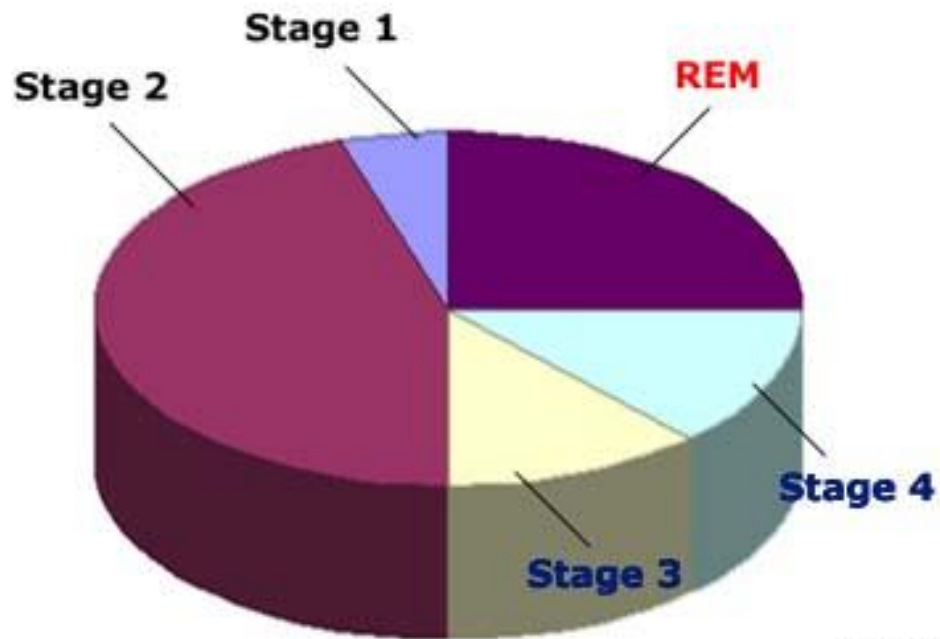


Duration of Sleep Stages



Stage 1 : 5% of sleep.
Stage 2 : 40-50% of sleep
Stage 3 : 12% of sleep
Stage 4 : 12% of sleep
REM : 25% of sleep

Deep Sleep {

According to interaction between environment [peripheral stimuli] and brain .

A person can be in the following states;

1. Maximal alertness [fight ,fear and stress situation]

2. Wakefulness like usual daily activities.

3. Sleep.

4. Coma.

What is sleep? •

It is state of unconsciousness from which the person can be aroused by sensory or other stimuli. •

Sleep is not a passive process in fact it is an active process. •

Human spend about a third of their lives sleeping. •

Why do we sleep ? It remains a mystery . •

Brain cells during sleep are not resting but rather there is a profound change in activity essential for learning and memory •

Coma: refer to the total unresponsiveness •
of a living person to external stimuli
caused by brain stem damage that
interfere with RAS or by widespread
depression of the cerebral cortex such as
accompanying O₂ deprivation

Types of sleep: •

There are two types of sleep •

During each night a person goes through stages of two •
types of sleep that alternate with each other

1. Slow-wave sleep [non rapid eye movement sleep] •

It is called so because in this type of sleep the brain •
waves are very large [high amplitude] but slow [low
frequency]

2. Rapid eye movement sleep. •

In this type the eyes undergo rapid eye movements •
despite the fact that the person is still a sleep but the
brain waves just like the awake person.

Most sleep during each night is of the slow wave variety [NREM]. This is the deep restful sleep that the person experiences during the first hour of sleep after having been awake for many hours .after this sleep REM sleep will follow .

Each episode normally recurs about every 90 minutes .

To summarize the events of sleep :

First the sleeping subject will enter NREM sleep consist of four stages [1,2 ,3and 4] and then shift to REM sleep

During REM the EEG pattern become similar to that of a wide ,awake, alert individual even though the person is still sleep that is why it is called paradoxical sleep which occupies 20-25% of total sleeping time through out adolescence and most adulthood. •

Infants spend more time in paradoxical sleep, in contrast paradoxical as well as stages 4 slow wave sleep decline in the elderly. •

Paradoxical sleep can be considered either •
the deepest sleep since it is hardest to
arouse sleepers from this stage or the
lightest sleep since sleepers are most apt
to awaken on their own during this stage.

But it is considered to be the deepest •
sleep because the person always passes
through slow wave sleep before entering
paradoxical sleep.

Character of slow wave sleep •

1. Display slow waves. •
2. Considerable muscle tone [frequent shifting] •
3. Minor reduction in respiratory rate ,heart rate and blood pressure. •
4. Dreaming rarely occur. •
5. Sleepereasily awakened. •
6. Sleeping time is 80% of whole sleeping hours. •
7. Has four stages ,sleeper must pass this type of sleep first. •
8. Nightmares,walk and talk occur in stage 3and 4 sleep. •

Character of REM sleep [paradoxical] •

1. Display EEG of alert awake person. •

2. Abrupt inhibition of muscle tone [no movement]. •

3. Irregular heart and respiratory rate and fluctuation in blood pressure. •

4. Dreaming is common and remembering. •

5. Sleeper hard to arouse but apt to wake up spontaneously. •

6. Sleeping time is 20-25% of whole sleeping hours. •

7. Rapid eye movement occur during this type of sleep. •

Theories of sleep [centers] •

1. Passive theory of sleep •

Excitatory area of the upper brain stem [reticular activating systems] simply fatigued during the waking day and become inactive. This is an old theory no one believes in it now.

2. Active inhibitory process •

Centers located below the mid pontine level of the brain stem that are required to cause sleep by inhibiting other parts of the brain. •

The most conspicuous stimulation area for causing almost natural sleep is the raphe nuclei in the lower half of the pons and in the medulla, they secrete serotonin. •

What is the effect of sleep on the nervous system? •

Sleep restores both normal levels of brain activity and normal balance among the different parts of the central nervous system. it is similar to rezeroing of electronic computer. •

The principle value of sleep is to restore the natural balance among the neuronal centers. •

Prolonged wakefulness is often associated with progressive malfunction of the thought process and some times even causes abnormal behavioral activities. •

Person can be irritable or even psychotic after forceful wakefulness •

How long a person can stay awake? •

The person to go the longest without sleep was a 17 years old student who stayed awake in sleep laboratory under medical supervision for 264 hours [11 days]. •

Fortunately he suffered no ill effects but during this ordeal he was irritable and had blurred vision ,slurred speech and memory lapses ,toward the end he seemed confused about his identity •

A very rare inherited condition fatal familial insomnia traced in a large Italian family since the 19th century illustrates vividly the importance of sleep .

Symptoms of emotional instability and hallucination begin at about age 50 and progress to stupor ,coma and death within 13 months.

In this condition the brain sleep centers degenerate abolishing slow wave and REM portions of sleep.

The common believe that every individual require 8 hours of sleep per night is not correct. the required numbers of sleep hours varies from individual to individual and for a given individual is not a constant value. Some individual require as little as 2 hours of sleep where as other individual may require 12 hours of day per 24 hours.

Individually experimentally deprived of paradoxical sleep for a night or two by being aroused every time the paradoxical EEG pattern appeared suffered hallucination and spent proportional more time in paradoxical sleep during subsequent undisturbed nights as if to make up to lost time.

Uses of sleep in diagnosing some condition: •

1. During each REM sleep males have penile •
erection. This phenomenon is of significant importance
since penile erection during sleep can be used to
distinguish physical abnormalities of sexual dysfunction
from emotional problems.

2. During sleep the pulse rate is low , this help us to •
distinguish tachycardia due to hyper thyroidism or due to
stress or anxiety ,in hyperthyroidism the tachycardia will
not be slowed while that due to anxiety will be low.

3. Sleep deprivation some times used to produced •
hallucination.