

Evaluating the Impacts of Cannabis Legalization in California

Monday, November 28, 2022

IMAGE SOURCE: Shutterstock.com 1683588835

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Indigenous Land Acknowledgement

- We respectfully acknowledge that we live and work in territories where Indigenous nations and Tribal groups are traditional stewards of the land.
- Please join us in supporting efforts to affirm Tribal sovereignty across what is now known as California and in displaying respect, honor and gratitude for all Indigenous people.

Whose land are you on?

Option 1: Text your zip code to 1-855-917-5263

Option 2: Enter your location at <https://native-land.ca>

Option 3: Access Native Land website via QR Code:





What we say and how we say it inspires the hope and belief that recovery is possible for everyone.

Affirming, respectful, and culturally-informed language promotes evidence-based care.

PEOPLE FIRST

Language Matters

in treatment, in conversation, in connection.





NATIVE AMERICAN HERITAGE MONTH

Artist Credit: River Tikwi Garza (<https://www.rivergarza.com/about>)





November Recognitions

November 7-11
International Stress Awareness Week

November 13
World Kindness Day

November 13-19
Transgender Awareness Week



A close-up photograph of vibrant green cannabis leaves with serrated edges, filling the background of the slide. The leaves are illuminated from above, creating highlights and shadows that emphasize their texture.

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Disclosures

FACULTY DISCLOSURE

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Cheryl Ho, MD

Stock or Stock options

Johnson & Johnson

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Disclosures and Disclaimers

- This research is being supported by the California Department of Cannabis Control
- None of the findings or implications presented in this report reflect the official opinions of the Department of Cannabis Control or any of its employees.
- None of these findings have been endorsed by the California Department of Health Care Services
- Data are limited for certain age and racial/ethnic groups - some population groups are not discussed due insufficient data (not lack of interest)

Learning Objectives

- Explain three (3) impacts that cannabis can have on health and well-being.
- Propose three (3) impacts that non-medicinal adult use legalization has had on the health and well-being of Californians
- Identify three (3) ways that Proposition 64 has impacted substance use disorder treatment systems in California, and its implications for clinical practice.

Agenda

- Cannabis and Health
- Non-medicinal adult use legalization in California (Proposition 64) and its impacts on use, heavy use, cannabis use disorder, and CUD treatment
- What this all means for you

What's Your Experience?

- What percentage of the clients you serve have trouble with cannabis use?
 - Under 5%
 - 5-10%
 - 11-20%
 - 20-35%
 - 36% or more

What's Your Experience?

- Does cannabis help or hinder clients' recovery from opioid use disorders?
 - It helps
 - It hinders
 - It depends

Part 1: Cannabis and Health



IMAGE SOURCE: shutterstock_660308902

What Is Cannabis?

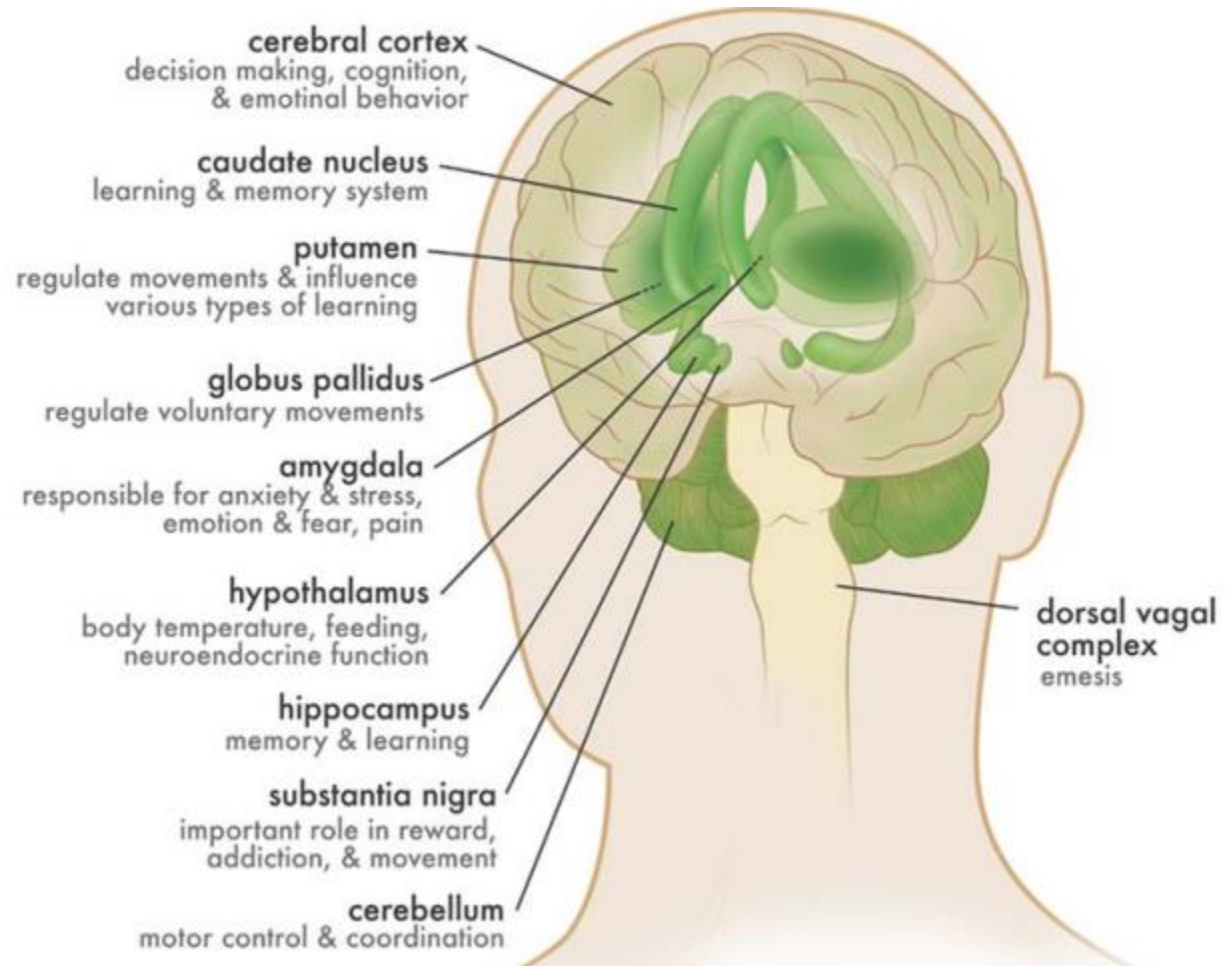


- Mix of leaves, flowers, stems, and seeds derived from subspecies of the hemp plant
- Contains over 500 chemicals
 - Cannabinoids, including psychoactive delta-9 tetrahydrocannabinol (THC) and non-psychoactive cannabidiol (CBD), which act on cannabinoid receptors
 - Over 100 terpenes that can have sedative and anti-inflammatory effects
- Active ingredients can be extracted for oral consumption, vaping

Cannabinoid Receptors are Located Throughout the Brain

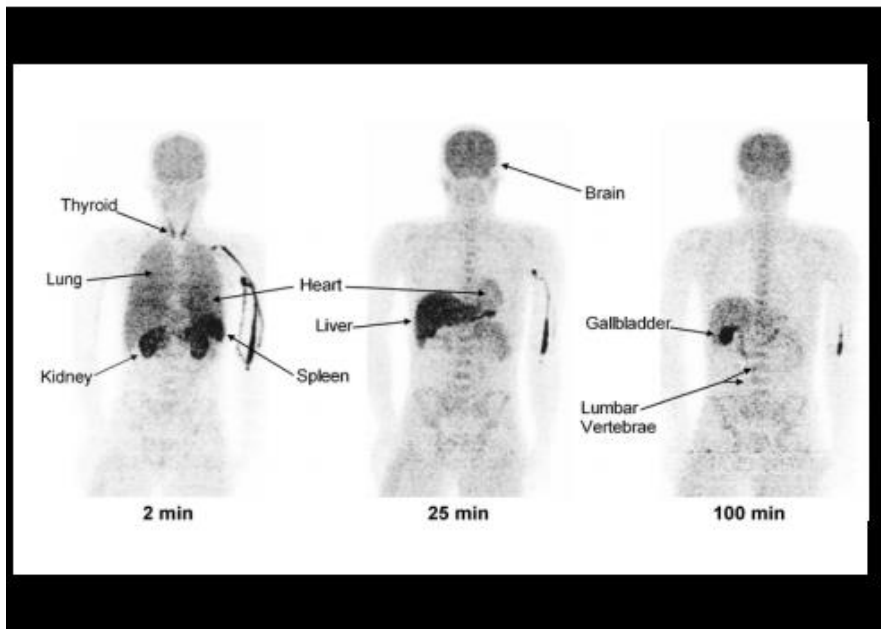
Regulation of:

- Brain Development
- Memory and Cognition
- Movement Coordination
- Pain Regulation & Analgesia
- Immunological Function
- Appetite
- Motivational Systems & Reward



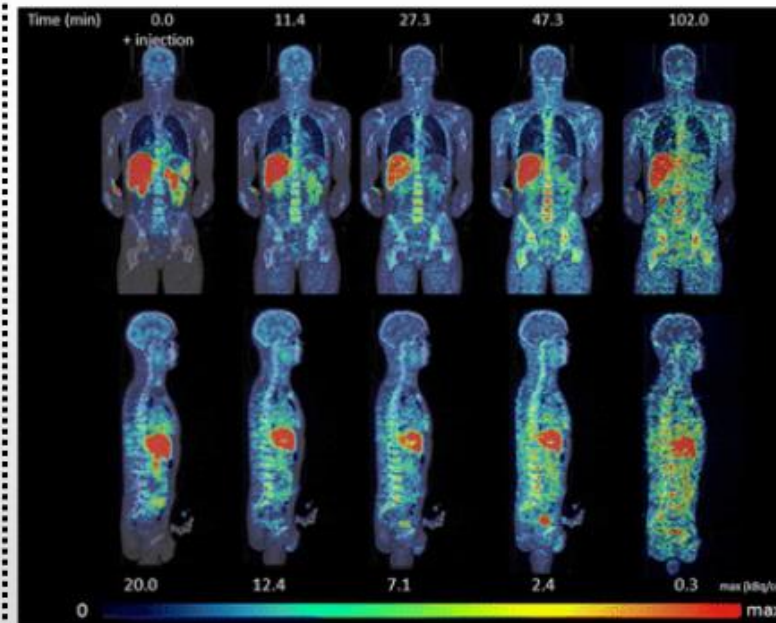
Cannabinoid Receptors are Located Throughout the Body

Whole Body Distribution of **CB1** Receptors (^{11}C -MePPEP)



Terry et al., Eur J Nucl Med Mol Imaging. 2010

Distribution of **CB2** Receptors [^{11}C]-NE40



Ahmad et al., Mol Imaging Biol. 2013 A

Cannabis' Therapeutic Potential: We're Just Starting to Learn

- Because cannabis has been illegal under federal law since 1937, we haven't had many pharmaceutical grade clinical trials like we have for most medicines
- Three synthetic cannabis-related drug products have been approved by the FDA
 - Marinol and Syndros (dronabinol) to treat loss of appetite/weight in HIV, nausea and vomiting in cancer chemotherapy
 - Cesamet (nabilone) to prevent nausea and vomiting caused by cancer medications
- The only FDA-approved cannabis-derived drug is Epidiolex (CBD-based), which treats epilepsy seizures

Cannabis' Therapeutic Potential: We're Just Starting to Learn

- We are starting to learn more about:
 - What compounds are therapeutic (THC, CBD, others?)
 - Individual variation
 - How often should we take it?
 - How does it affect different people?
 - It can be helpful at some doses, cause problems in others
- Most trials are on compounds found in cannabis, or cannabis that is much less potent than what we see on the market (both licit and illicit)



IMAGE SOURCE: shutterstock301537862

Where Has Cannabis Shown Therapeutic Promise?

Therapeutic Promise	No/Negative/Insufficient Evidence
Nausea and vomiting from chemotherapy	Dementia symptoms
	ALS
AIDS-related weight loss, appetite loss	Glaucoma symptoms
	Huntington's disease symptoms
Epilepsy	Parkinson's disease symptoms and medication side effects
Multiple sclerosis spasticity	
Chronic pain (depending on type of pain)	Cancer
	Depression caused by chronic pain
	Schizophrenia and psychosis
Certain anxiety symptoms	Treatment of Other Substance Use Disorders

SOURCE: National Academy of Sciences, 2017; Stockings et al., 2018; Cooper & Abrams, 2019

Cannabis Use and Opioids - What's the Relationship?

- Some studies have indicated that medical cannabis legalization could help address the opioid epidemic...
 - 2014: State medical cannabis laws from 1999-2010 associated with lower-than-expected opioid overdose rates
 - 2016-2017: State medical cannabis laws associated with decrease in prescriptions, including for opioids
 - 2018: Paper suggested that states with looser cannabis dispensary restrictions had greater reductions in opioid deaths (but noted that dispensary restrictions started tightening in 2010)
 - 2018: Lab study showed human subjects use less opioids to get pain relief if using together with cannabis
 - 2019: Study found that chronic pain patients who use cannabis frequently have lower odds of daily illicit opioid use
 - Scientific community has also started to discuss the potential of CBD as an effective treatment of OUD
- Has led some states to list opioid use disorders as conditions that could be treated with medical cannabis.



IMAGE SOURCE: shutterstock_488508634

SOURCE: Bachhuber et al., 2014; Bradford et al., 2018; Bradford & Bradford 2016; Bradford & Bradford 2017; Cooper et al., 2018; Hurd, 2017; Lake et al., 2019; Powell et al., 2018; Shover et al., 2019.

Cannabis Use and Opioids - What's the Relationship?

- But more recent research indicates that cannabis use may actually exacerbate opioid use
 - Meta-analysis showed evidence that cannabis leads to reduction in opioid use for pain is mixed
 - People who report cannabis use are more likely than others to use opioids non-medically, have opioid use disorders (OUD)
 - Study of people in OUD treatment found that their odds of using opioids doubled on days they used cannabis
 - Study of data from 1999-2017 found that medical cannabis laws were associated with an increase in opioid overdoses - authors questioned how much cannabis laws impact opioid use compared to other things



SOURCE: Caputi & Humphreys, 2018; Gorfinkel et al., 2020; Noori et al., 2021; Olsson et al., 2018; Shover et al., 2019

Where Is There Evidence of Health Risk with Cannabis?

Substantial Evidence	Moderate Evidence	Limited Evidence	No/Negative/Insufficient Evidence
Motor vehicle crashes	Impaired learning, memory, attention	Testicular tumors	Cancers (lung, head/neck, esophageal, prostate, cervical, bladder, lymphoma, leukemia)
Low birthweight in offspring	Depressive disorders	Metabolic syndrome	
Worse respiratory symptoms	Mania (if have bipolar disorder)	Prediabetes and Diabetes	Asthma
Schizophrenia and psychosis	Social anxiety disorder	COPD	Occupational injuries
Cannabis use disorder (the younger you start, the greater the risk)	Suicidal ideation and completion	Stroke	Negative outcomes for offspring after infancy
Other substance use disorders (including alcohol and tobacco)		Pregnancy complications	Overdose death
		Anxiety disorder and symptoms	
		Bipolar disorder	
		Cognitive impairment	
		Positive symptoms of schizophrenia	

SOURCE: National Academy of Sciences, 2017; Stockings et al., 2018; Cooper & Abrams, 2019

An Emerging Phenomenon: Cannabis Hyperemesis Syndrome (CHS)

- Persistent cyclical vomiting resulting from regular, high-dose cannabis consumption
 - Nausea, vomiting, abdominal pain, retching about 5 times per hour—generally lasts 1-2 days
 - Relieved by hot showers, leading to “pathological bathing behavior”
 - Generally occurs in people who have used cannabis regularly for over a year
 - Often unrecognized, so CHS patients visit EDs an average of 17.9 times before being diagnosed
 - Generally associated with inhaled cannabis
- Working theory is that cannabis use impacts endocannabinoids in the gastrointestinal system, leading to changes in muscular activity, causing vomiting
- Can be managed with heat, antipsychotics, topical creams
- Symptoms stop with cessation of cannabis use

SOURCE: Bahji et al., 2022; Leu & Routsolias 2020; Cedars Sinai 2022; Perisetti & Goyal, 2022

Cannabis Use Disorder (CUD)

- Approximately 8.9% of people who use cannabis regularly develop CUD
- Among people who start using regularly in their teens, about 17% develop CUD
- CUD withdrawal symptoms include irritability, mood and sleep difficulties, decreased appetite, cravings, physical discomfort for up to two weeks after stopping use
- From 2010-2020, 19.9% of admissions to publicly funded outpatient and residential SUD treatment in California were for CUD.

Part 2: Proposition 64



IMAGE SOURCE: shutterstock_551244208

Cannabis Legalization

- Cannabis is still illegal under federal law
- But as of May 2022:
 - 10 states allow for low-THC cannabis to be sold for medical purposes
 - 18 states allow use of cannabis with higher amounts of THC for medicinal purposes
 - 19 states plus D.C. allow non-medicinal adult use
- 70% of the U.S. population supports cannabis legalization
- Congress is considering federal legalization

SOURCE: Pacula et al., 2022

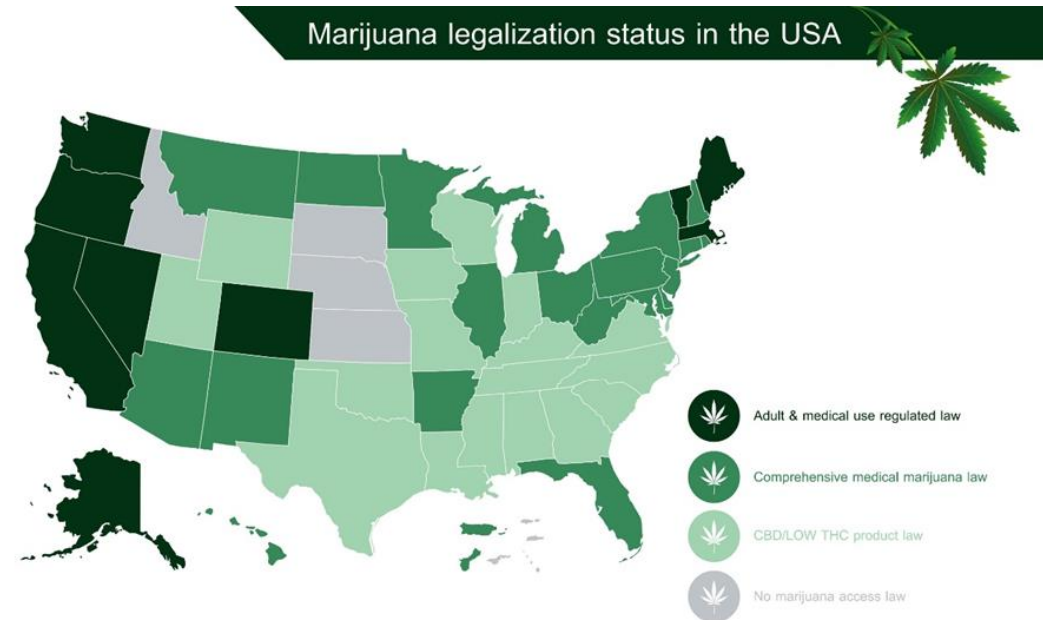


IMAGE SOURCE: shutterstock_1111698266

What Do We Know About Cannabis Legalization's Impacts? (all states)

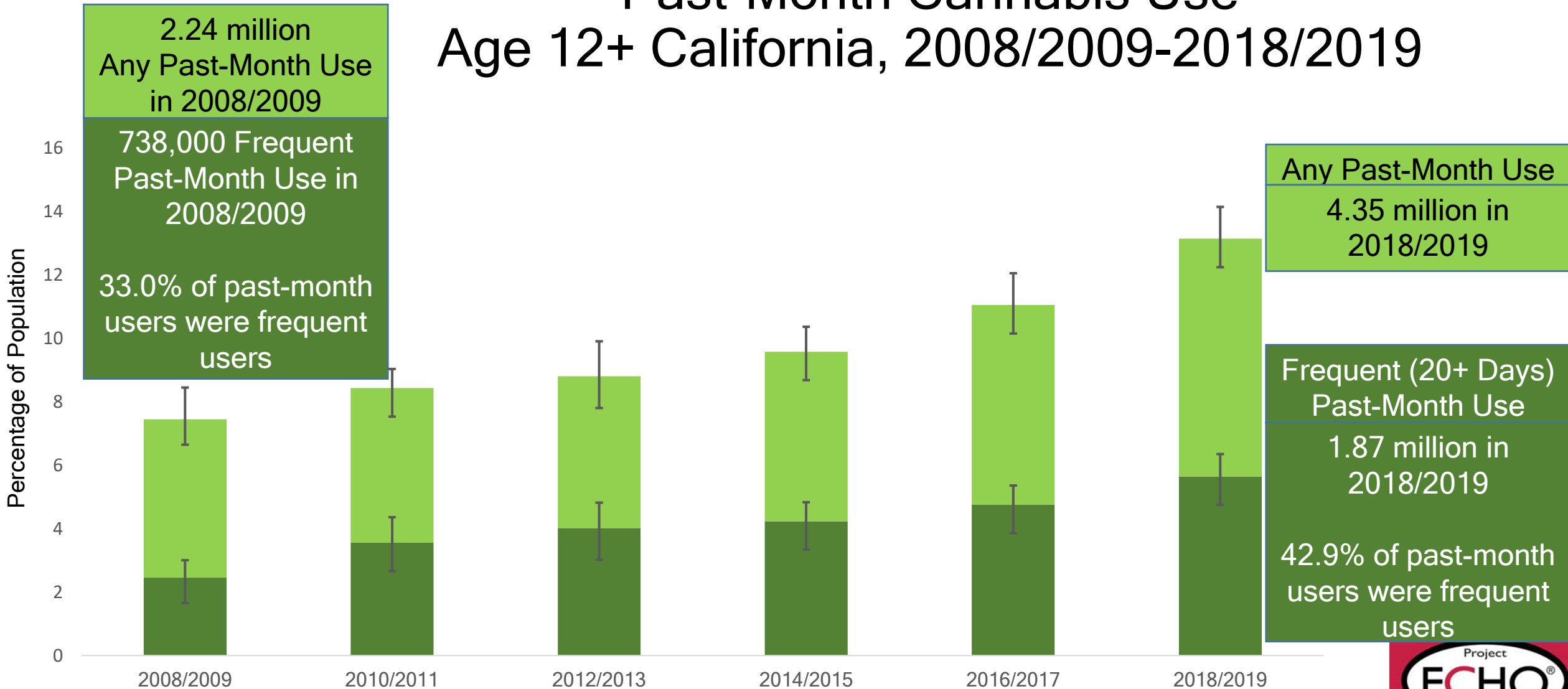
- Increased potency of cannabis products that are legally available
- Decline in the price of THC
- Increase in pediatric and youth cannabis-related ED visits
- Rise in cannabis-involved impaired driving
- Among adults (including pregnant women), more frequent use, more heavy use, more CUD
- Decrease in CUD admissions to specialty SUD treatment
 - Decrease in treatment retention (90 days), no impact on successful treatment completion

Cannabis Legalization in California



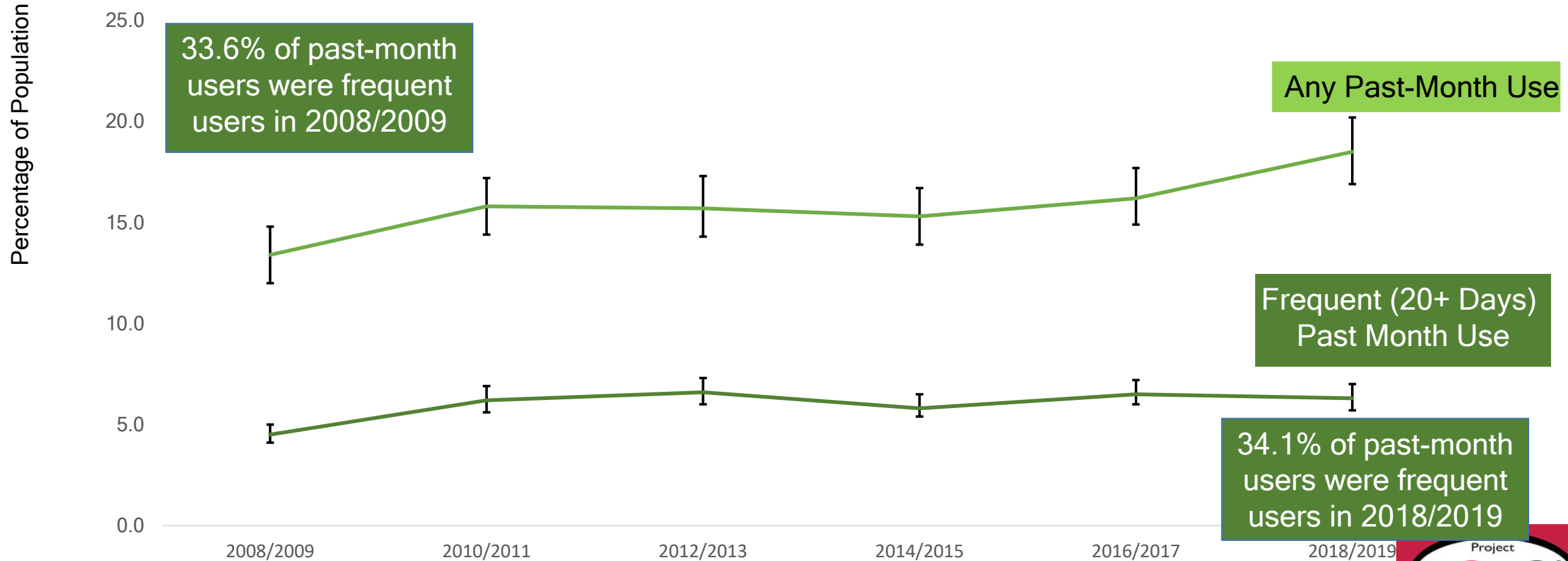
- California was the first state to legalize medical cannabis (1996)
- California voters legalized non-medicinal cannabis with Proposition 64 in November 2016
- Non-medicinal cannabis sales began in some municipalities January 1, 2018
- UCLA is evaluating the health impacts of Proposition 64
 - Use, Heavy Use, CUD
 - CUD Treatment

Past-Month Use and Frequent (20 of Past 30 Days) Past-Month Cannabis Use Age 12+ California, 2008/2009-2018/2019



NOTE: Error bars indicate 95% Confidence Interval. SOURCE - NSDUH RDAS

Past-Month Use and Frequent (20 of Past 30 Days) Past-Month Cannabis Use Age 12-25, California, 2008/2009-2018/2019



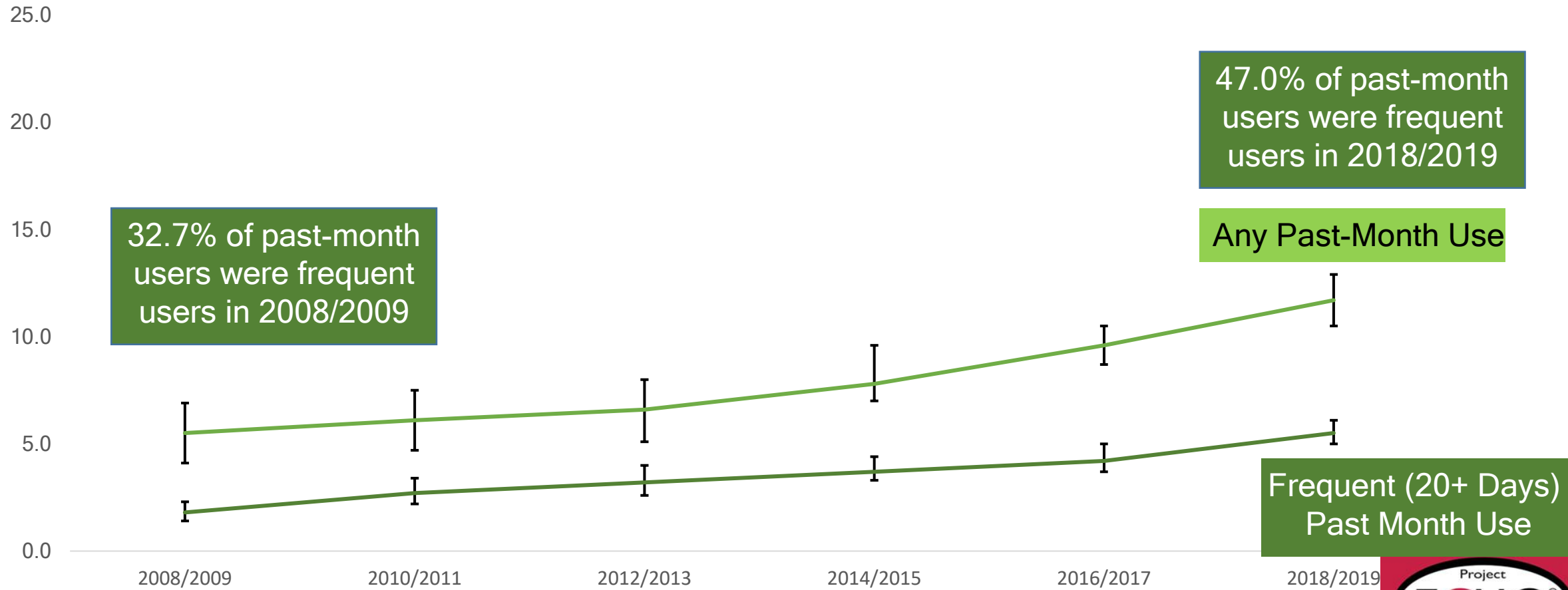
NOTE: Error bars indicate 95% Confidence Interval. SOURCE - NSDUH RDAS



University of California Los Angeles
Integrated Substance Abuse Programs

Past-Month Use and Frequent (20 of Past 30 Days) Past-Month Cannabis Use Age 26+, California, 2008/2009-2018/2019

Percentage of Population



32.7% of past-month users were frequent users in 2008/2009

47.0% of past-month users were frequent users in 2018/2019

Any Past-Month Use

Frequent (20+ Days) Past Month Use

Part 3: What This Means for You

For Clinicians

- Realize cannabis use disorders are serious—the average adult seeking CUD treatment has been using almost daily for over 10 years and tried to quit 6 times
- Ask about cannabis - clients won't automatically disclose their use, but if you ask you're more likely to discover an issue



What Do I Ask?

Cannabis Screening Tools

Severity of Dependence Scale (SDS)

Cannabis Abuse Screening Test
(CAST)

Cannabis Use Disorders Identification
Test - Revised (CUDIT-R)

Problematic Use of Marijuana

Cannabis Use Problems Identification
Test (CUPIT)

Marijuana Screening Inventory

More Detailed Assessments and Questions

Marijuana Smoking History Questionnaire (MSHQ)

Marijuana Problem Scale (MPS)

Rutgers Marijuana Problem Index (RMPI)

Cannabis Problems Questionnaire (CPQ)

Marijuana Consequences Questionnaire (MACQ)

Marijuana Craving Questionnaire (MSQ)

Marijuana Withdrawal Checklist (MWCQ)

Marijuana Quit Questionnaire (MJQQ)

Marijuana Motives Measure (MMM)

Comprehensive Marijuana Motives Questionnaire

Marijuana Effect Expectancy Questionnaire

SOURCE: Stoner 2016

Promising Practices in CUD Treatment

- Cognitive-Behavioral Therapy
- Contingency Management
- Motivational Enhancement Therapy
- There are no FDA approved medications for CUD treatment, but some have shown promise
 - Gabapentin
 - N-acetylcysteine may reduce withdrawal by affecting glutamate levels (youth)
 - Future research will examine allosteric modulators, which interact with cannabinoid receptors to inhibit THC's rewarding effects
- Treating co-occurring mental health disorders with standard behavioral and pharmacological interventions can also help reduce cannabis use

SOURCE: NIDA 2020

Thank You For Your Time!

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