

BEYOND THE LIVER

MEDICAL AND LIFE CONSEQUENCES OF ALCOHOL USE DISORDER (AUD)

The Human Cost of Excessive Alcohol Consumption



In the United States:

14.4M

adults reported heavy
drinking in the prior
month in 2024^{1*}

~178K

annual deaths from excessive
alcohol consumption in
2020-2021²

^{*}In the United States, a standard drink is defined as any beverage containing 0.6 fl oz (14 g) of pure alcohol. Heavy drinking is defined as consuming ≥ 5 (men) or ≥ 4 (women) drinks/day on any day or ≥ 15 (men) or ≥ 8 (women) drinks/week.³



Worldwide:

4.5%

rise in adults who are
heavy episodic drinkers
from 1990 to 2030^{4†}

2.6M

deaths caused by alcohol
consumption in 2019⁵

[†]From 18.5% in 1990 to 23% in 2030. Heavy episodic drinking is defined as ≥ 4 drinks consumed in any one occasion in the last month.⁴



The Medical Consequences of AUD Span Multiple Systems

Chronic alcohol intake causes significant, dose-dependent tissue injury across most organ systems. This systemic damage is thought to be driven by several processes including⁶:



Fibrosis



**Direct
cellular injury**



**Alterations in
cell signaling**



**Mitochondrial
dysfunction**

The Medical Consequences of AUD Span Multiple Systems (cont.)*

Musculoskeletal⁶⁻⁹

- Skeletal-muscle myopathy
- Reduced bone mineral density and enhanced risk of fractures
- Gout

💡 In a global meta-analysis of 8 studies, a ~30% increase in the risk of hip fracture was associated with consuming 3 drinks per day and a ~60% increase was associated with consuming 4 drinks per day¹⁰

Endocrine⁶⁻⁹

- Thyroid diseases
- Type 2 diabetes mellitus
- Hypogonadism
- Dyslipidemia

Immune^{7-9,11}

- Chronic inflammation
- Immune signaling
- Increased infection risk (eg, STIs, HIV, bacterial pneumonia, RSV)
- Reduced wound healing

💡 In a study of more than 5000 American patients undergoing elective total shoulder arthroplasty, patients with AUD experienced SSIs at ~4.8x the rate of patients without AUD¹²

Cellular Division^{7-9,11,13,14}

- Breast cancer
- Head and neck cancers
- Liver cancer
- Colorectal cancer
- Pancreatic cancer
- Skin cancer

Cardiovascular^{7-9,11}

- Hypertension
- Cerebrovascular accident (eg, stroke)
- Cardiovascular disease (eg, MI, heart failure, cardiomyopathy)
- Cardiac arrhythmia

💡 In a case-control analysis of INTERSTROKE data from 32 countries, binge drinking was associated with ~5-fold increased odds of stroke in adults ages 18-45 years (OR 5.44; 95% CI 1.81-16.4).¹⁷

Pancreatic^{9,11}

- Acute and chronic pancreatitis

Hematologic^{8,9}

- Anemia
- Thrombocytopenia
- Leukopenia

Renal^{19,20}

- Acute kidney injury
- Electrolyte abnormalities

Reproductive^{8,11}

- Decreased fertility
- Sexual dysfunction

Hepatic^{9,13,15}

- Alcohol-associated steatotic liver disease (ALD)
- Metabolic dysfunction-associated steatotic liver disease (MASLD)
- Fibrosis and cirrhosis

Central and Peripheral Nervous Systems^{7-9,11,15}

- Impaired neurocognition (eg, Wernicke-Korsakoff syndrome, dementia)
- Peripheral neuropathy
- Seizures

💡 In a systematic review of 87 studies, the pooled prevalence of peripheral neuropathy confirmed by nerve-conduction studies among people with chronic heavy alcohol use was ~46%.¹⁶

Psychiatric^{11,13,15}

- Mood disorders (eg, bipolar I, MDD)
- Personality disorders (eg, ASPD)
- Other SUDs (eg, tobacco use disorder)
- Insomnia
- Anxiety disorders

Gastrointestinal^{7-9,15,18}

- Gastrointestinal irritation (eg, GERD, esophagitis) and bleeding
- Malnutrition and nutrient deficiencies (eg, thiamine [vitamin B1], vitamin B12)

Respiratory⁹

- Acute respiratory distress syndrome
- Pneumonia

Integumentary¹⁴

- Increased epithelial inflammation and thickening
- Acne exacerbations
- Psoriasis exacerbations

*The risks associated with these health consequences can be mitigated by reducing or abstaining from alcohol.⁷

[†]Binge drinking is defined as consuming ≥5 (men) or ≥4 (women) drinks in 2 hours/occasion in the past month.³

ASPD=antisocial personality disorder. CI=confidence interval. GERD=gastroesophageal reflux disease. HIV=human immunodeficiency virus. MDD=major depressive disorder. MI=myocardial infarction. OR=odds ratio. RSV=respiratory syncytial virus. SSI=surgical site infection. STI=sexually transmitted infection. SUD=substance use disorder.

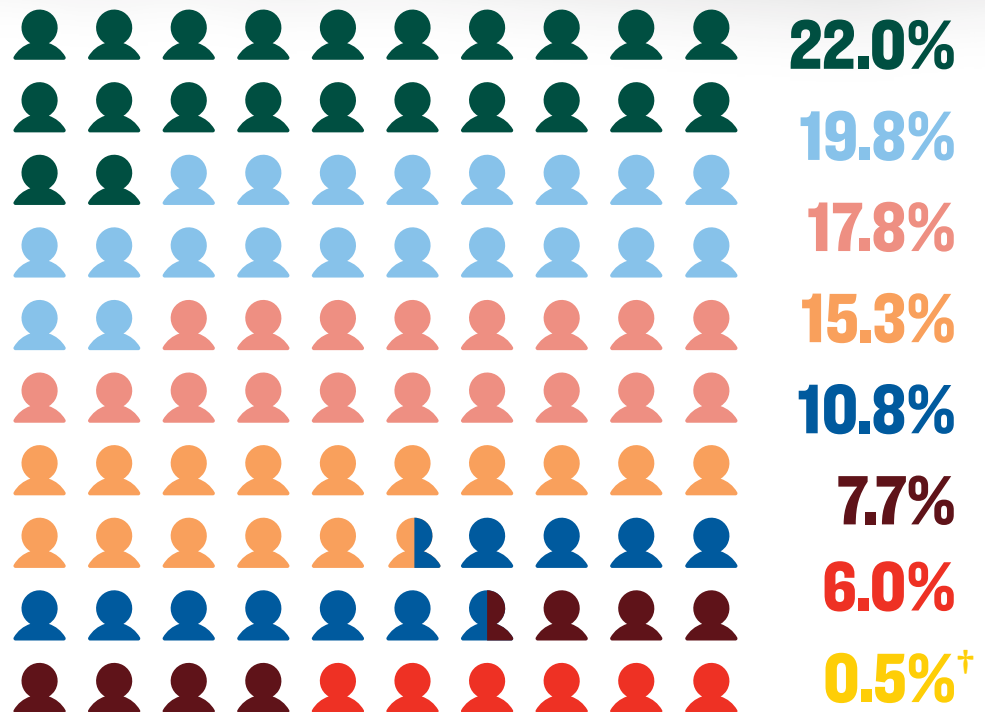
The Impacts of AUD on Death and Disability

Alcohol is the direct cause of **1 in 20 deaths worldwide**. It is also the underlying cause of death for millions more through unintentional injuries, digestive diseases, and cardiovascular and metabolic conditions.⁵

Percentage of Alcohol-Attributable Deaths in 2019 by Disease Category*

2.6M

Total alcohol-attributable deaths⁵



*Each person icon represents 1%. Each color corresponds to a disease category in the key at the bottom of the page.

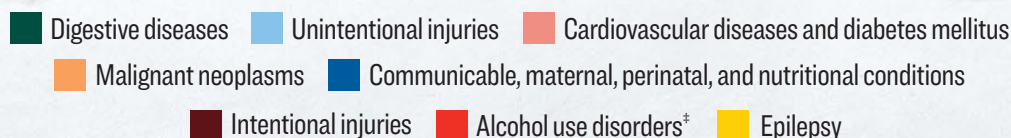
[†]In the visual, the values are rounded to the nearest 0.5%. Although not visually represented due to rounding, 0.5% of alcohol-attributable deaths were due to epilepsy.

Percentage of Alcohol-Attributable Disability-Adjusted Life Years (DALYs) in 2019 by Disease Category

115.9M

Total alcohol-attributable DALYs⁵

DALY is a burden of disease indicator. One DALY is equivalent to the loss of one healthy life year.⁵



⁵The alcohol-attributable deaths and DALYs include AUD itself as well as the other diseases that are a consequence of or exacerbated by AUD.

The Life Consequences of AUD Affect Individuals, Families, Livelihoods, and Communities



Individuals

- ~2x higher MDD risk in patients with AUD²¹
- ~3x higher suicide risk in patients with AUD²²
- Stigma contributes to greater social exclusion and isolation with AUD vs other mental health conditions²³



Families

- 38% increased risk of early drinking in children who have one parent with AUD²⁴
- 85% increased risk of early drinking in children aged ≤15 years who have two parents with AUD²⁴



Livelihoods

- Heavy alcohol use linked with workplace conflict, absenteeism, work-related accidents, and unemployment^{25,26}
- Up to 50% of youth (ages 16-25) experiencing homelessness identify AUD as a contributor to housing instability²⁷



Communities

- Alcohol use is associated with violence (firearm and domestic) and sexual assault²⁸
- BAC levels ≥0.075% have been associated with an increase in aggressive behavior²⁹
- More stringent state BAC limits have been associated with decreased alcohol-attributable motor vehicle fatalities²⁸

BAC=blood alcohol content.

The medical and life consequences of AUD extend well beyond any single organ—they have a widespread impact on patients, families, and society.

Ask your patients about their relationship with alcohol.

References

1. National Institute on Alcohol Abuse and Alcoholism. Alcohol Use in the United States: Age Groups and Demographic Characteristics. Updated August 2025. Accessed September 1, 2026. <https://www.niaaa.nih.gov/alcohols-effects-health/alcohol-topics-z/alcohol-facts-and-statistics/alcohol-use-united-states-age-groups-and-demographic-characteristics>
2. U.S. Centers for Disease Control and Prevention. Facts About U.S. Deaths from Excessive Alcohol Use. Published August 6, 2024. Accessed September 1, 2026. <https://www.cdc.gov/alcohol/facts-stats/index.html>
3. National Institute on Alcohol Abuse and Alcoholism. Understanding Alcohol Drinking Patterns. Updated January 2026. Accessed September 1, 2026. <https://www.niaaa.nih.gov/alcohols-effects-health/alcohol-drinking-patterns>
4. Manthey J, et al. *Lancet*. 2019;393(10190):2493-2502.
5. World Health Organization. Global Status Report on Alcohol and Health and Treatment of Substance Use Disorders. Published 2024. Accessed September 1, 2026. <https://iris.who.int/server/api/core/bitstreams/32b161e9-5683-40f5-a1c3-1c92a76d5cda/content>
6. Molina P, et al. *Physiology (Bethesda)*. 2014;29(3): 203-215.
7. National Institute on Alcohol Abuse and Alcoholism. Medical Complications: Common Alcohol-Related Concerns. Published May 9, 2025. Accessed September 1, 2026. <https://www.niaaa.nih.gov/health-professionals-communities/core-resource-on-alcohol/medical-complications-common-alcohol-related-concerns>
8. Abbas D, et al. *Clin Ther*. 2023;45(12):1201-1211.
9. National Institute on Alcohol Abuse and Alcoholism. Alcohol's Effects on the Body. Updated June 2025. Accessed September 1, 2026. <https://www.niaaa.nih.gov/alcohols-effects-health/alcohols-effects-body>
10. Godos J, et al. *Int J Environ Res Public Health*. 2022;19(1515):1-12.
11. U.S. Department of Veterans Affairs. Alcohol Use Disorder (AUD): Leading the Charge in the Treatment of AUD. Published February 2022. Accessed September 1, 2026. https://www.pbm.va.gov/PBM/AcademicDetailingService/Documents/508/10-1530_AUD_ClinicianGuide_508Conformant.pdf
12. Ashraf A, et al. *Semin Arthroplasty: JSES*. 2022;32(2):327-333.
13. Kranzler HR. *Am J Psychiatry*. 2023;180(8):565-572.
14. Wróblewska J, et al. *Molecules*. 2025;30(3111): 1-26.
15. Haber PS. *N Engl J Med*. 2025;392(3):258-266.
16. Julian T, et al. *J Neurol*. 2019;266:2907-2919.
17. Khan M, et al. *Neuroepidemiology*. 2023;57(5): 275-283.
18. Popa I, et al. *Exp Ther Med*. 2021;22(4):1132.
19. Yokus B, et al. *Am J Pathol*. 2026;196(1):78-91.
20. Maharjan J, et al. *Am J Med Sci*. 2022;364(1):46-52.
21. McHugh R, Weiss R. *Alcohol Res*. 2019;40(1):01.
22. Conner KR, Bagge CL. *Alcohol Res*. 2019;40(1):02.
23. Kilian C, et al. *Alcohol Clin Exp Res*. 2021;45:899-911.
24. McCutcheon V, et al. *Addiction*. 2018;113(2):336-345.
25. Karriker-Jaffe K, et al. *J Stud Alcohol Drugs*. 2018;79(2):239-243.
26. Campbell D, et al. *Alcohol Alcohol*. 2025;60:1-10.
27. Jose R, et al. *PLoS ONE*. 2024;19(5):e0303439.
28. Crowley R, et al. *Ann Int Med*. 2024;177(5):1-16.
29. Duke AA, et al. *J Stud Alcohol Drugs*. 2011;72(1):34-43.