

Sleep October 23, 2014

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- **Biorhythm** is 25 hours
- Midbrain, uppermost nuclei - **Pons Geniculate Occipital** spikes originate ... drive dreaming, mainly ach neurons, extremely prominent, connect to REM sleep... these waves are connected to visions during dreaming
- **REM eye movements** are caused by nerves in 3<sup>rd</sup> cranial nerve... so active that nearby neurons fire along with it when waves are being generated
- \*good chart on slide 28 of waves and stages/behaviors\*
- NE serotonin and dopamine take you into slow wave sleep ... serotonin - turned off by hallucinogens,
- **Perseverative** means that you think of only one thing, tends to be an older flashbulb memory
- Ach and amines compete during sleep
- Longer you sleep, longer your REM stages last ... ach puts you in sleep, amines take you out ... serotonin always takes you out of active sleep points
- Rem sleep is very similar to being awake, which is why it is so easy to wake yourself up immediately during a nightmare
- **Aminergic system** turns on your sleep during REM
- DA NE and 5-HT produce ipsp
- Studies done on seagoing mammals found that they put one hemi into REM at one time, showed us that there is no special "sleep juice" that controls sleep
- What controls your ascending arousal system? **Orexin** neurons! Innervates nuclei that are ascending, seem to be the master switch... waking up and being paralyzed-fearful experience that you can't move, reports that there is person in the room with them...orexin balances sleep and arousal promoting NTs, gets signals from retina and photoreceptors, responsible for SWS, people with narcolepsy have fewer Orexin neurons and lower levels of orexin in the CSF
- **Recurring dreams**-the more often you have them, the stronger the cxns become, brain is so plastic that it just always goes back to that dream
- **Core muscle relaxation**- you have to be relaxed during SWS , have to be paralyzed so you don't act out your dreams
- Sleep walking happens in SWS
- **REM Behavior Disorder(RBD)** - abnormal, flailing movements occurring during sleep, sleep-related injuries, movements that are potentially dangerous to sleep partner or self... may be a degeneration of the **GIV neurons**... may be initial manifestation of Parkinson... mainly happens in men, may be linked to pesticides on farms

DREAMING:

- Dreaming outside of REM tends to be very simple, SWS we know what is going on (thought to be b/c hippocampus is "downloading" memories and erasing them as well)
- Fear is a large part of dreams...PGO waves constantly generate action on limbic system
- Prior to 1900s, people reported being abducted by angels... before Christianity, people claimed abducted by demons... dreams relevant to info you see/know

- Males see fewer colors, generally pastels... men generally don't see/report faces of sexual partners
- Lucid dreamers use frontal lobes
- Longer SWS periods lead to longer estimates of sleep time by body... less time in SWS in the morning
- **Side effects of sleeping with opposite sex:** looked at sleep efficiency and personal sleep quality... sharing sleeping space had negative affect... sleep efficiency in men- not affected, found desire in men to "group sleep"

#### DREAMS IN CHILDREN:

- Only 20% of the time (under age 8) they report dreaming after awaking from REM ...if they do, it is static/bland, unemotional
- Suggests dreaming is due to gradual cognitive developmental process, more Myelination

#### LUCID DREAMERS:

- When you're awake, frontal lobes very active... normal REM the frontal lobe is cool in an fMRI scan
- Inherited, wiring to keep frontal lobes on

#### MISC:

- Why do some recall dreams and others don't? People that recalled dreams better tend to have more blood flow in medial area of frontal lobe and junction of temporal and parietal lobe... can make disassociation
- Suffocating dreams occur in SWS when respiration rate goes down ... brain incorporates the feeling into dreams