



Alcohol Use Disorder Update

- David Best, DO, ABAM
- October 26, 2024
- MOA Fall Conference, Grand Rapids, MI



Disclosures

None



Background

- Relevant Experience
 - Best Medical Services 2012-present
 - Opioid Health Home, 2021-present
 - Patient Centered Medical Home, September 2024-present
 - Bellaire Family Health Center 2005-2012
- Board Certified in Family Medicine, 2005
- Board Certified in Addiction Medicine, 2014
- Current Board Member with Novello Provider Organization, Des Moines University Alumni Association, Northern Michigan Osteopathic Association



Objectives

- Review mortality and morbidity risk from alcohol
- Review Screening tests, diagnostic criteria, and treatment options for AUD

Food for thought: Relative risk of addictive substances

Tobacco kills more than 8 million people each year, including an estimated 1.3 million non-smokers who are exposed to second-hand smoke

480,000 Tobacco related deaths annually in the U.S.

- World Health Organization, CDC

178,307 alcohol related deaths annually

- Data from 2023 National Survey on Drug Use and Health (NSDUH) as reported by NIAAA

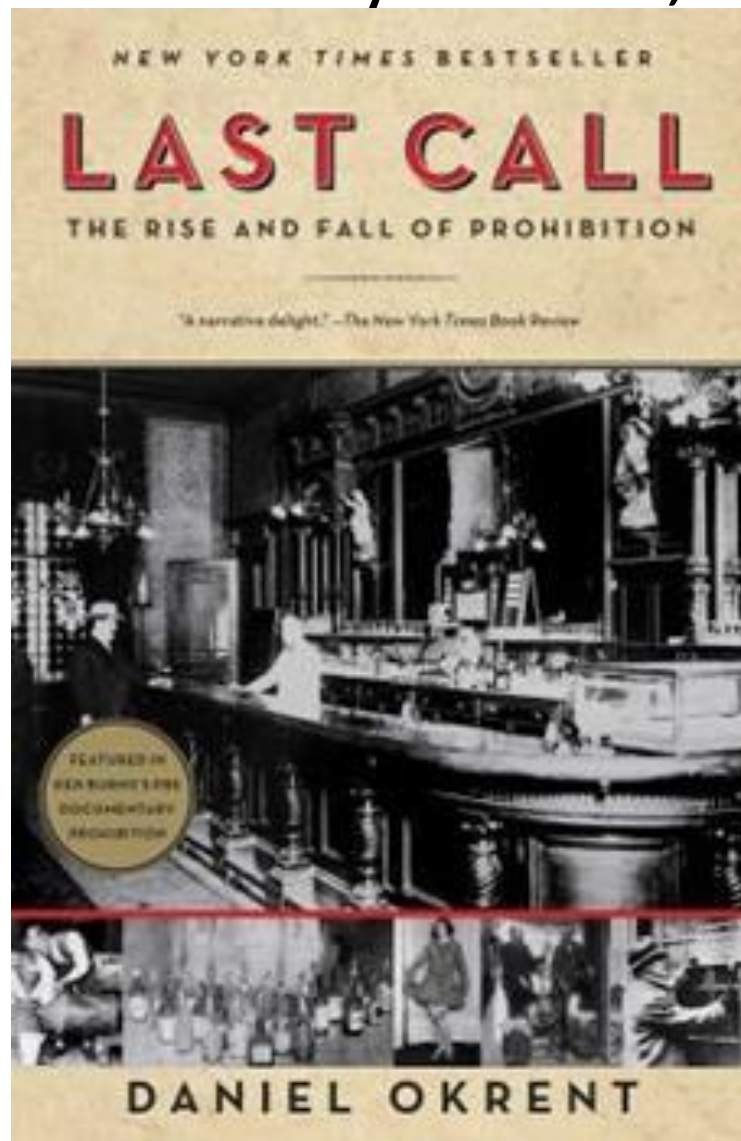
105,452 Drug overdose deaths in 2022

- CDC: **12 Month-ending Provisional Counts of Drug Overdose Deaths: United States (Dec 2022)**

57,000 Americans died from an overdose involving cocaine (24,000) or psychostimulants with abuse potential (33,000) in 2021

CDC

Prohibition didn't really work, so now what?





Quotes from “Last Call”

- A newspaper reporter mocked the inability of Prohibition law to prevent people from drinking:
 - “It was absolutely impossible to get a drink in Detroit unless you walked at least 10 feet and told the busy bartender what you wanted in a voice loud enough for him to hear you above the uproar.”
- Another person commented on the impossibility of stopping liquor smuggling across the US/Canadian border by saying:
 - “ You cannot keep liquor from dripping through a dotted line.”
- It was reported that up to 1500 crossings of the Detroit River per day were occurring (during prohibition)

Anti-saloon league super lobbyist, Wayne Wheeler

(November 10, 1869 – September 5, 1927)



18th Amendment to the United States Constitution

Passed by Senate and House in 1917, Ratified by the states in January 1919 and started on January 17, 1920

- prohibited the sale, manufacture, and transportation of alcohol, marking the beginning of Prohibition in the United States.

Senate voted 65 to 20, House 282 to 128 and 46 out of 48 states ratified the amendment

- Connecticut and Rhode Island voted no

The 21st Amendment to the United States Constitution repealed the Eighteenth Amendment to the United States Constitution in 1933.

Alcohol Use Disorder (AUD)

According to the DSM-5, alcohol use disorder is “a problematic pattern of alcohol use leading to clinically significant impairment or distress, as manifested by at least two of the following [criteria], occurring within a 12-month period.”

DSM-5 AUD Criteria

mild 2-3, moderate 4-5, severe 6 or more

- Alcohol is often taken in larger amounts or over a longer period than was intended.
- There is a persistent desire or unsuccessful efforts to cut down or control alcohol use.
- A great deal of time is spent in activities necessary to obtain alcohol, use alcohol, or recover from its effects.
- Craving, or a strong desire or urge to use alcohol.
- Recurrent alcohol use resulting in a failure to fulfill role obligations at work, school, or home.
- Continued alcohol use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of alcohol.
- Important social, occupational, or recreational activities are given up or reduced because of alcohol use.
- Recurrent alcohol use in situations in which it is physically hazardous.
- Alcohol use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by alcohol.
- Tolerance, as defined by either of the following: a. a need for markedly increased amounts of alcohol to achieve intoxication or desired effect b. a markedly diminished effect with continued use of the same amount of alcohol.
- The characteristic withdrawal syndrome for alcohol that is relieved with drinking alcohol or taking substance (such as a benzodiazepine) is taken to relieve or avoid withdrawal symptoms.



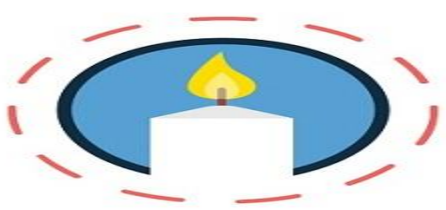
Advertising works, influences behaviors

We are inundated with advertising and messaging that promotes alcohol consumption and fast food that are damaging to our health

Example of the power of advertising; see Don Draper at work in the show Mad Men

The
“Carousel”
sales pitch





**Each year in the
United States
excessive
alcohol use is
responsible for:**

- 140,000 DEATHS
 - shortening those lives by an average of 26 years
- 1 in 5 DEATHS
 - among adults ages 20 to 49
- \$249 BILLION+
 - in economic costs, or \$2.05 a drink
- www.niaaa.nih.gov

When does alcohol use become a problem?

- Excessive alcohol use is a leading preventable cause of death in the United States.
 - Over centuries, alcohol has become the most socially-accepted addictive drug worldwide.
 - Excessive alcohol use includes:
 - Binge drinking, defined as consuming 4 or more drinks on an occasion for a woman or 5 or more drinks on an occasion for a man.
 - Heavy drinking, defined as 8 or more drinks per week for a woman or 15 or more drinks per week for a man.
 - Any alcohol use by pregnant women or anyone younger than 21.
- CDC

Re-evaluation of guidelines needed

- Depending on the country, current guidelines (including those in the US) could allow levels of drinking high enough to shorten life expectancy.





2018 Lancet Study showed lives shortened even with “moderate drinking”

- The Study found that regardless of gender, higher alcohol consumption was associated with:
 - higher rate of stroke, fatal aneurysms, heart failure, and death.
 - When compared with people who drank less than seven drinks per week:
 - Adults drinking seven to 14 drinks per week could expect, on average, a six-month shorter life expectancy (as of age 40)
 - Those drinking 14 to 25 drinks per week could expect a shorter life expectancy by one to two years
 - Those drinking more than 25 drinks per week (>3.5 per day) could expect a shorter life expectancy by four to five years
 - “Risk thresholds for alcohol consumption: combined analysis of individual-participant data for 599,912 current drinkers in 83 prospective studies”
 - The Lancet Vol 391 April 14, 2018
-

It's the dose
that makes
the poison

BEER CHEAT SHEET



**HEINEKEN
LIGHT**
99 calories
7 g carbs
3.5% ABV



**MICHELOB
ULTRA**
95 calories
3 g carbs
4.2% ABV



BUD LIGHT
110 calories
7 g carbs
4.2% ABV



DOS EQUIS
130 calories
10 g carbs
4.2% ABV



GUINNESS
125 calories
10 g carbs
4.3% ABV



BUDWEISER
145 calories
11 g carbs
5% ABV



**STELLA
ARTOIS**
190 calories
17 g carbs
5.2% ABV



**BLUE
MOON**
168 calories
14 g carbs
5.4% ABV



**RACER 5
IPA**
240 calories
21 g carbs
7.5% ABV

macros made easy

Serving Size examples

WHAT IS A STANDARD DRINK?



12 fl. oz.
of regular beer
(5% alcohol)



8–9 fl. oz.
of malt liquor
(7% alcohol)



5 fl. oz.
of table wine
(12% alcohol)



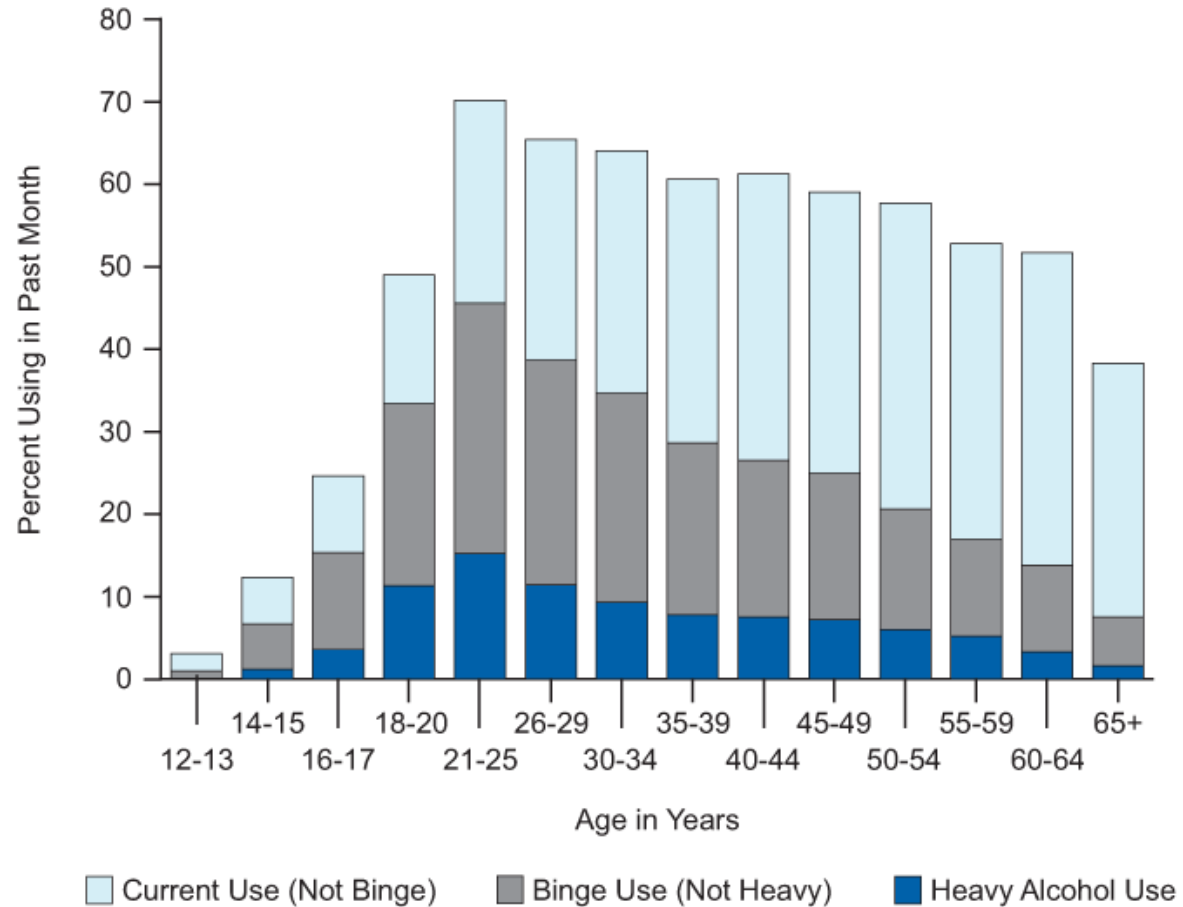
1.5 fl. oz.
of distilled spirits
(40% alcohol)

Each beverage portrayed above represents one standard drink of "pure" alcohol, defined in the United States as 0.6 fl. oz. or 14 grams. The percentage of pure alcohol, expressed here as alcohol by volume (alc./vol.), varies within and across beverage types. Although the standard drink amounts are helpful for following health guidelines, they may not reflect customary serving sizes.

Prevalence, Risks, and Consequences of alcohol use in the U.S.

- Past year alcohol use: 177,278,000 → 62.5% of U.S.
- ER Visits: 4,126,082
- Alcohol Use Disorder Prevalence: 28,859,000 → 10.2% of U.S.
- Alcohol Related Deaths: 178,307
 - 61,063 Acute
 - 117,245 Chronic
- Data from 2023 National Survey on Drug Use and Health (NSDUH) as reported in National Institute of Alcohol Abuse and Alcoholism (NIAAA) website

NSDUH 2010 Data shows peak use in the early to mid 20s





From www.fpnotebook.com

Prevalence

- Alcohol Dependence: 8-14% lifetime

Age of symptom onset: 15 to 19 years

Familial predisposition in Autosomal Dominant pattern

Chronic Health Effects of Excessive Alcohol Use

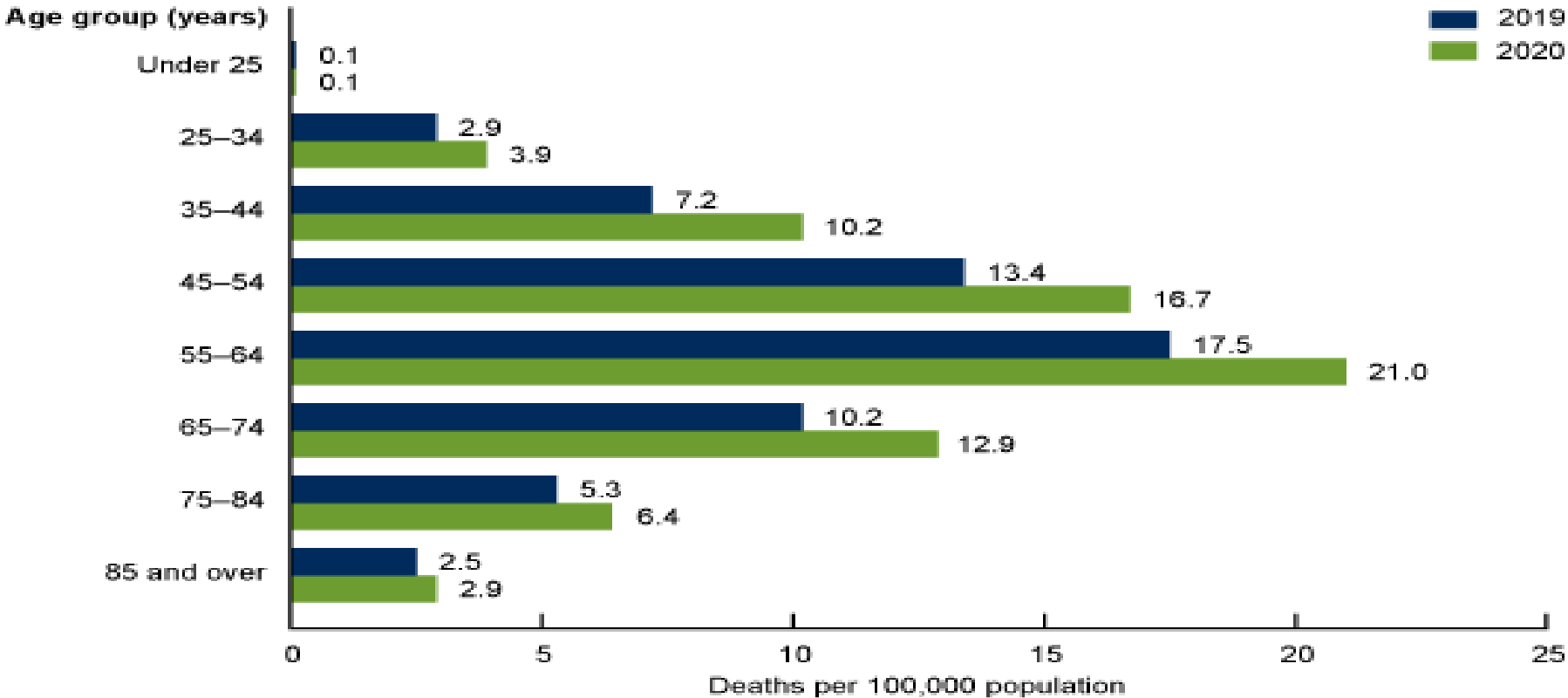
- Over time, excessive alcohol use can lead to chronic diseases and other serious problems, including alcohol use disorder and problems with learning, memory, and mental health
- **High Blood Pressure, Heart Disease, and Stroke**
 - Binge drinking and heavy drinking can cause heart disease, including cardiomyopathy, as well as irregular heartbeat, high blood pressure, and stroke.
- **Liver Disease**
 - Excessive alcohol use takes a toll on the liver and can lead to fatty liver disease (steatosis), hepatitis, fibrosis, and cirrhosis.

Binge Drinking effects (2024 study)

- binge alcohol consumption leads to augmented morning-after sympathetic transduction of muscle sympathetic nerve activity to blood pressure
 - highlighting a new mechanism whereby chronic or excessive alcohol consumption contributes to cardiovascular disease progression via altered end-organ responsiveness to sympathetic neural outflow.
- ‘fight-or-flight’ responses in the body can linger well beyond the actual drinking episode
- Recognize the adverse impact of binge drinking hours beyond the actual consumption
 - <https://doi.org/10.1161/HYPERTENSIONAHA.124.23416>

Alcohol-induced Death Rates in the United States, 2019–2020

CDC





Age-related physiological changes

decreased total body water and
increased body fat →

contribute to higher blood
alcohol concentration and →

prolonged alcohol effects in
older adults compared to
younger individuals



Specific risks in
elderly

Increased falls

Alcoholic dementia

Wernicke-Korsakoff
syndrome

Cancer risk increases with alcohol

Drinking alcoholic beverages can contribute to cancers of the mouth and throat, larynx, esophagus, colon and rectum, liver, and breast (in women).

For some cancers, even less than one drink in a day can increase risk. The less alcohol a person drinks, the lower the risk of these types of cancer.

Immediate Effects of excessive alcohol use

Excessive alcohol use has immediate effects that increase the risk of many harmful health conditions

Injuries, Violence, and Poisonings

- Drinking too much alcohol increases the risk of injuries, including those from motor vehicle crashes, falls, drownings, and burns.
- It increases the risk of violence, including homicide, suicide, and sexual assault.
- Alcohol also contributes to poisonings or overdoses from opioids and other substances.
- *A recent US study found that more than 40% of people who died violently had alcohol in their bloodstream.*

Pathophysiology

1. Alcohol increases activity at GABA Receptors with secondary CNS depression

1. Chronic Alcohol use down regulates GABA Receptors and up regulates NMDA receptors
2. Alcohol Withdrawal results in excessive excitation

2. Limbic System drive state

1. Bad decision making and impulsiveness

3. Alcoholics have lower level of endogenous endorphins

Physiology: Alcohol Digestion Pathway

1. One ounce Alcohol takes 1 hour, mouth to excretion
2. No Digestion required before absorption
3. Small amount absorbed in Stomach
4. Most Alcohol absorbed in Small Intestine (duodenum)
5. Metabolism
 1. Alcohol converted to acetaldehyde
 2. Acetaldehyde converted in liver to acetic acid
6. Excretion
 1. Renal excretion: 10%
 2. Hepatic excretion: 90%

“The Truth About Alcohol”

- “Risk starts to go up well below levels where people would think ‘Oh, that person has an alcohol problem,’”
 - Dr. Tim Naimi, director of the University of Victoria’s Canadian Institute for Substance Use Research
- Increased cancer risk due to acetaldehyde.
 - This toxic metabolite of alcohol can damage DNA , enabling the out-of-control cell growth that creates cancerous tumors
 - <https://theweek.com/science/health/1021892/the-truth-about-alcohol>

Mechanism of alcohol metabolism

Ethanol metabolites and oxidative stress (through accumulation of reactive oxygen species—ROS) are thought to be the main causes of alcohol-induced organ damage.

A majority of ethanol is metabolized in the liver by the enzyme alcohol dehydrogenase (ADH) to produce acetaldehyde, which is then further metabolized to another less active byproduct, acetate, by aldehyde dehydrogenase (ALDH)

The enzymes cytochrome P450 2E1 (CYP2E1) and catalase also break down alcohol to acetaldehyde.

- [Int J Environ Res Public Health](#). 2010 Apr; 7(4): 1285–1301.

Screening

- The US Preventive Services Task Force recommends that health care providers **screen all adults for excessive alcohol use and provide brief intervention** and referral to treatment as needed.
- QUESTION on Medicare Wellness Visit and Health Risk Assessment
- CAGE
- AUDIT-10

- Have you ever felt you should Cut down on your drinking?
- Have people Annoyed you by criticizing your drinking?
- Have you ever felt bad or Guilty about your drinking?
- Have you ever had a drink first thing in the morning to steady your nerves or to get rid of a hangover (Eye opener)?
 - Scoring: Item responses on the CAGE are scored 0 or 1, with a higher score an indication of alcohol problems. A total score of 2 or greater is considered clinically significant

CAGE

The Alcohol Use Disorders Identification Test: Interview Version

Read questions as written. Record answers carefully. Begin the AUDIT by saying "Now I am going to ask you some questions about your use of alcoholic beverages during this past year." Explain what is meant by "alcoholic beverages" by using local examples of beer, wine, vodka, etc. Code answers in terms of "standard drinks". Place the correct answer number in the box at the right.

<p>1. How often do you have a drink containing alcohol? (0) Never [Skip to Qs 9-10] (1) Monthly or less (2) 2 to 4 times a month (3) 2 to 3 times a week (4) 4 or more times a week</p> <input data-bbox="1131 305 1212 351" type="text"/>	<p>6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session? (0) Never (1) Less than monthly (2) Monthly (3) Weekly (4) Daily or almost daily</p> <input data-bbox="1612 305 1694 351" type="text"/>
<p>2. How many drinks containing alcohol do you have on a typical day when you are drinking? (0) 1 or 2 (1) 3 or 4 (2) 5 or 6 (3) 7, 8, or 9 (4) 10 or more</p> <input data-bbox="1131 511 1212 556" type="text"/>	<p>7. How often during the last year have you had a feeling of guilt or remorse after drinking? (0) Never (1) Less than monthly (2) Monthly (3) Weekly (4) Daily or almost daily</p> <input data-bbox="1612 511 1694 556" type="text"/>
<p>3. How often do you have six or more drinks on one occasion? (0) Never (1) Less than monthly (2) Monthly (3) Weekly (4) Daily or almost daily <small>Skip to Questions 9 and 10 if Total Score for Questions 2 and 3 = 0</small></p> <input data-bbox="1131 739 1212 785" type="text"/>	<p>8. How often during the last year have you been unable to remember what happened the night before because you had been drinking? (0) Never (1) Less than monthly (2) Monthly (3) Weekly (4) Daily or almost daily</p> <input data-bbox="1612 739 1694 785" type="text"/>
<p>4. How often during the last year have you found that you were not able to stop drinking once you had started? (0) Never (1) Less than monthly (2) Monthly (3) Weekly (4) Daily or almost daily</p> <input data-bbox="1131 958 1212 1003" type="text"/>	<p>9. Have you or someone else been injured as a result of your drinking? (0) No (2) Yes, but not in the last year (4) Yes, during the last year</p> <input data-bbox="1612 958 1694 1003" type="text"/>
<p>5. How often during the last year have you failed to do what was normally expected from you because of drinking? (0) Never (1) Less than monthly (2) Monthly (3) Weekly (4) Daily or almost daily</p> <input data-bbox="1131 1172 1212 1218" type="text"/>	<p>10. Has a relative or friend or a doctor or another health worker been concerned about your drinking or suggested you cut down? (0) No (2) Yes, but not in the last year (4) Yes, during the last year</p> <input data-bbox="1612 1172 1694 1218" type="text"/>
<p>Record total of specific items here <input data-bbox="1536 1265 1648 1310" type="text"/></p>	

Total scores of 8 or more are recommended as indicators of hazardous and harmful alcohol use. Higher scores indicate greater likelihood of hazardous and harmful drinking, or reflect greater severity of alcohol problems and dependence.

AUDIT-10 SCORING

- **The range of possible scores is from 0 to 40** where 0 indicates an abstainer who has never had any problems from alcohol.
- A score of **1 to 7** suggests low-risk consumption according to World Health Organization (WHO) guidelines.
- Scores from **8 to 14** suggest hazardous or harmful alcohol consumption
- A score of **15 or more** indicates the likelihood of alcohol dependence (moderate-severe alcohol use disorder).

Protocol: Brief Intervention for Problem Drinking (www.fpnotebook.com)

1. Chemical Dependency Brief Counseling in the office
2. Track patient progress
 1. Metrics for the last month
 1. Number of Alcohol free days
 2. Number of heavy drinking days
 3. Maximum number of drinks in one day
 2. Lab markers
 1. Biomarkers of Alcohol Use
 1. Urine Ethyl Glucuronide (eTG)
 1. Test strips for in office testing
 2. Urine Ethyl Sulfate
 3. Serum Gamma glutamyl transferase (GGT)
 4. Carbohydrate deficient Transferrin

AUD Treatment

- **Protocol: Alcohol Use Disorder**

1. Initial Management

1. Alcohol Detoxification (outpatient or inpatient)
2. Alcohol Withdrawal Protocol

2. Long-Term Abstinence Programs (12 step programs appear most effective)

1. Alcoholics Anonymous
2. Sponsor
3. Treatment Program
4. Transition House

Adjunctive Medications for abstinence (medication assisted treatment (MAT) for alcohol)

Best evidence is for naltrexone, gabapentin and topiramate

First line

1. Naltrexone (Vivitrol, Revia)

1. Blocks Opioid receptors
2. Decreases pleasure from Alcohol
3. Effective in reducing Alcohol use in non-abstaining patients
4. Dosing
 1. Oral: 50 mg orally daily (\$50/month in 2019)
 2. IM: Vivitrol once monthly IM (\$1500/month in 2019)

Second Line: Gabapentin

- KEY POINTS

- Gabapentin has been shown to be safe and effective for mild alcohol withdrawal but is not appropriate as mono-therapy for severe withdrawal owing to risk of seizures.
- During early abstinence, gabapentin may improve sleep, cravings, and mood—factors associated with relapse.
- Gabapentin is being used recreationally to achieve or enhance euphoria, but its misuse potential appears to be low when taken at therapeutic doses by patients without a history of drug abuse.
 - “Gabapentin for alcohol use disorder: A good option, or cause for concern?”
 - Cleveland Clinic Journal of Medicine December 2019, 86 (12) 815-823

Dosing gabapentin for AUD

- Gabapentin significantly improved the rates of abstinence and no heavy drinking.
 - The abstinence rate was 4.1% (95% CI, 1.1 to 13.7) in the placebo group
 - 11.1% (95% CI, 5.2 to 22.2) in the 900 mg group
 - 17.0% (95% CI, 8.9 to 30.1) in the 1800 mg group (p = 0.04 for linear dose effect, NNT = 8 for 1800 mg).
 - “Gabapentin Treatment for Alcohol Dependence: A Randomized Controlled Trial”
 - JAMA Intern Med. 2014 Jan 1; 174(1): 70–77.
- 300mg x1 day, then 300mg bid x1 day then 300mg tid
- May titrate to 600mg tid

Second Line: Topiramate

- Decreases Alcohol use severity and heavy, binge drinking
- Improves abstinence, well being, quality of life in Alcoholics
- Requires dose titration
 - Start 25mg daily for 1 week, then increase by 25mg daily every week
 - Target dose 100-150mg twice daily
- Johnson (2004) Arch Gen Psychiatry 61:905-12 [PubMed]

Other options for MAT

?Third Line

1. Disulfiram (Antabuse)

1. Taken 250 to 500 mg orally daily
2. Negative side effects with drinking alcohol

2. Campral (Acamprosate)

1. Balances GABA and glutamate Neurotransmitters
2. Reduces anxiety from abstinence (with better efficacy in abstinence than Naltrexone)
3. May prevent relapse in one in 12 patients with 3-6 months of use
4. Dosing: 2 tabs orally three times daily (\$200/month in 2019)
 1. Risk of lower compliance due to a very large tablet taken 3 times daily



The Serenity Prayer as a guide

- God grant me the serenity
to accept the things I cannot
change;
courage to change the things I
can;
and wisdom to know the
difference.

Thank You

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