

Why Biology Matters When it Comes to Drinking Alcohol

Live Well to
Learn Well

Web:
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Phone (24/7):
607-255-5155

Fax:
607-255-0269

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110 Ho Plaza,
Ithaca, NY
14853-3101

Your biological sex and gender identity don't determine the extent to which you can learn, play, contribute, or succeed, but they do affect the way your body processes alcohol. *There are some important physiological and social differences that change the way alcohol affects people of different sexes and gender identities.* Consider the following:

Generally, a female-bodied person gets drunk faster than a male-bodied person consuming the same amount of alcohol.

Imagine you are a 150 pound female-bodied person and you drink four 12 oz beers in 2 hours. Your estimated blood alcohol concentration (BAC) would be about .10. Most people feel drunk at .10 BAC. Your reaction time is delayed and your muscle control is impaired. You might feel dizzy, nauseous, and have trouble walking.

If a male-bodied person weighs the same 150 pounds and drinks the same amount alcohol over the same amount of time, their estimated BAC would be about .08 and they would experience fewer effects as a result. In fact, in this scenario a female-bodied person would achieve the same effects after four drinks that a male-bodied person would after five.

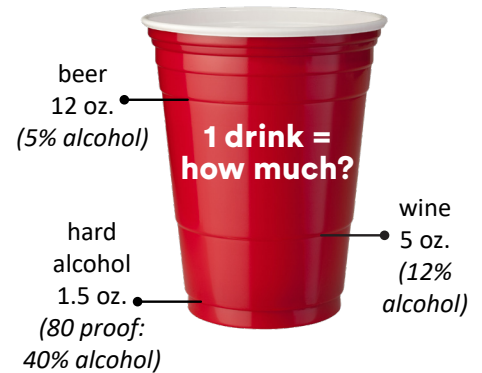
What accounts for the variation?

There are several factors to consider:

- First, there are *differences in body water content* for male-bodied and female-bodied people. The total weight of a male-bodied person is composed of 55-65% water (vs 45-55% water for a female-bodied person); so alcohol is more diluted in a male-bodied person.
- Second, male-bodied people *have higher levels of an enzyme* (gastric alcohol dehydrogenase) that aids the metabolism of alcohol. Having more of this enzyme enables male-bodied people to more effectively break down alcohol in the stomach before it even reaches the blood stream and impacts their BAC.
- Third, *hormonal changes in female-bodied people affect BAC*. Research has found that one week prior to menstruating, female-bodied people maintain the peak degree of intoxication for longer periods of time than menstruating or post-menstruating individuals do. This same pattern of prolonged peak intoxication is also found among people taking oral contraceptives.
- Finally, *body size matters*. Generally, male-bodied people have larger skeletal frames and muscles, so alcohol is diluted over a larger mass.

All of this means *female-bodied people typically experience greater impairment after drinking less*

What's a Standard Drink?



Know the STRENGTH (proof)

Know the AMOUNT (oz.)

Know the TIME (consumption rate)

alcohol than male-bodied people. With greater impairment comes an increased risk for harm, including hangovers, nausea, vomiting, memory loss, blackouts, and other regretted behaviors.

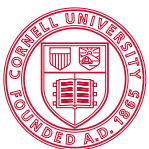
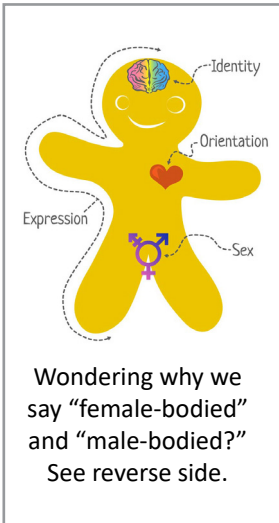
You can see how your own BAC would change based on your size, biological sex (i.e., birth sex) and drink choices with an online BAC calculator (healthstatus.com/calculate/blood-alcohol-bac-calculator). Then, consider the impact of BAC on your body and functioning (health.cornell.edu/resources/health-topics/alcohol-other-drugs).

Research on alcohol's effects on transgender and intersex people is seriously lacking.

The vast majority of alcohol research has been conducted with "cisgender" men and women (see definitions), which means we just don't know as much about how alcohol affects transgender and intersex bodies (Important research opportunity alert!). And, just like gender expression differs widely, the effects of alcohol can vary significantly among those who are cisgender, transgender and intersex. It's likely hormone therapy may increase the intoxication effects of alcohol, yet transitioning does not affect other important physiological traits that often play a larger role in processing alcohol (e.g., gastric alcohol dehydrogenase levels and liver size).

Even less is known about how alcohol may impact intersex bodies. We always recommend you consult your own health care provider(s) for individualized information about your body and the impact of alcohol or other drug use.

Female-bodied people develop alcohol-related organ damage at lower levels of alcohol consumption and after a shorter history of drinking than male-bodied people.



Female organs appear to be more vulnerable to alcohol-induced damage than male organs. For example, female-bodied people with alcoholism develop cirrhosis of the liver, alcohol-induced damage to the heart, and nerve damage after fewer years of heavy drinking than do male-bodied people with alcoholism.

Talking about organ damage may sound scary when thinking about college student drinking. But consider this: if the organs of female-bodied people are at greater risk for damage from heavy drinking over shorter periods of time, then four years of heavy college drinking may take a greater toll on cisgender female bodies than cisgender male bodies.

Alcohol often plays a role in sex & sexual violence

It is impossible to talk about alcohol and not talk about sex. Meeting potential partners (for dates, a relationship, or a one night hook-up) is a big part of the drinking scene. Alcohol can lower inhibitions and make it easier to talk to people you find attractive. However in larger doses, alcohol interferes with sexual performance. Heavy drinking can result in difficulty maintaining an erection or ejaculating for male-bodied people, and decreased lubrication or ability to orgasm for female-bodied people. For the best possible sexual experiences, limit alcohol intake or wait until you and your partner are both sober.

FACTOID: 73% of Cornell students who have had a positive sexual experience said: "I consumed no alcoholic drinks before my best sexual experience." *

Unfortunately, alcohol is involved in as many as 75% of sexual assaults nationally on college campuses. While anyone can be a victim or perpetrator, there is no doubt that sexual violence is a gendered issue. Research tells us the majority of victims are women and transgender people. The majority of perpetrators are men. Perpetrators often perceive a woman drinking to be a vulnerable target. Some use alcohol as a weapon, intentionally getting someone drunk in order to take advantage sexually. Studies show those who are even a little intoxicated are more likely to be victimized than those not drinking. While drinking less may help reduce your risk, drinking more *does not* excuse or justify violence. The perpetrator of sexual violence

is always the one responsible, no matter what choices were made by the person targeted.

See. Think. Act. Take action to protect friends and others from potential assault. Pay attention and intervene when you see someone acting inappropriately or about to take advantage in a drunken situation. Step in if you are worried that an intoxicated individual may be making a choice that they could regret in the morning— or worse, making a choice that ends up hurting themselves or someone else.

If you drink alcohol

As with any drug, most people who drink alcohol want to experience the optimal positive effect with the least amount of side effects. Proper "dosage" is key.

Reaching your buzz slowly and maintaining it will reduce the negative consequences from drinking. Here are some strategies— developed by other students who drink— for optimizing the positive effects of alcohol and avoiding negative consequences:

- Space and pace your drinking to about one drink per hour
- Alternate between non-alcoholic and alcoholic drinks
- Drink for quality, not quantity
- Eat before and during drinking
- Bring condoms/safer sex supplies for yourself or a friend
- Avoid drinking games
- Avoid shots and/or mixed drinks
- Stop drinking when you feel dizzy, nauseated, or tired
- Use a designated driver, walk with a friend, take TCAT, or bring cab fare

When not to drink

Most people know it is important not to drink when they are pregnant or trying to get pregnant, or if they are on certain prescription medications, such as certain antibiotics, antidepressants, or pain killers. However, there are other times when it is best to pass on alcohol. A good rule for when not to drink when Hungry, Angry, Lonely or Tired ("HALT").

Get help in alcohol emergencies

Alcohol emergencies can be fatal. Never hesitate to call 911 to get help for yourself or for a friend. Remember: New York State's Good Samaritan law and Cornell's Good Samaritan Protocol can eliminate judicial consequences in alcohol or other drug emergencies.

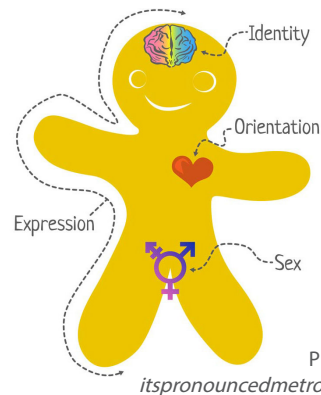


Photo credit: itspronouncedmetrosexual.com

Sex & Gender Terms

We say "female-bodied"/"male-bodied" in this fact sheet because it's your "sex" and related biology that contribute to your BAC, not your identity.

Gender Identity: Your sense of being masculine, feminine, both, or neither. Sexual orientation varies and is not dependent on gender identity.

Gender Expression: The way you choose to present your gender (clothing, hair styles, etc.).

Biological Sex: Medical term designating a combination of gonads, chromosomes, external gender organs, secondary sex characteristics and hormones.

Birth Sex: The biological sex assigned by a doctor at birth (male, female, intersex).

Intersex: Individual born having physical sex markers (genitals, hormones, gonads, or chromosomes) that are neither clearly male nor female.

Transgender: Individual whose gender identity differ from their assigned or presumed sex at birth.

Cisgender: Individual whose gender identity is the same as their assigned or presumed sex at birth (AKA: "cissexual").

It applies on and off-campus. Get more info at goodsam.cornell.edu

For more information

Visit these resources:

- Additional Sex & Gender terms: lgbtrc.cornell.edu
- Alcohol & Other Drug Resources: health.cornell.edu [search "AOD resources"]
- Signs of Alcohol Emergencies: health.cornell.edu [search "alcohol emergencies"]
- Good Samaritan Protocol: goodsam.cornell.edu