

# Alcohol Information and Education

## How Alcohol Affects Us

Almost all of us have heard that alcohol is a drug, but many of us do not think of the act of drinking alcohol as putting a drug into our bodies. It is important to understand that alcohol use impairs judgment, the peripheral nervous system (which controls motor skills), and the functions of the brain.

### How does impairment happen?

When a person drinks alcohol, it enters the bloodstream. The molecular structure of alcohol (ethanol, to be specific) is small and it can be absorbed or transferred into the blood through the walls of the stomach and the small intestine.

The stomach has a relatively slow absorption rate; it is the small intestine that absorbs most of the alcohol. This is why we want to keep the alcohol in the stomach as long as possible by eating food, which dilutes the alcohol and keeps it from entering the small intestine so quickly.

Alcohol also affects different people in different ways. Some of the characteristics that determine the effects of alcohol for an individual include the following:

- **Body Weight/Body Mass Index (BMI):** Not only heavier but more muscular individuals have more blood to dilute the alcohol, resulting in a lower blood alcohol concentration (BAC).<sup>1</sup>
- **Gender:** Women produce less of the alcohol metabolizing enzymes ADH and ALDH, meaning that it takes a woman longer to breakdown the same amount of alcohol than a man of equal size.<sup>2</sup> Women also generally have more body fat and less body fluid than men.<sup>1</sup> Less body fluid to dilute the alcohol means a higher BAC.
- **Full/Empty Stomach:** Caloric content in the stomach slows the release of its contents into the small intestine. This means that diet sodas, which contain artificial sweeteners, when used as mixers are released much quicker into the small intestine than their calorie rich counterparts (i.e., the alcohol can enter your blood stream faster).<sup>3</sup>
- **Type of Food or Drink in the Stomach:** For example, protein slows the stomach's release of substances into the small intestine and the subsequent alcohol absorption, more than any other kind of food.
- **Speed of Consumption:** Faster consumption (e.g. chugging, shooting) results in a higher peak BAC.
- **Use of Medication or Other Drugs:** For example, Acetaminophen competes with alcohol in your liver during the process of breaking down each substance, and acute liver failure can result as the organ struggles to break down both drugs.<sup>4</sup> The use of drugs, prescription or otherwise, may intensify or alter the effects of alcohol, but they do not change a person's BAC level.

Once alcohol gets into the bloodstream, it moves through the body and comes in contact with virtually every organ. Alcohol easily crosses the blood-brain barrier where it has some of the greatest impacts. These are discussed in the next section.

It is important to know that the body is quite efficient when it comes to processing alcohol. The liver is designed to metabolize the majority of alcohol as we drink it. Enzymes break down the alcohol into harmless products that are then excreted. However, the liver can only process so much alcohol at a time. For a person of average weight and body type, the liver and small intestine can process alcohol at a rate of about one drink per hour. If a person drinks at a faster rate than one drink per hour, the alcohol simply stays in the blood, waiting its turn to be metabolized. Since there is more alcohol in the body than can be metabolized, the result is increasing levels of intoxication.

## Blood Alcohol Concentration (BAC) Level Information and Chart

Of course, it is important to define what “a drink” means. Normally, a drink is thought of as:

- One beer
- One mixed drink
- One glass of wine
- One shot of alcohol

But it is important to understand that the formal definition is actually:

- 12 ounces of beer
- 4-5 ounces glass of wine (12-15% alcohol by volume)
- 1.5 ounces of 80 proof (40% alcohol) distilled spirits

Each of these contains the same amount of pure ethanol, about 0.6 ounces. In other words, a 20-ounce mug of beer is considered more than a drink—it is actually closer to a drink and a half. If a person orders a mixed drink at a bar or at a party, it may be possible that whoever mixed the drink may have put in two or three ounces of alcohol.

All of these factors will determine the amount of alcohol in a person’s blood, which is measured as the BAC, or Blood Alcohol Concentration.

### Blood Alcohol Concentration (BAC) Levels

- .01–.07** You feel mildly relaxed, a little lightheaded. Your inhibitions are loosened, and you feel less cautious. Judgment abilities are slightly impaired. No real feeling of the depressant effects of alcohol seen yet. Your behavior may become exaggerated and your emotions intensified.
- .08–.13** Your motor skills are starting to become impaired and your sense of balance may be compromised. Your emotions become a bit exaggerated—perhaps loud, perhaps aggressive. It is dangerous (and illegal) for you to drive. Your judgment is impaired, and you may have difficulty evaluating sexual situations. You believe you are functioning better than you actually are.
- .14–.19** The “good feelings” of euphoria begin to give way to some negative feelings such as anxiety and restlessness. You may begin to feel tired because the depressant qualities of alcohol begin to take effect. If you are a man, you will have difficulty achieving or maintaining an erection. You will have trouble walking or standing, and you will greatly increase the chance of hurting yourself physically. You may get nauseous.
- .20–.24** You feel confused and disoriented. At this point you may experience nausea and, since your gag reflex is impaired, you may choke on your vomit. You have trouble standing. You may not realize that you hurt yourself because you may not feel pain. Blackouts become likely at this point.
- .25–.29** Almost all aspects of your brain are severely impaired. You may have passed out by this point. Vomiting is likely and the chance of asphyxiation on your own vomit is greatly increased. If you have not passed out, the risk of personal injury is high because you have little to no physical control. You are emotionally numb.
- .30–.34** If you are still awake, you are in a stupor. You likely have no comprehension of where you are or what you are doing. There have been numerous cases of alcohol poisoning and death in this range of BAC. You are in need of medical help.
- .35 & UP** You have reached the level of surgical anesthesia. Coma is possible. The lungs and heart rate are slowing to the point of stopping. You need immediate medical help.

Try our BACCHUS BAC Calculator @ [friendsdrivesober.org/  
alcohol\\_drugs\\_driving/bac.html](https://friendsdrivesober.org/alcohol_drugs_driving/bac.html)

## Sources

1. National Highway Traffic Safety Association (2005). The ABC's of BAC: A guide to understanding blood alcohol concentration and alcohol impairment. Retrieved August 6, 2009 from [www.nhtsa.dot.gov/people/injury/alcohol/stopimpaired/ABCsBACWeb/page2.htm](http://www.nhtsa.dot.gov/people/injury/alcohol/stopimpaired/ABCsBACWeb/page2.htm)
2. Go Ask Alice!, Columbia University's Health Q&A Internet Service. (2005). Suddenly drinking alcohol makes me sick! Retrieved August 6, 2009 from [www.goaskalice.columbia.edu/2630.html](http://www.goaskalice.columbia.edu/2630.html)
3. McMillen, M. (2006) Risky Mixers. *The Washington Post*. September 12, 2006, HE02.
4. Go Ask Alice!, Columbia University. (2005, July 1). Mixing alcohol and acetaminophen: How can I reduce my risk for side effects? Retrieved August 6, 2009 from <http://www.goaskalice.columbia.edu/3508.html>

## Alcohol Chemistry 101

Want to host an educational program on alcohol poisoning? We have it ready for you! The Alcohol Poisoning Response Kit is an easy to use "program in a box" that contains the materials you need for this important topic. Each kit contains a facilitator manual, DVD with PowerPoint presentation, sample handouts, and giveaway items, including alcohol poisoning magnets and pamphlets. This is a program peer educators can learn and present to their peers. With this kit, you will be prepared to address this issue with students on your campus and equip more students with the knowledge and skills to prevent alcohol poisoning. To order the kit, visit [bacchusnetwork.org/store](http://bacchusnetwork.org/store)

