A Supplement That May Block The Toxic Effects of Alcohol

Of every 100 Americans who drink (140 million), about 12 (16 million) are considered in need of treatment for an alcohol use disorder, and eight will become chemically dependent on alcohol.[1] Of that eight, one will become addicted very early, even after the first drunken episode. The problem is, we do not yet have a way to predict who that one person will be.

Prevention is always the best answer to addiction. Do not drink. If you do drink, do not ignore the warning signs of becoming a problem drinker.

Let me ask you: How is your blood acetaldehyde today; or, more relevant, how was it late last night? You don't know? Why am I not surprised? Most people don't even think about acetaldehyde.

Ethyl alcohol is metabolized to acetaldehyde by alcohol dehydrogenase in the liver. Acetaldehyde is metabolized to acetate by aldehyde dehydrogenase and then to carbon dioxide and water. Depending on the alcohol dose, some of the acetaldehyde may escape hepatic metabolism and enter the general blood circulation.

Acetaldehyde is a close cousin to my old pathology lab friend formaldehyde. We use it to pickle surgical and autopsy tissues for preservation. Both are known carcinogens. Our body's defense mechanism against excess acetaldehyde is the amino acid l-cysteine and glutathione. These molecules, similarly to thiamine,

contain a sulfhydryl group that is chemically active against aldehydes.
Unless you are one of those people (typically East Asian) who are genetically deficient in aldehyde dehydrogenase or are taking disulfiram, you can metabolize roughly one

stiff drink per hour. If you drink more than that, depending on body weight, gastric contents, and the efficiency of your metabolic alcohol breakdown, acetaldehyde will build up because aldehyde dehydrogenase capability can be overwhelmed.
If you quit drinking at 11:00 PM, then around about 1:00 AM, your acetaldehyde level may be elevated and you may feel symptoms of acetaldehyde toxicity, including skin flushing, tachycardia, palpitations, anxiety, nausea, thirst, chest pain, and vertigo. Of course, you are trying to "sleep it off," so you may not feel toxic until the next morning when that dreaded hangover appears.

Metabolizing Alcohol

My friends in the nutritional supplement community tell me that you can enhance the metabolism of blood alcohol to acetate, carbon dioxide, and water and minimize the acetaldehyde molecular logjam by taking oral supplements. L-cysteine, vitamin C, and vitamin B_1 are purported to help. At supplement doses, they are cheap and harmless at worst. At best: Goodbye, acetaldehyde toxicity; hello, restful sleep. About 200 mg of L-cysteine per ounce of alcohol consumed is sufficient to block a major portion of the toxic effect of acetaldehyde. But because alcohol is absorbed and metabolized rapidly, it may be necessary to take L-cysteine before and

concurrently with consumption to maintain protection. Also, an excess of vitamin C (perhaps 600 mg) can help keep the L-cysteine in its reduced state and "on the job" against acetaldehyde. Experts recommend these doses (with or without extra B_1): one round before drinking, one with each additional drink, and one when finished.

Some say that this regimen works very well. Do not ask me for a list of published randomized, double-blind clinical trials. Not yet, at least. Research funding into "harm reduction" from addicting substances has not enjoyed favored status in research priorities.

Unfortunately, this concoction may have little effect on next-day hangovers, the causes of which are complex and resistant to prevention—except, obviously, by not drinking too much, which is, of course, the best answer to alcohol anyway.

With drug users, be redemptive, not punitive.