



WASHINGTON STATE UNIVERSITY  
**College of Nursing**

# Problematic Substance Use in Adults with Chronic Pain

**Ross J. Bindler, PharmD**  
Research Investigator  
Office of Research and Scholarship

# Disclosures

- Funding sources:
  - **Washington State Health Care Authority (K6375)**
    - Principal Investigator: Marian Wilson (marian.wilson@wsu.edu)
  - American Society for Pain Management Nursing
  - National Institutes of Health
  - Washington State Initiative 502
  - Washington State University's Alcohol and Drug Addiction Research Program



WSU

# Objectives

1. Recognize current trends in substance use among adults with chronic pain.
2. Understand how to access and utilize substance use risk assessment tools and harm reduction resources.
3. Apply risk assessment and harm reduction principles during the pain management care process.

# Chronic Pain

- In 2021 nearly 21% of adults in the U.S. (over 50 million) suffered from some form of chronic pain [Rikard, 2023] which had increased to over 24% by 2023 [Lucas, 2024].
- It has been estimated that chronic pain cost the U.S. around \$723 billion each year [Guy, 2025]:
  - \$531 billion directly for medical care, and
  - \$192 billion from lost work or other challenges.
- Chronic pain is also associated with elevated levels of [Mills, 2019; De La Rosa, 2024]:
  - Mental health concerns including substance misuse,
  - Social dysfunction, and
  - Occupational challenges.

# Chronic Pain and Substance Use

- Although individual rates vary by report, roughly 50% of adults with a substance use disorder (SUD) experience chronic pain while slightly lower numbers (16% to 48%) of those with chronic pain have a concurrent SUD [Wyse, 2021].
- Individuals with chronic pain are up to two times more likely to use substances, including prescription medications, than those without chronic pain [Alford, 2016; Shmagel, 2016].
  - Most commonly reported substances include cannabis, opioids (heroin, fentanyl, and prescription), cocaine, methamphetamines, and alcohol.
- Presence of chronic pain greatly increases the risk of polysubstance use [Ripon, 2025].

WWSU

# What is “Problematic Use”?

“Substance use disorder is a complex condition in which problematic patterns of substance use may interfere with a person’s life and lead to physical and/or psychological dependence and withdrawal symptoms. It is commonly known as addiction or *problematic use* of substances and can range from mild to severe.”

*American Psychiatric Association, DSM-5, 2018*



# 11 DSM-5 Criteria for SUD Adapted from McNeely, 2024

## Impaired Control Over Use:

- Impaired control: Taking substance(s) in larger amounts or for longer than intended.
- Unsuccessful cut down: Persistent desire or failed attempts to cut down or control use of the substance(s).
- Time spent: Great deal of time spent obtaining, using, or recovering from use of the substance(s).
- Craving: Intense desire or urge to use the substance(s).

## Social Impairment:

- Role obligation failure: Inability to fulfill one's major obligations at work, school, or home due to use of the substance(s).
- Social or interpersonal problems: Continue use of the substance(s) despite persistent social or interpersonal problems.
- Reduced activities: Reduction or discontinuation of important social, occupational, or recreational activities due to use of the substance(s).

# 11 DSM-5 Criteria for SUD Adapted from McNeely, 2024

## Risky Use:

- Risky use: Recurrent use of the substance(s) in physically hazardous situations.
- Physical and/or psychological problems: Continued use despite knowledge of having physical or psychological problem(s) likely caused or exacerbated by the substance(s).

## Physiologic/Pharmacologic:

- Tolerance: Individual needs an increasingly higher dose of the substance(s) to achieve the desired effect, or the usual dose has a reduced effect.
- Withdrawal: Development of a collection of signs and symptoms that occur when blood/tissue levels of the substance(s) decrease.
  - Often use of the substance(s) relieve the signs and symptoms.

# DSM-5 Severity Scale for SUD

- **Mild:** Presence of 2 to 3 criteria.
- **Moderate:** Presence of 4 to 5 criteria.
- **Severe:** Presence of 6 or more criteria.

In a large study (N>2,000) of adults in primary care centers throughout the eastern U.S., nearly 36% met criteria for an SUD and nearly 22% were evaluated as either Moderate or Severe (which is over 60% of those with an SUD) [Wu, 2017].

# The 4Cs approach

A simple way to describe problematic substance use that may have a negative impact on a person:

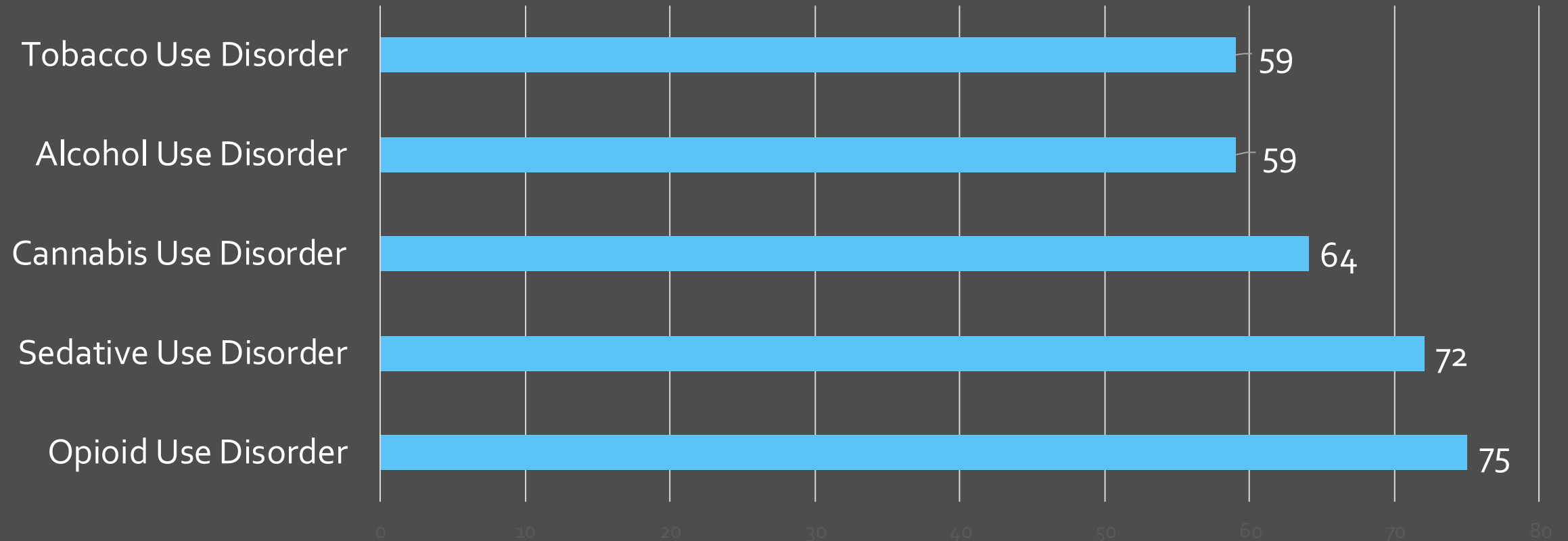
- **Craving:** Strong need to use the substance.
- **Control:** Difficult controlling how much or how often the substance is used.
- **Compulsion:** Feeling urges to use the substance.
- **Consequences:** Continuing to use the substance despite negative outcomes

Centre for Addiction and Mental Health, 2025



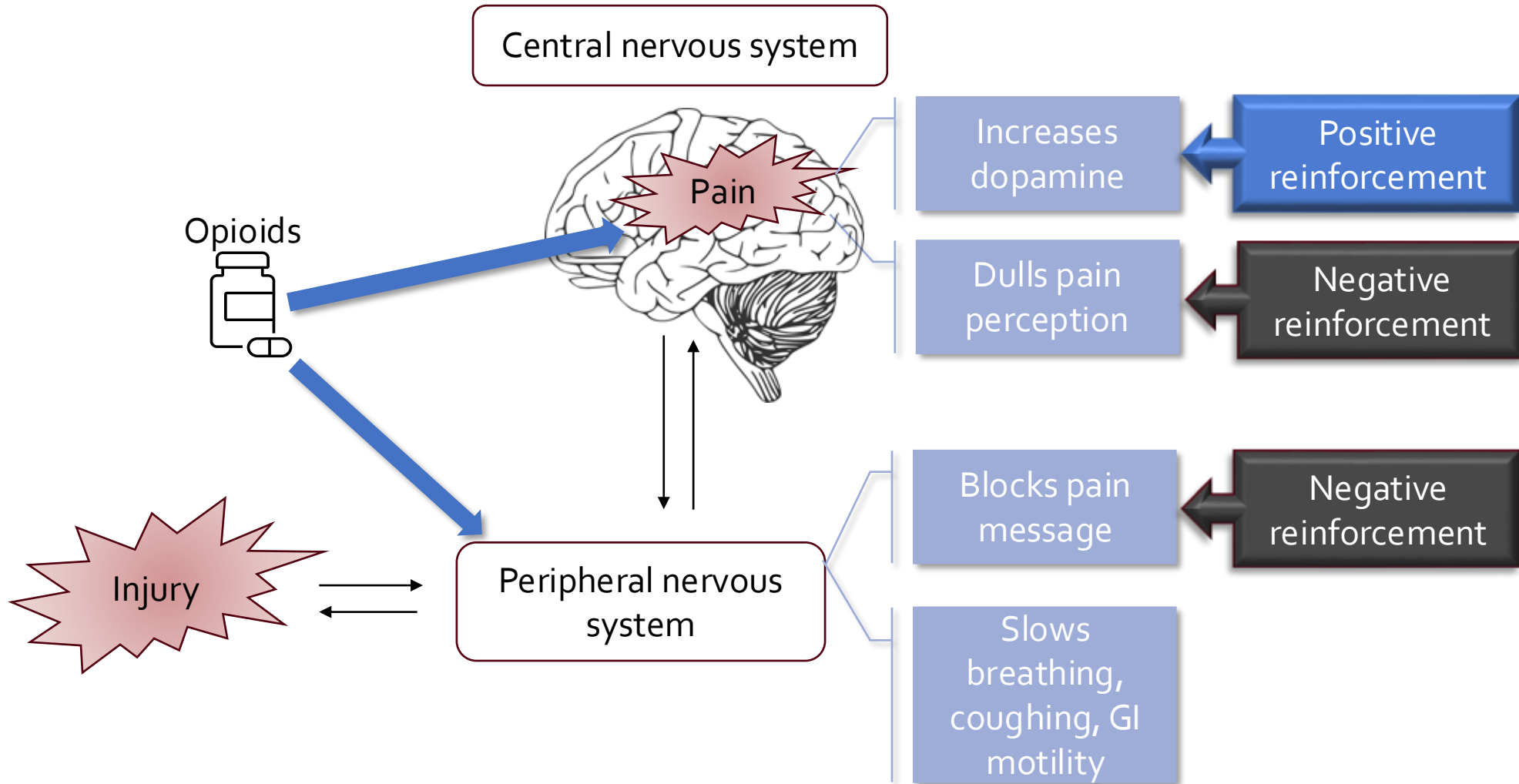
# Pain Promotes and Reinforces Substance Use

Percent with Concurrent Chronic Pain



Most (>50%) U.S. adults with a substance use disorder (alcohol, tobacco, cannabis, sedatives, opioids) have a concurrent chronic pain condition [John & Wu, 2020].

# Positive & Negative Reinforcement

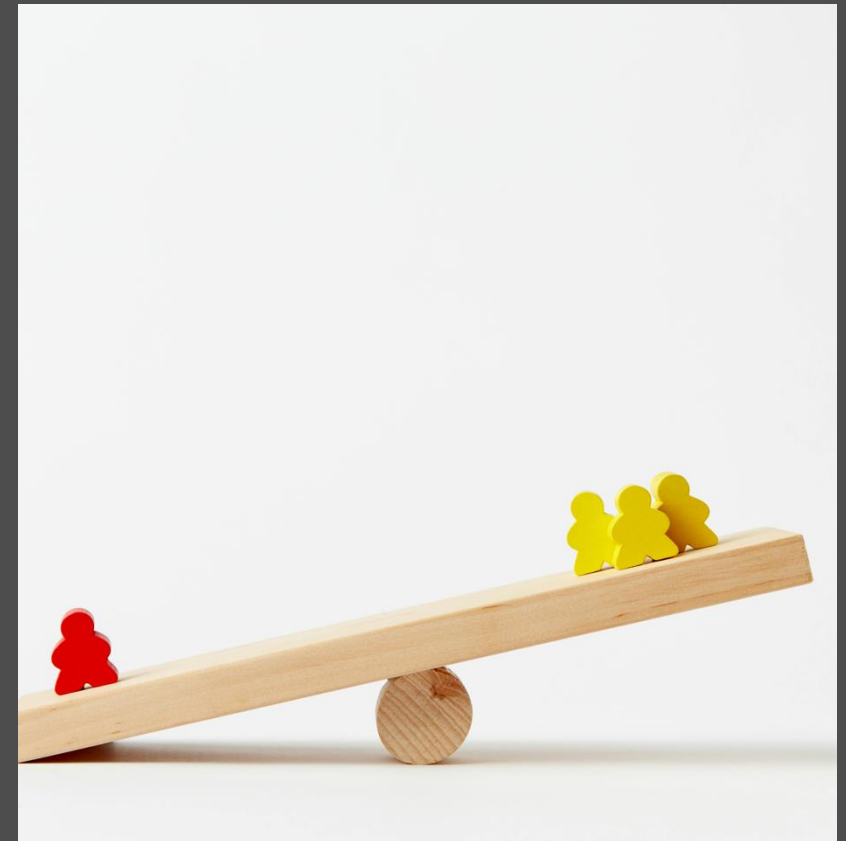


# Bidirectional Relationship Between Substances and Pain

**TOBACCO:** Moderate to severe pain may contribute to risk of initiating and maintaining daily smoking; smoking may contribute to risk of developing moderate or severe pain. Emotional pain is a possible explanation [Costa, 2025].

**ALCOHOL:** Individuals with chronic pain often consume alcohol for its short-term analgesic effects; alcohol exacerbates pain-related distress, can initiate or worsen pain, and elevates the risk of developing alcohol use disorder. Uncertainty-related anxiety provides a possible explanation [Radoman, 2025].


**CANNABIS:** Pain can drive cannabis use and co-use of cannabis and tobacco more than doubled the odds of experiencing moderate to severe pain later on in life; cannabis may worsen pain long term. Withdrawal one possible explanation [Rubenstein, 2025].



# Substance Use may Interfere with Pain Management

- Pain is underappreciated as a trigger for substance use (not only intensity and interference).
- Pain treatments may be less effective in the context of substance use:
  - Lower hydrocodone plasma levels when cannabis consumed may indicate cannabis's effect on metabolism [Bindler, 2022].

## **Drug-Drug Interaction Between Orally Administered Hydrocodone-Acetaminophen and Inhalation of Cannabis Smoke: A Case Report**

Hospital Pharmacy  
1-8  
© The Author(s) 2021  
Article reuse guidelines:  
[sagepub.com/journals-permissions](https://sagepub.com/journals-permissions)  
DOI: 10.1177/00185787211061374  
[journals.sagepub.com/home/hpx](https://journals.sagepub.com/home/hpx)  


- High need for non-pharmacologic options (deemed at least as effective as opioids for most types of pain).
- Recommendations 1 and 2 in Center for Disease Control and Prevention's (CDC) guidelines for prescribing opioids for pain [Dowell, 2022]:
  - Recommendation 1: Maximize use of non-pharmacologic and non-opioid pharmacologic therapies.
  - Recommendation 2: Non-opioid therapies are preferred for subacute and chronic pain.

# Risk Summary

- Regular use of substances may lead to the development of SUDs in someone with chronic pain especially when utilized directly for pain relief and/or as a coping mechanism.
- Use of substances may contribute to the development of **higher tolerance** and **dependence** when being utilized for pain relief.
- Risks are higher in those with a **history** of problematic substance use or previous misuse.
- Chronic pain history is a significant factor associated with increased rates of **polysubstance use**, especially in individuals with **depressive** and **anxiety** symptoms.

*There is a **high likelihood** of undertreated, problematic substance use within the populations you interact with everyday.*

Ripon, 2025: Data used from the National Health and Nutrition Examination Study (NHANES)

# The good news...



We all have the power to make a difference each time a person tells you that they have pain.



# What's your plan for assessment?

Deliberately plan to assess substance use in your setting:

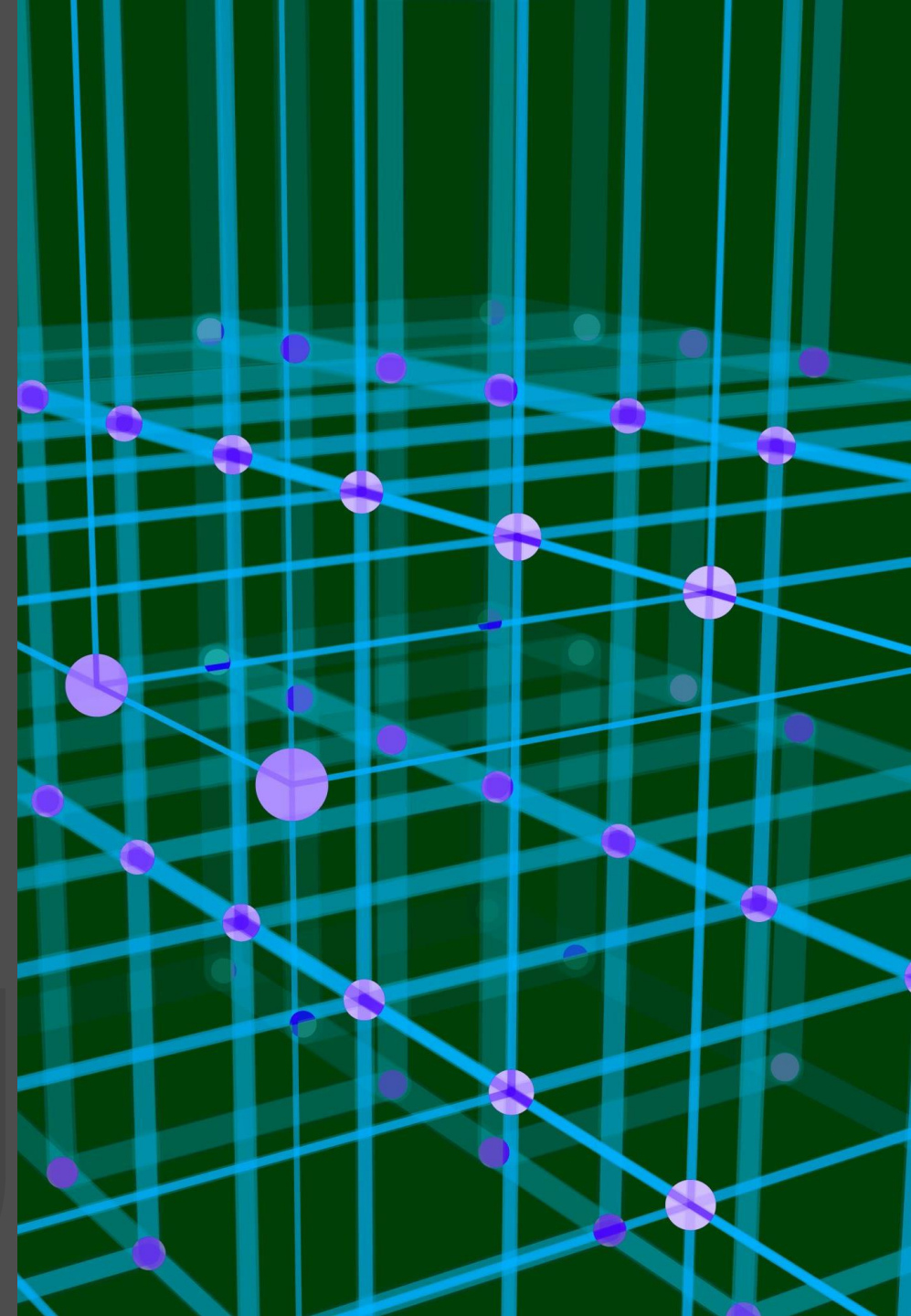
- **Universal implementation** of a brief screening tool for self-reported substance use is recommended.
- Screening, Brief Intervention, and Referral to Treatment (SBIRT): <https://www.samhsa.gov/substance-use/treatment/sbirt>
  - Full summary of SBIRT in SAMHSA's TAP 33.
- Modeling videos and additional SBIRT resources: <https://www.sbirtoregon.org/>



# Brief screen

Make it easy on yourself...

- Find validated tools to integrate into your workflow:
  - Examples of available tools:  
<https://nida.nih.gov/nidamed-medical-health-professionals/screening-tools-resources/chart-screening-tools>
- Create a process for follow up:
  - Full screen
  - Brief intervention or brief treatment
  - Referral to treatment
  - Further check in



## Screening tools

Tool	Substance type		Patient age		How tool is administered	
	Alcohol	Drugs	Adults	Adolescents	Self-administered	Clinician-administered
Screening to Brief Intervention (S2BI)	X	X		X	X	X
Brief Screener for Alcohol, Tobacco, and other Drugs (BSTAD)	X	X		X	X	X
Tobacco, Alcohol, Prescription medication, and other Substance use (TAPS)	X	X	X		X	X
Alcohol Screening and Brief Intervention for Youth: A Practitioner's Guide (NIAAA)	X			X		X
Opioid Risk Tool - OUD (ORT-OUD) Chart		X	X		X	

## Screening to Brief Intervention (S2BI)

This screening tool consists of frequency of use questions to categorize substance use by adolescent patients into different risk categories. The accompanying resources assist clinicians in providing patient feedback and resources for follow-up.

### Screening Tool Cutoffs and Scoring Thresholds:

Intended use: This screening tool is meant to be used under a medical provider's supervision and is not intended to guide self-assessment or take the place of a healthcare provider's clinical judgment.

This tool may be administered by either the patient or the clinician. Please indicate the mode of administration:

I AM THE PATIENT

I AM THE CLINICIAN

## TAPS

Tobacco, Alcohol, Prescription medication, and other Substance use Tool

The Tobacco, Alcohol, Prescription medication, and other Substance use (TAPS) Tool consists of a combined screening component (TAPS-1) followed by a brief assessment (TAPS-2) for those who screen positive.

This tool:

- Combines screening and brief assessment for commonly used substances, eliminating the need for multiple screening and lengthy assessment tools
- Provides a two stage brief assessment adapted from the NIDA quick screen and brief assessment (adapted ASSIST-lite)
- May be either self-administered directly by the patient or as an interview by a health professional
- Uses an electronic format (available here as an online tool)
- Uses a screening component to ask about frequency of substance use in the past 12 months
- Facilitates a brief assessment of past 3 months problem use to the patient

A positive TAPS finding corresponded with a SUD nearly 50% of the time [Wu, 2017].

# Tobacco Risk Level: In Early Remission, But at Risk

## Implications

Since the patient reports tobacco use during the past 12 months, they may still be at risk for adverse outcomes despite no use in the past 3 months and may meet DSM-5 criteria for Tobacco Use Disorder.

## Suggested Action



The suggested action for a “no recent (i.e. no past 3 months) tobacco use” result is to give positive reinforcement to maintain abstinence. Ask additional questions to determine use frequency and patterns in the previous time periods in order to better determine risk level.

- Since the patient reports tobacco use in the past 12 months, consider exploring the severity of tobacco use through a clinical interview either using questions from the Fagerstrom Test for Nicotine

Dependence or DSM-5 Tobacco Use Disorder criteria.

- Personalize the prevention message as much as possible.
  - For example: support recent abstinence, identify the impact of tobacco use on medical conditions, depression as a risk for relapse to tobacco use, etc.
- Offer a referral for counseling or a support group to maintain abstinence.

# Assessment in Action: TAPS

Video available: <https://vimeo.com/953726959/8c94a59798?share=copy>

Adult seeking care: John

Chief complaint: Lower leg pain following a fall from a ladder while cleaning out his home's gutters.

Diagnosis: Uncomplicated tibia-fibula fracture.

Medication: OTC ibuprofen & hydrocodone/APAP

Thoughts on tool?

\*TAPS tool begins at 4:29 mark of the video.



# A new option: *Relief Pain Hub*



<https://www.painreliefwa.org/>



Account

Welcome, lostwoodswilson



In crisis? Get help now

Home

Pain Management ▾

Assessments & Tools ▾

Opioid Safety ▾

Community ▾

***PAIN IS A PERSONAL EXPERIENCE.  
WE ARE HERE TO HELP.***

**COMPLETE A SELF-ASSESSMENT**

*to receive personalized feedback*

# The RELIEF Project

Resources and Education Leading to Improved Pain Care Equity For Washingtonians

Training and education necessary to reduce inappropriate prescriptions as well as **maintaining pain care access *safely*** for people who need opioids.

1. Develop a web-based central repository of resources for pain self-management for patients, providers and community members.
2. Offer evidence-based programs to help primary care providers better manage people with pain, allowing them to continue to provide care to their patients on chronic opioid therapy.
3. Develop and disseminate web-based opioid and pain prevention training for all WA state health science students.



*Better pain management is  
harm reduction*



## ***GET STARTED***

Our platform offers self-assessment tools to help you understand your pain, progress tracking to monitor your journey, and expert-backed pain management strategies. By registering, you can earn points while accessing valuable tools to take control of your pain. Start exploring today and take the first step toward better pain management.



### ***SELF-ASSESSMENT***

We offer a range of self-assessment tools designed to help you better understand your pain. These easy-to-use tools allow you to evaluate the nature and intensity of your pain and related impacts.

[Learn More](#)



### ***TRACK YOUR PROGRESS***

By registering with Relief Pain Hub, you can earn points every time you visit, take assessments, and utilize the resources available. Start your journey towards better pain management today.

[Learn More](#)



### ***PAIN MANAGEMENT***

Relief Pain Hub is your comprehensive guide to understanding and managing both chronic and acute pain. Our goal is to provide you, with the most up-to-date, evidence-based information.

[Learn More](#)

# Main Categories



Account

Welcome, lostwoodswilson



Logout

Home

Pain Management ▾

Assessments & Tools

Opioid Safety ▾

Education & Resources ▾

Acute Pain

Types of Pain

Healthy Living >

Medical Interventions >

Movement Therapies >

Pain Coping Methods >

## ACTIVITY PACING



ACTIVITY PACING FOR PAIN MANAGEMENT

## RESOURCES



SIX EMOTIONS THAT DRIVE CHRONIC PAIN

US Pain Foundation



BREATHING MEDITATION (5 MINUTES)

UCLA Mindfulness Center



LOVING KINDNESS MEDITATION (11 MINUTES)

UCLA Mindfulness Center



FIVE PROVEN RELAXATION TECHNIQUES TO REDUCE CHRONIC PAIN

Southern Pain and Neurological



GRATITUDE JOURNAL

Therapist Aid



MEDITATION TO CONTROL YOUR EMOTIONS

Declutter Your Mind

# Multidimensional Pain Assessments



## WELLBEING

Your wellbeing is a crucial component of your pain management plan. Feelings of stress, anxiety, and depression have been shown to make pain feel worse and increase your pain's interference with your life. Wellbeing and emotions can also reduce your ability to self-manage your pain while lowering your quality of life. Regular assessment and tracking of these emotions can help indicate your progress over time.

- ✓ **Patient Health Questionnaire 2 (PHQ-2):** A two-question assessment tool that helps evaluate depressive symptoms. The PHQ-2 is designed to be taken every two weeks (14-days).

Complete PHQ-2 Assessment

- ✓ **Generalized Anxiety Disorder 2 (GAD-2):** A two-question assessment tool that helps evaluate anxiety symptoms. The GAD-2 is designed to be taken every two weeks (14-days)

Complete GAD-2 Assessment

- ✓ **World Health Organization's Five Well-Being Index (WHO-5):** A five-question assessment tool that is used to measure your current overall wellbeing. It is designed to be completed every two weeks (14-days).

Complete WHO-5 Assessment

## PAIN TYPES

Identifying the type(s) of pain impacting your day-to-day life can be an important part of creating a successful management plan. There are many different types of pain; for example, it can be described by location (where does it hurt?), duration (how long has it hurt?), and cause (why does it hurt?) among others. Many people have more than one type of pain.

- ✓ **Pain Duration:** How long have you been dealing with your pain? Identifying acute and sub-acute (short-term) pain from chronic (long-term) pain can help develop an appropriate management plan.

Complete Duration Assessment

- ✓ **Neuropathic Pain:** Does your pain include a nerve or neuropathic component? Neuropathic pain, described as pain originating from a damaged or malfunctioning nervous system (such as fibromyalgia, post-shingles pain, diabetic neuropathy, and many others) can feel different from other painful medical conditions and have specific treatments. The Neuropathic Pain Assessment (DNA) is a tool that can help indicate the presence of neuropathic pain.

Complete Neuropathic Pain Assessment

## PAIN INTENSITY AND INTERFERENCE

Pain intensity is simply how much your pain hurts while pain interference is the degree that your pain impacts your ability to participate in, and complete, tasks such as activities of daily living and engaging in those that bring you joy.

- ✓ **Pain, Enjoyment of Life and General Activity (PEG) Assessment:** A brief, three-question assessment tool known as the "Pain, Enjoyment of Life, and General Activity" scale. The PEG-3 can be used to monitor your pain's intensity and interference with your life. It is designed to be taken every week (7-days). Completing it regularly can help you track any progress you are making with your pain management plan. Use this tool to help set priorities and see where to start with your pain relief plan.

Complete PEG Assessment

- ✓ **Patient-Reported Outcomes Measurement Information System (PROMIS) Pain Intensity Assessment:** We have included two assessments that can be used to evaluate your pain's intensity over the past week (7-days): 1) a single-question with a 0 to 10 scale, and 2) a three-question assessment tool.

Complete PROMIS 3a Assessment

- ✓ **PROMIS Pain Interference Assessment:** This assessment can be used to evaluate the consequences of pain on relevant aspects of one's life including the extent to which pain hinders engagement with social, cognitive, emotional, physical, and recreational activities.

Complete PROMIS 4a Assessment

## HEALTHY LIVING

Your pain can impact additional areas of your life including sleep, physical function, and substance use. Similar to evaluating your wellbeing, it is important to monitor additional areas as part of your overall pain management plan.

- ✓ **PROMIS Sleep Disturbance:** A four-question assessment tool that is designed to evaluate your sleep quality. It can be taken weekly (7-days).

Complete Sleep Disturbance Assessment

- ✓ **PROMIS Physical Function:** A four-question assessment tool evaluating your ability to complete physical functions. Although there is no specific recall period, it can be completed weekly (7-days).

Complete Physical Function Assessment

- ✓ **CAGE-AID:** A four-question assessment tool that is designed to identify potential substance use problems, including alcohol and other drugs.

Complete Substance Use Assessment

- ✓ **Brief Screener for Tobacco, Alcohol, and other Drugs (BSTAD)**

Complete Substance Use Risk Assessment

# Relief Pain Hub Content

- Oriented to those with pain, community, and professionals
- Internal and external vetted resources
- Videos in English and Spanish with downloadable transcripts that can be translated further
  - Movement therapies [Yoga, Physical therapy]
  - Psychological therapies [Cognitive Behavioral and Acceptance & Commitment Therapy]
  - Relationships [Social support, Professionals]
  - Symptom management [Sleep, Mood]
- Tracking and reporting tools to promote patient communication
- Accessible with smart phone, laptop/desktop, iPad, etc.



WSU

# Opioid-Specific Harm Reduction Resources



Account

Welcome, lostwoodswilson



Logout

Home

Pain Management ▾

Assessments & Tools ▾

Opioid Safety ▾

Education & Resources ▾

The Benefits and Risks of  
Opioids for Pain  
Management

Opioid Overdose –  
Administering Naloxone  
(Narcan)

What is Opioid Use  
Disorder?

Find Treatment

# Educational Resources

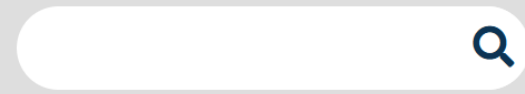


Account

Welcome, lostwoodswilson



Logout



In crisis

Home

Pain Management ▾

Assessments & Tools ▾

Opioid Safety ▾

Education & Resources ▾

Education >

Health Science Students

Research >

Professional Resources

Events / Classes

Pain Support Organizations

Learn

# For Healthcare Professionals

## *HOW TO USE THE RELIEF PAIN HUB*



Introduction to the RELIEF Pain Hub - Professionals

Washington State University CON



Introduction for Health Professionals



*INTRODUCTION TO THE RELIEF PAIN HUB - PROFESSIONALS*

# Professional Tools

## Weekly Pain Record

Date - Time	Pain Type	Pain Location	Potential Cause(s)	Duration	PEG Scale Scores			Action(s)	Result(s)
					Intensity	Enjoyment	General Activity		



### LEARNING & PRACTICE MODULES

GOAL:			
MODULE NAME	CLINICIAN RECOMMENDS	PATIENT RESULTS	
ACUTE PAIN			
TYPES OF PAIN			
<b>MEDICAL INTERVENTIONS</b>			
- Medical and Physical Approaches			
- Medications			
- Supplemental Health Products			
<b>MOVEMENT THERAPIES</b>			
- Yoga			
- Activity Pacing			
- Exercise			
- Physical Therapy			
- Tai Chi			
<b>PAIN COPING METHODS</b>			
- Acceptance & Commitment Therapy			



# Substance Use Assessment

SELF-ASSESSMENTS			
ASSESSMENT NAME	CLINICIAN RECOMMENDS	DATE COMPLETED	RESULT(S)
<b>PAIN TYPE</b>			
- Duration Assessment			
- Neuropathic Pain			
<b>PAIN INTENSITY &amp; INTERFERENCE</b>			
- General Pain Assessment (PEG)			
- PROMIS Pain Intensity			
- PROMIS Pain Interference			
<b>WELLBEING</b>			
- Depressive Symptoms (PHQ-2)			
- Anxiety Symptoms (GAD-2)			
- General Well-being (WHO-5)			
<b>HEALTHY LIVING</b>			
- Sleep Disturbances			
- Physical Function			
- Substance Use (CAGE-AID)			

# ***CAGE-AID Assessment***

The CAGE Adapted to Include Drugs (CAGE-AID) Questionnaire is an adaptation of the CAGE for the purpose of conjointly screening for alcohol and drug problems. The CAGE-AID focuses on lifetime use. When thinking about drug use, include illegal drug use and the use of prescription drug use other than prescribed.

**Have you ever felt that you ought to CUT DOWN on your drinking or drug use?** (Required)

Yes  No

**Have people ANNOYED you by criticizing your drinking or drug use?** (Required)

Yes  No

**Have you ever felt bad or GUILTY about your drinking or drug use?** (Required)

Yes  No

**Have you ever had a drink or used drugs first thing in the morning to steady your nerves or to get rid of a hangover (EYE OPENER)?**

(Required)

Yes  No

Submit

# Gamification



**Complete the “Pain Intensity & Interference: PROMIS 4a Assessment”**

Relief Points Award

May 16, 2025

5 Relief Points

**Complete the “Healthy Living: PROMIS Physical Function Assessment”**

Relief Points Award

May 16, 2025

5 Relief Points

**Complete the “Pain Intensity & Interference: PROMIS 3a Assessment”**

Relief Points Award

May 16, 2025

5 Relief Points

**Complete the “Pain Types: Neuropathic Pain Assessment”**

Relief Points Award

May 16, 2025

5 Relief Points

**Complete the “Pain Types: Duration Assessment”**

Relief Points Award

May 16, 2025

5 Relief Points



## **KNOWLEDGE SEEKER**

As a Knowledge Seeker, you are expanding your understanding of pain management and making valuable contributions to our discussions. Your efforts are making a significant impact, and we are grateful to have you as part of our community.

**Earn this rank after attaining 100 Relief Points**



# Does eHealth and mHealth Work?

- 17 RCTs with chief findings [Moman, 2019]:
  - eHealth and mHealth interventions had significant effects on multiple short- and intermediate-term pain outcome measures.
- Widespread and available at low/no cost.
- Clinicians treating patients with chronic pain should consider using eHealth and mHealth interventions as part of a multidisciplinary pain treatment strategy.

## A Systematic Review and Meta-analysis of Unguided Electronic and Mobile Health Technologies for Chronic Pain—Is It Time to Start Prescribing Electronic Health Applications? [Get access >](#)

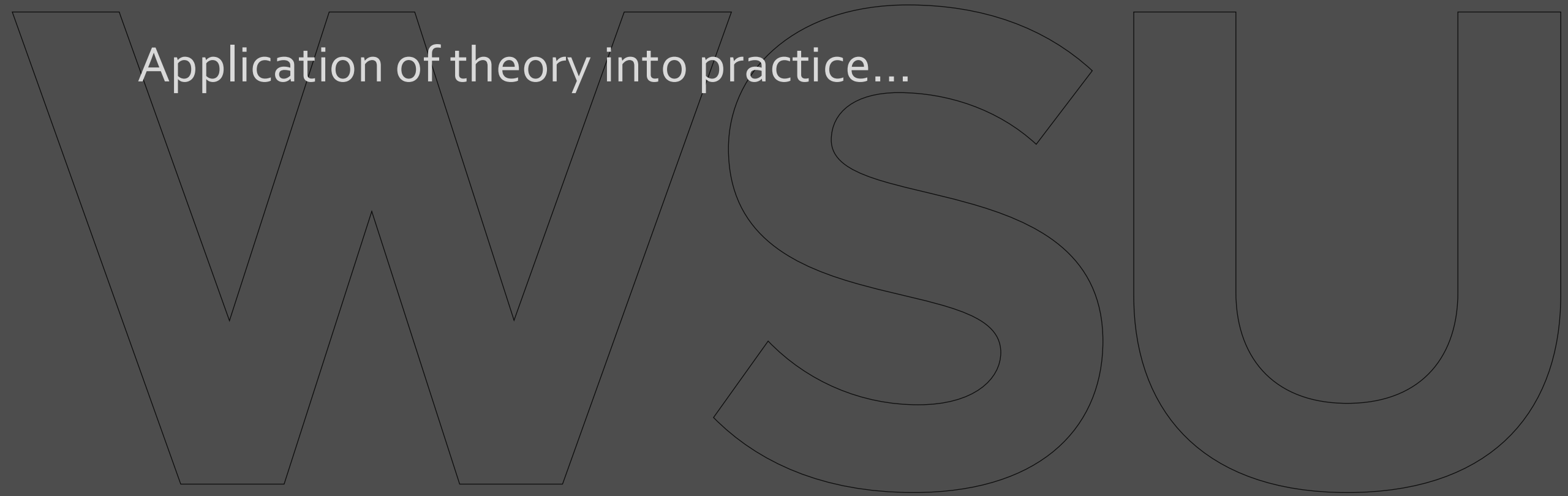
Rajat N Moman, MD, MA ✉, Jodie Dvorkin, MD, MPH, E Morgan Pollard, MD, Robalee Wanderman, MD, M Hassan Murad, MD, David O Warner, MD, W Michael Hooten, MD

*Pain Medicine*, Volume 20, Issue 11, November 2019, Pages 2238–2255,  
<https://doi.org/10.1093/pm/pnz164>

**Published:** 06 August 2019

# *Why* does eHealth and mHealth work?

■  
Application of theory into practice...



# Theoretical Background for Pain Self-Management

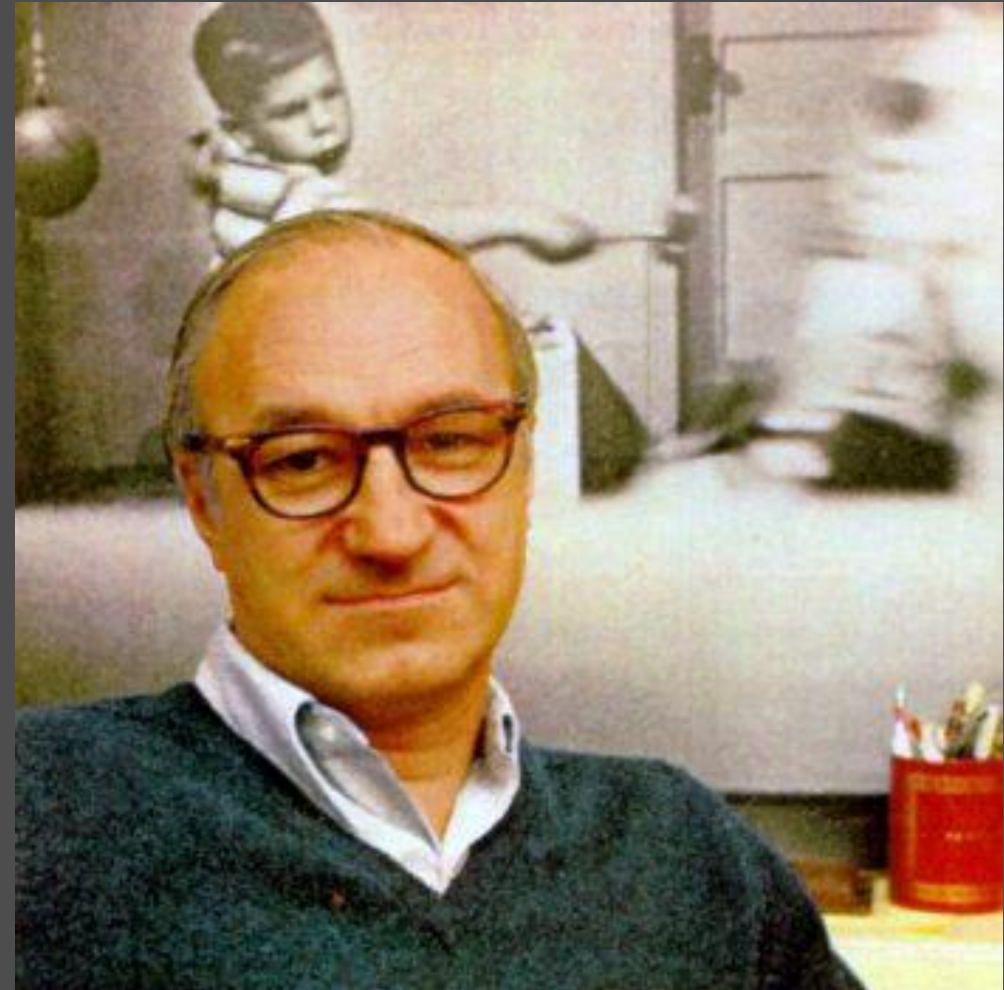
Self-efficacy =  
confidence to carry out a behavior  
necessary to reach a desired goal.

Confidence in controlling pain  
experiences can have positive impact  
on physical & psychological  
functioning.

Gatchel, 2007

Self-efficacy plays a role in substance  
use treatment success too!

Stewart, 2023



*"May the efficacy force be with you."*

Dr. Albert Bandura

Dec 04, 1925 - Jul 26, 2021

## Activity Tracker Pilot

### Join our study

Improving Activity in Adults with Chronic Pain: Self-Directed versus Guided Support with Online Resources



Researchers at Washington State University Spokane are seeking adults with chronic pain who are interested in increasing their activity level to participate in a research project.

All participants will be provided access to a new online pain management resource and randomized to self-directed resource use or guided support. Everyone will be asked to wear a Fitbit activity tracker and complete three surveys over the course of eight weeks.

#### Those eligible to participate will be:

- Adults (18+) living in the US with a history of chronic pain lasting 3+ months
- Interested in increasing their activity level
- Able to speak and read English
- Willing to provide address for shipment of a Fitbit activity tracker
- Able use the Fitbit application and wear the activity tracker for the majority of study days and nights (8 weeks)
- Free of medical or psychological conditions that prevent participation
- Free of surgical or medical procedures scheduled during the study period

All participants that complete the initial survey will receive a Fitbit to keep and earn a \$10 gift card for completing each additional survey (total \$20).

For additional information, call or email the research team at 509-324-7443 or [Spokane.PainStudy@wsu.edu](mailto:Spokane.PainStudy@wsu.edu) or scan the QR code below.

Principal Investigator Marion Wilson, PhD, MPH, RN, PMGT-BC Washington State University College of Nursing, 509-324-7443, [marion.wilson@wsu.edu](mailto:marion.wilson@wsu.edu).

This study #20309 has been approved by the WSU Institutional Review Board (IRB). If you have questions or concerns about your rights as a research participant in this study, you may contact the WSU IRB at [irb@wsu.edu](mailto:irb@wsu.edu).



# Activity Tracker Pilot

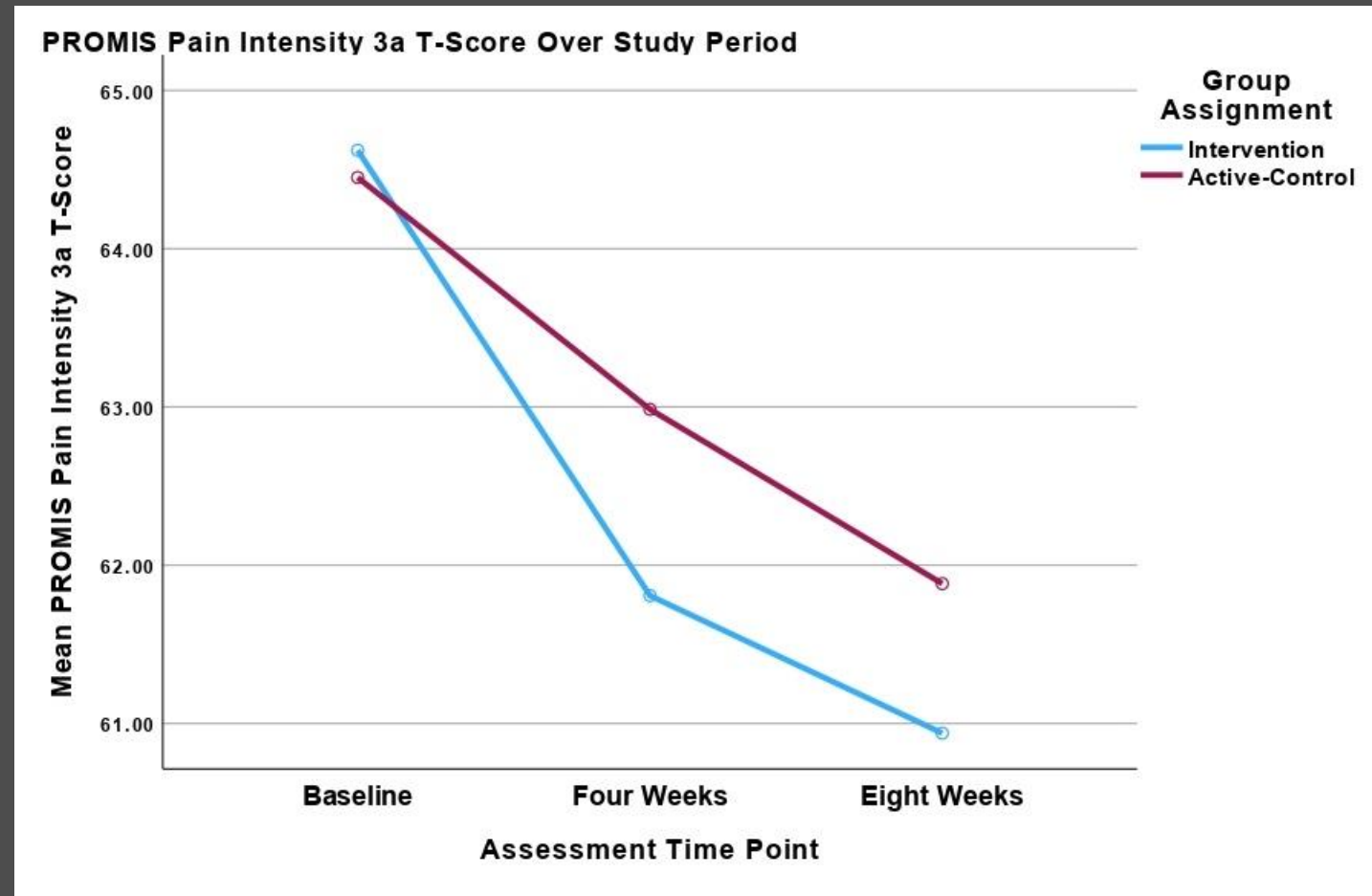
- Fitbit Inspire 3 devices were sent to participants (n=99) after completion of a Baseline Survey.
  - Beta testing provided first opportunity for use of resources by adults with pain
- One week after receipt of the Fitbit, the *Relief Pain Hub* was shared with all participants:
  - Intervention (n=50): received a ***detailed guide*** about suggested use along with optional ***weekly goal setting*** surveys.
  - Active-Control (n=49): received brief information on the *Relief Pain Hub* and general use instructions (e.g. how to create an account).
- Follow-up surveys were sent at Four and Eight Weeks.

# Activity Tracker Pilot: PROMIS Pain Intensity T-Score

	Intervention Mean (SD)	Active-Control Mean (SD)
Baseline	64.62 (4.37) <sup>a, b</sup>	64.45 (5.97)
Four Weeks	61.81 (5.4) <sup>a</sup>	62.99 (7.07)
Eight Weeks	60.94 (6.21) <sup>b</sup>	61.88 (6.63)

<sup>a</sup> -2.81; p=0.004  
<sup>b</sup> -3.68; p=0.002

Recommended minimal important difference: 2 to 5 point change.

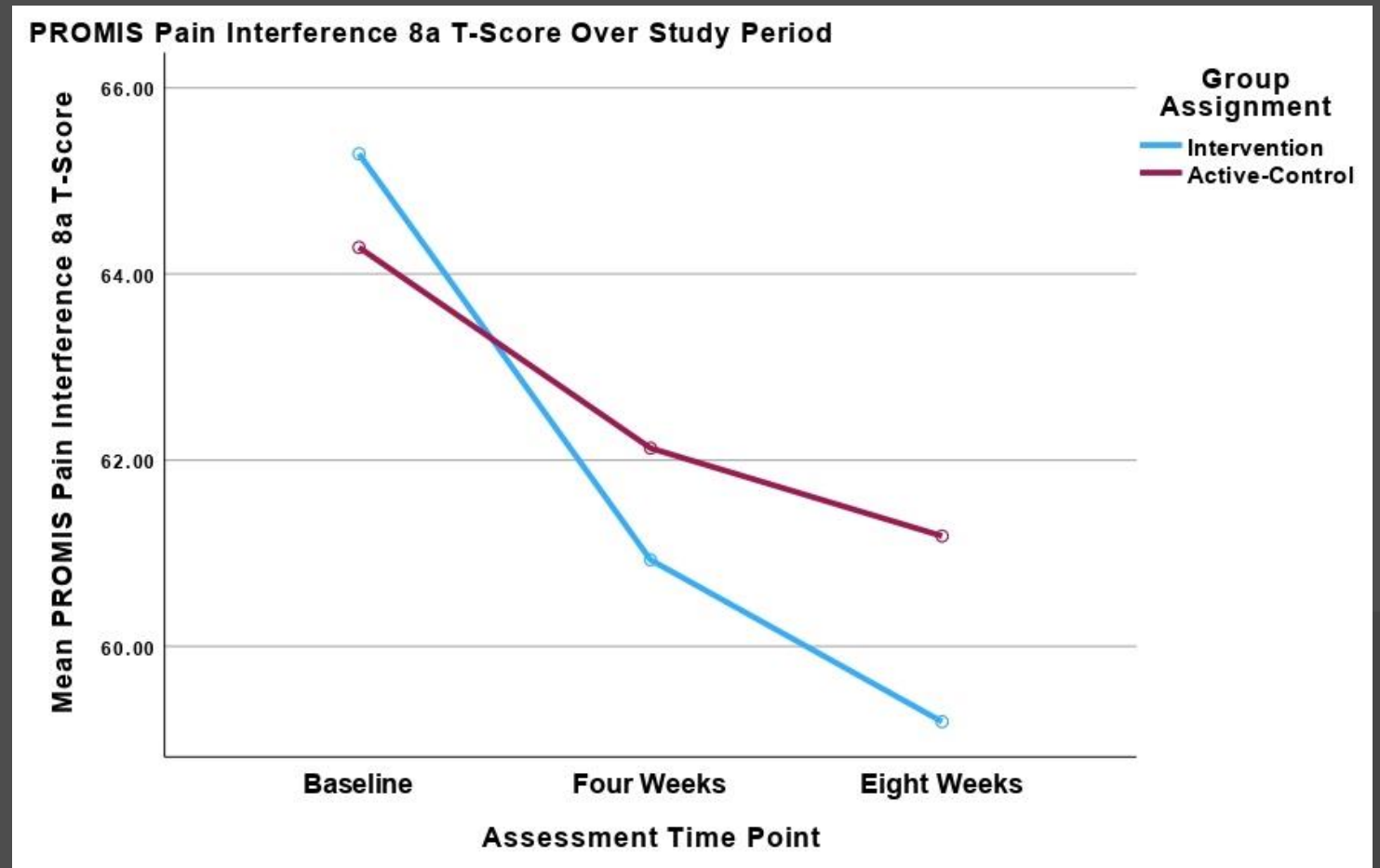


# Activity Tracker Pilot: PROMIS Pain Interference T-Score

	Intervention Mean (SD)	Active-Control Mean (SD)
Baseline	65.29 (6.7) <sup>a, b</sup>	64.29 (6.02) <sup>c</sup>
Four Weeks	60.93 (6.95) <sup>a</sup>	62.13 (7.09)
Eight Weeks	59.19 (4.97) <sup>b</sup>	61.18 (6.8) <sup>c</sup>

<sup>a</sup> -4.36; p<0.001  
<sup>b</sup> -6.1; p<0.001  
<sup>c</sup> -3.1; p=0.007

Recommended minimal important difference: 2 to 5 point change.



# Activity Tracker Pilot: PROMIS Sleep Disturbance T-Score

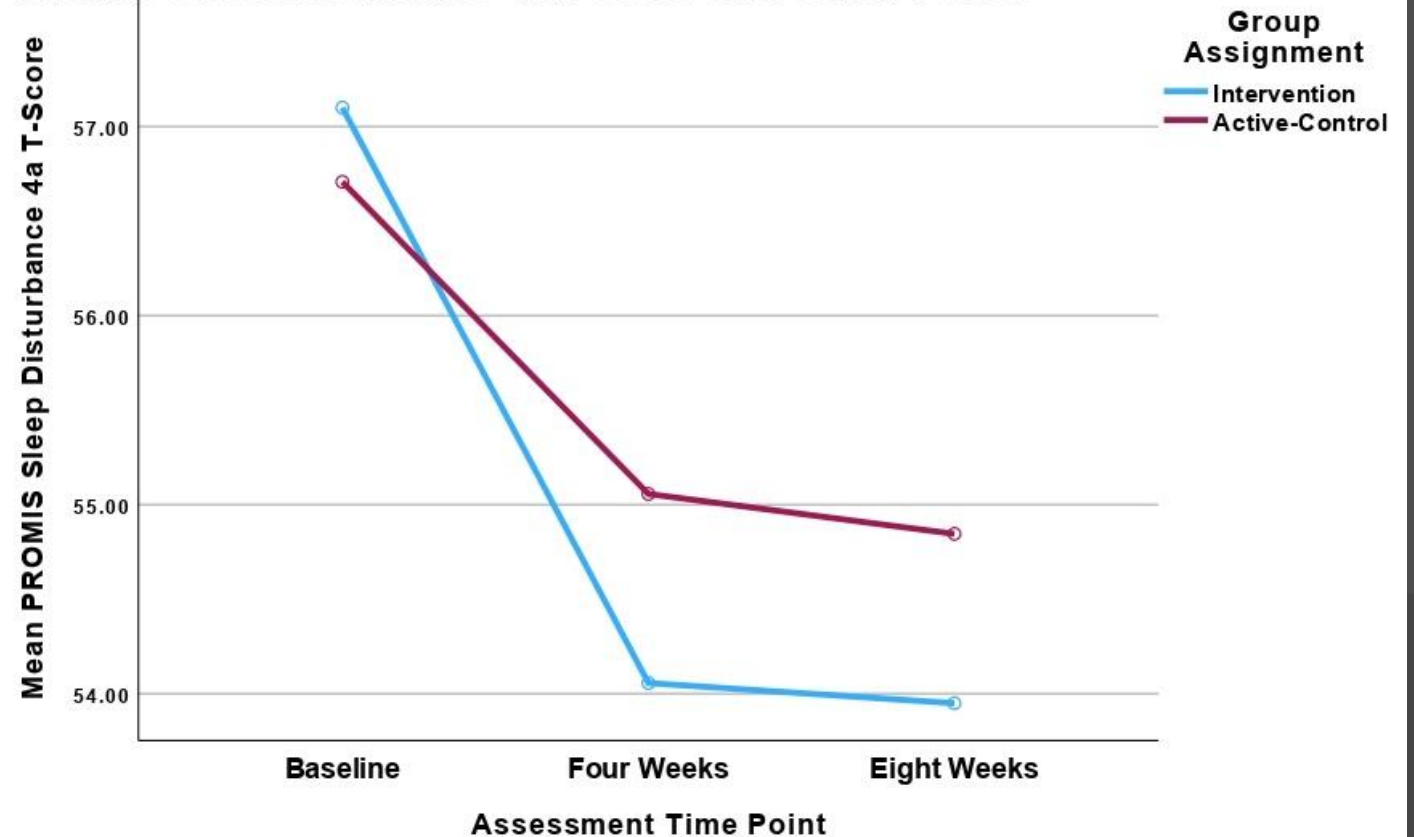
	Intervention Mean (SD)	Active-Control Mean (SD)
Baseline	57.1 (8.07) <sup>a, b</sup>	56.71 (8.59)
Four Weeks	54.06 (6.72) <sup>a</sup>	55.06 (9.04)
Eight Weeks	53.95 (7.83) <sup>b</sup>	54.85 (7.5)

<sup>a</sup> -3.04;  $p=0.02$

<sup>b</sup> -3.15;  $p=0.021$

Recommended minimal important difference: 3 to 5 point change.

PROMIS Sleep Disturbance 4a T-Score Over Study Period



# Activity Tracker Pilot: CPAQ-E Total Score

	Intervention Mean (SD)	Active-Control Mean (SD)
Baseline	41.79 (12.69) <sup>a, b</sup>	40.88 (13.95) <sup>c</sup>
Four Weeks	48.36 (13.39) <sup>a</sup>	43 (17.35)
Eight Weeks	50.4 (15.23) <sup>b</sup>	46.56 (16.14) <sup>c</sup>

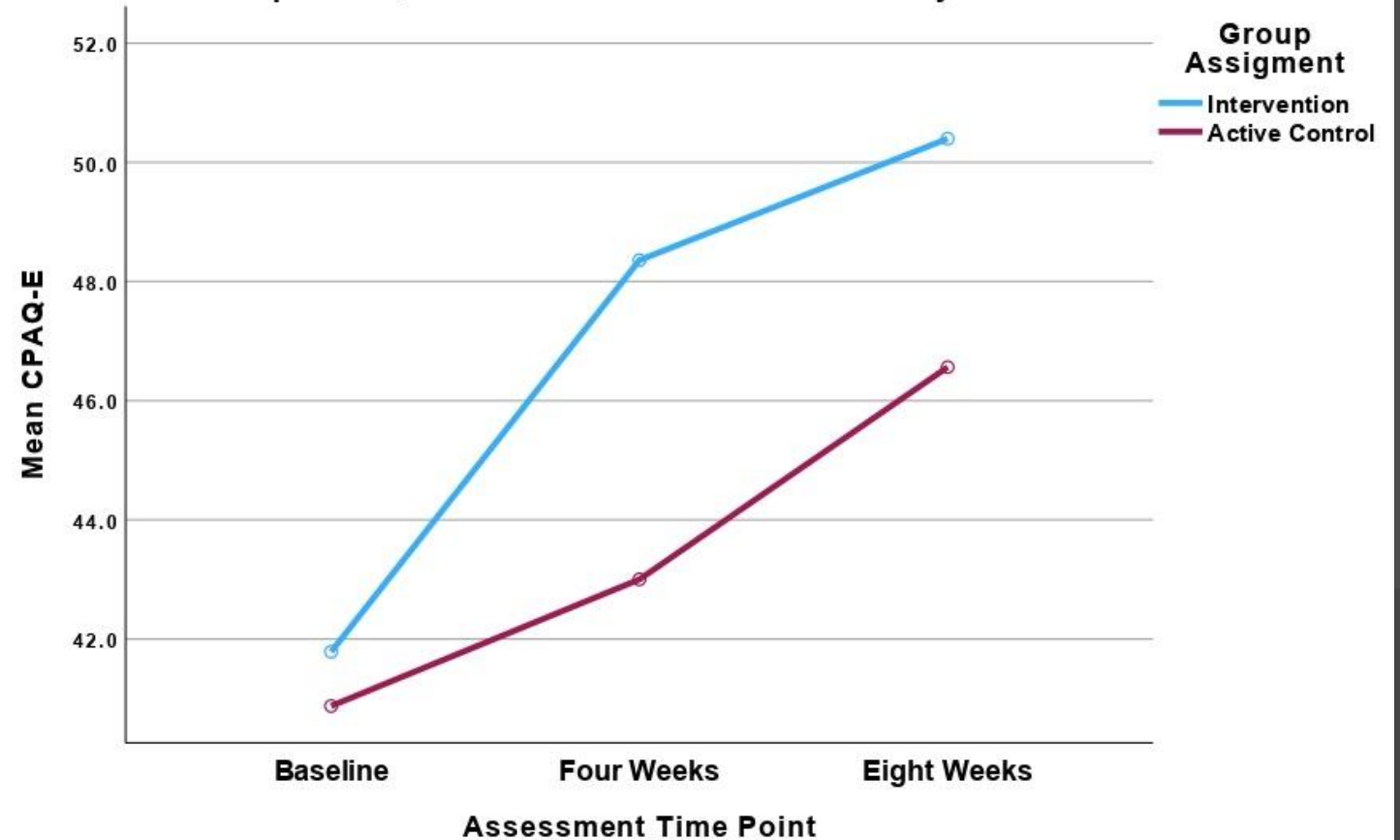
<sup>a</sup> 6.57;  $p < 0.001$

<sup>b</sup> 8.61;  $p < 0.001$

<sup>c</sup> 5.69;  $p = 0.021$

No referenced recommended minimal important difference, but similar scales report 5 to 10 point shifts as clinically meaningful.

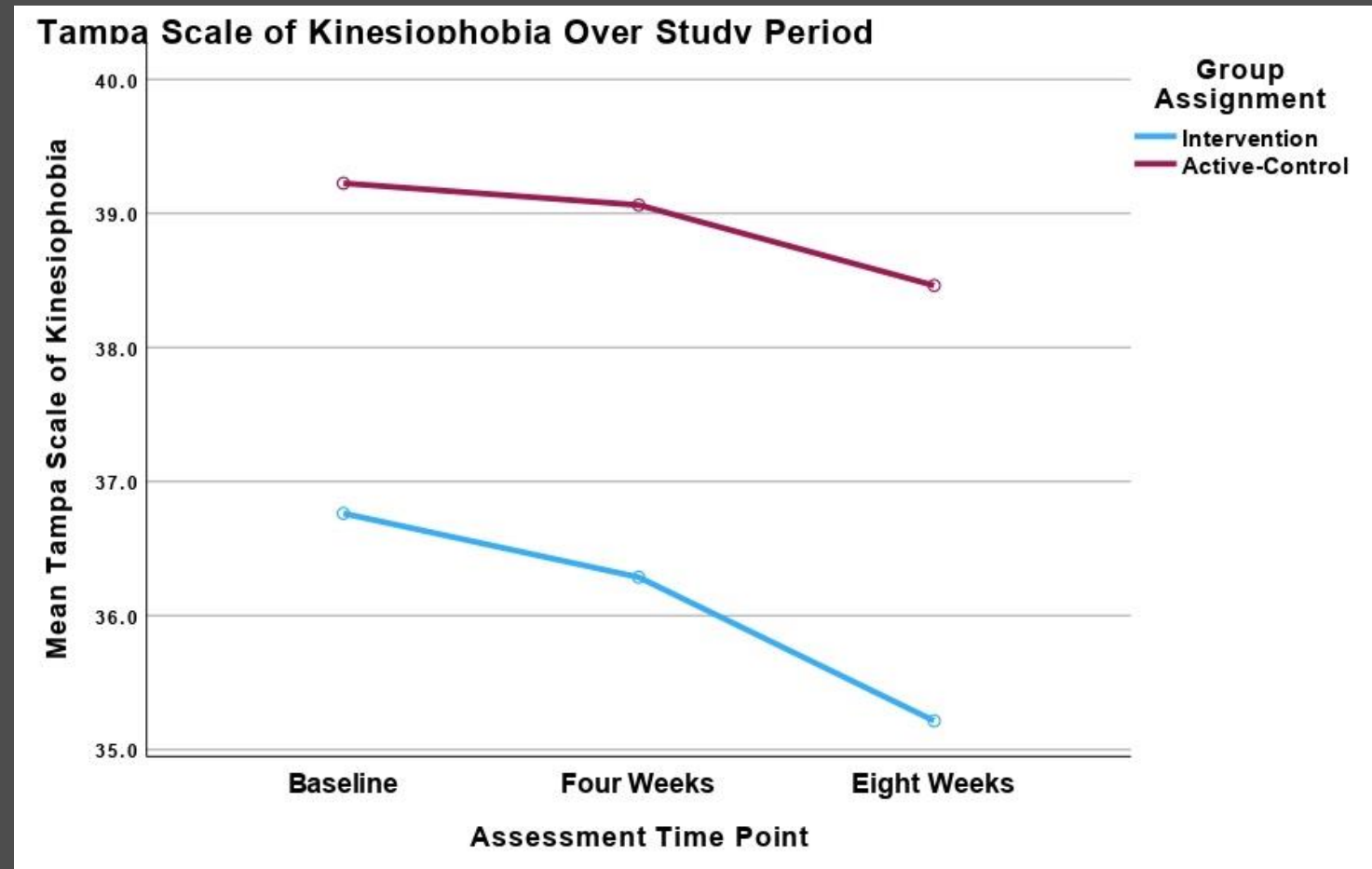
Chronic Pain Acceptance Questionnaire for Exercise Over Study Period



# Activity Tracker Pilot: TSK-17

	Intervention Mean (SD)	Active-Control Mean (SD)
Baseline	36.76 (7.6)	39.23 (8.35)
Four Weeks	36.29 (7.7)	39.06 (9.03)
Eight Weeks	35.21 (9.47)	38.46 (9.57)

Recommended minimal meaningful difference: 4 to 6 point (roughly 10%) change.



# Relief Pain Hub Usability and Satisfaction

		Four Week Survey Mean (SD)	Eight Week Survey Mean (SD)
System Usability Scale (SUS)	All Participants	66.56 (22.17)	68.94 (22.23)
	Intervention	62.65 (24.73)	67.08 (23.97)
	Active-Control	73 (15.64)	72.21 (19)
Client Satisfaction Questionnaire (CSQ-8)	All Participants	22.83 (4.69)	23.72 (5.35)
	Intervention	22.82 (4.66)	23.12 (5.63)
	Active-Control	22.85 (4.85)	24.74 (4.79)

SUS recommended minimal score: 68+ considered acceptable usability.

CSQ-8 recommended minimal score: 21 or 22 considered acceptable satisfaction.

# Pain Nurse Navigator Pilot

- Interested adults with self-reported chronic pain met one-on-one with a registered nurse via videoconferencing software.
- Initial visit lasted ~60-minutes and included multidimensional assessment:
  - McCaffery Initial Pain Assessment Tool, Patient Health Questionnaire – 9, and additional history including prior pharmacologic and complementary therapies as well as present support systems.
- Work together to create:
  - Personalized plan with SMART goals and select applicable educational content on Relief Pain Hub
- Follow-up appointment was scheduled for 10-14 days to review progress and readjust.
- Final satisfaction survey sent out after both appointments.

# Pain Nurse Navigator Pilot Results

- A total of 10 individuals completed both appointments.
- Half provided clearly defined SMART goals for the follow-up period.
- Satisfaction scores following meetings with the Nurse Navigator were acceptable illustrating a need for additional study.
- Suggestions for improvement: Additional contact with the Pain Nurse Navigator and a longer follow-up period.

	Mean (SD)	Median (IQR)
I am satisfied with how easy it was to participate.	6.9 (0.32)	7 (0)
I am satisfied with the amount of time it took to participate.	6.9 (0.32)	7 (0)
I am satisfied with the support available while participating.	6.3 (1.57)	7 (0.75)
I felt comfortable participating.	6.8 (0.42)	7 (0)
CSQ-8 Score	24 (7.76)	26 (7.5)

# Applying Harm Reduction Principles

## What:

- A compassionate, nonjudgmental approach aimed at reducing consequences associated with substance use and other potentially unsafe behavior.
- Emphasizes overdose prevention.
- Recognizes substance use disorder as a disease and not a moral failing.

## How:

- Advocate for the well-being of individuals who use substances.
- Support any positive change as defined by the individual.
  - Contingency management
- Numerous examples: syringe exchange, contraception, naloxone, peer support, take-back sites.

Douglass, 2024

# Applying Harm Reduction to Cannabis Use

## Assess:

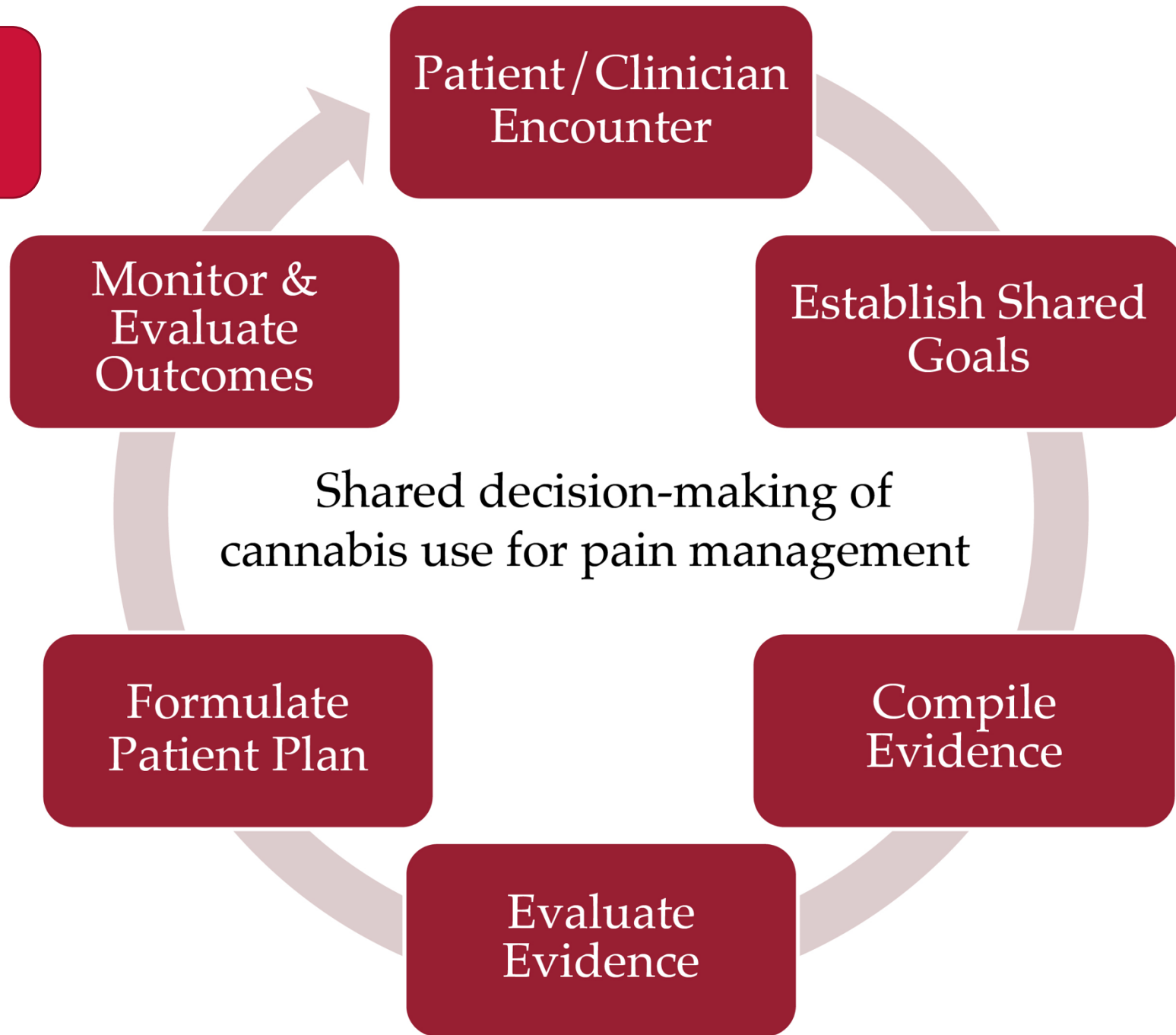
- Cannabis Use Disorder screening
  - Intervene as needed
  - Be prepared to refer if needed
- Ask about product type, source, amount, mode, dose,
- Symptoms treated and perception of effects
  - Ask why they are using cannabis
- Side effects



*Substitution of prescription drugs is now the most commonly reported motive for medical cannabis use [Reddon, 2023].*

In states with legalized medical cannabis access, findings suggest small but significant reductions in opioid prescribing and use [Shah, 2019].

What are their substance use goals?



Adapted from:  
Wilson, 2021

# Applying Harm Reduction to Cannabis Use

## Stay informed:

- Risks
- Interactions with prescribed medications
- Signs of withdrawal
- Alternatives for symptoms:
  - Sleep, mood, inactivity

- See Washington state resources: <https://doh.wa.gov/you-and-your-family/cannabis/medical-cannabis/healthcare-practitioners>

## Medical Cannabis - Healthcare Practitioners

Before you authorize the medical use of cannabis to a patient, you must be familiar with the regulations that govern this practice. The boards and commissions that regulate healthcare practitioners (HCPs) who are allowed to authorize the medical use of cannabis developed [Medical Cannabis Authorization Practice Guidelines \(PDF\)](#) that provide guidance on laws and best practices.

Key requirements for authorizing HCPs are listed below, and you should become familiar with HCP legal requirements in [RCW 69.51A.030](#).

### Overview of HCP Requirements

- **Conduct an in-person** physical exam to evaluate the patient for medical use of cannabis.
- **Document** in the patient's record:
  - That you have established a provider-patient relationship, as a principal care provider or specialist for their condition.
  - The patient's terminal or debilitating medical condition that may benefit from the use of medical cannabis.
  - That you provided the patient information about other treatment options.

# Consider the benefits of a medical authorization

## Changes for medical cannabis patients

In addition to the option to join the new medical cannabis database, the law requires:

### Standard Authorization Form

All medical cannabis authorizations must be written on the Department of Health form dated June 2015 (or later). All authorizations issued on or after July 1, 2018 are required to be printed on authorization tamper-resistant paper containing the RCW 69.51A.030 logo.

### Medical Cannabis Consultants

A certified medical cannabis consultant is on staff in every licensed and medically endorsed cannabis store. The consultant is not a medical provider and can only:

- Enter patient and designated provider information from the authorization form into the database and create the medical cannabis recognition card.
- Assist the patient with selecting products.
- Describe risks and benefits of methods for using products.
- Give advice on ways to properly store products and keep them safe from children and pets.
- Provide instruction on proper use of products.

### Recognition Card Fee

The cardholder must pay a \$1 fee when their card is created. This fee is collected by the medically endorsed store and paid to the Department of Health.

Note: The law does not restrict retail stores from charging more than \$1. The average cost for each card may be between \$1 and \$10 (or more) depending on which store you go to.

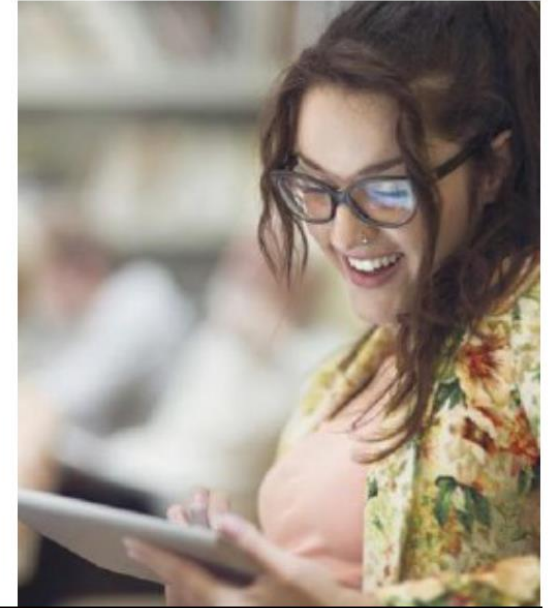
## Medical cannabis laws and rules

The Cannabis Patient Protection Act (SB5052) was signed into law April 2015 and went into full effect on July 1, 2016.

This law aligns licensing and regulation of all cannabis producers, processors and stores under the oversight of the Washington State Liquor and Cannabis Board. This includes medically endorsed cannabis stores.

Read the specific laws and rules for the medical cannabis database:

- RCW 69.51A.230
- Chapter 246-71



### Learn more...

Washington State Department of Health  
Medical Cannabis Program

[www.doh.wa.gov/medicalcannabis](http://www.doh.wa.gov/medicalcannabis)

360-236-4819

[medicalcannabis@doh.wa.gov](mailto:medicalcannabis@doh.wa.gov)

A patient's guide to the ...

# Medical Cannabis Database



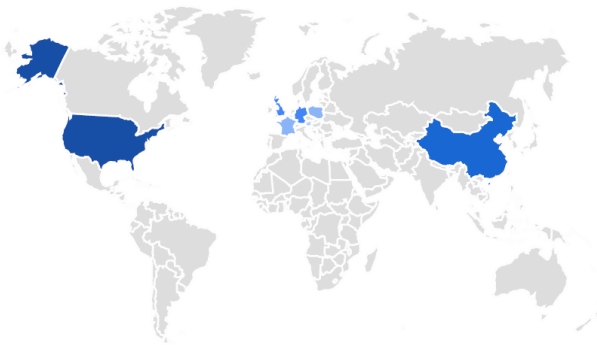
# Ask about substance use

- If you don't ask, they won't tell
- Meet them where they're at
- Offer information and options
  - How will this help or not help with pain?



WWSU

Active users▼ by Country



COUNTRY	ACTIVE USERS
United States	596
China	62
Germany	5
United Kingdom	3
France	2
Poland	2
Austria	1

# Next steps for RELIEF:

1. Maximize use of *Relief Pain Hub* resources.
2. Find rural and family practice pilot sites.
3. Additional education, updated/expanded content, incorporate feedback for completed studies.

Active users▼ by City



CITY	ACTIVE USERS
Seattle	83
San Jose	72
Moses Lake	65
Spokane	63
Ashburn	50
Des Moines	41
Boydton	24

*Your thoughts?  
Your partnership?*



# Open Studies at APPL

- Pharmaceutically-Enhanced Reinforcement for Reduced Drinking and Smoking Study (PERRAS):
  - Use of contingency management and varenicline (Chantix) to reduced alcohol use and smoking.
    - All participants get varenicline but randomized to either true contingency management or set rewards over 14 weeks (four additional follow-ups over next six months).
  - PERRAS-CAN
    - Sub-study open to those who have used cannabis for at least six days over the previous 30.
    - Complete a few additional sets of questionnaires over the course of the study.
- Mirtazapine for the Treatment of Methamphetamine Use in Opioid Use Disorder Patients Receiving Medication Assisted Treatment (MIRROM):
  - Participants randomized to mirtazapine or placebo with treatment for 10 weeks (three additional follow-ups with one per month).
  - Medication (active/placebo) coupled with contingency management.

# Open Studies at APPL



## Looking to Quit or Reduce your smoking and drinking?

The Washington State University APPL Research Clinic is looking for people who both smoke and drink regularly to participate in the Pharmeceutically Enhanced Reinforcement for Reduction of alcohol and Smoking (PERRAS) Study.

Participants will receive free varenicline treatment and earn financial rewards in the form of digital gift cards.

Call 509-638-2376 or email [wsu.appl@wsu.edu](mailto:wsu.appl@wsu.edu) to get started today!

*Earn up  
to \$890!*

If you use cannabis, you can earn up to an additional \$100 just for tracking usage during the study!


# Free Pain and SUD Focused CEs

- WSU's Elson S. Floyd College of Medicine Cloud CME platform (<https://wsu.cloud-cme.com>):
  - Evidence of Binaural Beats in Pain Management
  - From Stress to Strength: Yoga as a Complementary Healthcare Strategy
  - Interventional Pain Options for Spine Pain
  - Pain Management, Opioid Use, and Complications Among Older Adults
  - Desired and Undesired Effects of Opioids: Morphine in the Brain
  - Pharmacology Basics for Opioids: Pharmacokinetics and Pharmacodynamics of Morphine
  - Targeted Therapies using Behavioral Medicine: An Update on Innovative Evidence-Based Behavioral Medicine Treatments for Chronic Pain
  - Buprenorphine: Clinical Tips for Prescribing for Chronic Pain and/or OUD
  - Consequences of Trauma: Pain and PTSD
  - Managing Risk for Adults Prescribed Opioids: A Case-Management Learning Module
    - NOTE: Case-based learning module rather than recording.

WSU

# Free Empower Relief Courses

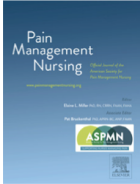
- Following completion of our RCT evaluating online nurse-delivered Empowered Relief sessions [Watson 2025], our team has been working on continuing virtual delivery.
  - ASPMN: [https://aspmn.org/upcoming\\_events.php](https://aspmn.org/upcoming_events.php)
- Empowered Relief information: <https://empoweredrelief.stanford.edu>



Contents lists available at [ScienceDirect](#)


## Pain Management Nursing

journal homepage: [www.painmanagementnursing.org](http://www.painmanagementnursing.org)



Original Research

### A National Randomized Controlled Trial Evaluating ASPMN Nurse-Delivered Empowered Relief®



Holly Watson, PhD, ANP-BC<sup>\*,1</sup>, Luzmercy Perez, BA<sup>†</sup>, Ross J. Bindler, PharmD<sup>‡</sup>, Megan Filoramo, MSN, APN-C, PMGT-BC, APHN-BC, HWNC-BC<sup>§,¶</sup>, Genna Saunders, BSN, RN, PMGT-BC<sup>¶</sup>, Michael Coriasco, PhD, MNE, RN, CNE<sup>‡,\*\*</sup>, Juliette Hong, MS<sup>†</sup>, Beth D. Darnall, PhD<sup>†</sup>, Marian Wilson, PhD, MPH, RN, PMGT-BC<sup>‡</sup>

<sup>\*</sup> Critical Encounters, PLLC, Bainbridge Island, Washington  
<sup>†</sup> Department of Anesthesiology, Perioperative and Pain Medicine, Stanford University School of Medicine, Palo Alto, California  
<sup>‡</sup> College of Nursing, Washington State University, Spokane, Washington  
<sup>§</sup> Everpoint Health, Pain Management, Morristown, New Jersey  
<sup>¶</sup> Nursing Beyond The Job LLC, Hillsborough, New Jersey  
<sup>¶</sup> Department of Anesthesiology, Pain Management, Virginia Mason Medical Center, Seattle, Washington  
<sup>\*\*</sup> School of Nursing, Oregon Health & Science University, Portland, Oregon

# WARecoveryHelpLine.org

washington  
recovery help line  
866-789-1511

[HOME](#) [ABOUT](#) [MEDICATIONS FOR OPIOID USE DISORDER](#) [RESOURCES](#) [GET INVOLVED](#) [CONTACT](#)



# washington recovery help line

**Help for Substance Use and Problem Gambling**


**Free · Caring · Confidential**  
**24-Hours a Day/7 Days a Week**


**866-789-1511**

A PROGRAM OF  
 **crisis  
connections**

# FindTreatment.gov

U.S. Department of Health & Human Services [En Español](#)

 **FindTreatment.gov**


 **SAMHSA**  
Substance Abuse and Mental Health  
Services Administration

Search SAMHSA.gov [Search](#)

[Home](#) [Search For Treatment](#) [State Agencies](#) [Facility Registration](#) [FAQs](#) [Help](#) [About](#) [Contact Us](#)

**Millions of Americans have mental and substance use disorders. Find treatment here.**

Welcome to FindTreatment.gov, the confidential and anonymous resource for persons seeking treatment for mental and substance use disorders in the United States and its territories.



**Find a Treatment Facility** ⓘ

Enter your address, city, zip code, or facility name [Search](#)

# Thank you for attending!

## Questions?

## Contact:

rossb4@wsu.edu

nursing.painrelief@wsu.edu

## MEET THE TEAM

The RELIEF Project encompasses a dynamic and diverse interprofessional team.

### WSU COLLEGE OF NURSING

**Marian Wilson, PhD, MPH, RN, PMGT-BC:** Dr. Wilson is an Associate Professor at Washington State University Spokane's College of Nursing and Chair of the Department of Nursing and Systems Science. She is board certified in Pain Management Nursing from the American Nurses Credentialing Center (ANCC) & American Society for Pain Management Nursing (ASPMN). She has published research testing internet-based self-management programs to assist patients with chronic pain and is interested in how adoption of non-pharmacologic pain strategies can reduce opioid reliance. Her recent research focuses on how mood disorders, opioid misuse, and addiction can be addressed within chronic pain populations.

**Fionnuala Brown, DNP:** Dr. Brown is Clinical Assistant Professor at Washington State University Spokane's College of Nursing and the coordinator for the family nurse practitioner (FNP) track within the Doctor of Nursing Practice (DNP) program.

**Ross J. Bindler, PharmD:** Ross is a Research Investigator in the Office of Research and Scholarship at Washington State University Spokane's College of Nursing. After graduating from Washington State University's College of Pharmacy and Pharmaceutical Sciences he completed a two-year postdoctoral residency in Drug Information and Academics at Washington State University Spokane's Drug Information Center. He has been involved in health outcomes research for over ten years with research focusing on the management of chronic pain and substance use disorders as well as healthcare practitioner wellbeing.

**Bradford Schwartz:** Brad Schwartz (he/him/his) is a creative, business savvy technologist and educator with a broad background in visual communication design. His skill set includes website design and development, graphic design, user experience and usability testing, content management, e-commerce, social media as well as project management, sales, and marketing.

**Michael Cariasco, PhD candidate:** Michael is currently a PhD student at Washington State University's College of Nursing.

### EWU SCHOOL OF SOCIAL WORK

**Rie Kobayashi, LMSW, PhD:** Dr. Kobayashi is the Program Director for Aging Studies at Eastern Washington University's School of Social Work.

### GOALISTICS, LLC

**Linda Ruehlman, PhD:** Dr. Ruehlman is a social and health psychologist with over 35 years of experience as a research scientist. Alongside Dr. Paul Karoly, she co-founded Goalistics, LLC and developed the innovative online Chronic Pain Management Program. Over her career, she has founded and directed three research companies and served as the principal investigator on 14 federally funded grants. Dr. Ruehlman has led teams in designing and developing cutting-edge online self-management programs that address behavioral and mental health challenges.

### RAYCE RUDEEN FOUNDATION

**Marsha Maisan:** Marsha is the Chief Executive Officer for the Rayce Rudeen Foundation.

### WSU COLLEGE OF MEDICINE

**Dawn DeWitt, MD, MSc, CMedEd, MACP, FRACP, FRCP-London:** Dr. DeWitt is the Senior Associate Dean at Washington State University's Elson S. Floyd College of Medicine and Director of the Center for InterProfessional Health Education Research & Scholarship (CIPHERS).

**Skye McKennon, PharmD, BCPS:** Dr. McKennon is an Associate Professor at Washington State University's Elson S. Floyd College of Medicine.

**Connie Remsberg, PharmD, PhD:** Dr. Remsberg is an Associate Professor at Washington State University's Elson S. Floyd College of Medicine.

**Jennifer C. Anderson:** Jennifer (she/her/hers) is a proactive administrative leader with extensive project management experience. Her skill sets include grant and manuscript writing, budget preparation and fiscal oversight, meeting and event coordination, and rapport building in the spirit of collaboration.

### WSU COLLEGE OF PHARMACY AND PHARMACEUTICAL SCIENCES

**Jennifer Miller, PharmD:** Dr. Miller is an Assistant Professor in Pharmacotherapy and Director of Co-curriculum.

### CRITICAL ENCOUNTERS, PLLC

**Holly Watson, PhD, ANP-BC:** Dr. Watson is a nurse practitioner with a clinical background in critical care, breast oncology, and acute pain management. She has a PhD in Depth Psychology with an emphasis in Somatic Studies and her dissertation research explored the impact of embodied psychoeducation for people with chronic pain.

### NORTHWEST SPINE AND PAIN MEDICINE (NWSPM)

**Jamie Lewis, MD:** Dr. Lewis is a board-certified physician in Physical Medicine and Rehabilitation with a subspecialty in Pain Medicine and Medical Director for both Northwest Spine and Pain Medicine and Northwest Center for Regenerative Medicine. He is a Clinical Assistant Professor in pain medicine at Washington State University's Elson S. Floyd College of Medicine and an attending physician for the Providence St. Luke's Physical Medicine and Rehabilitation Residency program.

# References

- Rikard SM, Strahan AE, Schmit KM, Guy GP. Chronic Pain Among Adults – United States, 2019-2021. *MMWR Morb Mortal Wkly Rep.* 2023; 73(15): 379-385. doi:10.15585/mmwr.mm7215a1. PMID: 37053114.
- Lucas JW, Sohi I. Chronic Pain and High Impact Chronic Pain in U.S. Adults, 2023. *NCHS Data Brief.* 2024; (518): CS355235. doi:10.15620/cdc/169630. PMID: 39751180.
- Guy GP Jr, Miller GF, Legha JK, et al. Economic Costs of Chronic Pain-United States, 2021. *Med Care.* 2025;63(9):679-685. doi:10.1097/MLR.0000000000002181. PMID: 40730349.
- Mills SEE, Nicolson KP, Smith BH. Chronic pain: a review of its epidemiology and associated factors in population-based studies. *Br J Anaesth.* 2019;123(2):e273-e283. doi:10.1016/j.bja.2019.03.023. PMID: 31079836.
- De La Rosa JS, Brady BR, Herder KE, et al. The unmet mental health needs of U.S. adults living with chronic pain. *Pain.* 2024;165(12):2877-2887. doi:10.1097/j.pain.0000000000003340. PMID: 39073375.
- Wyse JJ, Lovejoy J, Holloway J, et al. Patients' perceptions of the pathways linking chronic pain with problematic substance use. *Pain.* 2021;162(3):787-793. doi:10.1097/j.pain.0000000000002077. PMID: 32947546.
- Alford DP, German JS, Samet JH, Cheng DM, Lloyd-Travaglini CA, Saitz R. Primary Care Patients with Drug Use Report Chronic Pain and Self-Medicating with Alcohol and Other Drugs. *J Gen Intern Med.* 2016;31(5):486-491. doi:10.1007/s11606-016-3586-5. PMID: 26809204.
- Shmagel A, Krebs E, Ensrud K, Foley R. Illicit Substance Use in US Adults With Chronic Low Back Pain. *Spine (Phila Pa 1976).* 2016;41(17):1372-1377. doi:10.1097/BRS.0000000000001702. PMID: 27438382.
- Ripon RK, Maleki N. Association between chronic pain and substance use. *Sci Rep.* 2025;15(1):22038. Published 2025 Jul 1. doi:10.1038/s41598-025-04888-3. PMID: 40595886.
- American Psychiatric Association.(2018). *Diagnostic and Statistical Manual of Mental Disorders (DSM–5)*. <https://www.psychiatry.org/psychiatrists/practice/dsm>
- McNeely J, Hamilton LK, Whitley SD, et al. *Substance Use Screening, Risk Assessment, and Use Disorder Diagnosis in Adults*. Baltimore (MD): Johns Hopkins University; 2024 May. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK565474/>

# References

- Wu LT, McNeely J, Subramaniam GA, et al. DSM-5 substance use disorders among adult primary care patients: Results from a multisite study. *Drug Alcohol Depend.* 2017;179:42-46. doi:10.1016/j.drugalcdep.2017.05.048. PMID: 28753480.
- Centre for Addiction and Mental Health. (2025). Addiction. <https://www.camh.ca/en/health-info/mental-illness-and-addiction-index/addiction>
- John WS, Wu LT. Chronic non-cancer pain among adults with substance use disorders: Prevalence, characteristics, and association with opioid overdose and healthcare utilization. *Drug Alcohol Depend.* 2020;209:107902. doi:10.1016/j.drugalcdep.2020.107902. PMID: 32088587.
- Costa GPA, Nunes JC, Suh R, Sofuoglu M, Aquino JP. The bidirectional relationship between pain and tobacco use: Insights from the longitudinal Population Assessment of Tobacco and Health (PATH) study. *Drug Alcohol Depend.* 2025;268:112552. doi:10.1016/j.drugalcdep.2025.112552. PMID: 39848133.
- Radoman M, Heilner E, McGowan C, Neree-Thompson B, Sakmar E, Sinha R. Examining the moderating role of intolerance of uncertainty on pain tolerance and craving in patients with chronic pain and alcohol use disorder. *Alcohol.* 2025;127:55-61. doi:10.1016/j.alcohol.2025.06.001. PMID: 40513686.
- Rubenstein D, Green MJ, Sweitzer MM, Keefe FJ, McClernon FJ. Bidirectional relationships between pain and patterns of cannabis and tobacco use in a US nationally representative sample. *Pain.* 2025;166(3):518-526. doi:10.1097/j.pain.0000000000003381. PMID: 39172858.
- Bindler RJ, Watson CJW, Lyons AJ, et al. Drug-Drug Interaction Between Orally Administered Hydrocodone-Acetaminophen and Inhalation of Cannabis Smoke: A Case Report. *Hosp Pharm.* 2022;57(4):518-525. doi:10.1177/00185787211061374. PMID: 35898257.
- Dowell D, Ragan KR, Jones CM, Baldwin GT, Chou R. CDC Clinical Practice Guideline for Prescribing Opioids for Pain - United States, 2022. *MMWR Recomm Rep.* 2022;71(3):1-95. Published 2022 Nov 4. doi:10.15585/mmwr.rr7103a1. PMID: 36327391.
- Moman, R. N., Dvorkin, J., Pollard, E. M., Wanderman, R., Murad, M. H., Warner, D. O., & Hooten, W. M. (2019). A Systematic Review and Meta-analysis of Unguided Electronic and Mobile Health Technologies for Chronic Pain-Is It Time to Start Prescribing Electronic Health Applications?. *Pain medicine (Malden, Mass.)*, 20(11), 2238–2255. <https://doi.org/10.1093/pm/pnz164>.
- Gatchel, R. J., Peng, Y. B., Peters, M. L., Fuchs, P. N., & Turk, D. C. (2007). The biopsychosocial approach to chronic pain: scientific advances and future directions. *Psychological bulletin*, 133(4), 581–624. <https://doi.org/10.1037/0033-2909.133.4.581>

# References

- Stewart, S. A., Copeland, A. L., & Cherry, K. E. (2023). Risk Factors for Substance Use across the Lifespan. *The Journal of genetic psychology, 184*(2), 145–162. <https://doi.org/10.1080/00221325.2022.2130025>
- Douglass, A. R., Maister, A., Moeller, K. E., Salwan, A., Vallabh, A., Waters, K., & Payne, G. H. (2024). Exploring the harm reduction paradigm: the role of Board-Certified Psychiatric Pharmacists. *The mental health clinician, 14*(4), 253–266. <https://doi.org/10.9740/mhc.2024.08.253>
- Reddon, H., Lake, S., Socias, M. E., Hayashi, K., DeBeck, K., Walsh, Z., & Milloy, M. J. (2023). Cannabis use to manage opioid cravings among people who use unregulated opioids during a drug toxicity crisis. *The International journal on drug policy, 119*, 104113. <https://doi.org/10.1016/j.drugpo.2023.104113>
- Ripon, R. K., & Maleki, N. (2025). Association between chronic pain and substance use. *Scientific reports, 15*(1), 22038. <https://doi.org/10.1038/s41598-025-04888-3>
- Shah, A., Hayes, C. J., Lakkad, M., & Martin, B. C. (2019). Impact of Medical Marijuana Legalization on Opioid Use, Chronic Opioid Use, and High-risk Opioid Use. *Journal of general internal medicine, 34*(8), 1419–1426. <https://doi.org/10.1007/s11606-018-4782-2>
- Wilson, M., Klein, T., Bindler, R. J., & Kaplan, L. (2021). Shared Decision-Making for Patients Using Cannabis for Pain Symptom Management in the United States. *Pain management nursing : official journal of the American Society of Pain Management Nurses, 22*(1), 15–20. <https://doi.org/10.1016/j.pmn.2020.09.009>
- Watson H, Perez L, Bindler RJ, et al. A National Randomized Controlled Trial Evaluating ASPMN Nurse-Delivered Empowered Relief®. *Pain Manag Nurs.* 2026;27(1):50-60. doi:10.1016/j.pmn.2025.10.009

WWSU