

## Circadian Rythem

- 24 hours cycle that are the part of body's internal clock running in background to carry out essential functions and processes.

- well known circadian rythem is the sleep wake cycle.

Different systems of the body follow circadian rythems that are synchronized with a master clock in the brain.

a circadian rythem can promote consistent and restorative sleep.

When this is thrown off, it cause sleeping problems include insomnia.

Circadian rythems works by helping to make sure that the body's processes are optimized at various points during a 24 hour period.

circadem' mean around a day.

Circadian rhythms exist in all types of organisms.

It coordinate mental and physical systems throughout the body.

The digestive system produces prohen to match the typical timing of meals and secretion of hormones to suit normal energy expi expenditure.

Sleep - wake cycle; during day light causes the master clock to send signals that generate alertness to help keep us awake and active.

at at night falls, master clock initiates the production of melatonin, a hormone that promote sleep.

Disruption to circadian system can occur over the short or long term.

→ Jet lag disorder - crosses multiple time zones in a short period of time and gets its name from people from international flights probl sleeping problem and fatigue

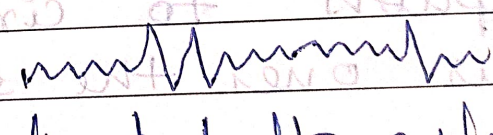
Shift work Disorder - working through night and sleep during day change in shift leads to issue.

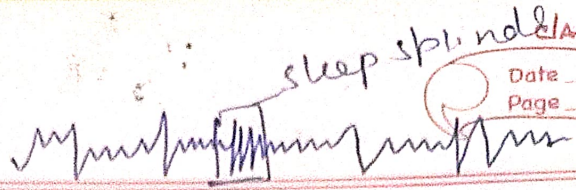
Advanced Sleep Phase Disorder  
wakes up early in the evening  
morning very early in the  
Even if they want to be up  
later in night or sleep later  
in the morning. middle  
older age

Delayed Sleep Phase Disorder  
night owl  
who stayed up late and sleep  
in late in the morning

## Stages of Sleep

4 stages including  
1 for REM (Rapid eye movement)  
3 that form non REM (NREM)

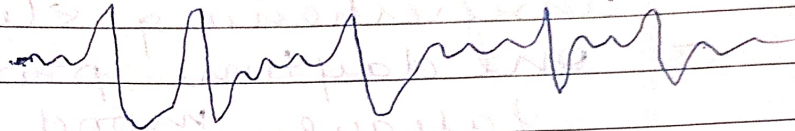
- alpha Stage 1 (N<sub>1</sub>) 
- when person first falls asleep
  - 1-7 minutes
  - not fully relaxed
  - body and brain activities relax with slow
  - easy to wake
  - if not disturbed went to sleep stage 2



### Stage (N2) theta beta wave

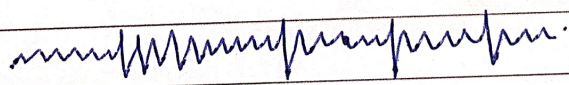
- drop in temperature
- relaxed muscles
- slowed breathing
- heart rate
- last for 10 to 25.
- N2 stages can become larger during the night
- spends about half their sleep time in N2 sleep.

### Stage 3 (N3)



- deep sleep
- harder to wake someone up.
- Muscle tone, pulse and breathing rate decrease.
- delta waves
- this stage is critical to restorative sleep, allowing for bodily recovery and growth.
- boost immune system.
- most time in deep sleep during the first half of the night.
- 20 to 40 minutes.
- these stages get shorter and more time get spent in REM sleep instead.

### REM



- cerebral activity increases to waking level
- muscle twitch
- general increase in BP, pulse & respiration

# Sleep Disorders

## 1) Insomnia

- difficulty in falling or staying asleep
- Waking up often during night and having trouble going back to sleep
- Waking up too early in the morning
- unrefreshing sleep
- one daytime problem: sleepiness, fatigue, mood problems, concentration
- It varies how long it last and how often it occurs

## 2 types:

Acute / short term — caused by life stresses (job loss, death, illness, light noise etc)

Chronic / long term — caused due to chronic depression & stress

pain

## ~~Sleep apnea~~ Hypersomnia

- repeatedly feel excessively tired during day and sleep longer than usual at night
- night fall asleep repeatedly during day, often at inappropriate times such as at work or during a meal.
- day naps provides no relief to symptoms
- can cause by another sleep disorder, medical condition, drug abuse
- also result from physical problem such as tumor, head trauma or injury to CNS.

## Sleep apnea

- impaired ability to breath while sleep
- have breathless periods of a minute or so from which they wake up for grasping for breath
- does not remember awakening but have consequences like sleepiness during the day and impaired attention
- increased risk of stroke, heart problems, other disorders
- show deficiency of learning, reasoning, attention and impulse control.
- causes - genetics, hormonal, old age deterioration of the brain mechanism that regulate breathing

