



Substance Use in Youth



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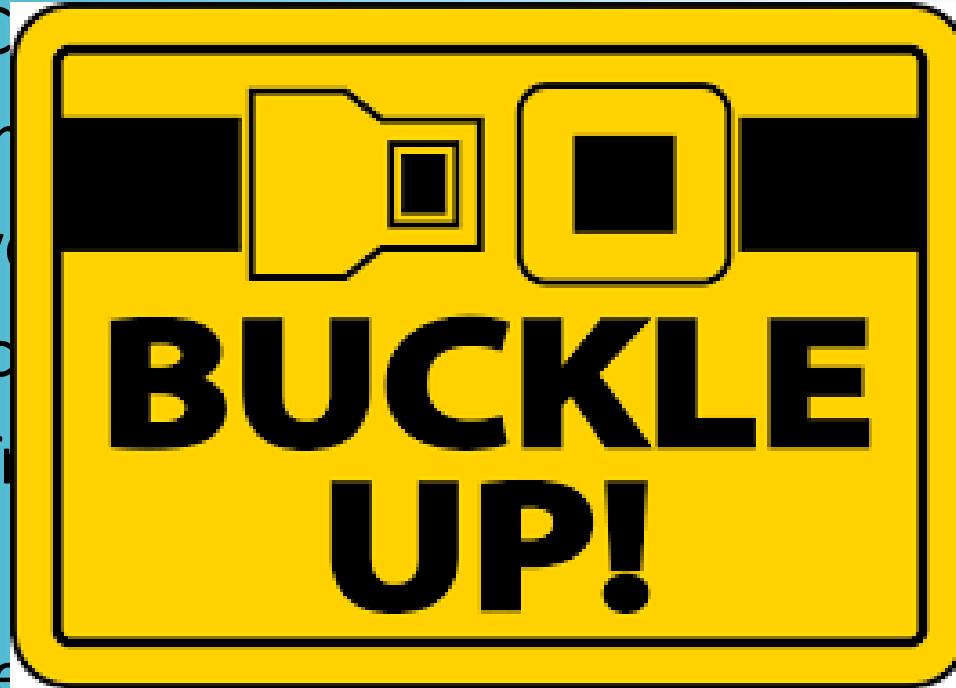
Disclosures

Neither I nor my spouse/partner has a relevant financial relationship with a commercial interest to disclose.



Overview of talk:

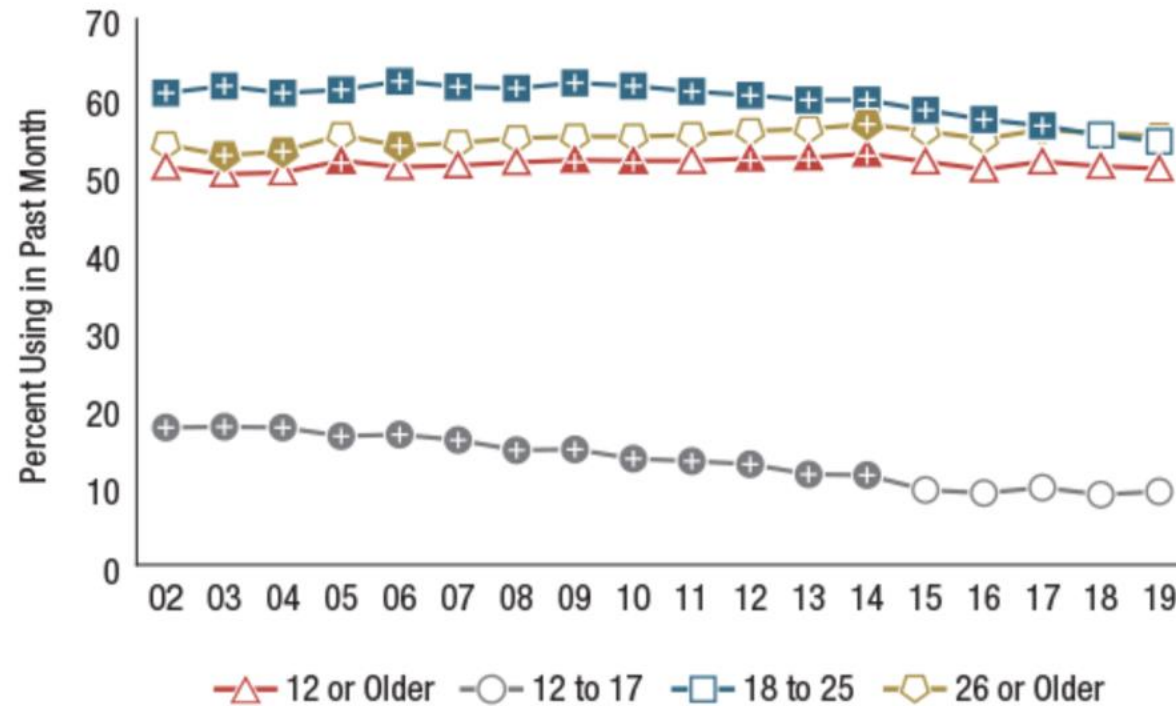
- Trends in use
- Review Alcohol, C
- Neurobiological in
- Challenges with y
- Assessment and o
- Evidence-based T
- Parental Role
- School-based care
- Recovery paths



Alcohol Use Trends by Age



Past Month Alcohol Use among People Aged 12 or Older: 2002-2019



UNDERAGE BINGE DRINKING

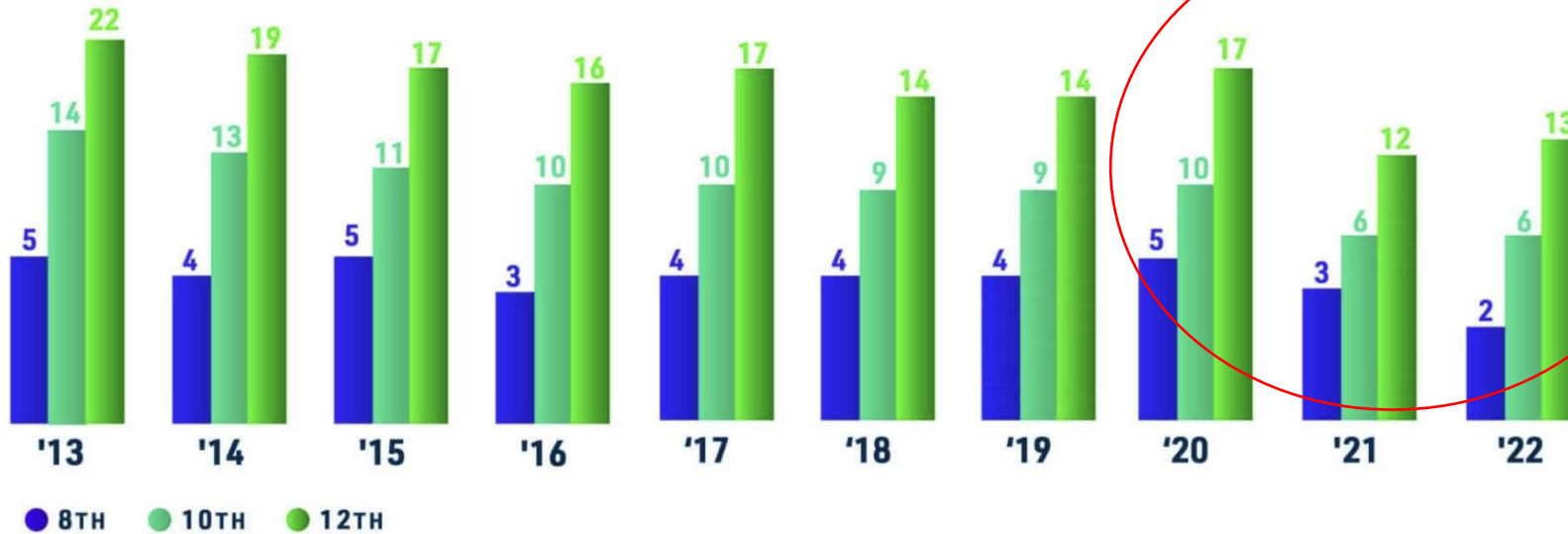


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PSYCHIATRY ACADEMY

DOWN ACROSS 8TH, 10TH AND 12TH GRADERS

(Numbers in Percentage)



Pandemic:
- General decrease
- Climbing for 12th graders

DECADE DECLINE



8TH GRADERS

↘ **57%**



10TH GRADERS

↘ **57%**



12TH GRADERS

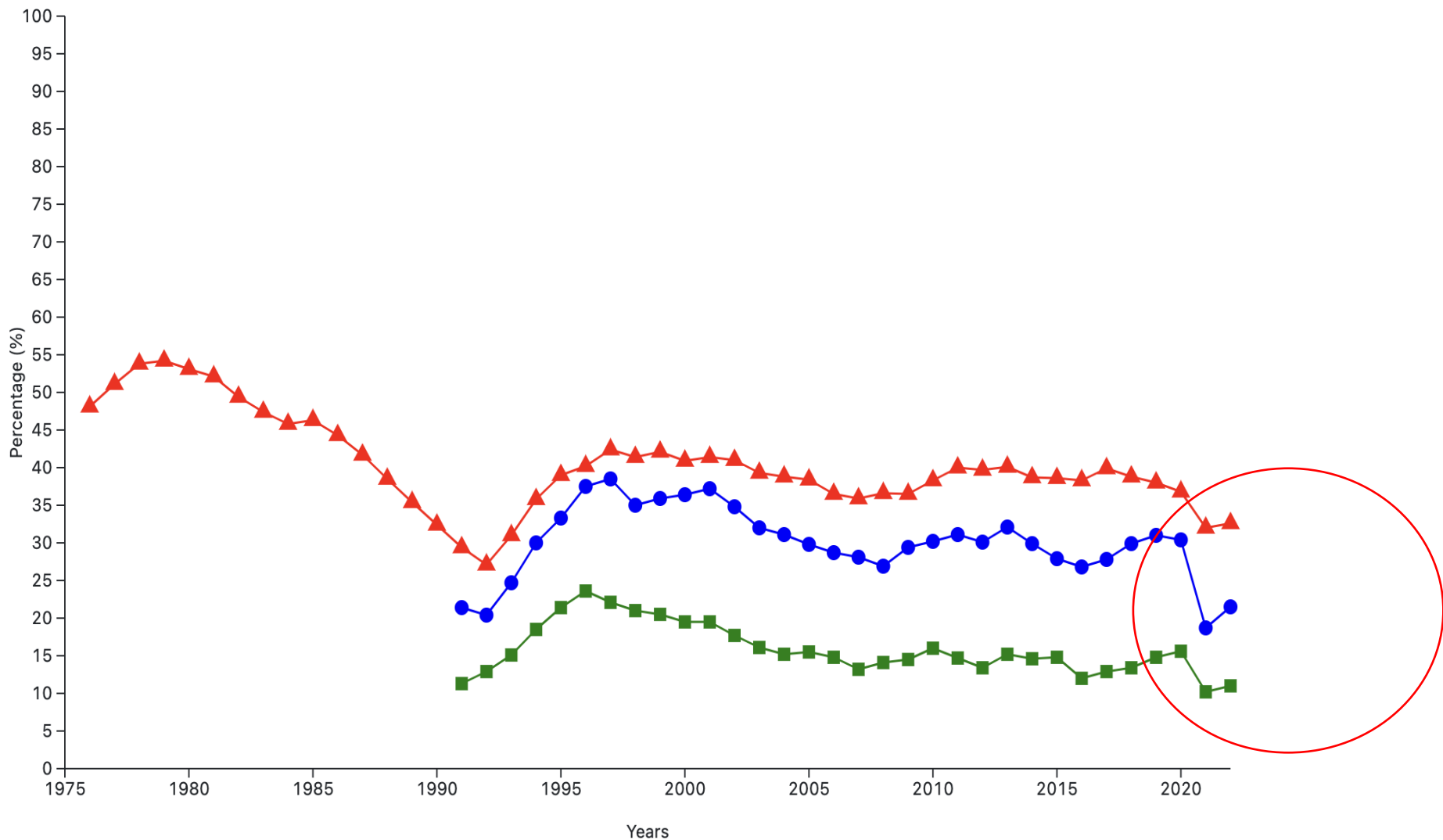
↘ **43%**

*Binge drinking is defined as five or more drinks in a row in the previous two weeks.

Monitoring the Future Study, 2022

Any Illicit Drug: Trends in Last 12 Months Prevalence of Use in 8th, 10th, and 12th Grade

■ 8th Grade ● 10th Grade ▲ 12th Grade



Pandemic:

- General decrease
- Climbing all grades
- Nicotine, prescriptions

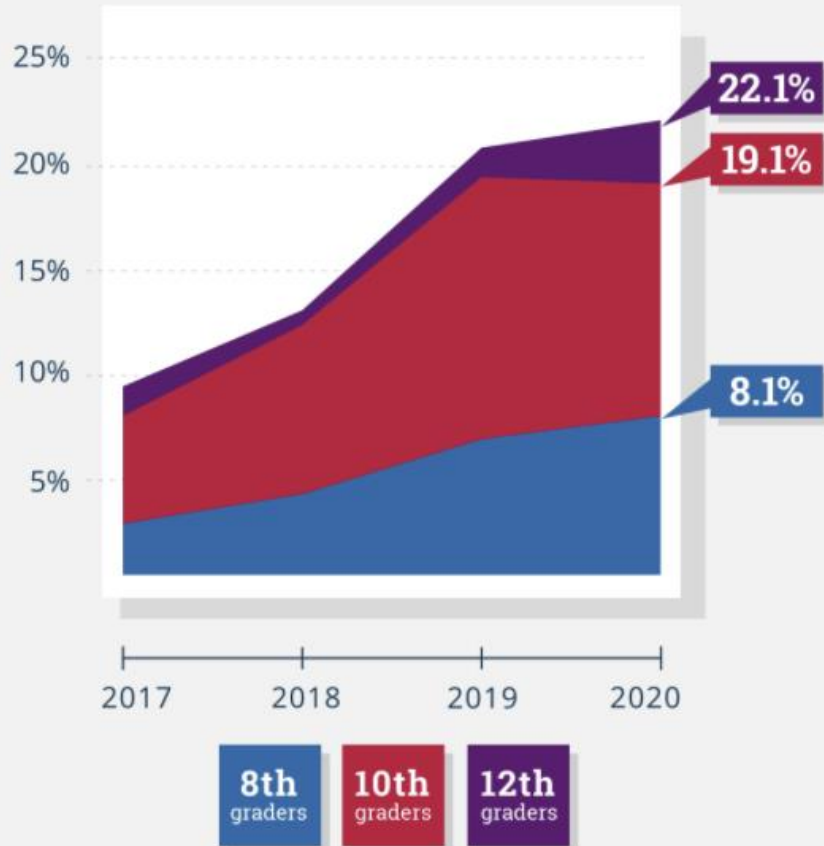
Past-Year Marijuana Vaping Holds Steady



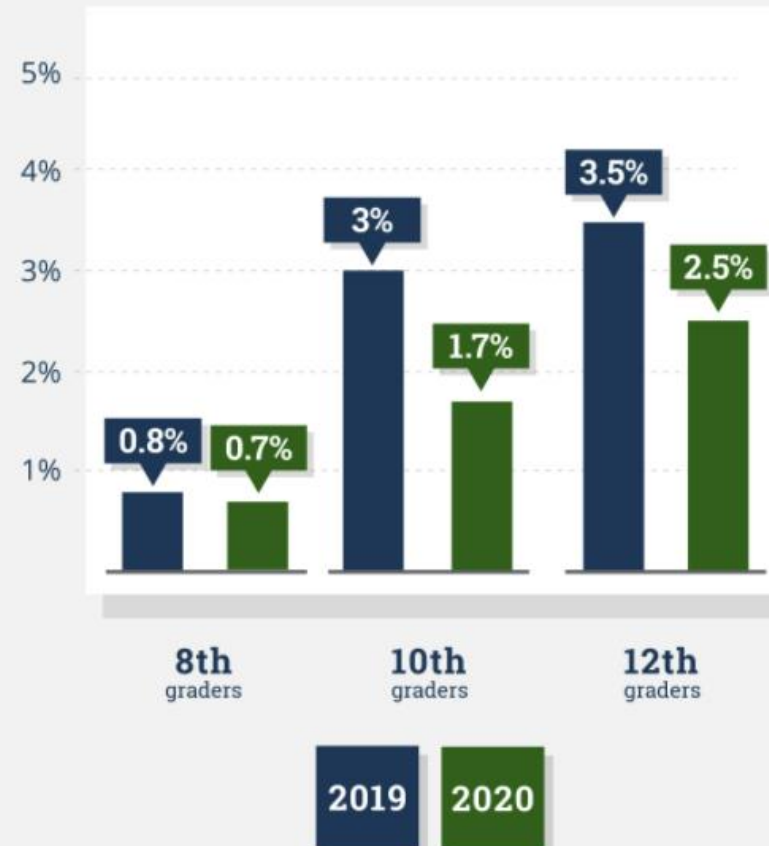
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Past-Year Marijuana Vaping



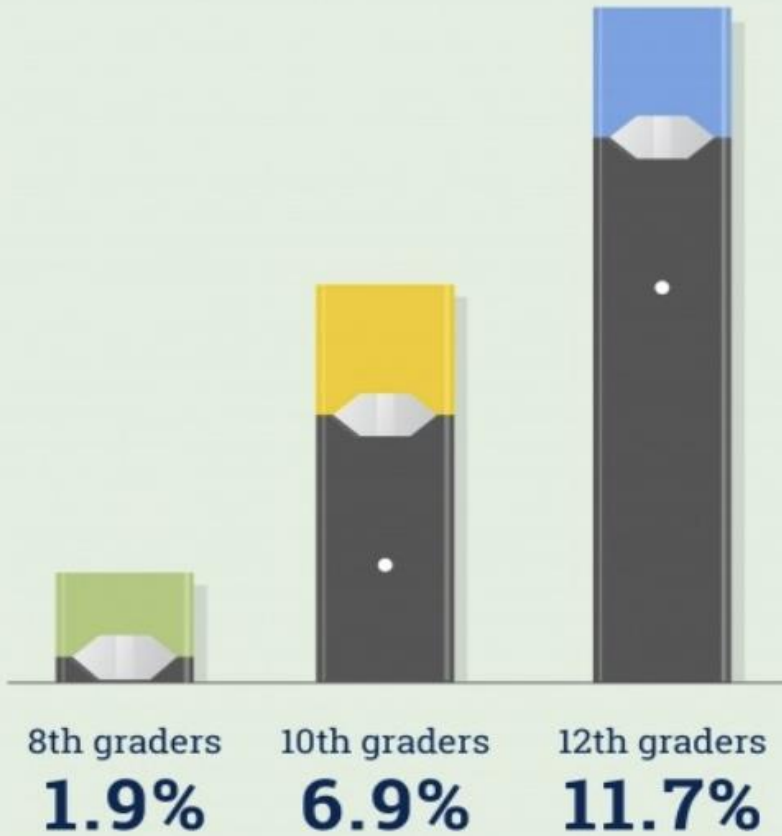
Daily or Near-Daily Marijuana Vaping Decreases Significantly Among 10th Graders



Monitoring the Future Study, 2020

DAILY NICOTINE VAPING¹

Measured for the first time in 2019



NICOTINE VAPING

Past month use



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1. Miech R, Johnston L, O'Malley PM, Bachman JG, Patrick ME. Trends in adolescent vaping, 2017–2019. *N Engl J Med* 2019; 381:1490-1491

2019 Past Month Nicotine Vaping Equates to:

1 IN 4 – 12TH GRADERS • 1 IN 5 – 10TH GRADERS • 1 IN 10 – 8TH GRADERS

Monitoring the Future Study, 2020

E-Cig/Vap - 101



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PSYCHIATRY ACADEMY

- Introduced in 2007/2008
- 450+ types of device on the market
- Consist of:
 - a cartridge or reservoir
 - liquid solution (*e-liquid* or *e-juice*) – nicotine, CBD, THC, flavor
 - a heating element (atomizer)
 - a power source (usually a battery)
 - a mouthpiece that the person uses to inhale
- Puffing activates the battery-powered heating device, which vaporizes the liquid in the cartridge. The person then inhales the resulting aerosol or vapor (called *vaping*). It does not contain water – myth.
- Nicotine stimulates adrenal gland to release adrenaline and dopamine





E-Cig/Vap and Teens

- Most commonly used form of Nicotine
- E-Cig use by 9th grade predicts later Cigarette use
- E-Cig users 6-7 x more likely to use regular cigarettes, but cig users no more likely to use e-cig.
- Tobacco rates down, vaping rates up
- Nicotine and mental health –
 - Early onset psychopathology → increased risk
 - Higher medication dosage, more hospitalizations, greater symptoms compared mental illness + non-smoking.



Morris et al, 2011; Fishcer et al, 2012; NIDA, 2016



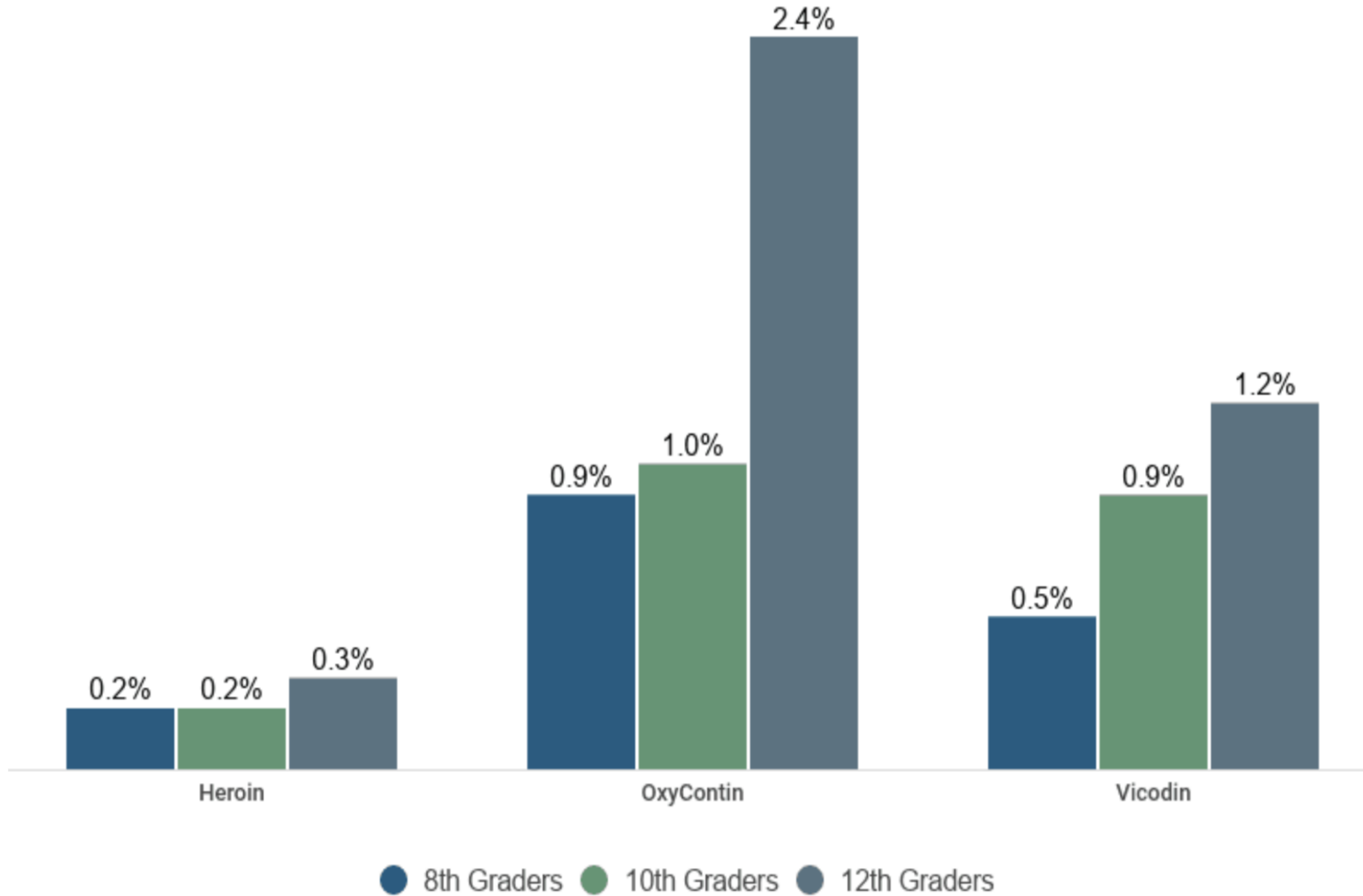
Do they help you quit?

- Lab based studies suggest:
 - Harm reduction – fewer chemicals
 - Can reduce cravings/urges
 - May be equivalent to NRT
 - Limited real-world examination
- Cochrane Review:
 - May help quit in long-term but strength of evidence is low, esp in youth



Brown et al, 2016; Kalkhoran et al, 2016; Hartman-Boyce et al, 2016, Erku et al, 2020

Youth Who Used Opioids in the Past Year



*Reported usage at any point throughout 2020.

Youth & Opiates

- Heroin average age onset 23.4
- < 25 % of OUD in youth get tx, < 2% under 18 y/o on MAT
- Overall use rates dropping, but OD is rising
- Long-term outcome – Hser, 2015 Review:
 - 6-20 x mortality rate
 - 50% overdose; 22-25% die by overdose
 - Stable abstinence is low → Alc and MJ
 - Improved outcome: treatment, mutual help, +ve sober relationship, non-using rewarding activities





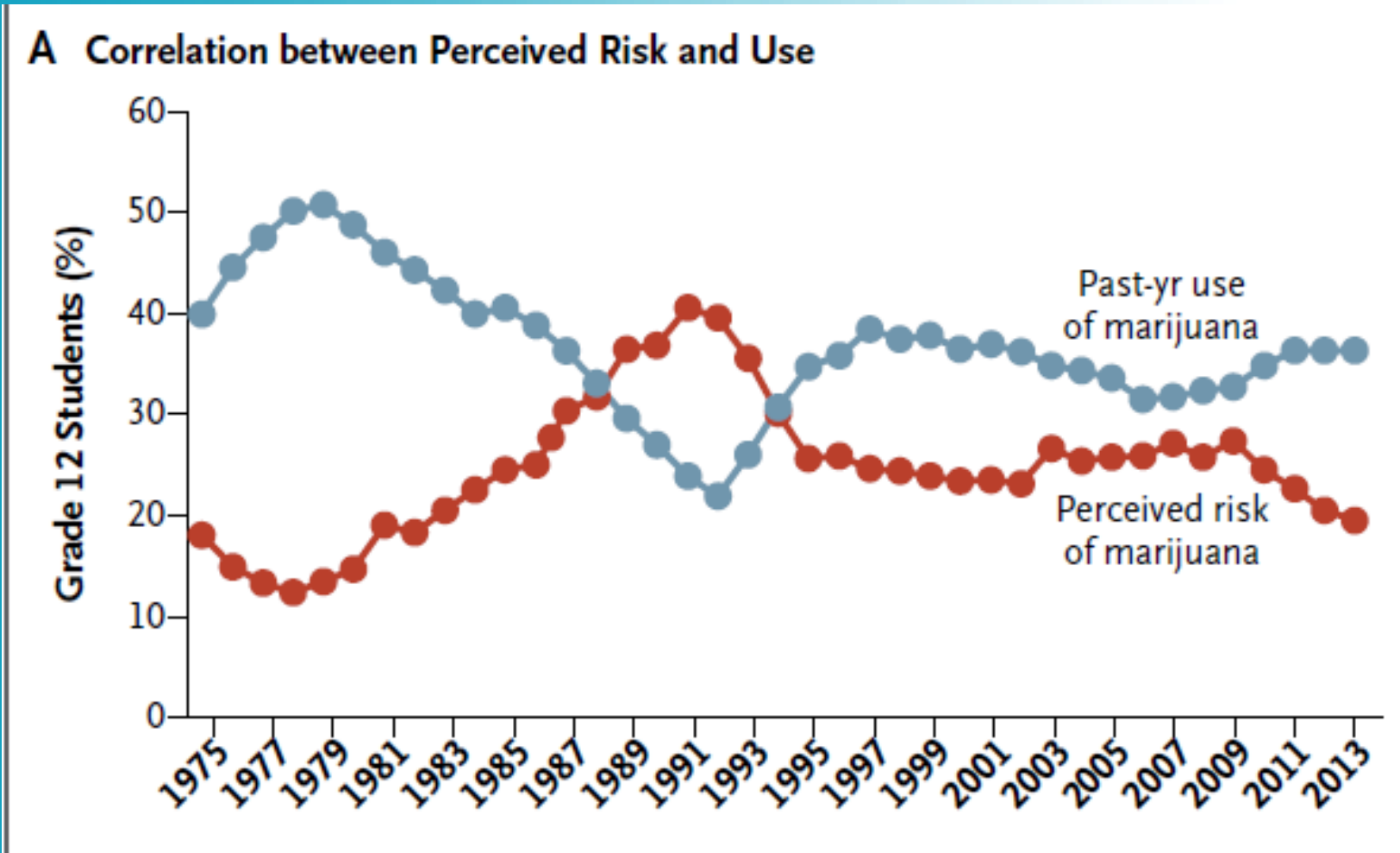
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Marijuana

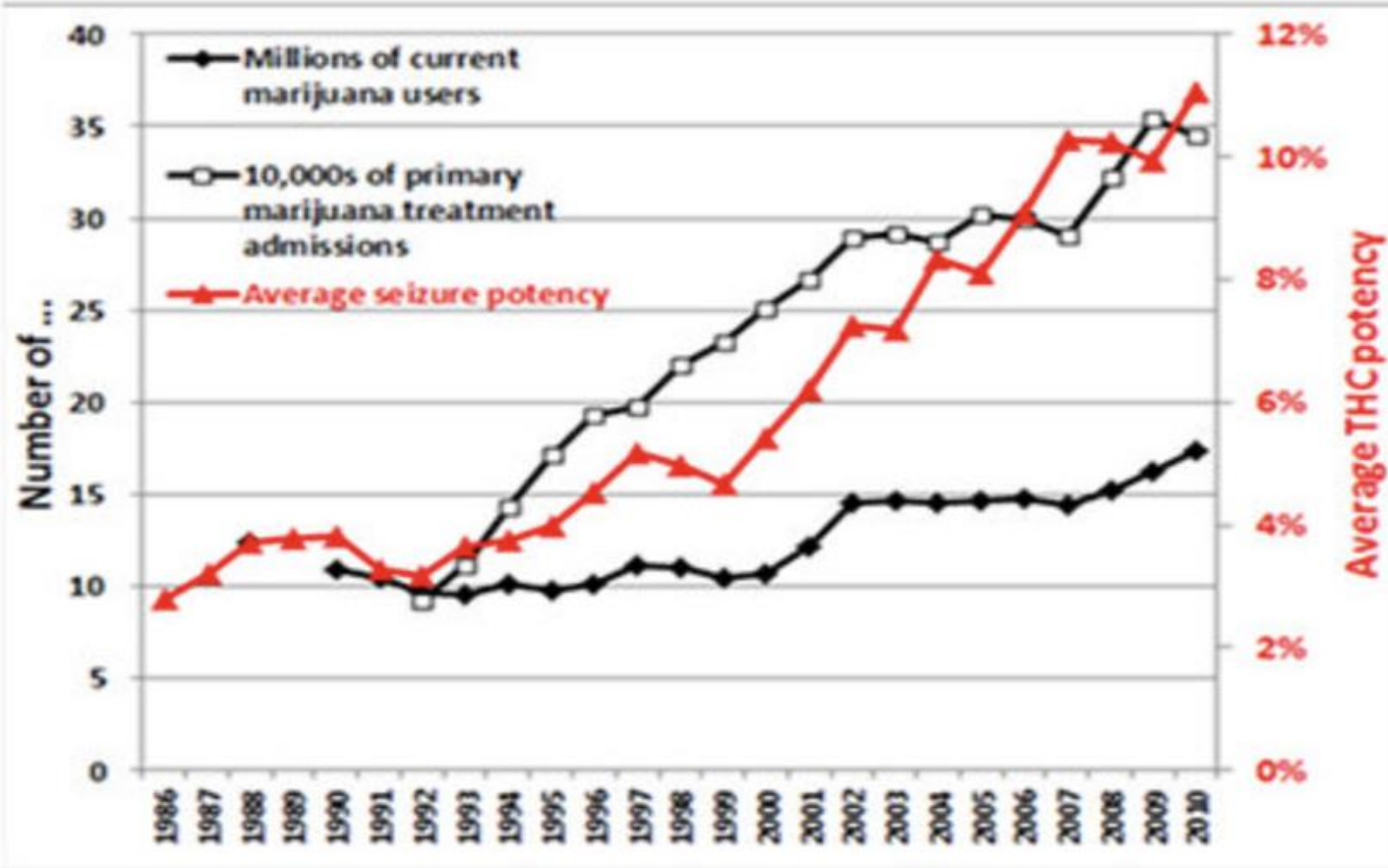


Adolescent marijuana use is inversely related to perceived risk





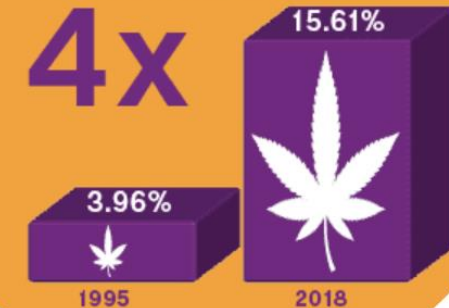
MARIJUANA USERS, TREATMENT ADMISSIONS, AND AVERAGE POTENCY: 1986-2010



Sources: [NSDUH](#), [TEDS](#), National Seizure System

Average THC concentration in leaf marijuana has increased nearly

4x



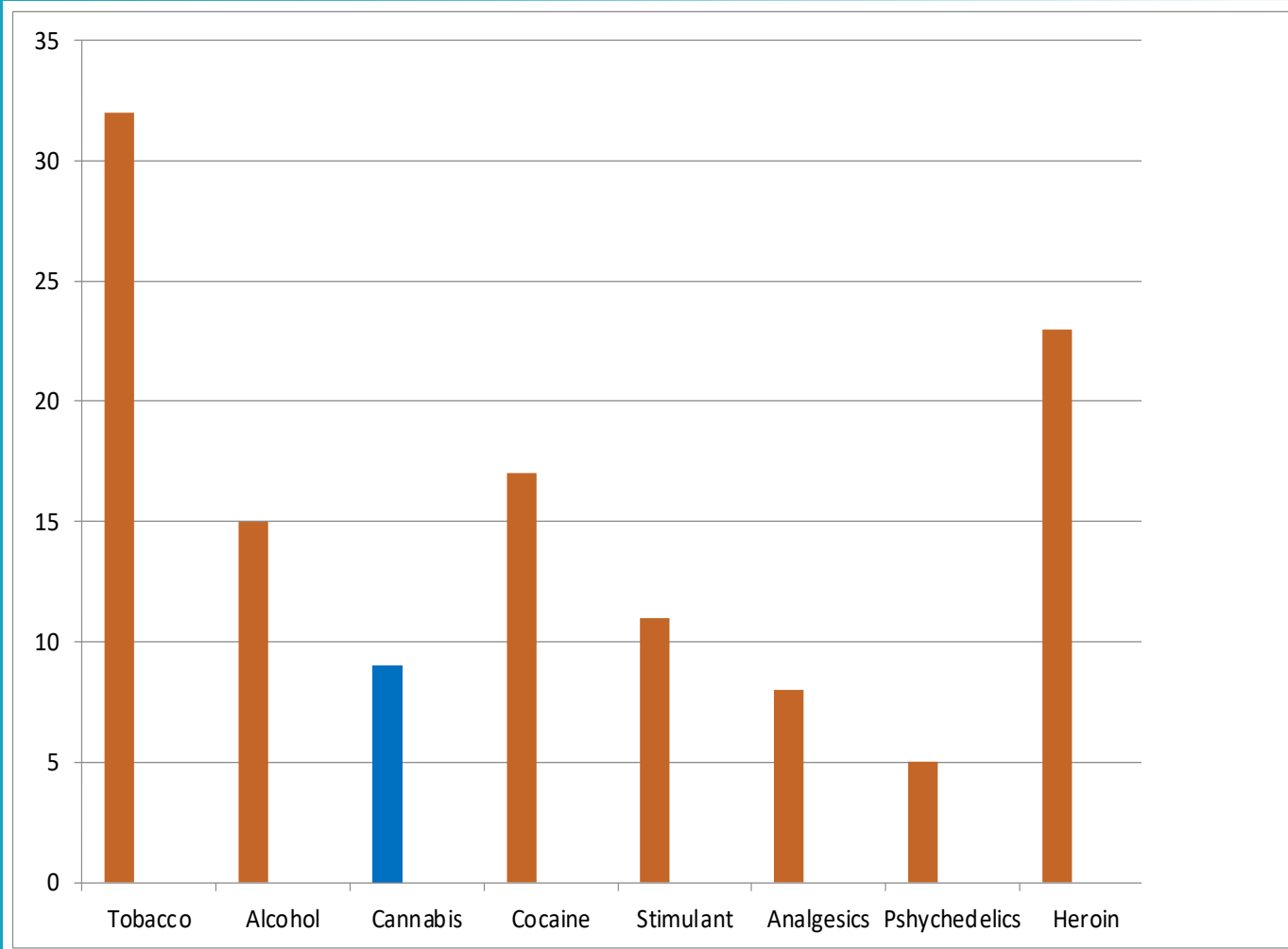
Comparative Prevalence of Dependence Among Different Drug Users



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Percent of users who
Become addicted



**About 9% of cannabis users
may become dependent**

**BUT increases to 17% of
those who start use in
adolescence**

* Nonmedical Use

Source: Anthony et al. Exp. Clin. Psychopharmacol. 2(3), pp.244-268 (1994)



Drugs Can be Chemical Imposters

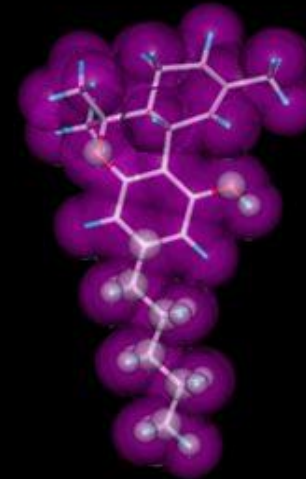
(THC mimics a natural brain chemical)

Brain's Chemical



Anandamide

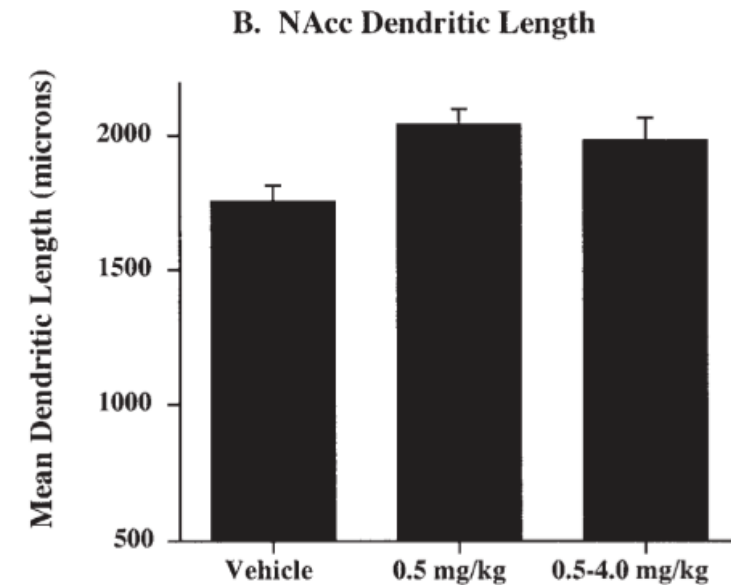
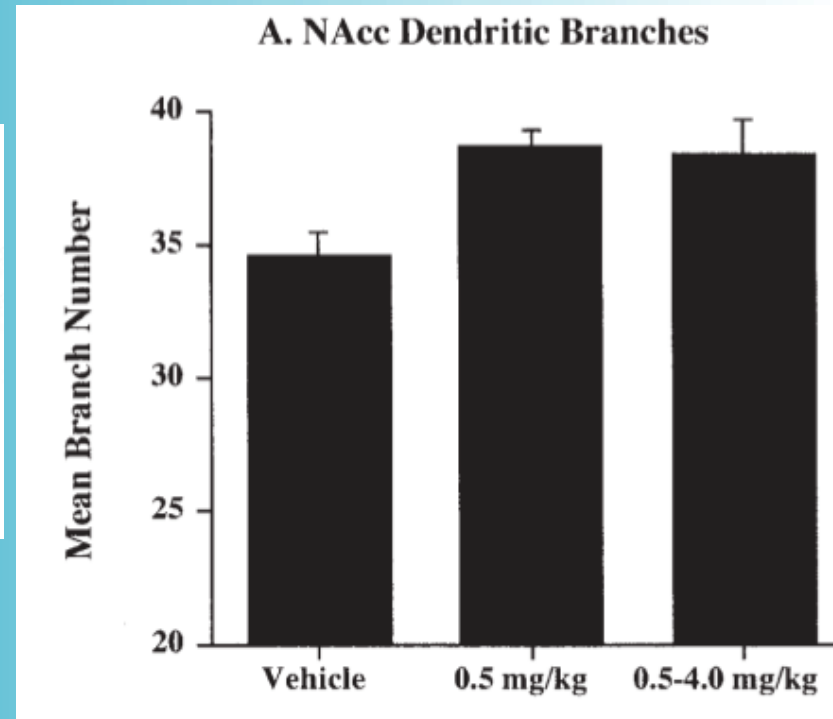
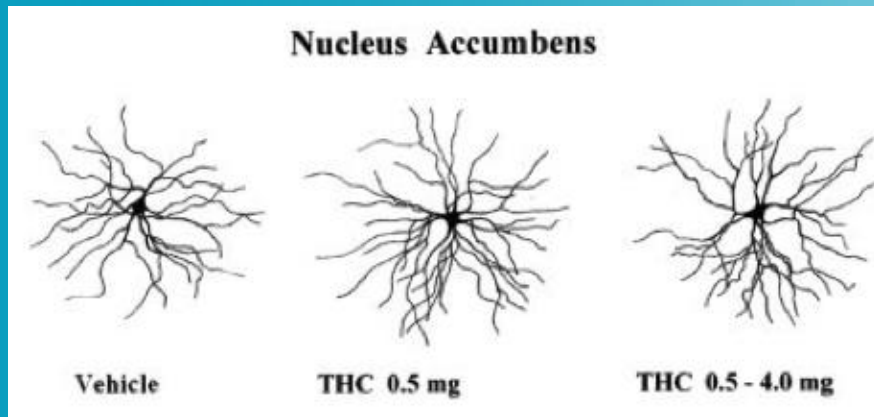
Drug



THC

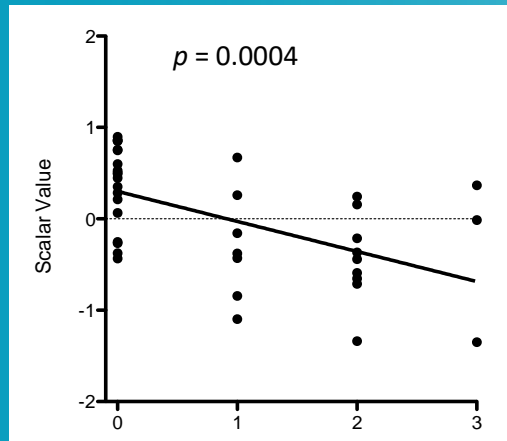
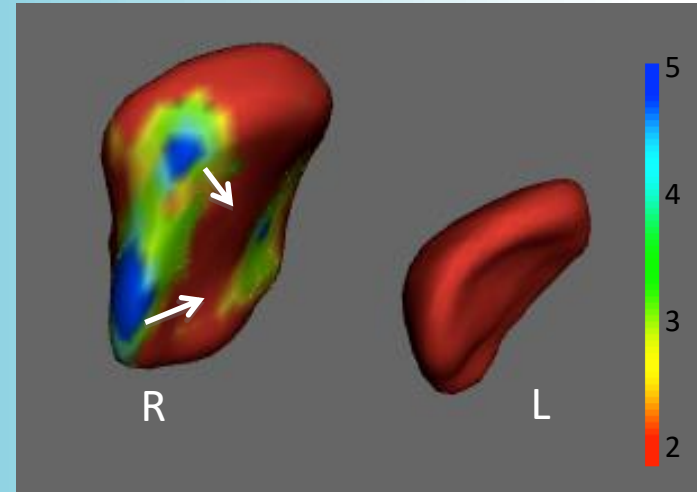
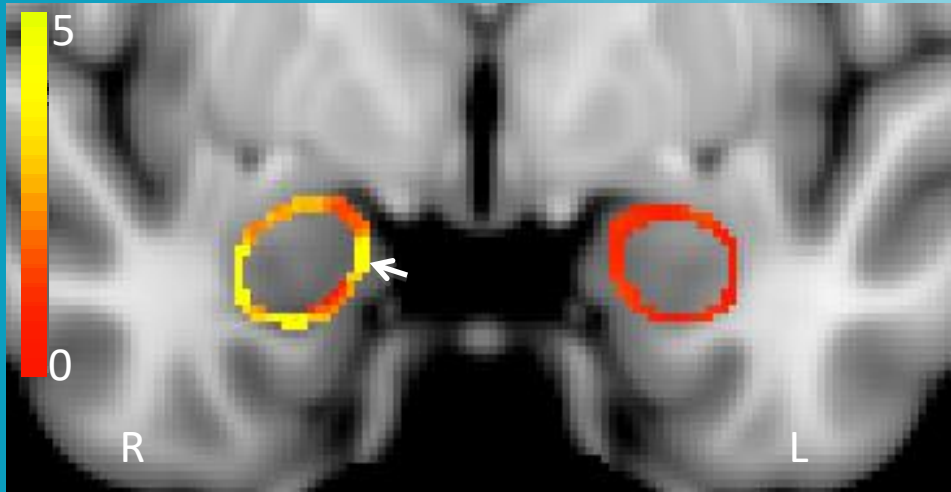
Effects of THC on Brain Structure: Animal Studies

- Structural changes occur in brain regions after exposure to THC, especially in the nucleus accumbens (NAc)

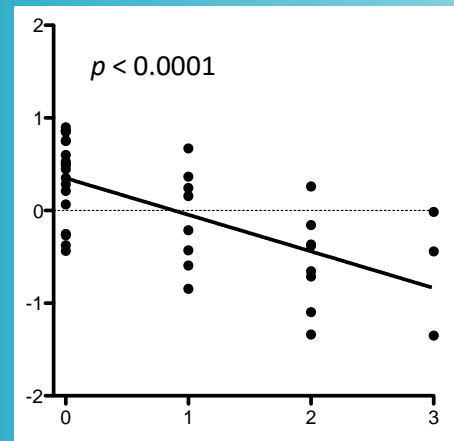


Kolb et al, Synapse 2006

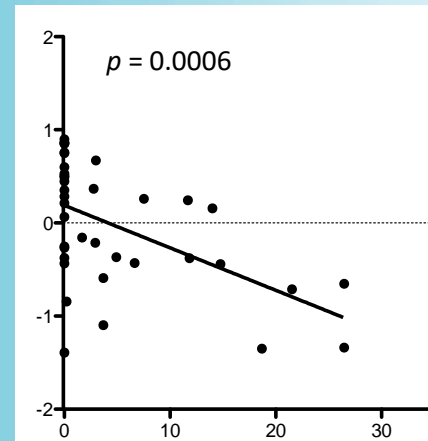
Brain Shape is Deformed in Young MJ Users vs. Controls and Associated with Frequency and Heaviness of Use: Amygdala



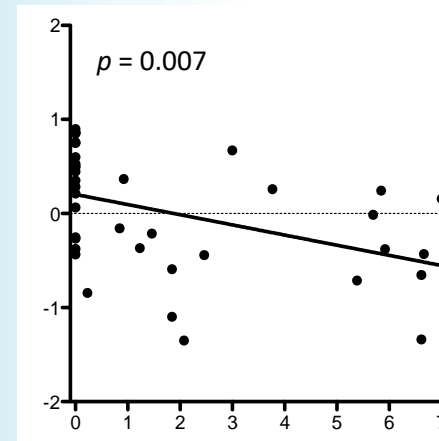
Smoking Occasions per Day



Joints per Occasion



Joints per Week



Smoking Days Per Week

Gilman et al, 2014

Marijuana and Aggression



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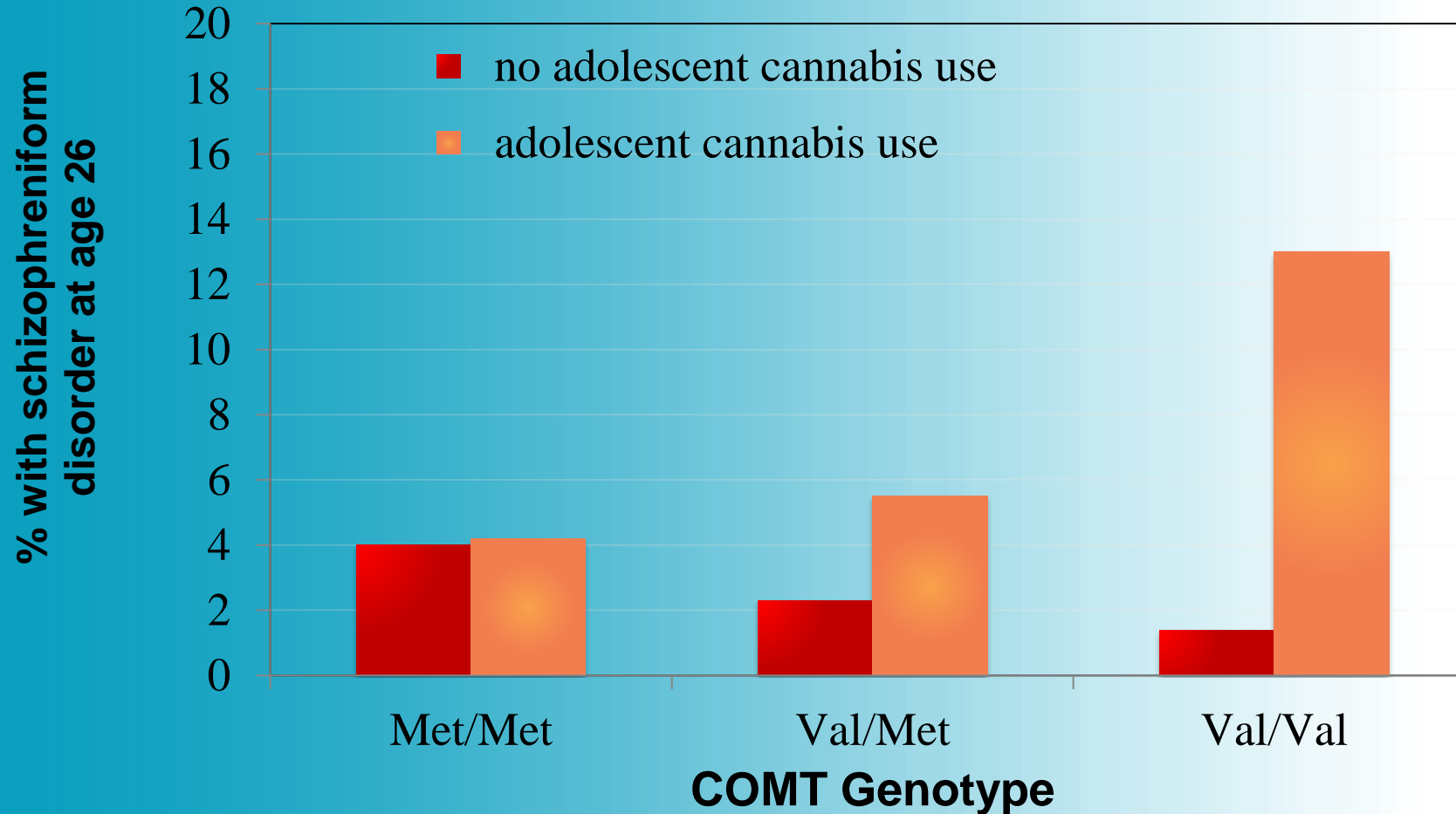
PSYCHIATRY ACADEMY

- Anecdotal in clinic & schools – Yes
- Data is mixed
 - White, 1998: 4 waves of data – assessed 12 y/o → 28 years
 - Adolescent MJ predicted later aggression
 - Early aggression didn't predict later MJ use
 - Lui, 2013: Early aggression, in boys, predicts MJ use only
 - Ansell, 2015: Smartphone readings: MJ and Aggression not related
 - McKowen et al 2022: higher self-report anger → THC concentration, usage, CUD dx
- During withdrawal phase: more supportive data:
 - Budney, 2003: During withdrawal – peak 2-6 days up to 20 days
 - Millin 2008: 13-19 y/o, anger increased in 1st two weeks, up to 3rd week.



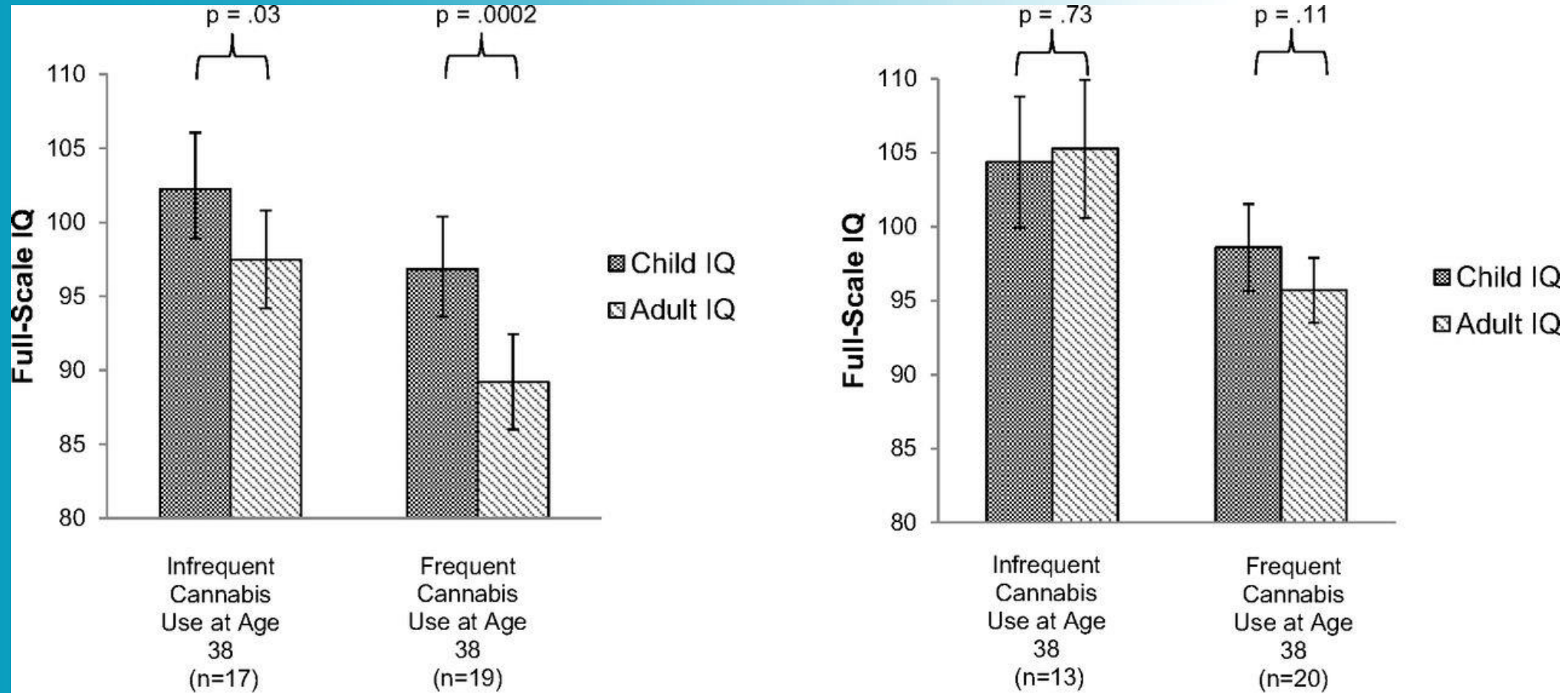


Adolescent Cannabis Use Increases the Risk for Adult Psychosis in Genetically Vulnerable Individuals



Caspi, A. et al., 2005

Longitudinal Impacts: NZ Study



Adolescent-Onset (Used Cannabis Weekly Before Age 18)

Adult-Onset (Did Not Use Cannabis Weekly Before Age 18)

Meier et al, 2012

Summary of Cannabis impacts on Executive Function



Executive Function Measured	Acute Effects (0-6 hrs)	Residual Effects (7hrs-20 days)	Long-Term Effects (21 days +)
Attention/Concentration	Impaired (light users) Normal (heavy users)	Mixed findings	Largely normal
Decision Making & Risk Taking	Mixed findings	Impaired	Impaired
Inhibition/Impulsivity	Impaired	Mixed findings	Mixed findings
Working Memory	Impaired	Normal	Normal
Verbal Fluency	Normal	Mixed findings	Mixed findings

Challenges with youth





Very few teens/young adults engage in treatment

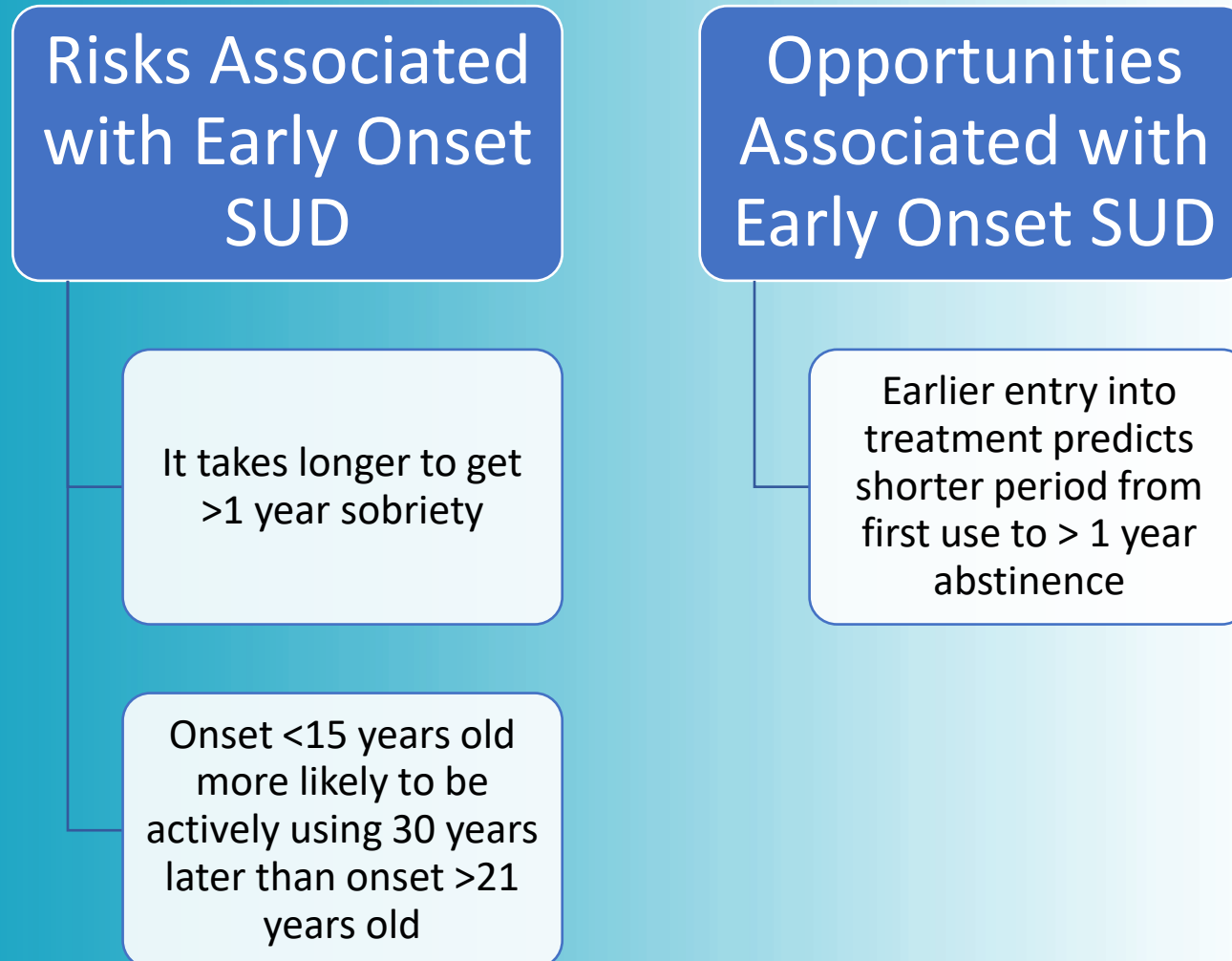
21% of youth need treatment for a substance use disorder (SAMHSA, 2009)

96% do not perceive the need to attend treatment (SAMHSA, 2009)

Only 10% of youth with substance use disorders enter treatment (NSDUH, 2013)

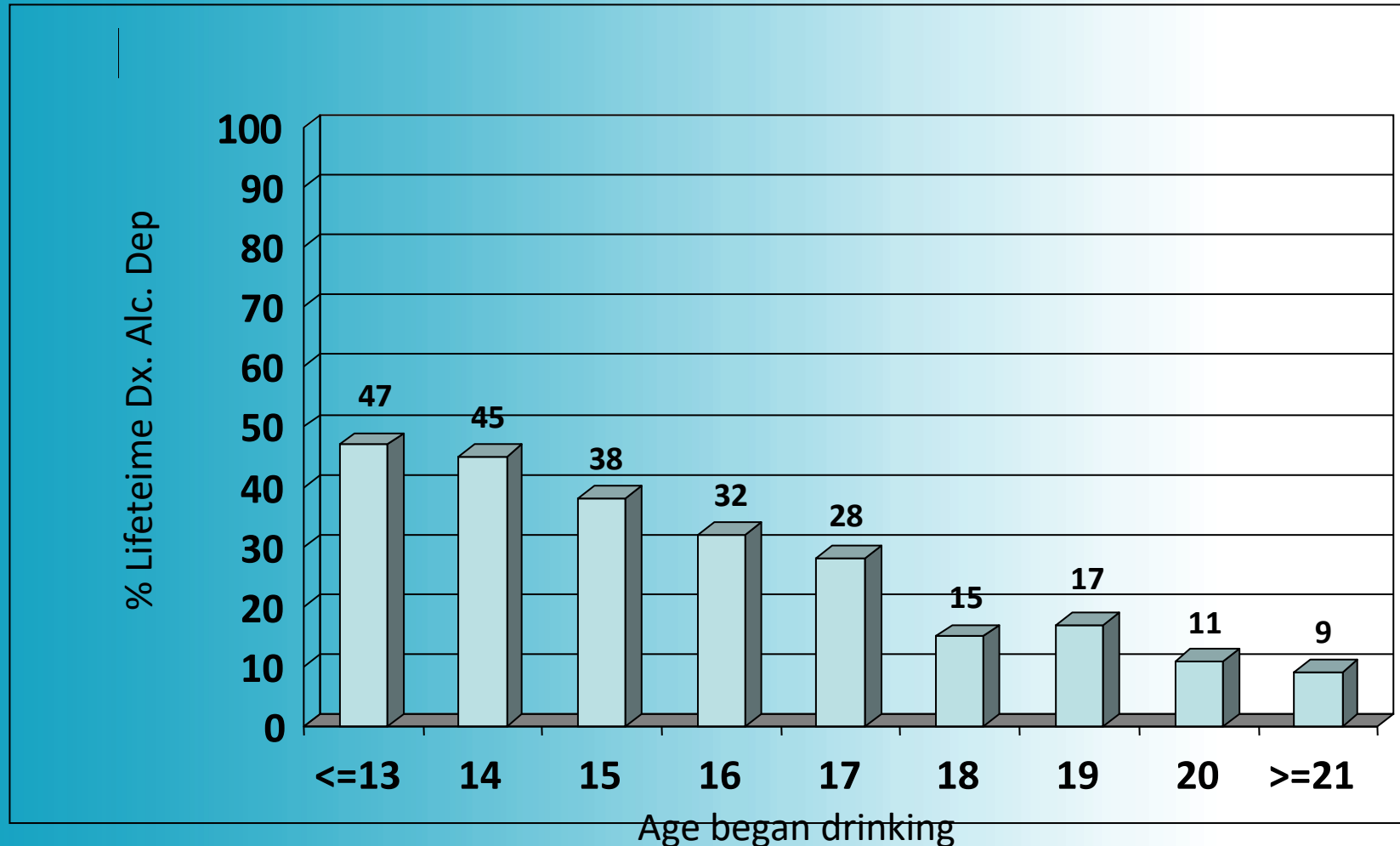
Only half *finish* treatment with mean length of time in treatment is 50 days (Dennis, 2005)

There are unique risks and opportunities associated with early onset substance use disorders





Prevalence of Lifetime Diagnosis of Alcohol Dependence by Age of Onset of Drinking

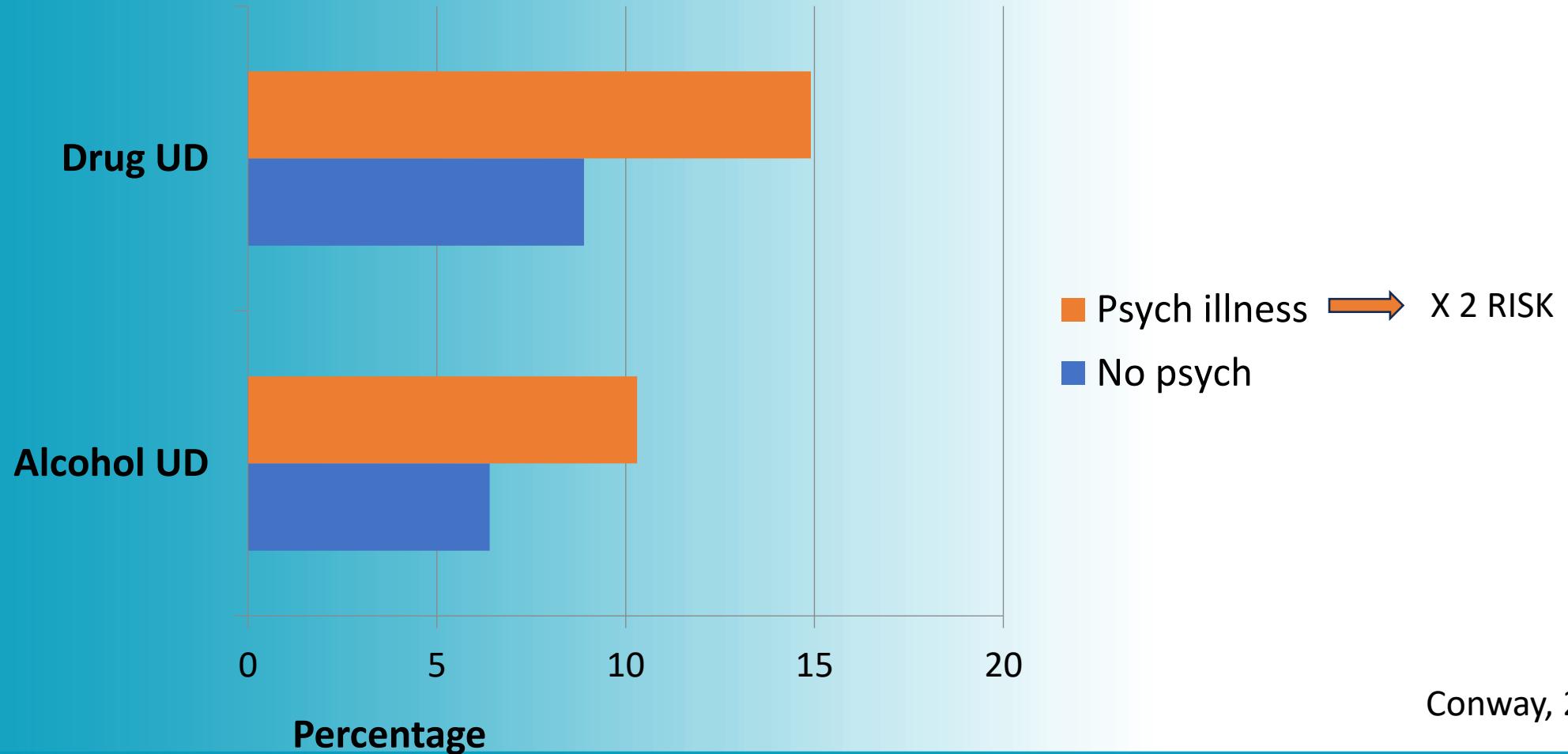


Hingson et al., 2006

Who is at risk?



Lifetime prevalence of SUD in adolescents with & without psych illness



Conway, 2016 NCA-A

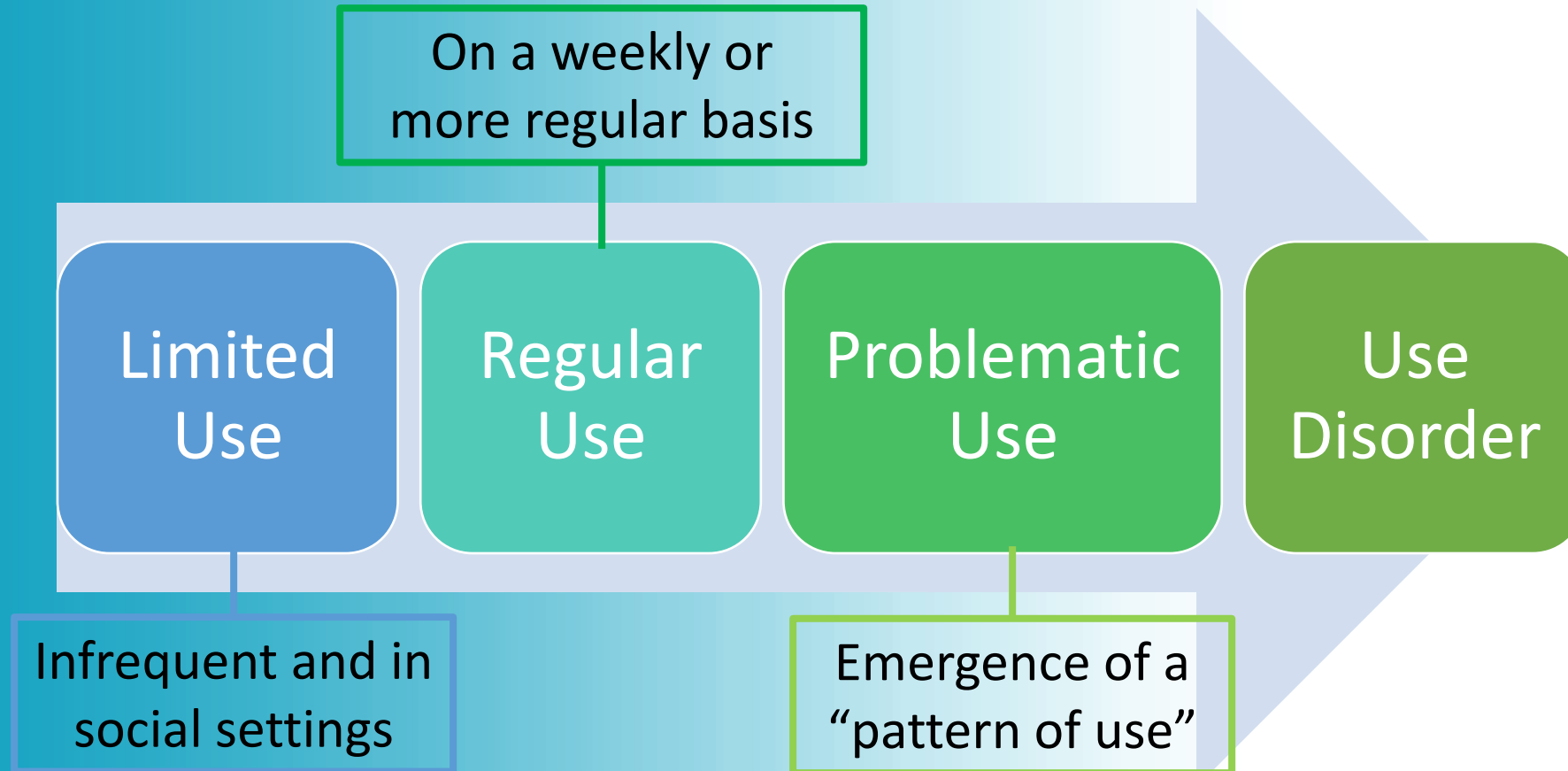


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Substance Use Patterns are on a Continuum





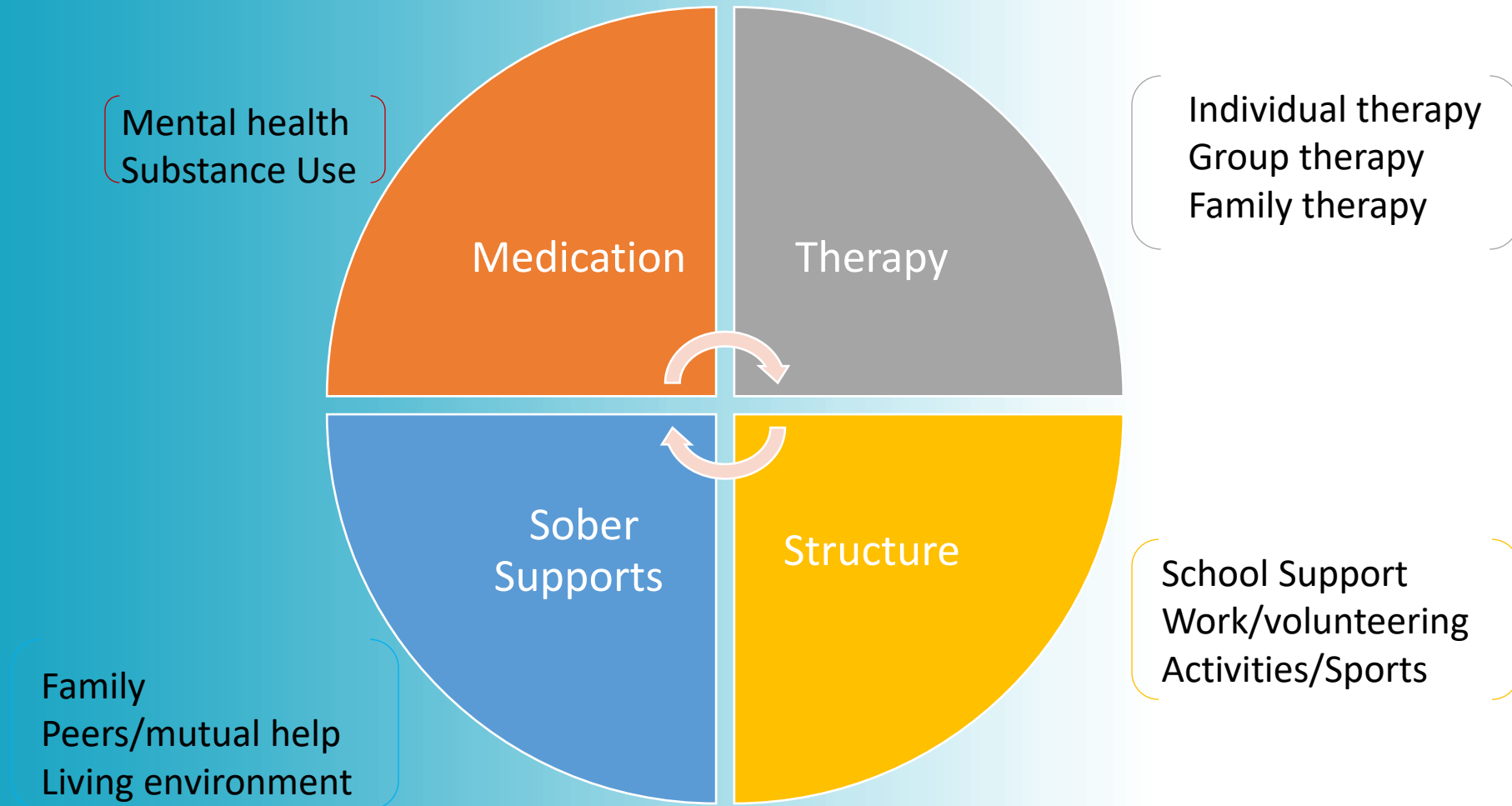
Adolescent Screening Tools



- CRAFFT
 - Can be self administered or clinician administered
 - Primary-care and schools (7&10th G)
 - Yes to 2 or more of the CRAFFT questions
→ patient is at high risk and needs further assessment for SUD
 - Sensitivity 92%, Specificity 82% for need for SUD treatment (Knight JR 1999)
- DAST-20 – drug screen
- Opioid Risk Screening Tool



Tools to support change: A Village



Severity of illness & number of tools to support sobriety may impact recommended level of care



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PSYCHIATRY ACADEMY

Most restrictive, Intensive,
& Structured

Least restrictive, Less Intensive

Inpatient
Detox

Residential

Outpatient

- Partial Hospital Program
- Intensive Outpatient Program
- Standard counseling

Evidence Based Therapy Interventions

- Strong Empirical Evidence:
 - Motivational Enhancement Therapy (MET)
 - Contingency Management (CM)
 - CBT Individual and Group therapy (CBT-I/G)
 - Brief Strategic Family Therapy (BSFT)
 - Behavioral Couples Therapy (BCT)
 - Twelve Step Facilitation (TSF) – Emerging evidence
 - Integrated Dual Disorders Treatment (IDDT) – in CJS



Many youth do not think they have a problem and certainly do not need treatment!



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Engage Them in Care:

- Motivational Interviewing
- Contingency Management
- ACRA therapy
- Family & Parent training - CRAFT

Medication for SUD



Anti craving

- Goal: decrease substance use, promote abstinence

Agonist

- Goal: prevent withdrawal, eliminate drug craving, and block euphoric or dangerous effects

Antagonist

- Goal: block the effect of substance use

Aversive therapy

- Goal: decrease likelihood of substance use due to concern about complications associated with substance use while taking the medication

Treatment for Alcohol UD



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Naltrexone

Acamprosate

Topriamate (Non-FDA)

Okay if less committed to sobriety

Disulfiram

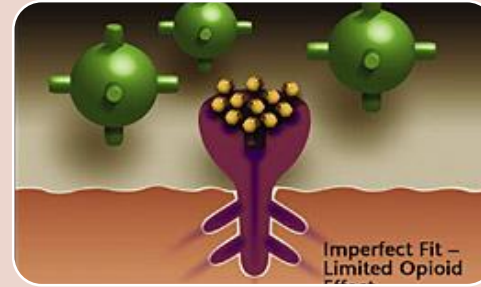
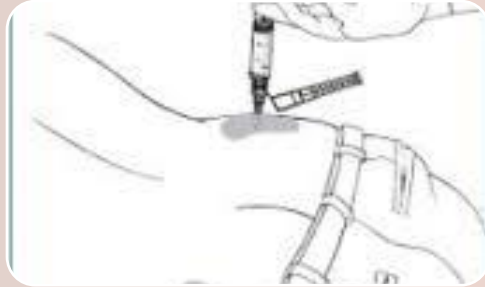
Need high commitment to sobriety

Treatment for Opioid UD



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**Naltrexone/
Vivitrol**

**FDA approved
18 years +**

**Least structured, Less
restricted**

**Buprenorphine/
naloxone & XR
Injection 1 x
month**

**FDA approved
16 years+**

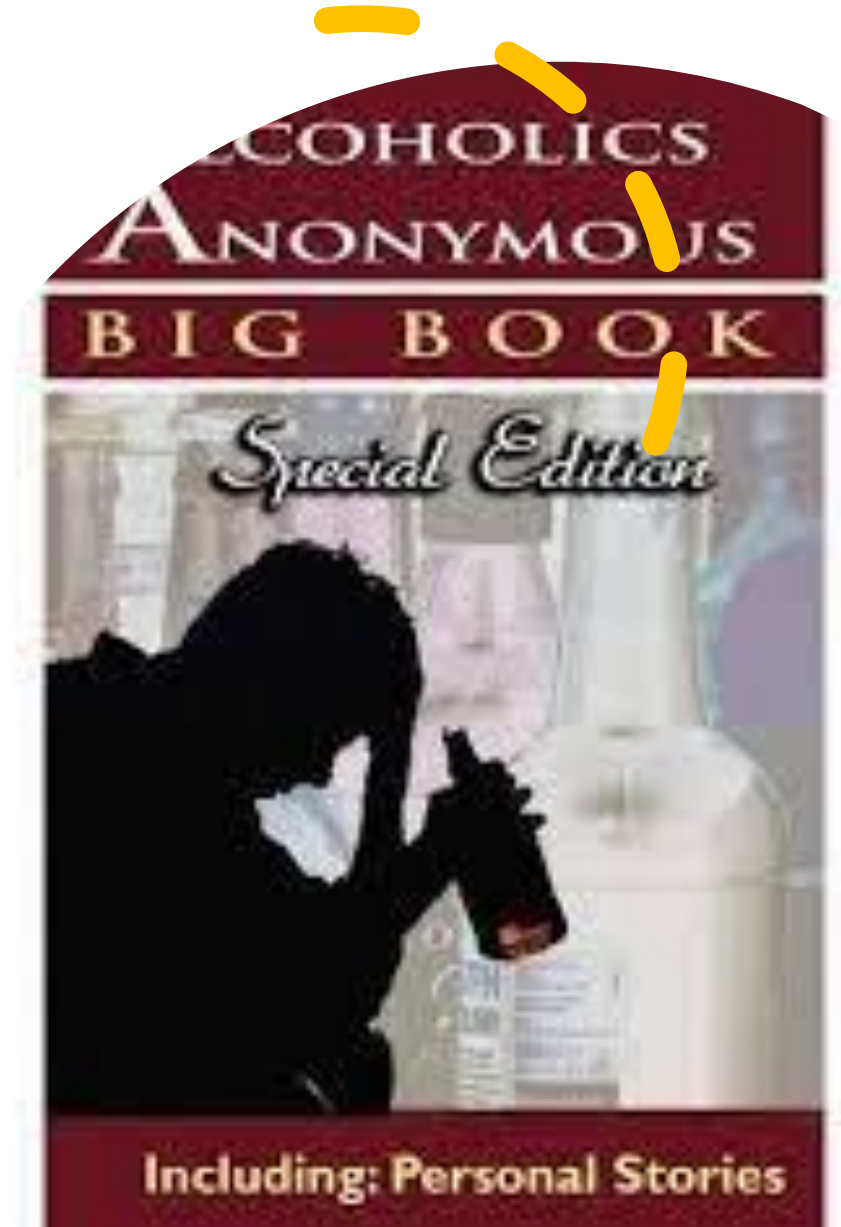
Methadone

**Generally
18 years +**

**Very structured,
Very restricted**

Mutual help organizations and youth

- AA/NA attendance significantly and independently predicted more days abstinent in adolescents engaged in outpatient SUD treatment
- Youth attending AA & NA feel safe at meetings
- Youth with co-occurring SUD and psychiatric illness benefit equally from AA as youth with SUD only (Bergman 2014)





What about parents?



Strain on families:

- Ordinary people faced with coping with an enormous stressor – typical coping is compromised
- Lee, 2011 – compared to controls: greater levels of depression, stress, & isolation
- Oreo, 2007 - Parents have “grief reaction” – avoidance, distress, all leading to worse parent-child interaction
- Handley, 2008 – youth addiction worsens parent substance use in those with low parent social support





Family/Wrap-around Evidence-Based Thpx

Multidimensional Family Therapy (MDT)

Functional Family Therapy (FFT)

Multi-systemic Therapy (MST)

Brief Strategic Family Therapy (BSFT)

Behavioral Couples Therapy (BCT)

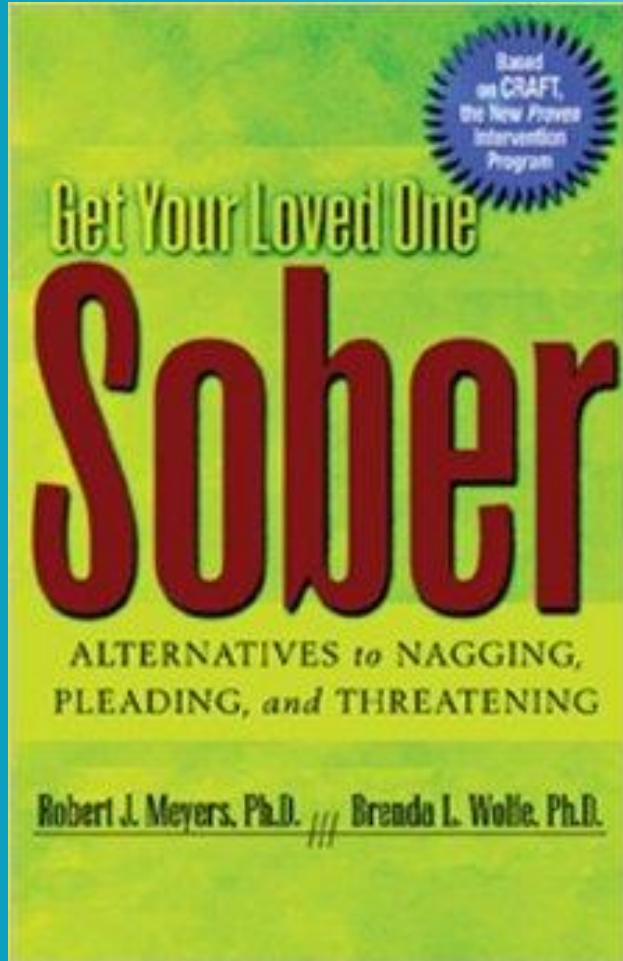
Community Reinforcement and Family Training (CRAFT)



Community Reinforcement and Family Training (CRAFT)



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- Targeted to caregivers to help motivate youth with SUD to engage in treatment
- **Goals:**
 - Empower with knowledge and a plan
 - Improve communication, problem-solving, understanding
 - Teach principals of contingency management to reinforce behavioral change
 - Enhance parental self-care

Meyers 1996



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School-based interventions

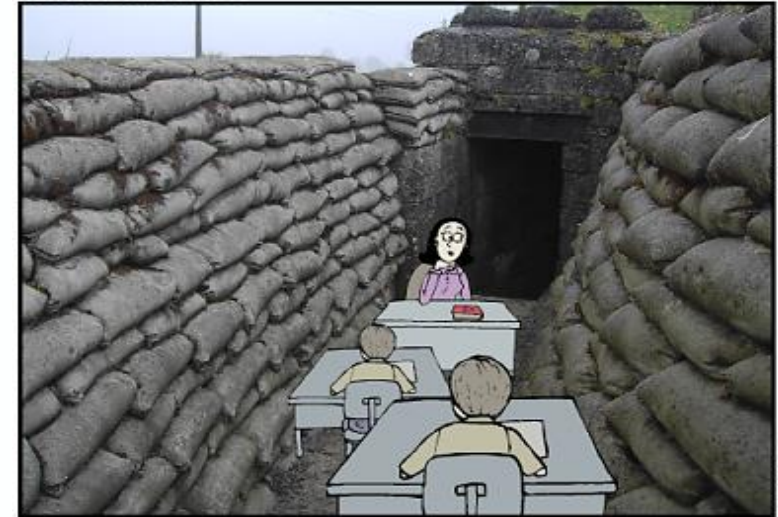


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- Meta-analysis, Onrust et al, 2016:
 - Nicotine > Alcohol > Drug use
 - Developmental variance
 - Elementary: social skills, problem-solving (PS), health edu
 - Early Ado: + normative feedback
 - Middle Ado: + normative feedback, MI, CBT, but not refusal skills
 - Late Ado: Refusal skills, MI, self-control training, PS & CBT
- Prevention:
 - Faggiano et al, 2012: Meta-analysis 29 RTC in 6-7th grades
 - Reduce MJ, hard drug, and improved decisions making & Self-esteem
 - Massachusetts: Mayor Walsh & Gavin Foundation
 - “Too Good For Drugs” Program – target middle school youth
 - 10 x 1 hour sessions addressing decision, refusal skills, self-esteem
 - 2 x large studies in FL w/ around 3000 K-12 grades

IN THE TRENCHES



Role of discipline?



- Options for substance use/problematic behaviors in school?
 - Improved assessment to determine risk/threat - SBIRT
 - Increase teacher/counselor resources
 - In-house, limited removal + increased:
 - Educational support, mentoring, teacher behavioral skills training, increased MH resources, alternative educational paths (trade, Job Corps, Youth Build)
- Expulsions - Controversial
 - Meta-Analysis (Dong & Krohn, 2020):
 - Labelling effects + increased unstructured/unsupervised negative socialization
 - Negative-dependent duration leads to increased substance use, risk of jail, low edu attainment & family stress
 - Intergenerational transmission of effects
 - Disproportionate impact on minority youth



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Is there any hope?

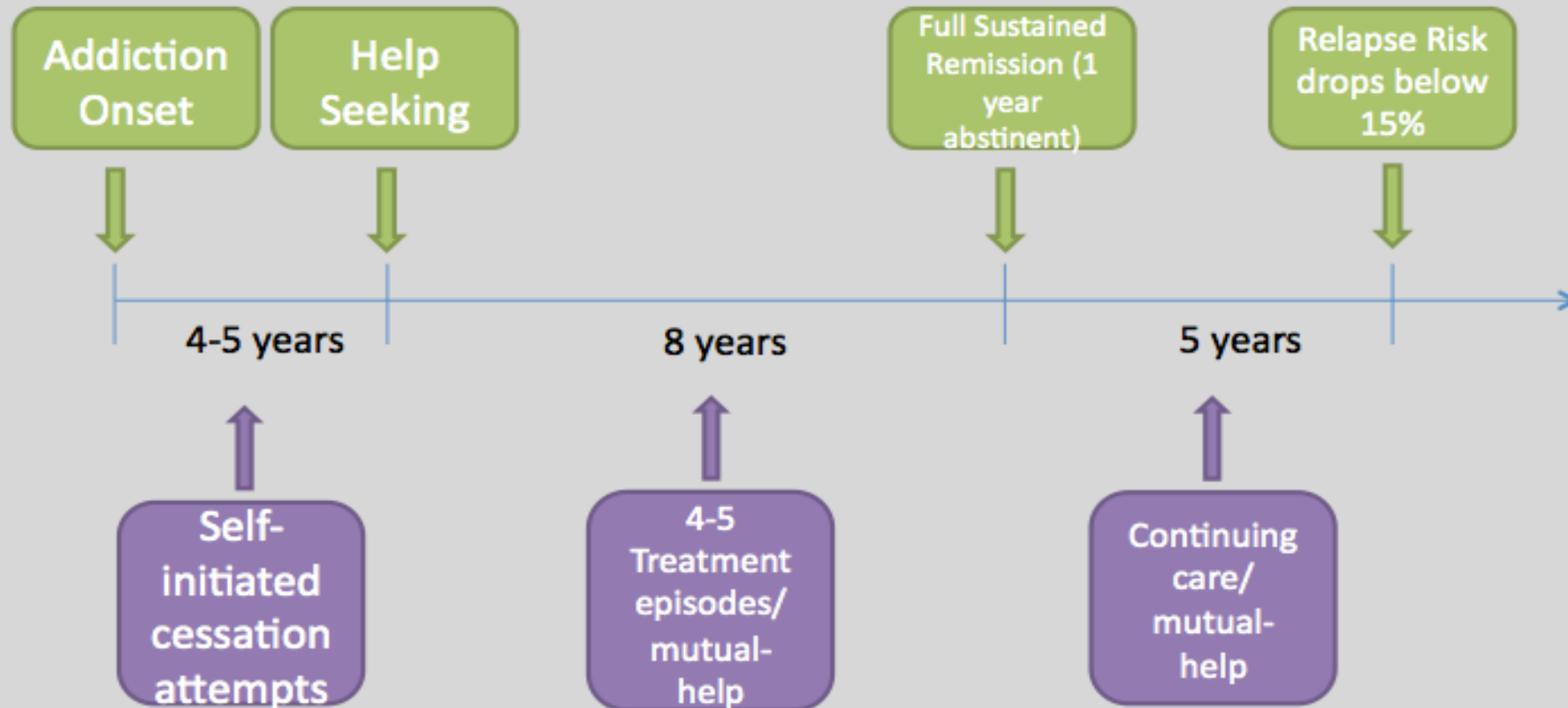
Can people recover?



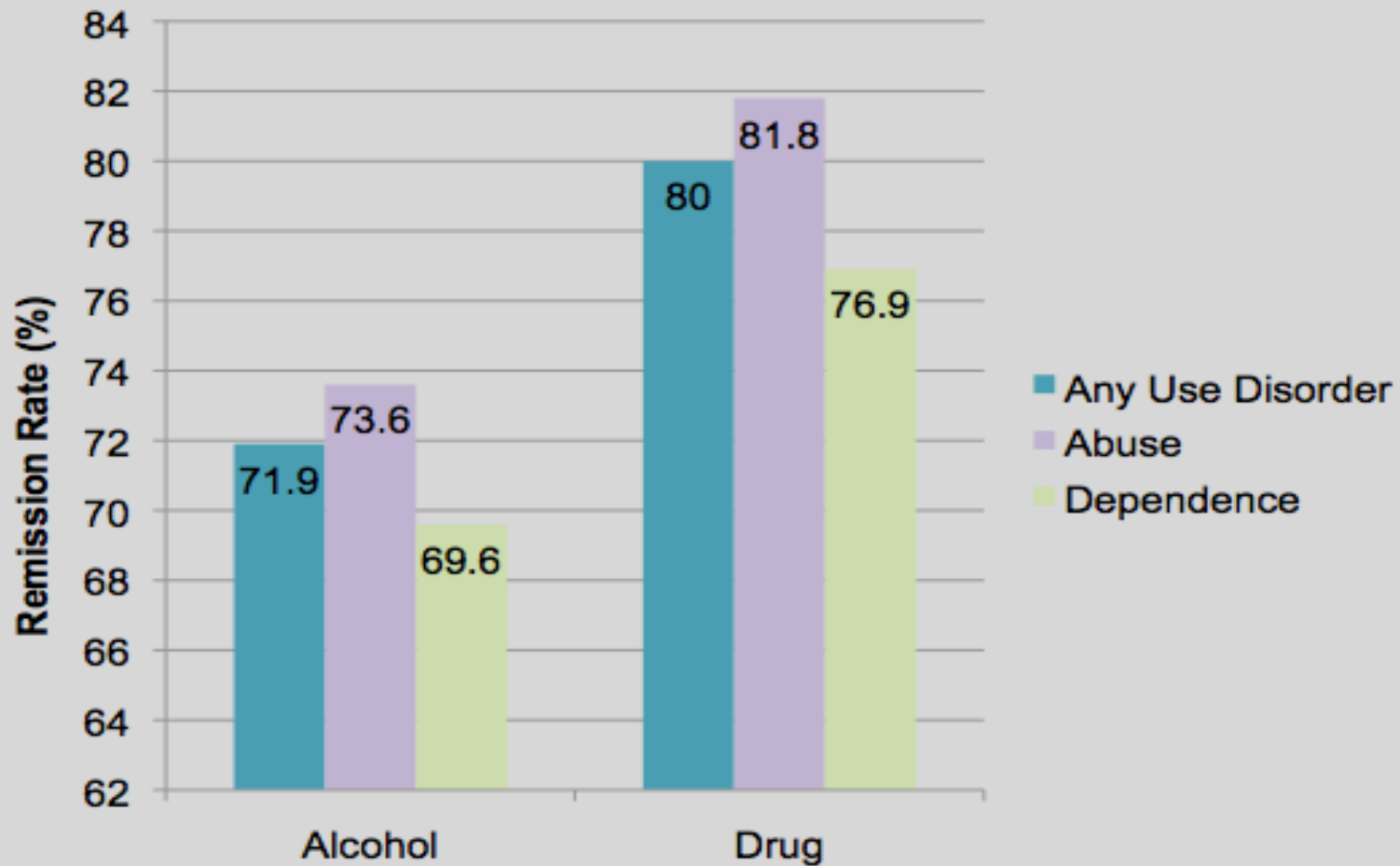


Chronic Illness Model

Typical Clinical Course for Substance Dependence and Recovery



Rates of Recovery



Relapse across chronic disorders



COMPARISON OF RELAPSE RATES BETWEEN DRUG ADDICTION AND OTHER CHRONIC ILLNESSES

Percentage of Patients Who Relapse

TYPE I DIABETES



DRUG ADDICTION



HYPERTENSION



ASTHMA



- Return to use doesn't equal failure – rather we've missed something. Learn not judge

MGH: ARMS Program



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PSYCHIATRY ACADEMY

- Recovery Management Philosophy
- Treats teens – 26 year olds and their parents
- Patient centered care: motivational model
- Evidence-based psychosocial treatments
- Medication Treatment
- Recovery Coach
- Parent Program



Engaging Youth at ARMS



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Referral

- Rapidly engage – capitalize on motivational window
- Risk Adjusted Intake Process – dual dx evaluation
- “Meet and greet” option
- Modify intake length/content
- Bio-psycho-social assessment
- Recovery coach initial engagement

Treatment

- Evidence-base youth treatments – ACRA, CBT, DBT
- Therapy and group (< 18 and > 18 yrs)
- Match treatment to readiness
- Support functional goals not just substance outcome
- Medication: suboxone/vivitrol/psychiatric medications
- Parent services
- Recovery Coach



Thank you!

- ARMS:
 - Youth aged <26 years and/or their parents
 - Intake Appointment: 617-643-4699
 - Insurance-based program including Masshealth
 - <http://www.massgeneral.org/psychiatry/arms/home.aspx>
 - Email: mgh-arms@partners.org