

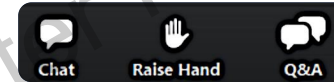
Welcome!



Ensure we can identify you for attendance.



Use the Zoom Q&A function to ask questions.



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Remain muted when not speaking.



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Cannabis 201: Getting to Know Cannabis Formulations and Delivery Systems

Vanessa Loukas, MSN, FNP-C, CARN-AP

April 2, 2026

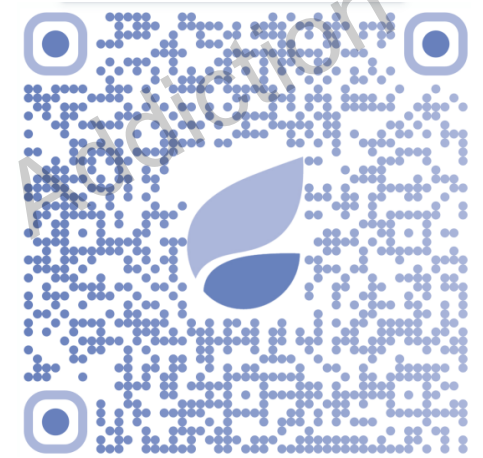


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Fri, 1/30, 10-11am – Nicotine 101: Youth

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Funders



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In support of improving patient care, Boston University Chobanian & Avedisian School of Medicine is jointly accredited by the Accreditation Council for Continuing Medical Education (ACCME), the Accreditation Council for Pharmacy Education (ACPE), and the American Nurses Credentialing Center (ANCC), to provide continuing education for the healthcare team.

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Accreditation Information



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Objectives

By the end of this training, participants will have the knowledge necessary to:

1. Name at least three different formulations of cannabis.
2. Evaluate how to read product labels, including recognizing active ingredient composition (THC:CBD ratio).
3. Identify effects related to cannabinoid consumption based on formulation or product type.
4. Provide health education including risk reduction interventions related to problematic cannabis use.

Basics of Cannabis

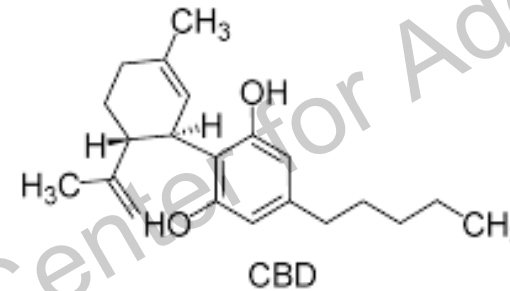
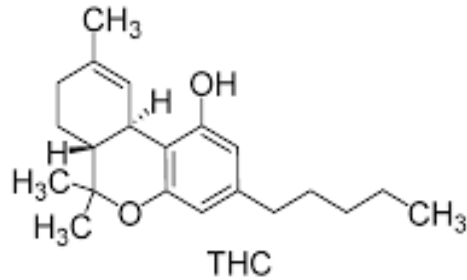
Cannabis: A Plant With Many Compounds

- *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
Dried cannabis (herbal cannabis, flower, bud)	- loose bud - pre-rolled	- smoked - vaped or vaporized	THC: 0% to 30% CBD: 0% to 20%
Cannabis extracts (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%
Edible cannabis (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)

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

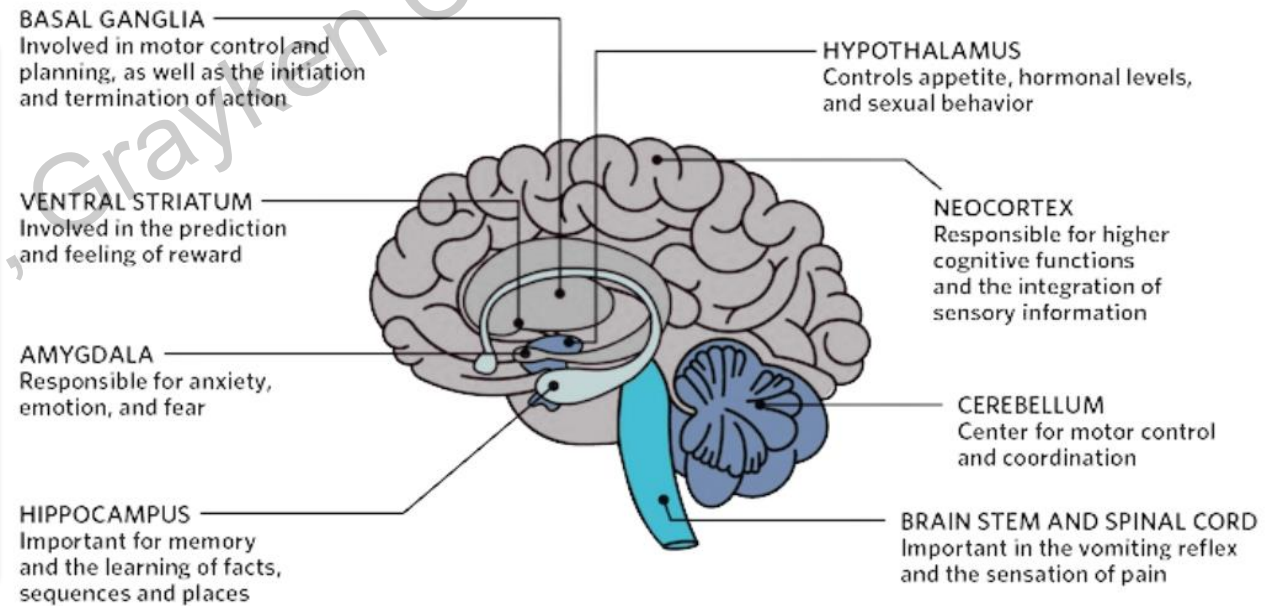
Cannabis Impacts

- 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

Significance of Formulations & Delivery Systems

Wide variety of cannabis formulations, potency and delivery systems available for use impacts patient presentation and risk factors.

- Increasing potency and product diversity available to patients
- Patients often unaware of dose equivalence
- Rise in cannabis-related ED visits (edibles, concentrates)
- Increased risk for dependency and adverse effects including psychosis and cannabinoid hyperemesis syndrome

Varied Adverse Effects from Cannabis Products

Acute:

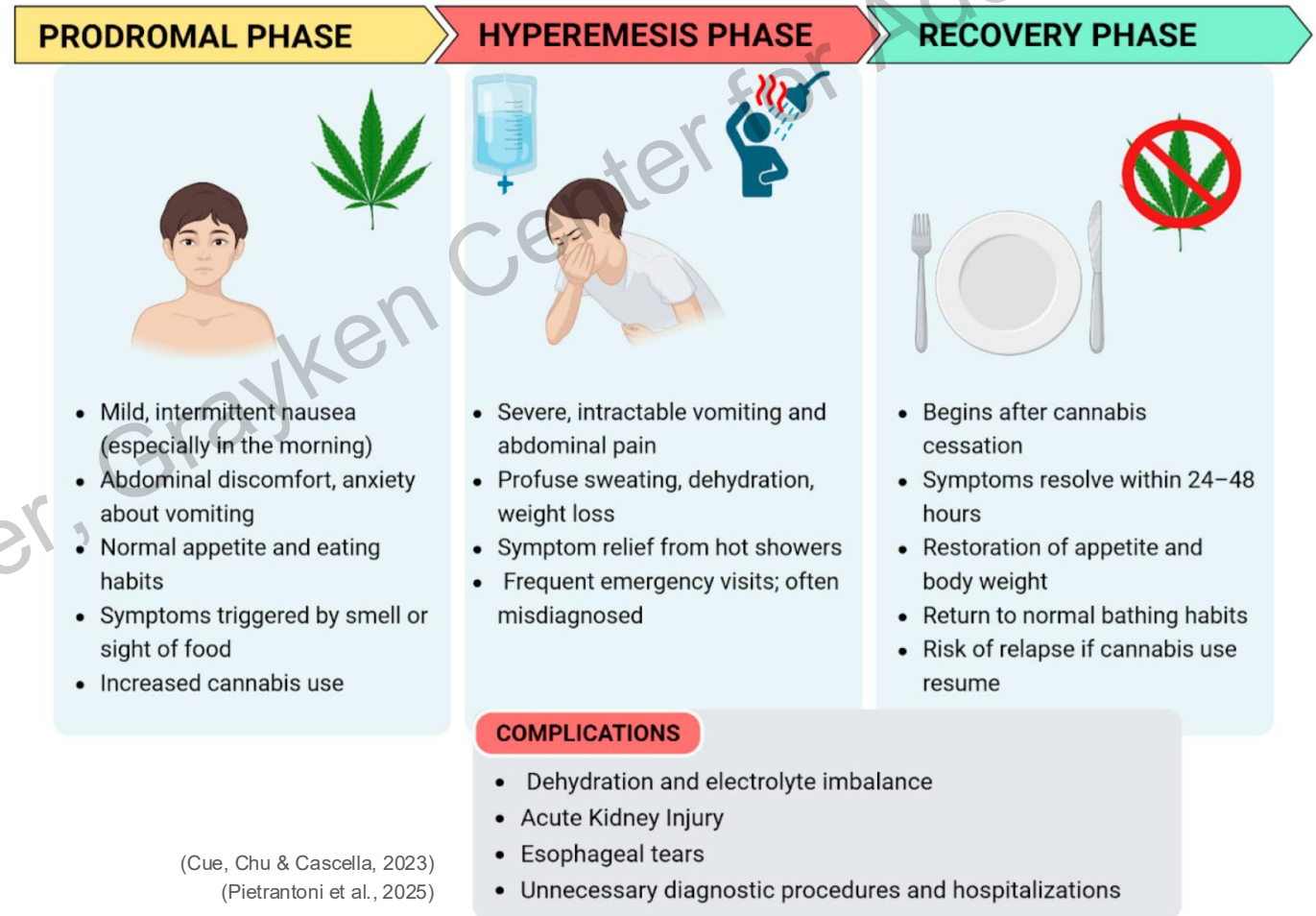
- Anxiety, paranoia, tachycardia
- Impaired cognition/coordination

Chronic:

- Cannabis use disorder
- Cognitive impairment (heavy use)
- Cyclic vomiting (CHS)

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.



Formulations & Delivery Systems

Routes Of Use

Each formulation has different **bioavailability, onset, and duration** impacting experience or intoxication effects and risks

Inhalation

- **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 //



(Stringer, 2023)

Image source: Cannabis Public Health Association

Route of Use & Drug Effect

Route	Onset	Peak	Duration
Inhaled	1–5 min	10–30 min	2–4 hrs
Edible	30–120 min	2–4 hrs	6–8+ hrs
Tincture SL	15–45 min	~1–2 hrs	4–6 hrs
Topical	Variable	Local	Minimal systemic

Formulations of Cannabis Products

Inhaled Forms

Flower (smoked)

Vaporized oils (cartridges, disposable vapes)

Concentrates (wax, shatter, live resin, dabs)

Oral Forms

Edibles (gummies, baked goods, beverages)

Capsules/tablets

Tinctures (sublingual vs swallowed)

Dissolvable powders

Beverages

Topical/Other

Topicals (creams, balms; minimal systemic absorption)

Transdermal patches (systemic delivery)

Inhaled Formulations

Examples: cannabis flower (smoked), vaporized oils (cartridges, disposable vapes), concentrates (wax, shatter, live resin, dabs)

- Rapid symptom relief due to onset timing
- Variable or unknown THC potency
- Frequent use increases risk for rapid dependency
- Combustion/inhalation method increases risk for respiratory irritation



Image source: Grayken TTA
(Spindle et al., 2021)

Risk Reduction with Smoked Products

Interventions to reduce risk may include

- Transition to **vaporization over smoking** (reduces combustion toxins)
- Use **lower-THC strains** (<10–15% if possible)
- Avoid deep inhalation/holding breath
- Limit frequency (avoid daily use if possible)

Cannabis Concentrates

Examples: dabs, wax, shatter, budder, batter, wax, others

- Highly concentrated THC product
- Potency: 80-100% THC vs 10-20% CBD
- Rapid intoxication → anxiety, psychosis
- Strong association with **tolerance, dependence, CHS**
- Method of extraction varies
- Often more economical



Electronic Delivery Systems (EDS)

*Examples: THC cartridges,
disposable pens, vapes*

- High THC concentrations (often 60–80%+)
- Easy, discreet → ↑ frequency of use
- Potential lung injury (EVALI risk with illicit products)



Risk Reduction: Concentrates & EDS

- **Avoid in inexperienced users**
- Use **very small amounts** (“start lower than you think”)
- Avoid daily use
- Screen for mental health risks before use
- Consider **transitioning to lower-potency formulations**

- Choose **regulated products only** (avoid illicit/black market)
- Take **1–2 small puffs**, wait 10–15 min before more
- Avoid continuous use throughout the day
- Consider switching to **lower-THC or CBD-balanced products**

Edible Cannabis Products

Examples: edibles, gummies, foods, beverages, tinctures (Sublingual/Oral)

- Stronger, longer-lasting intoxication
- Higher risk of: Anxiety/panic, Accidental overuse, ED visits
- Delayed onset → accidental overuse
- Longer duration (6–8+ hours)
- Higher ED visit risk (anxiety, panic, intoxication)

Risk Reduction: Edibles & Tinctures

- Start **2.5–5 mg THC max (naïve users)**
- Wait **at least 2 hours** before re-dosing
- Avoid mixing with alcohol
- Store safely (childproof)
- Educate: “**onset is delayed, not absent**”
- Use **measured dropper dosing**
- Hold under tongue **30–60 seconds for faster onset**
- Start low and titrate gradually
- Educate on difference vs edibles

Vapes (THC Cartridges, Disposable Pens)

! Risks

- High-potency THC oils
- Frequent use



✓ Harm Reduction

- Only use regulated products **only**
- Start with 1-2 puffs, wait **10–15 min.**
- Avoid sny lower-THC or balanced products

Edibles (Gummies, Foods, Beverages)

! Risks

- Delayed onset → overdose risk
- Longer duration (6-8+ hrs)



✓ Harm Reduction

- Start **2.5–5 mg THC** (naive user)³
- Wait at least **2 hours** before re-dosing

Topicals & Transdermal Products

- Often higher CBD ratio
- Minimal systemic risk (topicals)
- Transdermal patches may deliver systemic THC
- Low misuse potential
- Use appropriate for **localized symptoms**

Interpreting Cannabis Labels

Interpreting Cannabis Product Labels

Key Label Components

- Total THC (mg per package vs per serving)
- Total CBD
- THC:CBD ratio (e.g., 1:1, 10:1)
- Route specific dosing - Serving size vs total dose
- Strain/type (not clinically reliable)

THC:CBD Ratio Interpretation

- High THC (e.g., 20:1): ↑ intoxication, anxiety risk
- Balanced (1:1): potentially moderated psychoactive effects
- CBD dominant: minimal intoxication

How to Read a Cannabis Product Label

Cannabis Gummies

THC Infused Edibles

- Total THC: **100 mg** per package
- Serving Size: 1 Gummy
- THC per Serving: **10 mg**
- CBD per Serving: **2 mg**
- THC:CBD Ratio: **5:1**

⚠ Remember: TOTAL THC is NOT the same as Per Serving!

⚠ Common Pitfalls:

- ⚠ Eating entire package
- ⚠ Re-dosing too soon
- ⚠ Underestimating potency

1. THC Content

- Psychoactive component
- Start low: **2.5–5 mg** THC
- High risk: ≥ 10 mg/serving, ≥ 50 – 100 mg/package



2. THC : CBD Ratio

- High THC (e.g., **10:1**) → Intoxication, Anxiety
- **1:1** Balanced → Milder effects
- CBD-Dominant → Minimal intoxication



3. Serving Size vs. Total Dose

- Per Serving (e.g., **10 mg** each)
- Per Package (e.g., **100 mg** total)

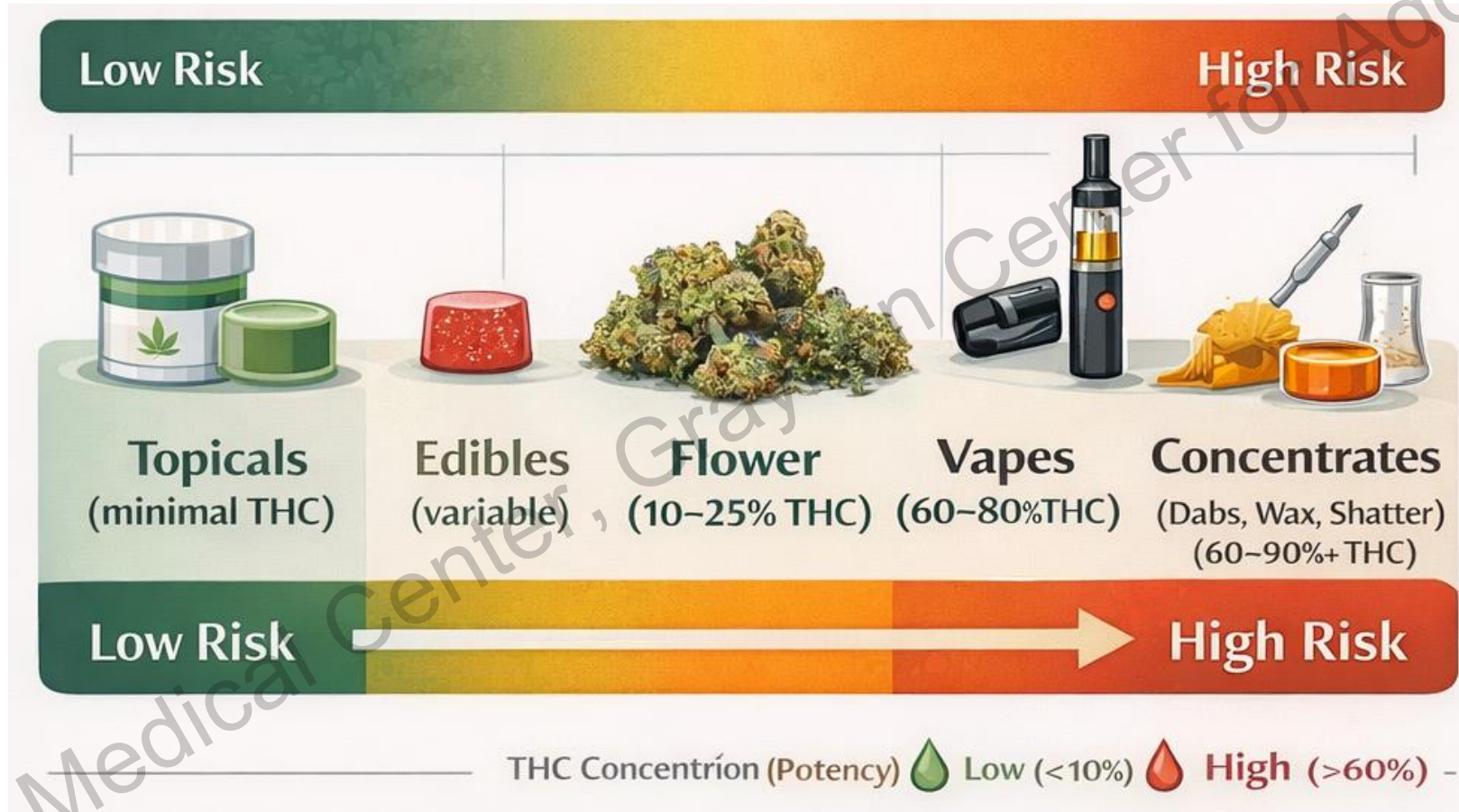


4. Product Type

- Edibles → Delayed effect
- Vapes → Rapid onset
- Concentrates → Very High THC



Increased THC Potency = Increased Risks



References

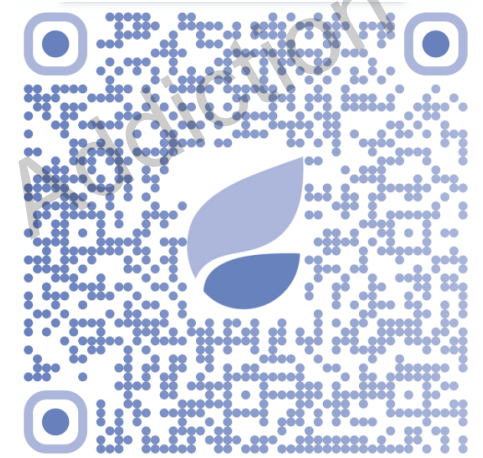
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Resources

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Additional Resources: Cannabis

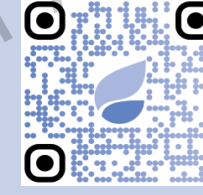
Promoting Wellness Resources

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.



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- Hosted by BMC Grayken TTA Clinical Educators
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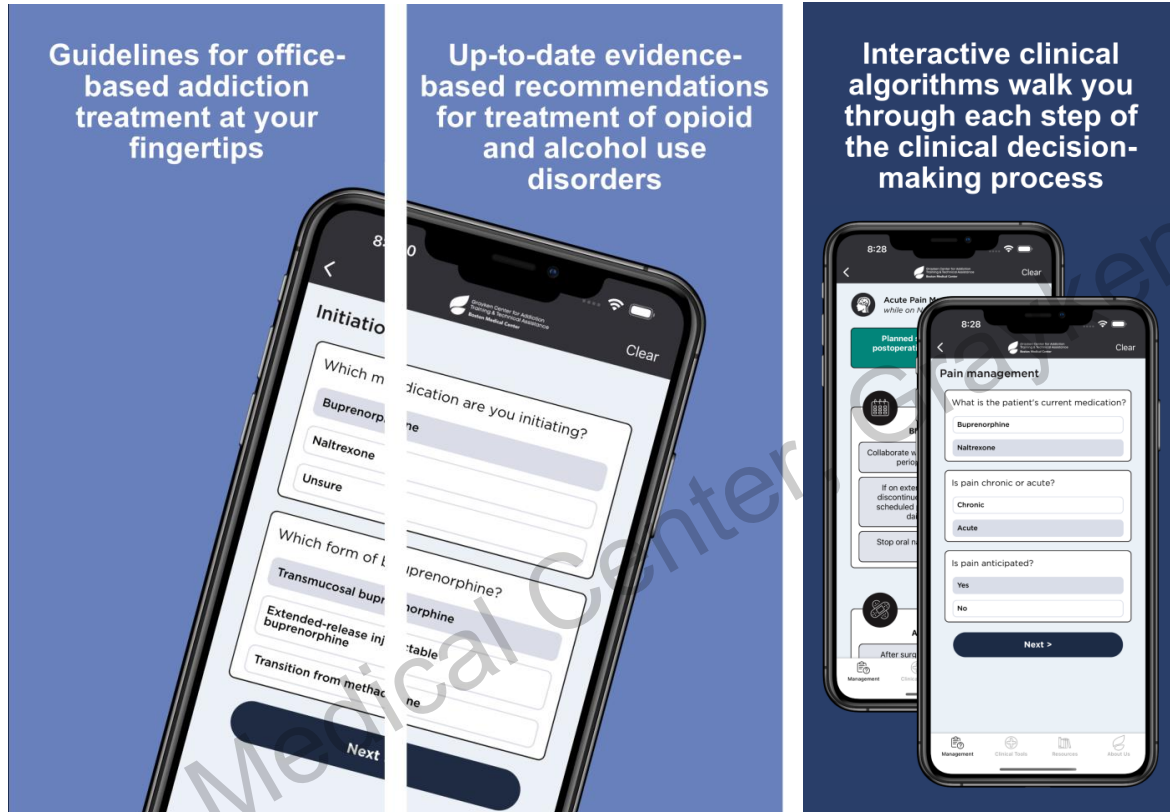
The screenshot shows the website header with the logo for Grayken Center for Addiction Training & Technical Assistance, Boston Medical Center. It includes a search bar and navigation links like 'Home', 'DEA MATE Act', 'MAT Mobile App', 'Training', 'Request TTA', 'Project ECHO', 'Resources', 'News', and 'About Us'. The 'Training' dropdown menu is open, highlighting 'Pre-recorded Trainings'. The main content area features the heading 'Pre-recorded Trainings' and 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.' Below this is a photo of a person at a computer. At the bottom of the screenshot, there is a call to action: 'To access our free recorded trainings, [click here](#) or scan the QR code!'.

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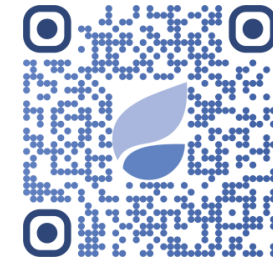
Free interactive clinical tools, decision trees, treatment protocols & resources



Provides real-time access to:

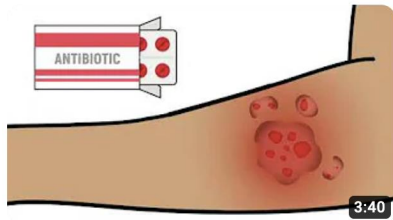
- ✓ Latest evidence-based guidance for treating opioid and alcohol use disorders
- ✓ Decision-making trees for initiation of buprenorphine and naltrexone
- ✓ Interactive tools, treatment protocols, and patient messaging features

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



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



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



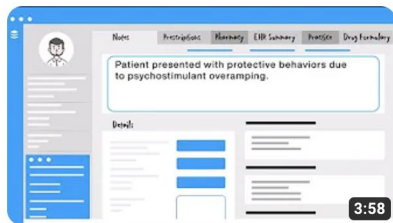
Pharmacodynamics of Medications for Opioid Use Disorder
1.8K views • 3 months ago



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



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



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