THE HEALTH BENEFITS OF ALCOHOL

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Stephanie Aldret, DO, CAQSM

DISCLOSURES

- None

OBJECTIVES

- At the conclusion of this presentation, the physician will be able to:
  - Identify health benefits of alcohol
  - Guide patients in appropriate use of alcohol
  - Identify problem behaviors with alcohol
  - Counsel patients on risks of alcohol
"Beer is proof that God loves us and wants us to be happy."
—Ben Franklin

INTRODUCTION

- People drink to socialize, celebrate, and relax
- Alcohol often has a strong effect on people
- "Alcohol can be considered either a tonic or toxin in dose dependent fashion"

INTRODUCTION

- Alcohol’s effects vary from person to person, depending on a variety of factors, including:
  - How much you drink
  - How often you drink
  - Your age
  - Your health status
  - Your family history
- While drinking alcohol is itself not necessarily a problem – drinking too much can cause a range of consequences, and increase your risk for a variety of problems
WHAT IS ALCOHOL?
- Ethyl alcohol
- Ethanol, grain alcohol, alcohol
- Organic compound C₂H₅OH
- Important industrial solvent in the synthesis of other organic chemicals and as an additive to automotive gasoline (gasohol)
- Intoxicating ingredient of many alcoholic beverages such as beer, wine, and distilled spirits

WHAT IS ALCOHOL?
- Created by fermentation or hydration of ethylene
  - Fermentation—transformation of carbohydrates to ethyl alcohol by growing yeast cells
    - Barley, wheat, corn, grapes
  - Hydration of ethylene—passing a mixture of ethylene and a large excess of steam at high temperature and pressure over an acidic catalyst

WHAT IS ALCOHOL?
- Concentrated by distillation
  - Direct distillation can yield a constant boiling point mixture containing 95.6% by weight of ethyl alcohol
  - Dehydration of the constant boiling point mixture yields anhydrous or absolute alcohol
  - Ethyl alcohol intended for industrial use is usually denatured with methanol, benzene, or kerosene.
WHAT IS ALCOHOL?

- Pure ethyl alcohol
- Colorless
- Flammable liquid, boiling point 173.3°F
- Agreeable ethereal odor and burning taste
- Toxic affecting the central nervous system

Ethanol does not require gastrointestinal digestion
May undergo first pass metabolism by gastric alcohol dehydrogenase
Converted in the body first to acetaldehyde and then to carbon dioxide and water at a rate of ~15ml per hour
When ingested, 20% is absorbed from the stomach into the bloodstream and rest is absorbed from the small intestine

HOW DOES ALCOHOL WORK?

- Binds to receptors to slow down the brain
  - Cerebral Cortex: senses, inhibitory centers (talkative, self-confident, judgment)
  - Limbic system: emotions, self control, urges, violent, out of character
  - Cerebellum: coordination and awareness
  - Hypothalamus: memory, black outs—chronic memory loss (long and short term)
  - Pituitary gland: ADH—hunger, thirst, urination, blood pressure increases, heart rate decrease
  - Medulla: heart rate and temperature regulation, wakefulness
Although the “standard” drink amounts are helpful for following health guidelines, they may not reflect customary serving sizes. For example, a single mixed drink made with 80-proof spirits (whiskey, gin, rum, vodka, tequila, etc.) can contain 1 to 3 or more standard drinks, depending on the type of spirits and the recipe.

**WHAT IS A STANDARD DRINK?**

![Diagram](image)

- 12 fl oz of regular beer
- 8 fl oz of malt liquor
- 5 fl oz of table wine
- 1.5 fl oz shot of 80-proof spirits (whiskey, gin, rum, vodka, tequila, etc.)

The percent of “pure” alcohol, expressed here as alcohol by volume (ABV), varies by beverage.

**DRINKING LEVELS DEFINED**

- **Binge Drinking:** NIAAA defines binge drinking as a pattern of drinking that brings blood alcohol concentration (BAC) levels to 0.08 g/dL. This typically occurs after 4 drinks for women and 5 drinks for men—in about 2 hours. 37
- **The Substance Abuse and Mental Health Services Administration (SAMHSA), which conducts the annual National Survey on Drug Use and Health (NSDUH), defines binge drinking as drinking 5 or more alcoholic drinks on the same occasion on at least 1 day in the past 30 days.** 38
- **Heavy Drinking:** SAMHSA defines heavy drinking as drinking 5 or more drinks on the same occasion on each of 5 or more days in the past 30 days.
- **Moderate alcohol consumption:** Moderate drinking is up to 1 drink per day for women and up to 2 drinks per day for men.
- **NIAAA’s Definition of Drinking at Low Risk for Developing an AUD:** For women, low-risk drinking is defined as no more than 3 drinks on any single day and no more than 7 drinks per week. For men, it is defined as no more than 4 drinks on any single day and no more than 14 drinks per week. NIAAA research shows that only about 2 in 100 people who drink within these limits have an AUD.

**Certain people should avoid alcohol completely, including those who:**

- Plan to drive a vehicle or operate machinery
- Take medications that interact with alcohol
- Have a medical condition that alcohol can aggravate
- Are pregnant or trying to become pregnant
HEALTH BENEFITS OF MODERATE ALCOHOL CONSUMPTION

- Up to 1 drink per day for women and up to 2 drinks per day for men
- In most Western countries, alcohol reduces mortality, especially among middle-aged and older men and women
  - protective effects of moderate alcohol consumption:
    - CHD
    - HTN
    - inflammatory liver disease
    - diabetes
    - cancers
    - dementia
    - ischemic stroke
    - kidney stones
    - peripheral arterial disease
    - gallstones
    - bone density

National Institute of Alcohol Abuse and Alcoholism


HEALTH BENEFITS OF MODERATE ALCOHOL CONSUMPTION

- It is estimated that 26,000 deaths were averted in 2005 because of reductions in ischemic heart disease, ischemic stroke, and diabetes from the benefits attributed to moderate alcohol consumption
- Expanding our understanding of the relationship between moderate alcohol consumption and potential health benefits remains a challenge, and although there are positive effects, alcohol may not benefit everyone who drinks moderately

National Institute of Alcohol Abuse and Alcoholism


HEALTH BENEFITS OF MODERATE ALCOHOL CONSUMPTION

- Most rapidly growing segment of the US population is that of older adults (>65 years)
- Trends of aging adults (>50yo) show fewer women than men consume alcohol, women consume less alcohol than men, and total alcohol intake decreases after retirement
- U- or J- shaped relationship between alcohol intake and mortality exists among middle aged (45-65yo) and older adults
- Due to the rising absolute number of older adults, there may be a silent epidemic of alcohol abuse in this group

National Institute of Alcohol Abuse and Alcoholism

Alcoholic beverages are food  
- 7 calories per gram of ethanol

Beer contains small percentages of the recommended daily allowance of vitamins and significant proportions of the recommended daily allowance of trace metals and minerals

Wine, while possessing significantly smaller amounts of vitamins and minerals than beer, has considerably more iron.

Wine, particularly red wine, has high levels of phenolic compounds that favorable influence multiple biochemical systems.

Both beer and wine have a favorable potassium to sodium ratio


HEALTH BENEFITS OF MODERATE ALCOHOL CONSUMPTION

- Coronary Heart Disease
  
  - Negative association with regular alcoholic beverage use. While some report a linear relationship, most studies agree that the relationship is U-shaped. Many studies have suggested that the inverse relationship is due to alcohol's effect of increasing levels of HDL, which aids in the removal of cholesterol from tissue
  
  - Other explanations for moderate alcohol's cardio-protective effect include:
    - Antioxidant activity
    - Suppression of cancer cell growth
    - Ability to lessen stress and/or alter personality patterns associated with CHD risks
    - Promotion of nitric oxide production

Diabetes Mellitus

- Dry non-sweet wines and diluted distilled spirits have been recommended in the treatment of diabetes
- Alcohol may improve glucose tolerance and blood glucose response to ingested carbohydrates
- Due to reported decreased HDL values in diabetics, alcohol has been suggested as useful for its HDL-increasing function

Kidney stones

- 39% reduction in stone formation with wine consumption
  - 59% in women
  - 31% red wine
  - 33% white wine
- 21-41% reduction in stone formation with beer
- Inhibition of ADH with increased urine flow and decreased urinary concentration


AREAS OF RESEARCH

- Oxidative stress
- Dementia
- Psychosocial functioning
- Dietary contributions
- Disease prevention
CONSEQUENCES OF DRINKING TOO MUCH

Alcohol's immediate effects can appear within 10 minutes

- Slurred speech
- Motor impairment
- Confusion
- Memory problems
- Concentration problems
- Coma
- Breathing problems
- Death
- Other risks of drinking can include:
  - Car crashes and other accidents
  - Risky behavior
  - Violent behavior
  - Suicide and homicide

The latest dietary guidelines make it clear that no one should begin drinking or drink more frequently on the basis of potential health benefits. So don't feel pressured to drink alcohol. But if you do drink alcohol and you're healthy, there's probably no need to stop as long as you drink responsibly and in moderation.

"The food you eat can be either the safest and most powerful form of medicine or the slowest form of poison."

- Ann Wigmore