1. Neuro psych
   1. Neural Plasticity
      1. Neural Plasticity
         1. The brain’s ability to change in response to experience
            1. Growth of synaptic connections
            2. Plasticity is adaptive
      2. Phantom Pain
         1. Some amputees feel a sensation in the part of the body that was amputated
      3. Hemispherectomies
         1. Removal of the left or right half of the brain
         2. Done in a very rare case
            1. Ie severe epilepsy
         3. In some cases these children are able to gain back some of their lost functions
         4. Example
            1. If you take out the left hemisphere, the person would have no language skills. Their right side would be paralyzed. With therapy and time the right hemisphere can compensate and take over the lost functions.
            2. The younger the child the better the prognosis
   2. Consciousness
      1. Consciousness is defined as an awareness of the sensations, thoughts, and feelings that one is attending to at any given moment
      2. Sleeping, meditating, under the influence of drugs or alcohol, to day dreaming
      3. **Sleep**
         1. Circadian cycles
            1. Tiny cluster of neurons that secrete hormones that either keep you awake or help you sleep at night
            2. The biological clock
            3. **Epinephrine**

What keeps you awake

Produced a few hours after you wake up

As the day wears on it drops

* + - * 1. Adenosine

Keeps you asleep

* + - * 1. Melatonin

When not around light your brain will produce melatonin which will make you sleepy

When lights are on you’re not going to produce melatonin

Used as a sleep aid

FDA does not approve melatonin for sleeping disorders, unknown long term safety

* + - * 1. Jetlag

It will take your body time to get back on schedule

* + - 1. The rhythm of sleep
         1. EEG records electrical activity in the brain
         2. EEG shows short, rapid brain waves when awake
         3. Stage 1

Heart rate slows down

Blood pressure goes down

If woken up you wouldn’t know you were asleep

* + - * 1. Stage 2

20 minutes later

Breathing and heart rate slow down

Brain waves slow down

* + - * 1. Stages 3 & 4

20 minutes later

Heart rate drops

Breathing slows down

Blood pressure goes down

* + - * 1. After an hour you’ll work backwards, so 1-2-3-4-3-2-REM
        2. REM Sleep (Paradoxical sleep)

Brain activity, heart rate, blood pressure resemble waking state

Rapid eye movements, paralysis

You lose all muscle tone

You will not sleep walk in REM sleep

It’s as if your body is like jello

Dreams are much more detailed and vivid when in REM sleep

Very difficult to wake up

If your alarm clock goes off while in REM sleep you’ll wake up

* + - * 1. You will go through the cycle 3-4 times per night

If you sleep for 8 hours a night after 5-6 hours you will spend more time in REM Sleep and less in stages 3&4

If you remember your dreams in the morning that means you were in a Rem stage when you woke up

* + - * 1. Sleep paralysis

Not common but normal

When you wake up in the morning, even though you are conscious, the reticular formation, that’s responsible for causing paralysis, is still firing. Even though awake the part of the brain that causes muscle paralysis is still very active, it takes your body a few moments to catch up

Dreaming while paralyzed is possible, as if they’re hallucinating.

* + - * 1. Stage 1 through Stage 4 constitute non REM-sleep

Myoclonic jerk

You start to dream, your brain produce very vivid visual sensation, then your body reacts to it

Brain waves slow down