

# Alcohol Consumption

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## **Reboot Recap**

### **Summary:**

#### Alcohol Consumption

When we talk about booze, you may think of happy hours, college keg stands, Sunday brunches, or just a post-work cocktail. Alcohol--like political issues and the future of certain aging quarterbacks--has been the source of much debate. For booze, the debate centers around the health risks and potential benefits. Let's take a look at the science of it.

Alcohol is a colorless volatile flammable liquid that is produced by the natural fermentation of sugars and is the intoxicating constituent of wine, beer, spirits, and other drinks. An alcoholic drink is a drink that contains ethanol, a type of alcohol produced by fermentation of grains, fruits, or other sources of sugar. Of course, the consumption of alcohol plays an important social role in many cultures and in getting social contacts together which may have a longer term benefit in managing stress and improving health (see GAR Co Reboot Review and Recap 056-004, and 056-004 Relationship Stress and Social Connections). For the purposes of this review, we will define a "drink" as the typical amount of alcohol found in a typical 12 ounce beer, 5 ounces of wine, or 1.5 ounces of a liquor. Each of these drinks contain about 14 grams of pure alcohol.

#### Key Takeaways From the Research Data:

- Know the definition of binge and heavy drinking. The CDC defines binge drinking as any time an individual's blood alcohol concentration (BAC) reaches 0.08%. On average they estimate this BAC level to be reached by 5 drinks in around 2 hours for a man, and 4 drinks in around 2 hours for a woman. <https://www.cdc.gov/alcohol/faqs.htm#excessivealcohol> Heavy drinking is to typically be equivalent to the consumption of 15 or more alcoholic drinks per week for men, and 8 or more drinks per week for women.  
These are useful definitions clinically, but they obviously vary greatly from individual to individual. There are many factors that influence how much alcohol in a short period of time is too much for functioning in the short for any one person.  
Long term effects are influenced by both levels from short term drinking (binge) and long term drinking habits (heavy or less).
- Drink more, risk more. In the long-term prospective cohort studies, heavy drinkers, defined as individuals who consumed more than 6 drinks per day, had a relative risk of death of 1.6 (95% CI, 1.3 to 2.0) compared to nondrinkers. The risk of death from all causes associated with drinking more than 6 drinks per day was even higher in female and younger cohorts. It was found that women had a relative risk of 2.2 (CI, 1.4 to 3.8), and those younger than 50 years had a relative risk of 1.9 (CI, 1.3 to 2.9).

- Light drinkers, meaning those who drink less than 2 drinks per day, were at relative risk of 0.7 (CI, 0.6 to 0.9) from dying of coronary heart disease. This apparent benefit of alcohol is thought by some to be due to a reverse causation effect—that those with coronary artery disease stopped drinking as part of their disease management and thus the non-drinking population was contaminated by those at higher risk. This debate has not been resolved.
- You stand to lose more when you drink more. Consistent, heavy drinking is associated with over a 20% increase in all-cause mortality.
  - The health benefits of booze are minimal. There appear to be no or only a small “red wine” factor—that is the health effects of alcohol consumption appear to be largely independent of type—but is modified by drinking with food.
  - But there may be some benefit to the heart. Moderate drinking is associated with cardiovascular protection: There is mounting data that drinking moderate amounts of alcohol does grant some cardiovascular health benefits. Studies such as this one by [Renaud et al](#) which reduction in all-cause mortality among men with hypertension, have led many to the conclusion that some alcohol may be better for you than no alcohol. This dose-response is referred to in much of the literature as the U-curve, or J-curve.

<https://academic.oup.com/ajcn/article/80/3/621/4690539>

Figure 2 Example of the proposed U-curve. In this case, specifically for relative risk of coronary heart disease. <https://pubs.niaaa.nih.gov/publications/arh27-1/39-51.htm> Research on the dose-dependent relationship between the alcohol and all-cause mortality is ongoing

- Moderate drinking is associated with increases in cancer (and other immune deficiency diseases): In “ [A meta-analysis of alcohol consumption and the risk of 15 diseases](#),” Carrao et al looked at 156 studies that they determined to be of high quality.
- <https://www.sciencedirect.com/science/article/abs/pii/S0091743503003384?via%3Dihub> and found that even at low levels of alcohol consumption (25 grams/day = 1.7 drinks per day ) that there was a significant increase in relative risk for cancers of the oral cavity, esophagus, and larynx; but this group had a lower relative risks of coronary heart disease (RR:0.81, 0.79-0.83) and ischemic stroke (RR: 0.90, 0.75-1.07). They estimate that alcohol consumption of 20 g/day is associated with 20% reduction in CV diseases. This apparent benefit of alcohol is thought by some to be due to a reverse causation effect—that those with coronary artery disease stopped drinking as part of their disease management and thus the non-drinking population was contaminated by those at higher risk. This debate has not been resolved. [Fillmore KM, Stockwell T, Chikritzhs T, Bostrom A, Kerr W. Moderate alcohol use and reduced mortality risk: systematic error in prospective studies and new hypotheses. Ann Epidemiol. 2007;17\(5 Suppl\):S16-23.](#)
- [Goulden R. Moderate alcohol consumption is not associated with reduced all-cause mortality. Am J Med. 2016;129\(2\):180-186.e4.](#)  
[Stockwell T, Naimi T. Study raises new doubts regarding the hypothesised health benefits of 'moderate' alcohol use. Evid Based Med. 2016;21\(4\):156.](#)

And data from the nurses health study support moderate use of alcohol: [Key Findings on Alcohol Consumption and a Variety of Health Outcomes From the Nurses' Health Study | AJPH | Vol. 106 Issue 9 \(aphapublications.org\)](#)

Conclusions. Regular alcohol intake has both risks and benefits. In analyses using repeated assessments of alcohol over time and deaths from all causes, women with low to moderate intake and regular frequency (> 3 days/week) had the lowest risk of mortality compared with abstainers and women who consumed substantially more than 1 drink per day.

- Days and amounts matter. Binge drinking seemed to be just as detrimental to mortality rates as frequency of drinking.
- Lower drinking is lower risk. The lowest risk of all cause mortality and disability appears to occur in those without risk of alcohol abuse who drink 3 to 4 times a week at ½ to 1 drink per time (women) or 1-2 drinks per time (men).

#### Recommendations:

- If there is a history of alcohol or drug abuse in the family or risk of alcohol or drug abuse based on genetic testing, do not consider alcohol as a potential to make your Reboot Age younger.
- Avoid consuming more than 2 drinks (women or those with the flush reaction to alcohol) or three drinks any day for men.
- If you have a low risk of Cardiovascular diseases in yourself and in your family or have a high risk of immune derangement diseases like cancer, do not consider alcohol as a health benefit, as it will likely make your Reboot Age older
- Alcohol has a dose dependent effect for promoting multiple cancers ( [Alcohol consumption and site-specific cancer risk: a comprehensive dose-response meta-analysis - PubMed \(nih.gov\)](#) ).
- If you have a high or low risk of Cardiovascular diseases in you or your family and have a low risk of immune derangement diseases like cancer, and already consume alcohol on occasion, consider making moderate consumption of ½ to 1 drink for women and 1 to 2 drinks for men a three or 4 day a week habit.
- Recognize that for some alcohol is an appetite stimulant, and therefore may promote weight gain.
- Low to moderate use of alcohol may maintain or improve global cognition scores, Association of Low to Moderate Alcohol Drinking With Cognitive Functions From Middle to Older Age Among US Adults | Dementia and Cognitive Impairment | JAMA Network This effect on global cognition may be from the effect of positive stress reducing effect that pausing at the end of the day for a social drink may be an important factor to off-set stress or to improve social connections.
- A frequency (of 3 to 4 days/week) had the lowest risk of mortality compared with abstainers and women who consumed substantially more than 1 drink per day.

Do Read & Review The “Concerns & Contraindications” section in the summary below (link) before starting or stopping any curated longevity therapy or process with Your Practitioner.

Benefit:

WHAT DO YOU DRINK? If 55 years old, and you consume ½ to 1 drink (women) or 1-2 drinks (men) a day two to seven days a week and never consume more than 2 (women) or 3 (men), and meet criteria 5 above, you are 1.9 years younger (Reboot Age). If you excessively consume alcohol (more than 3 drinks any day of the week for women or 4 for men) more than 4 times a year, your Reboot Age is 4 years older.

Drinking only 3-4 days a week, and never more than 2 drinks a day (women) and 3 drinks a day (men) and meet criteria 5 above are 2 steps up the Great Age Reboot Preparation Stairway.

## **Reboot Review**

### **Full Executive Summary, Outcome Data Summary, and Recommendations:**

#### Benefits of Moderate Alcohol Consumption

The fact that alcohol has been linked to positive health outcomes-- regular consumption of alcohol in small amounts prevents arterial aging and heart attacks-- is something of an unpopular fact. The narrative of alcohol being strictly a poison was pushed by the U.S. government even long after the end of prohibition. It was not until 1996 that the U.S. government acknowledged the health benefits of moderate alcohol consumption. In 1986 however, it was first observed that alcohol may benefit arterial health. This effect, dubbed the "red wine factor," was coined after researchers looked at the rates of cardiovascular disease in the south of France. In this region, the average diet consisted of large amounts of cheese, butter and red meats, all foods rich in saturated fats thought to accelerate the atherosclerosis process and contribute to cardiovascular disease.

It would seem obvious then that the population of the south of France would have increased incidence of cardiovascular disease. The data, however, showed no increased risk among this population.

There have been multiple theories proposed to explain this phenomenon, but one of the more popular was the "red wine factor. The answer may very well have been that these French men and women, also consistently paired their fatty charcuterie with a glass of red wine.

[Some suggested](#) that resveratrol from the skins of the grapes could be responsible, but this was questioned because the amount of resveratrol was too low to have a significant effect. In the end, it seems that it was simply the alcohol portion of the wine that provided the cardiovascular protective properties.

Jani BMC Med 19, 8 (2021). reported the [lowest risk was with red wine consumed with food and consumed 3-4 times a week](#) (The final sample size for analysis was N = 309,123 (61.5% of UKB sample). Spirit drinking was associated with higher adjusted mortality (hazard ratio (HR) 1.25; 95% confidence intervals (CI) 1.14–1.38), MACE (HR 1.31; 95% CI 1.15–1.50), cirrhosis (HR 1.48; 95% CI 1.08–2.03) and accident/injuries (HR 1.10; 95% CI 1.03–1.19) risk compared to red wine drinking, after adjusting for the average weekly alcohol consumption amounts. Beer/cider drinkers were also at a higher risk of mortality (HR 1.18; 95% CI 1.10–1.27), MACE (HR 1.16; 95% CI 1.05–1.27), cirrhosis (HR 1.36; 95% CI 1.06–1.74) and accidents/injuries (HR 1.11; 95% CI 1.06–1.17). Alcohol consumption

without food was associated with higher adjusted mortality (HR 1.10; 95% CI 1.02–1.17) risk, compared to consumption with food. Alcohol consumption over 1–2 times/week had higher adjusted mortality (HR 1.09; 95% CI 1.03–1.16) and MACE (HR 1.14; 95% CI 1.06–1.23) risk, compared to 3–4 times/week, adjusting for the amount of alcohol consumed.)

Predicted probability (7-year) of mortality, average amount of total weekly alcohol units and different patterns of alcohol consumption. All results adjusted for age, sex, Townsend score for socio-economic deprivation, smoking habits, BMI, physical activity levels, number of long-term conditions, self-rated health and CRP levels.

Another [systematic review of the literature](#) came to the same conclusion with regard to all cause mortality rates. They found that moderate alcohol consumption was associated with lower mortality rates than heavy drinkers, or even nondrinkers.

The researchers in this study were attempting to quantify exactly what “moderate” means, as the title of the paper “The level of alcohol consumption at which all-cause mortality is least” would suggest.

Looking at 20 cohort studies, and tens of thousands of deaths among men and women, they sought to quantify exactly what amount of alcohol consumption bestowed the lowest mortality rates, or as they termed it the nadir. They quantified alcohol consumption in units defined as 9 grams of alcohol.

From the studies they were able to find the levels of alcohol consumption with the lowest mortality rates, or nadir, in many different populations. Due to differences in disease rates, this lowest mortality rate number was surprisingly different.

In U.S. men for example, they found the lowest mortality rate, or nadir, to be at 7.7 units per week which is equivalent to about 5 drinks per week. In U.K. men however, they found that the lowest mortality rate was at 12.9 units per week, equivalent to about 8 drinks per week. From the data available at the time, they were only able to come up with a number for U.S. women which was 2.9 units, or about 2 drinks per week.

In the past many studies covering alcohol consumption and mortality rates, the data on female consumption is underrepresented. Therefore, studies like that of [Garg et al](#) focus explicitly on understanding the effects of alcohol consumption in women.

This study found that women reporting any amount of alcohol use had a 20% reduction in risk of ischemic heart disease (IHD) even after adjusting for other cardiovascular risk factors. The greatest reduction in risk, however, was in the group that consumed less than 2 drinks per day.

## **Alcohol Consumption Habits: (Poison or Healthful is in the Dose)-- “Concerns & Contraindications” section .**

Part of understanding the overall health impacts of alcohol is categorizing the different types of drinking habits. It is unhelpful to refer to individuals with vastly different consumption levels as the same cohort, or of being at the same risks.

We must make sure to differentiate an individual who binge drinks from an individual who consumes a glass of wine with dinner daily or once a week.

The Center for Disease Control uses the terms moderate, binge, and heavy drinking to define three broad categories of alcohol consumption habits.

According to the CDC, which cites the Dietary Guidelines for Americans, moderate drinking is defined as having 2 drinks or fewer per day for men, and only 1 drink per day for women. For the purposes of this review, we will define a “drink” as the typical amount of alcohol found in a typical 12 oz beer, 5 oz of wine, or 1.5 oz of a liquor. Each of these drinks contain about 14 grams of pure alcohol.

Figure 1 What is a Standard Drink? <https://www.niaaa.nih.gov/alcohols-effects-health/overview-alcohol-consumption/what-standard-drink>

The [CDC defines binge drinking](#) as any time an individual’s blood alcohol concentration (BAC) reaches 0.08%. On average they estimate this BAC level to be reached by [5 drinks in around 2 hours for a man, and 4 drinks in around 2 hours for a woman](#).

Heavy drinking is equivalent to the consumption of 15 or more alcoholic drinks per week for men, and 8 or more drinks per week for women.

These are useful definitions clinically, but they obviously vary greatly from individual to individual. There are many factors that influence how much alcohol in a short period of time is too much for functioning in the short for any one person. Long term health (and social) effects are influenced by both levels from short term drinking (binge) and long term drinking habits (heavy or less).

### Genetic Risk of Alcoholism

There is mounting data that drinking moderate amounts of alcohol does grant some cardiovascular health benefits. Studies such as this one by [Renaud et al](#) which reduction in all-cause mortality among men with hypertension, have lead many to the conclusion that some alcohol may be better for you than no alcohol. This dose-response is referred to in much of the literature as the U-curve, or J-curve.

Figure 2 Example of the proposed U-curve. In this case, specifically for relative risk of coronary heart disease. <https://pubs.niaaa.nih.gov/publications/arh27-1/39-51.htm>

Research on the dose-dependent relationship between the alcohol and all-cause mortality is ongoing (moderate level of drinking very likely won’t be the same for everyone ).

The optimal amount of alcohol consumption may be very different based on genetic factors, such as how you metabolize alcohol (process it to a non-toxin or to a beneficial compound), and, perhaps most importantly, an individual’s genetic and psychosocial predisposition(s) to alcoholism.

The [genetic and environmental causes of addiction to alcohol despite consequences \(alcoholism\) are estimated in the DSM-5](#) (the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition) to be 40%-60% influenced by genetics. The presence of a close relative such as a parent or sibling with alcoholism increases the risk of alcohol use disorder three to four times.



While the genetic impact on an individual's risk of developing alcoholism, or alcohol use disorder, is well established, it is difficult to say any one gene can be responsible for making an individual an alcoholic. There are, however, notable genes that seem to have the largest impacts.

The genes most closely related to alcoholism are involved in the metabolism of alcohol. Namely, these include allele variation of the genes [alcohol dehydrogenase 1B \(ADH1B\)](#) and [aldehyde dehydrogenase 2 \(ALDH2\)](#).

Figure 3 Primary pathway of alcohol

metabolism. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6286250/>

The ADH1B gene codes for the protein alcohol dehydrogenase 1B, which can also go by the same symbol, ADH1B. This protein is an enzyme that converts alcohol into its next metabolite acetaldehyde.

ADH1B is expressed in high levels in the liver and is thought to have the largest impact on alcohol consumption. The rate at which alcohol is converted to acetaldehyde determines how quickly an individual processes alcohol.

[There are three different variants of the ADH1B gene that each process alcohol into acetaldehyde at different rates](#). The first, and most common, is referred to as ADH1B\*1 in the literature. This variant is slowest and is used as the baseline for comparison.

The only population in the world in which this first variant is not the most common, is east Asia, where the second variant, ADH1B\*2 is more common. This variant of the protein is more efficient at converting alcohol to acetaldehyde. In vitro, the second variant, ADH1B\*2, has been shown to work 11 times faster than the primary variant, ADH1B\*1.

Though in vivo, it has only been shown to be able to help those homozygous for the ADH1B\*2 allele eliminate alcohol about 14% faster. The third variant, ADH1B\*3, is also faster than the ADH1B\*1 variant at up to 60 times faster in vitro.

ADH1B\*2 variant has robust protective properties from alcoholism—Individuals with at least one allele coding for the ADH1B\*2 variant had their relative risk of alcoholism reduced to 0.2, and if they were homozygous this relative risk was reduced to 0.12.

<https://pubmed.ncbi.nlm.nih.gov/10441588/>

The second important gene involved in the metabolism of alcohol is the ALDH2 gene which codes for the protein aldehyde dehydrogenase 2. This enzyme converts acetaldehyde into acetate, the next (and a neutral—neither beneficial nor harmful) metabolite in the primary pathway of alcohol metabolism.

The ALDH2\*2 variant of the aldehyde dehydrogenase 2 protein is found in around 30-50% of the East Asian population and is also commonly referred to as the “Asian flush gene”.

This is due to the fact that this variant converts acetaldehyde into acetate slower than the primary variant, leading to a buildup of acetaldehyde which accumulates in the body, resulting in the tell-tale flush of red in individuals with this variant.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6286250/>

This gene variant is also associated with reduced risk of alcohol use disorder, though the proposed mechanism is quite different. The flush that results from drastically increased levels of acetaldehyde is associated with increased skin temperature, nausea, vomiting, headaches, and increased pulse. This reaction is overall extremely unpleasant and is thought to decrease the propensity to drink in individuals with this variant.

## Mortality and Disability Risks and Benefits of Alcohol Consumption

Some of the risks associated with chronic excessive drinking include diseases (cirrhosis of the liver, many forms of cancer, high blood pressure, )and coronary heart disease and death with heavy drinking and especially binge drinking (death from other things such as accidents, suicide, and homicide also significantly increase).

In the long-term prospective cohort study by Klatsky et al, [Alcohol and Mortality](#), 128,000 individuals from the bay area in California were followed from 1978 to 1985. The study contained both men and women, ranging in age from their 20s to over 70 years of age. Data about drinking habits was gathered from questionnaires and compared to the data of lifelong non-drinkers.

After tracking all the deaths that occurred among this study population they came up with relative risks of death for heavy drinkers, light drinkers, young drinkers, old drinkers, male and female drinkers.

Heavy drinkers, defined as individuals who consumed more than 6 drinks per day, had a relative risk of death of 1.6 (95% CI, 1.3 to 2.0) compared to nondrinkers. This data, which was adjusted for variables such as age-related deaths, showed that heavy drinkers were significantly more likely to die from almost all causes. The risk of death from all causes associated with drinking more than 6 drinks per day was even higher in female and younger cohorts. It was found that women had a relative risk of 2.2 (CI, 1.4 to 3.8), and those younger than 50 years had a relative risk of 1.9 (CI, 1.3 to 2.9). Drinkers were not significantly more likely to die from cardiovascular disease.

Light drinkers were less likely to die from cardiovascular disease. Specifically, they found light drinkers, meaning those who drink less than 2 drinks per day, were at a relative risk of 0.7 (CI, 0.6 to 0.9) from dying of coronary heart disease.

In “ [A meta-analysis of alcohol consumption and the risk of 15 diseases](#),” Carrao et al looked at 156 studies that they determined to be of high quality. From these studies they gathered data on a multitude of diseases associated with alcohol. In total these studies collected data on 116,702 subjects.

Alcohol consumption was associated with strong risks of cancers of the oral cavity, esophagus, and larynx, as well as hypertension, liver cirrhosis, chronic pancreatitis, and injuries due to accidents and violence.

This study looked at the relative risks at three different alcohol consumption levels, 25 grams/day, 50 grams/day, and 100 grams/day. These measures of alcohol being roughly equivalent to 2 drinks per day, 4 drinks per day and 8 drinks per day.

This paper found that even at low levels of alcohol consumption (25 grams/day) that there was a significant increase in relative risk for cancers of the oral cavity, esophagus, and larynx.

The relative risk of oral cavity and larynx cancer, for example, among these moderate drinkers was 1.86 (CI, 1.76 – 1.96). These relative risks increased significantly to 3.11 (CI, 2.85 – 3.39) and 6.45 (5.76 – 7.24), for 50 grams alcohol/day and 100 grams alcohol/day, respectively.



Risk of diseases such as liver cirrhosis increased substantially as levels of alcohol consumption increased as well. The relative risk for liver cirrhosis among the different consumption levels were 2.90 (CI, 2.71 – 3.09), 7.13 (CI, 6.35 – 8.00), and 26.52 (CI, 22.26 – 31.59) at 25 grams/day, 50 grams/day, and 100 grams per day, respectively.

The group that consumed 25 g/day of alcohol had a lower relative risk of coronary heart disease (RR: 0.81, 0.79-0.83) and ischemic stroke (RR: 0.90, 0.75-1.07). They estimate that alcohol consumption of 20 g/day is associated with 20% reduction.

Even in the 50 g/day and 100 g/day groups, no significant increase in risk of coronary heart disease was discovered.

[A study of Russian men and women](#) found that the relative risk of daily drinkers vs occasional drinkers in men was found to be 1.52. This study, which primarily looked at the mortality of Russian men, included data from 10,475 males and 3,129 females.

### Heavy Drinking and Binge Drinking

Using occasional drinking of about once a month as a baseline for comparison, this study, contrary to others, found no benefit in moderate drinking in their male cohort. Compared to the occasional drinkers, those who never drank had a hazard ratio of only 0.70 (95% CI, 0.62-0.77). Predictably, this hazard ratio increased with frequency of drinking up to a hazard ratio of 1.95 (95% CI, 1.71–2.23) in daily drinkers.

Figure 4: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2626461/>

In the smaller, female cohort they did not find significant differences in mortality rate between women who never drank and those that drank occasionally. The hazard ratio of occasional drinkers was 1.07 (0.86–1.33) compared to never drinkers.

Binge drinking seemed to be just as detrimental to mortality rates as frequency of drinking. Members of the male cohort had higher risk of mortality (adjusted relative risk 1.09, 95% CI 1.00–1.19) even after the numbers were adjusted also to account for frequency of drinking. In women, binge drinking several times a month was associated with an adjusted relative risk of 2.68 (95% CI 1.54–4.66).

[Plunk et al](#) found similarly dangerous effects of binge drinking. They found that mortality risk increased steadily as heavy drinking frequency increased. Daily heavy drinkers were at twice the risk of death compared with abstainers.

### U-Shape of Alcohol Mortality Rates

Many studies over the past decades have seemed to show that moderate levels of alcohol consumption decrease all-cause mortality. Those that drink a little can be healthier than

those that drink none at all, and definitely healthier than those that consistently drink large amounts.

All-cause mortality rates very quickly shoot back up again way past the levels of nondrinkers when the dose of alcohol becomes too high. Heavy drinkers and binge drinkers increase their risk of death from liver cirrhosis, many forms of cancer, and accidents. They also lose all the benefits associated with moderate alcohol intake such as the protection from cardiovascular disease and coronary heart disease.

Binge drinking, defined as more than 160 grams of alcohol on an occasion, was shown in this Russian study by [Malyutina et al](#) to increase the relative risk of coronary heart disease to 1.27 (CI 0.81-1.99). Frequent binge drinkers had a relative risk ratio of 2.05 (CI 1.09–3.86) of a death from cardiovascular disease.

### Doubts About the U-Curve

This relationship between alcohol and mortality rates is said to be U-shaped, or J-shaped. This U-curve was highlighted in many studies, however, some raised questions about whether the data really supports this theory.

There has been some questioning of the idea that moderate alcohol consumption is protective of cardiovascular health. In a [review by Fillmore et al of the literature](#) like this one, the authors suggest that the improved rates of coronary heart disease may not be due to a protective property of alcohol.

Instead, they point out that as people get older, sicker, and at greater risk of coronary heart disease already, they also tend to stop drinking. They suggest that perhaps the increase in coronary heart disease is not caused by a lack of alcohol, but instead that these individuals stopped drinking because they became older and at higher risk.

They point out these individuals who become abstainers later in life because of developing health concerns might confuse the data regarding abstainers.

They call in this study for more precise language regarding “moderate” drinking and point out the need to control for more variables in the analysis of alcohol and mortality rates.

They do not disprove the theory of cardiovascular protection, but they do raise questions about the weaknesses of the studies in this area of research, their own analysis included.

[Carmelli et al](#) attempted to overcome this proposed weakness in a study that utilized the National Academy of Sciences-National Research Council World War II-veteran male twin registry. [In this study they looked through this large registry of twins to find examples in which one twin abstained from drinking and the other drank moderately.](#)

They followed these drinking-discordant twins for 24 years to record mortality and morbidity data. Among the abstainer co-twins there was a total of 27 deaths, compared to 14 among the twins that drank light to moderate amounts, giving a relative risk ratio of 1.93. The risk ratio for cardiovascular disease was 2.0 for abstaining twins compared to their light drinking twin.

### Poison is in the Dose

So, while there are valid critiques about the design of studies that support the U-curve in alcohol mortality, it seems far too early to dismiss the benefits of moderate drinking completely.

Precisely where the line between moderate and heavy drinking lies seems to be hard to determine. This line is almost certainly different from one individual to another, depending on their alcohol metabolism genes, and their predisposition to alcohol use disorder.

## **Conclusions:**

For some, at high risk of alcohol use disorder, perhaps due to the presence of certain genes or simply those with a history of the disorder in their family, their risk/reward analysis may look quite different from another who consistently drinks a solitary glass of wine with dinner every night.



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Michael Roizen (born January 7, 1946) is an [American anesthesiologist](#) and [internist](#), an award-winning author and the chief [wellness](#) officer at the [Cleveland Clinic](#). Roizen developed the [RealAge](#) concept and has authored or coauthored five number one New York Times best sellers.