# Recreational Marijuana in Ohio: What to Know in 2024

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1 VOICE VISION TEAM

# Disclosure Statement

- Christopher Hernandez has no relevant financial relationship(s) with ineligible companies to disclose.

  *and*

- None of the planners for this activity have relevant financial relationships with ineligible companies to disclose.

# Learning Objectives

At the completion of this activity, the participant will be able to:

1. Compare and contrast different formulations of marijuana
2. Discuss necessary medication adjustments needed with concomitant use of marijuana
3. Identify signs and symptoms of marijuana misuse and overuse

# MARIJUANA use in ohio

# Legalization of Marijuana

- Multiple states have passed laws allowing medical use and recreational use
  - Cannabis is still an illegal substance according to federal law
- FDA has recommended the DEA reschedule from Schedule I to III

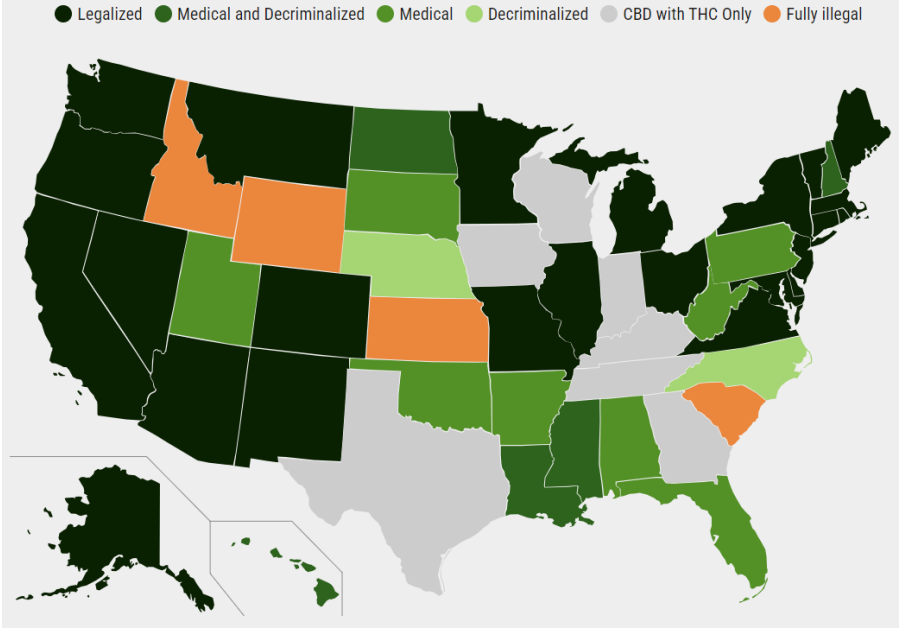



Image source: https://disa.com/marijuana-legality-by-state

# Ohio Law

- Medical marijuana legalized in Ohio in 2016
- Ohio Issue 2, Marijuana Legalization Initiative (2023)
  - allowing the sale and purchase of marijuana, which a new Division of Cannabis Control would regulate;
  - allowing adults who are at least 21 years old to use and possess marijuana, including up to 2.5 ounces of marijuana; and
  - enacting a 10% tax on marijuana sales.
- Hold up in legislation
  - Main topics of discussion:
    - Time to approve non-medical cannabis facilities
    - Number of homegrown plants per person/residence
    - Distribution of taxes

# Recreational Timeline Approval

**11/7/2023**

- Issue 2 Majority Vote by Ohio Voters

**12/7/2023**

- Statute became effective & Division of Cannabis Control (DCC) Created

**6/7/2024**

- Required to have licensure application and timeline for initial applications available

**9/7/2024**

- Provisional licenses will be awarded (to current medical marijuana dispensaries)

# Overview of marijuana (cannabis)

# Terminology

## Cannabis:

- Genus name for marijuana, which encompasses species (sativa/indica)

## Marijuana:

- Dried leaves, flowers, stems, and seeds from the Cannabis sativa or Cannabis indica plant

## Cannabinoids:

- Molecule that interacts with cannabinoid receptors
- 100+ in cannabis

## Terpenoids:

- Aromatic organic compounds
- β-caryophyllene, myrcene, limonene, and pinene

# Terminology: Variety Names

- Cultivar (variety) names for plants that have undergone years of breeding to express desired traits
- There has been so much cross-breeding and blending of strains that strain names have become meaningless

‘Skunk #1’
‘Haze’
‘Northern Lights’
‘G-13’
‘AK-47’
‘White Widow’
‘Hindu Kush’
‘Bubblegum’
‘Chronic’
‘Sour Diesel’
‘Blueberry’
‘Cannatonic’
‘AC/DC’

# Cannabis Main Cannabinoids

**Δ-9tetrahydrocannabinol (THC)**

- Psychoactive formulation
- Properties:
  - Anti-inflammatory
  - Neuroprotective
  - Anti-nausea
  - Analgesic
- No FDA-approved treatment derivative
  - Only synthetic versions exist

**Cannabidiol (CBD)**

- Non-psychoactive formulation
- Properties:
  - Minimizes side effects of THC
- FDA approved for the treatment of:
  - Lennox-Gastaut syndrome
  - Dravet syndrome

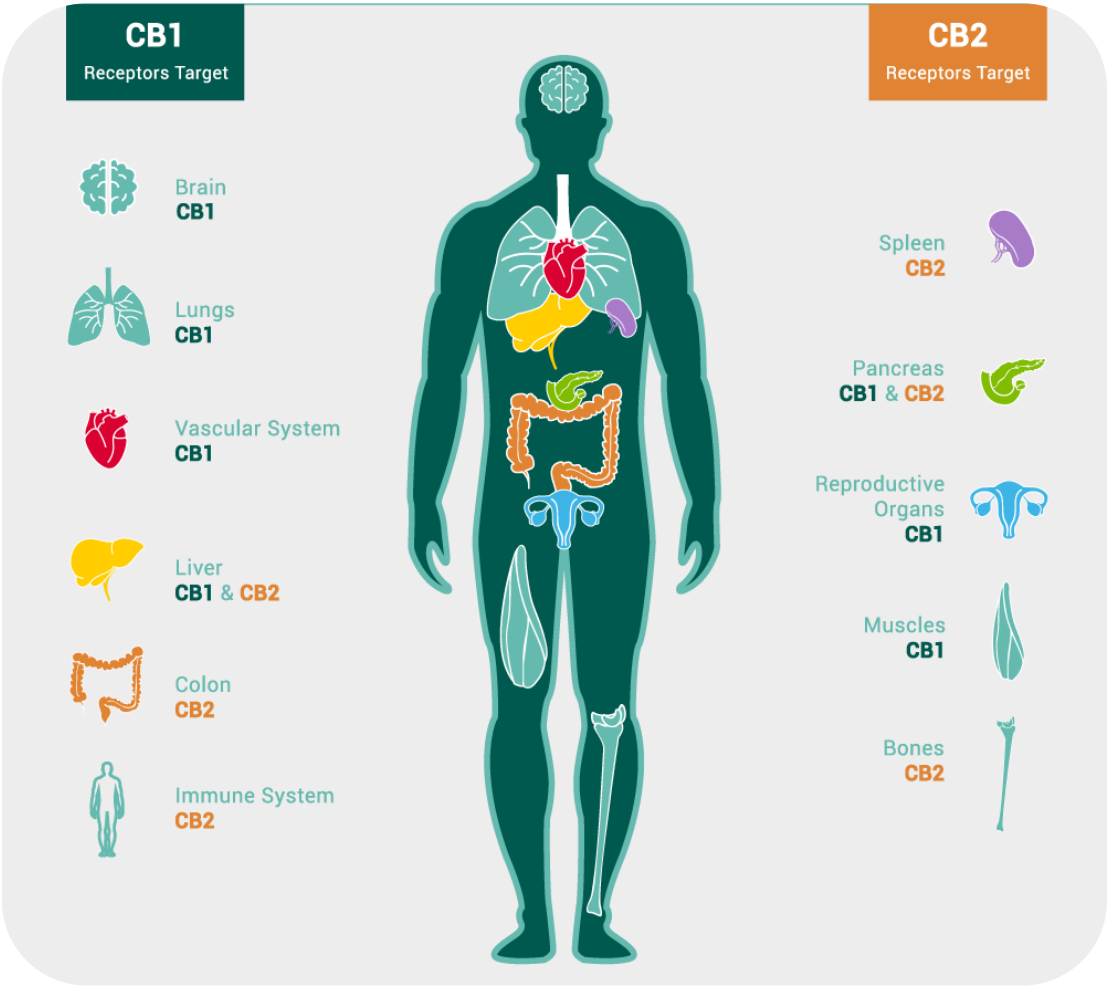
Others: Cannabinol (CBN), Cannabigerol (CBG), Cannabichromene (CBC)



Szutorisz H, Hurd YL. *Neurosci Biobehav Rev*. 2018;85:93-101

# Human Endocannabinoid System

- CB1 receptors in CNS
- CB2 receptors in the immune system
- CBD has little affinity for CB1 and CB2 receptors




National Academies of Sciences, Engineering, and Medicine. 2017. The health effects of cannabis and cannabinoids

Tanaka K, et al. *Eur J Obstet Gynecol Reprod Biol*. 2020;244:87-94.

# Cannabis Formulations

# Common Formulations

Flower “bud”

Fuzzy part of plant

Edibles

brownies, cookies, gummy bears, ice cream, lollipops, etc

Hemp

Paper, rope, textiles, clothing, food, building material, etc

- Lower concentrations of THC, generally 5-20%
  - 1995: ~4%, 2014: ~12%
- Hemp: Cannabis with very low THC concentrations (<0.3%)

ElSohly MA, et al. *Biol Psychiatry*. 2016;79(7):613-619.

# Concentrated Extracts

hash oil or honey oil

a gooey liquid

wax or budder

a soft solid with a texture like lip balm

shatter

a hard, amber-colored solid

- Highest concentrations of THC, generally 60-90%
  - 2008: ~6.7%, 2017: ~55.7%
- Per Ohio law, allowed 15 grams

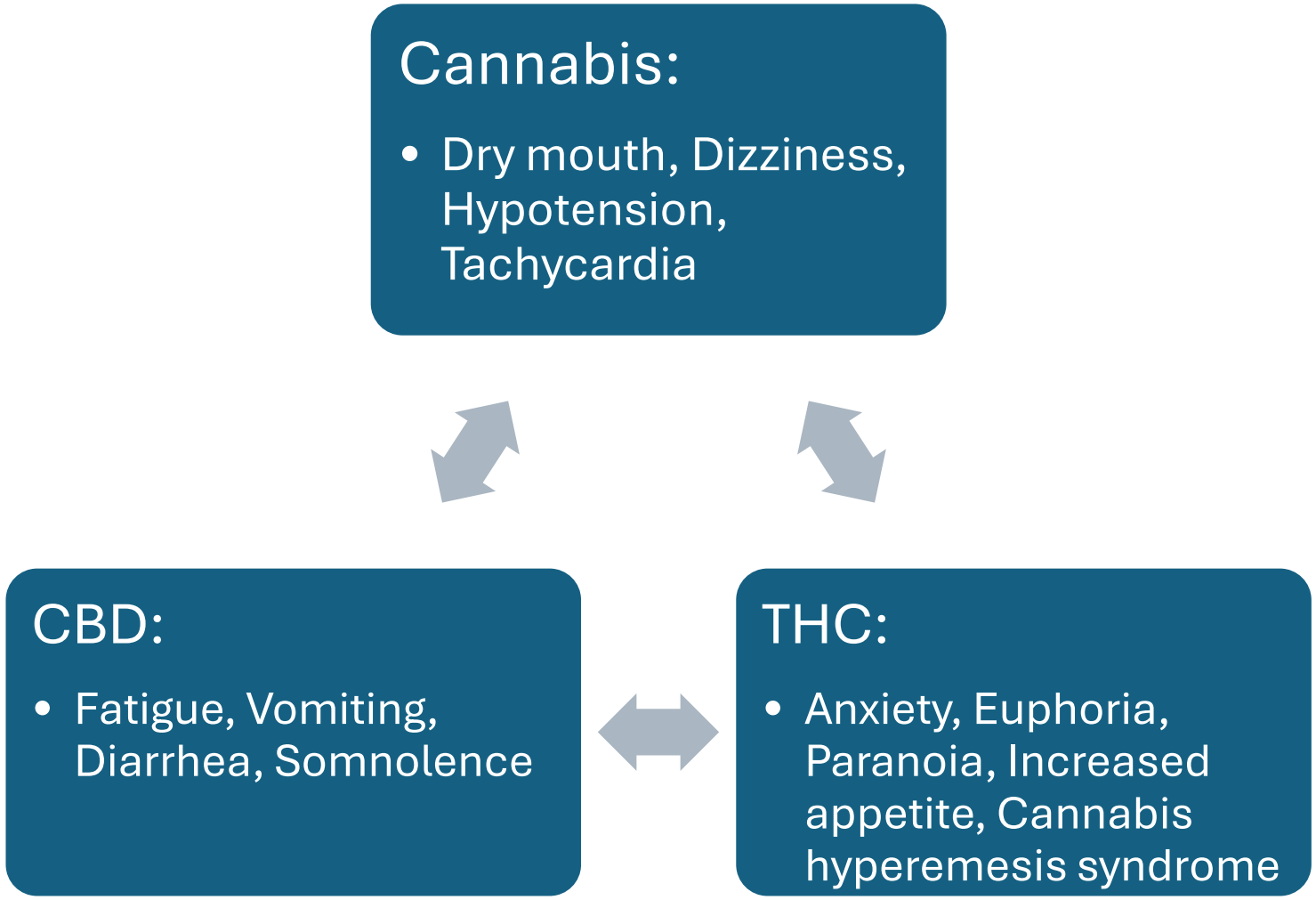
National Academies of Sciences, Engineering, and Medicine. 2017. The health effects of cannabis and cannabinoids
Chandra S, et al. *Eur Arch Psychiatry Clin Neurosci.* 2019;269(1):5-15.
Image source: https://adf.org.au/drug-facts/butane-hash-oil

# FDA Approved Therapies

| Marinol®<br>(Dronabinol) | Cesamet®<br>(Nabilone) | Epidiolex®<br>(Cannabidiol) |
|---|---|---|
| • Synthetic THC<br>• FDA approved: 1985<br>• Control: CIII<br>• Available as generic<br>• Indicated for anorexia and chemo-induced nausea and vomiting | • Synthetic THC<br>• FDA approved: 1985, marketed 2006<br>• Control: CII<br>• Available as generic<br>• Indicated for chemo-induced nausea and vomiting | • Plant-derived CBD<br>• FDA approved: 2018<br>• Control: Non-control<br>• Available as brand-name only<br>• Indicated for seizure disorders |

Marinol [package insert]. High Point, NC: Banner Pharmacap, Inc; 2004
Cesamet [package insert]. Costa Mesa, CA: Valeant Pharmaceuticals; 2006
Epidiolex [package insert]. Palo Alto, CA: Jazz Pharmaceuticals, Inc; 2023

# Adverse Effects



# Cannabis Trends

- Where all cannabis is prohibited
  - Smoking > edibles
- Where medical cannabis is legalized
  - Edibles > smoking
- In Colorado, recreational sales
  - 49.8% herbal cannabis
  - 30.1% solid concentrates
  - 12.8% edibles
  - 6.1% infused non-edibles

https://sbg.colorado.gov/sites/sbg/files/2020-Regulated-Marijuana-Market-Update-Final.pdf

# Knowledge Check

- Which of the following cannabis formulations generally has the **highest** amount of THC per gram?
  A. Edibles
  B. Wax
  C. Bud
  D. Hemp

# Knowledge Check

- Which of the following cannabis formulations generally has the **lowest** amount of THC per gram?
  A. Edibles
  B. Wax
  C. Bud
  D. Hemp

# Evidence-based Uses of Cannabis

# Research Limitations

Cannabis research is highly limited, with some data coming from FDA-approved medications

Schedule I at a federal level leaves higher regulatory struggles

Which supply of cannabis to choose?!

# Evidence Per National Academy of Sciences

## Conclusive or substantial evidence

- Treatment of chronic pain in adults (mostly neuropathic)
- Treatment of chemotherapy-induced nausea and vomiting
- Improving patient-reported multiple sclerosis spasticity symptoms

## Moderate evidence

- Improving short-term sleep outcomes in individuals with sleep disturbance associated with:
  - obstructive sleep apnea syndrome
  - fibromyalgia
  - chronic pain
  - multiple sclerosis

## Limited evidence

- Increasing appetite and decreasing weight loss associated with HIV/AIDS
- Improving symptoms of Tourette syndrome
- Improving anxiety symptoms in individuals with social anxiety disorders
- Improving symptoms of posttraumatic stress disorder

?

National Academies of Sciences, Engineering, and Medicine. 2017. The health effects of cannabis and cannabinoids

# Drug Interactions

# Drug-Drug Interactions

- Most of our drug-drug interactions come from FDA-approved labelling
  - Not consistent with in-vivo data and recreational use
- Highlights:
  - Cannabis is a CNS depressant
  - Cannabinoids and terpenes can affect metabolism
  - THC & CBD have separate CYP metabolism
    - **THC: CYP1A2 inducer**
    - **CBD: CYP2C19 inhibitor**

Lucas CJ, et al. *Br J Clin Pharmacol*. 2018;84(11):2477-2482

# Drug Interaction Studies

## THC

- Increase warfarin levels
  - Frequent cannabis use has been associated with increased INR
- Alcohol may increase THC levels

## CBD

- Increase clobazam levels
  - In children treated with CBD for epilepsy, CBD increased clobazam levels

## Cannabis

- Decrease theophylline levels
- Additive CNS depressant effects with ETOH, barbiturates, and benzodiazepines
- Cannabis does not have additive CNS effects with opioids

Smythe MA, et al. *Pharmacotherapy*. 2023;43(12):1327-1338.

# Knowledge Check

- THC is known to have what effect on warfarin?
  A. Increase INR
  B. Decrease INR
  C. Unknown effects

# Knowledge Check

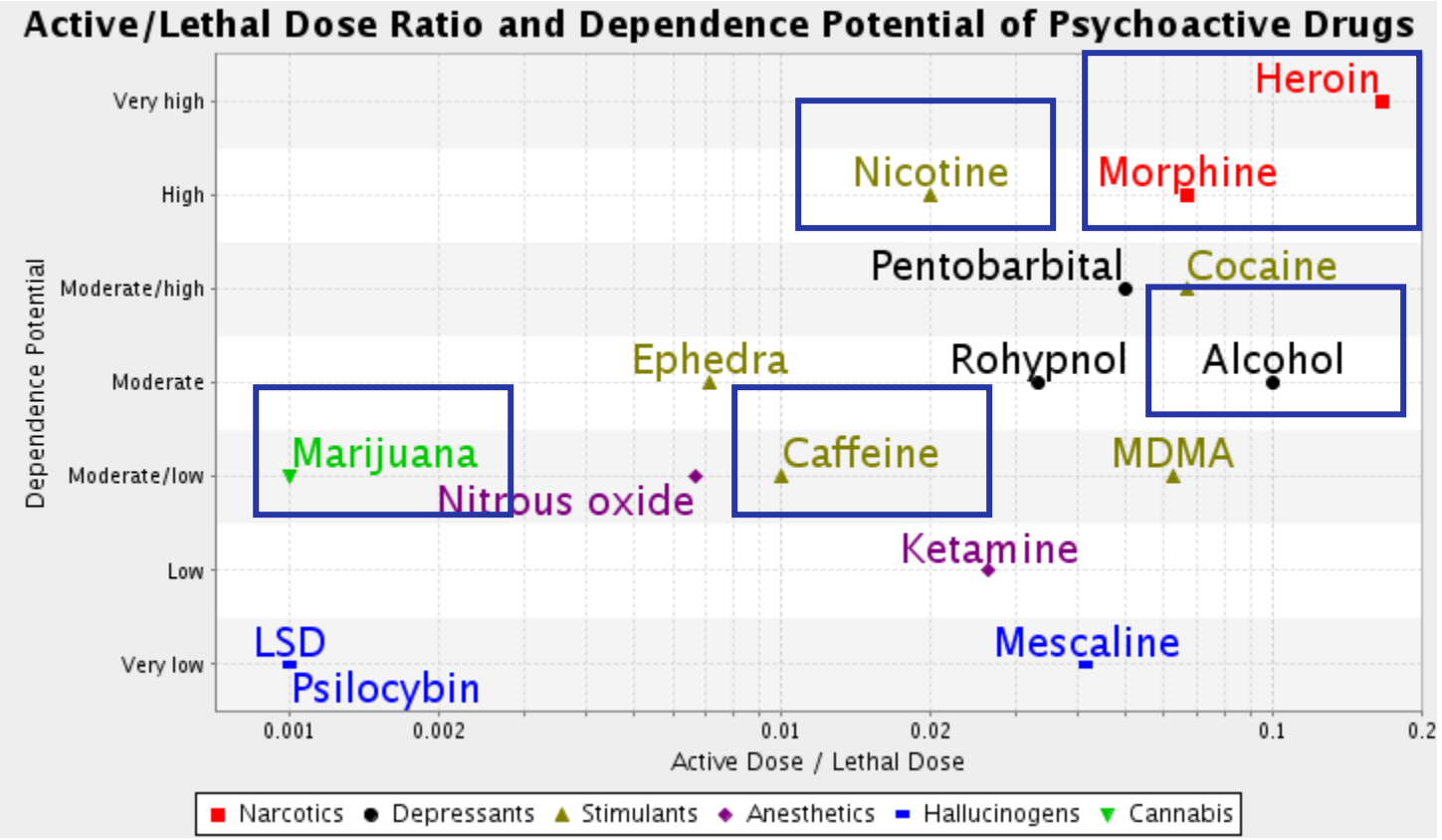
- True or False: Cannabis has additive CNS effects when used in combination with opioids
  A. True
  B. False

# Cannabis Safety and special populations

# Safety - Acute Toxicity

- Physiologically, cannabis overdose is not an apparent risk
  - Hyperemesis, blood pressure changes, or fear/anxiety
- Frequently manifests with severe anxiety, tachycardia, and acute psychosis
- More frequent with edibles given the slow onset of effect
  - Children make up a large amount of cannabis-based acute toxicity in ED visits

# Safety – Lethal?




- Older data: does it still apply today?

Gable RS. *Addiction*. 2004;99(6):686-696.

# Safety – Contraindications

- Acute psychosis and other unstable psychiatric conditions
  - Statistical association between dose-dependent cannabis and the development of schizophrenia
- Unstable cardiovascular disease
  - Associated with increased risk of stroke and developing heart failure
  - Not associated with acute MI
- Severe respiratory disease (inhaled products)
  - Associated with bronchitis
  - Not associated with COPD
- Pregnancy

National Academies of Sciences, Engineering, and Medicine. 2017. The health effects of cannabis and cannabinoids
Kalla A, et al. J Cardiovasc Med. 2018 Sep;19(9):480-484.
Mittleman MA, et al. Circulation. 2001; 103(23):2805–2809.

# Pregnancy and Lactation

- Cannabis use during pregnancy is not recommended
  - Heavy use of cannabis during pregnancy may cause adverse effects on neurodevelopment
- Cannabis use has not been shown to increase the risk of congenital anomalies
- “Pumping and dumping” is not a viable choice since THC from cannabis can stay in breastmilk for up to six days after use

Metz TD, Stickrath EH. *Am J Obstet Gynecol.* 2015;213(6):761-778.

# Adolescents

Potential detrimental effects on cognition, brain, and educational outcomes

Impaired cognitive function improves with sustained abstinence

Important to practice medication safety

Lorenzetti V, Hoch E, Hall W. *Eur Neuropsychopharmacol*. 2020;36:169-180.

# Older Adults

- Products are much stronger now than they were before
- In California, cannabis-related visits are increasing amount older adults
- Cannabis use is prone to:
  - Slow reaction time
  - Impaired attention
  - Leading to injuries, including falls
- Polypharmacy and DDI

Han BH, et al. *J Am Geriatr Soc*. 2023;71(4):1267-1274.

# Cannabis Misuse/Overuse

# Cannabis Use Disorder

- DSM-5 defined criteria within a 12-month period
  - Loss of control over use, repeated failures to quit, and continuous usage despite negative consequences
- Abrupt discontinuation of cannabis use can elicit a withdrawal syndrome

Leffers P, et al. Substance Use Disorders I: Opioids, Cannabis, and Stimulants. Pharmacotherapy A Pathophysiologic Approach, 12e. McGraw Hill; 2021.

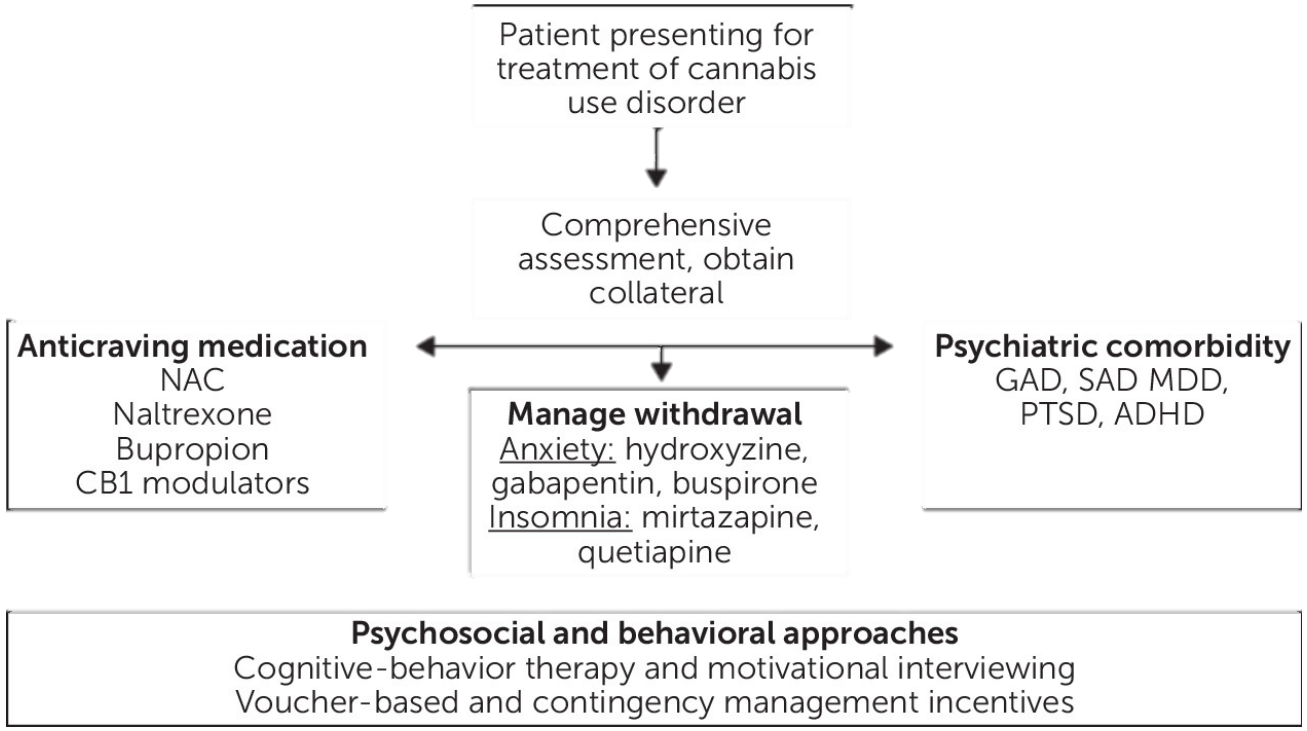
# Cannabis Withdrawal

- Not all patients go through withdrawal
- Withdrawal symptoms are minor for most patients
  - Heavy cannabis use can cause withdrawal syndrome
- Symptoms of withdrawal include irritability, insomnia, loss of appetite, sweating, diarrhea, and mild increases in heart rate and blood pressure.
- Begins about 24 hours after the last use and continues for 1–2 weeks

Leffers P, et al. Substance Use Disorders I: Opioids, Cannabis, and Stimulants. Pharmacotherapy A Pathophysiologic Approach, 12e. McGraw Hill; 2021.

# Cannabis Withdrawal Treatment

- There are no FDA-approved drug treatments for cannabis use disorder




Williams AR, Hill KP. *Focus (Am Psychiatr Publ)*. 2019;17(2):98-103.

# Cannabinoid hyperemesis syndrome "Cyclic Vomiting Syndrome"

- Episodes of nausea and vomiting, abdominal pain, and polydipsia
- Will likely increase in incidence given the increase in access and potency of THC-containing products (Activation of CB1)
- Treatment:
  - **Hot baths or showers**
  - IV fluids
  - Traditional antiemetics
  - Haloperidol
  - Topical capsaicin

Leffers P, et al. Substance Use Disorders I: Opioids, Cannabis, and Stimulants. Pharmacotherapy A Pathophysiologic Approach, 12e. McGraw Hill; 2021.

# Pharmacist role

# Talking with your patients

- Public perceives smoking cannabis is safer than smoking tobacco
- Some conditions show favorable evidence, some not as strong, and most have no data
- “Start low and go slow”
- Reduce stigma associated with cannabis

# Summary

- Overall cannabis use will increase in the upcoming months with legalization
- Cannabis has strong data for neuropathic pain and CINV
- Chemical profile is the most important factor in determining side effects
- Drug-drug interactions possible, likely theoretical, monitoring required!
- Apply medication safety

# References


- Images not cited provided by Adobe Stock Images non-commercial licensing
- National Academies of Sciences, Engineering, and Medicine; Health and Medicine Division; Board on Population Health and Public Health Practice; Committee on the Health Effects of Marijuana: An Evidence Review and Research Agenda. The Health Effects of Cannabis and Cannabinoids: The Current State of Evidence and Recommendations for Research. Washington (DC): National Academies Press (US); January 12, 2017.

# Need More Information?

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