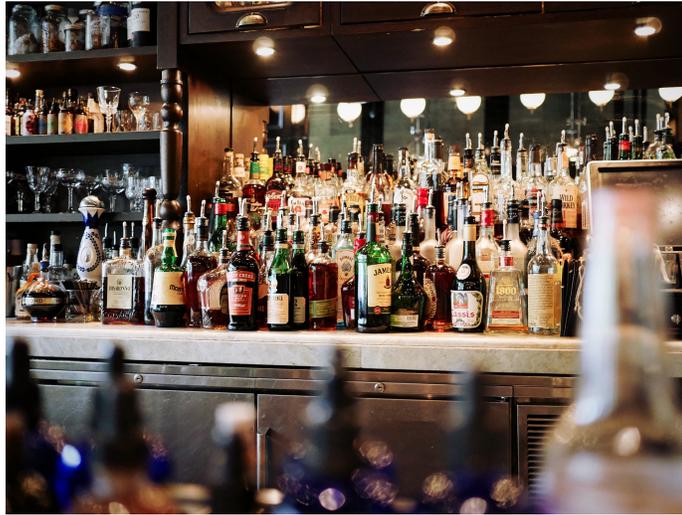


## *Ten Questions About Alcohol*



### **1. How much alcohol is too much alcohol?**

*Two out of three adults who drink alcohol in the United States drink more than what is considered to be a "moderate" amount at least once a month. One alcoholic beverage contains ½ an ounce or 14 grams of ethanol. This is the equivalent of 12 ounces of beer, five ounces of wine, or 1½ ounces of distilled liquor. It is recommended that women have no more than one drink a day and that men limit themselves to two drinks a day. Excessive drinking is defined as more than eight drinks a week for women and more than 15 for men.*

### **2. Drinking alcohol is good for my heart, right?**

*Among adults in their middle years and beyond, it has been speculated that moderate alcohol reduction might help to prevent certain health conditions including heart disease, stroke, gallstones, age-related memory loss, and type 2 diabetes. Drinking a little alcohol appears to increase insulin sensitivity and lower blood glucose, as well as decrease the risk of heart disease, among people with diabetes. However, heavy drinking drastically increases the risk of type 2 diabetes. There are few, if any, health benefits to drinking alcohol for young adults.*

*For older adults, moderate alcohol consumption decreases levels of fibrinogen, which promotes blood clot formation, and increases levels of an enzyme that dissolves blood clots. This is part of how moderate alcohol consumption might decrease the risk of*

stroke. Light to moderate drinking also reduces levels of c-reactive protein, a marker of inflammation, in the blood.

It is true that one to two alcoholic beverages a day can increase HDL cholesterol (by ten percent at most), but it also causes blood pressure to rise and increases triglycerides. This increase in triglycerides is dose-dependent; the more you drink, the higher they go. Heavy drinking is linked to high blood pressure and an increased risk of stroke, irregular heart rhythms, cardiomyopathy, and fatal heart attack. Cardiac arrhythmia is associated with binge drinking (defined as four or more beverages in two hours for females and five or more in men). These arrhythmias might be in response to increased levels of acetaldehyde or disturbances in electrolyte balance and can lead to sudden heart attacks, even among young individuals. In cardiomyopathy, the heart muscle weakens and can no longer forcibly contract. Blood flow to vital organs, including the lungs, liver, kidneys, and brain is therefore reduced. Heart failure can result from cardiomyopathy. Women are more likely to develop cardiomyopathy than men. These health problems can develop after five years of drinking seven or more alcoholic beverages a day.

It's especially challenging to determine if wine provides a boon to health because the individuals who drink wine also tend to make the most money, be more physically active, consume less saturated fat, eat more fruits and vegetables, and be less likely to smoke compared to individuals who don't drink or who choose other types of beverages.

One thing is clear - no one should ever start drinking to improve wellbeing. Alcohol contributes to four percent of deaths in the United States and is the leading risk factor for premature death and disability. Alcohol is a drug, which is defined as any substance that modifies bodily functions.

### **3. How does alcohol damage the liver?**

The liver likes to use fatty acids as their fuel. However, when we drink alcohol, the liver has to stop processing these fatty acids and focus on metabolizing the alcohol instead. This allows the fatty acids to accumulate and circulate around the body while they wait for the liver to be available again. If this happens reasonably often, the alcohol can also permanently change liver cells and impair their ability to metabolize fat. Besides being harmful to the heart, this accumulation of lipids causes fatty liver disease. One in five heavy drinkers develops fatty liver disease, which over time can progress to alcoholic

hepatitis, marked by an enlarged, inflamed liver. These liver cells are deprived of oxygen and nutrients, and they die as a result. About ten percent of heavy drinkers will develop cirrhosis, which is the buildup of scar tissue in the liver. Cirrhosis can progress to liver failure and death.

The accumulation of fat in the liver means that it can't activate vitamin D, produce and release the bile that is essential for digestion, or make glucose from protein. This is one reason why blood glucose can plummet in heavy drinkers, sometimes resulting in irreversible damage to the central nervous system.

#### **4. Does alcohol affect cancer risk?**

Alcohol is both a carcinogen and a co-carcinogen, meaning that it doesn't only initiate formation of cancer-causing compounds, but also enhances the carcinogenicity of other substances. For example, alcohol might interfere with cigarette smoke to make it even more dangerous.

Heavy drinking, defined as four or more alcoholic beverages a day, increases the risk of certain types of cancer, especially of the mouth, esophagus, colon, liver, and breast. In fact, half of all cases of mouth and esophagus cancer are associated with heavy drinking. Even low to moderate intake can increase women's risk of these cancers, especially the risk of breast cancer. In some research, binge drinking, but not the frequency of drinking, has been associated with the development of breast cancer after controlling for total alcohol intake. Some research has also shown an increase in prostate cancer risk, especially among individuals with low folate status

The nutrient deficiencies exhibited with alcoholism might also play a role in cancer formation. Reduced levels of iron, zinc, vitamin E, specific B vitamins, and vitamin A have been experimentally linked to certain types of cancer.

#### **5. Is it true that going for a walk around the block, drinking a few cups of coffee, popping two Tylenol, or eating some fatty food are great ways to sober up?**

None of these things help to sober you up and nothing you eat or drink will speed up the process. Drinking caffeine with alcohol is pretty dangerous because caffeine masks intoxication. This means that you're just as drunk as you would be without the caffeine, you just believe that you're thinking more clearly. Walking around the block will not help in any way other than taking up time. Your blood alcohol concentration is at its

highest 30-45 minutes after you've had a drink. Your muscles will not "burn up" the alcohol that you've consumed if you go for a walk or do a few lunges. However, people who have more muscle tissue, in general, will be able to drink more than a less muscular person because muscle tissue contains more water than fat does, and so takes up the alcohol more readily. The fact is that alcohol is mostly metabolized in the liver and the liver can only handle one alcoholic beverage an hour. Never take Tylenol or another acetaminophen-containing painkiller when you've had (or plan on having) alcohol. Even drinking a small amount of alcohol after taking acetaminophen can cause liver damage.

#### **6. What can I do to avoid a hangover?**

Don't drink so much. Sorry, it was too obvious. The simple truth is that there isn't much that you can do although you might hear lots of ideas that people have come up with over the years. Hangovers are caused by the acetaldehyde dehydrogenase in your liver (and a little in your stomach) converting alcohol to acetaldehyde, which is a toxic molecule that causes headaches, nausea, and vomiting. There isn't any way to alter or stop this process.

#### **7. What causes someone to develop "tolerance" to alcohol?**

There is a backup system to help prevent alcohol from reaching dangerously high levels in the blood- this is the microsomal ethanol-oxidizing system (MEOS), and it handles about 20% of the alcohol that you consume in typical instances. This system is up-regulated in individuals who drink often, though; and this is a significant part of how "tolerance" is developed.

The MEOS is used to process many of the medications that we take and it's prudent to remember that the system might be so overwhelmed with alcohol that it isn't able to metabolize medications that you take. As a result, toxic levels of the medication can build up. If someone who drinks a lot suddenly stops, they might find that they absorb their drugs too quickly if the dosage was determined during the time that they were drinking heavily.

#### **8. Why do some people get "beer bellies," but most alcoholics are quite thin?**

Many Americans consume 108 calories worth of alcohol each day. This is 756 calories a week or 39,420 calories a year; this is certainly enough to have an impact on body

weight. The calories in alcohol are not insignificant, but the mixers sometimes contribute more calories than the alcohol.

12 oz light beer	103 calories
12 oz regular beer	120 calories
5 oz red or white wine	98 calories
1 ½ ounce of 80 proof liquor	97 calories
1 ½ ounce of 86 proof liquor	105 calories
1 ½ ounce of 90 proof liquor	110 calories
1 ½ ounce of 100 proof	124 calories
1 ½ ounce of crème de menthe	186 calories
4-ounce daiquiri	224 calories
4 ½ ounce whiskey sour	226 calories
4 ½ ounce pina colada	245 calories

The primary reason that individuals with alcohol abuse disorder are usually quite thin is that they simply stop eating. Individuals with a drinking problem generally consume very little protein. Furthermore, if they do consume protein, an alcoholic's liver will deaminate the amino acids and use the carbon fragments to make fat or ketone bodies. This means that an alcoholic's body won't even be able to use the small amount of protein that they do eat to build and maintain body tissues. Among many other things, the synthesis of protein is essential in immune system functioning, and individuals who drink heavily are much more likely to both contract infections and to have a more difficult time recovering from illness. The MEOS that we talked about above also uses energy to work. People who drink heavily lose weight despite high-calorie intake because of the burden on this system.

9. Besides weight loss, what other nutritional issues might an alcoholic develop?

Once about 30% of total calories is coming from alcohol, micronutrient deficiency is assured. Alcohol decreases the production of antidiuretic hormone, which is produced by the pituitary gland. This leads to the loss of water via diuresis and essential minerals are lost along with that fluid.

Niacin is essential to the metabolism of alcohol, but it is also integral to other energy pathways, and these systems fail while the available niacin works to aid in the processing of the alcohol. This results in the body's acid-base balance shifting towards acidic as lactate and hydrogen build up with nowhere to go. Lactate causes uric acid levels to increase, and gout can result (people with gout should abstain from alcohol entirely). Niacin deficiency causes the four D's – dermatitis, dementia, diarrhea, and death. It also causes depression, anxiety, irritability, and an inability to concentrate.

Retinol, a form of vitamin A, is an alcohol. When a person drinks heavily, less is metabolized. This is detrimental to vision, especially night vision, and can result in damage to the cornea, dry eyes, scarring, and even blindness. Adequate vitamin A is necessary for a healthy immune system.

Alcohol metabolism interferes with the absorption and metabolism of thiamin, which tragically results in damaged nerves in the brain. The Wernicke-Korsakoff syndrome is a disease of alcohol-induced dementia and presents with paralysis of eye muscles, involuntary eye movements, poor muscle coordination, confusion, and short-term memory loss. Unfortunately, while liver cells can be replaced, the lost brain cells experienced by a person with alcoholism are permanent. More than 80% of alcoholics are thiamin deficient.

The disease of vitamin C deficiency, scurvy, is not uncommon among individuals who abuse alcohol. Vitamin C is vital for the immune, cardiovascular, neurological, and endocrine systems. It is also necessary for collagen in connective tissues that make up the skin, muscles, cartilage, tendons, and gums.

The inhibition of riboflavin absorption caused by heavy drinking results in muscle weakness, the formation of sores around the mouth and lips, inflammation of the mouth, and a swollen and inflamed tongue.

Heavy drinkers are more likely to develop osteoporosis, not only because the alcohol affects the cycle of bone remodeling, but also because the diet is likely to be inadequate in calcium, vitamin D, and protein.

*The liver of a heavy drinker loses the ability to retain folate, while the kidneys simultaneously increase the excretion of it. This devastates the functioning of the digestive system. The small intestine usually continuously releases and retrieves folate, but alcohol toxicity makes the system unable to reclaim its own folate and causes it to miss any folate made available from food. The interference with the ability of folate to convert the amino acid homocysteine to methionine cause the buildup of homocysteine, which is associated with both heart disease and the slowed production of new cells, especially rapidly dividing cells in the intestine and blood. Inadequate folate status and alcohol ingestion are known to increase the risk of colorectal cancer.*

#### **10. What effect does alcohol have on the gastrointestinal system?**

*About 20% of the alcohol that you drink is absorbed from the stomach. Another ten percent leaves the body in the breath and urine. The other 70% is absorbed in the small intestine.*

*Excessive consumption of alcohol causes the formation of protein plugs that block pancreatic ducts. This makes it difficult for the pancreas to release the pancreatic juice that supplies enzymes necessary for digestion and results in impaired nutrient absorption. Between 70 and 90% of chronic pancreatitis cases are related to drinking.*

*Alcohol causes the stomach cells to over-secrete both gastric acid and histamine, which causes inflammation. Beer is especially likely to stimulate gastric acid production, which irritates the linings of the stomach and esophagus and makes them vulnerable to ulcer formation.*

*Alcohol damages the intestine and causes excess iron to be absorbed, which causes apathy, lethargy, and fatigue. Excess accumulation of iron causes free radical damage and increases the risk of infection. Untreated, excessive iron accumulation can lead to the development of cirrhosis, liver cancer, heart failure, and arthritis.*