



**Pink Elephants:
Is Alcohol a Pain Panacea or Problem?**

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Titles & Affiliations

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Disclosures

Jennifer Hah
• NIH NIDA (R01DA045027) Psychological Risk Factors for Persistent Opioid Use and Prevention of Chronic Opioid Use and Misuse After Surgery: Postoperative Motivational Interviewing and Guided Opioid Weaning
• NIH NLM (R01LM013362) Advancing Knowledge Discovery for Postoperative Pain Management
• NHLBI, NINDS (U24NS100659, U24NS100655) Clinical Trial of COVID-19 Convalescent Plasma in Outpatients (C3PO)
• Nalu Medical- Consultant
• SPR Therapeutics- Consultant

Ravi Prasad
• None



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Learning Objectives

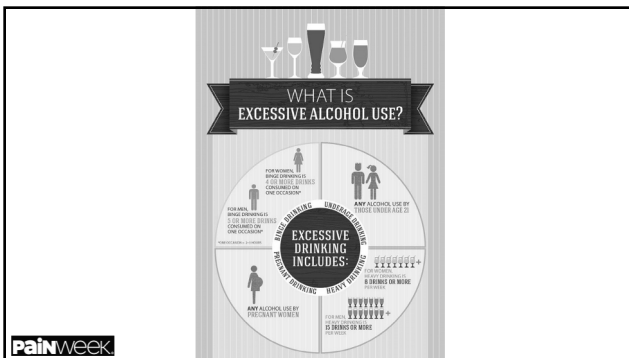
- Describe excessive alcohol use
- Summarize the epidemiology of co-occurring pain and alcohol use disorder
- Explain how COVID-19 impacted alcohol use
- Identify psychological/behavioral interventions used in the treatment of alcohol use disorders

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WHAT IS CONSIDERED A "DRINK"?
 U.S. STANDARD DRINK SIZES

12 OUNCES OF 5% ABV BEER

8 OUNCES OF 7% ABV MALT LIQUOR

5 OUNCES OF 12% ABV WINE

1.5 OUNCES OF 40% ABV (80-PROOF) DISTILLED SPIRITS OR LIQUOR (Examples: gin, rum, vodka, whiskey)

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HOW DOES EXCESSIVE DRINKING AFFECT US?

88,000 DEATHS PER YEAR

\$\$\$ 249 BILLION ECONOMIC COST

VIOLENCE, INJURIES, AND MOTOR VEHICLE CRASHES

CHRONIC CONDITIONS SUCH AS CANCER, HEART DISEASE AND HIGH BLOOD PRESSURE

RISKY SEXUAL BEHAVIORS, UNINTENDED PREGNANCIES, MISCARRIAGE AND STILLBIRTH

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BINGE DRINKING IS THE MAIN PROBLEM

OVER 90% OF EXCESSIVE DRINKERS BINGE DRINK

1 IN 6 MORE THAN 30 MILLION U.S. ADULTS BINGE DRINK

BINGE DRINKERS GO TO WORK 4 TIMES A MONTH

BINGE DRINKERS AVERAGE 8 DRINKS PER BINGE

MOST PEOPLE WHO BINGE DRINK ARE NOT ALCOHOL DEPENDENT OR ALCOHOLICS


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Alcohol and COVID-19: what you need to know

Under no circumstances should you drink any type of alcoholic product as a means of preventing or treating COVID-19 infection. Consumption of alcohol WILL NOT protect you from COVID-19.

- Avoid alcohol altogether**
If you are not well, avoid alcohol. It can worsen your symptoms and health and may not put you at the lowest risk of death.
- Do not use alcohol as a way of dealing with your emotions and stress**
Alcohol is not a solution and drinking too much increases the risk of death. Please call a health professional if you have suicidal thoughts.
- Reach out for help**
If you think you're drinking or that drinking is causing you stress or you're in need of support.
- Never mix alcohol with medications**
Some alcohol can interact with certain medications, including those used to treat COVID-19, and may cause serious side effects or even death. Please call a health professional if you have any questions.
- Avoid alcohol as a social cue for smoking**
Alcohol and smoking are both harmful to your health. Avoiding alcohol and smoking together can help reduce the risk of COVID-19.
- Make sure that children and young people do not have access to alcohol**
Alcohol is not a solution for children and young people. The health of your children, and the well-being of your community, depends on responsible drinking and moderation. Please call a health professional if you have any questions.
- Discuss with children and young people the problems associated with drinking and COVID-19**
Talk to your children and young people about the risks of alcohol and smoking, and how to stay safe during the pandemic.

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COVID and Alcohol Consumption

- Alcohol was consumed 1 day more per month by 3 of 4 adults
- In the Understanding America Study, U.S. adults reported increases in the number of drinking days. Increases were sustained among males, white, and older adults
- Among Canadian adults, self-reported increased alcohol consumption was associated with anxiety, depression, and self-perceived loneliness during the pandemic
- 539 participants completed longitudinal surveys in the UK during the pandemic. Increased alcohol consumption was associated with personal coping motives, anxiety, and drinking at home alone or with others.
- U.S. Veterans reported significant decrease in alcohol use and binge drinking

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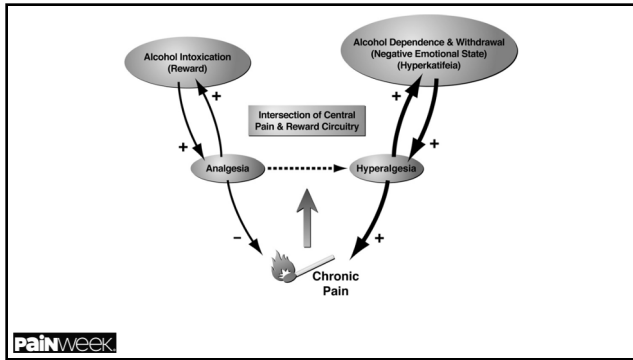
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Alcohol Consumption **Pain**



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Acute Consumption

<ul style="list-style-type: none"> ▪ Intoxication – Reward – Stimulation – Impairment – Analgesia 	<ul style="list-style-type: none"> ▪ Withdrawal – CNS/ANS hyperexcitability – Anxiety – Sleep disturbances – Dysphoria – Hypermalgesia
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Analgesic Effects

- Increased pain tolerance to electrical stimulation with IV alcohol (1g/dl)
- Increased analgesic response among those with family history of AUD and high neuroticism
- Analgesia to electric shock pain and mechanical pressure pain with oral alcohol administration
- Acute ingestion stimulates release of endogenous opioids

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Co-Occurring Alcohol Use and Pain

- Problem drinkers are more likely to report pain conditions and hyperalgesia
- Alcohol dependence is an important risk factor for pain severity after injury
- A positive family history of alcoholism is associated with heightened pain sensitivity
- Vulnerability to alcohol dependence is proportional to alcohol's pain alleviating effects
- 73% of patients who identified alcohol as their drug of choice in SUD treatment also reported moderate-to-severe past-month pain
- 25% of patients with pain endorse heavy drinking
- Patients with back or neck pain may be twice more likely to meet criteria for AUD



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Biopsychosocial Factors

- Men are more likely to drink to cope with pain
- Older adults with pain are more likely to have drinking problems
- Obesity is a risk factor for chronic low back pain and AUD
- Family history of AUD is also prevalent in patients with chronic pain
- Prevalence of tobacco smoking is elevated in patients with AUD (90%) and chronic pain (49-68%)
- Among males, pain-related anxiety is associated with alcohol-related consequences and alcohol dependence symptoms

* Zain EI, LaFosse LP, Bismarck J, Meleo SA, Olin JW. Gender differences in associations between pain-related anxiety and alcohol use among adults with chronic pain. Am J Drug Alcohol Abuse. 2018;45(2):479-487.



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Tolerance

- Tolerance to analgesic effects with repeated use
- When alcohol is administered to rats in a liquid diet for 10 days, analgesic effects peak within 2–4 days and subside with continued administration until pain responses return to baseline levels by day 10
- Experiences that sustain or exaggerate alcohol's analgesic effects may involve learned mechanisms



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Withdrawal

- Decreased GABA activity
- Increased glutamate activity
- Upregulated calcium channel activity
- Increased noradrenergic activity
- **INCREASED CNS activity**



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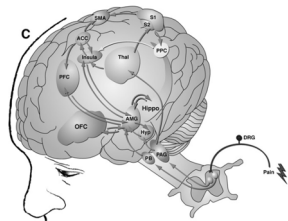
Chronic Excessive Drinking and Alcohol Dependence

- Induces pain and worsens chronic pain conditions
- Withdrawal from chronic use increases pain sensitivity
- Small fiber peripheral neuropathy
 - 25-66% of AUD patients
 - F>M
- Drinking in alcoholics may be motivated by desire to alleviate ethanol withdrawal-induced hyperalgesia



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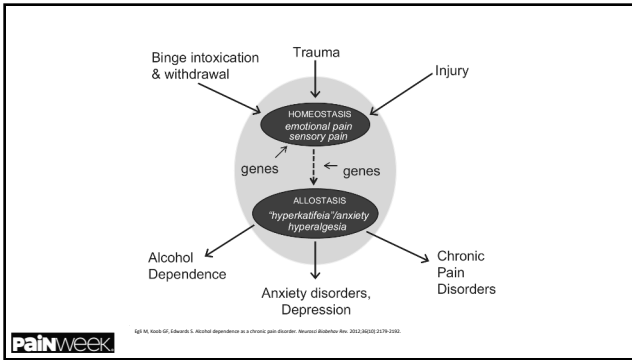
Intersection of Nociception and Alcohol Dependence



Egli M, Koob GF, Edwards S. Alcohol dependence as a chronic pain disorder. *Neurosci Biobehav Rev.* 2012;36(10):2179-2192.



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Alcohol-Induced Painful Conditions

- Alcohol-induced pancreatitis
- Alcohol-related neuropathy (sensory, motor, autonomic)
 - 25-66% of patients with AUD
- Excessive drinking is associated with the development of osteoarthritis and knee pain among men and chronic pain among women
- Excessive drinking is associated with poorer pain-related outcomes after trauma
- Increased risk of traumatic injuries

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What about low-to-moderate alcohol consumption?

- Any alcohol use (vs. none) is associated with 80% reduced risk of developing chronic widespread pain, 25% reduced risk of developing back pain
- Moderate alcohol consumption (vs. none) is associated with 40-70% reduced likelihood of developing disabling back or neck pain and chronic widespread pain
- In patients with fibromyalgia, low-to-moderate alcohol consumption (vs. none) was associated with greater QOL and physical functioning, less missed work, and fewer fibromyalgia symptoms

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How Does Pain Influence Alcohol Consumption?

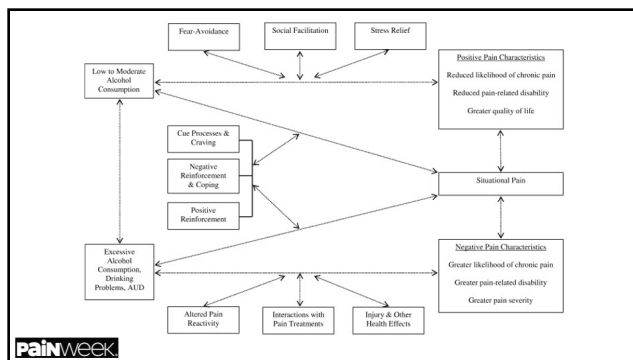
- Among patients with chronic pain, greater pain severity and unpleasantness was associated with increased alcohol consumption
- Older adults with more severe pain and pain-related interference were 20% and 50% more likely to have drinking problems
- Persistent pain is associated with post-AUD treatment alcohol consumption
- Self—medication pain coping strategy?
- Situational motivator- increased motivation to drink in response to pain due to negative (negative affect, stress, craving reduction) or positive reinforcement pathways

—Steeper delay discounting rates are associated with weaker expectancies for alcohol analgesia among men but not women.

1. Pappas G, Vitek D, Williams G, Anderson M, LaPlante L, Dine JM, Stewart B, Bucknerweid J. Sex differences in associations between delay discounting and expectancies for alcohol analgesia. Exp Clin Psychopharmacol. 2021 Aug 19.



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Alcohol and Pain Medications

- NSAIDs- increased risk of GI bleeding
- Acetaminophen-liver toxicity
- Opioids- increased depressive effects
- Benzodiazepines- increased sedative effects



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Alcohol and Prescription Opioids

- 36% of patient receiving prescription opioids consume alcohol
- AUD is more prevalent among those who use prescription opioids
- SUDs including alcohol are the strongest predictors of opioid misuse
- Excessive alcohol use precedes the onset of opioid misuse



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CAGE Questionnaire

2 or more positive responses are strongly associated with alcohol dependence

- Have you ever felt you should **C**ut down on your drinking?
- Have people **A**nnoyed you by criticizing your drinking?
- Have you ever felt bad or **G**uilty 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 (**E**ye opener)?



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Alcohol Use Disorders Identification Test-Concise (AUDIT-C)

1. How often do you have a drink containing alcohol?

<input type="checkbox"/> Never	<input type="checkbox"/> 2-3 times a week
<input type="checkbox"/> Monthly or less	<input type="checkbox"/> 4 or more times a week
<input type="checkbox"/> 2-4 times a month	
2. How many standard drinks containing alcohol do you have on a typical day?

<input type="checkbox"/> 1 or 2	<input type="checkbox"/> 7 to 9
<input type="checkbox"/> 3 to 4	<input type="checkbox"/> 10 or more
<input type="checkbox"/> 5 to 6	
3. How often do you have six or more drinks on one occasion?

<input type="checkbox"/> Daily or almost daily	<input type="checkbox"/> Less than monthly
<input type="checkbox"/> Weekly	<input type="checkbox"/> Never
<input type="checkbox"/> Monthly	



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AUD FDA-Approved Medications (relapse prevention)

- Naltrexone
- Naltrexone IM
- Acamprostate
- Disulfiram



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Oral Naltrexone

- 50 mg/day
- Mu, delta, and kappa opioid receptor antagonist
- Adverse effects
 - Abdominal pain, diarrhea, decreased appetite, nausea
 - Sedation, daytime sleepiness, fatigue, insomnia, headache
 - Elevated LFTs



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Alcohol Detoxification and Gabapentin

- Normalizes alcohol-induced effects on GABA, glutamate
- No hepatic metabolism
- More effective than lorazepam in reducing drinking after detoxification



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Effect of Pain on AUD Treatment

- Reductions in physical pain during AUD treatment predicted lower risk of relapse
- Pain interference and pain intensity at the end of AUD treatment predicted heavy drinking and time to first heavy drinking day during and following treatment



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References

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Ravi Prasad, PhD

Psychological and Behavioral Approaches to Address Alcohol Use Disorder



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The 30,000 Foot Perspective



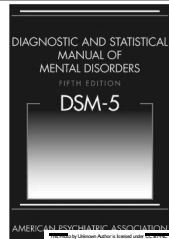
- 95K deaths per year in the US are attributed to excessive alcohol consumption
- Alcohol misuse in the US was associated with a cost of \$249 billion (2010)
- 75% of the above cost is related to binge drinking
- 1 in 6 US adults binge drink --once per week
- 9 of 10 binge drinkers do not have severe AUD



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Alcohol Use Disorder: Diagnostic Criteria (DSM-5)

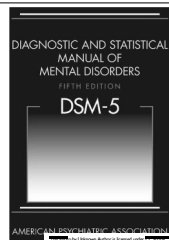
- Problematic pattern of alcohol use leading to clinically significant impairment as evidenced by at least 2 of the following within the last 12 months:
 - Taken in larger amounts or over a longer period than intended
 - Desire/unsuccessful efforts to reduce intake or control use
 - Extensive time spent in activities related to obtaining, using, or recovering from alcohol
 - Presence of craving
 - Failure to fulfill major role obligations secondary to use



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Alcohol Use Disorder: Diagnostic Criteria (DSM-5)

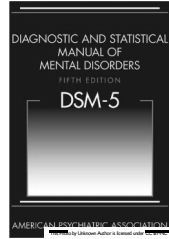
- Problematic pattern of alcohol use leading to clinically significant impairment as evidenced by at least 2 of the following within the last 12 months:
 - Continued use despite negative ramifications
 - Important activities are abandoned because of use
 - Use despite physical/psychological problems caused/worsened by alcohol
 - Use in hazardous situations
 - Tolerance
 - Withdrawal



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Alcohol Use Disorder: Diagnostic Criteria (DSM-5)

- Specify remission status
 - Early remission (sx in 12 mo but not 3)
 - Sustained remission
- Specify severity
 - Mild (2-3 symptoms)
 - Moderate (4-5 symptoms)
 - Severe (6+ symptoms)



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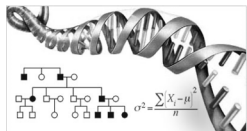
Addressing in Clinical Practice

- Incorporate questions in patient questionnaires
- Consider use of screening tools
- Use information to inform clinical treatment
- Document and track in medical record



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Nature or Nurture?



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Genetics

- Role of adoption studies
- No single addiction or alcoholism gene
- Approximately 50% heritability of AUD



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Environment

- Learning theories shape our responses to environmental stimuli
 - Classical conditioning
 - Operant conditioning
 - Social learning
- Adverse childhood experiences are also associated with substance use behaviors, coping styles later in life



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Nature AND Nurture



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Psychological and Behavioral Interventions

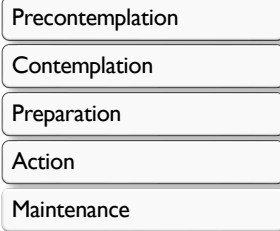
- Motivational interviewing
- Cognitive behavioral therapy
- Contingency management
- Mindfulness approaches
- 12-step model
- Family/systems work



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Motivational Interviewing

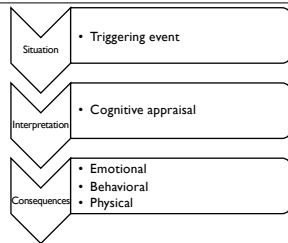
- Facilitates behavioral change
- Relies on intrinsic motivation
- Multiple steps involved
- Efficacy in promoting health behaviors



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Cognitive Behavioral Therapy

- Target thought processes that reinforce maladaptive behavior
- Identification of triggers
 - Psychosocial stressors
 - Physical pain
- Development of strategies to develop healthier responses/relapse prevention



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Contingency Management



- Use of operant learning strategies
- Reinforcement system to encourage abstinence-related behaviors
- Promotes treatment adherence

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Mindfulness Approaches

- Focuses on being in the present moment
- Does not target changing thoughts
- Used to address cravings/responses to triggers



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12-Step Model

- Alcoholics Anonymous
- Accepts powerlessness to control alcohol
- Focus on self-improvement through following The Steps
- No formalized curriculum/clinician facilitator
- Effective for alcohol-related outcomes, supports abstinence



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Family/Systems Work



- Acknowledges inter-relationships between alcohol use and relationship functioning
- Inclusion of spouse can improve treatment outcomes versus individual treatment
- May be challenging to incorporate significant other in counseling process



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Conclusions

- Strong evidence base for psychological/behavioral interventions to address AUD
- Which treatment to include when is determined in initial evaluation
- If AUD and pain are concurrent, both need to be treated
 - Pain low, AUD severe: SUD tx
 - Pain high, AUD severe: SUD tx + interdisciplinary pain tx
 - Pain high, AUD low: Monitor AUD, consider SUD tx, + interdisciplinary pain tx



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