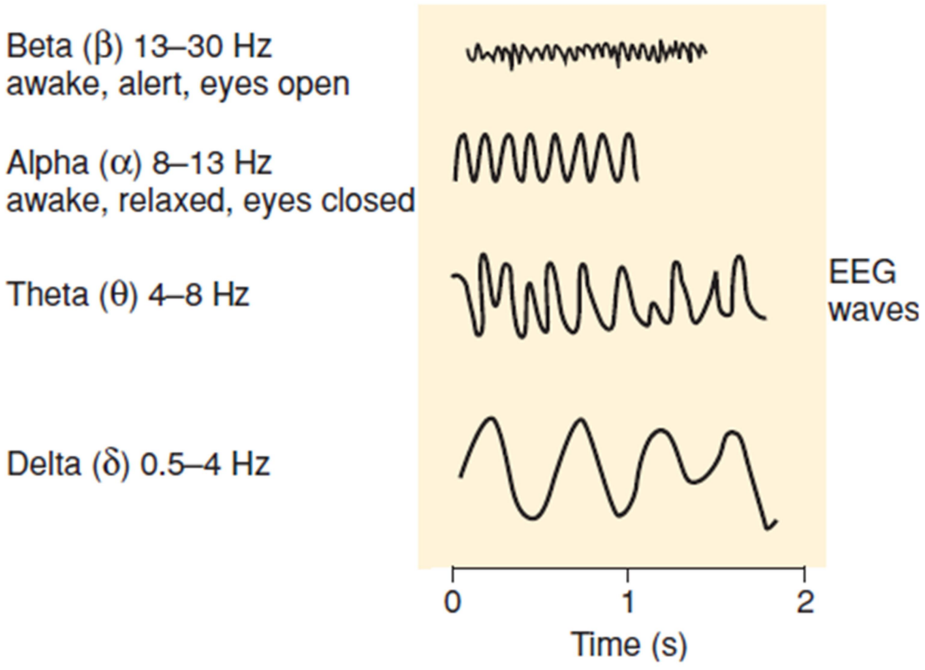
The electroencephalogram (EEG)

The electroencephalogram (EEG) records electrical activity of the cerebral cortex via electrodes placed on the skull. In normal healthy people, most waves in the EEG can be classified as alpha, beta, theta, and delta waves with variable frequency (Hz, or cycles per second) and amplitude(uV):

- Alpha waves are rhythmical waves that occur at frequencies between 8 and 13 cycles per second and amplitude of 50-100 uv
- Beta waves occur at frequencies greater than 14 cycles per second and as high as 80 cycles per second. Recorded while a person is experiencing visual and mental activity.
- Theta waves have frequencies between 4 and 7 cycles per second. They occur normally in the parietal and temporal regions in children, but they also occur during emotional stress in some adults, and degenerative brain states.
- Delta waves include all the waves of the EEG with frequencies less than 3.5 cycles per second. They occur in very deep sleep, in infancy, and in serious organic brain disease.



Sleep

Sleep is defined as unconsciousness from which the person can be aroused by sensory or other stimuli. There are two types of sleep: rapid eye movement (REM) sleep and non-
REM (NREM) sleep.

(1).Non- rapid eye movement (NREM) sleep.

NREM sleep is characterized by a reduction in physiological activity. As sleep gets deeper, the brain waves as measured by EEG get slower and have greater amplitude, breathing and heart rate slow down, and blood pressure drops. The NREM phase occupies most of our sleep period and consists of four stages ,the four NREM stages (stages 1, 2, 3, and 4) roughly parallel a depth-of sleep continuum.

(2) rapid eye movement sleep (REM sleep),

REM sleep, on the other hand, occurs in episodes that occupy about 25% of the sleep time in young adults; each episode normally recurs about every 90 minutes. REM Sleep marked by intense brain activity. In REM sleep most of dreams occur.

Sleep Disorder

- **Sleep Apnea,** a serious, potentially life-threatening disorder characterized by episodes of interrupted breathing during sleep. There are two types of sleep apnea- central and obstructive. Successful treatment, usually with nasal continuous positive airway pressure or CPAP.

- **Narcolepsy,** a chronic neurological disorder that causes the sufferer to fall asleep at times when he or she wants to be awake. In addition to an overwhelming and recurring need to sleep at inappropriate times.
- **Insomnia,** insomnia is the complaint of difficulty initiating or maintaining sleep, waking too early and not being able to get back to sleep, or waking feeling unrefreshed and lethargic

Epilepsy

Epilepsy (also called “seizures”) is characterized by uncontrolled excessive activity of either part or all of the central nervous system. Epilepsy cause sudden, massive discharge of neurons (seizures) resulting in motor convulsions, sensory and psychic disturbances, and often impaired consciousness; may result from birth trauma, tumors, infections, drug or alcohol abuse, or congenital brain malformation Epilepsy can be classified into three major types: grand mal epilepsy, petit mal epilepsy, and focal epilepsy.

Memory

Memory is the mechanism for storing what is learned. Memory also defined as the mental faculty of retaining and recalling past experiences, the act or instance of remembering recollection. Learning takes place when we retain and utilize past memories.

There are three basic types of memory:

1. Sensory Memory
2. Short Term Memory
3. Long Term Memory

Sensory Memory

In the sensory storage the stimulus is held for a fraction of a second. If the information has some meaning it will be moved to short-term memory. If it has no importance it will be dumped. A sensory memory retains an exact copy of what is seen or heard.

Short Term Memory (STM)

Short Term Memory last seconds to hours, it acts as a scratch pad for temporary recall of the information under process. After short –term memory loop is formed, the fate of information stored are:

- The information kept in short term and used for short period
- The information converted into long term memory.
- The information lost.

Long-term memory(LTM) has a long duration and virtually limitless capacity.

Long-term memory last years or some time throughout the life, its of two main pattern

1.declarative, in this pattern of memory we store such pieces of information as our names, frequently used telephone numbers, recollections of prior experiences, general knowledge about the world, and things we've learned in school.

2. procedural, in this pattern of memory we store knowledge about how to perform various behaviors, such as how to ride a bicycle, swing a baseball bat, such knowledge about how to do things is known as procedural knowledge.