



Alcohol: Considering Different Impacts for Different People

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Learning Objectives:



1. To understand how a person's gender and weight are related to blood alcohol level
2. To understand factors associated with absorption of alcohol and the rate of burning off (or "oxidizing") alcohol
3. To understand what counts as a "drink"
4. To identify strategies to reduce risks when one makes the choice to drink

Technical Requirements:



Flip chart and markers

Handouts:



BAC Levels and Effects

Approximate BAC Levels as Function of Number of Drinks and Time, Determined by Weight of Women

Time Needed:

30 minutes

Group Size:

Any group of 12 or more

Physical Setting:

Any facility where the group can sit comfortably, facing the facilitator

Preparation:

Look up the university policies and local laws related to alcohol. Be sure to review the blood alcohol charts (see handouts) and related information in advance to gain a clear understanding of relevant points. Write the list of "drinks" on the flip chart paper prior to beginning the workshop.

Resources:

Based on "Brief Alcohol Screening and Intervention for College Students" by Dimeff et al (1999)

INTRODUCTION (5 minutes)

The facilitator should introduce himself/herself, welcome and thank everyone for attending the session. Remind participants that drinking by students under the age of 21 is illegal, and that the only way to avoid all unwanted consequences associated with drinking is to abstain.



Our goal for this workshop is to help you become aware of and think critically about factors at play in situations where alcohol might be present. This includes being aware of ways to reduce risks associated with drinking for those who make the choice to drink, and providing information to reinforce the decision of those who choose not to drink.

WHAT IS A “DRINK”? (5 minutes)



Distribute BAC Levels and Effects handout.

Let's think about a scenario that you could encounter in a social setting here at college.

One of your sisters is at a party and has decided that she is only going to have two drinks tonight. It's been a few hours since she had anything to eat. Upon walking into the party, she is handed a red cup with a mixed drink in it. She downs the drink pretty quickly, and she gets her second drink of the night. Though she intends to drink this one more slowly, she starts to feel pretty intoxicated, finishes this drink, and moves on for a third.

Let's think about what's happening here. *Pose the four questions; do not give time for the group to answer them yet. You will go through each question in depth throughout the workshop.*

- What's going on for your sister?
- How many drinks has she had?
- What has contributed to getting intoxicated quickly?
- Why might she have had difficulty sticking to her goal?

Let's go through these final three questions. First, how many drinks has she had? We really can't tell.

A standard drink is anything that contains a half-ounce (or three teaspoons) of ethyl alcohol—drinks are not defined by the number of containers they come in. While there are always some differences across brands and within types of drinks, the following count as “a drink”:

- 12 ounces of beer
- 10 ounces of a microbrew – *Specialist beer produced in a microbrewery*
- 10 ounces of a wine cooler
- 8 ounces of malt liquor – *A drink that is brewed from malt, especially one having a higher alcohol content than most beer or ale*
- 8 ounces of ice beer – *Beer brewed by a process that freezes the beer and removes some of the ice, thus increasing the beer's alcohol content, e.g. Miller Lite Ice or Bud Ice*
- 4 ounces of wine
- 2½ ounces of fortified wine – *A drink that is made from wine to which a strong alcohol such as grape brandy has been added, e.g. sherry or port*
- 1¼ ounces of 80 proof hard alcohol (40% alcohol by volume)
- 1 ounce of 100 proof hard alcohol (50% alcohol by volume)

In preparation:

- Write the list of what constitutes “a drink” on a flip chart or white board in advance. Some definitions are included **for the facilitator** in case participants need more explanation.





Work with the group to compute some standard drink examples for a range of “two” drinks. You will pose the example and ask participants to think about how many drinks it consists of. Call on participants for answers. Be sure to provide them with the correct answer after several guesses.

Let’s think about what would make up two “drinks” by our definition.

How about two pints of a microbrew? How many drinks is that?

- Two pints of microbrew beer is actually about three standard drinks. There are 32 ounces in two pints, and every 10 ounces counts as a drink.

How about two 40-ounce bottles of malt liquor? How many drinks is that?

- Two 40-ounce bottles are actually 10 standard drinks. This is 80 total ounces, and every eight ounces counts as a drink.

How about two mixed drinks with three 1¼-ounce shots of hard alcohol in each?

- Remember that each 1¼-ounce shot classifies as a drink, so these two mixed drinks are actually six standard drinks.



What can you conclude about this?

What does this mean a sister could do if she makes the choice to drink?

Positive answers could include:

- *Set a limit that is defined by standard drinks.*
- *Don’t accept a drink if she doesn’t know what’s in it.*
- *Don’t leave a drink unattended.*
- *Drink for quality instead of quantity.*

INTOXICATION (5 minutes)

Now, let’s go back to the questions. What has contributed to the member in our scenario getting intoxicated quickly?

When a person drinks, alcohol reaches the stomach and is absorbed into the bloodstream. From the stomach, alcohol moves into the small intestine and continues going into the bloodstream.

There are four factors that affect the rate of absorption of alcohol:

- 1. Having food in a person’s stomach:** All the alcohol still gets into the body, but is absorbed more slowly when a person has eaten prior to drinking or eats while drinking. So, a person wanting to stay more in control of her night could be sure to eat prior to drinking.
- 2. The rate of drinking:** The more quickly someone drinks, the more quickly alcohol gets absorbed. The opposite is also true—when a person drinks slowly, the rate of absorption is slower. A person wanting to stay more in control of her night could be sure to slow down and pace herself.
- 3. The concentration or potency of the drink:** The more potent/concentrated the drink (e.g., hard alcohol), the more quickly it gets absorbed. A person trying to stay in control of her night could choose drinks higher up in the standard drink conversion chart (e.g., beer instead of hard alcohol) or, if she has made the choice to drink hard alcohol, could put extra ice in her drink or add more mixer to the drink so that it is less potent. The type of mixer used can be a factor, because the fourth impact to absorption is...
- 4. The effervescence of the drink:** The more bubbly a drink is, the more quickly it gets absorbed. This means that mixed drinks with a flat mixer like juice will be absorbed slower than a drink of the same potency made with a carbonated mixer.

Now back to our final question from the scenario. Why might the member have had difficulty sticking to her goal?

Alcohol is a central nervous system depressant. This does not mean it makes us depressed; rather, it depresses (or slows down) the central nervous system (CNS). The CNS controls functions that are voluntary (like walking and talking) and involuntary (like breathing and heart rate). Because alcohol is absorbed into the bloodstream, everywhere blood goes, the alcohol goes too. This includes the brain.

With a CNS depressant in the brain, things like reaction time become more affected as a person's blood alcohol content (BAC) increases. That is why it is not safe to drink and drive.

As a person's BAC goes up, we can visibly see signs that the voluntary functions are getting depressed. For example, people slur their speech or get clumsy. At high doses, involuntary functions are slowing down. Breathing can slow and/or be labored or blood pressure and pulse can be lowered. In fact, the shutting off of these systems is what is considered "alcohol poisoning."

Judgment and decision making worsen from a BAC of .06% and higher, which means people might say something they wouldn't normally say or do something they wouldn't normally do once they reach that point. Affected decisions can even include decisions about continuing the use of alcohol.

The key for participants to understand is that with an impaired judgment, a person who sets a limit will have more difficulty sticking to that limit. By the time that their physical cues suggest that "it's time to call it a night," they are no longer at a point where they really pay attention to such cues.

SOBERING UP (5 minutes)



The rate of sobering up is called "oxidation." We've already reviewed the four factors that affect absorption. What do you think affects the rate of sobering up, or "oxidation"?

Take several guesses from participants.

This is a trick question – there are no ways to sober up quickly!

You might have heard people say to drink water to sober up, and while this will help with the process of re-hydration, it does nothing to the rate of oxidation. However, do note that alcohol is a diuretic, which is associated with dehydration. Dehydration can be related to some "day after" effects.

You might hear three things typically associated with the perception of feeling more alert—drink coffee, take cold shower or even exercise. While these might make someone feel more alert, these have no actual effect on blood alcohol level.

Occasionally, people will ask about whether or not vomiting impacts the rate of sobering up—it does not at all. A person might feel better after throwing up, but this seems to be because it lessens feelings of nausea.

The key here is that alcohol absorbed into the blood stream, its elimination from the body and the various issues discussed here, do not impact the rate of oxidation.

Instead, alcohol is burned off because of the action of an enzyme in the liver (*called "alcohol dehydrogenase"*—*don't worry about mentioning this by name, it's just here in case you're asked about it*). As a whole, people burn off alcohol at a very predictable rate. With each hour that passes, BAC is lowered by .016% per hour.



Use the flip chart to work with the participants to “do the math” on how long it will take to sober up at various BACs.



If someone is at .16% at midnight, it will take until 10 a.m. before BAC is back down to 0.0%.

If someone is at .2% or higher at midnight, the person will stay intoxicated into the following afternoon.

**If someone is at .08% at midnight,
it will take until 5 a.m. before BAC is back down to 0.0%.**

Midnight	.08%
1 a.m.	.08% - .016% = .064%
2 a.m.	.064% - .016% = .048%
3 a.m.	.048% - .016% = .032%
4 a.m.	.032% - .016% = .016%
5 a.m.	.016% - .016% = 0.0%



What implications do you think this has?

If not mentioned by the group, explain the implications for safety, including drinking and driving. Most students understand that drinking and driving is dangerous, and may even choose to stay the night at a friend’s house after drinking to, presumably, avoid the behavior. Unfortunately, it’s possible that the person could even be driving with a positive BAC the following day.

THE GENDER EFFECT (5 minutes)



Distribute Approximate BAC Levels as a Function of Number of Drinks and Time, Determined by Weight of Women handout.

Let’s think about another scenario.

One of your sisters is at a party and is keeping up with the drinking of one of her male friends. She weighs 120 pounds; he weighs 160 pounds. They both have five drinks over three hours. As the night progresses, she is getting much more intoxicated than her male friend. What’s going on?

Alcohol affects men and women very differently.

Within one gender, two people of different weights drinking the same amount of alcohol over the same amount of time will get to different blood alcohol levels. The lighter person will become more intoxicated. And if you have a man and woman of the same weight, drinking the same amount over the same time, the woman will become more intoxicated.

There are four reasons for this:

1. On average, women have a higher fat content in their bodies than men do. This translates to a lesser fluid volume. In other words, a woman has less blood going through her bloodstream than a man of the same weight. This results in alcohol getting more concentrated in the bloodstream of a woman.
2. Remember that we all have a liver enzyme that results in the oxidation of alcohol. Men actually have a gastric version of this enzyme. Research suggests that woman have, at best, trace amount of this same gastric enzyme. This means that men have a head start at burning off alcohol.

The next two reasons are primarily differences within women:

3. There is monthly variability in BAC for women. Depending on where a woman is in her menstrual cycle, it can impact the BAC she attains, and it will take her longer to burn off alcohol since the rate of oxidation will actually change. This seems to be the case during the phase right before a woman's next period.
4. If a woman is taking an oral contraceptive (birth control pills), not only will she feel more intoxicated when she does drink, she will stay intoxicated longer.

Let's revisit our scenario.

The man in this example will be at a blood alcohol level of .069%, meaning that while there is some reaction impairment and his judgment is starting to be affected, he is not yet legally intoxicated. The woman in this example will be at a blood alcohol level of .139%, meaning she is actually twice as intoxicated as the man, has a clear deterioration in judgment, a clear deterioration in motor coordination, and could even be at risk for blacking out depending on the factors we discussed.



Based on this information, what implications does this have when you are consuming alcohol with your date or male friends at a party?

Highlight the importance of knowing what one brings to the table based on weight/size and sex.

WRAP-UP/DISCUSSION (5 minutes)



What does all of this information mean to you as an individual?
What does it mean to you as a chapter?

They should consider their own decisions about alcohol use and the safety of their sisters.

What steps could you take to reduce risks associated with alcohol if you make the choice to drink?



Revisit the suggestions discussed above:

- *Setting a limit that is defined by standard drinks*
- *Don't accept a drink if you don't know what's in it*
- *Don't leave your drink unattended*
- *Drink for quality instead of quantity*

Also consider these suggestions:

- *Keep track of how much you drink*
- *Space your drinks (one way to do this is to alternate drinks that have alcohol in them with non-alcoholic drinks)*
- *Avoid or alter your approach to drinking games*
- *If you choose to drink, drink slowly*

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BAC Levels and Effects

BLOOD ALCOHOL CONTENT

Alcohol's effects are roughly predictable from the amount of alcohol in the bloodstream, assuming that no tolerance has been developed. The following list indicates what effects alcohol typically has at several Blood Alcohol Content levels:

- .02% Light and moderate drinkers begin to feel some effect (about one drink).
- .04% Most people begin to feel relaxed.
- .06% Judgment is somewhat impaired; people are less able to make rational decisions about their capabilities, for example driving.
- .08% Definite impairment of muscle coordination and driving skills. Increased risk of nausea and slurred speech.
- .10% Although reaction time is affected after the first drink, there is a clear deterioration of reaction time and control at this level.
- .15% Balance and movement are impaired. Risk of blackouts, accidents, nausea, passing out and hangovers.
- .30% Many people lose consciousness.
- .40% Most people lose consciousness, some die.
- .45% Breathing stops, death occurs.

*Note: These effects occur for people who have not developed a high tolerance for alcohol. For people with high tolerances, these effects may not occur until higher levels of intoxication. Heavy drinkers must therefore consume more alcohol to achieve the same effects as moderate drinkers, which costs more money and is more harmful to the body.

ONE DRINK

4 oz. wine

1 cocktail

12 oz. beer

1 oz. shot

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Approximate BAC Levels as a Function of Number of Drinks and Time, Determined by Weight of Women

100 lb. Female	NUMBER OF HOURS							
	1	2	3	4	5	6	7	8
NUMBER OF DRINKS	1	2	3	4	5	6	7	8
1	.029	.013	-	-	-	-	-	-
2	.074	.058	.042	.026	.010	-	-	-
3	.119	.103	.087	.071	.055	.039	.023	.007
4	.164	.148	.132	.116	.100	.084	.068	.052
5	.209	.193	.177	.161	.145	.129	.113	.097
6	.254	.238	.222	.206	.190	.174	.158	.142
7	.299	.283	.267	.251	.235	.219	.203	.187
8	.344	.328	.312	.296	.280	.264	.248	.232
9	.389	.373	.357	.341	.325	.309	.293	.277
10	.434	.418	.402	.386	.370	.354	.338	.322
11	.479	.463	.447	.431	.415	.399	.383	.367
12	.524	.508	.492	.476	.460	.444	.428	.412

140 lb. Female	NUMBER OF HOURS							
	1	2	3	4	5	6	7	8
NUMBER OF DRINKS	1	2	3	4	5	6	7	8
1	.016	-	-	-	-	-	-	-
2	.048	.032	.016	-	-	-	-	-
3	.080	.064	.048	.032	.016	-	-	-
4	.112	.096	.080	.064	.048	.032	.016	-
5	.144	.128	.112	.096	.080	.064	.048	.032
6	.176	.160	.144	.128	.112	.096	.080	.064
7	.209	.193	.177	.161	.145	.129	.113	.097
8	.241	.225	.209	.193	.177	.161	.145	.129
9	.273	.257	.241	.225	.209	.193	.177	.161
10	.305	.289	.273	.257	.241	.225	.209	.193
11	.337	.321	.305	.289	.273	.257	.241	.225
12	.369	.353	.337	.321	.305	.289	.273	.257

180 lb. Female	NUMBER OF HOURS							
	1	2	3	4	5	6	7	8
NUMBER OF DRINKS	1	2	3	4	5	6	7	8
1	.009	-	-	-	-	-	-	-
2	.034	.018	.002	-	-	-	-	-
3	.059	.043	.027	.011	-	-	-	-
4	.084	.068	.052	.036	.020	.004	-	-
5	.109	.093	.077	.061	.045	.029	.013	-
6	.134	.118	.102	.086	.070	.054	.038	.022
7	.159	.143	.127	.111	.095	.079	.063	.047
8	.184	.168	.152	.136	.120	.104	.088	.072
9	.209	.193	.177	.161	.145	.129	.113	.097
10	.234	.218	.202	.186	.170	.154	.138	.122
11	.259	.243	.227	.211	.195	.179	.163	.147
12	.284	.268	.252	.236	.220	.204	.188	.172

120 lb. Female	NUMBER OF HOURS							
	1	2	3	4	5	6	7	8
NUMBER OF DRINKS	1	2	3	4	5	6	7	8
1	.021	.005	-	-	-	-	-	-
2	.059	.043	.027	.011	-	-	-	-
3	.096	.080	.064	.048	.032	.016	-	-
4	.134	.118	.102	.086	.070	.054	.038	.022
5	.171	.155	.139	.123	.107	.091	.075	.059
6	.209	.193	.177	.161	.145	.129	.113	.097
7	.246	.230	.214	.198	.182	.166	.150	.134
8	.284	.268	.252	.236	.220	.204	.188	.172
9	.321	.305	.289	.273	.257	.241	.225	.209
10	.359	.343	.327	.311	.295	.279	.263	.247
11	.396	.380	.364	.348	.332	.316	.300	.284
12	.434	.418	.402	.386	.370	.354	.338	.322

160 lb. Female	NUMBER OF HOURS							
	1	2	3	4	5	6	7	8
NUMBER OF DRINKS	1	2	3	4	5	6	7	8
1	.012	-	-	-	-	-	-	-
2	.040	.024	.008	-	-	-	-	-
3	.068	.052	.036	.020	.004	-	-	-
4	.096	.080	.064	.048	.032	.016	-	-
5	.124	.108	.092	.076	.060	.044	.028	.012
6	.152	.136	.120	.104	.088	.072	.056	.040
7	.180	.164	.148	.132	.116	.100	.084	.068
8	.209	.193	.177	.161	.145	.129	.113	.097
9	.237	.221	.205	.189	.173	.157	.141	.125
10	.265	.249	.233	.217	.201	.185	.169	.153
11	.293	.277	.261	.245	.229	.213	.197	.181
12	.321	.305	.289	.273	.257	.241	.225	.209

200 lb. Female	NUMBER OF HOURS							
	1	2	3	4	5	6	7	8
NUMBER OF DRINKS	1	2	3	4	5	6	7	8
1	.006	-	-	-	-	-	-	-
2	.029	.013	-	-	-	-	-	-
3	.051	.035	.019	.003	-	-	-	-
4	.074	.058	.042	.026	.010	-	-	-
5	.096	.080	.064	.048	.032	.016	-	-
6	.119	.103	.087	.071	.055	.039	.023	.007
7	.141	.125	.109	.093	.077	.061	.045	.029
8	.164	.148	.132	.116	.100	.084	.068	.052
9	.186	.170	.154	.138	.122	.106	.090	.074
10	.209	.193	.177	.161	.145	.129	.113	.097
11	.231	.215	.199	.183	.167	.151	.135	.119
12	.254	.238	.222	.206	.190	.174	.158	.142

ONE DRINK = 4 ozs. wine; or

1 cocktail; or

12 ozs. beer; or

1 oz. shot

These charts are for your information and are not intended to convey that drinking is safe. Drinking alcoholic beverages is unlawful for those under 21 years of age.