

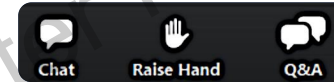
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# Cannabis 101

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**March 5th, 2025**



Grayken Center for Addiction  
Training & Technical Assistance  
Boston Medical Center



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# Accreditation Information



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# Objectives

1. Identify prevalence of cannabis use in the United States
2. Recognize at least two risks and benefits of cannabis use in adult population
3. Describe symptoms associated with cannabinoid hyperemesis syndrome
4. Name at least two strategies for managing cannabis dependency and withdrawal

# Cannabis Overview

# Terminology

**Cannabis** – general term referring to psychoactive substances produced by the *Cannabis sativa* plant

**Cannabinoids** – compounds structurally similar to THC or share many of the pharmacological properties of THC (includes synthetic THC)

**weed** (weed)  
**marijuana** (mar-uh-wah-nuh)  
**pot** (pot)  
**chronic** (kron-ik)  
**cannabis** (kan-uh-bis)

# Prevalence of Cannabis Use

- Globally, prevalence of past year cannabis use among 15-64 y/o has been estimated to be 3.8% (200 million people)
- Most commonly used federally illicit substance in the US, with 48.2 million Americans (18%) who report using cannabis at least once in 2019
- Most common in adolescents and young adults (AYAs, age 15-25) with past year prevalence reaching 43% in 2021
- Cannabis-associated adverse health outcomes are even smaller
- Aside from cannabis-related MVC fatalities, cannabis use makes virtually no direct contribution to mortality (unlike alcohol and tobacco)

# Cannabis: A Plant With Many Compounds

- *Cannabis sativa L.* is a plant that contains > 100 naturally occurring compounds called “cannabinoids”
- Several species, subspecies, types
  - Indica, sativa, ruderalis, hemp, hybrids
- Potency related to the concentration of THC, THC-CBD ratio, and route of administration
- **Psychoactive component** – delta-9 tetrahydrocannabinol (THC)

Category of product	Type or format	Methods of use	THC & CBD Concentrations or amounts
<b>Dried cannabis</b> (herbal cannabis, flower, bud)	- loose bud - pre-rolled	- smoked - vaped or vaporized	THC: 0% to 30% CBD: 0% to 20%
<b>Cannabis extracts</b> (including concentrates)	- hash (hashish) - shatter - wax, budder - vape cartridges - oil sprays, tinctures - capsules	- vaped or vaporized - ingested - smoked	THC: 0% to 95% CBD: 0% to 84%
<b>Edible cannabis</b> (including beverages)	- chocolate - brownies - soft candies (gummies) - sparkling water, soda - juice, tea	- ingested	THC: 0 to 10 mg/unit CBD: 0 to 25 mg/unit

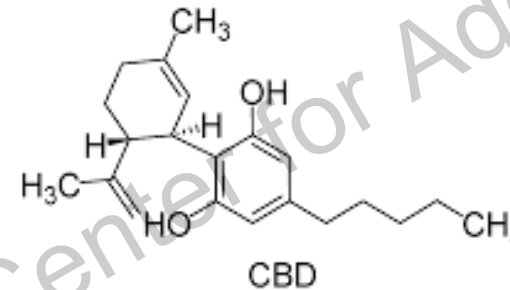
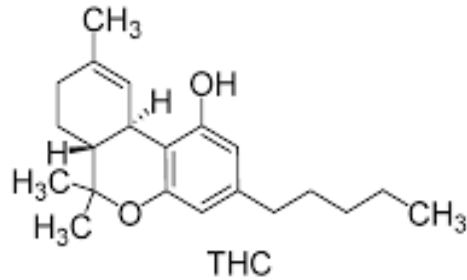
(Balachandran, Elsohly & Hill, 2021)  
 (Chayasirisobhon, 2020)  
 (NIDA, 2024)  
 (Lapierre, Monthony& Torkamaneh, 2023)  
 (Okey et al., 2023)

# Pharmaceutical and Synthetic Cannabinoids

- There are several FDA-approved cannabinoids
  - Dronabinol: low appetite and nausea
  - Epidiolex: prevention of specific types of seizure
  - Nabilone: treat nausea and vomiting
- Synthetic cannabinoids: new psychoactive substances
  - Diverse group that may contain multiple compounds, many of which are illegal
  - Clandestine production, no standards, varying potency.
  - Can be 2–100x more potent than THC
  - K2, spice, “fake weed”, Kronic



# Roles Of THC And CBD



## Tetrahydrocannabinol (THC)

- Psychoactive, appetite stimulant
- Dose-response relationship between THC and adverse (e.g., neurocognitive) effects
- Delta-9 THC isomer = most common
- \*Delta-8 THC naturally exists in small quantities, ~ 50-75% as psychoactive; Growing quasi-legal market.

## Cannabidiol (CBD)

- Less psychoactive
- Neuroprotective, anti-inflammatory, and anticonvulsant effects.
- Attenuates some of the neurocognitive and behavioral effects of THC
- Few and mostly mild adverse effects of itself

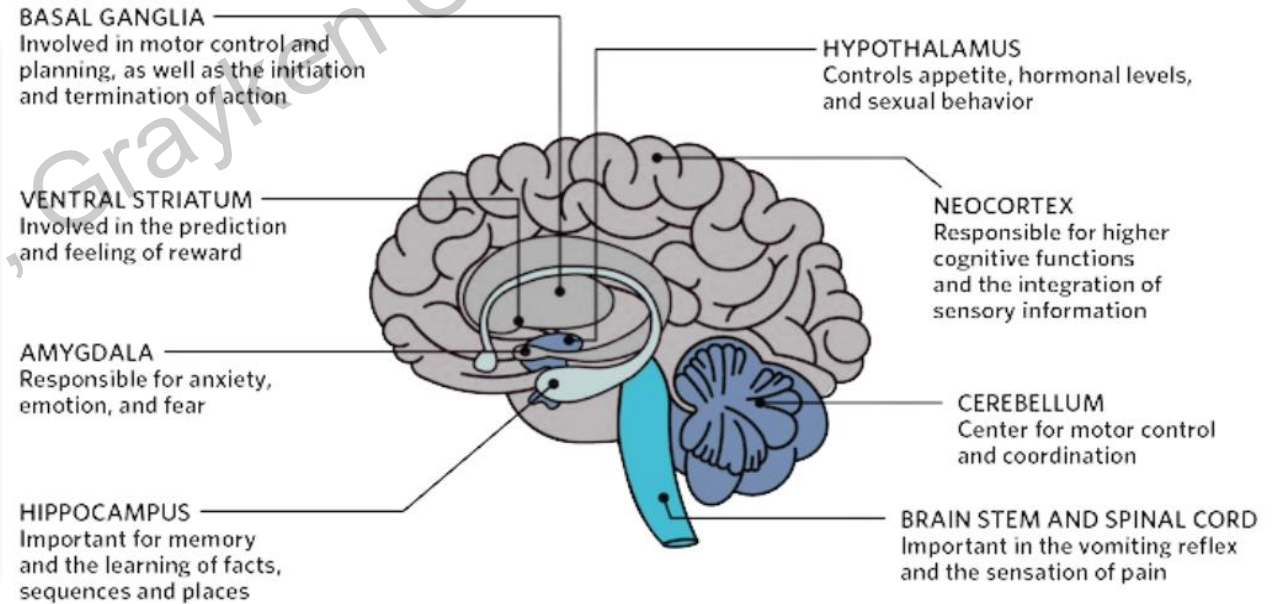
# Cannabis Impacts

- Tetrahydrocannabinol (THC) activates CB1 receptors in the brain
- CB1 part of the endocannabinoid system that regulates mood, memory, reward, and pain
  - Highly concentrated in the prefrontal cortex, hippocampus, basal ganglia, and cerebellum
  - Impacts attention, memory, decision-making, coordination, and perception

THC increases dopamine release in reward pathways, contributing to its reinforcing effects and potential for dependence.

Acute cannabis use may produce euphoria, relaxation, altered perception, impaired short-term memory, and slowed reaction time.

High-potency THC products or frequent use can trigger anxiety, paranoia or psychosis



(Simons, 1998)  
(Simons, Correia & Carey, 2000)  
Image Source: Adapted from APA

# Routes Of Use

- **Smoking:** Combustion, burning
- **Vaping:** activating raw plant matter without combustion
- **Dabbing:** inhale cannabis vapor from potent THC concentrates or extracts through an “glass oil dab rig”
- **Ingestion:** Edibles, drinkables
- **Topicals:** oils, creams, primarily CBD

01 //



02 //



03 //



04 //



# Dabs, Vapes & Concentrates

- Highly concentrated THC product
- Potency: 80-100% THC vs 10-20%
- Types: Shatter, crumble, budder, batter, wax, others
- Method of extraction varies
- Often more economical

**Concentrates, Extracts & Wax**

			
<b>Shatter</b> Glass-like, brittle	<b>Wax / Budder</b> Soft, crumbly texture	<b>Live Resin</b> Fresh frozen extraction	<b>Rosin</b> Solventless, pressed
			
<b>Crumble</b> Dry, honeycomb consistency	<b>Sauce</b> Viscous, terpene-rich extract	<b>THC Diamonds</b> Pure THCA crystal extract	<b>Distillate</b> Highly refined cannabis oil

**Common Consumption Methods**

		
<b>Dab Rig</b>	<b>Vape Pen</b>	<b>Dab Cartridge</b>

# Health Impacts of Cannabis

# Health Benefits

**Conclusive to Substantial** evidence that cannabis or cannabinoids are effective:

- Treatment of chronic pain in adults
  - Most studies focused on neuropathic pain
- Nausea medicine for chemotherapy-induced nausea and vomiting
- Improved multiple sclerosis spasticity symptoms



**Moderate evidence** that cannabis or cannabinoids are effective for:

- Improving short-term sleep in people with obstructive sleep apnea, fibromyalgia, chronic pain, and multiple sclerosis

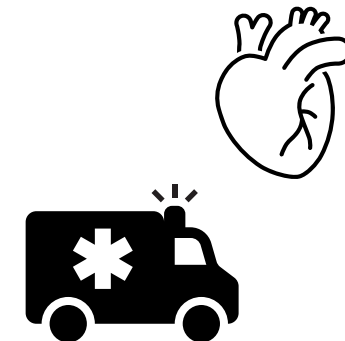
# Physical Health Risks

## Substantial evidence of association between cannabis use and:

- Motor Vehicle Collisions (MVCs)
  - 15-30% of PWUC drive under the influence. 20% of cannabis-related MVC injuries being fatal.
  - Acute use impairs driving-related reaction, tracking, and psychomotor control. Youth drivers a particular high-risk group for driving-related events
- Neurocognitive Deficits: deficits in memory, learning, decision-making
- Adverse Respiratory outcomes
  - Co-use with tobacco increases adverse respiratory health outcomes

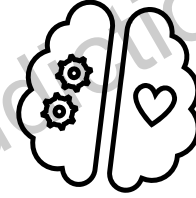
## Moderate evidence of association between cannabis use and:

- Reproductive Difficulty
  - Negative impacts on sperm count, motility, morphology and viability. Amenorrhea.
- Cardiovascular Stress: THC exposure can exert substantial stress (e.g. tachycardia)
- Hyperemesis syndrome with frequent use



(Pope et al., 2014)  
(Khoj et al., 2024)  
(Hancox et al., 2015)  
(Lo, Hedges & Girardi, 2022)  
(Hasler, Alshaarawy, Venkatesan, 2024)

# Mental Health Risks



## Substantial evidence of association between cannabis use and:

- The development of schizophrenia or other psychoses (frequent use)

## Moderate evidence of association between cannabis use and:

- Increased symptoms of mania and hypomania in individuals diagnosed with bipolar disorder (regular use)
- A small increased risk for the development of depressive disorders
- Increased incidence of suicidal ideation, suicide attempts, and completion
- Increased incidence of social anxiety disorder (regular use)

### **Get Sensible Resources**

Variety of resources for patients, families and healthcare teams regarding cannabis use.



(Ganesh & D'Souza, 2022)  
(Hall & Degenhardt, 2000)  
(Henquet et al., 2004)  
(Niemi-Pynttari et al., 2013)  
(Carra et al., 2018)  
(Domen et al., 2019)

(Winkel, Stefanis & Myin-Germeys, 2008)

# Fentanyl Laced Cannabis NOT Substantiated

- Combination reported in the news for several years. "Click Bait" mostly.
- Case: Nov 2021: CT State DPH linked 39 overdoses to fentanyl-laced cannabis
  - Vast majority were among patients with histories of opioid use.
  - One confirmed sample. First ever in US.
- As of 2022, no cases ever confirmed in Canada.
- The belief that dealers lace cannabis with fentanyl to cause opioid addiction is overwhelmingly not substantiated, logical, or financially sound.
  - Fentanyl has a high-profit margin, whereas cannabis has a low-profit margin.
- Burning fentanyl with flame destroys it. Heat and extraction used in baking would erode fentanyl.
  - Fentanyl also has very low oral bioavailability if swallowed.
  - Vaping pens do not get hot enough to “boil” fentanyl which has a boiling point of 466°C

# Cannabis Dependency & Withdrawal

# Cannabis Dependency

Considered a chronic, recurring condition similar to other SUDs

Diagnosis with DSM-5 criteria including severity of symptoms

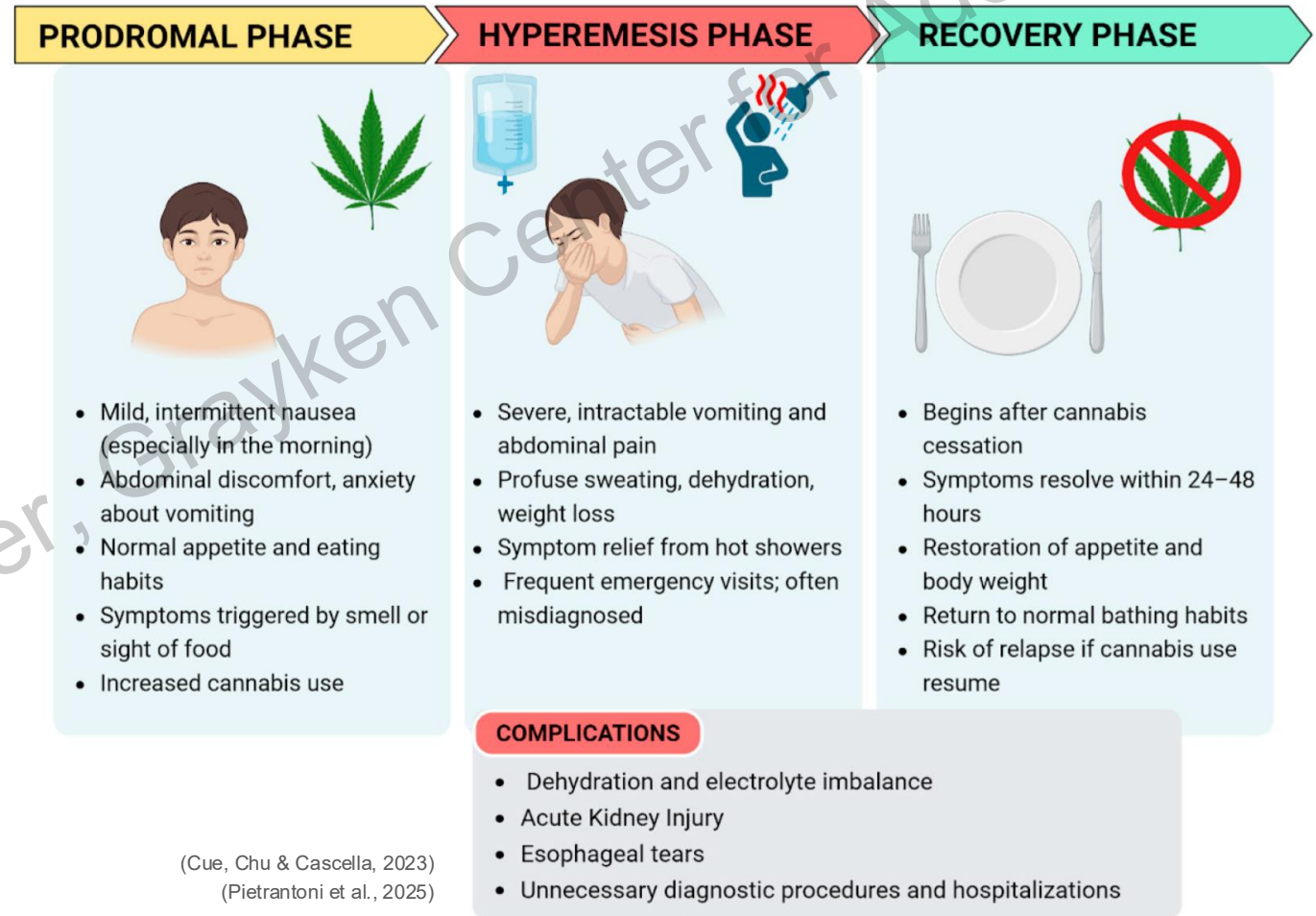
Risk factors include early initiation of cannabis use, high-potency THC products, frequent use, co-occurring mental health disorders, and other SUDs

Dependency may result in report of symptom exacerbation with cessation or when trying to cut back

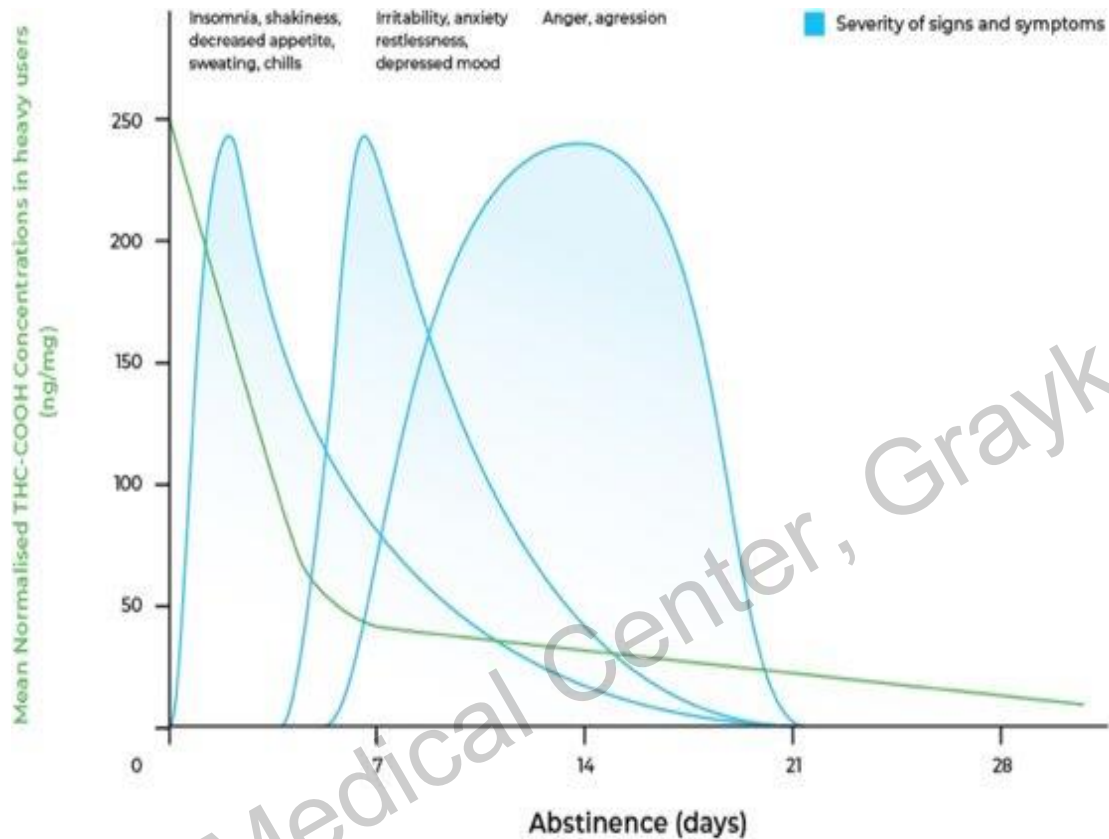
(Foll et al., 2024)  
(Health Canada, 2018)  
(Dawson et al, 2024)  
(Le Foll et al., 2024)  
(Cue, Chu & Cascella, 2025)

# Cannabinoid Hyperemesis Syndrome

- Vomiting
- Abdominal pain
- Compulsive bathing or hot showers for temporary relief of symptoms
- While intravenous fluids or antiemetics may provide temporary relief, the only intervention to resolve symptoms associated with cannabinoid hyperemesis syndrome is cessation of cannabis.



# Cannabis Withdrawal



## Symptom Progression:

- Onset 24-48 hours
- Peak 2-6 days
- Subside 3 weeks

As with other substances, incremental and slow reduction may reduce the probability and severity of withdrawal

- Short-term symptomatic treatment may be used when clinically indicated
- Assess & treat co-occurring medical (e.g. pain), mental health or substance use disorders that may complicate withdrawal

# Practical Treatment Strategies

# Treatment Options For Cannabis Use Disorder

## Diagnosis

- DSM-5 or ICD-11, Cannabis Withdrawal Scale
- Complicated by polysubstance use

## Behavioral Therapies

- Most data supports: Cognitive-Behavioral Therapy, Motivational Enhancement Therapy
- Supplement with Contingency Management, therapeutic living, A-CRA

## Pharmacotherapy

- No specific meds FDA-approved
- Promising Maintenance:
  - Oral THC?
  - Cannabinoid agonist
  - N-Acetylcysteine for adolescents
- Promising Withdrawal Management:
  - Dronabinol >> nabilone, gabapentin, oral THC, quetiapine, metoclopramide
  - Not helpful: SSRIs, lofexadine, bupropion, zolpidem

## Recommendation: Choose Products Wisely

- Only use cannabis and cannabis products from trusted sources.
- Don't use cannabis products that seem contaminated or spoiled.
- Avoid "synthetic cannabinoid" products
- Know the nature and composition of your cannabis products, and ideally use cannabis products with lower THC content or high CBD/THC ratio.
- Probably best to avoid Delta-8 products

*Substantial Evidence*

### Promoting Wellness Resources

To access cannabis resources including short videos on cannabis use, [click here](#) or scan the QR code.



## Recommendation: Safer Route of Use

Every method of consumption has drawbacks, however inhalation of combusted cannabis (smoking) shown to be most harmful.

- If smoking, avoid deep inhalation, as this disproportionately increases the intake of toxic material.
- Avoid co-use of tobacco
- Avoid dabbing
- Edibles and drinkables eliminate respiratory risks, but the slow absorption and delayed onset make it difficult to predict or control the psychoactive effects.

*Substantial to Moderate Evidence*



## Recommendation: Limit Frequency and Intensity of Use

Frequent or intensive cannabis use is strongly associated with higher risks of severe and/or long-term adverse outcomes.

- Know your limits! If cannabis is hurting your quality of life, cut back or stop.
- Be aware and vigilant to about your cannabis use—and that of peers.
- Occasional use (e.g. on 1-2 days/week, weekends only) at most.
- Avoid repeated intensive binge use throughout the day or night.

*Substantial Evidence*

- Cut back or pause. Evidence suggests that many adverse effects may be reduced or reversed with periods of abstinence or reduced intensity.

*Limited Evidence*

## Recommendation: Populations to Limit or Avoid Use

- Pregnant People and Those Wishing to Procreate: Reduce or abstain

*Limited evidence*

- People with biological predispositions or co-morbidities:

- Genetic predisposition or diagnosis psychosis, mood disorder, or substance use disorder.
- Cardiovascular problems, especially with high-potency THC products.
- Older adults at increased risk due to general ageing-related deficits, other co-morbid chronic health conditions.

*Moderate Evidence*



# Resources

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# Additional Resources: Cannabis

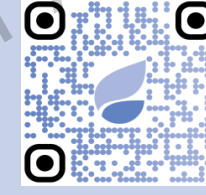
## Promoting Wellness Resources

To access cannabis resources including short videos on cannabis use, [click here](#) or scan the QR code.



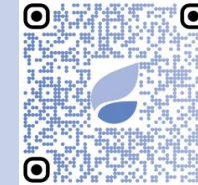
## Get Sensible Resources

Variety of resources for patients, families and healthcare teams regarding cannabis use.



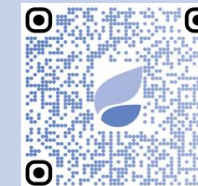
## Cannabis HR Guideline

Fischer B, Robinson T, Bullen C, et al. Lower-Risk Cannabis Use Guidelines (LRCUG) for reducing health harms from non-medical cannabis use: A comprehensive evidence and recommendations update. *Int J Drug Policy*. 2022;99:103381. [doi:10.1016/j.drugpo.2021.103381](https://doi.org/10.1016/j.drugpo.2021.103381)



## Understanding your Risk for Cannabis Use Disorder

To access this resource from the Centers of Disease Control and Prevention, [click here](#) or scan the QR code.



# Virtual Drop-in Office Hours

*Monthly opportunities to ask your addiction-related questions*



To learn more and join an upcoming session, [click here](#) or scan QR code!

## General Office Hours:

2<sup>nd</sup> Thursday of each month from 5 – 6pm EST

## Stimulant-Focused Office Hours:

3<sup>rd</sup> Thursday of each month from 5– 6pm EST

- Hosted by BMC Grayken TTA Clinical Educators
- Open to all clinical providers and staff supporting those with substance use



# FREE Pre-Recorded Trainings

*Advancing Addiction Treatment: Building Knowledge of Substance Use & Specialty Topics; Substance Use Disorders 101; Nuts & Bolts of Buprenorphine Treatment*



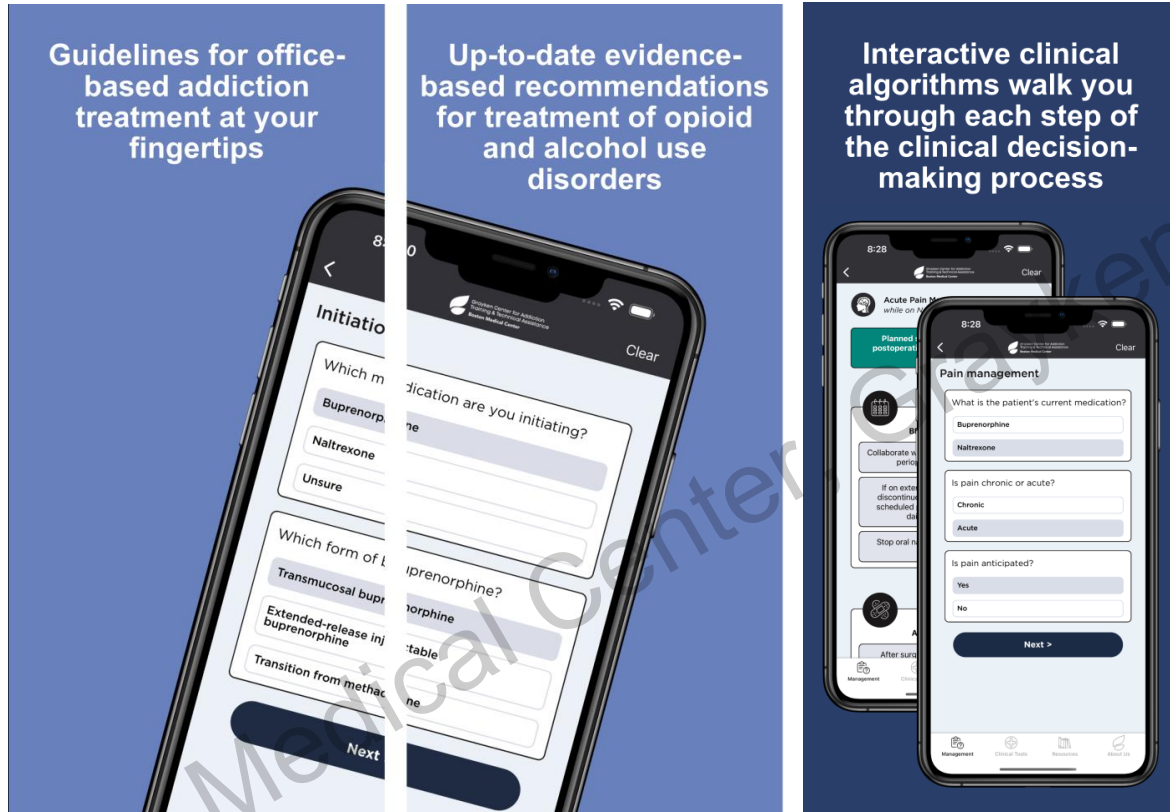
The screenshot shows the website header with the logo for Grayken Center for Addiction Training & Technical Assistance, Boston Medical Center. It includes a search bar, a navigation menu with options like Home, DEA MATE Act, MAT Mobile App, Training, Request TTA, Project ECHO, Resources, News, and About Us. The main content area features a section for 'Pre-recorded Trainings' with a sub-menu for 'Pre-recorded Trainings' and 'Live Trainings'. Below this is a paragraph: 'Our free pre-recorded trainings are available on demand when it's convenient for you. Browse options by training topic and register online to get started.' An image shows a person in a lab coat looking at a laptop displaying a training slide. At the bottom, a call to action says: 'To access our free recorded trainings, [click here](#) or scan the QR code!'.

- ✓ 20 separate trainings on various **specialty topics**
- ✓ Count towards **DEA MATE Act** requirement
- ✓ **FREE CME/CE** & completion certificates
- ✓ **On-demand 24/7**



# BMC MAT Quick Start App

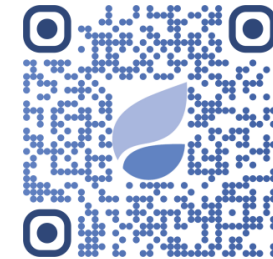
*Free interactive clinical tools, decision trees, treatment protocols & resources*



## Provides real-time access to:

- ✓ Latest evidence-based guidance for treating opioid and alcohol use disorders
- ✓ Decision-making trees for initiation of buprenorphine and naltrexone
- ✓ Interactive tools, treatment protocols, and patient messaging features

Available for download on [iOS](#) and [Android](#), free of charge! [Web version](#) also available.



*This initiative was made possible with funding from the SAMHSA Opioid Response Network and the Massachusetts Department of Public Health. This app is not a substitute for individualized patient care and treatment decisions. It is the responsibility of the treating clinician to rely on their own experience and knowledge about their specific patient to determine dosages and the best treatment for that patient.*

# Empowering Loved Ones of People with Addiction

## *An Educational Group*

*Empowering Loved Ones* is a FREE educational program for family members, partners, and friends of people who use substances problematically. Information given to families can, directly and indirectly, impact the course of a loved one's substance use disorder. Just as the course of a loved one's substance use disorder can, directly and indirectly, impact family members and their wellbeing.

The group offers education, up-to-date information, and skill-building to promote the health of those impacted by a loved one's substance use.

**When?** 2nd and 4th Wed of every month  
7:00 to 8:30 PM EST

**Where?** Virtual via Zoom

**Who?** This group is only for family members, partners, and friends impacted by the substance use of a loved one.

### To sign up

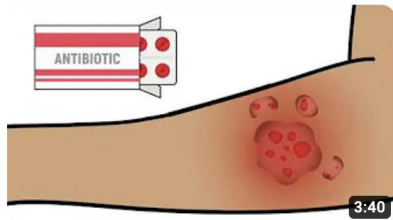
**Email:** [EmpoweringFamilies@bmc.org](mailto:EmpoweringFamilies@bmc.org)

Once added to our listserv, session registration and other resources will be emailed.



# Short Explainer Videos

Expert-authored short videos covering a variety of substance use disorder topics



**Xylazine 102: Focus on Wound Care**  
1.7K views • 2 months ago



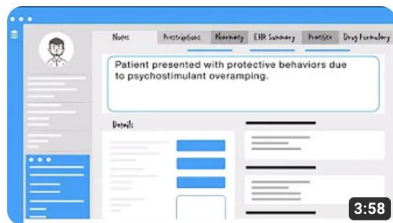
**Pharmacodynamics of Medications for Opioid Use Disorder**  
1.8K views • 3 months ago



**Harm reduction strategies for cannabis use**  
1.2K views • 4 months ago



**Adolescent e-cigarette use: Clinical conversation tools**  
514 views • 5 months ago



**Reframing and responding to protective behaviors associated with stimulant use**  
1.2K views • 7 months ago



**How to use an overdose prevention helpline**  
1.1K views • 7 months ago



**Xylazine 101**  
9.7K views • 9 months ago



**Information impacts action: Debunking myths about the family and recovery**  
3.8K views • 1 year ago

Available on:

[YouTube](#)



[addictiontraining.org](http://addictiontraining.org)



# Harm Reduction Short Videos

*we're excited to announce our new*

## HARM REDUCTION SHORT VIDEO SERIES



The new Harm Reduction Educational Series is a collection of **15 short videos** now available as part of our virtual harm reduction toolkit developed to equip healthcare professionals and community partners with **practical harm reduction skills to better support patients who use substances**. Topics covered include **safer smoking**, **injecting**, **sniffing**, **booty bumping**, and **overdose prevention and reversal**.



[Click here](#) or scan  
QR code to watch!



# More from Grayken Center for Addiction TTA

*A free education, support and capacity building resource on best practices for caring for patients with substance use disorder*



Register for free [live](#) and [recorded](#) trainings



Access free [resources](#)



[Join our mailing list](#) to stay in touch and informed about our offerings!



Grayken Center for Addiction  
Training & Technical Assistance  
**Boston Medical Center**

Questions? Email [info@addictiontraining.org](mailto:info@addictiontraining.org)