Sleep and Sleep Disorders

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Question

How do we know about sleep?

What is sleep?

Sleep is made up two physiological states:
(measured by eletroencephalogram (EEG)

l **non-rapid eye movement (NREM) sleep**

l **rapid eye movement (REM)   sleep**

Rapid Eye Movement (REM) sleep

- spontaneous rapid eye movement
- dreaming
- body movement is absent
- heart rate, blood pressure, respiration are
  variable

NREM and REM sleep

ı **Awake :** alpha waves (8-12cps, low voltage)

ı **NREM sleep : increasing depth**
- Stage 1: low voltage of mixed frequency,
  reduced alpha activity(3-7 cps)
- Stage 2: more slow activity , sleep spindles
  and K complexes
- Stage 3, 4: slow-wave sleep (SWS) or delta sleep

ı **REM sleep:** low voltage, mixed frequency with sawtooth
  waves.

NREM and REM sleep

REM sleep
25%

stage 1
5%

stage 4
13%

stage 3
12%

stage 2
45%
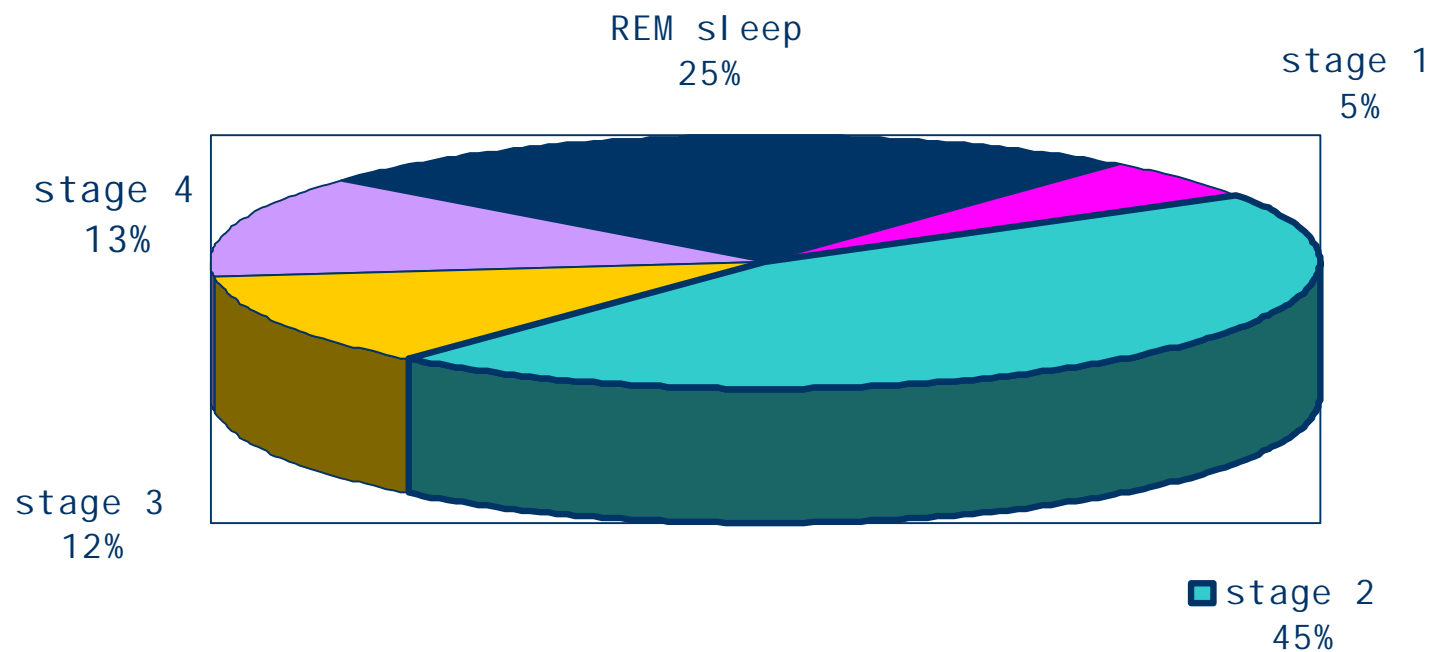
Sleep cycles

- NREM and REM sleep alternate cyclically throughout the night
- Start with NREM 80 minutes followed by REM 10 minutes
- Cycles repeat 3-6 times per night
- Each REM period ends with a brief arousal or transition into light NREM sleep

Question 2?

I How many hours do we need for sleep per night?

Sleep requirements

- Short sleeper: < 6 hours per night to function adequately

- Long sleeper: > 9 hours per night to function adequately

Sleep Disorders

l **disorders of initiating and maintaining sleep-- insomnia**

l **disorders of excessive somnolence—DOES, hypersomnia**

l **sleep-wake schedule disorders**

Insomnia

- Disorder of initiating or maintaining sleep
- Most common sleep complaint
- 30% of normal people
- Brief insomnia is most often associated with anxiety: examination
- Persistent insomnia is most difficulty in falling asleep.

Factors contribute to insomnia

- Situational stressors : job problem, marital discord; study pressure
- Aging: the older, the less sleep
- Drugs: caffeine, alcohol, withdrawal from some drugs
- Psychiatric disorders: depression, etc

Treatments for insomnia (1)

- Psychotherapy: change the cognition
- Medication:
  - Tricyclic antidepressants: reduce REM sleep;
  - SSRIs:
  - Benzodiazepine: reduce time in Delta sleep
  - Other sleep pills:increase sleep length

Treatment for insomnia (2)

- **Behavioral intervention strategies**
  - **Progressive relaxation techniques**
  - **Biofeedback : muscle feedback, relaxation training**
  - **Sleep restriction**
  - **Stimulus control**
  - **Hot bath several hours before bed**

Treatment for insomnia (3)

- **Sleep hygiene techniques**
  - **Regular sleep-wake schedule**
  - **Reduced light and noise**
  - **Eliminate caffeine, smoking, alcohol**
  - **Cool room**
  - **Exercise during the day**
  - **Reduce activity at night**

Hypersomnia

- **Excessive sleepiness**
- **Complaint in narcolepsy, Kleine-levin syndrome, sleep apnea**

Narcolepsy

l **Sleep attack: fall sleep while doing sth. , last 15 minutes**

l **Hallcinations: visual or auditory hallcinations may precede sleep or occur during the sleep attack**

Narcolepsy

- **Cataplexy: a sudden loss of muscle tone, often initiated by an emotional outburst**
- **Sleep paralysis:unable to move a muscle when awake and conscious**

Kleine-Levin syndrome

- Last up to 20 hours

- Occur infrequently, three to four times a year

Sleep apnea

- Loud snoring at night
- Excessive sleepiness during the day
- Decreased attention span
- Decreased memory
- Hyperirritability

Treatment for sleep apnea

- Behavioral intervention: sleep position training, weight loss, exercise, and alcohol reduction

- Mechanical intervention: clear the airway

- Surgery

Sleep disorders common to children

- Enuresis(bed- wetting)

- Sleepwalking disorder

- Sleep terror disorder

When we are sleeping…

- An active disengagement from our environment
- Shut out sensory input
- Cease to be aware of the outer world

When we are sleeping…

- Brain waves change
- Eye movement slow
- Dream
- Memory close