

# STATES OF CONSCIOUSNESS



*Consciousness is our awareness of ourselves and our environment.*

*- William James*

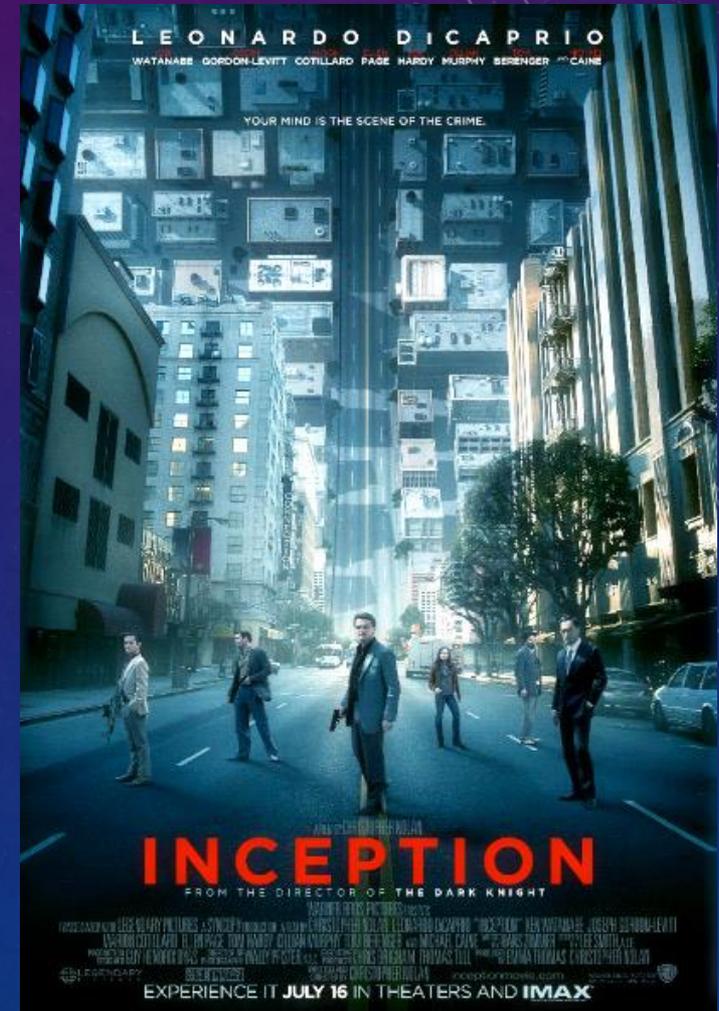


# LEVELS OF CONSCIOUS AWARENESS

- **Conscious (Controlled) Processes:** Require full awareness, alertness and concentration
  - Learning to drive a car, studying for an exam, baking from a recipe.
- **Automatic (Non & Pre-conscious) Processes:** Require little awareness, take minimal attention, driving a familiar route.
  - Eating while watching TV, talking to a friend while walking.
- **Subconscious:** Below conscious awareness
  - Subliminal processes (Knowing what was said on the TV even though you were not paying attention to it.)
- **Unconscious:** Total lack of sensory awareness and complete loss of responsiveness to one's environment.
  - Comas resulting from trauma, disease, or injury.

# ALTERED STATES OF CONSCIOUSNESS

- **Mental states, other than ordinary waking consciousness.** (Sleep, dreaming, psychoactive drug use, meditation, hypnosis, etc.)
  - *Perceiving our internal and external environments or worlds in ways very different from normal perception.*



# BIOLOGICAL RHYTHMS

**“Biological rhythms are controlled by internal biological clocks.”**



**Annual cycles:** On an annual cycle, geese migrate, grizzly bears hibernate, and humans experience seasonal variations in appetite, sleep, and mood.

***Seasonal Affective Disorder (SAD)*** is a mood disorder people experience during dark winter months.

**Female menstrual cycle:** Every 28 days the female reproductive system prepares the uterus for pregnancy

# THE RHYTHM OF SLEEP

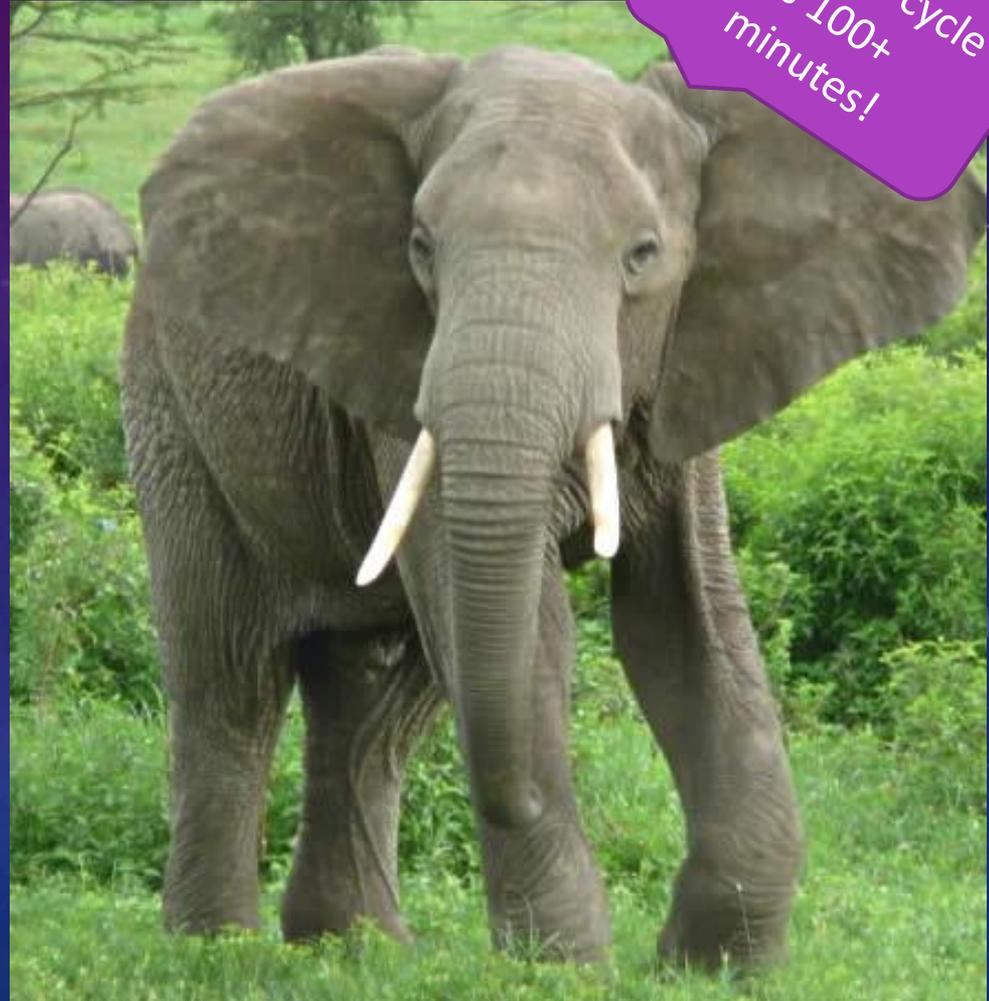
- **The Circadian Rhythm:** a 24- hour cycle that tells our bodies when to sleep, rise, eat-- regulating many physiological processes such as body temperature.
- This internal body clock is affected by environmental cues, like sunlight and temperature. When one's circadian rhythm is disrupted, sleeping and eating patterns can run amok.



# NINETY-MINUTE CYCLES

**We go through various stages of sleep in 90 minute cycles**

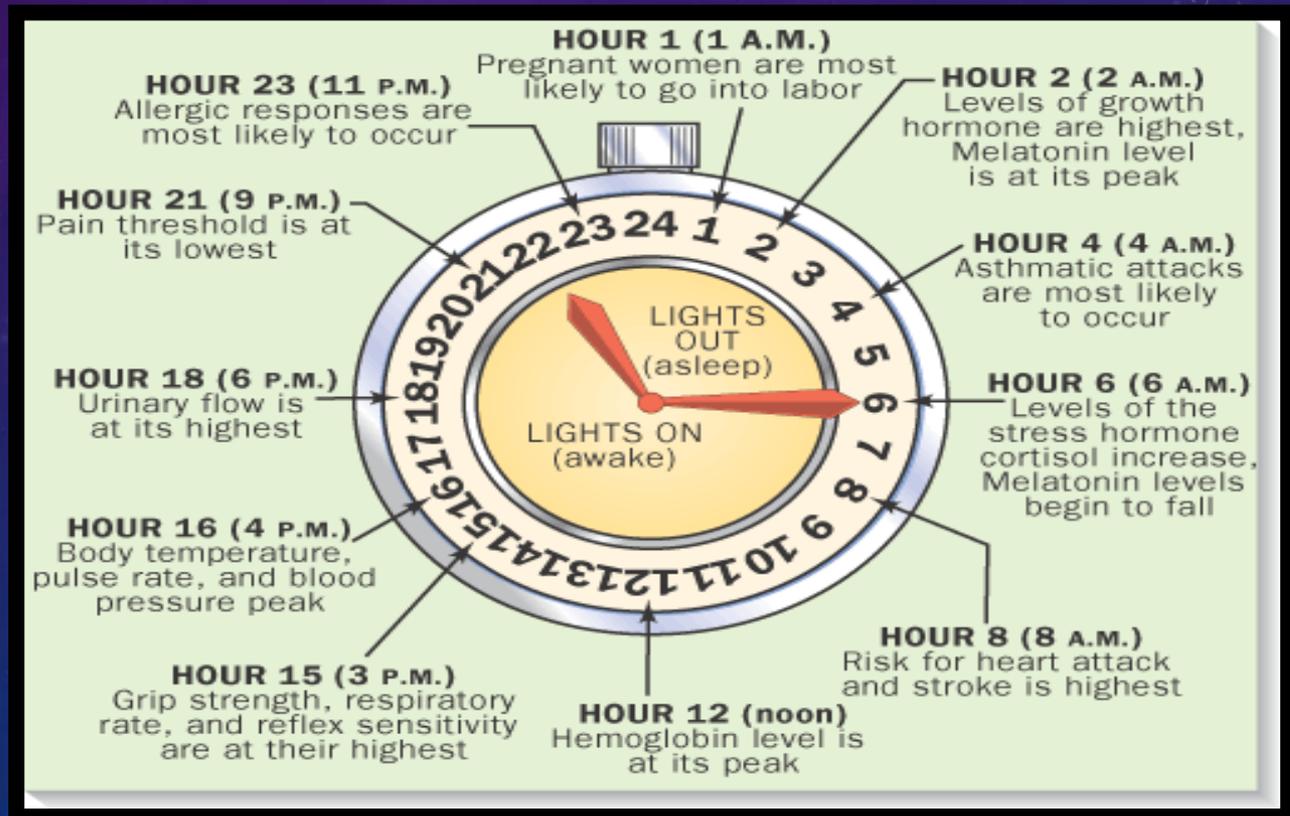
My sleep cycle is only 9 minutes!



My sleep cycle is 100+ minutes!

# CIRCADIAN RHYTHMS

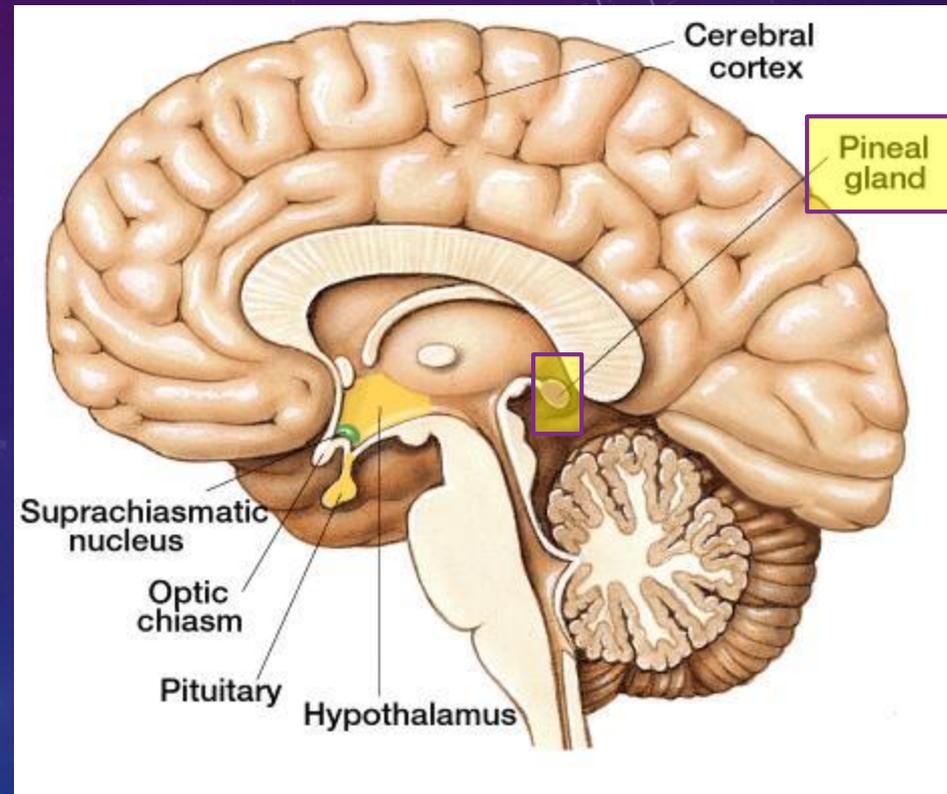
- Many of our behaviors display rhythmic variation.
- Circadian rhythms
  - Light is an external cue that can set the circadian rhythm.



# PINEAL GLAND

Participates in setting the body's clock

- Melatonin hormone
  - Assists in regulating timing of sleep, body temperature, appetite.
- Melatonin secreted during darkness
- Melatonin is high when young and is reduced as we age

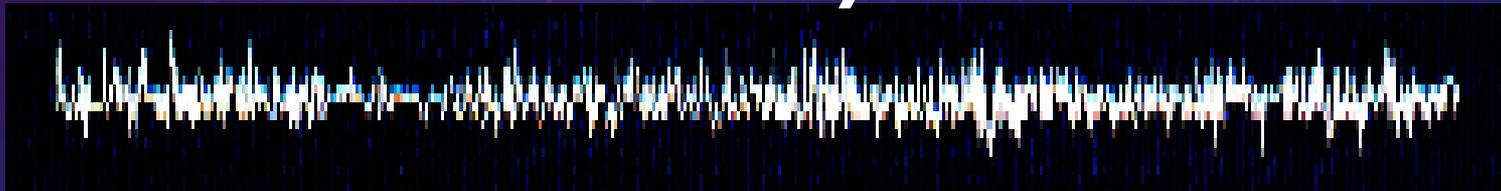


# SLEEP PATTERNS



# Awake & Alert

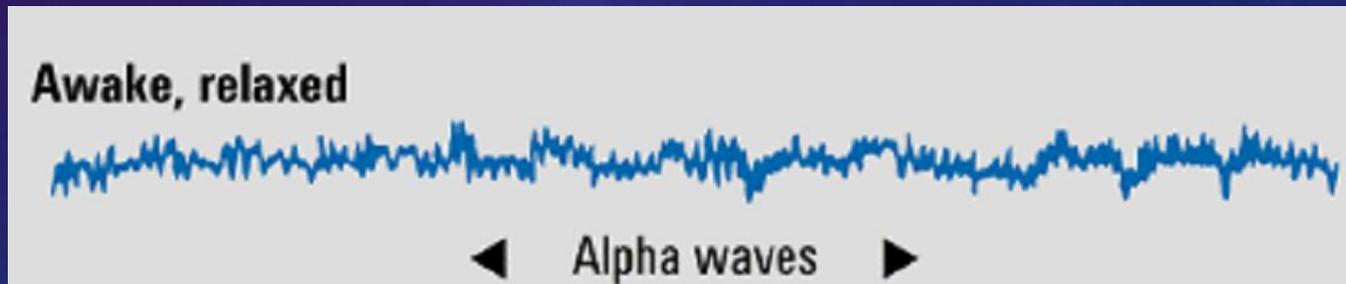
**During strong mental engagement, the brain exhibits low amplitude and fast, irregular beta waves (15-30 cps). An awake person involved in a conversation shows beta activity.**



Beta Waves

# Before you sleep: Awake but Relaxed

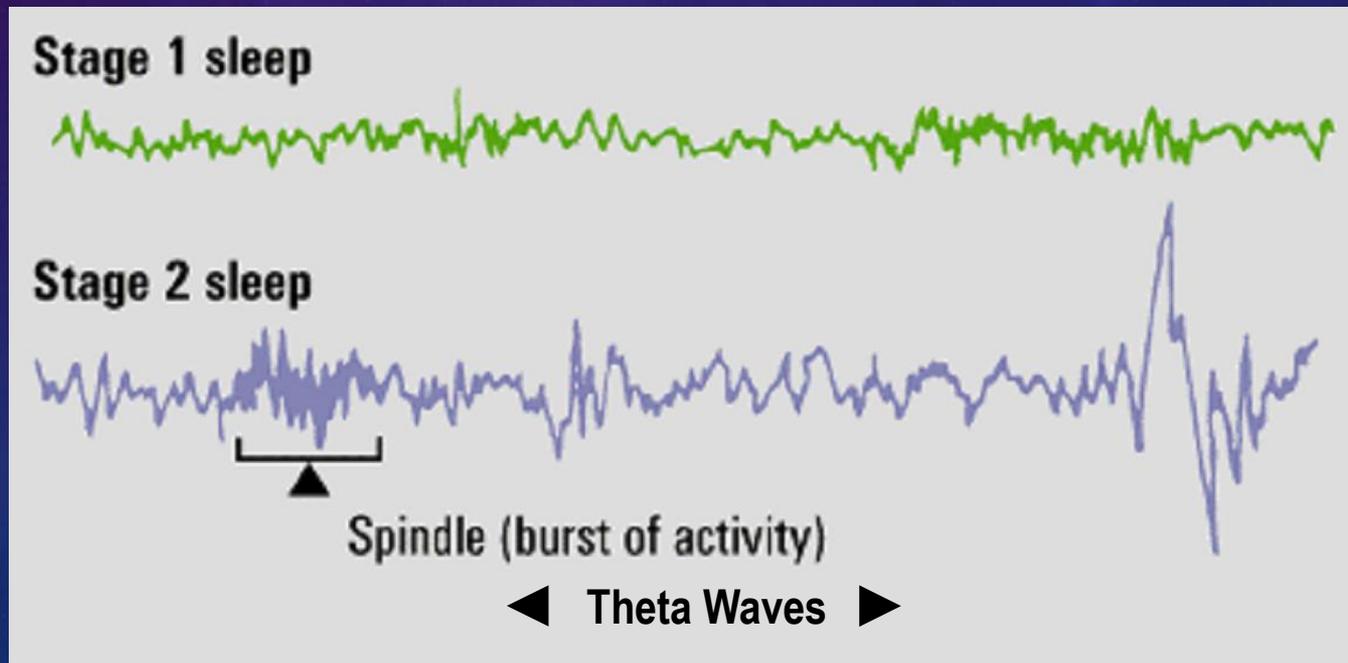
**When an individual closes his eyes but remains awake, his brain activity slows down to a large amplitude and slow, regular alpha waves (9-14 cps). A meditating person exhibits an alpha brain activity.**



# Sleep Stages 1-2

During early, light sleep (stages 1-2) the brain enters a high-amplitude, slow, regular wave form called theta waves (5-8 cps). A person who is daydreaming shows theta activity.

Stage 1 - Hypnic / Hynagogic Jerk: Reflex muscle twitch throughout body that may occur



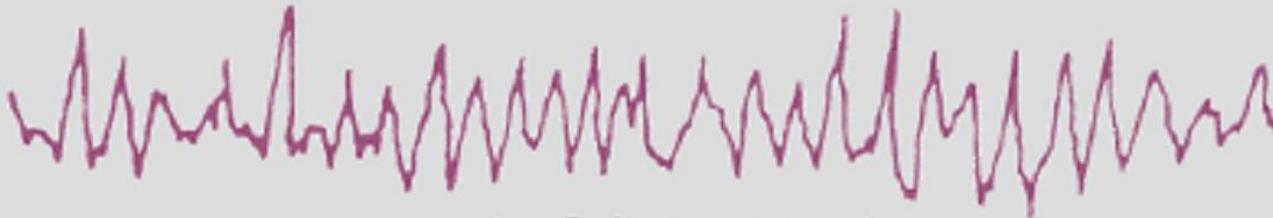
# Sleep Stages 3-4

**During deepest sleep (stages 3-4), brain activity slows down. There are large-amplitude, slow delta waves (1.5-4 cps).**

**Stage 3 sleep**



**Stage 4 sleep**



◀ Delta waves ▶



# REM Sleep

**After reaching the deepest sleep stage (4), the sleep cycle starts moving backward towards stage 1. Although still asleep, the brain engages in low- amplitude, fast and regular waves very similar to beta waves (15-40 cps) much like awake-aroused state.**

**REM sleep**



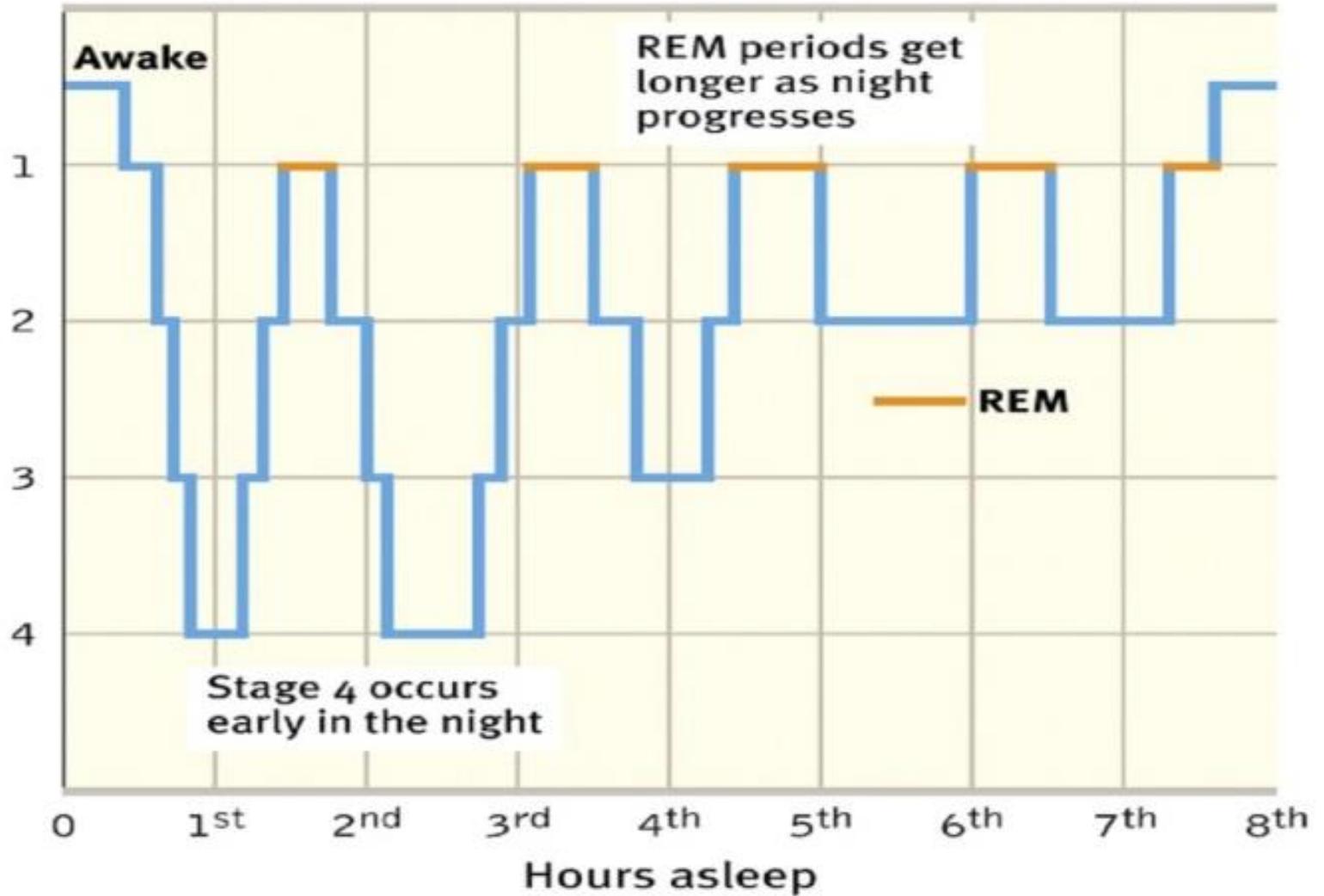
**Eye movement phase**

## REM: Rapid Eye Movement

- This is a very active stage of sleep.
- Composes 20-25 % of a normal nights sleep.
- Breathing, heart rate and brain wave activity quicken.
- Vivid Dreams can occur.
- From REM, you go back to Stage 2

*Your brain's motor cortex is active during REM sleep but your brainstem blocks its messages. This leaves your muscles relaxed, so much so that, except for an occasional finger, toe, or facial twitch, you are essentially paralyzed. Sometimes this last even when you wake up producing sleep paralysis.*

Sleep stages



Awake

REM periods get longer as night progresses

Stage 4 occurs early in the night

REM

BRAIN WAVES

Beta  $\beta$   
13+ cps



Mind and body active and busy  
Short-term memory being used

Alpha  $\alpha$   
8-12 cps



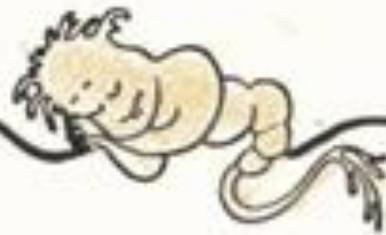
Mind and body calm and relaxed  
Long-term memory activated  
Learning is easy and rapid

Theta  $\theta$   
4-7 cps



A state of deep relaxation  
High creativity and insight  
Sub-conscious mind accessible

Delta  $\delta$   
0.5-3 cps



Sleeping  
Minimum brain activity



# SLEEP THEORIES

**Sleep Protects:** Sleeping in the darkness when predators loomed about kept our ancestors out of harm's way.

**Sleep Recuperates:** Sleep helps restore and repair brain tissue.

**Sleep Helps Remembering:** Sleep restores and rebuilds our fading memories.

**Sleep and Growth:** During sleep, the pituitary gland releases growth hormone. Older people release less of this hormone and sleep less.

**Sleep helps creative thinking:** REM is highly conducive to fluid reasoning and flexible thought.

# WHY DO WE SLEEP?

- **We will spend roughly one-third of our lives sleeping**
  - **The claim that everyone needs eight hours of sleep a night is a myth.**
    - **Newborns spend two-thirds of their day sleeping, while adults spend only one third**
    - **Some people thrive on fewer than six hours of sleep per night; Others need nine or more hours**
- **If a person remains awake for several days, they deteriorate in terms of immune function and concentration. They are more likely to make mistakes in judgment and decision making that could lead to accidents.**

# What is *R.E.M. Rebound*?

**When a person finally gets to sleep after not sleeping for an extended period of time, *R.E.M. rebound* often occurs.**

**In these instances, the depth and frequency of *R.E.M.* sleep increases, as a way for the body to catch up on the deep, restorative sleep of the *R.E.M.* cycle.**

# SLEEP DEPRIVATION

(Seen in videos watched at home)

## Effects

- **Fatigue and subsequent death**
- **Impaired concentration**
- **Emotional irritability**
- **Depressed immune system**
- **Greater vulnerability to a host of disorders**

