Alcohol Metabolism

Absorbing

Once alcohol is swallowed, it is not digested like food. First, a small amount is absorbed directly by the tongue and mucosal lining of the mouth. Once in the stomach, alcohol is absorbed directly into your blood stream through the tissue lining of the stomach and small intestine.

Food in the stomach can inhibit the absorption of alcohol in two ways:

First, it physically obstructs the alcohol from coming in contact with the stomach lining. Food can either absorb alcohol, or simply “take up space” so the alcohol does not enter the bloodstream through contact with the wall of the stomach.

Second, food in the stomach will prevent alcohol from passing into the duodenum, which is the upper portion of the small intestine. The surface area of the small intestine is very large (about the size of a tennis court), so alcohol has more access to enter the bloodstream once it leaves the stomach. If alcohol is sequestered in the stomach it will be absorbed slower.

Transporting

Once alcohol is in your bloodstream, it is carried to all organs of your body. In the majority of healthy people, blood circulates through the body in 90 seconds, thereby allowing alcohol to affect your brain and all other organs in a short amount of time. The full effects of a drink are felt within 15 to 45 minutes depending on the speed of absorption.

Alcohol enters all tissues of the body except bone and fat. In an adult male, alcohol can penetrate approximately 68% of body tissues. Body composition is important, because if the percentage of adipose tissue is high, the alcohol can only be distributed throughout the remaining lean tissue – resulting in a higher concentration for those areas.

The effects of alcohol on the body will vary according to the individual: their sex, body composition, the amount of alcohol consumed, the presence of food, and the ability of the liver to produce the alcohol dehydrogenase enzymes.

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Alcohol is a toxin that must be neutralized or eliminated from the body. Ten percent of alcohol is eliminated through sweat, breath, and urine.

Alcohol is volatile (will evaporate in air), so when alcohol in the blood comes in contact with air in the alveoli of the lungs, it can be transferred out of the body through breath.

The liver is the primary organ responsible for the detoxification of alcohol. Liver cells produce the enzyme alcohol dehydrogenase which breaks alcohol into ketones at a rate of about 0.015 g/100mL/hour (reduces BAC by 0.015 per hour).

Nothing will speed up the rate of detoxification, but the effective metabolism of alcohol can be limited by medications and liver damage.

When the rate of consumption exceeds the rate of detoxification, BAC will continue to rise.

How Fast Can You Sober Up?

Alcohol leaves the body at an average rate of 0.015 g/100mL/hour, which is the same as reducing your BAC level by 0.015 per hour. For men, this is usually a rate of about one standard drink per hour. However, there are other factors that affect intoxication level (gender, some medications, illness) that will cause BAC to rise more quickly, and fall more slowly.

Example: At an average rate of -0.015/hr, how long would it take someone with a BAC of 0.20 to sober up?

Time	Activity	BAC Level
2:00 a.m.	In bed. dizzy and disoriented	.200
3:00 a.m.	Nauseous, unable to sleep	.185
4:00 a.m.	Very restless	.170
5:00 a.m.	Sleeping, but not well	.155
6:00 a.m.	Sleep	.140
7:00 a.m.	Get up for class with a headache	.125
8:00 a.m.	Drive to school, risk DUI or worse	.110
9:00 a.m.	In class, trouble focusing on lecture	.095
10:00 a.m.	Judgment still impaired	.080
11:00 a.m.	Mind still foggy, fatigued	.065
12:00 p.m.	Not hungry, cottonmouth	.050

1:00 p.m.	In afternoon class, still unfocused	.035
2:00 p.m.	Head cleaning	.020
3:00 p.m.	Feeling a little better	.005
4:00 p.m.	Sober at last, but not fully recovered	.000

Can You Speed Up This Process?

Once alcohol is in the bloodstream, it can only be eliminated by the enzyme alcohol dehydrogenase, sweat, urine, and breath. Drinking water and sleeping will not speed up the process. Coffee, energy drinks, and a cold shower will not sober you up faster. These might make you feel more awake, but caffeine and cold showers will not pull alcohol out of the blood - and thus will not lower your BAC level.