NIAAA Director's Report on Institute Activities to the 160th Meeting of the National Advisory Council on Alcohol Abuse and Alcoholism

May 10, 2022
Virtual Meeting

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Director
National Institute on Alcohol Abuse and Alcoholism
National Institutes of Health

https://www.niaaa.nih.gov/about-niaaa/advisory-council

FY 2022 Budget

- On March 15, 2022, the President signed H.R. 2471 - Consolidated Appropriations Act, 2022.
- NIH received a total of $45.2 billion for FY 2022 (5.4% increase), including
  - General increases to NIH Institutes and Centers
  - Allocations for the Helping to End Addiction Long-term (HEAL) Initiative, the 21st Century Cures Act, NIH Brain Research Through Advancing Innovative Neurotechnologies (BRAIN), and the All of Us research program
  - Continued support for the Gabriella Miller Kids First Act pediatric research initiative.
- NIAAA received a total of $573.7 million for FY 2022 (3.4% increase)

The President's FY 2023 Budget was released on March 28, 2022.

NIAAA Funding Opportunities

(See Director's Report for Complete Listing)

Specialized Alcohol Research Centers (P50, RFA-AA-22-001): Invites applications to foster and conduct interdisciplinary, collaborative research on alcohol use disorder (AUD), alcohol misuse and alcohol related problems, and other health related consequences across the lifespan and across racial/ethnic groups and other health disparity populations. *Scientific Contacts: Drs. Kathy Jung, Mariela Shirley, Ivana Grakalic, Greg Bloss, Antonio Noronha*

Comprehensive Alcohol Research Centers (P60, RFA-AA-22-002): Invites applications to conduct and foster interdisciplinary, collaborative research on topics relevant to the NIAAA mission across the lifespan and across racial/ethnic groups and other health disparity populations. Applications must include a dissemination core to initiate and expand community education related to the activities of the proposed Center. *Scientific Contacts: Drs. Kathy Jung, Mariela Shirley, Ivana Grakalic, Greg Bloss, Antonio Noronha*

Alcohol Health Services Research (R01, R34, PAR-22-157, PAR-22-157): Encourages research on closing the treatment gap for AUD, including increasing access to AUD treatment and making it more appealing and reducing health disparities. *Scientific Contacts: Dr. Laura Kwako*

Alcohol Treatment and Recovery Research (R01, R34, PAR-22-158, PAR-22-159): Encourages research on topics relevant to treatment of and recovery from AUD, including behavioral and pharmacotherapy, recovery, precision medicine, translational research, and innovative methods and technologies for AUD treatment and recovery. *Scientific Contacts: Dr. Brett T. Hagman and Dr. Dan Falk*

NIAAA Funding Opportunities
(See Director's Report for Complete Listing)

Notices of Special Interest Issued by NIAAA

Research on Alcohol and Coronavirus Disease (COVID-19) within the Mission of NIAAA (R01, R03, R21, K99/R00, NOT-AA-22-012): Invites grant applications that advance understanding of the critical interactions between alcohol use, SARS-CoV-2, and COVID-19. A central focus is research that can improve public health by informing responses to the evolving COVID-19 pandemic and its consequences. *Scientific Contact: Dr. Kathy Jung*

Alcohol and Healthy Aging: Current Research and Future Directions

- On May 9, 2022, NIAAA participated in a webinar on alcohol and aging sponsored by *the Friends of NIAAA, American Psychological Association, and the Research Society on Alcoholism*
- Speakers included:
  - *Dr. Robert Huebner, Chair, Friends of NIAAA*
  - *Dr. George F. Koob, Alcohol and Aging: An Overview*
  - *Dr. Katherine Keyes, Increased Alcohol Consumption Among Older Adults: Trends, Causes, and Consequences*
  - *Dr. Sara Jo Nixon, Neurobiological and Behavioral Consequences of Moderate Alcohol Consumption in Older Adults*
  - *Dr. Frederick C. Blow, Assisting Older Adults Who Misuse Alcohol: Brief Evidence-Based Treatment Approaches*
  - *Dr. Jeff Boissoneault, Pain and Alcohol Use: Implications for Healthy Aging*

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Research Society on Alcoholism

From NIAAA: The Healthcare Professional's Core Resource on Alcohol

Launched May 10, 2022!

From NIAAA: The Healthcare Professional's Core Resource on Alcohol

From NIAAA
THE HEALTHCARE PROFESSIONAL'S
CORE RESOURCE ON ALCOHOL
Knowledge. Impacts. Strategies.

What is the Core Resource on Alcohol?

The Healthcare Professional's Core Resource on Alcohol consists of 14 interconnected articles covering the basics of what every healthcare professional needs to know about alcohol. The "Core" was developed by NIAAA.

With guidance from practicing physicians and clinical psychologists, NIAAA created the Core with busy clinicians in mind. The Core articles provide user-friendly, practical overviews of

- **Foundational knowledge for understanding alcohol-related problems (4 articles)**
- **Clinical impacts of alcohol (4 articles)**
- **Strategies for prevention and treatment of alcohol problems (5 articles)**
- **How to "put it all together" to promote practice change (1 article)**

The Core articles are living documents that will be updated regularly.

Who can receive continuing education credit?

Free continuing education credit—0.75 to 1 credit hour for each of 14 articles (10.75 credit hours total)—is offered for **physicians, physician assistants, nurses, pharmacists, and clinical psychologists.**

From NIAAA: The Healthcare Professional's Core Resource on Alcohol

From NIAAA

THE HEALTHCARE PROFESSIONAL'S
CORE RESOURCE ON ALCOHOL

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Sample article

‹ Core Resource on Alcohol Home

The Basics: Defining How Much Alcohol is Too Much

Step 1 - Read the Article

- What counts as a drink?
- How many drinks are in common containers?
- When is having any alcohol too much?
- What are the U.S. Dietary Guidelines on alcohol consumption?
- What is heavy drinking?
- What is the clinical utility of the "heavy drinking day" metric?
- Resources
- References

Step 2 - Complete the CME/CE Post-Test

- Earn CME/CE Credit

Last Revised 04/01/2022

Takeaways

- **Show your patients a standard drink chart when asking about their alcohol consumption** to encourage more accurate estimates. Drinks often contain more alcohol than people think, and patients often underestimate their consumption.
- **Advise some patients not to drink at all,** including those who are managing health conditions that can be worsened by alcohol, are taking medications that could interact with alcohol, are pregnant or planning to become pregnant, or are under age 21.
- **Otherwise, advise patients who choose to drink to follow the *U.S. Dietary Guidelines,*** by limiting intake to 1 drink or less for women and 2 drinks or less for men—on *any single day, not on average.* Drinking at this level may reduce, though not eliminate, risks.
- **Don't advise non-drinking patients to start drinking alcohol for their health.** Past research overestimated benefits of moderate drinking, while current research points to added risks, such as for breast cancer, even with low levels of drinking.

How much, how fast, and how often a person drinks alcohol all factor into the risk for alcohol-related problems. *How much and how fast* a person drinks influences how much alcohol enters the bloodstream, how impaired he or she becomes, and what the related acute risks will be. Over time, *how much and how often* a person drinks influences not only acute risks but also chronic health problems, including liver disease and alcohol use disorder (AUD), and social harms such as relationship problems.[1] (See Core articles on medical complications and AUD.)

It can be hard for patients to gauge and accurately report their alcohol intake to clinicians, in part because labels on alcohol containers typically list only the percent of alcohol by volume (ABV) and not serving sizes or the number of servings per container. Whether served in a bar or restaurant or poured at home, drinks often contain more alcohol than people think. It's easy and common for patients to underestimate their consumption.[2,3]

While there is no guaranteed safe amount of alcohol for anyone, general guidelines can help clinicians advise their patients and minimize the risks. Here, we will provide basic information about drink sizes, drinking patterns, and alcohol metabolism to help answer the question "how much is too much?" In short, the answer from current research is, the less alcohol, the better.

What counts as a drink?

In the United States, a "standard drink" is any drink containing 14 grams, or about 0.6 fluid ounces, of "pure" ethanol. As shown in the illustration, this amount is found in 12 ounces of regular beer (with 5% alcohol by volume or alc/vol), 5 ounces of table wine (with 12% alc/vol), or 1.5 ounces of 80-proof distilled spirits (with 40% alc/vol).

Each drink shown above represents one U.S. standard drink and has an equivalent amount (0.6 fluid ounces) of "pure" ethanol.

The sample standard drinks above are just starting points for comparison, because actual alcohol content and customary serving sizes can vary greatly both across and within types of beverages. For example:

- **Beer:** The most popular type of beer is light beer, which may be light in calories, but not necessarily in alcohol. The mean alc/vol for light beers is 4.3%, almost as much as a regular beer with 5% alc/vol.[4] On average, craft beers have more than 5% alc/vol and flavored malt beverages, such as hard seltzers, more than 5% alc/vol.[5] Some craft beers and flavored malt beverages have in the range of 8–9% alc/vol. Advise patients to check container labels for the alcohol content and adjust their intake accordingly.
- **Wine:** The largest category of wine is table wine. On average, table wines contain about 12% alc/vol[4] and can range from about 5% to 16%. Larger wine g
wine with 12% alc/vol cons
- **Cocktails:** Recipes for co
Drinking shows the alcoho

Showing your patients a stand
to estimate their consumption

How many drinks

Below is the approximate num

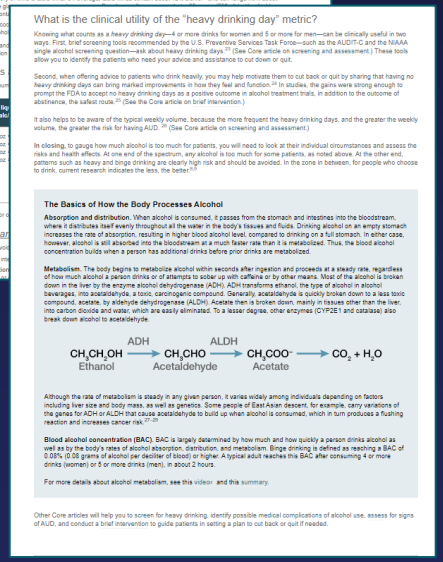
regular beer (5% alc/vol)	malt liq (7% alc
12 fl oz = 1	12 fl oz
16 fl oz = 1¼	16 fl oz
22 fl oz = 2	22 fl oz
40 fl oz = 3¼	40 fl oz

See the drink size calculator

When is having a

It is safest for patients to avoi

- Take medications that
- Have a medical condition



What is the clinical utility of the "heavy drinking day" metric?

Knowing what counts as a *heavy drinking day*—4 or more drinks for women and 5 or more for men—can be clinically useful in two ways. First, brief screening tools recommended by the U.S. Preventive Services Task Force—such as the AUDIT-C and the NIAAA single alcohol screening question—ask about heavy drinking days.[27] (See Core article on screening and assessment.) These tools allow you to identify the patients who need your advice and assistance to cut down or quit.

Second, when offering advice to patients who drink heavily, you may help motivate them to cut back or quit by sharing that having no *heavy drinking days* can bring marked improvements in how they feel and function.[28] In studies, the gains were strong enough to prompt the FDA to accept no heavy drinking days as a positive outcome in alcohol treatment trials, in addition to the outcome of abstinence, the safest route.[29] (See the Core article on brief intervention.)

It also helps to be aware of the typical weekly volume, because the more frequent the heavy drinking days, and the greater the weekly volume, the greater the risk for having AUD.[30] (See Core article on screening and assessment.)

In closing, to gauge how much alcohol is too much for patients, you will need to look at their individual circumstances and assess the risks and health effects. At one end of the spectrum, any alcohol is too much for some patients, as noted above. At the other end, patients such as heavy and binge drinking are clearly high risk and should be avoided. In the zone in between, for people who choose to drink, current research indicates the less, the better.[6,7]

The Basics of How the Body Processes Alcohol

Absorption and distribution. When alcohol is consumed, it passes from the stomach and intestines into the bloodstream, where it distributes itself evenly throughout all the water in the body's tissues and fluids. Drinking alcohol on an empty stomach increases the rate of absorption, resulting in higher blood alcohol level, compared to drinking on a full stomach. In either case, however, alcohol is still absorbed into the bloodstream at a much faster rate than it is metabolized. Thus, the blood alcohol concentration builds when a person has additional drinks before prior drinks are metabolized.

Metabolism. The body begins to metabolize alcohol within seconds after ingestion and proceeds at a steady rate, regardless of how much alcohol a person drinks or of attempts to sober up with caffeine or by other means. Most of the alcohol is broken down in the liver by the enzyme alcohol dehydrogenase (ADH). ADH transforms ethanol, the type of alcohol in alcohol beverages, into acetaldehyde, a toxic, carcinogenic compound. Generally, acetaldehyde is quickly broken down to a less toxic compound, acetate, by aldehyde dehydrogenase (ALDH). Acetate then is broken down, mainly in tissues other than the liver, into carbon dioxide and water, which are easily eliminated. To a lesser degree, other enzymes (CYP2E1 and catalase) also break down alcohol to acetaldehyde.

$$CH_3CH_2OH \xrightarrow{ADH} CH_3CHO \xrightarrow{ALDH} CH_3COO^- \longrightarrow CO_2 + H_2O$$

Ethanol → Acetaldehyde → Acetate

Although the rate of metabolism is steady in any given person, it varies widely among individuals depending on factors including liver size and body mass, as well as genetics. Some people of East Asian descent, for example, carry variations of the genes for ADH or ALDH that cause acetaldehyde to build up when alcohol is consumed, which in turn produces a flushing reaction and increases cancer risk.[27–29]

Blood alcohol concentration (BAC). BAC is largely determined by how much and how quickly a person drinks alcohol as well as by the body's rates of alcohol absorption, distribution, and metabolism. Binge drinking is defined as reaching a BAC of 0.08% (0.08 grams of alcohol per deciliter of blood) or higher. A typical adult reaches this BAC after consuming 4 or more drinks (women) or 5 or more drinks (men), in about 2 hours.

For more details about alcohol metabolism, see this video› and this summary.

Other Core articles will help you to screen for heavy drinking, identify possible medical complications of alcohol use, assess for signs of AUD, and conduct a brief intervention to guide patients in setting a plan to cut back or quit if needed.

Resources

Alcohol Metabolism

- Alcohol Metabolism› , Video (20 minutes), Vijay Ramchandani, Ph.D., NIAAA, 2021

Resources to Share with Patients Related to this Article

- Rethinking Drinking, website and booklet [PDF – 1.93 MB], NIAAA
- Patient handout - Drink Sizes and Drinking Levels [PDF – 184 KB], NIAAA Core Resource on Alcohol
- Fact Sheets on Excessive Alcohol Use and Men's Health› and Excessive Alcohol Use and Women's Health› , CDC
- Fact Sheets on Moderate Drinking› and Binge Drinking› , CDC

Read More ↓

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The [illegible] professionals including primary care physicians, physician assistants, nurses, pharmacists, and psychologists to complete a post-test after reviewing this article to earn FREE continuing education (CME/CE) credit. This CME/CE credit opportunity is jointly provided by the Postgraduate Institute for Medicine and NIAAA.

CME/CE Activity — The Basics: Defining How Much Alcohol is Too Much

Released on 5/6/2022
Expires on 5/10/2023

$ FREE

This activity provides 0.75 CME/CE credits

Complete CME/CE Post-Test

Learning Objectives

After completing this activity, the participant should be better able to:

- Assist patients in accurately estimating their alcohol intake.
- Identify the categories of patients who need advice to avoid alcohol altogether.
- Counsel patients on guideline-concordant limits for alcohol consumption.

To learn more about CME/CE credit offered as well as disclosures, visit our CME/CE General Information page. You may also click here to learn more about contributors.

From NIAAA: The Healthcare Professional's Core Resource on Alcohol

From NIAAA

THE HEALTHCARE PROFESSIONAL'S
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Knowledge. Impacts. Strategies.

‹ Core Resource on Alcohol Home

Support Recovery: It's a Marathon, Not a Sprint

Sample article

Step 1 - Read the Article

- How is recovery defined?
- What are the odds for recovery?
- What does the change process for AUD recovery look like?
- How can healthcare professionals support recovery?
- What strategies can help patients prevent or recover from a return to heavy drinking?
- Resources
- References

Step 2 - Complete the CME/CE Post-Test

- Earn CME/CE Credit

Last Revised 04/01/2022

Takeaways

- **Most people with AUD can and do recover**, and their individual paths to recovery vary widely. By highlighting the likelihood of recovery, you may encourage more patients with AUD to accept treatment or to reduce their drinking with or without treatment.
- **Recovery is a long-term change process** that may be characterized by occasional returns to heavy drinking. Especially in the bumpy first year, patients will benefit from ongoing support to help maintain the changes they are making.
- **Healthcare professionals can support recovery** by offering AUD medications in primary care, referring to specialists as needed, encouraging engagement with supportive people and activities that do not involve alcohol, and offering ways to help prevent or recover from drinking episodes.
- **It helps to apply compassion and awareness of the difficulty of behavior change** when encouraging patients to get back on track after a drinking episode. Avoid criticizing the patient for the episode, which can stigmatize rather than normalize an expected part of the recovery process.
- **Online resources from NIAAA can help you support your patients** by providing modules on building drink refusal skills and handling urges to drink as well as a treatment navigator to help locate healthcare professionals who offer evidence-based care.

For different patients, both alcohol use disorder (AUD) and its recovery will play out differently. Here, we provide tips to help you understand and support your patients with AUD as they forge their individual paths to recovery.

A note on a drinking level term used in this Core article: Heavy drinking has been defined for women as 4 or more drinks on any day or 8 or more per week, and for men as 5 or more drinks on any day or 15 or more per week.

How is recovery defined?

Definitions of recovery from AUD can vary in their emphasis on different physical or psychosocial outcomes or quality of life dimensions. Recently NIAAA developed a definition of recovery to provide a research and clinical framework.[1,2] It states that recovery is a dynamic process with two clinical goals:

- **Remission from AUD symptoms** as listed in the DSM-5 with the exception of craving (a DSM-5 symptom checklist is provided in the Core article on assessment and can be downloaded here [PDF – 80 KB]); and
- **Cessation from heavy drinking,** defined for women as no more than 3 drinks on a single day and no more than 7 drinks per week, and for men as no more than 4 standard drinks on a single day and no more than 14 drinks per week.

If people achieve both goals and maintain them over time, they are considered clinically recovered from AUD. Importantly, more broadly, the NIAAA definition also notes that recovery is often marked by improvements in physical health, mental health, relationships, spirituality, and other measures of well-being, which, in turn, help sustain recovery.

What are the odds for recovery?

The majority of people with AUD can reduce their drinking and alcohol-related problems over time, with studies showing a reliable pattern of improvement that counters views of AUD as an inevitably worsening disorder.[3–5] A 2019 analysis of nationally representative data, for example, found a "substantial level of recovery" among people who had AUD a year or more before being surveyed.[4] More than half of the nearly 7,800 participants reported no longer having AUD symptoms (other than craving) for the previous 12 months. This recovery rate is similar to findings from other population surveys, community studies, and follow-up studies.[4,5]

Even patients in recovery who have some periods of heavy drinking following alcohol treatment may reduce their consumption and alcohol-related problems by more than half,[6] a substantial improvement that can be maintained for many years after treatment.[7–9] By highlighting the likelihood of improvements and recovery, you may encourage more patients with AUD to reduce their drinking with or without treatment.

What does the

The emerging picture of

challenges and improvem

- **AUD severity and oth** disorder, recover witho health disorders, traum
- **Many people choose** recovery, many people more common among common goal for those of remission for those
- **Success often happe** mean of five, according expect "seemingly end actually be needed. Th
- **Relapses to heavy dr** AUD report at least son short periods or a few outcomes, it is importa possible, and to promp
- **Negative emotional st** brain neurocircuits as maintaining abstinence majority of which may
- **Improvements can be** meeting personal, soci worsen before they ge beginning 6 to 12 month improve and psycholog

How can healthcare professionals support recovery?

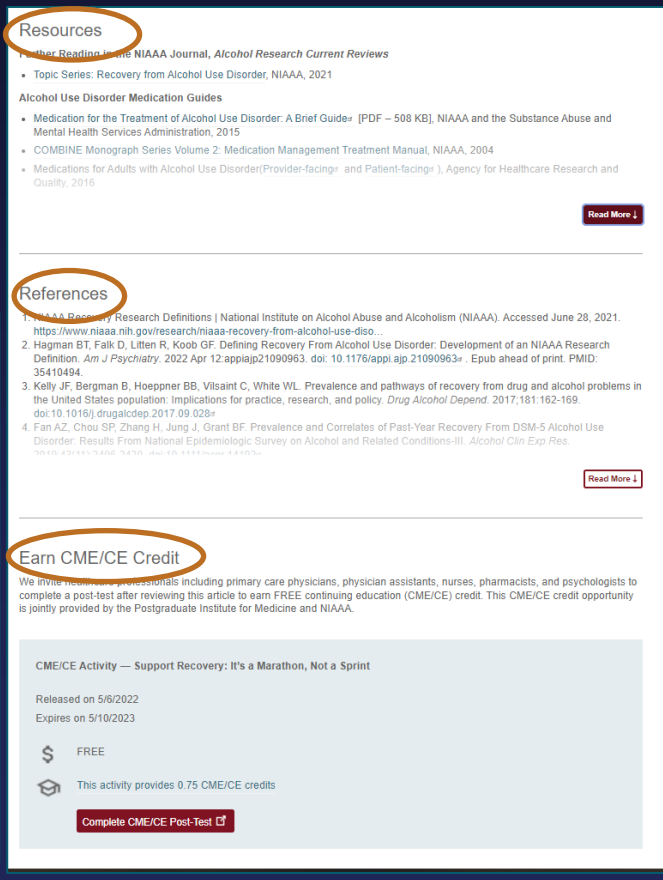
Here are a few ways healthcare professionals can support individuals in the AUD recovery process:

- **Negotiate recovery goals with your patient.** Advise abstinence for those with AUD as the safest route, but if a patient is hesitant to abstain, then negotiate stepped treatment goals that start with significantly cutting back, such as having no heavy drinking days. Emphasize future-oriented values and goal setting, and help patients see the tradeoff between any immediate, short-term rewards of alcohol and delayed, longer-term rewards of value to them, such as improvements in health, relationships, and work.
- **Recommend evidence-based AUD treatment with continuing care.** Patients may wish for a quick fix, so emphasize that AUD recovery is more a marathon than a sprint. Particularly for those with moderate to severe AUD, it is important to make both initial and continuing care plans to help reduce the number and severity of heavy drinking episodes.[23,24] Treatment plans can involve FDA-approved AUD medications, which you can prescribe in primary or specialty care; behavioral healthcare, which can include individual, couples, or family therapy; and mutual support groups. You can use the NIAAA *Alcohol Treatment Navigator* to find specialist prescribers and therapists who provide evidence-based care. (See Core articles on treatment and referrals.)
- **Normalize the difficulties on the path to change.** Provide compassionate and supportive education about the recovery process, noting that craving, alcohol-related thoughts and dreams, and challenges maintaining abstinence or drinking reduction are not a failure, but to be expected. Avoid criticism or shaming in response to a relapse to heavy drinking or related problems, which can be stigmatizing. Be optimistic. Note that change is possible, even in the face of challenges and even when prior attempts have not fully met the goal. Share the premise of "progress, not perfection."
- **Encourage engagement with activities that do not revolve around alcohol.** People with AUD often have social networks and activities centered around drinking. Research has found that substance-free activity scheduling is effective in reducing heavy drinking.[25] Recommend that patients develop or rekindle interests that do not involve alcohol and encourage them to schedule these activities. Also help your patients identify supportive people with whom they can schedule enjoyable alcohol-free activities.
- **Help your patients identify people who can offer a variety of support.** Different people will offer different types of support, and it is important for a patient to identify who can help them with what. These people may be friends, family members, or mutual support group sponsors who would be available, for example, when your patient has a craving or needs moral support. For many, this contact is critical to reduce the risk of a return to heavy drinking.
- **Suggest joining a mutual support group.** You can find links to Alcoholics Anonymous (AA), groups for women only, and groups structured without spiritual or 12 step components such as Secular AA or SMART Recovery, in the Resources below. Many groups are now online. Groups vary widely even within the same organization, so encourage patients to try several to find a good match.
- **Help patients who smoke to quit.** About 4 in 10 people with AUD smoke cigarettes, more than twice the rate for people without AUD.[26] Continuing to smoke during recovery may increase their risk of returns to heavy drinking.[27] Effective smoking interventions include nicotine replacement therapy, behavioral healthcare, medications, or a combination of approaches.[28] More research on treatment timing is needed, but some studies indicate that concurrent treatments for AUD and smoking can be successful rather than waiting to start the smoking treatment until AUD treatment is completed.[29]

What strategies can help patients prevent or recover from a return to heavy drinking?

Share the strategies below with your patients to help them recognize, avoid, and cope with common causes of heavy drinking episodes.

- **Manage stress.** Stress and negative mood (see next bullet) are significantly linked with increased craving and relapse.[29] Inform patients that it's especially important to learn effective stress management strategies to use throughout recovery, especially in early abstinence in which stress-related symptoms may be more prominent.[29] Cognitive behavioral therapy (CBT) and other AUD-focused behavioral care can help patients develop skills to avoid heavy drinking by managing stressors and emotions. (See Core article on treatment.)
- **Recognize the cycle of drinking and negative mood.** Patients who experience more negative moods in recovery have the highest odds of heavy and frequent drinking, and conversely, those who drink more heavily and frequently have more negative moods.[30] Help patients understand that drinking to reduce a negative mood fuels a feedback cycle and that abstinence will likely decrease negative affect over time.[30] "Mindfulness-based relapse prevention" may be an optimal behavioral treatment for patients caught in the dynamic of drinking to regulate negative moods.[31] (See Core articles on neuroscience, treatment, and mental health issues.)
- **Handle urges to drink.** An urge to drink can be set off both by external triggers in the environment and by internal triggers within the patient. External triggers, or "cues," are people, places, things, times of day, or days of the week that remind people of drinking. These cues create "high-risk situations" that are often more obvious, predictable, and avoidable than internal triggers. Internal triggers can be a fleeting thought, a positive emotion such as excitement, a negative emotional state such as low mood or frustration, or a physical sensation such as a headache, tension, or nervousness. The combination of external and internal triggers



Resources

Further Reading in the NIAAA Journal, *Alcohol Research Current Reviews*

- Topic Series: Recovery from Alcohol Use Disorder, NIAAA, 2021

Alcohol Use Disorder Medication Guides

- Medication for the Treatment of Alcohol Use Disorder: A Brief Guide [PDF – 508 KB], NIAAA and the Substance Abuse and Mental Health Services Administration, 2015
- COMBINE Monograph Series Volume 2: Medication Management Treatment Manual, NIAAA, 2004
- Medications for Adults with Alcohol Use Disorder(Provider-facing and Patient-facing), Agency for Healthcare Research and Quality, 2016

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CME/CE Activity — Support Recovery: It's a Marathon, Not a Sprint

Released on 5/6/2022

Expires on 5/10/2023

FREE

This activity provides 0.75 CME/CE credits

Complete CME/CE Post-Test

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THE HEALTHCARE PROFESSIONAL'S CORE RESOURCE ON ALCOHOL
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The NIAAA Core Resource on Alcohol was developed with the help of more than 70 contributors, including physicians, clinical psychologists, and basic and clinical alcohol researchers, who served as writers for full articles, content contributors to subsections, reviewers, and editorial staff. These contributors included both experts external to NIAAA as well as NIAAA staff.

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THE HEALTHCARE PROFESSIONAL'S
CORE RESOURCE ON ALCOHOL
Knowledge. Impacts. Strategies.

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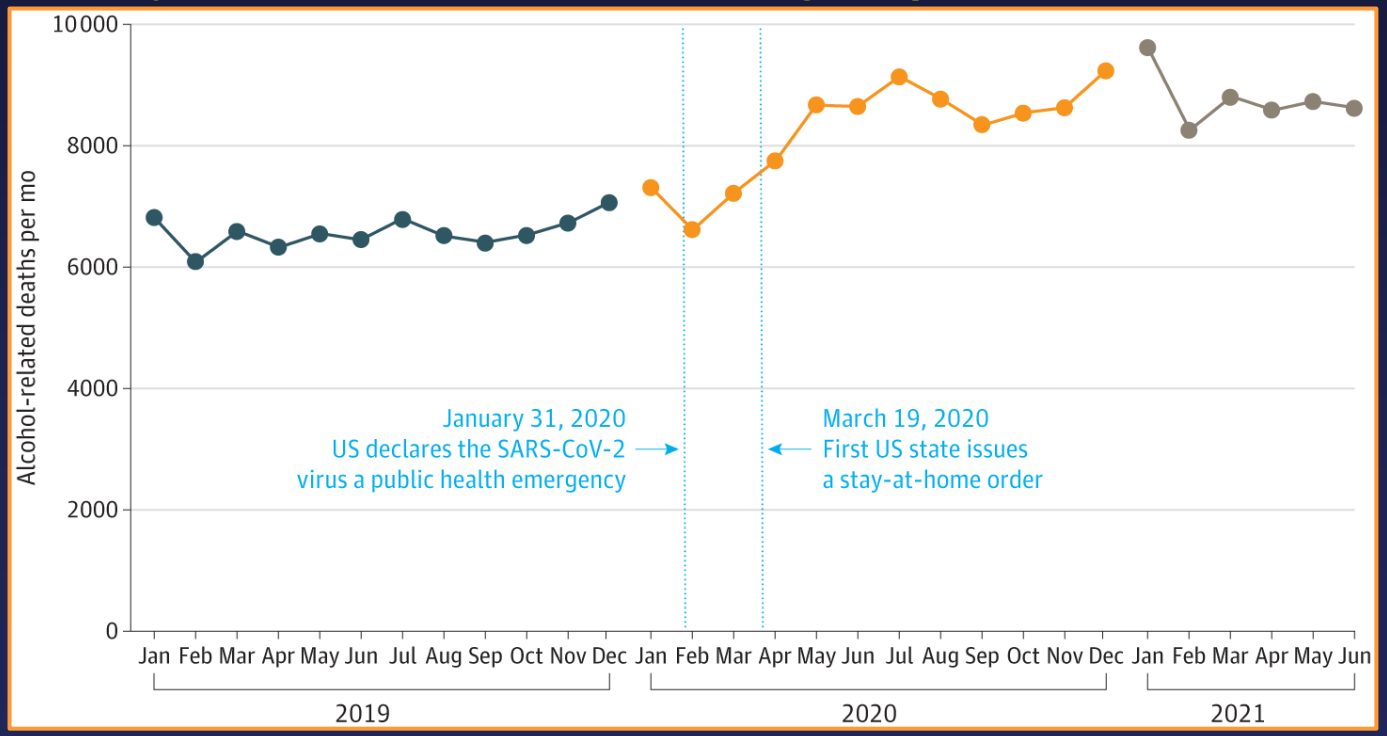
Research Highlights

Alcohol-Related Deaths During the COVID-19 Pandemic

The number and rate of alcohol-related deaths increased approximately 25% between 2019 and 2020, the first year of the COVID-19 pandemic. Rates increased for all age groups, with the largest increases occurring for people ages 35 to 44 (39.7%) and 25 to 34 (37.0%) . The number of deaths remained elevated in the first half of 2021.

Monthly Alcohol-Related Deaths Among People 16 Years and Older



Citation: White AM, Castle IP, Powell PA, Hingson RW, Koob GF., JAMA. 2022 Mar 18;e224308. doi: 10.1001/jama.2022.4308. Online ahead of print. PMID: 35302593

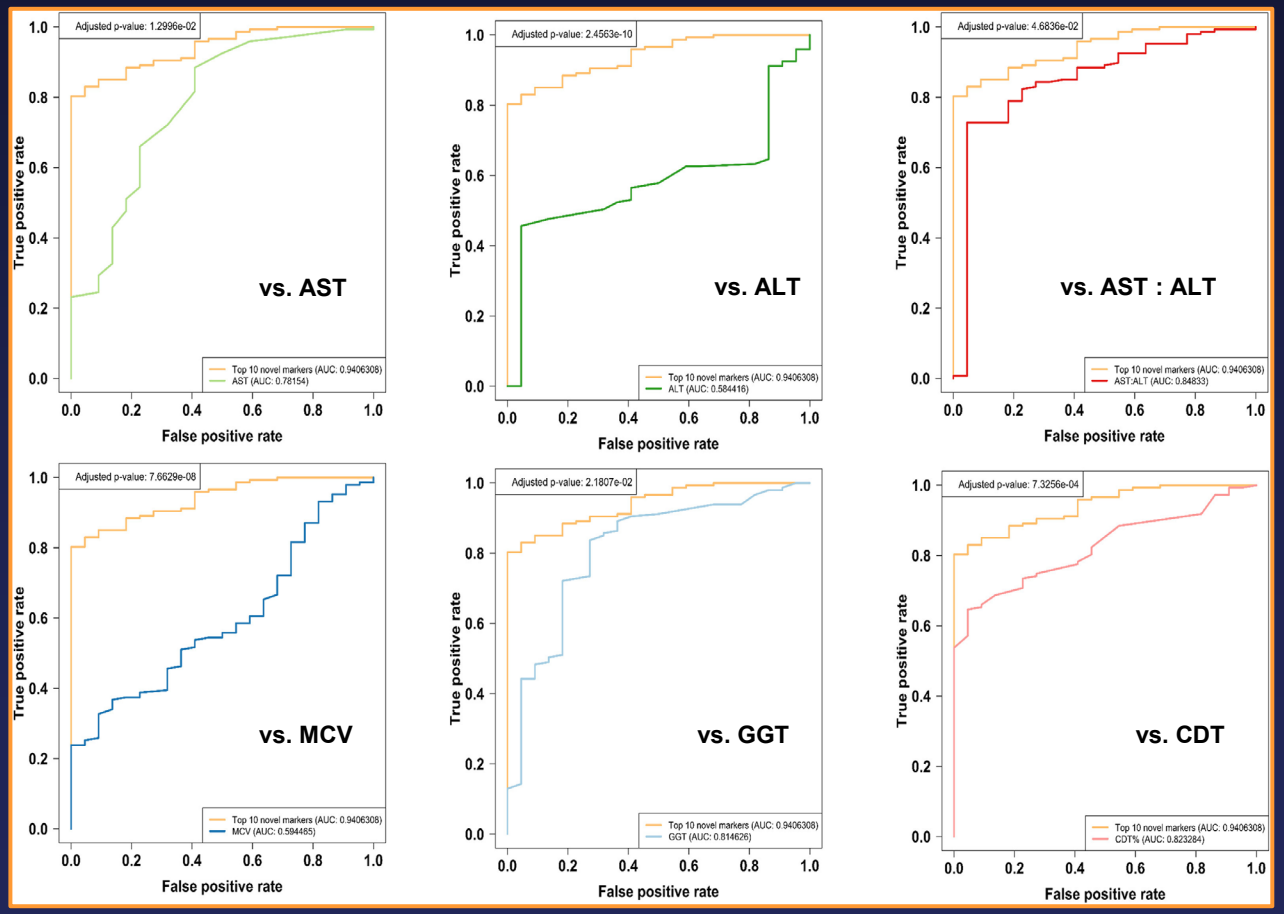
Serum Metabolomic Analysis Reveals Several Novel Metabolites in Association with Excessive Alcohol Use - An Exploratory Study

To identify biomarkers of excessive alcohol use, NIAAA-supported researchers profiled metabolites in the serum of research participants with a history of excessive alcohol use, compared to healthy participants. Of the metabolites identified, ten were most significantly associated with quantity and average number of drinks in the last 30 days and had better diagnostic performance on Receiver Operating Curve (ROC) for screening than commonly used lab tests.

Most metabolites identified were in the sphingolipid pathway.

Diagnostic performance of the top 10 metabolites (orange lines) compared to commonly used biomarkers

AST: aspartate aminotransferase
ALT: alanine aminotransferase
MCV: mean corpuscular volume of erythrocytes
GGT: gamma-glutamyl transpeptidase
CDT: carbohydrate-deficient transferrin

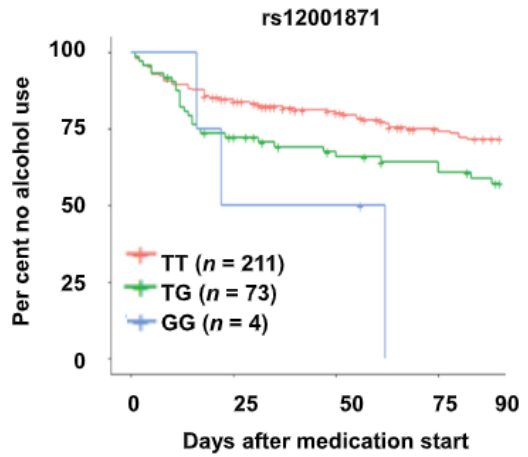


Citation: Liu D, Yang Z, Chandler K, Oshodi A, Zhang T, Ma J, Kusumanchi P, Huda N, Heathers L, Perez K, Tyler K, Ross RA, Jiang Y, Zhang D, Zhang M, Liangpunsakul S. *Transl Res*. 2022 Feb;240:87-98. doi: 10.1016/j.trsl.2021.10.008. Epub 2021 Nov 3.PMID: 34743014

Genetic Variants Associated with Acamprosate Treatment Response in Alcohol Use Disorder Patients: A Multiple Omics Study

Acamprosate is an approved FDA-approved medication for the treatment of alcohol use disorder (AUD) and is thought to reduce alcohol craving during abstinence. Patients vary in their treatment response to acamprosate and pharmacogenomic variations could partially explain the differences. Researchers conducted a genome-wide association study (GWAS) to identify genetic variants that contribute to variations in plasma metabolomic profiles associated with craving and/or acamprosate treatment outcomes. A series of genes were identified, including a protein-protein interaction network involving the protein tyrosine phosphatase receptor type D (PTPRD) gene. Single nucleotide polymorphisms (SNPs) in PTPRD were associated with worse acamprosate treatment outcomes.

PTPRD **SNPs were associated with time until first alcohol use during 3 months of acamprosate treatment**



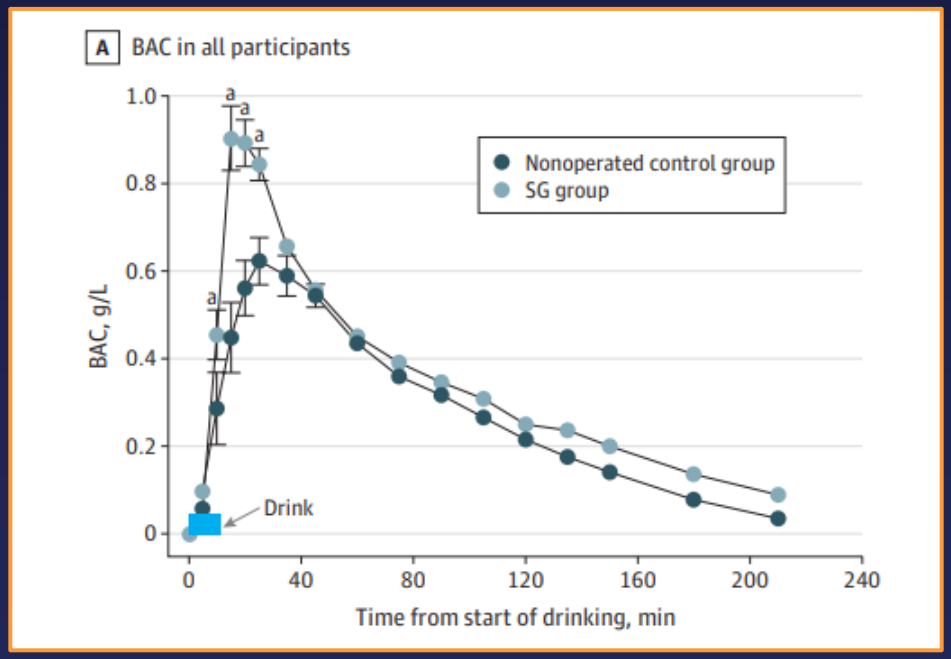
(b) ***PTPRD*** **SNPs were associated with acamprosate treatment outcomes**

rs ID	Time until first alcohol use during 3 months of acamprosate treatment	Time until heavy drinking during 3 months of acamprosate treatment	Relapse to alcohol use during 3 months of acamprosate treatment	Relapse to heavy drinking during 3 months of acamprosate treatment
rs12001871	HR: 2.21 (1.55–3.16)*	HR: 2.26 (1.52–3.36)*	OR: 3.90 (3.54–4.26)*	OR: 2.77 (2.44–3.10)*
rs10122491	HR: 2.21 (1.55–3.16)*	HR: 2.26 (1.52–3.35)*	OR: 3.90 (3.54–4.26)*	OR: 2.77 (2.44–3.10)*
rs12349713	HR: 2.20 (1.54–3.14)*	HR: 2.26 (1.52–3.34)*	OR: 3.89 (3.53–4.25)*	OR: 2.77 (2.44–3.10)*
rs12348723	HR: 2.20 (1.54–3.14)*	HR: 2.26 (1.52–3.34)*	OR: 3.90 (3.54–4.26)*	OR: 2.77 (2.44–3.10)*

Citation: Ho MF, Zhang C, Wei L, Zhang L, Moon I, Geske JR, Skime MK, Choi DS, Biernacka JM, Oesterle TS, Frye MA, Seppala MD, Karpyak VM, Li H, Weinshilboum RM. *Br J Pharmacol*. 2022 Jan 11. doi: 10.1111/bph.15795. Online ahead of print. PMID: 35016259

Site of Alcohol First-Pass Metabolism Among Women

Bariatric surgery is associated with higher blood alcohol concentrations (BACs), higher bioavailability of alcohol, and, thus, higher risk of alcohol-related consequences. These effects are hypothesized to be due to deficits in first-pass metabolism of alcohol. To better understand how the stomach contributes to first-pass metabolism, researchers examined alcohol pharmacokinetics after alcohol administration among women with sleeve gastrectomy. Women with the gastrectomy had an approximately 40% higher peak BAC after oral alcohol administration compared to women without the procedure. The higher BACs indicate that the stomach contributes significantly to the first-pass metabolism of alcohol in this population. These results might help explain the link between bariatric surgery and elevated risk of alcohol-related consequences.



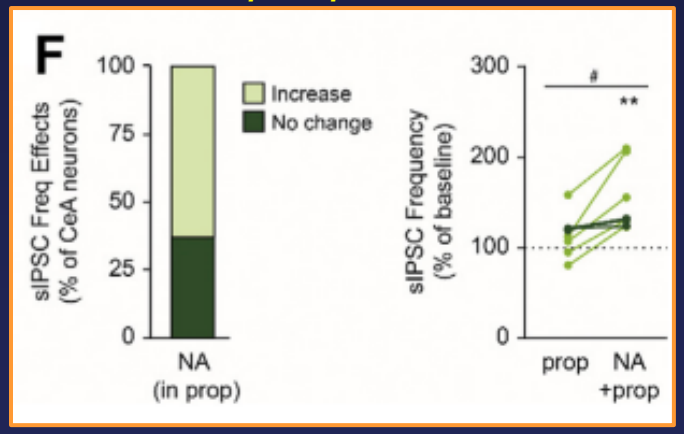
Blood Alcohol Concentrations (BAC) for Sleeve Gastrectomy (SG) Group and Nonoperated Control Group

Citation: Seyedsadjadi N, Acevedo MB, Alfaro R, Ramchandani VA, Plawecki MH, Rowitz B, Pepino MY. *JAMA Netw Open*. 2022 Mar 1;5(3):e223711.

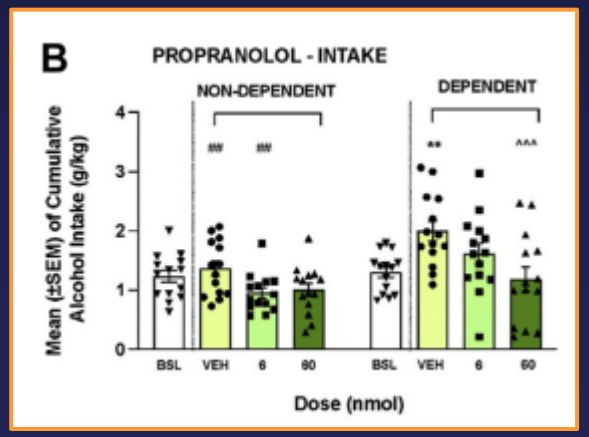
The Amygdala Noradrenergic System is Compromised with Alcohol Use Disorder

The central amygdala (CeA) and the noradrenaline/norepinephrine (NA) system are both involved in the brain's responses to stress and alcohol. In the current study, researchers investigated how the NA system regulates CeA activity and influences drinking behavior in animal models of AUD. They found that NA receptors, α_1 and β, potentiated CeA GABAergic transmission and drove alcohol intake. In the animal model of alcohol dependence, β receptors disinhibited a subpopulation of CeA neurons and contributed to elevated alcohol intake. Postmortem analyses of human brain tissue of humans with AUD revealed increased α_{1B} receptor mRNA expression in the amygdala.

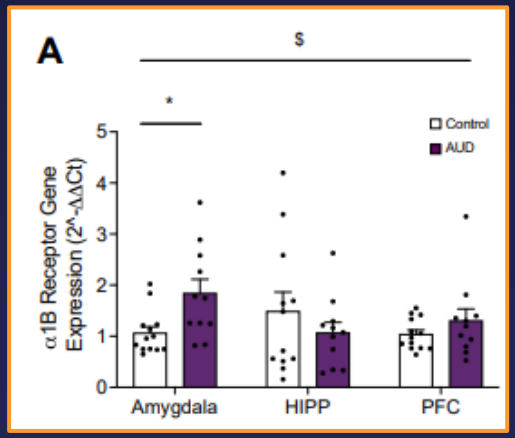
Propranolol prevented the NA's ability to reduce GABA release, suggesting involvement of β receptors



Propranolol reduces alcohol consumption in dependent animals



Significant increase in amygdala α_{1B} mRNA levels in humans with AUD

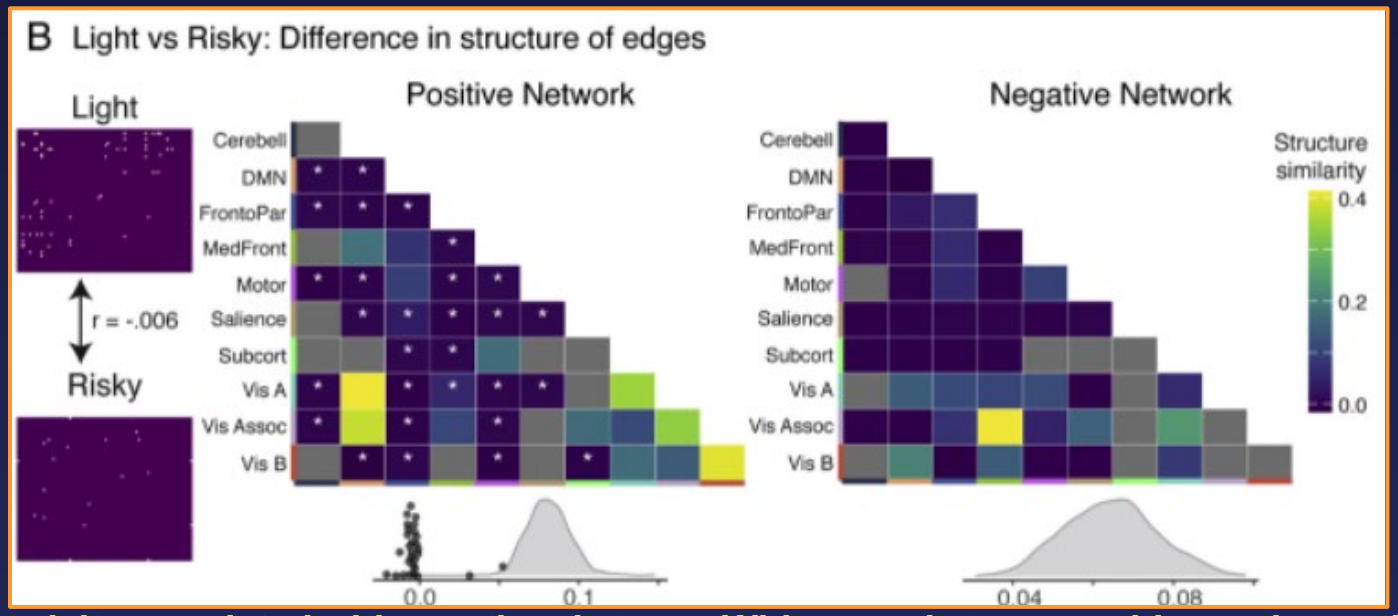


Without propanol treatment, NA decreased sIPSC frequency in half the neurons suggesting reduced GABA release. After 20 mM propranolol pretreatment, NA increased sIPSC frequency in 5/8 cells, revealing beta adrenergic receptor recruitment in alcohol dependence in that NA's disinhibitory effects are mediated by β adrenergic receptors.

Citation: Varodayan FP, Patel RR, Matzeu A, Wolfe SA, Curley DE, Khom S, Gandhi PJ, Rodriguez L, Bajo M, D'Ambrosio S, Sun H, Kerr TM, Gonzales RA, Leggio L, Natividad LA, Haass-Koffler CL, Martin-Fardon R, Roberto M. *Biol Psychiatry*. 2022 Apr 5:S0006-3223(22)00090-7. doi: 10.1016/j.biopsych.2022.02.006. Online ahead of print. PMID: 35430085

High-risk Drinkers Engage Distinct Stress-Predictive Brain Networks

This study examined whether changes in brain networks that underlie emotional stress responses can serve as an early marker of alcohol misuse. Functional brain imaging and predictive modeling were conducted with people who engaged in binge drinking or "light" drinking and showed differences in stress-related brain networks. Stress was associated with visual and motor networks in the binge drinking group and with the default mode and frontoparietal networks in the light drinking group. To uncover differences in *how strongly* different edges predicted emotional stress, a "virtual lesion" approach was used, allowing only subsets of the brain to serve as predictors. This revealed that visual and salience networks were significantly stronger predictors of emotional stress in the binge drinking group.



Edgewide connectivity correlated with emotional stress. Widespread stress positive and negative network differences between the groups are indicated by asterisks.

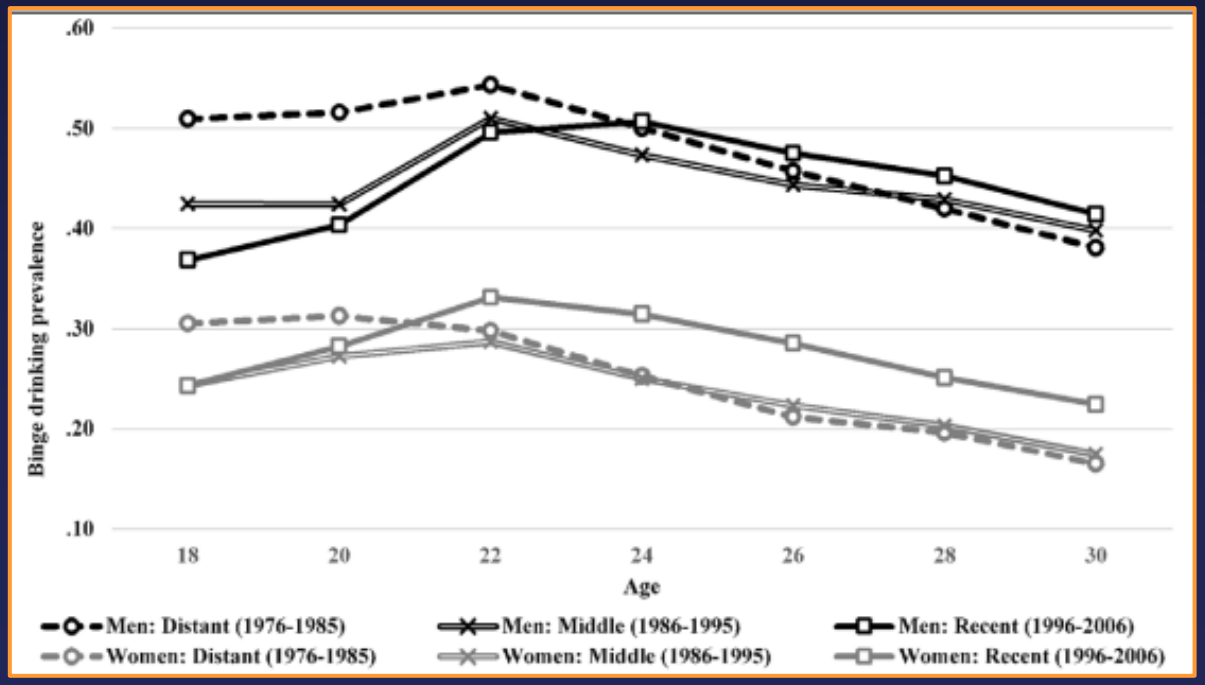
Edges or connections selected on every leave-one-out fold for all temporal models were used to understand predictive networks.

Citation: Goldfarb EV, Scheinost D, Fogelman N, Seo D, Sinha R. *Biol Psychiatry Cogn Neurosci Neuroimaging.* 2022 Mar 7:S2451-9022(22)00049-0. doi: 10.1016/j.bpsc.2022.02.010. Online ahead of print. PMID: 35272096

Age 18-30 Trajectories Of Binge Drinking Frequency And Prevalence Across The Past 30 Years For Men And Women: Delineating When And Why Historical Trends Reversed Across Age

Binge drinking at age 18 has been decreasing historically but by the mid to late 20s, the reverse is true as reflected in increased binge drinking. The current study examined data from the Monitoring the Future study to examine this reversal. Researchers found that the reversal occurred primarily between ages 18-24 for men and 18-22 for women. The historical narrowing in the gap in binge drinking between men and women was more pronounced at the beginning than at end of the transition to adulthood.

Trajectories of binge drinking by sex and historical cohort group



Citation: Jager J, Keyes KM, Son D, Patrick ME, Platt J, Schulenberg JE. *Dev Psychopathol*. 2022 Jan 24:1-15. doi: 10.1017/S0954579421001218. Online ahead of print. PMID: 35068407

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