

LIQUID PASSES THROUGH GLOTTIS: FORGETS ABOUT RIGOR MORTIS

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ABSTRACT

Wine is an alcoholic drink typically made from fermented grapes. Yeast consumes the sugar in the grapes and converts it to ethanol, carbon dioxide and heat. Different varieties of grapes and strains of yeasts are major factors in different styles of wine. These differences result from the complex interactions between the biochemical development of the grape, the reactions involved in fermentation, the grape's growing environment (terroir), and the wine production process. Many countries enact legal appellations intended to define styles and qualities of wine. These typically restrict the geographical origin and permitted varieties of grapes, as well as other aspects of wine production. Wines not made from grapes involve fermentation of additional crops, including rice wine and other fruit wines such as plum, cherry, pomegranate, currant and elderberry. Wine has been produced for thousands of years. The earliest evidence of wine is from ancient China (c. 7000 BC), Georgia (6000 BC), Persia (5000 BC), and Italy (4000 BC). New World wine has some connection to alcoholic beverages made by the indigenous peoples of the Americas, but is mainly connected to later Viking area of Vinland and Spanish traditions in New Spain. Later, as Old-World wine further developed viticulture techniques, Europe would encompass three of the largest wine-producing regions. Today, the five countries with the largest wine-producing regions are in Italy, Spain, France, the United States, and China. Alcoholism is, broadly, any drinking of alcohol that results in significant mental or physical health problems. Alcoholism is not a recognized diagnostic entity. Predominant diagnostic classifications are alcohol use disorder (DSM-5) or alcohol dependence (ICD-11). Excessive alcohol use can damage all organ systems, but it particularly affects the brain, heart, liver, pancreas and immune system. Alcoholism can result in mental illness, delirium tremens, Wernicke-Korsakoff syndrome, irregular heartbeat, an impaired immune response, liver cirrhosis and increased cancer risk. Drinking during pregnancy can result in fatal alcohol spectrum disorders. Women are generally more sensitive than men to the harmful effects of alcohol, primarily due to their smaller body weight, lower capacity to metabolize alcohol, and higher proportion of body fat. In a small number of individuals, prolonged, severe alcohol misuse ultimately leads to frank dementia. Environmental factors and genetics are two factors affecting risk for alcoholism, with about half the risk attributed to each. Someone with a parent or sibling with alcoholism is three to four times more likely to become an alcoholic themselves, but only a minority of them do. Environmental factors include social, cultural and behavioural influences. High stress levels and anxiety, as well as alcohol's inexpensive cost and easy accessibility, increase the risk. People may continue to drink partly to prevent or improve symptoms of withdrawal. After a person stops drinking alcohol, they may experience a low level of withdrawal lasting for months. Medically, alcoholism is considered both a physical and mental illness. Questionnaires are usually used to detect possible alcoholism. Further information is then collected to confirm the diagnosis.

KEYWORDS: Red wine, White wine, Rose wine, Orange wine, Sparkling wine, Dessert wine, Fruit wine, Honey wine, Starch wine, Vintage, Cocktail Mocktail, Blood alcohol concentration.

INTRODUCTION

Ethanol [CAS: 64-17-5] (also called ethyl alcohol, grain alcohol, drinking alcohol, or simply alcohol) is an organic chemical compound. It is a simple alcohol with

the chemical formula C_2H_6O . Its formula can be also written as CH_3-CH_2-OH or C_2H_5OH (an ethyl group linked to a hydroxyl group), and is often abbreviated as EtOH. Ethanol is a volatile, flammable, colorless liquid

with a slight characteristic odor. It is a psychoactive drug, recreational drug, and the active ingredient in alcoholic drinks. Wine has long played an important role in religion. Red wine was associated with blood by the ancient Egyptians and was used by both the Greek cult of Dionysus and the Romans in their Bacchanalia; Judaism also incorporates it in the Kiddush, and Christianity in the Eucharist. Egyptian, Greek, Roman, and Israeli wine cultures are still connected to these ancient roots. Similarly, the largest wine regions in Italy, Spain, and France have heritages in connection to

sacramental wine, likewise, viticulture traditions in the Southwestern United States started within New Spain as Catholic friars and monks first produced wines in New Mexico and California.^[1]

From grapes

The type of grape used and the amount of skin contact while the juice is being extracted determines the color and general style of the wine. The color has no relation to a wine's sweetness--all may be made sweet or dry.

Types of wine from grapes			
Red grapes	Long contact with grape skins	Short contact with grape skins	No contact with grape skins
	Red wine	Rose wine	
White grapes	Orange wine		White wine

Red wine: Red wine gains its color and flavor (notably, tannins) from the grape skin, by allowing the grapes to soak in the extracted juice. Red wine is made from dark-colored red grape varieties. The actual color of the wine can range from violet, typical of young wines, through red for mature wines, to brown for older red

wines. The juice from most red grapes is actually greenish-white; the red color comes from anthocyanins present in the skin of the grape. A notable exception is the family of rare *teinturier* varieties, which actually have red flesh and produce red juice.



Figure-1: Red wine.

White wine: To make white wine, grapes are pressed quickly with the juice immediately drained away from the grape skins. The grapes used are typically white grape varieties, though red grapes may be used if the winemaker is careful not to let the skin stain the wort during the separation of the pulp-juice. For

example, pinot noir (a red grape) is commonly used in champagne. Dry (low sugar) white wine is the most common, derived from the complete fermentation of the juice, however sweet white wines such as Moscato d'Asti are also made.



Figure-2: White wine.

Rosé wine: A rosé wine gains color from red grape skins, but not enough to qualify it as a red wine. It may be the oldest known type of wine, as it is the most straightforward to make with the skin contact method.

The color can range from a pale orange to a vivid near-purple, depending on the varieties used and wine-making techniques.^[2]



Figure-3: Rose wine.

There are three primary ways to produce rosé wine: skin contact (allowing dark grape skins to stain the wort), saignée (removing juice from the must early in fermentation and continuing fermentation of the juice separately), and blending of a red and white wine (uncommon and discouraged in most wine growing regions). Rosé wines have a wide range of sweetness levels from dry Provençal rosé to sweet White

Zinfandels and blushes. Rosé wines are made from a wide variety of grapes all over the world.^[3]

Orange wine: Sometimes called amber wines, these are wines made with white grapes but with the skins allowed to soak during pressing, similar to red and rosé wine production. They are notably tannic, and usually made dry.



Figure-4: Orange wine.

Sparkling wine: These are effervescent wines, made in any of the above styles (i.e., orange, red, rosé, white). They must undergo secondary fermentation to create carbon dioxide, which creates the bubbles.

Two common methods of accomplishing this are the traditional method, used for Cava, Champagne, and more expensive sparkling wines, and the Charmat method, used for Prosecco, Asti, and less expensive wines. A hybrid *transfer method* is also used, yielding intermediate results, and simple addition of carbon dioxide is used in the cheapest of wines. The bottles used for sparkling wine must be thick to withstand the pressure of the gas behind the cork, which can be up to 6 standard atmospheres (88 psi).

Dessert wine: This refers to sweet wines that have a high level of sugar remaining after fermentation. There

are various ways of increasing the amount of sugar in a wine, yielding products with different strengths and names. Icewine, Port, Sauternes, Tokaji Aszú, Trockenbeerenauslese, and Vin Santo are some examples.

From other fruits and foods

Fruit wine: Wines from other fruits, such as apples and berries, are usually named after the fruit from which they are produced, and combined with the word "wine" (for example, apple wine and elderberry wine) and are generically called fruit wine or country wine (similar to French term *vin de pays*). Other than the grape varieties traditionally used for wine-making, most fruits naturally lack either sufficient fermentable sugars, proper amount of acidity, yeast amounts needed to promote or maintain fermentation, or a combination of these three materials.^[4]



Figure-5: Fruit wine.

This is probably one of the main reasons why wine derived from grapes has historically been more prevalent by far than other types, and why specific types of fruit wines have generally been confined to the regions in which the fruits were native or introduced for other reasons.

Mead (honey wine): Mead, also called honey wine, is created by fermenting honey with water, sometimes with various fruits, spices, grains, or hops. As long as the primary substance fermented is honey, the drink is considered mead. Mead was produced in ancient history throughout Europe, Africa and Asia, and was known in Europe before grape wine.

Starch-based "wine" and wine-based products: Other drinks called "wine", such as barley wine and rice wine (e.g. sake, huangjiu and cheongju), are made from starch-based materials and resemble beer more than traditional wine, while ginger wine is fortified

with brandy. In these latter cases, the term "wine" refers to the similarity in alcohol content rather than to the production process. The commercial use of the English word "wine" (and its equivalent in other languages) is protected by law in many jurisdictions.^[5]

Some UK supermarkets have been criticized for selling "wine based" drinks, which only contain 75% wine, but which are still marketed as wine. The International Organisation of Vine and Wine requires that a "wine-based drink" must contain a minimum of 75% wine, but producers do not have to divulge the nature of the remaining 25%.

Vintages: In the United States, for a wine to be vintage-dated and labelled with a country of origin or American Viticultural Area (AVA; e.g., Sonoma Valley), 95% of its volume must be from grapes harvested in that year. If a wine is not labeled with a country of origin or AVA the percentage requirement is lowered to 85%.



Figure-6: Vintage.

Vintage wines are generally bottled in a single batch so that each bottle will have a similar taste. Climate's impact on the character of a wine can be significant enough to cause different vintages from the same vineyard to vary dramatically in flavour and quality. Thus, vintage wines are produced to be

individually characteristic of the particular vintage and to serve as the flagship wines of the producer. Superior vintages from reputable producers and regions will often command much higher prices than their average ones. Some vintage wines (e.g. Brunello), are only made in better-than-average years.

For consistency, non-vintage wines can be blended from more than one vintage, which helps wine-makers sustain a reliable market image and maintain sales even in bad years. One recent study suggests that for the average wine drinker, the vintage year may not be as significant for perceived quality as had been thought, although wine connoisseurs continue to place great importance on it.

A proof spirit was now a liquor with an alcohol level 12/13 the weight of an equal volume of distilled water at 11 °C (51 °F). This specific gravity corresponds to about 57.06% ABV [Alcohol By Volume]. This standardization became incorporated in Great Britain's 1952 Customs and Excise Tax. A "proof spirit" has to be at least 100 proof. Overproof: Interchangeable with Navy Strength, indicating a gin or rum over 57% ABV. In the United States, the system — established around 1848 — is a bit simpler: "Proof" is straight up two times alcohol by volume. So a vodka, say, that is 40 percent ABV is 80 proof and one that is 45 percent ABV is 90 proof. A "proof spirit" is 100 proof (50 percent ABV) or higher.

Collecting: Outstanding vintages from the best vineyards may sell for thousands of dollars per bottle, though the broader term "fine wine" covers those typically retailing in excess of US\$30–50. "Investment wines" are considered by some to be Veblen goods: those for which demand increases rather than decreases as their prices rise. Particular selections such as

"Verticals", which span multiple vintages of a specific grape and vineyard, may be highly valued. The most notable was a Château d'Yquem 135-year vertical containing every vintage from 1860 to 2003 sold for \$1.5 million. The most common wines purchased for investment include those from Bordeaux and Burgundy; cult wines from Europe and elsewhere; and vintage port.^[6]

Characteristics of highly collectible wines include:

1. A proven track record of holding well over time
2. A drinking-window plateau (i.e., the period for maturity and approachability) that is many years long
3. A consensus among experts as to the quality of the wines
4. Rigorous production methods at every stage, including grape selection and appropriate barrel aging.

Investment in fine wine has attracted those who take advantage of their victims' relative ignorance of this wine market sector. Such wine fraudsters often profit by charging excessively high prices for off-vintage or lower-status wines from well-known wine regions, while claiming that they are offering a sound investment unaffected by economic cycles. As with any investment, thorough research is essential to making an informed decision.^[7]



Figure-7: Cocktail party.

Cocktail: A cocktail is an alcoholic mixed drink. Most commonly, cocktails are either a combination of spirits, or one or more spirits mixed with other ingredients such as fruit juice, flavored syrup, or cream. Cocktails vary widely across regions of the world, and many websites publish both original recipes and their own interpretations of older and more famous cocktails. The origins of the word cocktail have been debated. The first written mention of *cocktail* as a beverage appeared in *The Farmers Cabinet*, 1803 in the United States. The first definition of a cocktail as an alcoholic beverage appeared three years later in *The Balance and Columbian Repository* (Hudson, New York) May 13, 1806. Traditionally, cocktail ingredients included spirits, sugar, water and bitters, however, this definition evolved throughout the 1800s, to include the addition of a

liqueur. In 1862 Jerry Thomas published a bartenders' guide called *How to Mix Drinks; or, The Bon Vivant's Companion* which included 10 cocktail recipes using bitters to differentiate from other drinks such as punches and cobbles. Cocktails continued to evolve and gain popularity throughout the 1900s, and in 1917 the term "cocktail party" was coined by Mrs. Julius S. Walsh Jr. of St. Louis, Missouri. With wine and beer being less available during the Prohibition in the United States (1920–1933), liquor-based cocktails became more popular due to accessibility, followed by a decline in popularity during the late 1960s. The early to mid-2000s saw the rise of cocktail culture through the style of mixology which mixes traditional cocktails and other novel ingredients.

Usage and related terms: The Oxford Dictionaries define cocktail as "An alcoholic drink consisting of a spirit or spirits mixed with other ingredients, such as fruit juice or cream". A cocktail can contain alcohol, a sugar, and a bitter/citrus. When a mixed drink contains only a distilled spirit and a mixer, such as soda or fruit juice, it is a highball. Many of the International Bartenders Association Official Cocktails are highballs. When a mixed drink contains only a distilled spirit and a liqueur, it is a duo, and when it adds a mixer, it is a trio. Additional ingredients may be sugar, honey, milk, cream, and various herbs. Mixed drinks without alcohol that resemble cocktails are known as "mocktails" or "virgin cocktails".

Etymology: The origin of the word cocktail is disputed. The first recorded use of cocktail not referring to a horse is found in *The Morning Post and Gazetteer* in London, England, March 20, 1798:

Mr. Pitt, *two petit vers of "L'huile de Venus"*

Ditto, one of "perfeit amour"

Ditto, "cock-tail" (vulgarly called ginger)

The Oxford English Dictionary cites the word as originating in the U.S. The first recorded use of *cocktail* as a beverage (possibly non-alcoholic) in the United States appears in *The Farmer's Cabinet*, April 28, 1803: Drank a glass of cocktail—excellent for the head...Call'd at the Doct's. found Burnham—he looked very wise—drank another glass of cocktail.^[8]

The first definition of a Cocktail by Harry Crosswell: The first definition of cocktail known to be an alcoholic beverage appeared in *The Balance and Columbian Repository* (Hudson, New York) May 13, 1806; editor Harry Crosswell answered the question, "What is a cocktail?": *Cock-tail* is a stimulating liquor, composed of spirits of any kind, sugar, water, and bitters—it is vulgarly called *bittered sling*, and is supposed to be an excellent electioneering potion, in as much as it renders the heart stout and bold, at the same time that it fuddles the head. It is said, also to be of great use to

a democratic candidate: because a person, having swallowed a glass of it, is ready to swallow anything else. Etymologist Anatoly Liberman endorses as "highly probable" the theory advanced by Låftman (1946), which Liberman summarizes as follows: It was customary to dock the tails of horses that were not thoroughbred [...] They were called *cocktailed horses*, later simply *cocktails*. By extension, the word *cocktail* was applied to a vulgar, ill-bred person raised above his station, assuming the position of a gentleman but deficient in gentlemanly breeding. [...] Of importance [in the 1806 citation above] is [...] the mention of water as an ingredient. [...] Låftman concluded that cocktail was an acceptable alcoholic drink, but diluted, not a "purebred", a thing "raised above its station". Hence the highly appropriate slang word used earlier about inferior horses and sham gentlemen.

In his book *Imbibe!* (2007), cocktail historian David Wondrich also speculates that *cocktail* is a reference to gingering, a practice for perking up an old horse by means of a ginger suppository so that the animal would "cock its tail up and be frisky."

Several authors have theorized that cocktail may be a corruption of cocktail.

Development: There is a lack of clarity on the origins of cocktails. Traditionally cocktails were a mixture of spirits, sugar, water, and bitters. By the 1860s, however, a cocktail frequently included a liqueur. The first publication of a bartenders' guide which included cocktail recipes was in 1862 – *How to Mix Drinks; or, The Bon Vivant's Companion*, by "Professor" Jerry Thomas. In addition to recipes for punches, sours, slings, cobblers, shrubs, toddies, flips, and a variety of other mixed drinks were 10 recipes for "cocktails". A key ingredient differentiating cocktails from other drinks in this compendium was the use of bitters. Mixed drinks popular today that conform to this original meaning of "cocktail" include the Old Fashioned whiskey cocktail, the Sazerac cocktail, and the Manhattan cocktail.^[9]

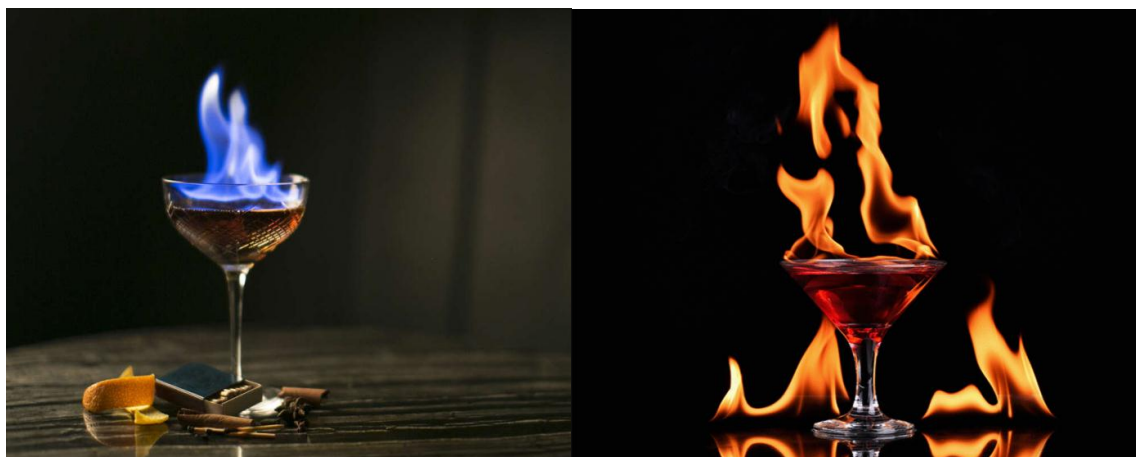


Figure-8: Firing cocktail.

The ingredients listed (spirits, sugar, water, and bitters) match the ingredients of an Old Fashioned, which originated as a term used by late 19th century bar patrons to distinguish cocktails made the "old-fashioned" way from newer, more complex cocktails.

In the 1869 recipe book *Cooling Cups and Dainty Drinks*, by William Terrington, cocktails are described as:

Cocktails are compounds very much used by "early birds" to fortify the inner man, and by those who like their consolations hot and strong. The term highball appears during the 1890s to distinguish a drink composed only of a distilled spirit and a mixer.

Published in 1902 by Farrow and Jackson, "Recipes of American and Other Iced Drinks" contains recipes for nearly two dozen cocktails, some still recognizable today. The first "cocktail party" ever thrown was allegedly by Mrs. Julius S. Walsh Jr. of St. Louis, Missouri, in May 1917. Walsh invited 50 guests to her home at noon on a Sunday. The party lasted an hour, until lunch was served at 1 pm. The site of this first cocktail party still stands. In 1924, the Roman Catholic Archdiocese of St. Louis bought the Walsh mansion at 4510 Lindell Boulevard, and it has served as the local archbishop's residence ever since.

During Prohibition in the United States (1920–1933), when alcoholic beverages were illegal, cocktails were still consumed illegally in establishments known as speakeasies. The quality of the liquor available during Prohibition was much worse than previously. There was a shift from whiskey to gin, which does not require aging and is therefore easier to produce illicitly. Honey, fruit juices, and other flavoring served to mask the foul taste of the inferior liquors. Sweet cocktails were easier to drink quickly, an important consideration when the establishment might be raided at any moment. With wine and beer less readily available, liquor-based cocktails took their place, even becoming the centerpiece of the new cocktail party. Cocktails became less popular in the late 1960s and through the 1970s, until resurging in the 1980s with vodka often substituting the original gin in drinks such as the martini. Traditional cocktails began to make a comeback in the 2000s, and by the mid-2000s there was a renaissance of cocktail culture in a style typically referred to as mixology that draws on traditional cocktails for inspiration but utilizes novel ingredients and often complex flavors.^[10]

Alcoholism: Prevention of alcoholism may be attempted by regulating and limiting the sale of alcohol (particularly to minors), taxing alcohol to increase its cost, and providing education and inexpensive treatment. Prohibition did not work. Treatment of alcoholism may take several forms. Due to medical problems that can occur during withdrawal, alcohol detoxification should be carefully controlled. One common method involves the use of benzodiazepine medications, such as

diazepam. These can be either given while admitted to a health care institution or occasionally while a person remains in the community with close supervision. Mental illness or other addictions may complicate treatment. After detoxification, various forms of individual or group therapy or support groups can help keep a person from returning to drinking. One commonly used form of support is the group Alcoholics Anonymous. The medications acamprosate, disulfiram or naltrexone may also be used to help prevent further drinking. The World Health Organization has estimated that as of 2016, there were 380 million people with alcoholism worldwide (5.1% of the population over 15 years of age). As of 2015 in the United States, about 17 million (7%) of adults and 0.7 million (2.8%) of those age 12 to 17 years of age are affected. Alcoholism is most common among males and young adults. Geographically, it is least common in Africa (1.1% of the population) and has the highest rates in Eastern Europe (11%). Alcoholism directly resulted in 139,000 deaths in 2013, up from 112,000 deaths in 1990. A total of 3.3 million deaths (5.9% of all deaths) are believed to be due to alcohol. Alcoholism reduces a person's life expectancy by approximately ten years. Many terms, some insulting and others informal, have been used to refer to people affected by alcoholism; the expressions include *tippler*, *drunkard*, *dipsomaniac* and *souse*. In 1979, the World Health Organization discouraged the use of "alcoholism" due to its inexact meaning, preferring "alcohol dependence syndrome".^[11]

Signs and symptoms

Effects of alcohol on the body: The risk of alcohol dependence begins at low levels of drinking and increases directly with both the volume of alcohol consumed and a pattern of drinking larger amounts on an occasion, to the point of intoxication, which is sometimes called "binge drinking".

Long-term misuse

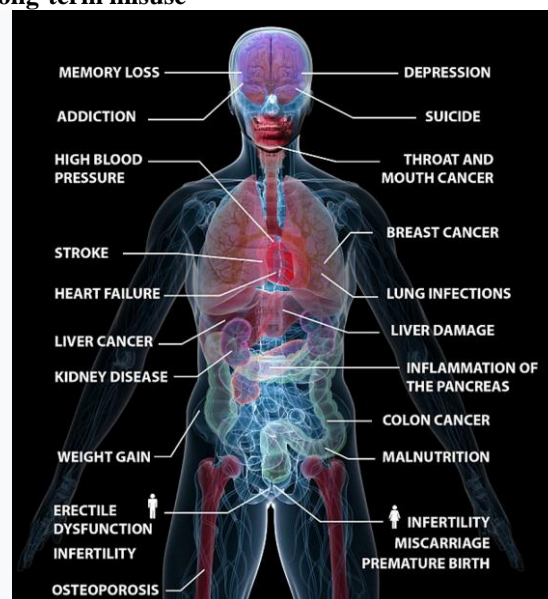


Figure-9: Effect of alcohol in body.

Some of the possible long-term effects of ethanol an individual may develop. Additionally, in pregnant women, alcohol can cause fatal alcohol syndrome. Alcoholism is characterised by an increased tolerance to alcohol – which means that an individual can consume more alcohol – and physical dependence on alcohol, which makes it hard for an individual to control their consumption. The physical dependency caused by alcohol can lead to an affected individual having a very strong urge to drink alcohol. These characteristics play a role in decreasing an alcoholic's ability to stop drinking. Alcoholism can have adverse effects on mental health, contributing to psychiatric disorders and increasing the risk of suicide. A depressed mood is a common symptom of heavy alcohol drinkers.

Warning signs: Warning signs of alcoholism include the consumption of increasing amounts of alcohol and frequent intoxication, preoccupation with drinking to the exclusion of other activities, promises to quit drinking and failure to keep those promises, the inability to remember what was said or done while drinking (colloquially known as "blackouts"), personality changes associated with drinking, denial or the making of excuses for drinking, the refusal to admit excessive drinking, dysfunction or other problems at work or school, the loss of interest in personal appearance or hygiene, marital and economic problems, and the complaint of poor health, with loss of appetite, respiratory infections, or increased anxiety.^[12]

Physical: Drinking enough to cause a blood alcohol concentration (BAC) of 0.03–0.12% typically causes an overall improvement in mood and possible euphoria (a "happy" feeling), increased self-confidence and sociability, decreased anxiety, a flushed, red appearance in the face and impaired judgment and fine muscle coordination. A BAC of 0.09% to 0.25% causes lethargy, sedation, balance problems and blurred vision. A BAC of 0.18% to 0.30% causes profound confusion, impaired speech (e.g. slurred speech), staggering, dizziness and vomiting. A BAC from 0.25% to 0.40% causes stupor, unconsciousness, anterograde amnesia, vomiting (death may occur due to inhalation of vomit while unconscious) and respiratory depression (potentially life-threatening). A BAC from 0.35% to 0.80% causes a coma (unconsciousness), life-threatening respiratory depression and possibly fatal alcohol poisoning. With all alcoholic beverages, drinking while driving, operating an aircraft or heavy machinery increases the risk of an accident; many countries have penalties for drunk driving.^[13]

Long-term effects: Having more than one drink a day for women or two drinks for men increases the risk of heart disease, high blood pressure, atrial fibrillation, and stroke. Risk is greater with binge drinking, which may also result in violence or accidents. About 3.3 million deaths (5.9% of all deaths) are believed to be due to alcohol each year. Alcoholism reduces a person's

life expectancy by around ten years and alcohol use is the third leading cause of early death in the United States. No professional medical association recommends that people who are non-drinkers should start drinking. Long-term alcohol misuse can cause a number of physical symptoms, including cirrhosis of the liver, pancreatitis, epilepsy, polyneuropathy, alcoholic dementia, heart disease, nutritional deficiencies, peptic ulcers and sexual dysfunction, and can eventually be fatal. Other physical effects include an increased risk of developing cardiovascular disease, malabsorption, alcoholic liver disease, and several cancers. Damage to the central nervous system and peripheral nervous system can occur from sustained alcohol consumption. A wide range of immunologic defects can result and there may be a generalized skeletal fragility, in addition to a recognized tendency to accidental injury, resulting a propensity to bone fractures. Women develop long-term complications of alcohol dependence more rapidly than do men. Additionally, women have a higher mortality rate from alcoholism than men. Examples of long-term complications include brain, heart, and liver damage and an increased risk of breast cancer. Additionally, heavy drinking over time has been found to have a negative effect on reproductive functioning in women. This results in reproductive dysfunction such as anovulation, decreased ovarian mass, problems or irregularity of the menstrual cycle, and early menopause. Alcoholic ketoacidosis can occur in individuals who chronically misuse alcohol and have a recent history of binge drinking. The amount of alcohol that can be biologically processed and its effects differ between sexes. Equal dosages of alcohol consumed by men and women generally result in women having higher blood alcohol concentrations (BACs), since women generally have a lower weight and higher percentage of body fat and therefore a lower volume of distribution for alcohol than men.

Psychiatric: Long-term misuse of alcohol can cause a wide range of mental health problems. Severe cognitive problems are common; approximately 10 percent of all dementia cases are related to alcohol consumption, making it the second leading cause of dementia. Excessive alcohol use causes damage to brain function, and psychological health can be increasingly affected over time. Social skills are significantly impaired in people suffering from alcoholism due to the neurotoxic effects of alcohol on the brain, especially the prefrontal cortex area of the brain. The social skills that are impaired by alcohol use disorder include impairments in perceiving facial emotions, prosody, perception problems, and theory of mind deficits; the ability to understand humour is also impaired in people who misuse alcohol. Psychiatric disorders are common in alcoholics, with as many as 25 percent suffering severe psychiatric disturbances. The most prevalent psychiatric symptoms are anxiety and depression disorders. Psychiatric symptoms usually initially worsen during alcohol withdrawal, but typically improve or disappear

with continued abstinence. Psychosis, confusion, and organic brain syndrome may be caused by alcohol misuse, which can lead to a misdiagnosis such as schizophrenia. Panic disorder can develop or worsen as a direct result of long-term alcohol misuse.^[14]

The co-occurrence of major depressive disorder and alcoholism is well documented. Among those with comorbid occurrences, a distinction is commonly made between depressive episodes that remit with alcohol abstinence ("substance-induced"), and depressive episodes that are primary and do not remit with abstinence ("independent" episodes). Additional use of other drugs may increase the risk of depression. Psychiatric disorders differ depending on gender. Women who have alcohol-use disorders often have a co-occurring psychiatric diagnosis such as major depression, anxiety, panic disorder, bulimia, post-traumatic stress disorder (PTSD), or borderline personality disorder. Men with alcohol-use disorders more often have a co-occurring diagnosis of narcissistic or antisocial personality disorder, bipolar disorder, schizophrenia, impulse disorders or attention deficit/hyperactivity disorder (ADHD). Women with alcohol use disorder are more likely to experience physical or sexual assault, abuse, and domestic violence than women in the general population which can lead to higher instances of psychiatric disorders and greater dependence on alcohol.^[15]

Social effects: Serious social problems arise from alcohol use disorder; these dilemmas are caused by the pathological changes in the brain and the intoxicating effects of alcohol. Alcohol misuse is associated with an increased risk of committing criminal offences, including child abuse, domestic violence, rape, burglary and assault. Alcoholism is associated with loss of employment, which can lead to financial problems. Drinking at inappropriate times and behavior caused by reduced judgment can lead to legal consequences, such as criminal charges for drunk driving or public disorder, or civil penalties for tortious behavior. An alcoholic's behavior and mental impairment while drunk can profoundly affect those surrounding him and lead to isolation from family and friends. This isolation can lead to marital conflict and divorce, or contribute to domestic violence. Alcoholism can also lead to child neglect, with subsequent lasting damage to the emotional development of the alcoholic's children. For this reason, children of alcoholic parents can develop a number of emotional problems. For example, they can become afraid of their parents, because of their unstable mood behaviors. In addition, they can develop considerable amount of shame over their inadequacy to liberate their parents from alcoholism. As a result of this failure, they develop wretched self-images, which can lead to depression.

The term *alcoholism* is commonly used amongst laypeople, but the word is poorly defined. Despite the

imprecision inherent in the term, there have been attempts to define how the word *alcoholism* should be interpreted when encountered. In 1992, it was defined by the National Council on Alcoholism and Drug Dependence (NCADD) and ASAM as "a primary, chronic disease characterized by impaired control over drinking, preoccupation with the drug alcohol, use of alcohol despite adverse consequences, and distortions in thinking." MeSH has had an entry for "alcoholism" since 1999, and references the 1992 definition.

The WHO calls *alcoholism* "a term of long-standing use and variable meaning", and use of the term was disfavored by a 1979 WHO expert committee.^[16]

In professional and research contexts, the term "alcoholism" is not currently favored, but rather alcohol abuse, alcohol dependence, or alcohol use disorder are used. Talbot (1989) observes that alcoholism in the classical disease model follows a progressive course: if a person continues to drink, their condition will worsen. This will lead to harmful consequences in their life, physically, mentally, emotionally and socially. Johnson (1980) explores the emotional progression of the addict's response to alcohol. He looks at this in four phases. The first two are considered "normal" drinking and the last two are viewed as "typical" alcoholic drinking. Johnson's four phases consist of:

1. Learning the mood swing. A person is introduced to alcohol (in some cultures this can happen at a relatively young age), and the person enjoys the happy feeling it produces. At this stage, there is no emotional cost.
2. Seeking the mood swing. A person will drink to regain that feeling of euphoria experienced in phase 1; the drinking will increase as more intoxication is required to achieve the same effect. Again at this stage, there are no significant consequences.
3. At the third stage there are physical and social consequences, i.e., hangovers, family problems, work problems, etc. A person will continue to drink excessively, disregarding the problems.
4. The fourth stage can be detrimental, as Johnson cites it as a risk for premature death. As a person now drinks to feel normal, they block out the feelings of overwhelming guilt, remorse, anxiety, and shame they experience when sober.

DSM and ICD: In the United States, the Diagnostic and Statistical Manual of Mental Disorders (DSM) is the most common diagnostic guide for substance use disorders, whereas most countries use the International Classification of Diseases (ICD) for diagnostic (and other) purposes. The two manuals use similar but not identical nomenclature to classify alcohol problems.^[17]

Manual	Nomenclature	Definition
DSM-IV	Alcohol abuse, or Alcohol dependence	<ul style="list-style-type: none"> Alcohol abuse - repeated use despite recurrent adverse consequences. Alcohol dependence - <i>alcohol abuse</i> combined with tolerance, withdrawal, and an uncontrollable drive to drink. The term "alcoholism" was split into "alcohol abuse" and "alcohol dependence" in 1980's DSM-III, and in 1987's DSM-III-R behavioral symptoms were moved from "abuse" to "dependence". Some scholars suggested that DSM-5 merge alcohol abuse and alcohol dependence into a single new entry, named "alcohol-use disorder".
DSM-5	Alcohol use disorder	"A problematic pattern of alcohol use leading to clinically significant impairment or distress, as manifested by [two or more symptoms out of a total of 12], occurring within a 12-month period"
ICD-10	Alcohol harmful use, or Alcohol dependence syndrome	Definitions are similar to that of the DSM-IV. The World Health Organization uses the term "alcohol dependence syndrome" rather than alcoholism. The concept of "harmful use" (as opposed to "abuse") was introduced in 1992's ICD-10 to minimize underreporting of damage in the absence of dependence. The term "alcoholism" was removed from ICD between ICD-8/ICDA-8 and ICD-9.
ICD-11	Episode of harmful use of alcohol, Harmful pattern of use of alcohol, or Alcohol dependence	<ul style="list-style-type: none"> <i>Episode of harmful use of alcohol</i> - "A single episode of use of alcohol that has caused damage to a person's physical or mental health or has resulted in behaviour leading to harm to the health of others" <i>Harmful pattern of use of alcohol</i> - "A pattern of alcohol use that has caused damage to a person's physical or mental health or has resulted in behaviour leading to harm to the health of others" <i>Alcohol dependence</i> - "Alcohol dependence is a disorder of regulation of alcohol use arising from repeated or continuous use of alcohol. The characteristic feature is a strong internal drive to use alcohol ... The features of dependence are usually evident over a period of at least 12 months but the diagnosis may be made if alcohol use is continuous (daily or almost daily) for at least 1 month."

Social barriers: Attitudes and social stereotypes can create barriers to the detection and treatment of alcohol use disorder. This is more of a barrier for women than men. Fear of stigmatization may lead women to deny that they are suffering from a medical condition, to hide their drinking, and to drink alone. This pattern, in turn, leads family, physicians, and others to be less likely to suspect that a woman they know has alcohol use disorder. In contrast, reduced fear of stigma may lead men to admit that they are suffering from a medical condition, to display their drinking publicly, and to drink in groups. This pattern, in turn, leads family, physicians, and others to be more likely to suspect that a man they know is an alcoholic.

Screening: Screening is recommended among those over the age of 18. Several tools may be used to detect a loss of control of alcohol use. These tools are mostly self-reports in questionnaire form. Another common theme is a score or tally that sums up the general severity of alcohol use.^[18]

The CAGE questionnaire, named for its four questions, is one such example that may be used to screen patients quickly in a doctor's office.

Two "yes" responses indicate that the respondent should be investigated further.

The questionnaire asks the following questions:

1. Have you ever felt you needed to Cut down on your drinking?
2. Have people Annoyed you by criticizing your drinking?
3. Have you ever felt Guilty about drinking?
4. Have you ever felt you needed a drink first thing in the morning (Eye-opener) to steady your nerves or to get rid of a hangover?

The CAGE questionnaire has demonstrated a high effectiveness in detecting alcohol-related problems; however, it has limitations in people with less severe alcohol-related problems, white women and college students.

Other tests are sometimes used for the detection of alcohol dependence, such as the Alcohol Dependence Data Questionnaire, which is a more sensitive diagnostic test than the CAGE questionnaire. It helps distinguish a diagnosis of alcohol dependence from one of heavy alcohol use. The Michigan Alcohol Screening Test (MAST) is a screening tool for alcoholism widely used by courts to determine the appropriate sentencing for

people convicted of alcohol-related offenses, driving under the influence being the most common. The Alcohol Use Disorders Identification Test (AUDIT), a screening questionnaire developed by the World Health Organization, is unique in that it has been validated in six countries and is used internationally. Like the CAGE questionnaire, it uses a simple set of questions – a high score earning a deeper investigation. The Paddington Alcohol Test (PAT) was designed to screen for alcohol-related problems amongst those attending Accident and Emergency departments. Its concords well with the AUDIT questionnaire but is administered in a fifth of the time.^[19]



Figure-10: Breathalyser for alcohol detection.

With regard to alcoholism, BAC is useful to judge alcohol tolerance, which in turn is a sign of alcoholism. Electrolyte and acid-base abnormalities including hypokalemia, hypomagnesemia, hyponatremia, hyperuricemia, metabolic acidosis, and respiratory alkalosis are common in alcoholics.

However, none of these blood tests for biological markers is as sensitive as screening questionnaires. Drivers are initially tested for alcohol impairment at the roadside with a screening device. If this produces a positive test, evidential breath testing is performed at the police station. Motorists can be stopped and required to take a breath test by police at the scene of a road traffic accident, if a police officer suspects a motorist may be driving under the influence of alcohol, or if a motorist commits a moving traffic offence. Screening devices are about the size of old-fashioned mobile phones. The driver blows into a disposable mouthpiece for each test. The whole process takes about a minute for the device to record the result. Screening devices offer four result categories: zero (0.001–0.029%/volume, 0.030–0.059%/volume), pass (0.060–0.099%/volume, 0.100–0.199%/volume), warn (0.200–0.299%/volume, 0.300–0.399%/volume) and fail (0.400–0.500%/volume, >0.50%/volume). Anyone who fails the test is arrested and is required to perform an evidential breath test at a police station. The maximum permissible limit of alcohol in 100ml blood is 0.035%. The blood alcohol content (BAC) legal limit is 0.03% or 30 μ L alcohol in 100ml blood. Breathalyzers detect alcohol in blood through

Urine and blood tests: There are reliable tests for the actual use of alcohol, one common test being that of blood alcohol content (BAC). These tests do not differentiate alcoholics from non-alcoholics; however, long-term heavy drinking does have a few recognizable effects on the body, including:

- Macrocytosis (enlarged MCV)
- Elevated GGT
- Moderate elevation of AST and ALT and an AST:ALT ratio of 2:1
- High carbohydrate deficient transferrin (CDT)

alcohol detection tests. The legal reading in 30 and above for drunk driving. This means per decilitre of blood, 30 μ L and above.^[20]

Conclusion: Alcoholism has been known by a variety of terms, including alcohol abuse and alcohol dependence. Today, it's referred to as alcohol use disorder. It occurs when you drink so much that your body eventually becomes dependent on or addicted to alcohol. When this happens, alcohol becomes the most important thing in your life. People with alcohol use disorder will continue to drink even when drinking causes negative consequences, like losing a job or destroying relationships with people they love. They may know that their alcohol use negatively affects their lives, but it's often not enough to make them stop drinking. Some people may drink alcohol to the point that it causes problems, but they're not physically dependent on alcohol. This used to be referred to as alcohol abuse.

The cause of alcohol use disorder is still unknown. Alcohol use disorder develops when you drink so much that chemical changes in the brain occur. These changes increase the pleasurable feelings you get when you drink alcohol. This makes you want to drink more often, even if it causes harm. Eventually, the pleasurable feelings associated with alcohol use go away and the person with alcohol use disorder will engage in drinking to prevent withdrawal symptoms. These withdrawal symptoms can be quite unpleasant and even dangerous. Alcohol use

disorder typically develops gradually over time. It's also known to run in families.

Although the exact cause of alcohol use disorder is unknown, there are certain factors that may increase your risk for developing this disease.

Known risk factors include having:

- more than 15 drinks per week if you're male
- more than 12 drinks per week if you're female
- more than 5 drinks per day at least once a week (binge drinking)
- a parent with alcohol use disorder
- a mental health problem, such as depression, anxiety, or schizophrenia

You may also be at a greater risk for alcohol use disorder if you:

- are a young adult experiencing peer pressure?
- have low self-esteem
- experience a high level of stress
- live in a family or culture where alcohol use is common and accepted
- have a close relative with alcohol use disorder

Symptoms of alcohol use disorder are based on the behaviors and physical outcomes that occur as a result of alcohol addiction.

People with alcohol use disorder may engage in the following behaviors:

- drinking alone
- drinking more to feel the effects of alcohol (having a high tolerance)
- becoming violent or angry when asked about their drinking habits
- not eating or eating poorly
- neglecting personal hygiene
- missing work or school because of drinking
- being unable to control alcohol intake
- making excuses to drink
- continuing to drink even when legal, social, or economic problems develop
- giving up important social, occupational, or recreational activities because of alcohol use

People with alcohol use disorder may also experience the following physical symptoms:

- alcohol cravings
- withdrawal symptoms when not drinking, including shaking, nausea, and vomiting
- tremors (involuntary shaking) the morning after drinking
- lapses in memory (blacking out) after a night of drinking
- illnesses, such as alcoholic ketoacidosis (includes dehydration-type symptoms) or cirrhosis

Self-testing: Do I misuse alcohol?

Sometimes it can be hard to draw the line between safe alcohol use and the misuse of alcohol. The Mayo Clinic

suggests that you may misuse alcohol if you answer "yes" to some of the following questions:

- Do you need to drink more in order to feel the effects of alcohol?
- Do you feel guilty about drinking?
- Do you become irritable or violent when you're drinking?
- Do you have problems at school or work because of drinking?
- Do you think it might be better if you cut back on your drinking?

Professional diagnosis: Your doctor or healthcare provider can diagnose alcohol use disorder. They'll do a physical exam and ask you questions about your drinking habits.

Your doctor may ask if you:

- drive when you're drunk
- have missed work or have lost a job as a result of your drinking
- need more alcohol to feel "drunk" when you drink
- have experienced blackouts as a result of your drinking
- have tried to cut back on your drinking but couldn't

Your doctor may also use a questionnaire that assesses alcohol use disorder to help diagnose your condition.

Typically, a diagnosis of alcohol use disorder doesn't require any other type of diagnostic test. There's a chance your doctor may order blood work to check your liver function if you show signs or symptoms of liver disease. Alcohol use disorder can cause serious and lasting damage to your liver. Your liver is responsible for removing toxins from your blood. When you drink too much, your liver has a harder time filtering the alcohol and other toxins from your bloodstream. This can lead to liver disease and other complications. Treatment for alcohol use disorder varies, but each method is meant to help you stop drinking altogether. This is called abstinence. Treatment may occur in stages and can include the following:

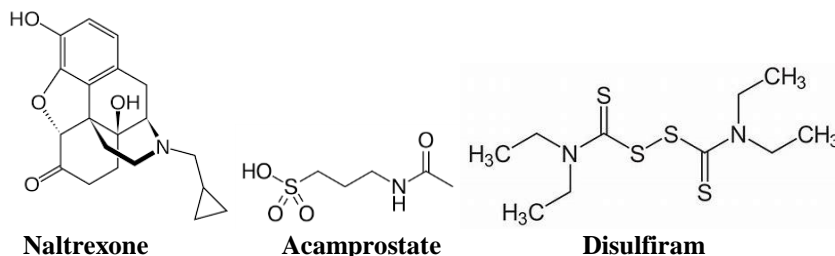
- detoxification or withdrawal to rid your body of alcohol
- rehabilitation to learn new coping skills and behaviors
- counseling to address emotional problems that may cause you to drink
- support groups, including 12-step programs such as Alcoholics Anonymous (AA)
- medical treatment for health problems associated with alcohol use disorder
- medications to help control addiction

There are a couple of different medications that may help with alcohol use disorder:

- Naltrexone (ReVia) is used only after someone has detoxed from alcohol. This type of drug works by

blocking certain receptors in the brain that are associated with the alcoholic “high.” This type of drug, in combination with counseling, may help decrease a person’s craving for alcohol.

- Acamprosate is a medication that can help re-establish the brain’s original chemical state before



Naltrexone

Acamprosate

Disulfiram

You may need to seek treatment at an inpatient facility if your addiction to alcohol is severe. These facilities will provide you with 24-hour care as you withdraw from alcohol and recover from your addiction. Once you’re well enough to leave, you’ll need to continue to receive treatment on an outpatient basis.

Recovering from alcohol use disorder is difficult. Your outlook will depend on your ability to stop drinking. Many people who seek treatment are able to overcome the addiction. A strong support system is helpful for making a complete recovery.

Your outlook will also depend on the health complications that have developed as a result of your drinking. Alcohol use disorder can severely damage your liver. It can also lead to other health complications, including:

- bleeding in the gastrointestinal (GI) tract
- damage to brain cells
- cancer in the GI tract
- dementia
- depression
- high blood pressure
- pancreatitis (inflammation of the pancreas)
- nerve damage
- changes in mental status, including Wernicke-Korsakoff syndrome (a brain disease that causes symptoms such as confusion, vision changes, or memory loss)

You can prevent alcohol use disorder by limiting your alcohol intake. According to the National Institute on Alcohol Abuse and Alcoholism, women shouldn’t drink more than one drink per day, and men shouldn’t drink more than two drinks per day. See your doctor if you begin to engage in behaviors that are signs of alcohol use disorder or if you think that you may have a problem with alcohol. You should also consider attending a local AA meeting or participating in a self-help program such as Women for Sobriety.

alcohol dependence. This drug should also be combined with therapy.

- Disulfiram (Antabuse) is a drug that causes physical discomfort (such as nausea, vomiting, and headaches) any time the person consumes alcohol.

Knowing the signs and symptoms of each stage can aid you in seeking help before your problem turns into dependence and addiction.

- Stage #1: Occasional abuse and binge drinking
The first stage of alcoholism is a general experimentation with alcohol. These drinkers may be new to different forms of alcohol and likely to test their limits. This experimental stage is commonly seen in young adults. These experimental drinkers also frequently engage in binge drinking. While they may not drink regularly, they consume exceptionally large amounts of alcohol at one time. Medline Plus characterizes binge drinking as:

- for men, five or more alcoholic beverages within two hours
- for women, four or more alcoholic beverages within two hours

Many binge drinkers exceed this amount. This is especially true for teens who attend parties where drinking is the primary activity. You might think binge drinking is safe when you only do it occasionally, but that couldn’t be further from the truth.

Drinking large amounts of alcohol at one time is dangerous, and can even lead to coma or death. Furthermore, you may become dependent on the feeling you get from drinking and find that these episodes increase in frequency.

- Stage #2: Increased drinking
Drinkers leave the experimental stage when their alcohol consumption becomes more frequent. Instead of just drinking at parties once in a while, you may find yourself drinking every weekend.

Increased alcohol consumption can also lead to drinking for these reasons:

- as an excuse to get together with friends
- to alleviate stress
- out of boredom
- to combat sadness or loneliness

Regular alcohol use is different from moderate drinking. There is usually a higher emotional attachment to it. A moderate drinker might pair a glass of wine with a meal, while a regular drinker uses alcohol to feel good in general. As increased drinking continues, you become more dependent on alcohol and are at risk of developing alcoholism.

- Stage #3: Problem drinking

Frequent, uncontrolled alcohol abuse eventually leads to problem drinking. While any form of alcohol abuse is problematic, the term “problem drinker” refers to someone who starts experiencing the impacts of their habit.

You may become more depressed, more anxious, or start losing sleep. You may start to feel sick from heavy drinking, but enjoy its effects too much to care. Many drinkers at this stage are more likely to drink and drive or experience legal troubles as a result of their drinking.

There are also specific social changes related to problem drinking. These include:

- relationship issues
- decreased social activity because of erratic behavior
- sudden change in friends
- difficulty conversing with strangers

- Stage #4: Alcohol dependence

Alcoholism has two facets: dependence and addiction. It’s possible for a person to be dependent on alcohol, but not yet addicted.

Dependence forms after the problem drinking stage. At this point, you have an attachment to alcohol that has taken over your regular routine. You’re aware of the adverse effects, but no longer have control over your alcohol consumption.

Alcohol dependence also means that you have developed a tolerance to drinking. As a result, you may have to drink larger quantities to get “buzzed” or drunk. Increased drinking has more damaging effects on the body.

Another characteristic of dependence is withdrawal. As you sober up, you may feel undesirable symptoms such as:

- nausea that is unrelated to a hangover
- body tremors
- sweating
- severe irritability
- a racing heart
- trouble sleeping

- Stage #5: Addiction and alcoholism

The final stage of alcoholism is addiction. At this stage, you no longer want to drink just for pleasure. Alcohol

addiction is characterized by a physical and psychological need to drink.

People with alcohol addiction physically crave the substance and are often inconsolable until they start drinking again. They may be addicted to other drugs as well. Compulsive behaviors are prominent in addiction, and people with alcohol addiction often drink whenever and wherever they desire.

The deeper into the stages of alcoholism you enter, the tougher it is to quit drinking. Long-term risks of heavy drinking include:

- liver damage
- heart disease
- brain damage
- malnutrition
- mental health disorders, including an increased risk of suicide

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