Why Your Biology Matters When It Comes to Drinking

Our biological sex and gender identity don’t determine the extent to which we can learn, play, contribute, or succeed, but they do affect the way our bodies process 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 will get 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.

What about the guys? If a male-bodied person weighs the same 150 pounds and drinks the same amount alcohol over the same amount of time, his estimated BAC would be about .08 and he 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 this 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 men than women.
- Second, male-bodied people have higher levels of an enzyme (gastric alcohol dehydrogenase) that aids in the metabolism of alcohol. Having more gastric alcohol dehydrogenase 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 people do. This same pattern of prolonged peak intoxication was also found among people taking oral contraceptives.
- Finally, body size matters. Generally, male-bodied people have larger skeletal frames and musculature, so alcohol is diluted over a larger mass.

All of this means that female-bodied people typically experience greater impairment after drinking less alcohol than male-bodied people. With that greater impairment comes an increased risk for harm, including hangovers, nausea and 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 (www.healthstatus.com/bac.html). Then, consider the impact of BAC on your body and functioning. (Visit www.gannett.cornell.edu/topics/drugs/alcohol/whattoknow.cfm.)
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 heavy 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 muscle (cardiomyopathy), and nerve damage (peripheral neuropathy) after fewer years of heavy drinking than do male-bodied people with alcoholism.

Talking about organ damage may sound scary when thinking about typical college student drinking. But consider this: If the organs of female-bodied people are at risk for damage from heavy drinking over shorter periods of time, 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 and 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 your 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 that the majority of victims are women and transgender people and the majority of perpetrators are men.

Perpetrators often perceive women drinking alcohol to be vulnerable targets. Some use alcohol as a weapon, intentionally getting someone drunk in order to take advantage of them sexually. Studies show that individuals who are even a little intoxicated are more likely to be victimized than those who are not drinking. While drinking less may help reduce your risk, deciding to drink 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 individual targeted.

See. Think. Act. It’s important to 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:

- 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 is “HALT.” HALT stands for feeling Hungry, Angry, Lonely or Tired.

Getting 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 help reduce/eliminate legal/judicial consequences in alcohol or other drug emergencies. It applies on and off-campus. Get more info at GoodSam.cornell.edu

For more information

Visit these resources for information about:

- Additional Sex and Gender terms: lgbtrc.cornell.edu
- Alcohol and other drug info & resources: visit “Topics & Concerns” at www.gannett.cornell.edu
- Signs of alcohol emergencies: www.gannett.cornell.edu/topics/drugs/alcohol/emergencies.cfm
- Good Samaritan Protocol: GoodSam.cornell.edu

Contact us:

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phone: 607.255.5155
fax: 607.255.0269
110 Ho Plaza, Ithaca, NY 14853-3101