Alcohol

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The Law

- Unscheduled Substance
- Drinking age = 21 in United States

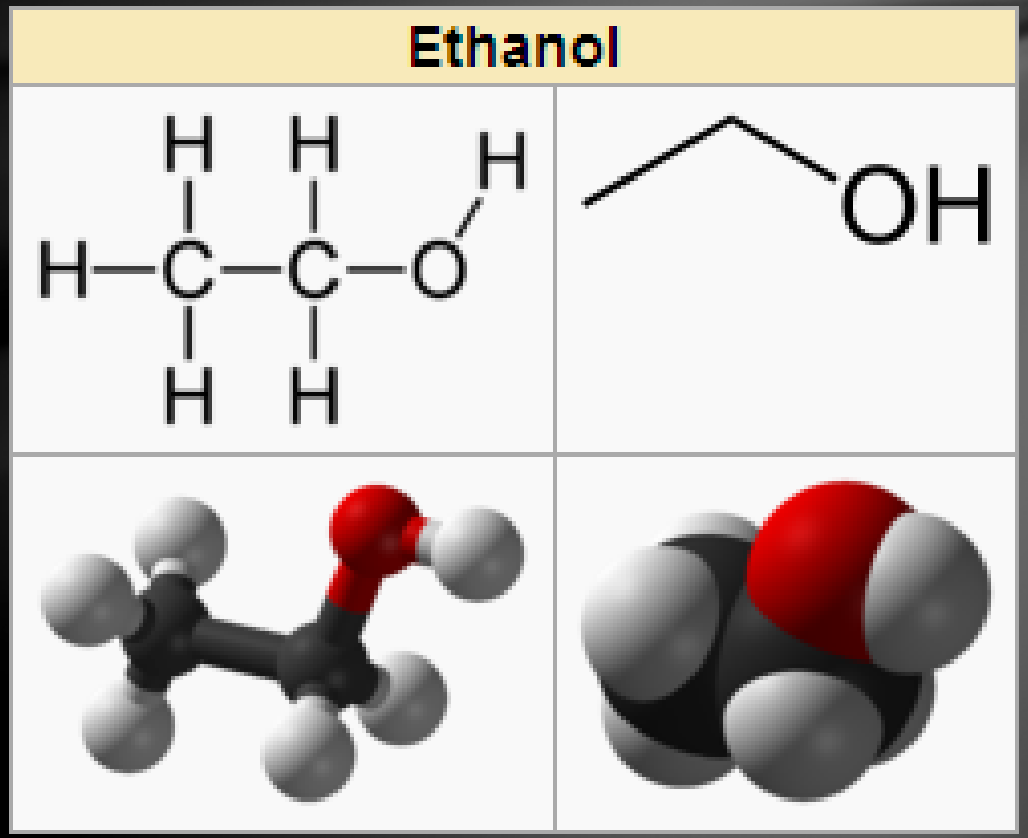
Underage Drinking

2011 National Survey of Drug Use and Health (NSDUH) for Ages 12 and Older (in percent)*

Drug	Time Period	Ages 12 or Older	Ages 12-17	Ages 18-25	Ages 26 or Older
Alcohol	Lifetime	82.2	34.5	[84.3]	87.9
	Past Year	66.2	27.8	[77.0]	69.1
	Past Month	51.8	13.3	60.7	55.1

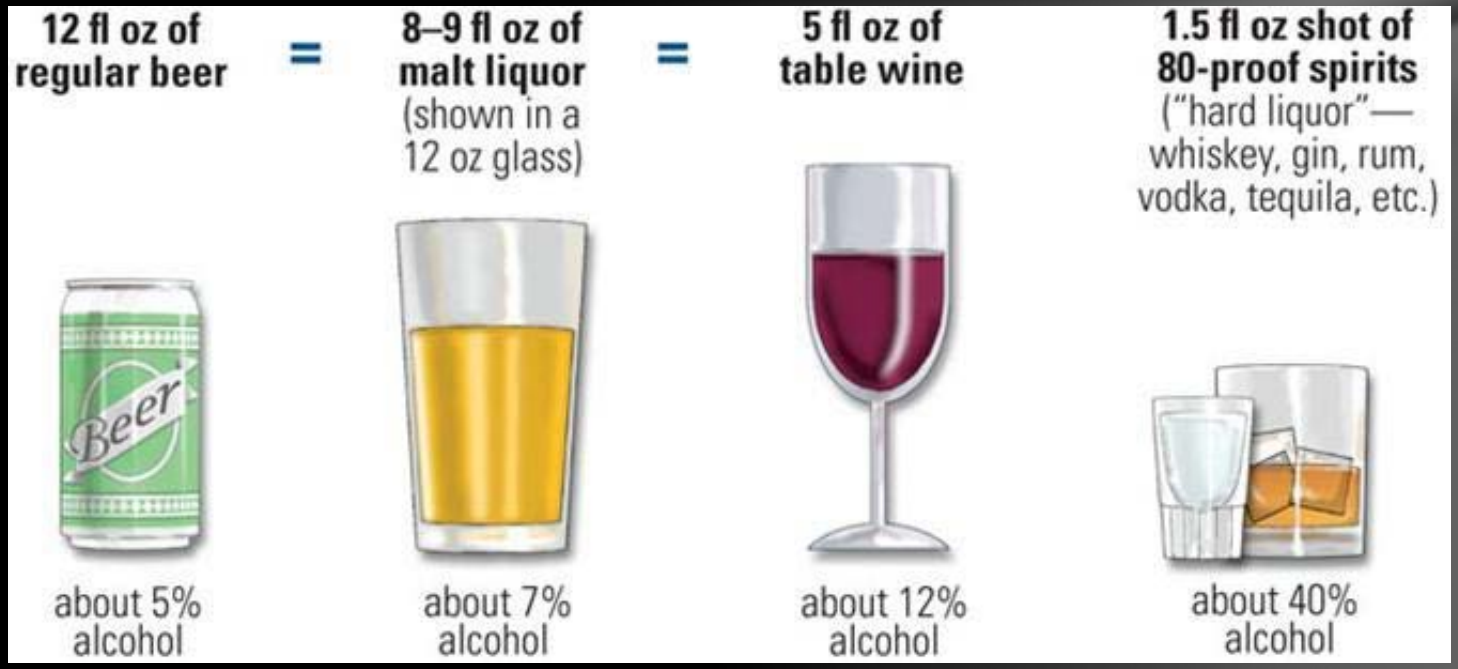
Alcohol: Beer, Wine & Hard Liquor

- Produced by fermentation and distillation of natural sugars
  - Barley = Beer and Whiskey
  - Apples = Cider
  - Grapes = Wine
- Psychoactive compound is Ethanol
  - Dissolves in water
    - Lower Boiling Point
    - Lower Freezing Point



The Standard

- A Standard Drink = 0.6 ounces of Ethanol
  - 12 oz Beer (5%)
  - 5 oz glass of Wine (12%)
  - One shot (40%)



Beginning the Night

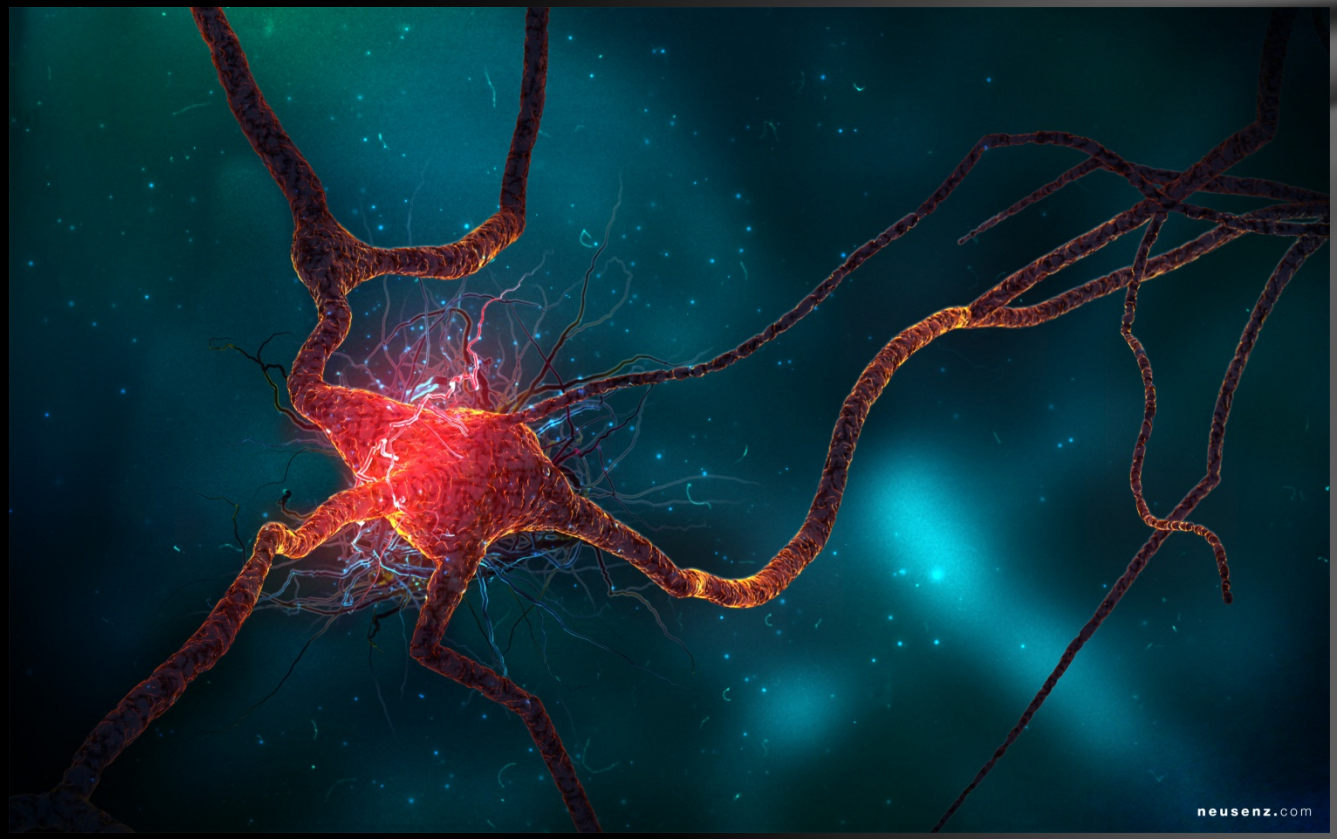
- Absorbed into bloodstream

- Rate of absorption depends on:
  - Concentration of alcohol in drink
  - Carbonation: Speeds up
  - Empty or Full Stomach

- Once in the bloodstream ethanol can travel to the brain
  - Effects on Brain: All the reasons to not drink and drive and more
    - **Effects dependent on Blood Alcohol Concentration**

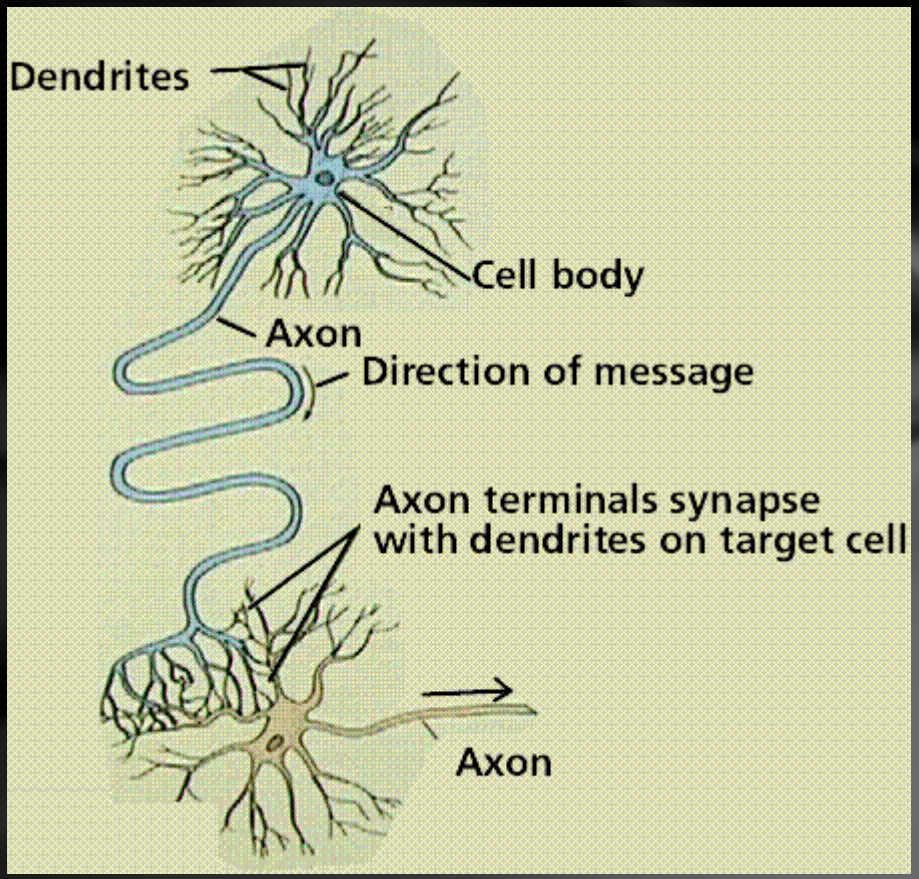
Neurons

- Specialized cells that conduct signals throughout the Nervous System
- Tasks
  - Receive information about the environment
  - Send information to the muscles
  - **Communicate information with other neurons**



Parts of a Neuron

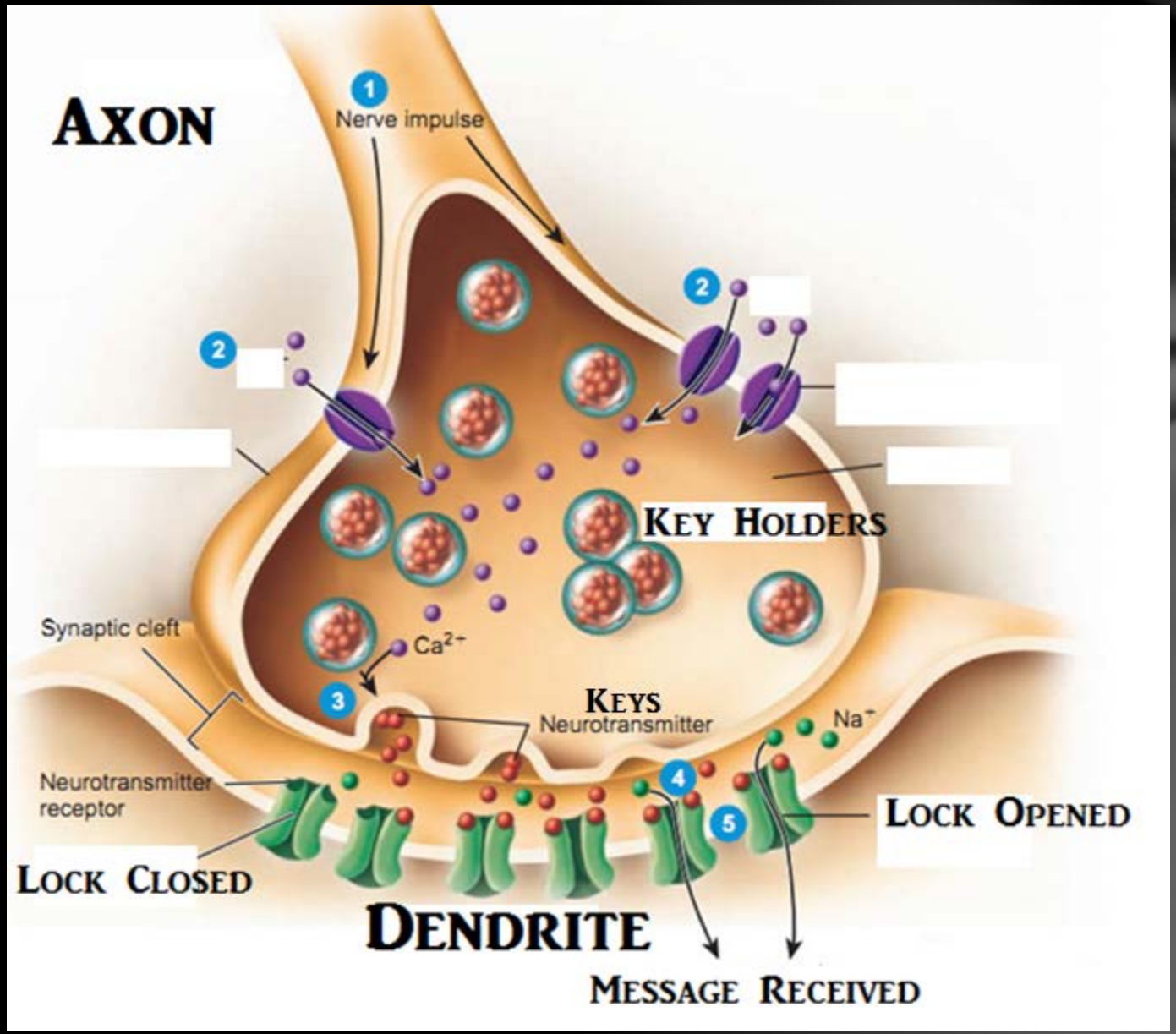
- Dendrite
  - Contain Receptors
    - Receivers of signals
- Cell Body or Soma
- Axon
  - Sends signals to other neurons
- Synapse
  - Area where the axon of one neuron meets the dendrite of another neuron



The Synapse & Neurotransmitters

- "Chemicals as Couriers"
  - Released from axons
- Receptors
  - Located on dendrites
  - A "Lock"
    - Keys are Neurotransmitters
    - Opened Lock = a message can be passed on
- Relationship to Psychoactive Drugs
  - Drugs interfere with normal message signaling
    - Makes people think, feel, and act differently
  - Alcohol acts as an inhibitor

Sending the Message



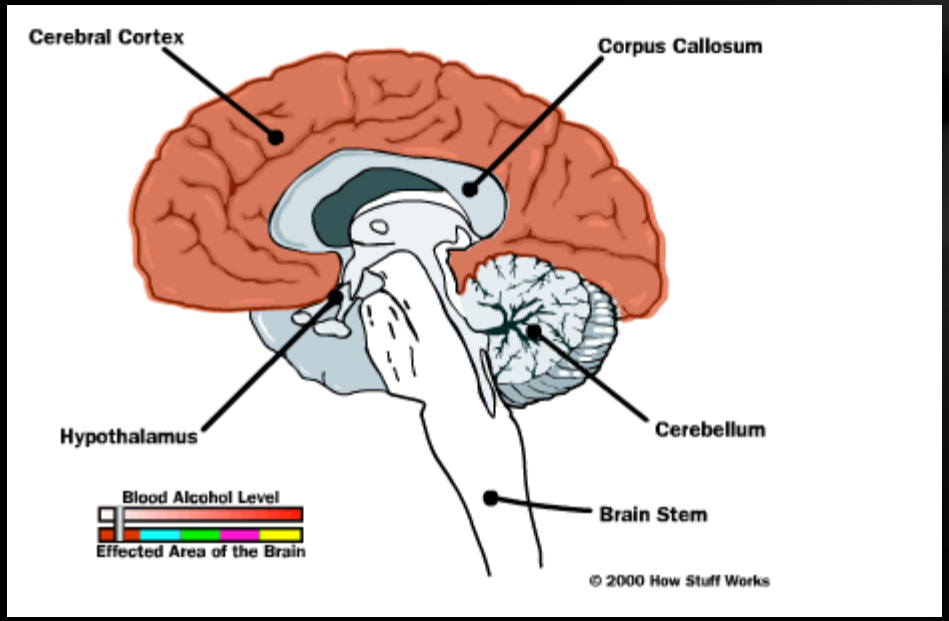
Blood Alcohol Concentration

- Amount of Ethanol in Blood
- BAC rises when ethanol is consumed faster than the body can eliminate it
- Women tend to be more sensitive to ethanol and BAC changes
- **Different areas of the brain do different things**
  - **Different areas affected by different BACs**

- BAC can be estimated

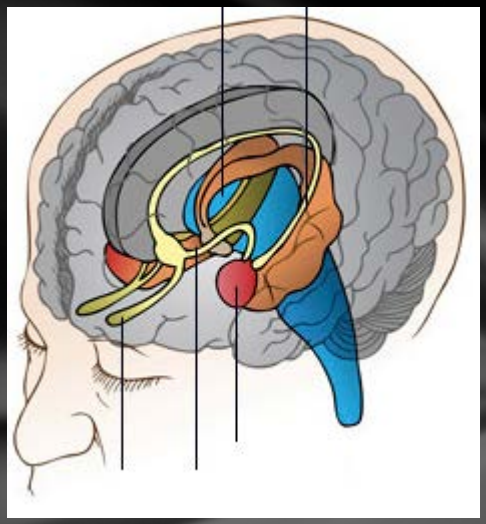
Inhibition of Cerebral Cortex (BAC > 0.01)

- In charge of conscious thought processing
- Ethanol makes people:
  - More talkative and self-confident
  - Reduce sensory processing and reflexes
    - Harder to see, hear, smell, feel and taste
  - Increase pain threshold
  - Lose good judgment and clear thinking



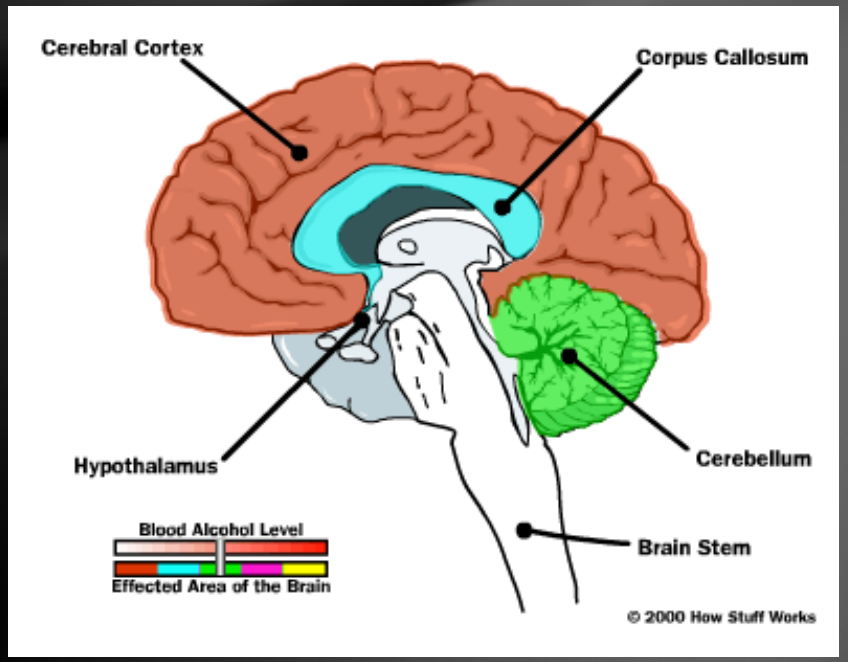
Inhibition of Limbic System (BAC > 0.06)

- In charge of emotional control and memories
- Ethanol makes people:
  - Exaggerate emotions
  - Lose memories of events while drunk
    - Black-out



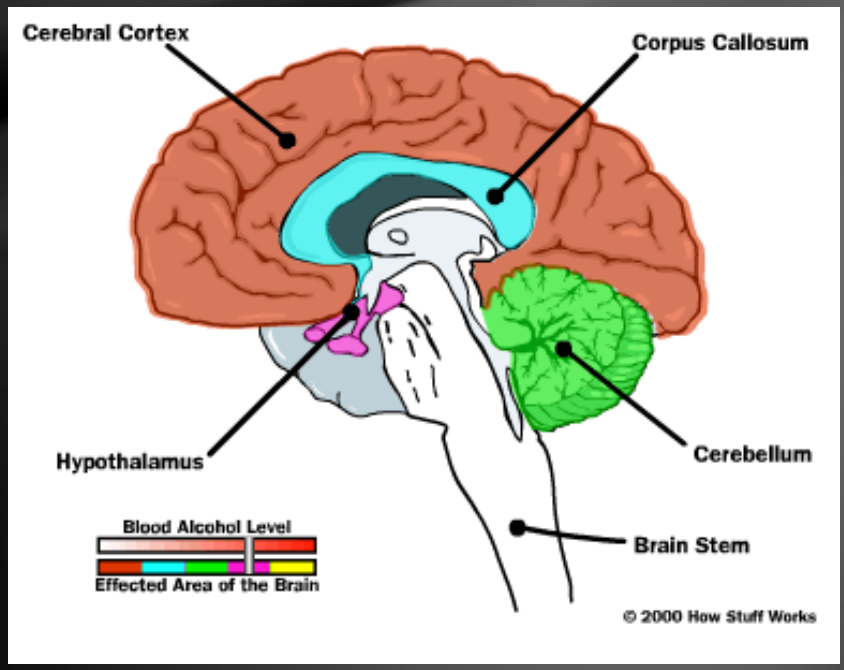
Inhibition of Cerebellum (BAC > 0.10)

- In charge of fine muscle movements and balance
- Ethanol makes people:
  - Lose balance
  - Unable to walk in a straight line
  - Unable to touch finger to nose smoothly
  - BAC Legal Limit to Drive = 0.08



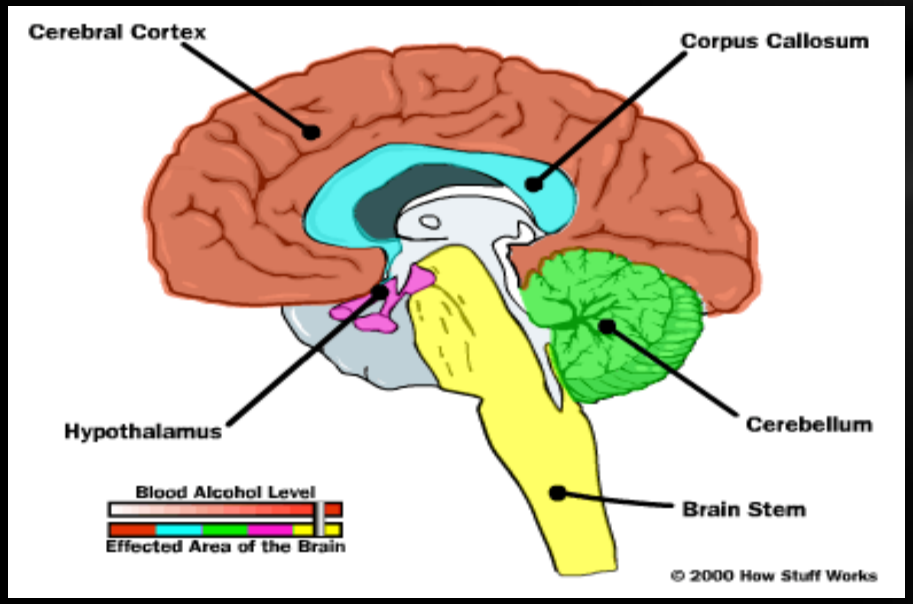
Inhibition of Hypothalamus and Pituitary Gland (BAC > 0.16)

- In charge of urination and hormones
- Ethanol makes people:
  - Increase urination
    - Breaking the seal
  - Increase sexual behavior
  - Decrease sexual performance
    - Whiskey Dick



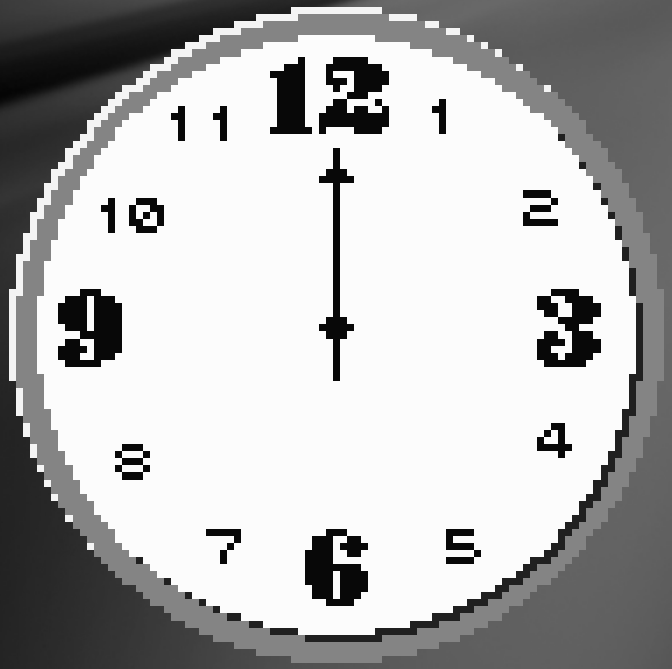
Inhibition of Medulla (BAC > 0.25)

- In charge of unconscious bodily functions
  - Breathing
  - Heart rate
  - Consciousness
- Ethanol makes people:
  - Sleepy/unconscious/coma
  - Reduce breathing
  - Reduce blood pressure
    - BAC > 0.40 = Death



Sobering Up

- Kidney: eliminates 5% into urine
- Lungs: exhales 5%
  - Breathalyzer
- Liver: Breaks down rest of Ethanol
- On average 0.5 oz of ethanol (one standard drink) is eliminated per hour
  - Steady rate vs. multiple drinks
  - Varies person to person
  - Depends on age, gender, weight and genetics.
- Coffe
- Fo d
- Wate
- Only time can sober someone up



The Drunchies

- Ethanol is high in calories
- Beer bellies
  - Not caused by the calories in alcohol
  - Due to excessive eating while drunk
    - Not due to stimulation of brain feeding centers

The Morning After: Hangovers

- Psychoactive drugs offer a loan to the brain
  - Receive an advance on good feelings and euphoria
  - But all loans must be paid back
- Hangovers/withdrawals
  - Opposite the effects of being on drugs
  - For Ethanol:
    - Nausea
    - Anxiety
    - Dysphoria
    - Sensitivity to light and sound
    - Fatigue
    - Dehydration

Mixing Drugs and Alcohol

- Ethanol = Central Nervous System Depressant
  - Large consumption = Death
- Other CNS Depressants
  - Opiates (Heroin, Morphine, Vicodin)
  - Benzodiazepines (Valium, Xanax)
  - Barbiturates (Amytal, Nembutal, Secobarbital)
  - Large consumption = Death
- Synergistic effect of mixing
  - Medium consumption of both = Death
- Stimulates and Ethanol
  - Caffeine masks sedative effects
    - More drinking

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