



# Pain and Addiction

**O. Trent Hall, DO**

*Assistant Professor of Addiction Medicine  
Department of Psychiatry & Behavioral Health  
The Ohio State University Wexner Medical Center*

**MedNet21**  
Center for Continuing Medical Education

 **THE OHIO STATE UNIVERSITY**  
WEXNER MEDICAL CENTER

## Objectives

- Define pain and addiction
- Discuss the pain / addiction connection
- Describe the basics of evaluation and management

## What is Addiction?

Addiction is a treatable, chronic medical disease involving complex interactions among **brain circuits**, **genetics**, the **environment**, and an individual's **life experiences**. People with addiction use substances or engage in behaviors that become compulsive and often continue despite harmful consequences. Prevention efforts and treatment approaches for addiction are generally as successful as those for other chronic diseases.

## What is Pain?

**An unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage.**

International Association for the Study of Pain. *IASP terminology*. Available at: <https://www.iasp-pain.org/terminology?navItemNumber=576#Centralsensitization>.

## What is Pain?

- Pain is always a personal experience that is influenced to varying degrees by biological, psychological, and social factors.
- Through their life experiences, individuals learn the concept of pain.
- A person's report of an experience as pain should be respected.

International Association for the Study of Pain. *IASP terminology*. Available at: <https://www.iasp-pain.org/terminology?navItemNumber=576#Centralsensitization>.

## What is Pain?

- Pain is always a personal experience that is influenced to varying degrees by biological, psychological, and social factors.
- Through their life experiences, individuals learn the concept of pain.
- A person's report of an experience as pain should be respected.

International Association for the Study of Pain. *IASP terminology*. Available at: <https://www.iasp-pain.org/terminology?navItemNumber=576#Centralsensitization>.

**When someone with an alcohol or substance use disorder tells you they are in pain...**

**Please Take Them Seriously**

**Patients with pain and addictive disorders...**

- Have worse physical,

## **Patients with pain and addictive disorders...**

- Have worse physical, psychiatric

## **Patients with pain and addictive disorders...**

- Have worse physical, psychiatric, and social functioning

### **Patients with pain and addictive disorders...**

- Have worse physical, psychiatric, and social functioning
- Are more likely to relapse

### **Patients with pain and addictive disorders...**

- Have worse physical, psychiatric, and social functioning
- Are more likely to relapse
- Are more likely to overdose

## **Patients with pain and addictive disorders...**

- Have worse physical, psychiatric, and social functioning
- Are more likely to relapse
- Are more likely to overdose
- Are more likely to die by suicide

Dennis BB, Bawor M, Paul J, et al. The impact of chronic pain on opioid addiction treatment: a systematic review protocol. *Syst Rev*. 2015;4(1):1-9.

Hartz SM, Culverhouse RC, Mintz CM, et al. Association between recent overdose and chronic pain among individuals in treatment for opioid use disorder. *PLOS ONE*. 2022;17(11):e0271379. doi:10.1371/journal.pone.0271379

Larson MJ, Paasche-Orlow M, Cheng DM, Lloyd-Travaglini C, Saitz R, Samet JH. Persistent pain is associated with substance use after detoxification: a prospective cohort analysis. *Addiction*. 2007;102(5):752-760

## **Chronic Pain as a Co-Occurring Disorder in Addiction**

- Between 43 and 73% of alcohol use disorder (AUD) patients have moderate to severe pain.
- The prevalence of pain in the opioid use disorder (OUD) treatment population may be as high as 36-62%.
- Nearly 60% of individuals with tobacco use disorder (TUD) have chronic pain

## **Why are chronic pain and addiction so frequently co-occurring?**

- Negative reinforcement processes
- Genetics, environment, life experiences
- Neurobiology

## **Neurobiological Overlap**

- Chronic pain and substances like alcohol and opioids can change the brain in ways that amplify pain
- Dysfunctional reward system (dopamine)
- Endogenous opioid system
- Brain structures / circuits are shared between addiction and pain (anterior cingulate, insula, central nucleus of the amygdala, etc.)
- Therefore, chronic pain and addiction overlap in how they affect the brain and behavior – ‘Double Hit Hypothesis’



## CNS Pain Sensitization

- Alcohol and substance use can contribute to CNS pain sensitization (aka “Central Sensitization”)
- Neural substrates of central sensitization overlap with those of withdrawal/negative affect
- However, assessment of central sensitization is a challenge in clinical settings.



General Section  
Research Paper

OPEN

**PAIN**<sup>®</sup>  
REPORTS

### Central sensitization in opioid use disorder: a novel application of the American College of Rheumatology Fibromyalgia Survey Criteria

O. Trent Hall<sup>a,\*</sup>, Julie Teater<sup>a</sup>, Kara M. Rood<sup>b</sup>, K. Luan Phan<sup>a</sup>, Daniel J. Clauw<sup>c,d</sup>

Research Paper

**PAIN**<sup>®</sup>

OPEN

### Fibromyalgia predicts increased odds of pain-related addiction exacerbation among individuals with pain and opioid use disorder

Orman Trent Hall<sup>a,\*</sup>, Julie Teater<sup>a</sup>, Parker Entrup<sup>a</sup>, Megan Deaner<sup>a</sup>, Craig Bryan<sup>a</sup>, Steven E. Harte<sup>b</sup>, Chelsea M. Kaplan<sup>d</sup>, Kihn Luan Phan<sup>a</sup>, Daniel J. Clauw<sup>b,c</sup>

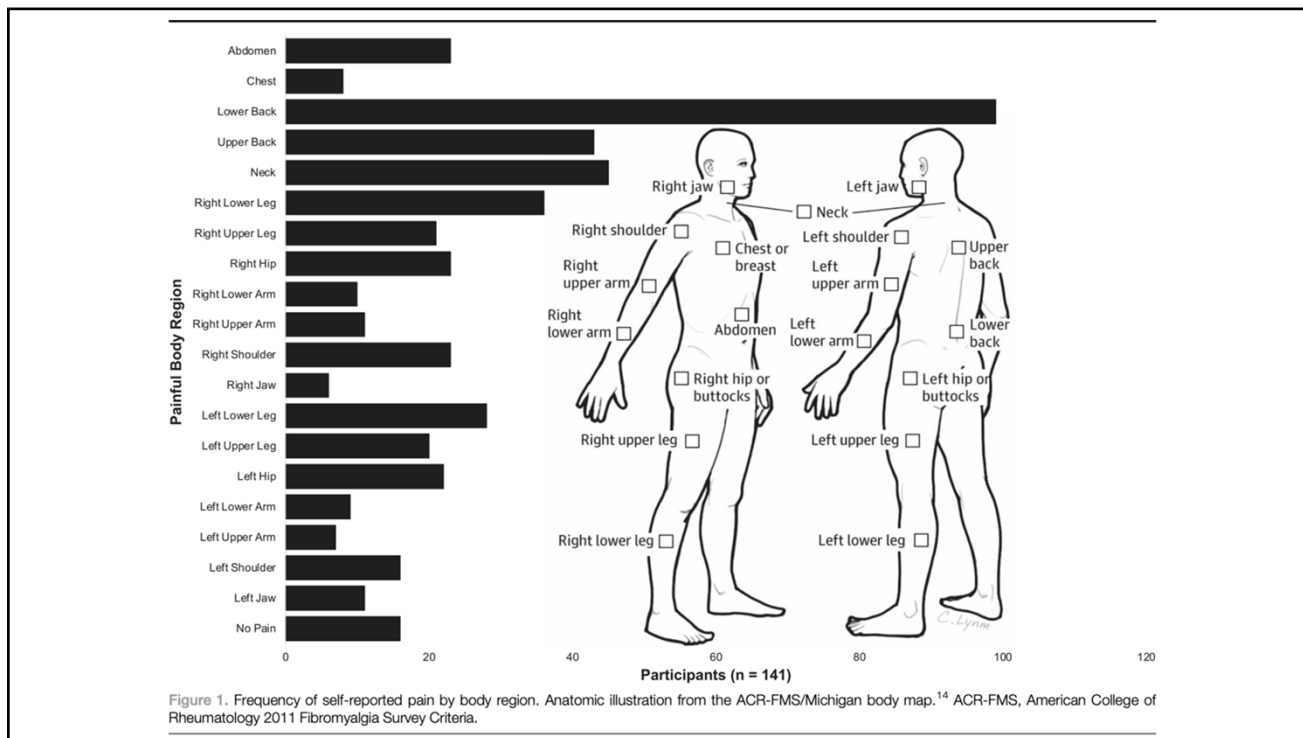


Table 1 - Original Items about Pain and OUD

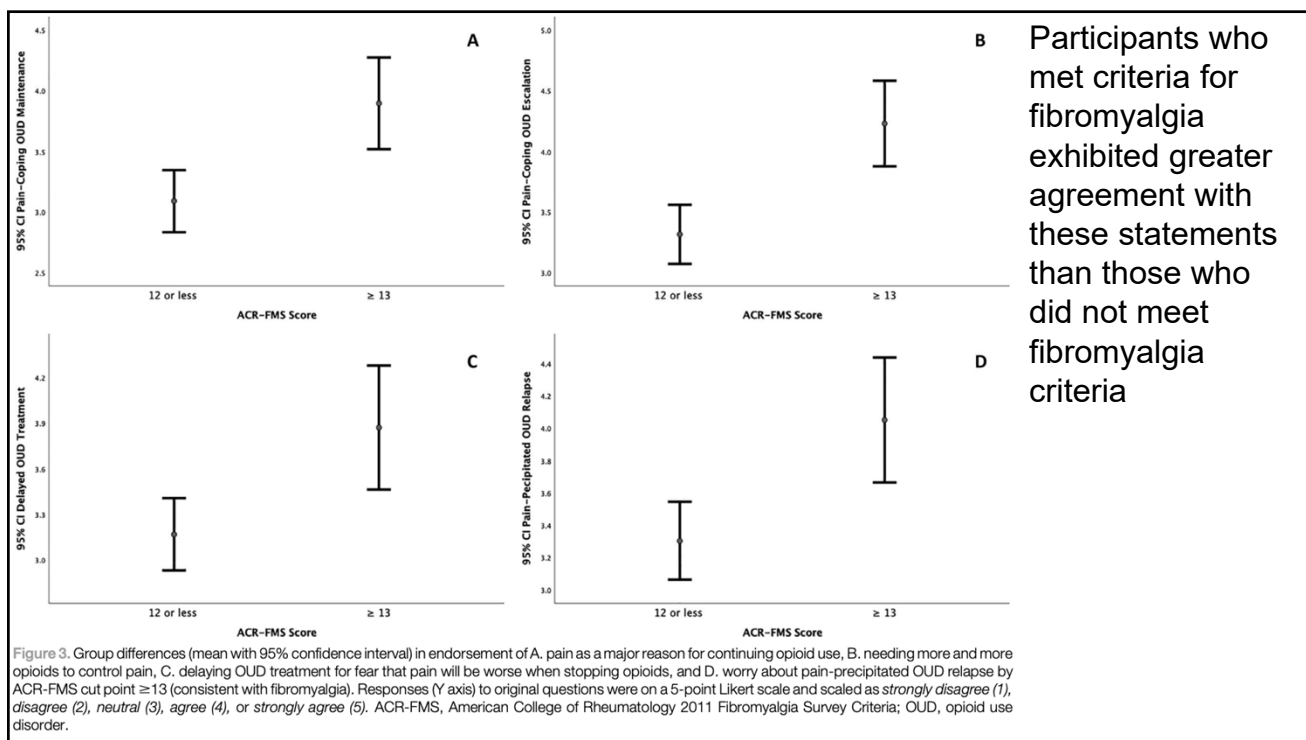
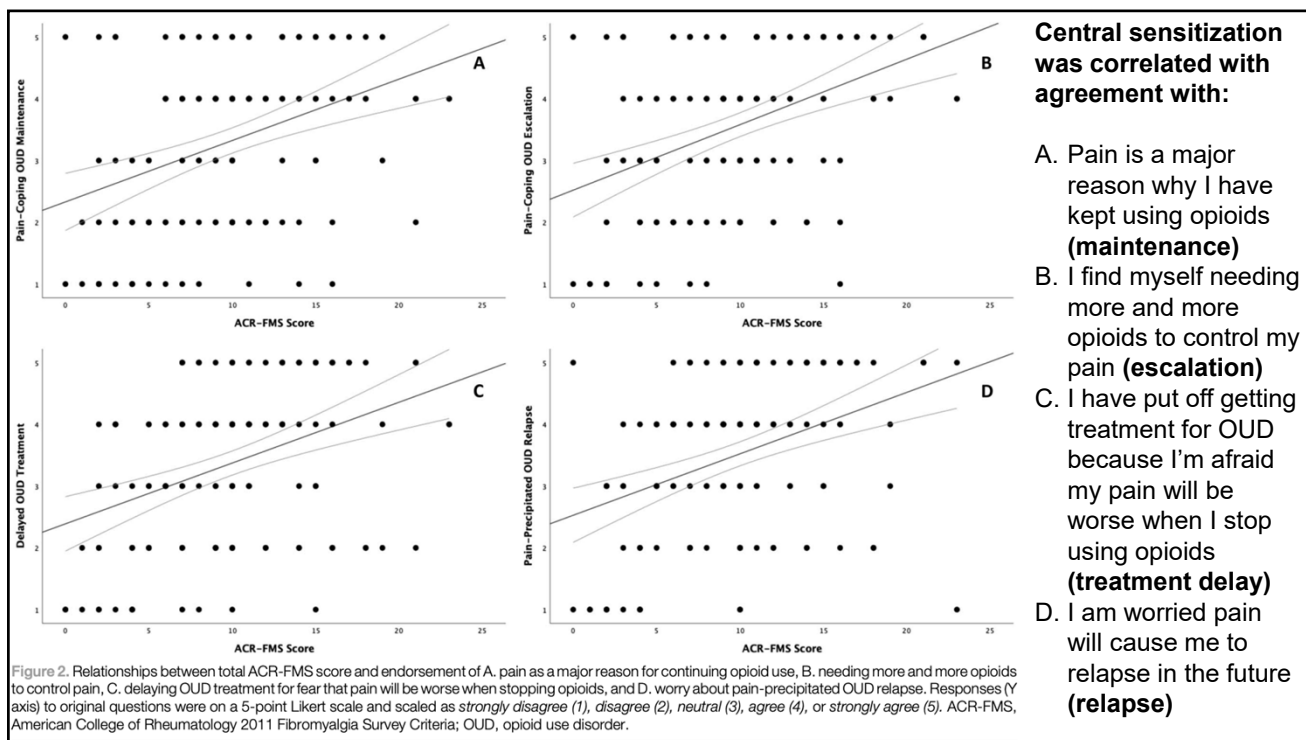
Pain is a major reason why I have kept using opioids.

I find myself needing more and more opioids to control my pain.

I have put off getting treatment for Opioid Use Disorder because I'm afraid my pain will be worse when I stop using opioids.

I am worried pain will cause me to relapse in the future.

Participants were asked "To what degree do you agree or disagree with the following statements?" Responses were scaled as *strongly disagree* (1), *disagree* (2), *neutral* (3), *agree* (4) or *strongly agree* (5).

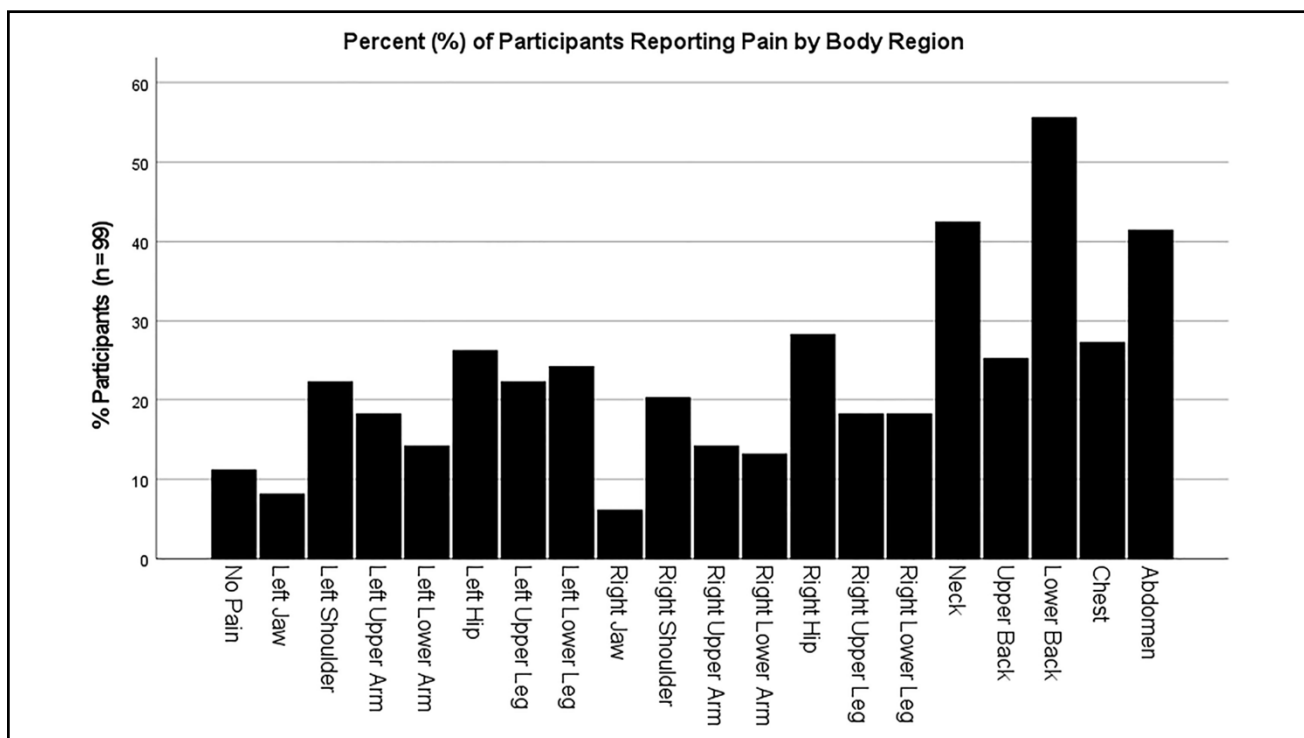


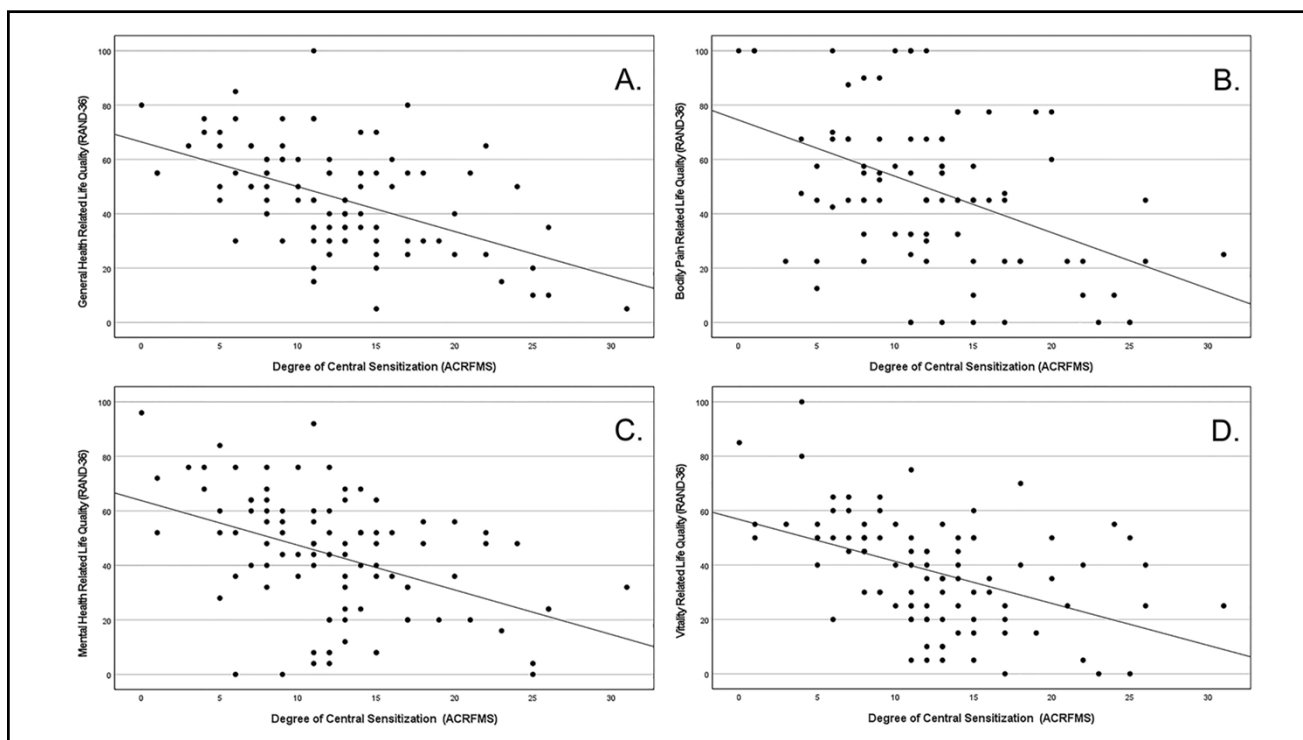
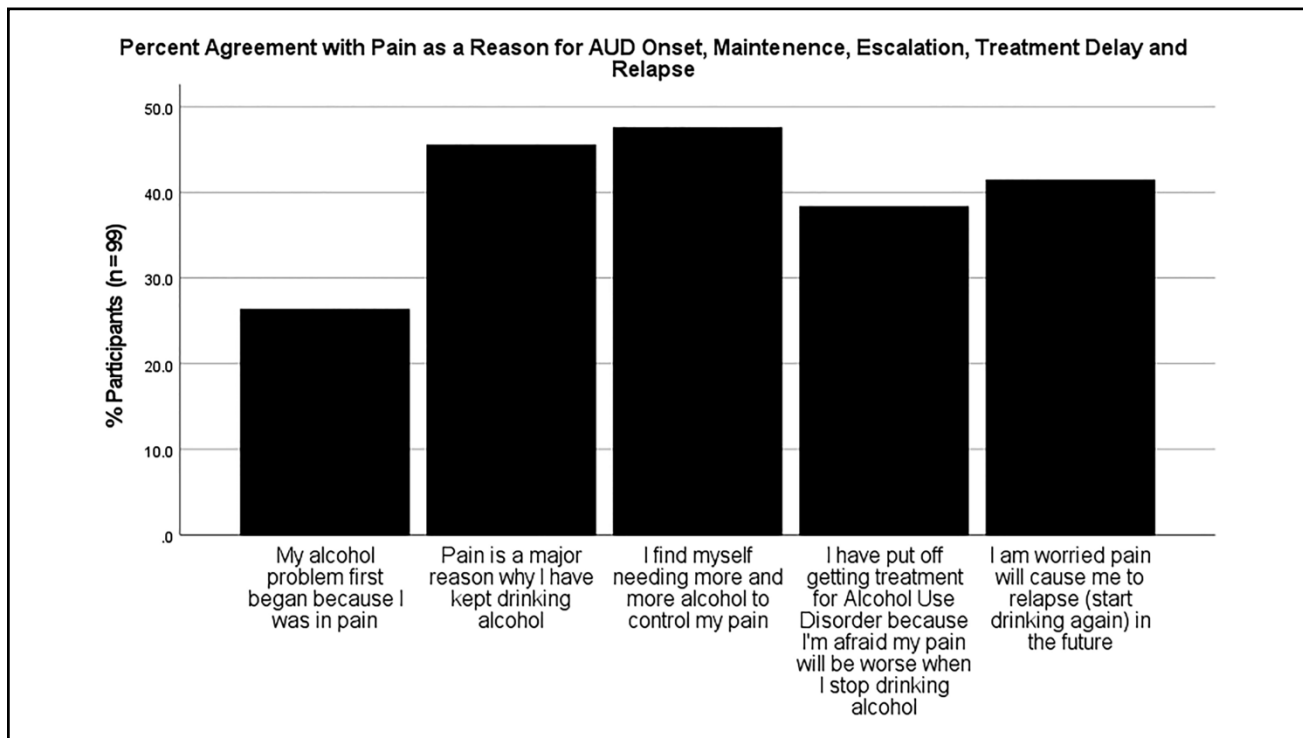
## Central Sensitization in Alcohol Use Disorder: Correlates of Pain, Addiction and Health-Related Quality of Life

We found similar results among patients with **Alcohol Use Disorder** (n = 138)

**Central sensitization** was associated with greater agreement with pain as a reason for the **onset, maintenance, escalation, treatment delay, and relapse of AUD.**

Hall OT, Entrup P, King A, et al. Central sensitization in alcohol use disorder: correlates of pain, addiction and health-related quality of life. *J Addict Dis.* 2023;0(0):1-12. doi:10.1080/10550887.2023.2237396





## Central Sensitization is Associated with Pain-Motivated Drinking in Alcohol Use Disorder

- Manuscript currently under review
- Cross-sectional survey of adults with AUD (n = 138)
- Developed a new scale, the Pain-Motivated Drinking Scale (PMDS)
- Then conducted MHLR to determine if central sensitization was associated with frequency of pain-motivated drinking after controlling for age, gender, race, ethnicity, number of AUD criteria present, depression, anxiety, and pain severity.

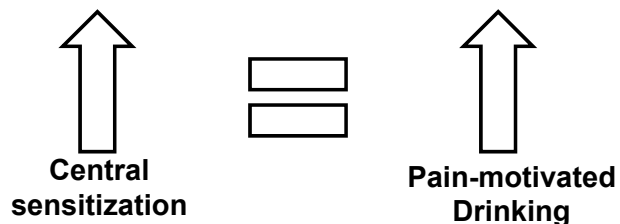
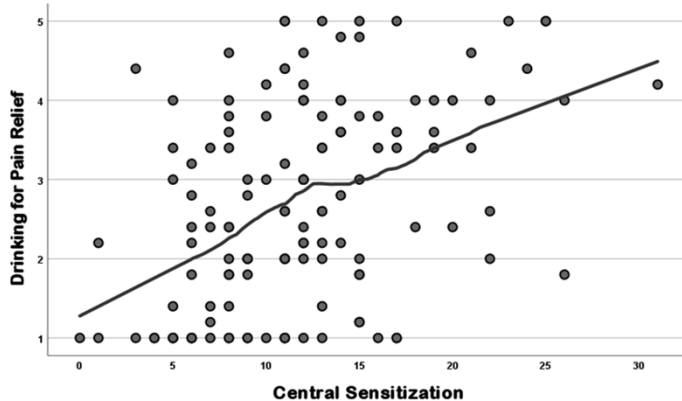
### Central Sensitization is Associated with Pain-Motivated Drinking in Alcohol Use Disorder

Among patients with pain **and** AUD (n = 114), those higher in central sensitization reported they drank more often to relieve pain. This effect was **independent of pain severity**, AUD severity, anxiety, depression and other covariates.

Table 3 - Hierarchical Multiple Regression: Pain-Motivated Drinking Scale.

|         | R    | R <sup>2</sup> | Adj. R <sup>2</sup> | ΔR <sup>2</sup> | ΔF   | P     |
|---------|------|----------------|---------------------|-----------------|------|-------|
| Model 1 | .009 | .000           | -.009               | .000            | .010 | .922  |
| Model 2 | .124 | .015           | -.002               | .015            | 1.72 | .193  |
| Model 3 | .256 | .066           | .013                | .050            | 1.44 | .225  |
| Model 4 | .297 | .088           | .028                | .022            | 2.61 | .109  |
| Model 5 | .309 | .096           | .027                | .008            | .877 | .351  |
| Model 6 | .526 | .277           | .214                | .181            | 26.0 | <.001 |
| Model 7 | .573 | .329           | .263                | .052            | 7.94 | .006  |

Model 1: **age**.  
 Model 2: **age, gender**.  
 Model 3: **age, gender, race, ethnicity**.  
 Model 4: **age, gender, race, ethnicity, Mental Health (RAND-36)**.  
 Model 5: **age, gender, race, ethnicity, Mental Health (RAND-36), AUD severity (DSM-5)**.  
 Model 6: **age, gender, race, ethnicity, Mental Health (RAND-36), AUD severity (DSM-5), Pain severity (RAND-36)**.  
 Model 7: **age, gender, race, ethnicity, Mental Health (RAND-36), AUD severity (DSM-5), Pain severity (RAND-36), Central Sensitization (ACR-FMS)**.



## **Why does this matter?**

## **Why does this matter?**

- Pain mechanism might inform treatment approach

## **Why does this matter?**

- Pain mechanism might inform treatment approach
- Pain that is predominantly related to Central Sensitization is unlikely to respond to peripherally directed interventions (surgery, injections, etc.) and may be worsened by opioid analgesics.

## **Interventions for Central Sensitization**



## **Non-Pharmacological Treatments as a First Step**

- Trustful doctor–patient relationship acknowledging the validity of symptoms
- Communicate neurophysiological mechanisms with the use of simple terminology such as a hyper, sensitized, or fired-up nervous system
- Explanation of treatment strategies
- Realistic expectations
- Promotion of self-management and internal locus of control
- Continued life participation (eg, work, physical, and social activities)
- Exercise, diet, sleep hygiene, stress reduction
- Physical Therapy, Alternative / Complementary Treatments

## **Non-Pharmacological Treatments as a First Step**

- Pain Guide – An education and self-management resource for patient-centered chronic pain care
- Developed by the Chronic Pain and Fatigue Research Center at the University of Michigan
- [Homepage | PainGuide | University of Michigan](#)

## **Psychiatric / Psychological Therapies**

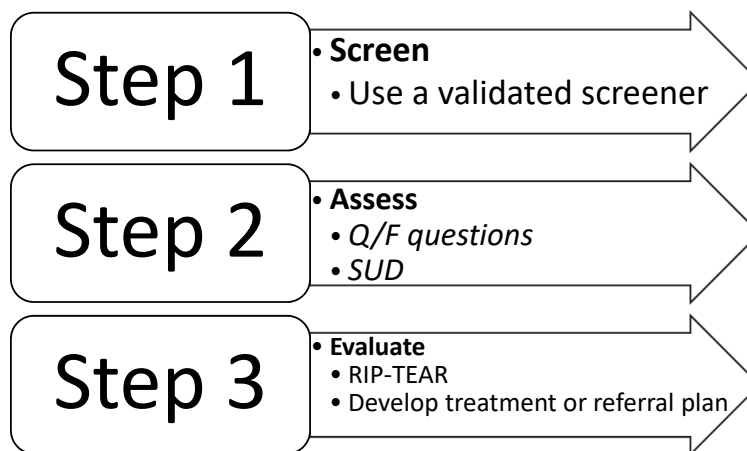
- Cognitive-behavioral therapies
- Acceptance-based therapies
- Treatment of any mental health comorbidities (i.e., depression, anxiety, PTSD)

## **Medications**

- Tricyclic antidepressants
- Serotonin–norepinephrine reuptake inhibitors
- Gabapentinoids and other membrane stabilizers
- Simple analgesics and non-steroidal anti-inflammatory drugs
  - have little effect
- Avoid opioids

# Assessment and Treatment of Addiction

## 3-Step Approach



3-Step Approach used with permission.

The Curbsiders - An Internal Medicine Podcast [Internet]. 2022 [cited 2024 Feb 2]. # 8 Back to Basics: A Stigma-Free History - The Curbsiders. Available from: <https://thecurbsiders.com/addiction-medicine-podcast/8-back-to-basics-a-stigma-free-history>

## **Step 1 – Use a validated screener**

- This can be as easy as asking two simple questions

### **Single Question Substance Use Screener**

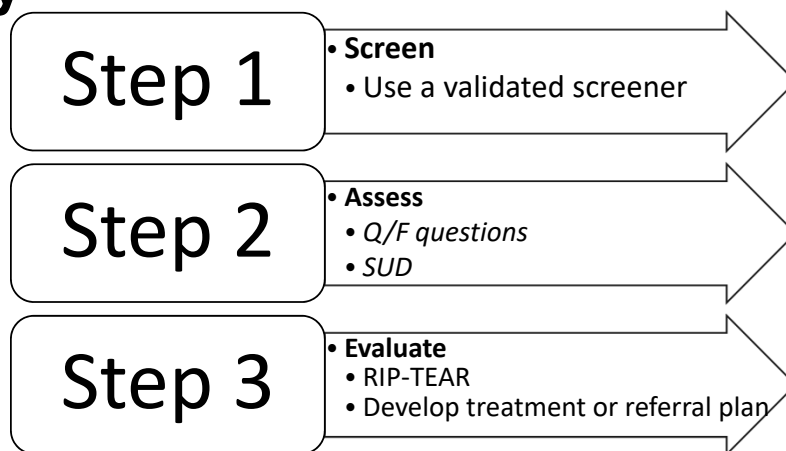
**“How many times in the past year have you used an illegal drug or used a prescription medication for non-medical reasons?”**

- *i.e., used the medication for the feeling or experience it caused?*

## Single Question Alcohol Screener

“How many times in the past year have you had five or more drinks in a day (men) or four or more drinks in a day (women)?”

## 3-Step Approach to a Substance Use History



3-Step Approach used with permission.

The Curbsiders - An Internal Medicine Podcast [Internet]. 2022 [cited 2024 Feb 2]. # 8 Back to Basics: A Stigma-Free History - The Curbsiders. Available from: <https://thecurbsiders.com/addiction-medicine-podcast/8-back-to-basics-a-stigma-free-history>

## Step 2 – Assess Quantity & Frequency

- How often
- How much
- Last use
- First use

## Step 2 – Apply DSM-5 Criteria

### Craving

- Craving
- Tolerance
- Withdrawal

### Loss of Control

- Larger quantity over longer period of time
- Unsuccessful attempts to cutback or control
- Increased time spent

### Consequences

- Failure to fulfill major role obligations
- Social/Interpersonal problems
- Activities given up
- Use in hazardous situations
- Physical and psychological consequence

3-Step Approach used with permission.

The Curbsiders - An Internal Medicine Podcast [Internet]. 2022 [cited 2024 Feb 2]. # 8 Back to Basics: A Stigma-Free History - The Curbsiders. Available from: <https://thecurbsiders.com/addiction-medicine-podcast/8-back-to-basics-a-stigma-free-history>

## Step 3 – Evaluate (RIP-TEAR)

| Framework            | Related Questions   |
|----------------------|---|
| Risks of current use | Are there immediate risks to address? History of overdose, IV use, use of multiple substances, acute withdrawal |
| Initiation           | When did the substance use start?   |
| Pattern              | What is the quantity and frequency of substance use?  |
| Treatment            | Have there been prior treatment episodes? With what?  |
| Effects              | What are the positive and negative effects of substance use?  |
| Abstinence           | Have there been prior periods of not using? How long did they last?   |
| Return to use        | What factors can help prevent return to substance use?  |

RIP-TEAR used with permission.

The Curbsiders - An Internal Medicine Podcast [Internet]. 2022 [cited 2024 Feb 2]. # 8 Back to Basics: A Stigma-Free History - The Curbsiders. Available from: <https://thecurbsiders.com/addiction-medicine-podcast/8-back-to-basics-a-stigma-free-history>

## Step 3 – Evaluate (Treatment & Referral Plan)

- Medications
- Multimodal pain management plan
- Mutual aid (AA, NA, SMART Recovery)
- Psychosocial treatment

### **Step 3 – Evaluate (Treatment & Referral Plan)**

- Medications for OUD
- Buprenorphine
- Methadone
- IM Naltrexone

### **Step 3 – Evaluate (Treatment & Referral Plan)**

- Medications for AUD
- PO or IM Naltrexone
- Acamprosate
- Disulfiram



## **Step 3: Develop a treatment or referral plan**

- Medications
- Multimodal pain management plan
  - Therapies (PT/OT/Complementary/Pain Psychology)
  - Adaptive equipment / ergonomic evaluation
  - Interventional procedures / surgical evaluation if needed
  - Non-opioid analgesics
  - Exercise regimen
  - Digital therapeutics (Pain Guide)
- Mutual aid (AA, NA, SMART Recovery)
- Psychosocial treatment

## **Bibliography**

Full bibliography available in the webcast downloads for this program.