

# Upcoming Webinars

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Remaining SCCAP webinars:

- Oct. 7 Noon ET **Children and Technology Use** - Justin Parent, PhD
- Oct. 20 2PM ET **Preventing Childhood Sexual Abuse: Enlisting Parents in Education**  
Maureen C. Kenny, PhD Joint program with Div 37
- Nov. 4 1pm ET *R. Bob Smith Excellence in Assessment Webinar:*  
**New Thoughts About Assessment and Diagnosis of Autism**, Catherine Lord, PhD  
Free Member CE
- TBA Joan Asarnow, PhD, Distinguished Career Presentation
- TBA Panel Discussion-Students and Advocacy and Career Development

# Cannabis Use in Adolescents

*Mary A. Fristad, PhD, ABPP*

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# Conflicts of Interest

*Ms. Powell-None; Dr. Fristad-see below*

- *Royalties:*
  - American Psychiatric Press
  - Child & Family Psychological Services
  - Guilford Press
  - JK Seminars
- *Research:*
  - Janssen

# Learning Objectives

1. **Recognize changes in potency and availability of marijuana in 2020**
2. Increase familiarity with marijuana usage and associated risk in adolescence
3. Name 3 clinical strategies for addressing usage
4. List initial interventions for adolescents using marijuana

# Current Legalization Status

- *October, 2009*: US Attorney General distributed guidelines for federal prosecution of possession and use of marijuana, ceding jurisdiction of marijuana law enforcement to state governments
- *33 states*: medical marijuana is legal
  - beginning in 1996 (California)
  - 33% since 2014
- *11 states*: recreational marijuana is legal
  - Beginning in 2012 (Colorado, Washington)
  - 82% since 2014

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# Biology of Cannabis

Chandra et al *European Archives of Psychiatry and Clinical Neuroscience* (2019) 269:5–15

Cannabis plants bio-synthesize at least 144 cannabinoids

- the most abundant are  $\Delta 9$ -tetrahydrocannabinoid (THC) and cannabidiol (CBD)
- THC can → memory impairment, anxiety, and transient psychotic-like symptoms in a dose-dependent manner
- CBD is nonintoxicating and has been found to offset several, harmful effects of THC
- Both the THC dose and the THC:CBD ratio matters



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# It's Not Your Dad's/Mom's Marijuana

*Chandra et al (2019)*

- NIDA has tested >18,000 confiscated samples from 2008→2017
  - ↑ mean THC concentration, 8.9%→17.1%
  - ↑ mean THC:CBD ratio, 23→104
  - ↑ Hash oil THC concentration, 6.7→55.7%
- Similar increases have been reported in the Netherlands, U.K., France, Italy, E.U., Norway, Turkey
- Naturalistic studies indicate that cannabis users only partially adapt their smoking behavior to variation in THC concentrations
- (Some products are >80%, NIDA provides <4% samples for research)

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# Biology of the Adolescent/Emerging Adult (AEA) Brain & Marijuana

*Wright et al, PLoS ONE, 2016, 11 (11)*

- The primary brain cannabinoid receptor, CB1, has ***significantly greater binding in adolescence than in adulthood***
- This binding ***modulates the reward system*** within the ventral tegmental area (VTA) of the brain, increasing release of dopamine
- Repeated CB1 binding due to exogenous cannabis (THC) exposure results in downregulation of the endogenous CB (eCB) system, particularly in limbic regions, such as the hippocampus
- The endogenous eCB system is ***implicated in mood symptomatology and executive functioning deficits***, perhaps due to its concentration of CB1 receptors in prefrontal and limbic regions
- AEAs typically experience changes in frontal/limbic neuroanatomy and the eCB system
- Thus, marijuana use is implicated in ↑ executive dysfunction, anxiety, depressive symptoms, impulsivity, especially in AEAs
- ***Can lead to persistent, enduring changes in brain function***

# More About Developing Brains

*Volkow et al, 2014, NEJM, 371: 878-79*

**Short-term use-** associated with

- ↓ short-term memory
- ↓ motor coordination
- altered judgment (↑ risk of risky sexual behavior)

**Long-term/heavy use-** associated with

- altered brain development\*
- ↓ educational outcome
- cognitive impairment (↓ IQ)
- ↓ life satisfaction
- ↓ achievement
- addiction
- chronic bronchitis
- chronic psychosis (in high-risk individuals).....



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# Developmental Impact: THC Exposure

*Volkow et al, 2014*

## **Prenatal:**

- interferes with cytoskeletal dynamics, which are critical for the establishment of axonal connections between neurons
- Alters developmental regulation of the mesolimbic dopamine system of affected offspring

**Youth:** THC can recalibrate sensitivity of the reward system to other drugs

**Adults w/ regular use in adolescence:** ↓ neural connectivity

- Precuneus: alertness, self-conscious awareness
- Fimbria (hippocampus): learning and memory
- Prefrontal networks: executive functioning (inhibitory control)
- Subcortical networks: process habits and routines

**Adults w/ regular use:**

- ↓ activity in prefrontal regions, ↓ hippocampal volume

# Addiction & Withdrawal

*Volkow et al, 2014*

## **Addiction**

- 9% of those who experiment
- 17% of those with adolescent onset of use
- 25-50% of daily users
- 2012: 2.7 million with dependence

## **Withdrawal**

- Mood-irritable/dysphoric/anxious
- Sleep disturbance
- Cravings



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# Statistics on Adolescent Marijuana Use

## **Lifetime use:**

- 44.4%, 12th graders
- >57.5%, young adults

**First use:** usually during adolescence

**Peak use:** 18–25

## **Decline in perceived risk from 2008→2011:**

- lifetime use rates ↑ by 21%
- past-year use ↑ by 31%
- 9% of 9-12 graders use daily/nearly every day, ↑ 80%
- Past year use has doubled in 18-29 year olds



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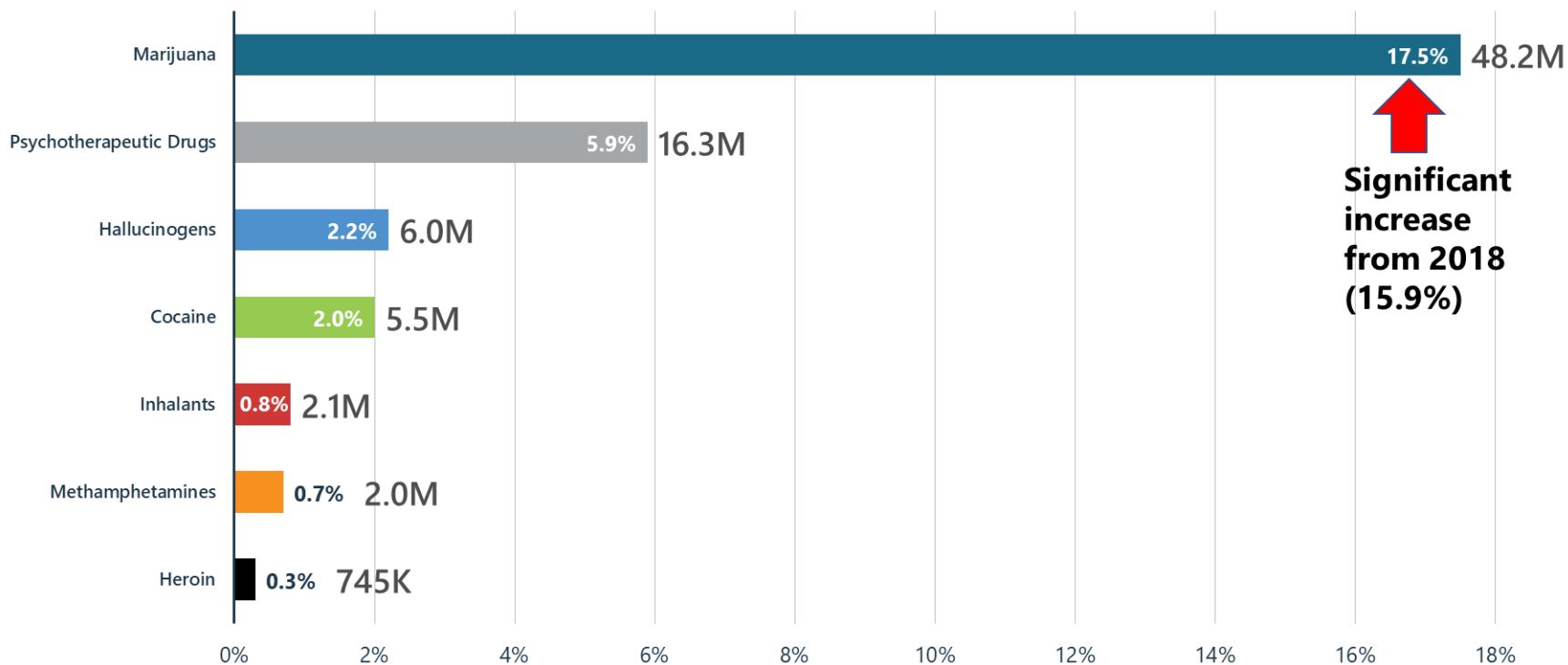


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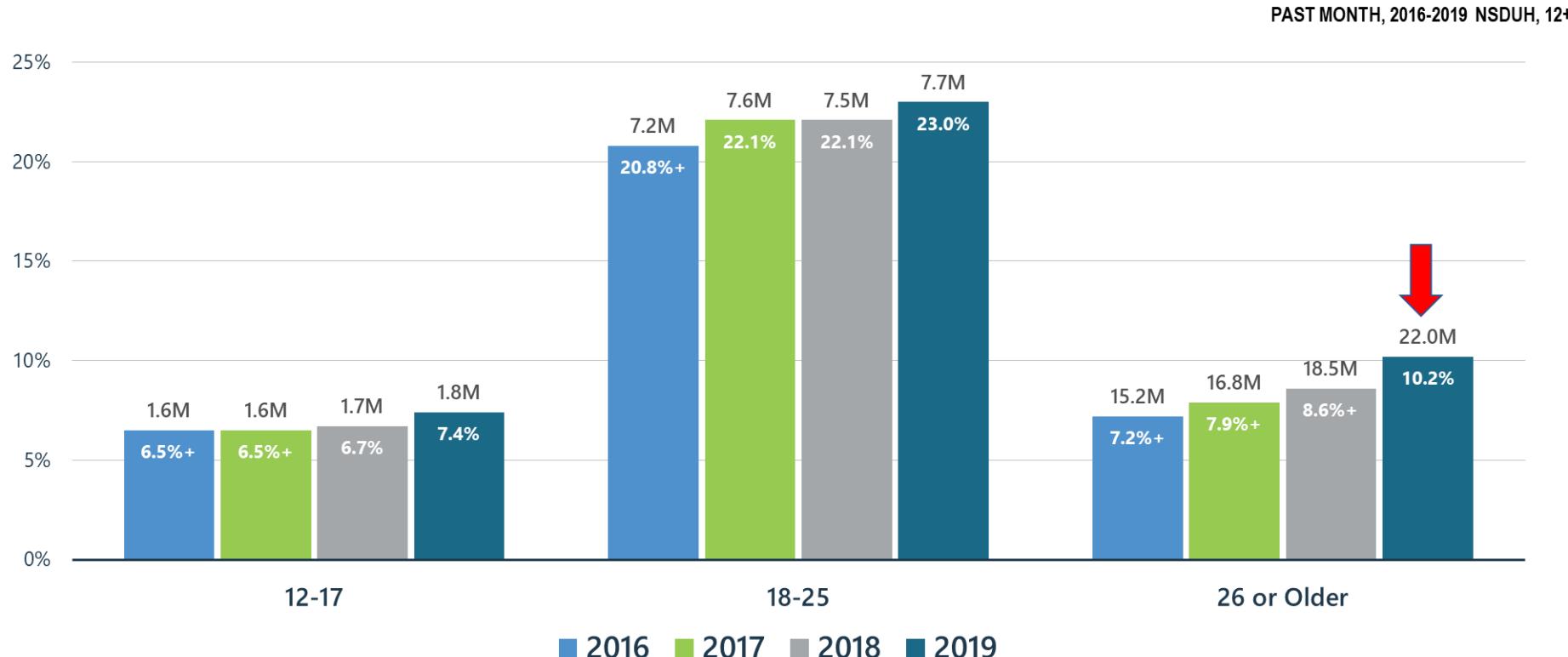
# Past Year Illicit Drug Use: Major Concerns: Opioids, Marijuana, Methamphetamines

National Survey on Drug Use and Health (NSDUH, 2020)

PAST YEAR, 2019 NSDUH, 12+



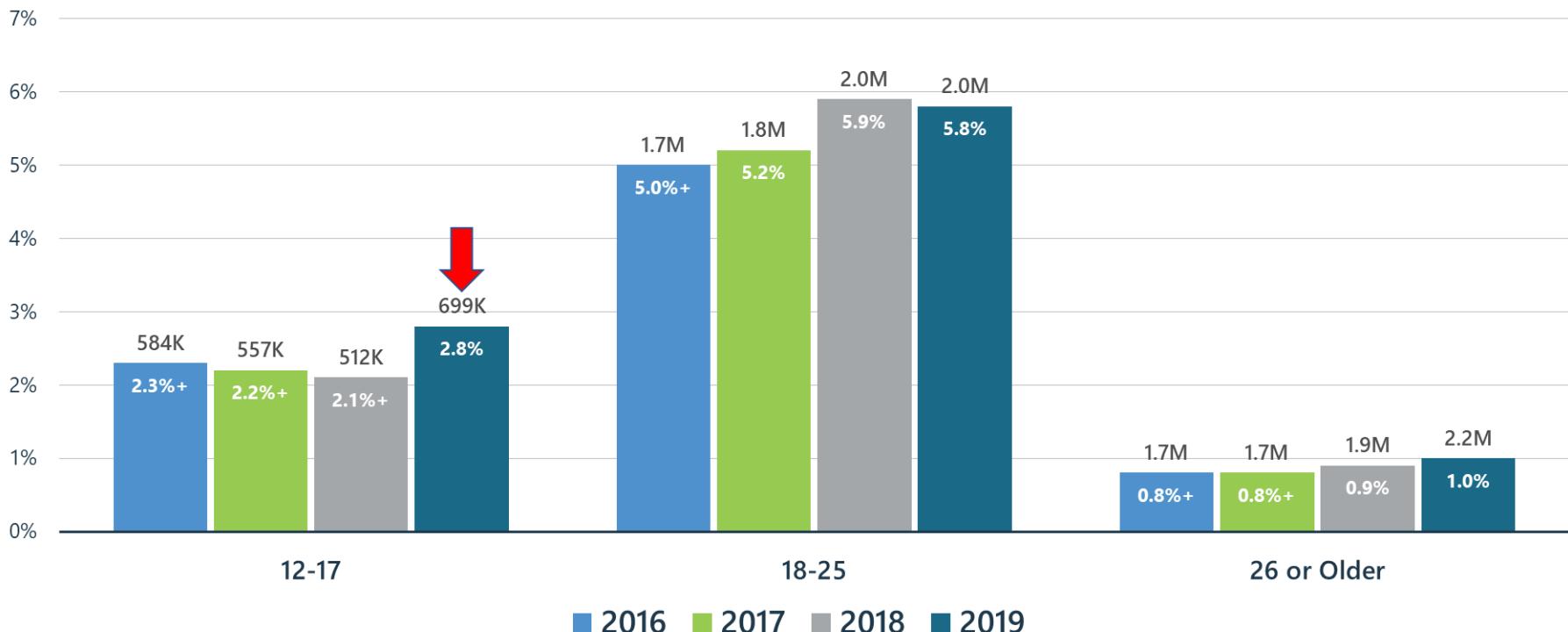
# Past Month Marijuana Use for All Age Groups



+ Difference between this estimate and the 2019 estimate is statistically significant at the .05 level.

# Marijuana Use Disorder: Significant Increase for 12-17 y.o.

PAST YEAR, 2016-2019 NSDUH, 12+



+ Difference between this estimate and the 2019 estimate is statistically significant at the .05 level.

# What Are the Benefits?

*National Academy of Science, Engineering, & Medicine,  
(NASEM) 2017*

## ***Substantial Evidence***

- Chronic pain in adults
- Anti-emetic: chemotherapy induced nausea/vomiting (oral CBD)
- Multiple sclerosis (MS): patient-reported spasticity (oral CBD)

## ***Moderate Evidence***

- Short-term sleep for patients w/ obstructive sleep apnea, fibromyalgia, chronic pain, MS (THC+CBD-nabiximols)

# What Are the Benefits? (Cont'd, NASEM)

## ***Limited Evidence***

- HIV/AIDS: ↑ appetite (cannabis, oral CBD)
- Tourette (THC capsule)
- Social Anxiety Disorder: ↓ anxiety in a public speaking test (CBD)
- PTSD: (synthetic CBD)
- TBI/intracranial hemorrhage: ↓ mortality/disability

# What Are the Mental Health Risks?

NASEM, 2017

**Substantial risk:** develop schizophrenia or psychoses

**Moderate evidence:** regular use → ↑

social anxiety disorder, suicidal ideation, attempts, completions

manic/depressive symptoms in patients w/ bipolar d/o risk of depression

**Limited evidence:** near daily use → ↑

+ symptoms in psychosis

development of bipolar and anxiety disorders

PTSD severity

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# What Are Other Risks?

NASEM, 2017

## Cognitive

- transient deficits in short-term memory
- Impaired judgment
- ↓ motor coordination

## *“Driving while high”*

- delayed reaction times
- ↓ hand-eye coordination
- altered time perception
- ↑ crashes

## *Use in pregnancy → ↓ birth weight*

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# Risk Factors for Problematic Use

*NASEM, 2017*

## NOT A RISK

Adolescent ADHD

Stimulant tx for ADHD

Anxiety, personality, &  
bipolar disorder-adults

## RISK

Depression, child anxiety

Males and smoking

cigarettes are risks for  
use → problematic use

Use at a younger  
age → problematic use

Male → severity of use

In teens, ODD/CD sxs,  
younger alcohol use,  
nicotine use, parental  
substance use, ↓ school  
performance, sex abuse

# Unknown Risks

Levy, *JAMA Pediatrics*, 2013, 167(7): 600-601

No biomarker to measure driving under the influence

No safety thresholds for second-hand smoke

No longitudinal outcome data

Tobacco use:

- Declined since 1996
- Anecdotally, many teens in treatment (*Boston Children's Adolescent Substance Abuse Program*) wish to quit, aware of health risk (unlike their attitude toward marijuana)



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# Perception of Risk

*Hammond, Fristad...Miller, 2020, NNDC Poster*

- *Preliminary data from the Medical Marijuana (MM) and Cannabidiol (CBD) Attitudes, Beliefs, and Behaviors Survey*
- 12 youth/young adults aged 12-25, outpatient mood clinic
- Household member use: MM: 33%, CBD: 27%
- 100% youth report both are safe and effective treatments
- Agree/strongly agree: MH providers should recommend and/or prescribe: MM, 58%; CBD, 63%
- Depression improves with using: MM, 58%, CBD, 36%
- *MH clinicians and public health campaigns should provide targeted, evidence-based education and encourage fact-driven discussions.*

# Marijuana Use: Health Concerns

- Use during pregnancy may be associated with fetal growth restriction, stillbirth, preterm birth, and neonatal intensive care unit admission (Metz and Borgelt, 2018; Stickrath, 2019).
- Use linked to depression/suicide: adolescents (Roberts BA, 2019), veterans (Kimbrel et al., 2018)
- Use in adolescence is associated with increased risk for psychotic disorders in adulthood and is linked with suicidal ideation or behavior (D'Souza et al, 2016; McHugh et al, 2017).
- The risk for psychotic disorders increases with frequency of use, potency of the marijuana product, and as the age at first use decreases (NASEM, 2017).
- Use among adolescents is linked to a decline in IQ and is associated with educational drop out (Meier, 2012).
- Use has been linked to the development of drug use disorders including alcohol, tobacco and other illicit drugs (NASEM, 2017).
- Marijuana intoxication is an important cause of MVAs associated with injury and death—it is wrong to say that marijuana use never killed anyone (NASEM, 2017).
- Association between state laws allowing medical marijuana and opioid overdose mortality reversed direction from -21% (1999-2010) to +23% (1999-2017). (Shover, et al., 2019)
- Risk of subsequent prescription opioid misuse and use disorder was increased among people who reported marijuana use 5 years earlier (Olfson et al., 2017)

# Marijuana: The Colorado Experiment

Monte et al, JAMA. 2015 January 20; 313(3): 241–242

*Smoking marijuana* → clinical effects  $\leq$ 10 minutes, peak blood concentration, 30-90 minutes; clearance within 4 hours of inhalation

*Oral THC* → significant blood concentration  $\geq$ 30 minutes, peak,  $\approx$  3 hours; clearance  $\approx$  12 hours after ingestion

*Intoxication, 10-30mg THC*: ingestible packages have 100mg THC (and manufacturing practices are not standardized, 0-146mg have been reported)

*Symptoms of overdose*: anxiety, hallucinations, panic episodes, dyspnea, chest pain, nausea, vomiting, dizziness, somnolence, central nervous system depression, respiratory depression, coma

*New/increased medical issues*: burns, cyclic vomiting, edible overdoses



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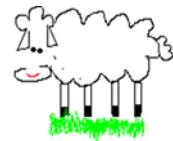
# Comparison of Rates of Mental/Substance Use Disorders Associated with Marijuana Use: National vs. Colorado Data from the NSDUH (2019)

	National (%)	Colorado (%)	National vs. Colorado P-value
Past Month Marijuana Use (18-25 y)	23.0	37.0	0.0009
Past Year Daily Marijuana Use (18-25y)	7.5	14.8	0.0085
Past Month Marijuana Use ( $\geq$ 26y)	10.2	18.8	<0.0001
Substance Use Disorder (SUD) (18+)	7.7	10.9	0.0206
Co-occurring SUD and SMI (18+)	1.4	2.5	0.0430

Estimates for Colorado are direct single-year estimates for 2019 and will differ from model-based estimates using data from 2018 and 2019.

# Drug and Alcohol Use in LAMS Youth

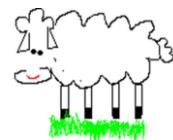
Horwitz et al 2017, JAACAP, 56(2): 149-156.



- 685 youth from 4 Midwestern sites, most w/ “elevated symptoms of mania” ESM
- Assessed every 6 months for up to 6 years
- 68% male; 65% white, 26% Black, 9% other
- Alcohol/drug risk assessment began at age 10

Age at Baseline	Age at Follow-up	Any Alcohol	Regular Alcohol	Any Drug	Regular Drug
6-8	11-14	8.8%	0.8%	9.1%	2.8%
10-12	15-18	34.9%	11.9%	30.1%	16.2%

# Drug and Alcohol Use in LAMS Youth



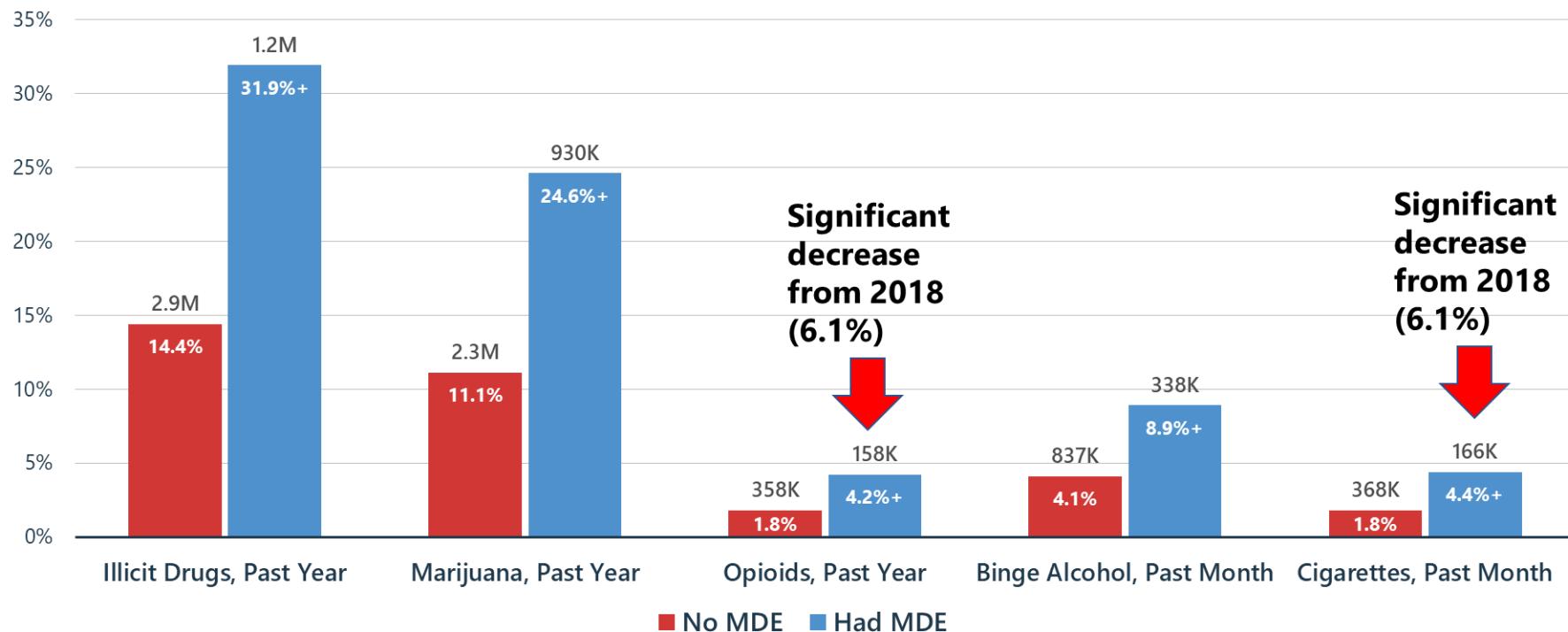
Horwitz et al 2017, JAACAP, 56(2): 149-156.

Predictors of drug/alcohol use in those 10-12 yrs at baseline (15-18 years at follow-up):

- 35% used alcohol  $\geq 1X$ ; predictors—parental marital status, older age, primary dx of baseline DBD, more stressful child life events (ScLEs)
- 12% regular alcohol users; predictors-parental marital status, age, sustained ESM over 24 mos
- 30% used drugs  $\geq 1X$ ; predictors—single parent, parental substance use, more ScLEs
- 16% regular drug users; predictors-parental marital status, ScLEs, baseline DBD; baseline medications  $\rightarrow \downarrow$  risk of regular drug use

# Substance Use among Youths (12-17 y.o.) by Past Year Major Depressive Episode (MDE) Status

PAST YEAR/MONTH, 2019 NSDUH, 18+



+ Difference between this estimate and the estimate for youths without MDE is statistically significant at the .05 level.

# Association between Cannabis Use, Self-Harm, and Mortality Risk among Youth with Mood Disorders *Fontanella et al, in press, JAMA:Peds*

- 204,780 OH youth (age 10-24 yrs) with mood disorders (2010-2017)
- > 10% also had Cannabis Use Disorder (CUD) dx'd 6 mos before through 1 year follow-up
- Mood+CUD: associated with:
  - Older age, male, Black, bipolar/dysthymic/unspecified d/o, prior self-harm, prior MH service (inpt, ED visits)
- CUD associated w/ ↑:
  - Non-fatal self-harm
  - Overall mortality
  - Death by unintentional overdose and homicide (suicide)



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# Learning Objectives

1. Recognize changes in potency and availability of marijuana in 2020
2. Increase familiarity with marijuana usage and associated risk in adolescence
3. **Name 3 clinical strategies for addressing usage**
4. List initial interventions for adolescents using marijuana

# Three Clinical Strategies

- Evidence-based assessment
  - Screening: considerations
  - Screening: available tool
- Evidence-based approach
  - Motivational interviewing
- Evidence-based treatment
  - Cognitive-behavioral therapy
  - Family therapy



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# Screening for Marijuana Use

There is overlap between the risk factors for problematic substance use and the presenting problem/s for many of the youth seen in Behavioral Health.

## General Guidelines

- Word choice matters
- Use gentle assumption
- Simultaneous genuineness & mistrust



# Screening Tool – CRAFFT 2.0

Part 1: During the PAST 12 MONTHS, on how many days did you:

- Drink more than a few sips of beer, wine, or any drink containing alcohol? Say “0” if none.
- Use any marijuana (pot, weed, hash, or in foods) or synthetic marijuana? Say “0” if none.
- Use anything else to get high? (like other illegal drugs, prescription or over-the-counter medications, and things that you sniff or “huff”) Say “0” if none.

If the above is “0”, ask CAR questions, then stop. If “1” or greater, ask all six CRAFFT questions.

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# CRAFFT 2.0

Have you ever ridden in a **CAR** driven by someone (including yourself) who was "high" or had been using alcohol or drugs?

Do you ever use alcohol or drugs to **RELAX**, feel better about yourself, or fit in?

Do you ever use alcohol/drugs while you are by yourself, **ALONE**?

Do you ever **FORGET** things you did while using alcohol or drugs?

Do your family or **FRIENDS** ever tell you that you should cut down on your drinking or drug use?

Have you gotten into **TROUBLE** while you were using alcohol or drugs?



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# Evidence-Based Approach to Treatment

According to the National Institute on Drug Abuse, the most effective and evidence-based treatment components for substance use and addiction are **Motivational Interviewing, Cognitive Behavioral Therapy, & Family Therapy**

In order to:

- Understand how thoughts and feelings influence using behavior
- Be realistic about risks, choices, and consequences
- Enhance motivation for behavior change
- Engage the family in supporting their adolescent

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# Evidence-Based Approach: Motivational Interviewing

“MI is about arranging conversations so that people talk themselves into change, based on their own values and interests.”

*(Miller & Rollnick, 2013, pg. 4)*

- Motivational Interviewing was developed for the treatment of alcohol and substance use concerns
- Focus is on personal choice

# Cognitive Behavioral Therapy

“Cognitive-behavioral strategies are based on the theory that in the development of maladaptive behavioral patterns like substance abuse, learning processes play a critical role. Individuals in CBT learn to identify and correct problematic behaviors by applying a range of different skills that can be used to stop drug abuse and to address a range of other problems that often co-occur with it.” (NIDA, 2020)

- Self-reflective
- Increases understanding of ability to make choices
- Focuses on present day issues

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# Learning Objectives

1. Recognize changes in potency and availability of marijuana in 2020
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3. Name 3 clinical strategies for addressing usage
4. **List initial interventions for adolescents using marijuana**

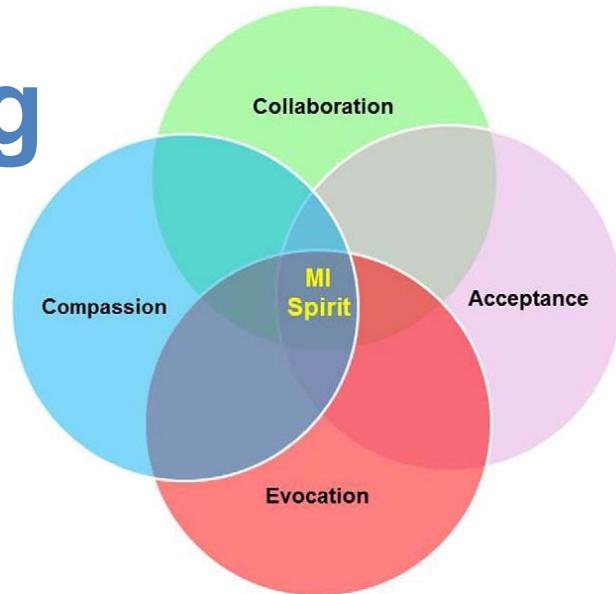
# Initial Interventions

- Use the spirit and skills of Motivational Interviewing (MI)
- Cognitive-Behavioral Therapy (CBT)
- Family Therapy
- Referrals as needed

# Motivational Interviewing

## Spirit

- Partnership - active collaboration
- Acceptance – suspend judgement, display accurate empathy
- Compassion – for the challenges that youth face
- Evocation – draw out a youth's motivations for using, as well as the hesitations and concerns they have about changing that behavior



# Motivational Interviewing

**O**pen ended questions – “What are the good things about marijuana use for you?” “What are the not-so-good things?”

**A**ffirmations – “Thinking about and talking through the pros and cons of this shows maturity.”

**R**eflections – “You feel that marijuana helps your anxiety, but there’s also a lot of worry about getting caught.”

**S**ummaries – “Though there are things you really like about vaping, it’s damaged the trust you’ve worked so hard to build with your parents and jeopardized your spot on the track team.”

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# Motivational Interviewing

## Techniques

- Elicit & explore
- Draw out the pro and cons of using/ not using
- Consistently attend to change talk
- Develop discrepancy



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# Cognitive Behavioral Therapy (CBT)

- Psychoeducation
- Functional Analysis
- Standard Interventions
- Substance Use Specific Interventions

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# Psychoeducation

- Convey information about substances, use, and risks in an age-appropriate manner.
- Psychoeducation may be given in family sessions or to youth and caregiver separately.
- If and when information is given, ask permission to do so.

*“I attended a training a couple weeks ago on some research about marijuana. Can I tell you about it?”*

# Psychoeducation

Assist youth to apply this information to their own life and situation.

*“Marijuana has negative effects on memory, which could make it harder to study and bring up your grades.”*

*“During your first session, your mom talked about a family member who has schizophrenia. Using marijuana increases your own risk for developing psychosis.”*

Provide references & educate about information sources.

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# Functional Analysis

Goal: to identify factors which cause or maintain substance use behavior

The 5 W's of a youth's substance use

- When?
- Where?
- Why?
- With/ from whom?
- What happened?



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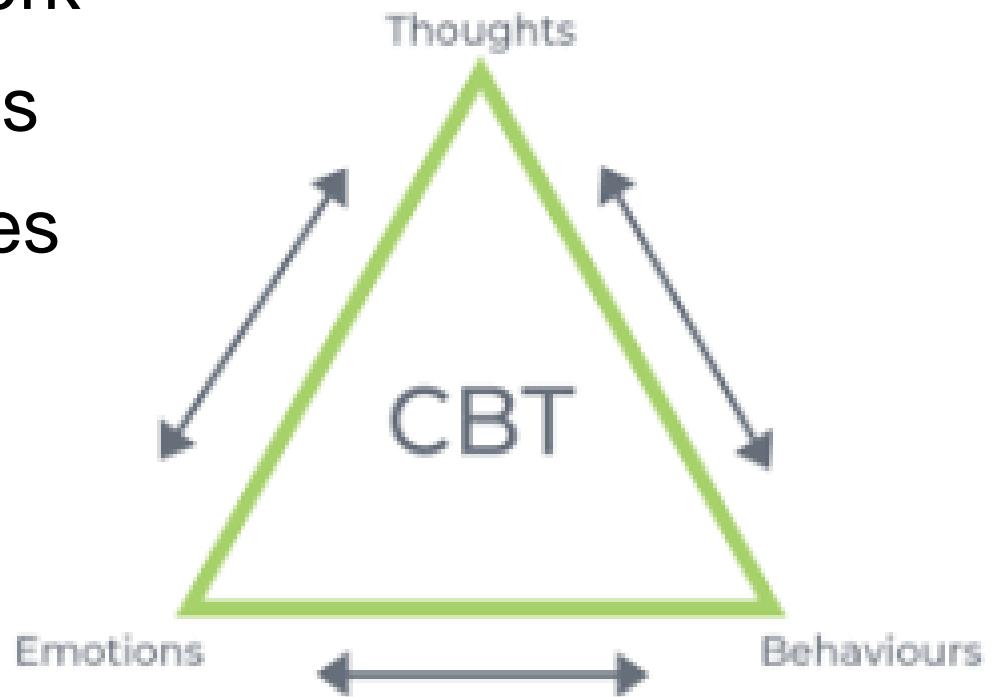
# Standard CBT Interventions

Identifying, labeling, & managing emotions

Cognitive triangle work

Problem solving skills

Relaxation techniques



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# Specific Substance Use CBT Interventions

Activity substitution

Identify situations which are high risk for using

Develop plans for coping with high risk situations

Skill rehearsal



# Family Therapy

Family involvement is a particularly important component of treatment for youth with substance use concerns.

Session topics may include:

- Improving communication skills and patterns
- Clarifying expectations and consequences
- Providing education about substances, substance use disorders, and related risks
- Supportive changes to the environment

# Referring to a Specialized Program

## When?

- Substance use concerns have become a primary focus of treatment
- Mental health and substance use symptoms are interacting/ exacerbating one another
- Inability to make progress at the current level of care
- Risk and safety concerns

# Treatment for Healthy Alternatives

## Substance Abuse Treatment Programming at Nationwide Children's Hospital

### Outpatient treatment

- Focus is to reduce substance use and the symptoms of any related mental health disorders.
- Weekly or biweekly sessions at the Close to Home Center at 399 E. Main St.

### Integrated Co-occurring Treatment (ICT) Program

- Intensive Home Based Treatment model
- Sessions take place in the family's home, school, or community and occur 2 to 4 times a week for 4 to 6 months.
- Must live in Franklin County and have both a substance use & a mental health disorder.



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# Questions?

Still have questions? Please post them on the SCCAP Listserv to continue the community discussion

[div53@lists.apa.org](mailto:div53@lists.apa.org)



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# Thank you for your attention!

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- Fristad, M.A., Powell, N. , (2020). *Cannabis use in Adolescents* [PowerPoint slides]. Webinar sponsored by the Society of Clinical Child and Adolescent Psychology, Division 53 of the American Psychological Association. New York, NY.

