



## Alcohol: Overview Ethyl Alcohol Ethanol

Psychology 472: Pharmacology of  
Psychoactive Drugs

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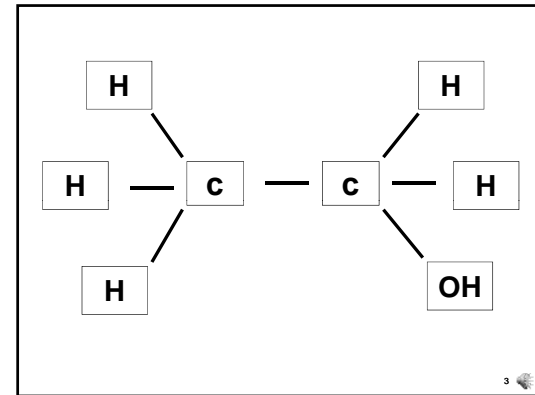
## Types

● Over 100 different types

● Ethanol =  $C_2H_5OH$

● Methanol =  $CH_3OH$

● Isopropyl =  $(CH_3)_2CH_2OH$



## Social Overview

- Fermentation to make alcohol dates back to 4200 BC
- Second most used drug in the world (caffeine #1)
- Luxembourg tops list for legal purchase and consumption (12.6 liters/person)
- Latvia tops list for legal, illegal, and homemade purchase and consumption (16-20 liters/person)
- Whites have highest alcohol consumption rates
- Americans consumed twice as much alcohol in 1830 as they do now.



## College and University Use

- Students drink 4 billion cans of beer yearly
- 360,000 of 12 million undergraduates will die from alcohol-related causes while in school.
- Nearly  $\frac{1}{2}$  of college students are binge drinkers
- Average student spends \$900 per year on alcohol (books \$450/year)



## Other Social Problems Associated with Alcohol Consumption

- Correlated with crime in general
  - Domestic violence
  - Rape
  - DWI
- Economic costs are huge
  - >82 Billion in lost productivity
  - 18.8 billion for alcohol problems
  - 9.9 billion for other drug problems
- Economic burden of alcohol and drug problems falls on the population that do not abuse alcohol or drugs.



## Other Comments

- Can have therapeutic effects when consumed in moderation (1 drink per day).
  - Does not depend on the beverage
- Causes body damage when consumed in greater amounts.
- Minimum age drinking laws have mixed effects.
- Most laws related to drinking and driving have minimal impacts at changing behavior. Get short term reductions and the behavior goes back to normal. (Ross studies)

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## Ethanol Background Information

- Is a simple molecule
- Is classified as a CNS depressant
- Contains no vitamins, minerals etc
- Only contains 210 calories/oz
- Requires no digestion
- Once in the system it stays until metabolized
- Makes it unique

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## Distribution

- After absorption goes evenly throughout the body
- Easily crosses the blood-brain barrier
- Also crosses the placenta and enters the blood stream of a developing fetus.
- Essentially goes to all cells
- Impacts all cells

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## Behavioral Effects

- .01** Decreased Inhibitions
- .01-02** Vision Changes
- .03** Changes in inhibition
- .05** Buzz
- .05** Beginning to decrease motor coordination
- .08 - .10** Decreased motor coordination, legal limit
- .15 - .20** Severe loss of judgment and muscle coordination
- .30** Passing out, coma
- .40 - .5** Death

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## Factors that Influence BACs

- Concentration that is ingested
- Proof of the beverage
- Speed of consumption
- Carbon Dioxide
- Sex of the individual
- Tolerance
- Altitude
- Circadian Variation
- Ascending vs. Descending BACs
- Fructose
- RO-15-4513 and others

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## Concentration that is Consumed

- Generally, the greater the concentration, the faster ethanol enters the bloodstream.
  - On the rocks is better than not on the rocks
- If concentration becomes too great, can decrease bloodstream entry
  - Can shut down the system

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## Proof of the Beverage

- Amount of alcohol/volume of water
  - 100% Ethanol / 0% Water = 200 Proof
    - Only exists in airless environments
    - Usually 190 Proof is as good as you can get
  - 50% Ethanol / 50% Water = 100 Proof
  - 40% Ethanol / 60% Water = 80 Proof
- Proof is not the same as concentration
- The greater the proof, the faster the entry into the blood stream
- To high (>100 proof), it can inhibit entry until the concentration is reduced.

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## Speed of Consumption

- The faster you drink, the faster the BAC rises

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## Carbon Dioxide

- Carbon Dioxide makes ethanol cross the mucosal membranes faster than straight ethanol
- Makes you drunk faster
- Scotch and soda gets you faster than scotch and water.

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## Sex of the Individual

- If a male and female are the same body weight, the female will get drunk faster than the male

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## Reasons

- Women have less alcohol dehydrogenase than men. Metabolizes alcohol slower
- Men have more muscle to body fat than women. More muscle = more blood in solution dilutes the ethanol and lowers the BAC.
- Women have more body fat than men. Fat contains little blood in solution. Less solution, the higher the BAC

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## Tolerance

- The greater the tolerance, the better the person will function when under the influence.
- Note: BAC is still the same

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## Altitude

- The greater the altitude, the faster the ethanol crosses the mucosal membranes.
- Get drunk faster

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## Circadian Variation

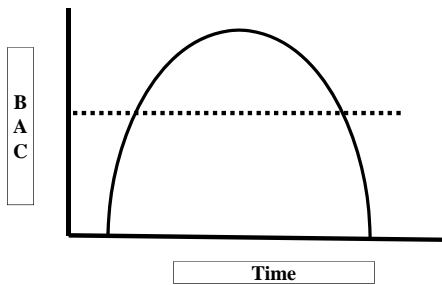
- Circadian rhythms will influence how drunk you will get

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## Ascending vs. Descending BACs

- You are drunker on the Ascending side of the BAC curve than at the same level on the Descending side of the BAC curve.

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## Fructose

- Increases the metabolism of the liver
- Slightly decreases the BAC

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## RO-15-4513 and others

- Block the effects of alcohol on receptor binding sites.
- Have the same BAC but no behavioral effects.

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## Conclusions

- Lots of issues associated with alcohol use and abuse
- Lots of variables influence alcohol effects

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