muscle weakness can be quite slight and sufferer is conscious but unable to speak. Severe attacks of cataplexy may results in a complete body collapse with a fall to the ground and risk of being injury. Even though cataplexy can occur spontaneously, it is more often triggered by sudden,

strong emotion such as stress, excitement, anger, humor or fear.

Hallucination that occurs when falling rapidly into Rapid Eye Movement sleep called hypnagogic hallucination. Experiencing the dreams as a reality, and may be particularly frightening and vivid. The condition when people with narcolepsy temporary have inability to move or speak while falling asleep or waking is called sleep paralysis. This natural inhibition usually goes to unnoticed by people who experience normal sleep because it occurs only when they are fully asleep and into Rapid Eye Movement stage at appropriate time in the cycle. This symptom is not only for those who have narcolepsy especially when young adulthood. On the other hand, narcolepsy also have additional symptom such as automatic behavior and disturbed nocturnal sleep. Automatic behavior occurs when people carry out certain action without awareness and this happen when the sufferer is changeable between wakefulness and sleep. Disturbed nocturnal sleep is along with excessive daytime sleepiness and the Rapid Eye Movement is related with abnormalities and it called " narcolepsy pentad".

Doctor may make an introduction diagnosis of narcolepsy based on excessive daytime sleepiness and cataplexy. After a preliminary diagnosis doctor refer to a sleep specialist for further information. Methods of

determining and diagnosing of narcolepsy is divided into severity include:  
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sleep records, sleep history, multiple sleep latency test, polysomnogram.

Sleep records is known as a sleep pattern, the doctor will ask to keep an every single report of a sleep pattern for a week or two week and doctor can comparing how alertness and sleep pattern are related to each other. In addition, doctor will asked the patient for a detail sleep history, which is in each part of history, involves filling out the Epworth Sleepiness Scale and use a short questions to estimate your degree of sleepiness. For example, the patient indicates on a numbered scale how likely it is that you would doze off in certain situations, such as sitting down after eat. Multiple sleep latency test will measures how long it takes to fall asleep during the day.

Polysomnogram measures a variety of signal during sleep using electrodes places on your scalp. Another test that is recommended is hypocretin test, which is to detect the levels of hypocretin in the fluid that surrounded spinal cord. People who have narcolepsy usually will have a lower level of this brain chemical that regulates Rapid Eye Movement sleep.

So far many doctors or researches haven't found the way or any drugs to treats narcolepsy. Even there is no way narcolepsy to be cured but there is have a drug and behavioral therapies that have been proven to treat excessive daytime sleepiness and cataplexy such as medication and lifestyle modification that can help for manage the symptom. Medication for narcolepsy includes norepinephrine reuptake inhibitors or selective serotonin, stimulants, sodium oxybate, and tricyclic antidepressant.

Stimulants is kind drugs that is for stimulate central nervous system which is primary treatment to help the patient stay awake during the day. Tricyclic antidepressant is also help people to treat narcolepsy but these drugs is

older treatment and many people complaint about it because it may give side effects, such as constipation and dry mouth. Sodium oxybate helps people to improve nighttime sleep, which is often poor in narcolepsy. These drugs also may give serious side effects, such as bed wetting, worsening of sleep walking and nausea. If the patient takes a high dose of these drugs it will lead the patient to difficulty of breathing, coma and even death.

Norepinephrine reuptake inhibitors or selective serotonin is to help alleviate the symptom of cataplexy, sleep paralysis and hypnagogic hallucinations.

Narcolepsy is kind a sleep disorder who may give sufferer a very bad effects, such as damaging of brain, mentally or even in social life. Sufferer of narcolepsy can't control when they are supposed to fall asleep. They can fall asleep many times during a day. Narcolepsy can affect the person who suffering from it to future life, for example can affect relationship, education or career prospect. The person who suffering from narcolepsy may not be able to do a lot of things or even that person can't be able to socializing because some people will get irritated of that disorder. Consequently, people with narcolepsy often also have low self esteem and depression. Because, there is no way to cure narcolepsy but there have some drugs and another way to avoid cataplexy and excessive daytime sleepiness.

## **Case Study**

### **Sleepy Genes**

Jason was a good student throughout grade school and middle school.

However, when he began high school, he started to have odd symptoms that made his academic performance plummet. He was unable to stay awake



during class, even when he had gotten plenty of sleep the night before. Even worse were the periods of paralysis called cataplexy. If he was startled by a slamming locker door, he might collapse and be unable to move for a few minutes. In his freshman year he broke three pairs of glasses as a result of these bouts of cataplexy. The diagnosis finally came when Jason was a junior in high school. Along with about 200, 000 other Americans, Jason suffers from a disorder of the central nervous system called narcolepsy. Learning the name of his disease didn't cure Jason, but it has helped him to manage the symptoms. For example, he now takes amphetamines to keep himself awake during his normal daily activities. Even with these stimulants, he still needs to nap throughout the day, which he can manage by carefully organizing his schedule. Antidepressants seem to help prevent the embarrassing and often dangerous instances of cataplexy.

Jason and the thousands of other narcoleptics share their plight with several colonies of dogs that are being studied at Stanford University. The excitement of getting a doggie biscuit can trigger cataplexy in these narcoleptic Daschunds, Dobermans, or Labrador retrievers. They regain muscle control a short time later, apparently none the worse for undergoing the uncontrollable collapse. In August 1999 the Stanford researchers reported the culmination of 36 years of study on these animals: They had discovered a gene that is defective in some of their narcoleptic dogs. The hope is that this information may help in developing new treatments for sleep disorders such as narcolepsy. How can scientists find genes? To answer this question, we must first go back in time about 140 years to a

monastery garden in what is now the Czech Republic, where the science of genetics was born.

## **Case Study Revisited: Sleepy Genes**

Following in the footsteps of Gregor Mendel, researchers at the Stanford Center for Narcolepsy crossed narcoleptic dogs to one another and analyzed the progeny. This analysis showed that narcolepsy in dogs results from a recessive allele of a single gene. But where is this gene and what kind of protein does it encode? Further studies by Dr. Mignot's research group revealed that the narcolepsy gene is on chromosome 12. After years of effort, they were eventually able to clone the gene-only to find that it had already been discovered! The gene is called *Hcrt2*, and it encodes a protein receptor that is present on the cell surfaces of some cells in the hypothalamus (a part of the brain). The protein encoded by *Hcrt2* binds to signaling molecules called hypocretins. In the narcoleptic dogs the receptor was defective, making their brain cells ignore the molecular signal delivered by the hypocretins. Narcoleptic mice, studied by another research group, appear to have normal *Hcrt2* genes, but they have a different mutation that prevents them from producing hypocretins at all. In a most interesting turn of events, hypocretins (also called orexins) had been under investigation because of their role in controlling feeding behavior. Thus, the molecular systems that control sleep and feeding may have some common features.

What about the human connection? In January 2000 Mignot's research group and their collaborators reported that seven out of nine patients with narcolepsy did not produce hypocretin. These individuals may have a genetic defect similar to that of the narcoleptic mice. Two of the nine narcoleptic

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humans did produce hypocretins. These individuals may have a mutation in the hypocretin receptor gene similar to that in the narcoleptic dogs. Intense investigation is under way to use this information to develop treatments for patients with narcolepsy. This knowledge might also allow scientists to develop better medicines to promote sleep in people suffering from insomnia.

Because genetics is important to so many aspects of human behavior, defense attorneys might consider using a defendant's genetic constitution as a strategy to excuse criminal behavior. First, take the side of the defense and present an argument about why a defendant's genes should be considered as a factor in the criminal behavior. Then take the prosecution's side and present an argument about why a defendant's genes do not excuse criminal behavior.

## **SUMMARY**

Narcolepsy tends to start in adolescence and Jacob experienced this disorder when he was started in high school. He was a good student throughout primary school and junior school. In high school he started with the odd symptom of narcolepsy such as he was not be able to stay awake during his class even though he had gotten plenty of sleep the night before. Even worse were the periods of cataplexy. If he was startled by slamming locker door, he might collapse and not be able to move for a few minutes. Finally the diagnosis comes out and he was positively got narcolepsy disease. He tried to do the treatment but it didn't cure him from narcolepsy. Jacob just takes some stimulants to keep him stay awake during his normal daily life, it

was helped him to manage the symptom. Although, he takes these stimulants he still need a nap throughout his day.