



What is Consciousness?


Chapter 5-Consciousness





Class Objectives

- ◆ What is consciousness?
- ◆ What are the stages of sleep?
- ◆ How does sleep deprivation effect us?



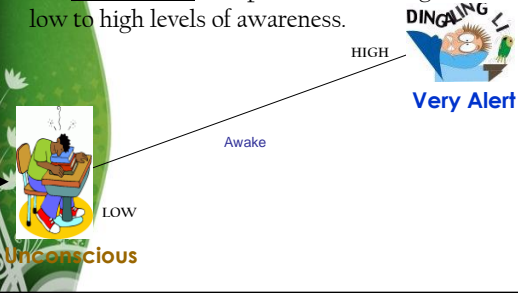
How would YOU define consciousness?

- ◆ *Consciousness* is a state of awareness and responsiveness
- ◆ Events in the environment
- ◆ Your own mental processes and inner awareness

- Example: Your knowledge of your feelings, thoughts, and memories.

Is consciousness a black or white state?

◆ No, *Consciousness* is a spectrum that ranges from low to high levels of awareness.



Feeling Sleepy?

How many hours do you sleep a night?



What do you know about sleep?

True or false?

- Teens who fall asleep in class have are just lazy.
False! Teens need at least 8.5 – 9.25 hours of sleep each night, compared to an average of seven to nine hours each night for most adults.
- Health problems such as obesity, diabetes, hypertension, and depression are unrelated to the amount and quality of a person's sleep.
False!
- The older you get, the fewer hours of sleep you need.
False!
- During sleep, your brain is very active.
True!
- If you wake up in the middle of the night, it is best to lie in bed, count sheep, or toss and turn until you eventually fall back asleep.
False!

Did you know?

Did you know that we spend about 1/3 of our lives asleep. If you live to be 75 years old you will have slept about 25 years!

An average 20 year old student has spent about 6 years asleep!

Researchers have established what happens during sleep, but not why we sleep.

One theory is that we sleep because we are tired. In other words, sleep has a restorative function, like rebooting a computer.

Is it important to maintain a regular bed and wake time?



Biological Clock

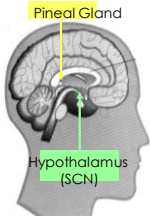
- ◆ Humans and other animals have an internal biological clock called the circadian rhythms
- ◆ These patterns vary over approximately a 24-hour cycle and occur even in the absence of normal cues about whether it is day or night
- ◆ Responsible for body functions including:
 - Hormone levels
 - Sleep and wakefulness
 - Blood pressure
 - Body temperature

The Brain's Control of Circadian Rhythms

- ◆ Generated by the suprachiasmatic nucleus (SCN)

Regulates the pineal gland's secretion of the hormone - *melatonin*

Increases in *melatonin* produce drowsiness



Can your clock get out of whack?

- ◆ Yes, problems can occur if someone works through the night and sleeps during the day
- ◆ Also experienced with jet lag
 - We are awake when our circadian rhythm cries "SLEEP!"
 - To speed up resetting your biological clock after a long flight - spend time outdoors
 - Bright lights help reset our biological clocks

Morning People versus Evening People

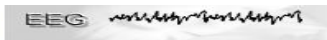
- ◆ Morning people awaken early and full of energy – doing their best work before noon
 - Most people over 65 are morning people
- ◆ Evening people take longer to warm up in the morning – doing their best work in the afternoon or evening
 - Most young people are evening people

Isn't sleep all the same?

- ◆ No, the use of the EEG shows variations in brain waves which determine different stages of sleep.
- ◆ There are 5 Stages of sleep
 - (4) Non REM and (1) REM
- ◆ During an 8 hour period, people typically progress through all 5 full cycles,
 - Each cycle lasts about 90 minutes

Non REM Sleep

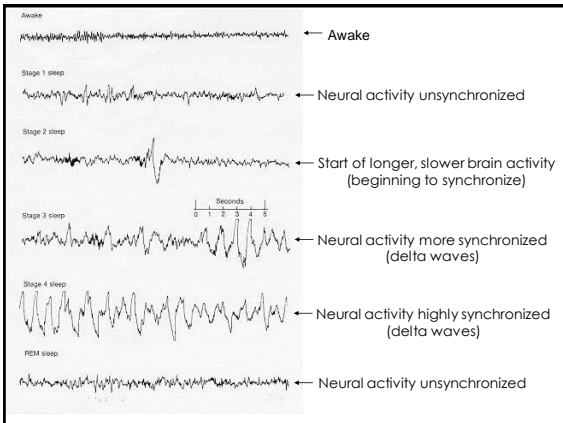
- ◆ When awake, brain waves show a high frequency, low amplitude pattern



- ◆ NREM (non-rapid eye movement) sleep involves increasing bodily relaxation
 - Slower EEG activity occurs
 - The heart rate and respiration are slower during NREM

Non-REM Stages of Sleep

- ◆ NREM brain waves are of low amplitude and are fast, with mixed frequencies
- Brain activity changes with each stage
- ◆ People become more difficult to awaken as they progress through the four stages of NREM sleep.



Non-REM Sleep

◆ Sleepers take about 30 to 40 minutes to go through the four stages of NREM sleep

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    graph TD
      A[Fall asleep] --> B[Non-REM Stage 1]
      B --> C[Non-REM Stage 2]
      C --> D[Non-REM Stage 3]
      D --> E[Non-REM Stage 4]
      E --> C
      C --> B
      B --> A
  
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REM Sleep

- ◆ Rapid eye movement (REM)
- ◆ This stage of sleep is characterized by high-frequency, low-amplitude brain wave activity
- Occurs only after people go through first 4 stages of NREM



REM Sleep

- ◆ REM is difficult to distinguish from being awake on the basis of physiological measures
- ◆ During REM sleep breathing and heart rate increase
- The same rate as if we were awake




Function of REM Sleep

- ◆ Memory storage- REM Helps consolidate memories
- ◆ Brain areas that are active during the learning of the task become active again during sleep
- ◆ Performance on tasks usually improves if you test someone a day after they've learned the task
- As long as they get at least 6 hours of sleep


- ◆ REM dreams tend to be longer, more vivid, and involve more detail and movement.
 - However, dreaming occurs during all sleep stages.
- ◆ Paralysis of muscles occurs so we cannot act out our dreams.


What Happens When We Don't Get Enough Sleep?



Do YOU Get Enough Sleep?


Sleep Deprivation Quiz






Sleep Deprivation

- ◆ The longer people go without sleep – the sleepier they get and the worse their performance becomes
- ◆ A fatigued, sleep deprived person may experience:
 - Impaired concentration diminished productivity
 - Tendency to make mistakes
 - Irritability
 - A depressed immune system
 - Greater vulnerability to accidents



Sleep Deprivation

- ◆ Research on total sleep deprivation with humans is not possible
- ◆ However, rats totally deprived of sleep die
 - lose inability to regulate body temperature
 - lose weight



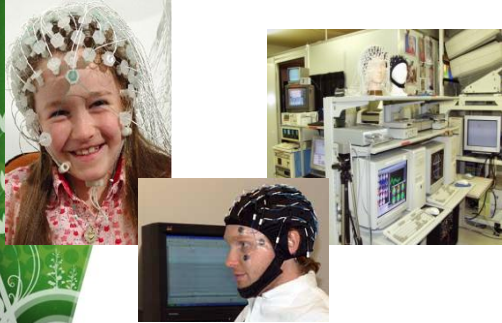
Chapter 5-Sleep Disorders

CLASS OBJECTIVES-

What are Sleep Disorders?

- Narcolepsy
- Insomnia
- Sleep apnea
- Night terrors
- Sleep walking

The EEG is used to help diagnose sleep disorders



Sleep disorders quiz... True or False?


- ◆ Approximately 70 million people in the United States are affected by a sleep problem. **True**
- ◆ If you regularly doze off unintentionally during the day, you may need more than just a good night's sleep. **True**
- ◆ If you snore loudly and persistently at night and are sleepy during the day, you may have a sleep disorder. **True**
- ◆ Narcolepsy is a sleep disorder marked by "sleep attacks." **True**

Sleep Disorders are divided into two major diagnostic categories:

Dyssomnias and Parasomnias


Approximately two-thirds of adult suffer from sleep problems, and about 25% of children under the age of 5 have sleep disturbance

What is Narcolepsy?




Sleep Disorders

- ◆ People who experience sudden, uncontrollable episodes of sleep have Narcolepsy.
- ◆ Main symptoms:
 - Fall asleep suddenly and unexpectedly
 - Excessive daytime sleepiness and
 - Abnormal REM sleep.



Sleep Disorders

- ◆ Sleep apnea causes airflow into the lungs stop for at least 15 seconds.
 - The sleeper stops breathing, chokes, then awakens briefly. Rather than choking awake, some choke and die (Skatrud & Pappard, 2004).
- ◆ People with this disorder can have as many as 100 episodes per night.



Consequences of Sleep Apnea

- ◆ People with sleep apnea get poor-quality sleep and feel extremely sleepy during the day.
- ◆ The person may have:
 - Memory loss
 - Suffer from severe headaches or work-related accidents.
- ◆ Sleep apnea may also lead to high blood pressure, heart disease, heart attack, and stroke.

Who's effected by this sleep disorder?

- ◆ This disorder is fairly common, 33% of the population experience symptoms of sleep apnea.
- ◆ Middle-aged, overweight men are at risk, but even children can have this disorder.



Can it be treated?

- ◆ Several effective therapies have been developed, including minor surgery or the use of a machine that affects airway pressure.





I just CAN'T sleep!!

Insomnia is the most common dyssomnia effecting as many as one in ten people each year!

Insomnia

- ◆ *Insomnia* involves problems in going to sleep or maintaining sleep.
- ◆ 10% of the population experience insomnia at sometime and is often associated with anxiety or depression.
- ◆ People with insomnia may actually sleep as much as norm, but quality of sleep tends to be poor and don't feel rested (Dement, 1999).

Insomnia



- ◆ People with insomnia tend to be listless and tired during the day, which often leads to the use of sleep medications.
- ◆ Drugs are not a preferred treatment due to a high link to dependence on sleeping pills and other drugs.
- ◆ Behavioral treatments for insomnia include relaxation training, cognitive therapy, and self-hypnosis.

Insomnia



Parasomnias include
abnormal disturbances
during sleep

These include nightmares, night terrors,
sleep walking and sleep talking

Night Terrors

- ◆ *Night Terrors* is a sleep disorder in which a person experiences symptoms of a panic attack
- ◆ The child can usually be seen sitting upright in state of sheer panic.
 - Scream, breathe rapidly appear awake- yet person is not fully conscious
- ◆ This disorder is most common in children between ages 3-8 and disappears as the child grows older.

Are these just BAD nightmares?

- ◆ NO, they are not nightmares and they occur in NREM sleep, usually stage 3 or 4.

Sleepwalking



- ◆ Sleep Disorder characterized by walking or other activity while seemingly still asleep.
- ◆ Sleepwalking is common in children 6-12 years old. It may occur at any age and it appears to run in families.
- ◆ Sleepwalking affects approximately 1% to 17% of children and is more frequently seen in boys.
 - The incidence of sleepwalking decreases with age.

Sleepwalking



TRUE or FALSE?

- ◆ Sleepwalkers are acting out dreams False!
- ◆ It is dangerous to wake a sleep walker False!

Sleepwalking

- ◆ Sleepwalkers are NOT acting out a dream-brainwave activity of sleepwalkers indicate that they are in stage 4 sleep.
- ◆ There is no danger in waking a sleepwalker. most likely you cannot because they are so deeply asleep.
