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ALCOHOL

Alcohol came to America with the explorers and colonists. The *Mayflower* landed at Plymouth in 1620 partly because they were running especially low on beer and the necessary ingredients to ferment more. Spanish missionaries brought grapevines and made wine. The Dutch distilled fermented mixtures in 1640, and in the Massachusetts Bay Colony, brewing ranked next in importance after milling and baking.

Americans still love to drink. Statistics from different national surveys do not agree precisely, but they're close enough to make the following estimates about the drinking behaviors of all adults age 18 and older and college students specifically:

- About 65% of all adults and 82% of college students consumed at least one drink during the past year.
- About 50% of all adults and 70% of college students are *current drinkers*, having consumed at least one drink during the past month.
- Nearly 23% of all adults and 45% of college students can be classified technically as *binge drinkers*, defined as having consumed at least 5 drinks on one occasion at least once during the past month.
- Less than 10% of all adults and college students are considered *heavy drinkers*, defined as having had five or more drinks on five or more occasions in the past month.

Beer, wine, and liquor all contain some amount of ethyl alcohol, or ethanol—distinct from other kinds of alcohol, such as rubbing alcohol, which is poisonous if taken internally. In its purest form, ethanol is colorless and odorless.

Ethanol is made by two methods:

- *Fermentation* is a natural process that occurs when yeasts combine with plants like potatoes, fruits, and grains. When the sugar in the

- plants sits for a while with the yeast, it produces an enzyme that converts into alcohol. Natural fermentation can produce alcoholic beverages like beer and wine that contain up to 14% ethanol.
- *Distillation* is a simple mechanical process that starts with boiling fermented fruit or grain mixtures. Since alcohol boils at a lower temperature than other liquids, it turns into steam sooner and separates from those liquids. The steam is caught in a cooling tube and transferred to a different container where it turns back into liquid, leaving the other liquids behind. When the alcohol liquid is distilled several times, it can produce up to 95% pure ethanol. Distillation is typically used to produce spirits, also known as liquor (e.g. rum, vodka, whiskey, etc.).

“Proof” is the standard measurement of the amount of alcohol in a product. It is based on a formula that expresses ethanol concentration or percentage. Proof appears on labels of foods and beverages that contain alcohol. Generally, the proof number on a label equals two times the percentage of alcohol in that product.

The ethanol concentration, or proof, of different types of popular beverages varies widely.

- Beer: 8-12 proof (4%–6% ethanol)
- Wine: 14-28 proof (7%–14% ethanol)
- Distilled spirits (also known as liquor): 80-190 proof (40%–95% ethanol)

The majority of distilled spirits sold in liquor stores are 80 proof (40%) and 100 proof (50%) alcohol. Some highly concentrated forms of rum and whisky run as high as 75%–95%. For example, Everclear, a brand of grain alcohol, is distilled to concentrations of 190 proof (95%) and 151 proof (75.5%) alcohol. (It is illegal to purchase the 190 proof version of Everclear in many U.S. states. This is due to the fact that it is clear, odorless, and so potent that consuming it can be very dangerous.)

In this section:

Alcohol Myths & Facts Quiz

Are you the local alcohol expert? This alcohol quiz offers fun and useful alcohol information.

Alcohol Basics

A select group of reliable, informative, and interesting Web sites.

Binge Drinking

A frequently discussed but typically misunderstood behavior and misquoted statistic.

Alcohol Blackouts

An article that describes alcohol-induced amnesia, not to be confused with passing-out.

Alcohol Myths & Facts: What's Your BQ (Booze Quotient)?

Are the following statements **Myths** or **Facts**? Scroll down for the answers.

1. Q: The U.S. has the strictest youth drinking laws of all Western countries and the highest minimum drinking age in the entire world.

A: Fact. The U.S. government attempts to curb the use and abuse of alcohol by people under the age of 21 through legal restrictions.

2. Q: In the US, people in higher social classes are more likely to abstain from drinking alcohol.

A: Myth. The truth is just the opposite: The lower the social class, the higher the abstention rate.

3. Q: More people in the U.S. abstain from drinking alcohol than in any other Western country.

A: Fact. Compared to other Western countries, we are big abstainers.

4. Q: Drinking alcohol raises body temperature.

A: Myth. Actually, drinking lowers rather than raises the body temperature. Alcohol causes the capillaries to dilate and fill with more warm blood, creating the *illusion* of increased heat.

5. Q: Alcohol consumption goes up by as much as 40% during a full moon.

A: Myth. Contrary to popular belief, alcohol consumption *decreases* during the time of the full moon.

6. Q: Drinking gin and tonic can help relieve menstrual bloating and cramps.

A: Fact.

7. Q: One glass of milk can give a person a .02 blood alcohol concentration (BAC) on a Breathalyzer test.

A: Fact. Believe it or not, this is true.

8. Q: People who drink responsibly and in moderation tend to be healthier and live longer than those who either abstain from or abuse alcohol.

A: Fact. The highest death rate is among heavy drinkers. The lowest is for responsible, moderate drinkers. Abstainers fall in the middle.

9. Q: High tolerance (the ability to drink a lot and not feel drunk) is proof that a person does not have a drinking problem.

A: Myth. People who can drink heavily without becoming intoxicated have probably developed a tolerance for alcohol, which can indicate the onset of dependency. High tolerance is one of the symptoms of a genetic predisposition to alcoholism.

10. Q: Food in the stomach, especially high protein foods such as cheese and peanuts, helps slow the absorption of alcohol into the body.

A: Fact. Food in the stomach does not prevent absorption of alcohol into the blood, but it does slow it down.

11. Q: There is actually a worm in the bottle of some types of tequila.

A: Myth. This popular and somewhat charming misconception is based on mezcal, a spirit beverage distilled from a different plant. It's not actually a worm, but rather a butterfly caterpillar called a gusano.

12. Q: Heavy drinking increases fat percentage and raises cholesterol.

A: Myth. In fact, alcohol contains no fat or cholesterol of any kind.

And a “beer belly” is not caused by drinking too much beer; it develops from eating too much food.

13. Q: A mixed drink containing a carbonated beverage is absorbed into the body more quickly than shots.

A: Fact. The addition of a carbonated beverage accelerates the absorption of alcohol into the system.

14. Q: One 12-ounce cup of “trashcan punch” typically contains at least as much alcohol as a six-pack of beer.

A: Fact. It can contain considerably more than that if the main ingredient is Everclear, which is 95% ethanol.

15. Q: Binge drinking is an epidemic problem on college campuses.

A: Myth. Binge drinking certainly is a problem, but not one of epidemic proportions. The proportion of college students who drink has declined over the past 10 years, as has the percentage of those who drink heavily. While some students push the limits of alcohol consumption and put themselves and those around them at great risk, the majority of college students either don't drink at all or do so moderately and responsibly.

16. Q: Even moderate consumption of alcohol kills brain cells and impairs cognitive functioning.

A: Myth. Moderate consumption of alcohol does not destroy brain cells and is often associated with improved cognitive functioning. This long-standing and popular myth is based on the fact that long-term, heavy drinking can destroy brain cells and impair cognition.

17. Q: Alcohol, Xanax, and Rohypnol (the date rape drug) all work in similar ways in the brain.

A: Fact. Alcohol, Xanax, Valium, Librium, Rohypnol, and other similar drugs all belong to the sedative family of drugs and act similarly on the human brain.

18. Q: If stopped by police after drinking, you should refuse to take a Breathalyzer test because the machines aren't accurate.

A: Myth. This is widely believed and strongly perpetuated by criminal defense lawyers. Breathalyzers are tested regularly and have been proven exceedingly accurate. Furthermore, refusal to take a breathalyzer test will result in the automatic suspension of your driver's license for a minimum of six months.

19. Q: People in the US consume more alcohol than people in most other countries.

A: Myth. Most people are surprised to learn that the U.S. isn't even among the top ten alcohol consuming countries. We're number 32. The top ten: Portugal, Luxembourg, France, Hungary, Spain, Czech Republic, Denmark, Germany, Austria, and Switzerland.

20. Q: Your brain may take as long as 48 hours to return to normal after a big night of drinking.

A: Fact. Heavy drinking, especially heavy binge drinking, can really wreck havoc on the noggin.

Alcohol Basics

How Alcohol Works

HowStuffWorks, a reliable online source for clear, unbiased explanations, offers a lively, in-depth discussion of alcohol and how it affects the body and mind.

www.science.howstuffworks.com/alcohol.htm

National Institute on Alcohol Abuse & Alcoholism

NIAAA, a division of The National Institutes of Health (NIH) provides an exhaustive array of information on alcohol use, abuse, and dependence, including news alerts and articles, publications, research information, and resources.

www.niaaa.nih.gov

Alcohol Problems and Solutions

Developed and maintained by David J. Hanson, PhD, a professor in the Sociology Department of State University of New York, this site offers well-organized, interesting, and comprehensive alcohol information, including everything from fun facts to health effects.

www2.potsdam.edu/hansondj/index.html

**U.S. Department of Health and Human Services
Substance Abuse & Mental Health Services Administration (SAMHSA)
Office of Applied Studies**

This report presents comprehensive statistics from the 2004 National Survey on Drug Use and Health (NSDUH). This survey represents the most current, primary source of information on the use of alcohol, illicit drugs, and tobacco by the civilian, non-institutionalized population of the United States aged 12 years old or older. The survey interviews approximately 67,500 persons each year. Click on the link at:

www.oas.samhsa.gov

Topics in Alcohol Research

Developed and maintained by Aaron M White, PhD, an Assistant Professor in the Department of Psychiatry and Behavioral Sciences at Duke University Medical Center, this site features articles on a variety of issues, including alcohol-induced blackouts, college drinking, and alcohol and adolescent brain development. It also offers video clips on topics such as acute alcohol intoxication.

www.duke.edu/~amwhite

The Vaults of Erowid: Alcohol

Erowid provides reliable, non-judgmental information about psychoactive plants and chemicals and related issues. The site includes input from academic, medical, and experiential experts. The section on alcohol includes sections on history, health, chemistry, and media.

www.erowid.org/chemicals/alcohol

Binge Drinking

On February 5, 2004, the National Institute on Alcoholism & Alcohol Abuse (NIAAA) National Advisory Council approved the following statement:

A “binge” is a pattern of drinking alcohol that brings blood alcohol concentration (BAC) to 0.08 gram percent or above. For the typical adult, this pattern corresponds to consuming 5 or more drinks (for a male), or 4 or more drinks (for a female), in about 2 hours. Binge drinking is clearly dangerous for the drinker and for society.

- *In the above definition, a “drink” refers to half an ounce of alcohol (e.g., one 12-oz. beer, one 5-oz. glass of wine, or one 1.5-oz. shot of distilled spirits).*

- *Binge drinking is distinct from “risky” drinking (reaching a peak BAC between .05 gram percent and .08 gram percent) and a “bender” (2 or more days of sustained heavy drinking).*
- *For some individuals (e.g., older people or people taking other drugs or certain medications), the number of drinks needed to reach a binge-level BAC is lower than for the “typical adult.”*
- *People with risk factors for the development of alcoholism have increased risk with any level of alcohol consumption, even that below a “risky” level.*
- *For pregnant women, any drinking presents risk to the fetus.*
- *Drinking by persons under the age of 21 is illegal.*

Source: *NIAAA Newsletter* (NIH Publication No. 04-5346, Number 3, page 3). (Winter 2004). Bethesda, MD: NIAAA Office of Research Translation and Communications, NIAAA, NIH, DHHS.

Prior to the 2004 definition, the term “binge drinking” referred simply to 5 or more drinks in a row for males and 4 or more in a row for females, without referencing time or BAC. Consequently, most researchers believe that the incidence of binge drinking among college students has been grossly over-estimated. As researchers integrate the revised definition into research designs, a more accurate picture of college binge drinking should emerge.

Blackouts: What are they? How do they Relate to Understanding and/or Diagnosing Alcoholism? A Review of the Literature

by Kevin J. Drab, MA, M.Ed., LPC, CAC Diplomat

<http://users.erols.com/kjdrab/Blackouts.pdf>

Blackouts are the occurrence of alcohol-induced amnesia, and not to be confused with passing-out. Commonly the memory gap covers several hours, but may extend for days. The intoxicated person may have carried out activities and conversations fairly normally during the period of amnesia, but has no memory of these events afterwards.

Jellinek (1946; 1960) was the first to publish a scientific description and examination of the phenomenon of blackouts, basing his conclusions on limited and highly biased surveys carried out with Alcoholic Anonymous members through that organization's magazine "The Grapevine". He concluded that blackouts marked the beginning of the prodromal phase (early) stage of alcoholism and considered them as reliable signs of the developing disease.

Based on Jellinek's observations, it became an accepted truism in the addictions field that blackouts alone were accurate indicators of alcoholism (in fact it remains one of the more common questions on formal and informal alcoholism assessment instruments).

Aaron White (2000) states in one of the only articles I have been able to find on blackouts: "The belief that blackouts occur primarily among alcoholics remains deeply embedded in both the scientific and popular cultures, despite the fact that the issue has received very little scientific attention (Anthenelli et al., 1994). In the half-century since Jellinek's initial characterization of blackouts, relatively few scientific papers have been published on the topic (Goodwin, 1995).

The dearth of reports on alcohol-induced blackouts led Jennison and Johnson (1994) to assert that blackouts have been "neglected as a subject of research". More importantly, this lack of scientific study has perpetuated the fallacy that blackouts, by themselves, are an indication of alcoholism and an inevitable occurrence in alcoholics."

Aaron White (2002) explains the mechanism of blackouts as follows: "Alcohol primarily interferes with the ability to form new memories, particularly memories that are episodic in nature. Episodic memories are memories for facts (e.g., names, phone numbers, etc.) and events (e.g., what you did last night). The impact of alcohol on the formation of new episodic memories is far greater than the drug's impact on the recollection of previously established memories. For instance, alcohol would have a much bigger impact on the ability to learn a new person's name than on the ability to remember the name of someone that you already know."

"Research with both humans and rodents suggests that alcohol effects learning and memory by disrupting activity in the hippocampus. In humans, alcohol and hippocampal system damage produce a similar pattern of learning and memory impairments, characterized by a disruption in the ability to encode new episodic information. At low doses, alcohol's effects on encoding can lead to mild impairments in short-term memory. At much higher doses, alcohol's effects on encoding can lead to blackouts, an inability to recall entire events that occurred while intoxicated."

An informal poll of any group of individuals with a history of drinking, will typically find a few who have had blackouts, usually, but not always, associated with heavy alcohol consumption, without any indications that they are or ever were alcoholics. Various surveys of teen-age drinking, for example, have found reports of blackouts in almost a quarter of those who

drank (e.g., Martin et al., 1995; Stewart & Brown, 1995). Over the years my informal surveys of alcoholics has found many who had never experienced blackouts. Simply put, blackouts can happen to anyone, and if you're prone to them, drinking more, more often will result in more of them whether you're an alcoholic or not.

Consider that if blackouts were reliable indicators of alcoholism there would be considerable investigation into their implications about the alcoholic versus the nonalcoholic brain. The absence of published research or even discussions of the subject outside of the popular literature would imply that blackouts are not unique to alcoholism. The neurological reasons why some individuals experience blackouts and others don't, regardless of quantities consumed, have little relevance to our quest to understand the nature of alcoholism.

While blackouts can not be considered criteria for directly diagnosing alcoholism, the individual's reactions to them can provide considerable support for concluding they are alcoholic. I typically enquire about blackouts in an assessment to ascertain frequency, seriousness and the client's subsequent attitude towards them. If an individual is experiencing blackouts which are adversely impacting their life, especially if they are expressing some concern about them, and yet she/he continues to drink, I would certainly consider that a strong indication that the individual may be caught up in an addictive process. Consider how a "normal social drinker" would react to a serious blackout, DUI, or other negative consequence of their drinking—they'd probably be scared or concerned enough to cut back or stop entirely! Far from definitive proof, but it does weight the assessment toward a dependency diagnosis.

As the amount consumed bears some relation to the occurrence of blackouts, this would also raise questions about the level of abuse—this is probably what originally lead to the association of alcoholism with blackouts, i.e., the more you drink with regard to times and amounts the more likely you'll have more blackouts. That anyone would continue to persevere despite such negative consequences lies at the heart of understanding alcoholism. The DSM-IV-TR (2000) puts it quite succinctly as: "Once a pattern of compulsive use develops, individuals with Dependence may devote substantial periods of time to obtaining and consuming alcoholic beverages. These individuals often continue to use alcohol despite evidence of adverse psychological or physical consequences (e.g., depression, blackouts, liver disease, or other sequelae)" (p. 213).

The effects of long-term use of alcohol is another matter, especially when it comes to cognitive difficulties, such as impaired memory or reasoning ability.

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