Alcohol
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The Law

- Unscheduled Substance
- Drinking age = 21 in United States
### 2011 National Survey of Drug Use and Health (NSDUH) for Ages 12 and Older (in percent)*

<table>
<thead>
<tr>
<th>Drug</th>
<th>Time Period</th>
<th>Ages 12 or Older</th>
<th>Ages 12-17</th>
<th>Ages 18-25</th>
<th>Ages 26 or Older</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol</td>
<td>Lifetime</td>
<td>82.2</td>
<td>34.5</td>
<td>[84.3]</td>
<td>87.9</td>
</tr>
<tr>
<td></td>
<td>Past Year</td>
<td>66.2</td>
<td>27.8</td>
<td>[77.0]</td>
<td>69.1</td>
</tr>
<tr>
<td></td>
<td>Past Month</td>
<td>51.8</td>
<td>13.3</td>
<td>60.7</td>
<td>55.1</td>
</tr>
</tbody>
</table>
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%)
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

**THE AMOUNT OF BEER I DRINK:**

**THE AMOUNT OF BEER I PEE OUT:**
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.
- Coffee
- Food
- Water
- 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

SHE THOUGHT I WAS DONE EATING

NOPE, NIPPLE PINCH!
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
References