Substance Use Disorders in Youth: a Developmentally Informed Approach to Early Intervention and Treatment

Emily Tejani MD, MPH

Board Certified in Child & Adolescent Psychiatry, Adult Psychiatry, and Addiction Medicine

Assistant Clinical Professor, Department of Psychiatry, UCSF Weill Institute for Neurosciences

Supervisor and Consultant, UCSF Youth Outpatient Substance Use Disorder Program

Consultant, Opioid Response Network, SAMHSA

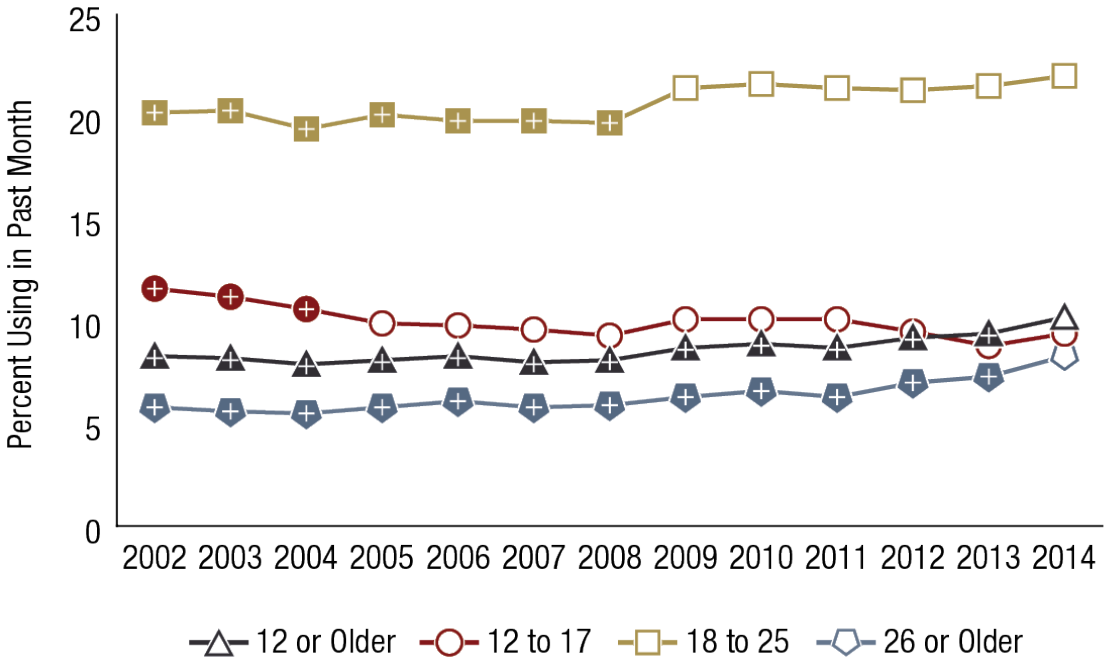
America's Addiction Epidemic: A Call to Action

- **Over 10% of Americans have a current or previous SUD**
- **Drug overdose is the leading cause of death in Americans under age 50**
- **Globally, psychiatric and SUDs are the leading cause of disability in youth**
- **Less than 10% of people with a SUD get *any* treatment**
- **Less than 1/3 of people who get SUD tx receive evidence-based care**

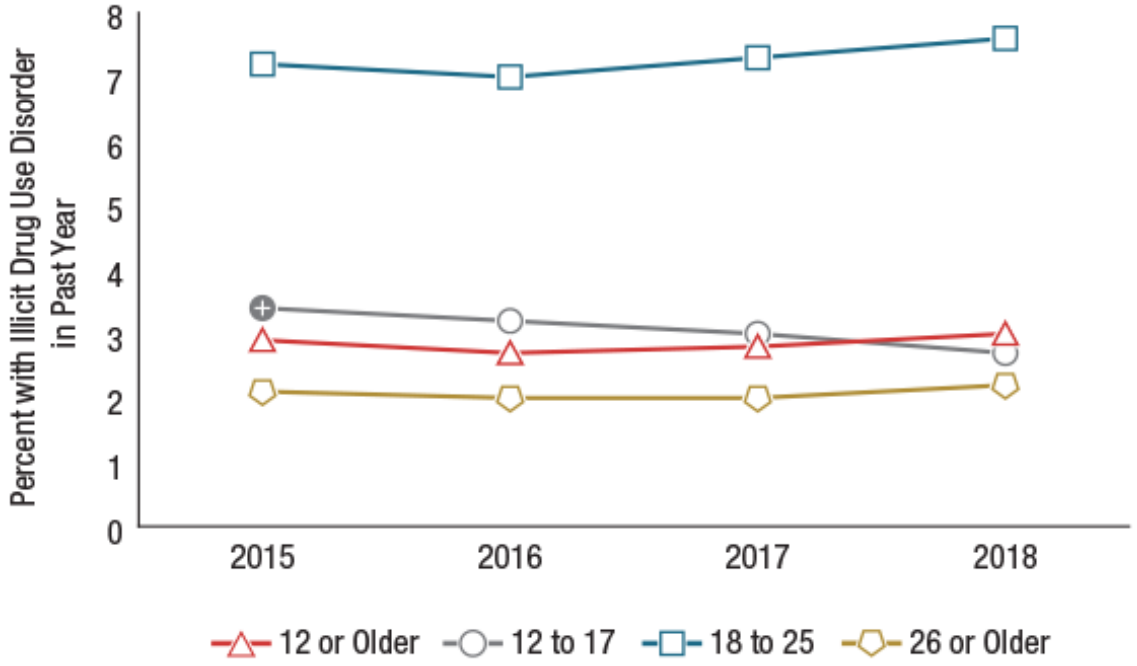
Source: SAMHSA 2015

Epidemiology of Youth SU & SUD

Past Month Illicit Drug Use among People Aged 12 or Older, 2002-2014



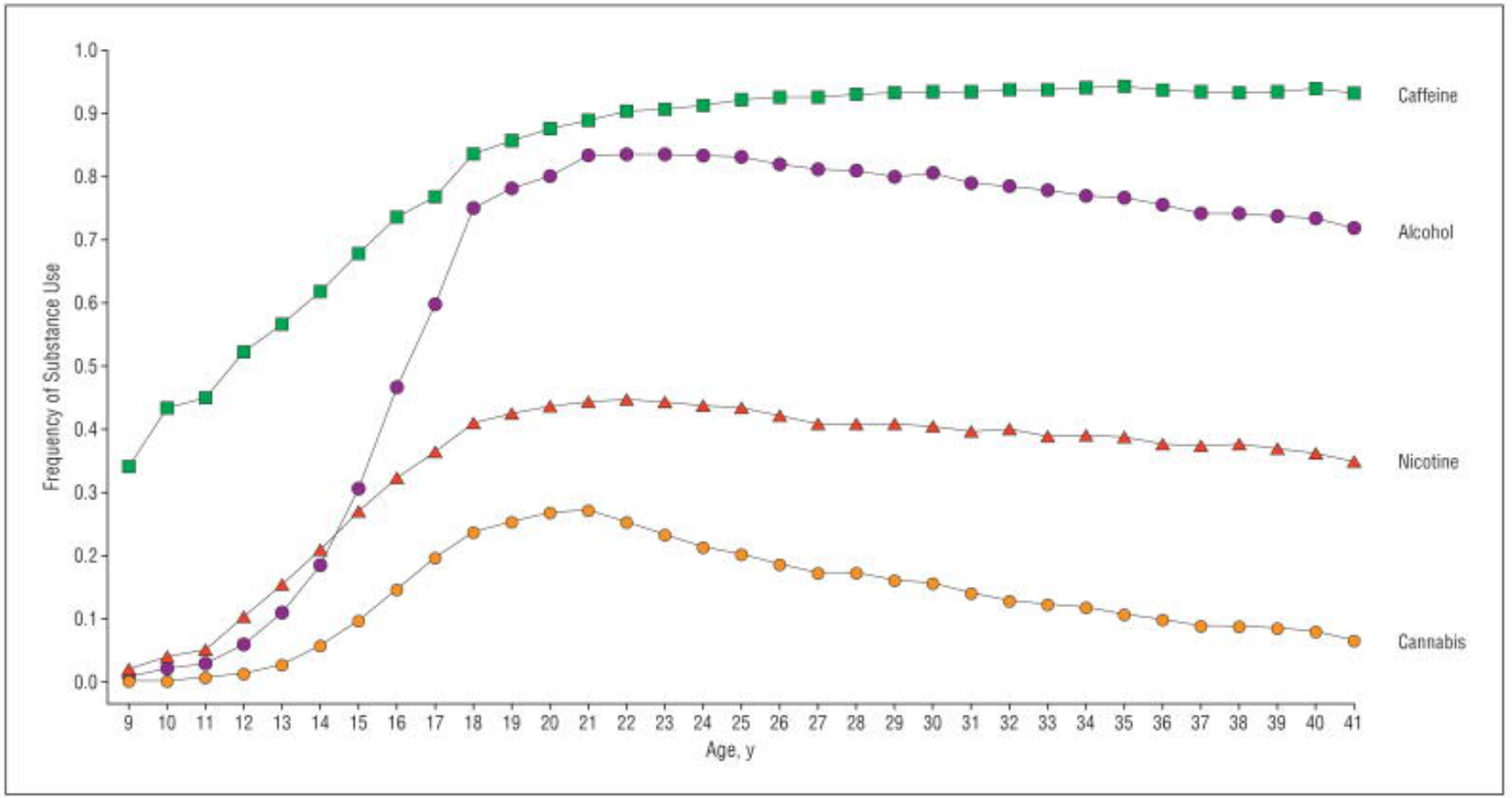
Substance Use Disorder in the Past Year by Age Group: Percentages, 2015-2018



Source: NSDUH, 2018

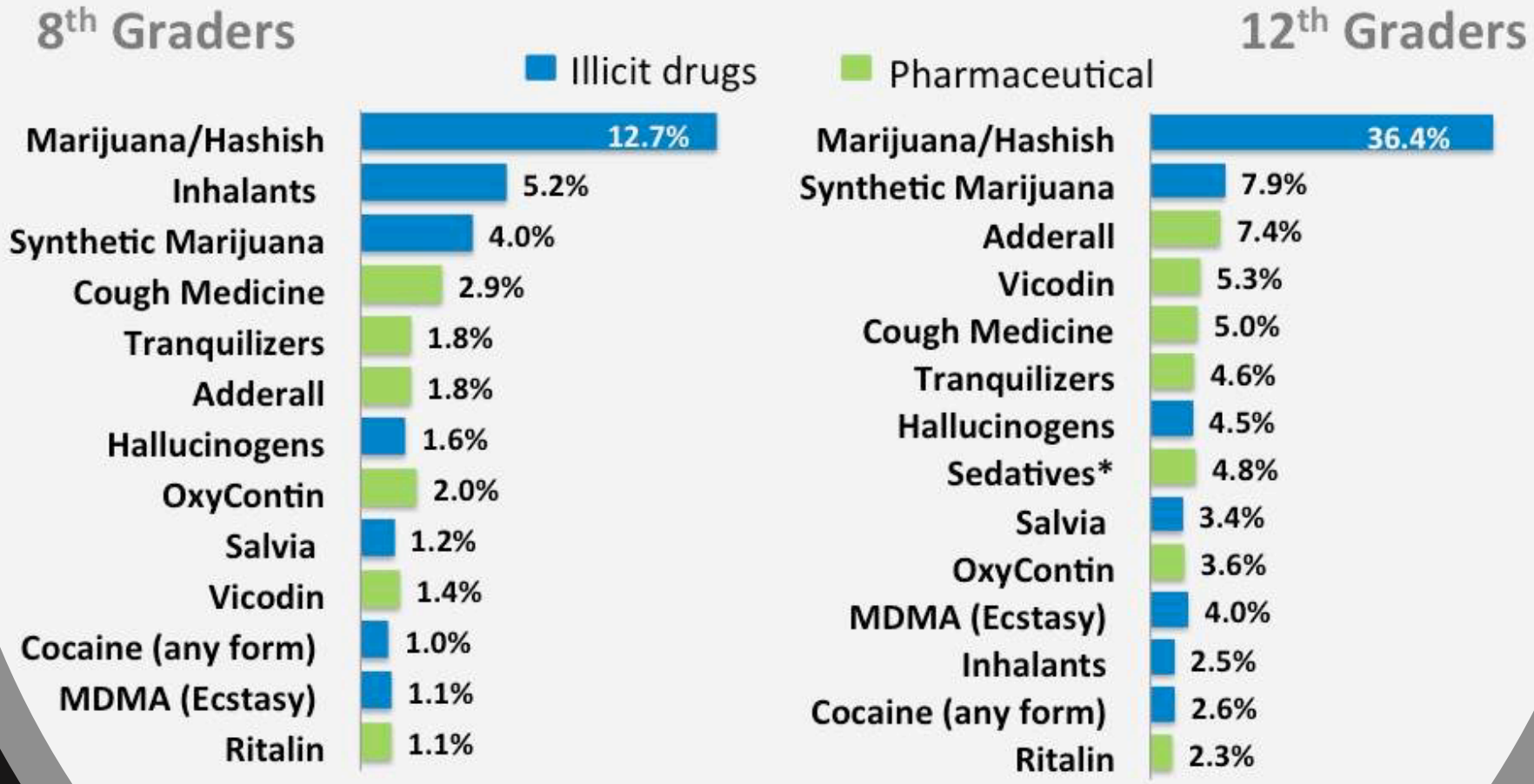
Substance Use Patterns Are Established by Late Adolescence

- The frequency of any use of caffeine, alcohol, nicotine, and cannabis by year from ages 9 to 41 years.



Source: Kendler et al, 2008

Top Drugs among 8th and 12th Graders, Past Year Use

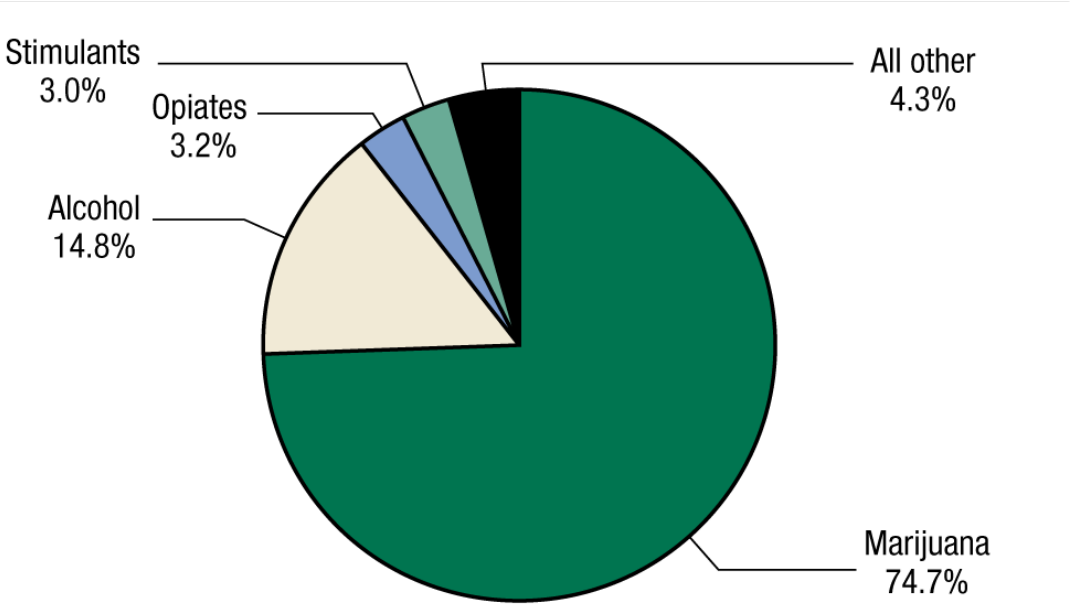


* Only 12th graders surveyed about sedatives use

Source: University of Michigan, 2013 Monitoring the Future Study

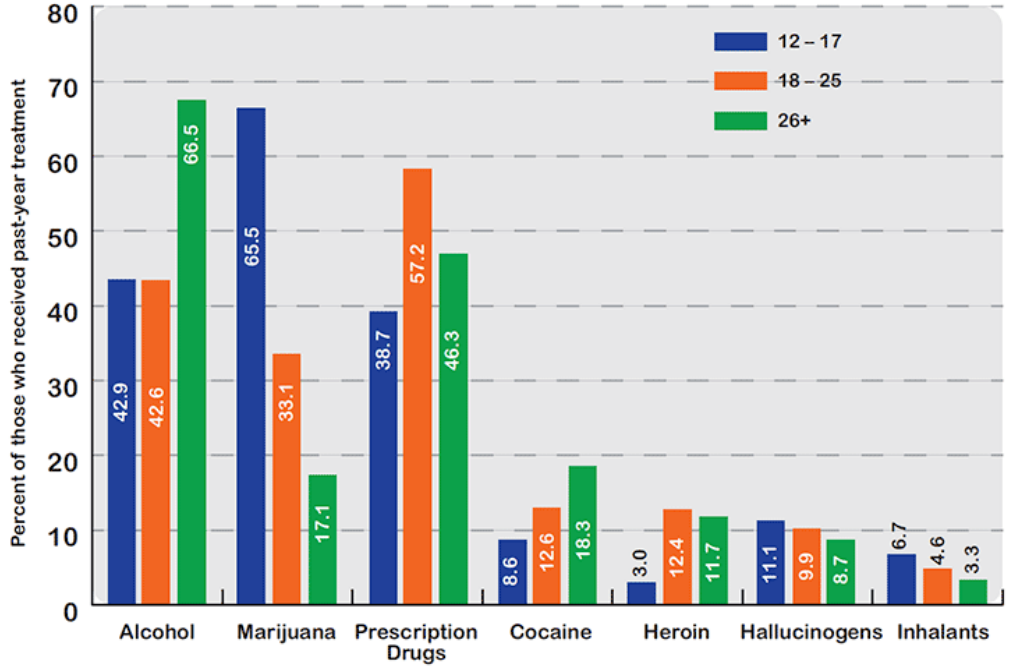
Which SUDs do Youth Commonly Seek Treatment For?

Primary substance of abuse at admission among adolescent discharges from substance abuse treatment aged 12 to 17.



Source: SAMHSA, Center for Behavioral Health Statistics and Quality, Treatment Episode Data Set (TEDS), 2011.

Adolescents' Drug Use and Treatment Needs are Different than Adults



Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2013.

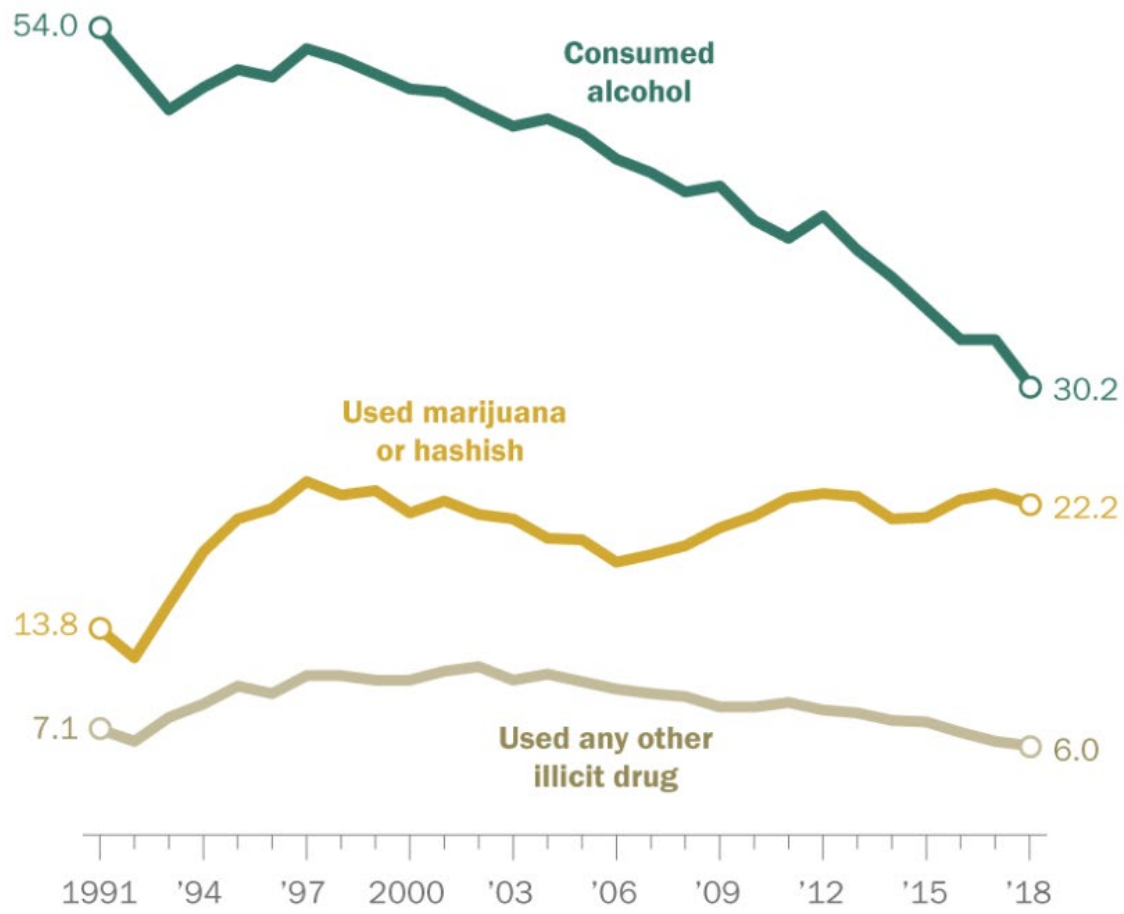
Youth Substance Use Trends

Historic lows for past month use of alcohol & most drugs

Historic highs for past month marijuana use

Alcohol use drops among youth, but marijuana use largely steady

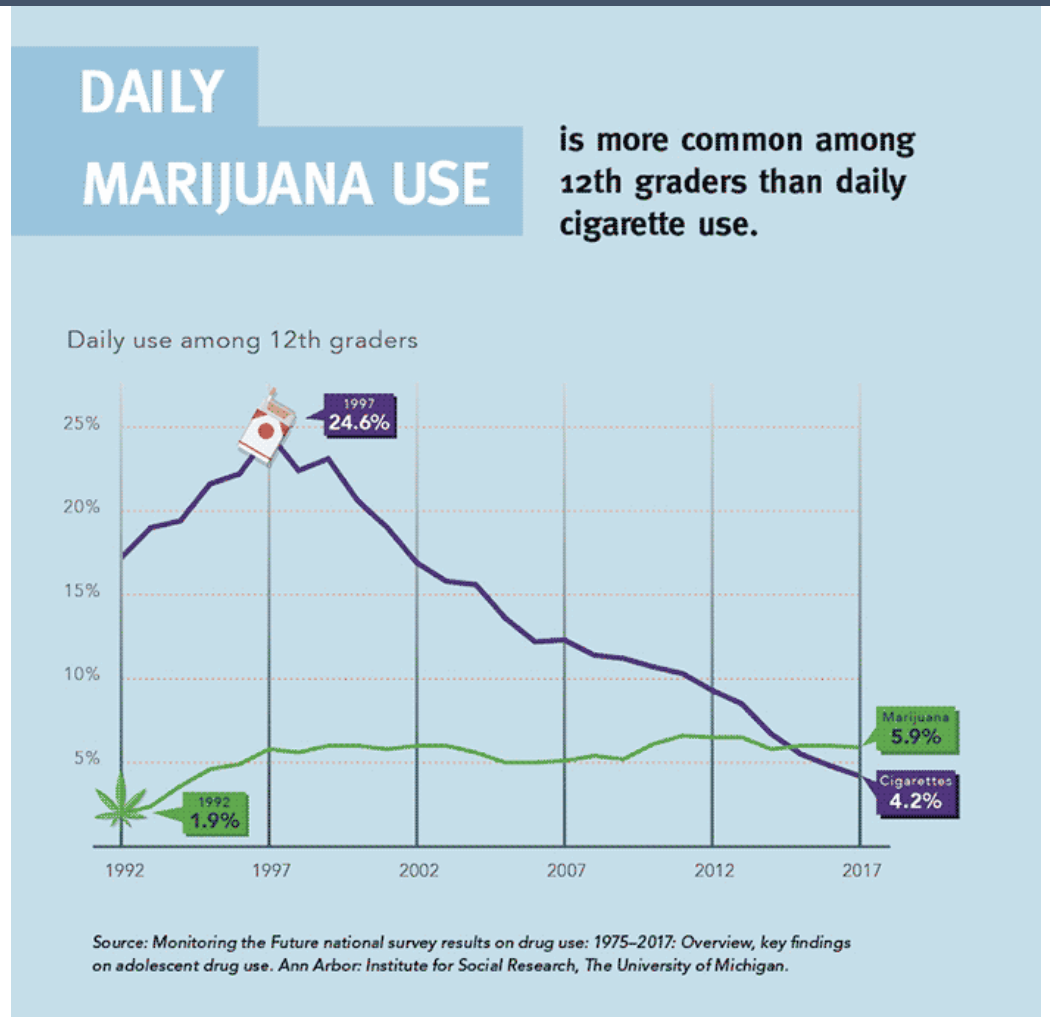
% of 12th-graders who have ____ in the past 30 days

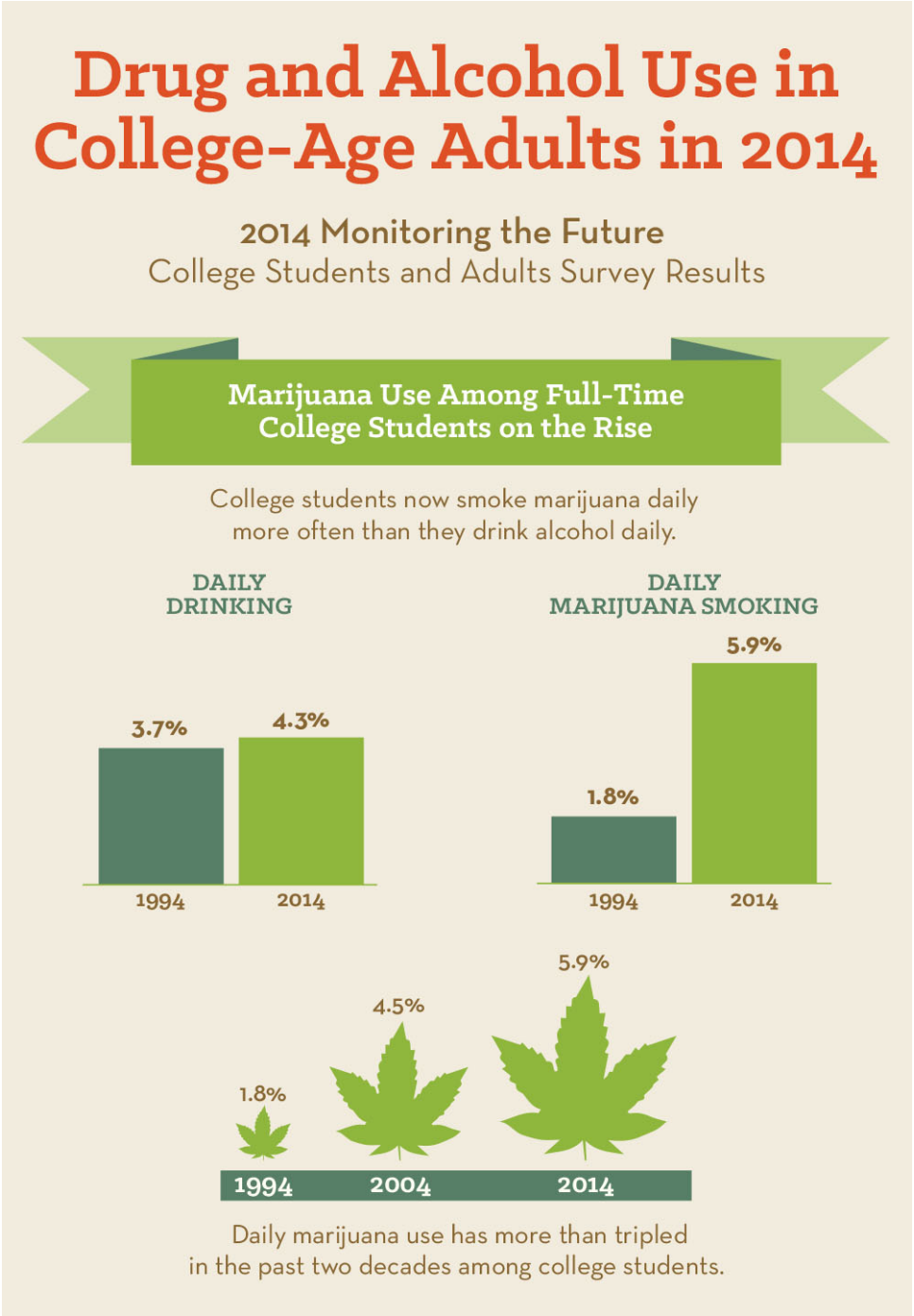


Note: Vaping category includes nicotine, marijuana and flavoring only.
Source: 2018 "Monitoring the Future" survey, University of Michigan.

PEW RESEARCH CENTER

Daily Use of Marijuana On the Rise






Heal. It's legal.
01-01-18
LAX Airport


Craft farmers
Small batch
Sustainable
That's cannabis,
the California Way
NOW IN SELECT DISPENSARIES

Risks of Early & Frequent Marijuana Use

Cannabis Use Trajectories Ages 14-26 years

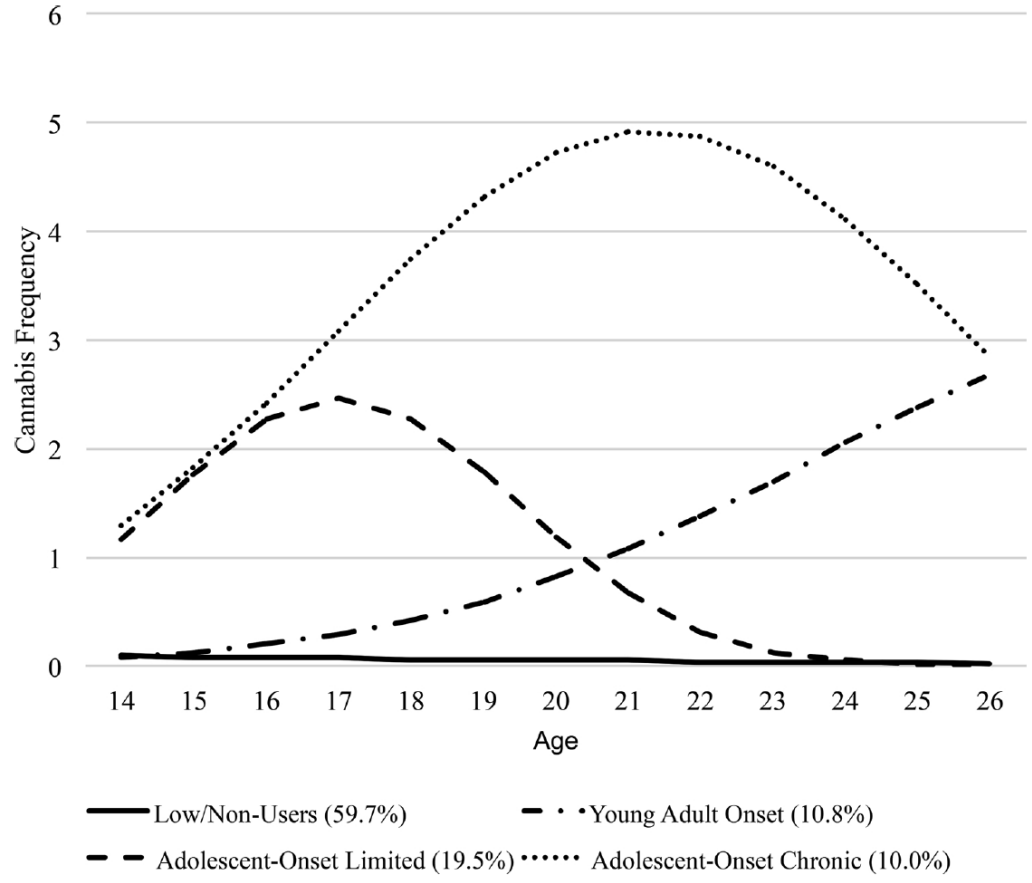
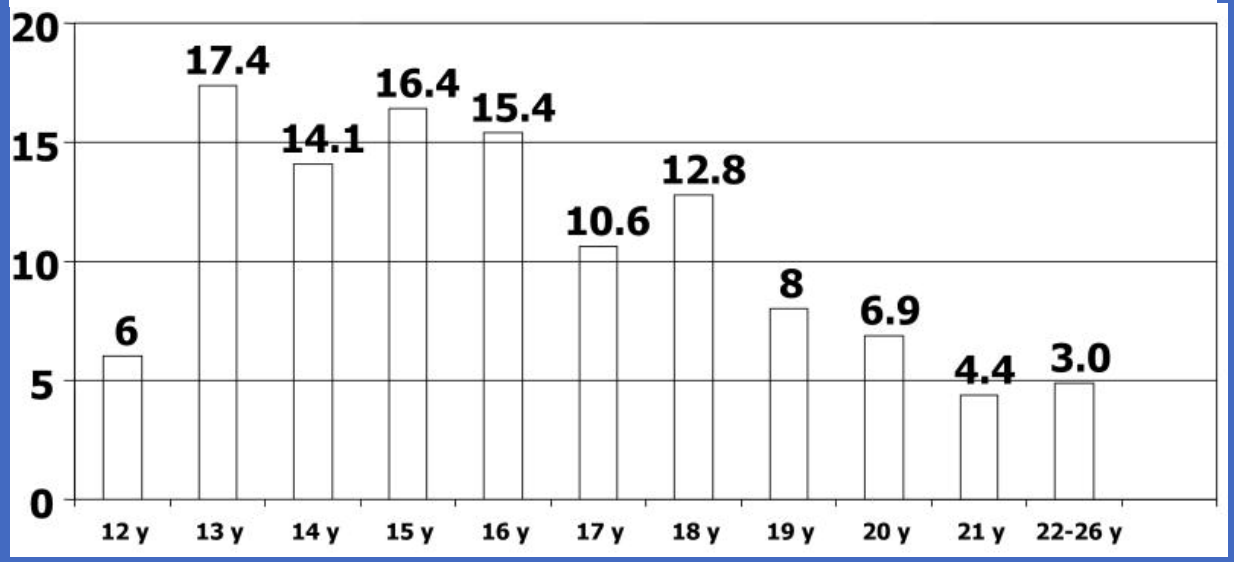


Fig. 1. Cannabis Trajectories Ages 14-26.

Source: Reboussin et al, 2020

Percentages of past year cannabis use disorder by age among recent cannabis onset users (prior 2 years; $n = 2176$)



Source: Winter et al, 2008

Harms Associated with Marijuana Use: *Opioid Use Disorder*

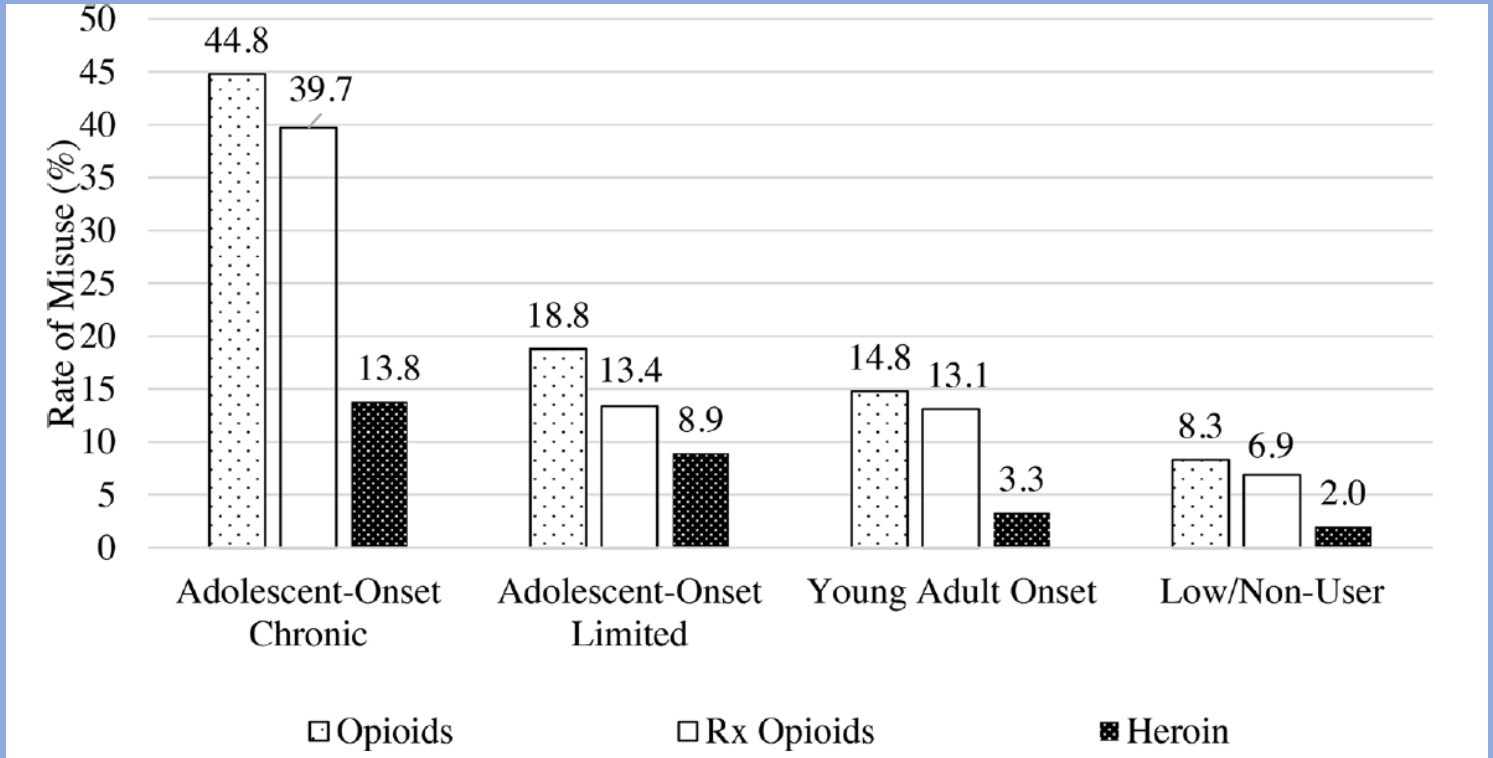
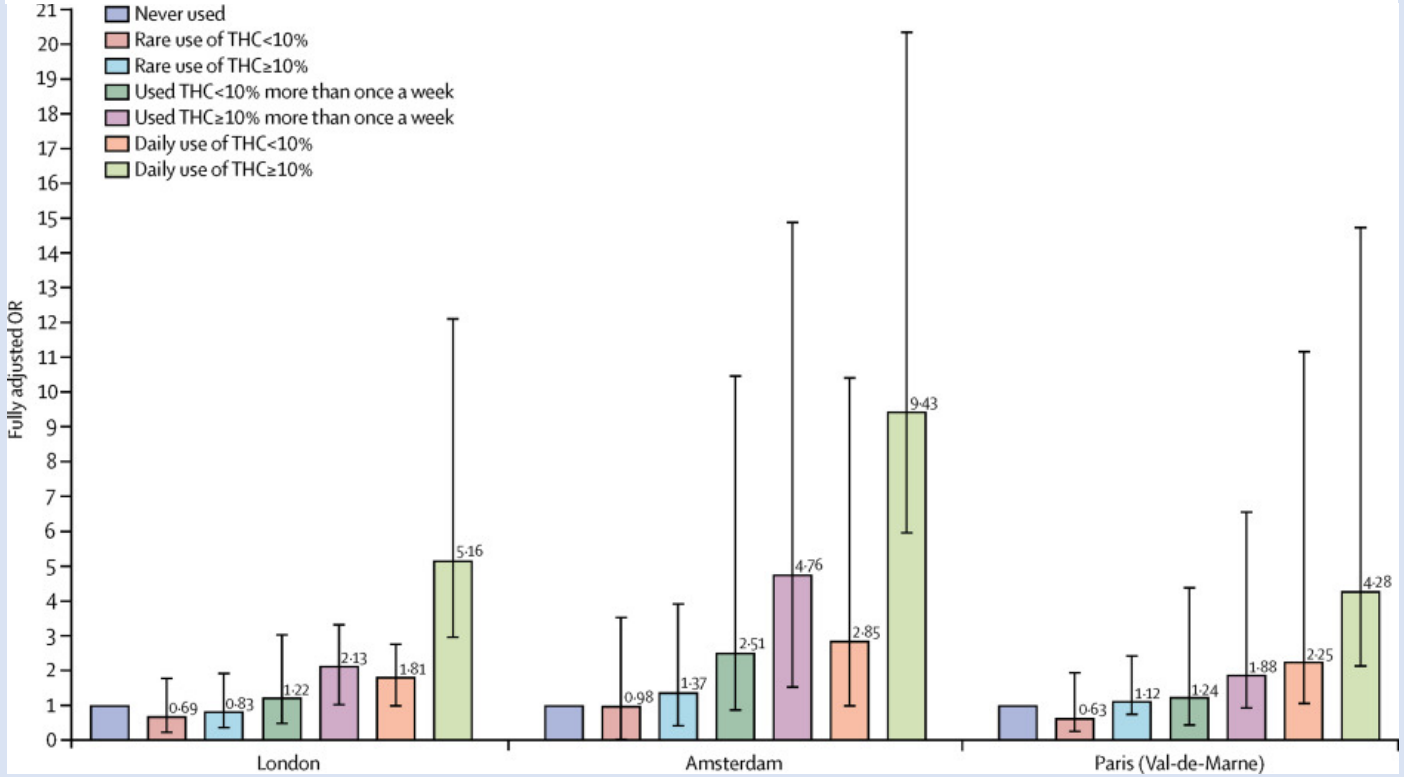


Fig. 2. Rates of Opioid Misuse Between Ages 19-26 by Cannabis Trajectory Group.

Source: Reboussin et al, Drug and Alcohol Dependence, 2020

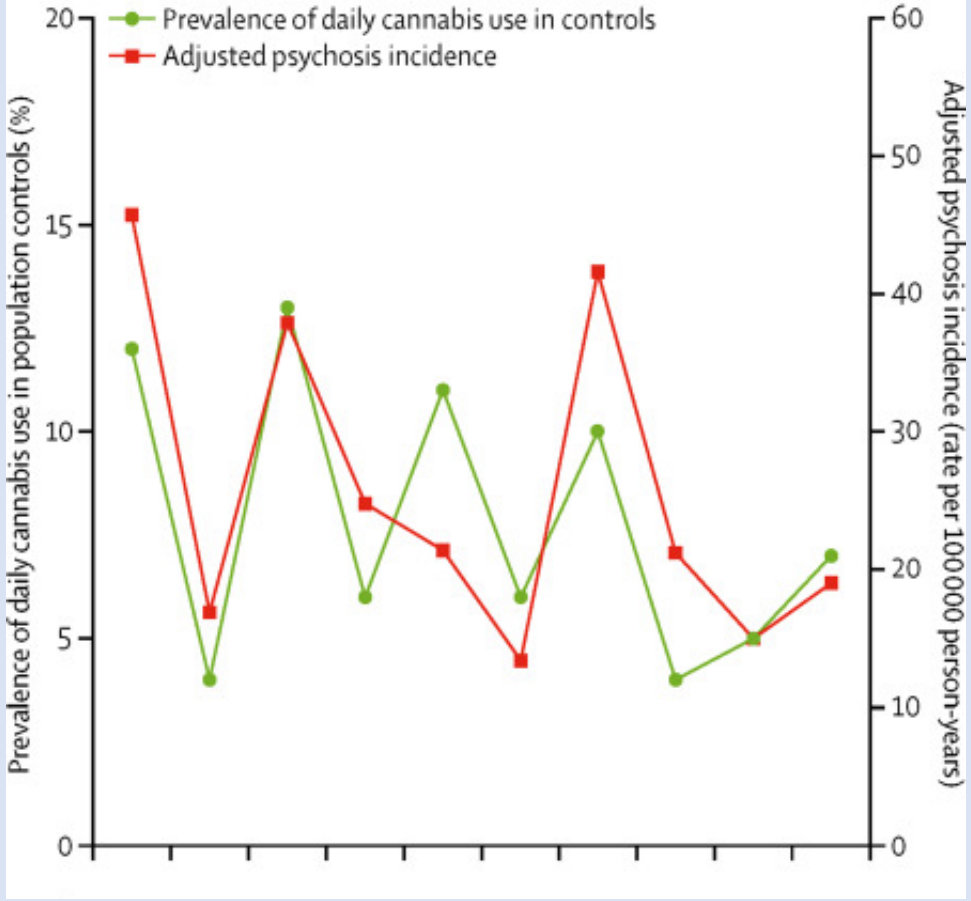
Harms Associated with Marijuana Use: *Psychotic Disorders*

Fully adjusted ORs of psychotic disorders for the combined measure of frequency plus type of cannabis use in three sites



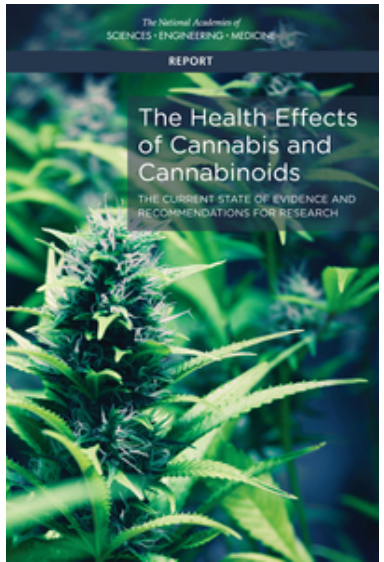
Source: DI Forti et al, Lancet, 2019

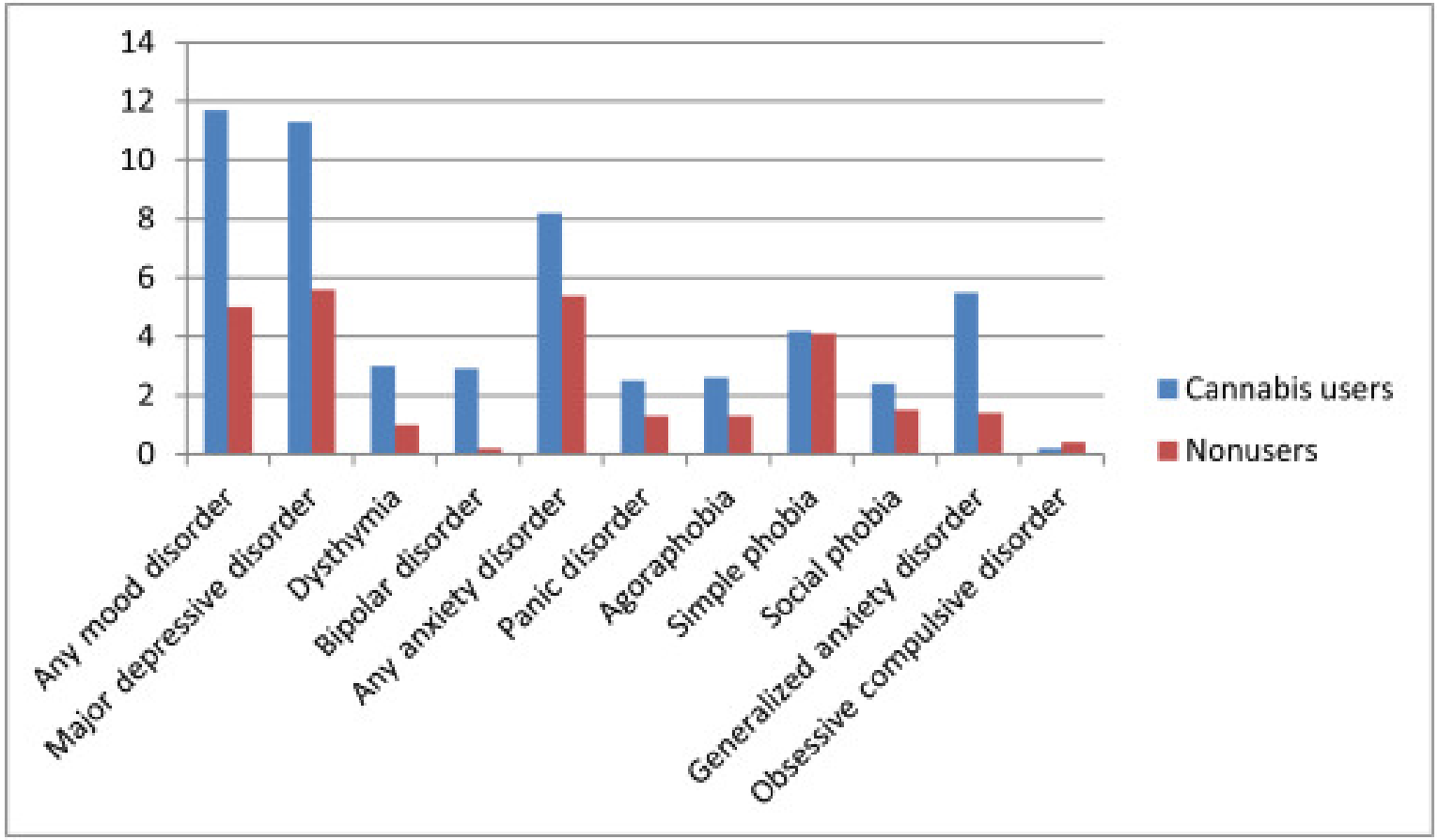
Adjusted incidence rates for psychosis for the 11 sites plotted against the prevalence of daily use in the population controls



Harms Associated with Marijuana Use: *Mood Disorders*

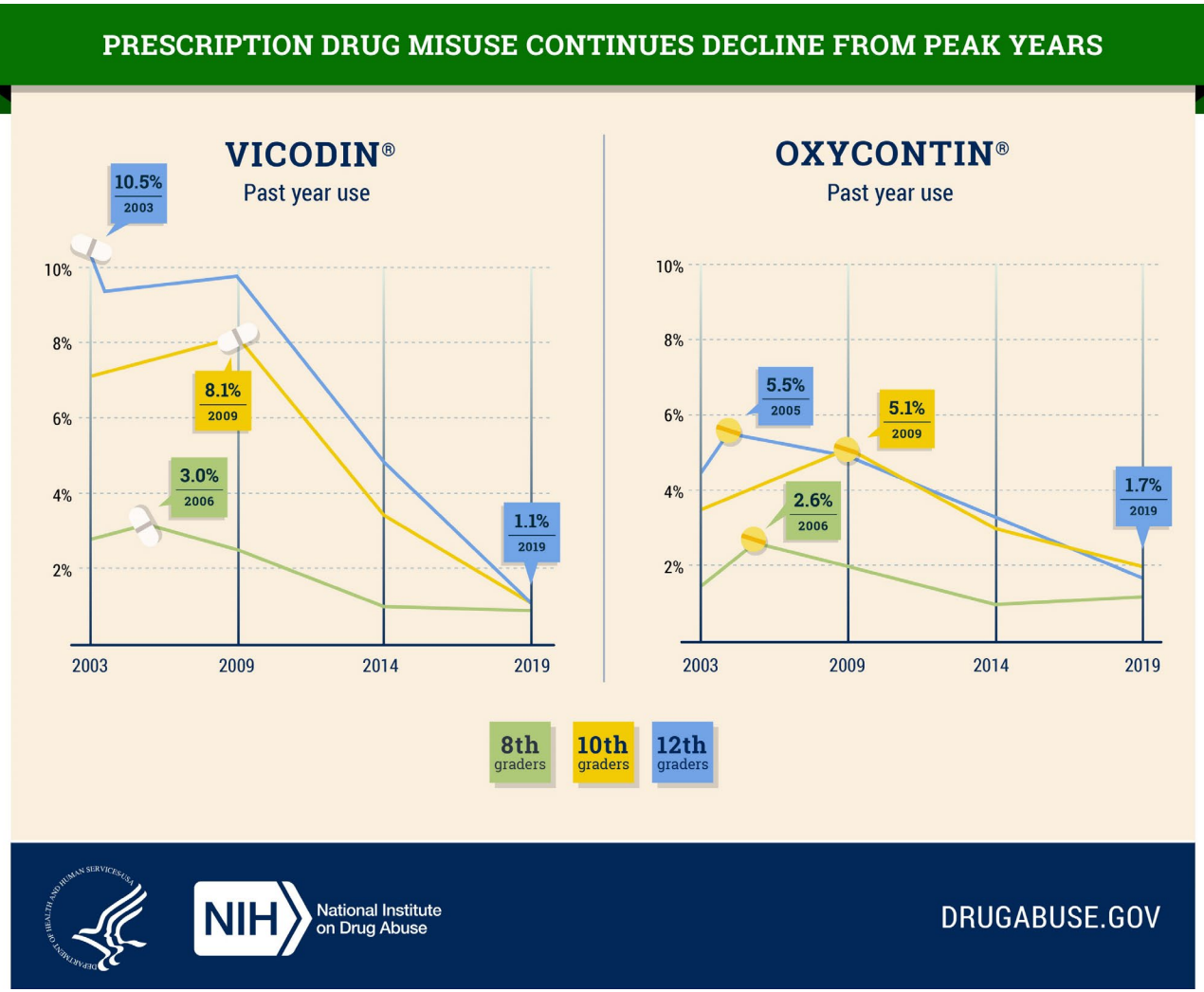
"Study findings suggest that frequent users of marijuana, but not alcohol, may experience more loneliness, more psychological distress, and less flourishing. " –Rhew et al, 2020

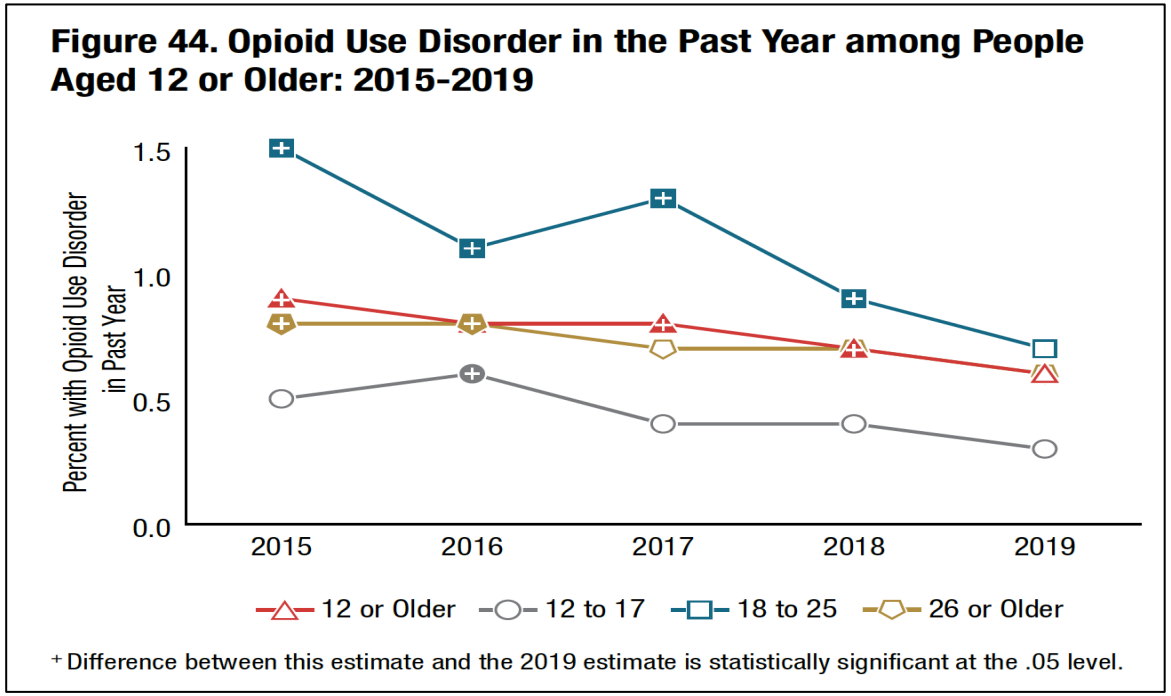




Source: Lev-ran et al, 2017

Youth Trends in Opioid Use



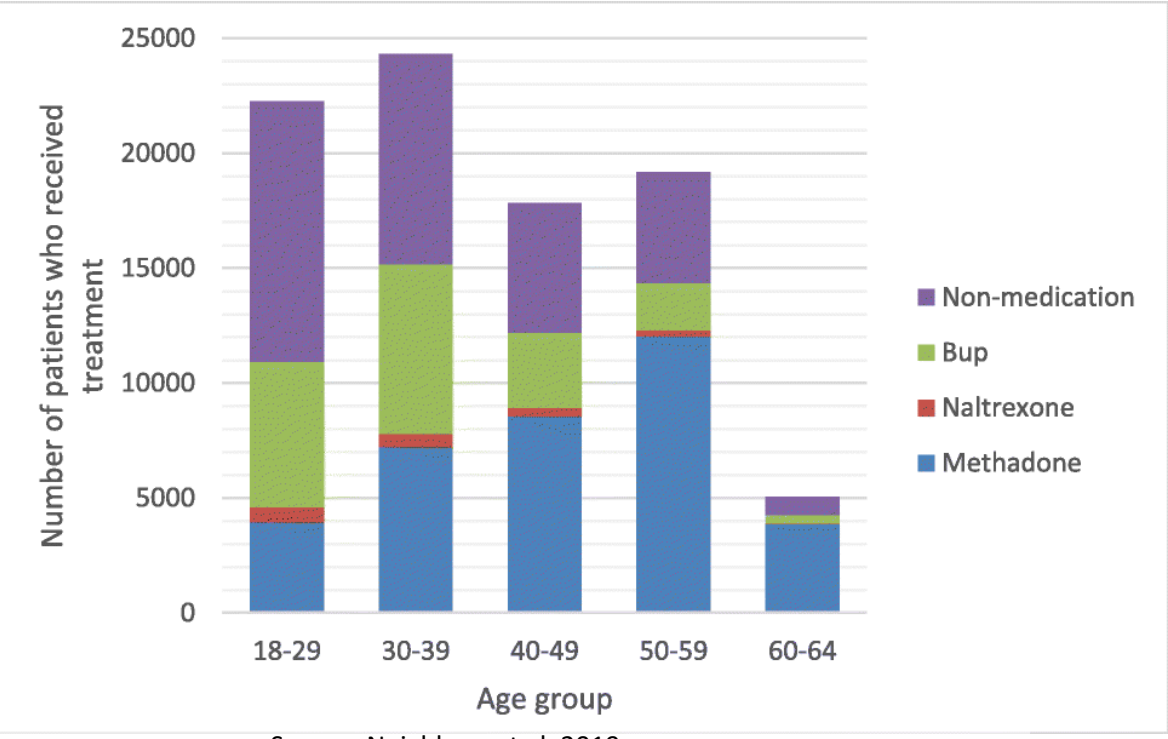


National Survey on Drug Use and Health, 2019

Youth are Much Less Likely to Receive Gold Standard Treatment for OUD

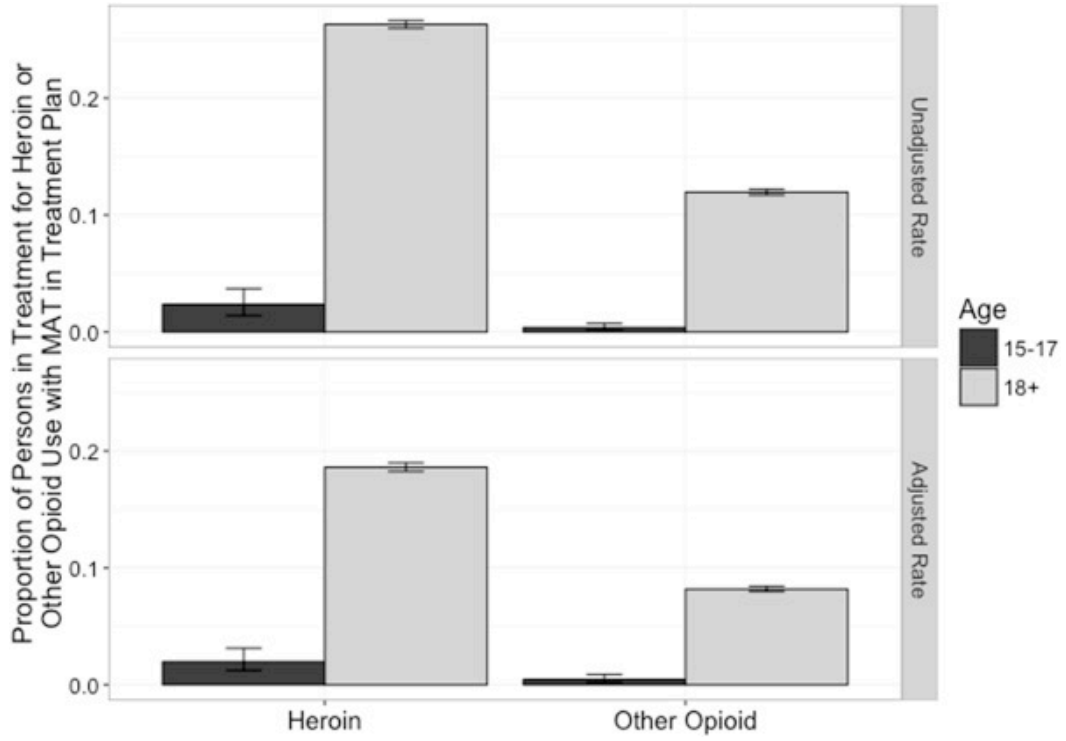
- Rates of opioid overdose deaths in teens tripled from 1999-2016
- Buprenorphine is FDA approved for ages 16+
- 26% of adults with heroin use disorder get MAT vs. <2.4% of Teens

Opioid use disorder (OUD) medication treatment types among OUD patients by age distribution



Source: Neighbors et al, 2019

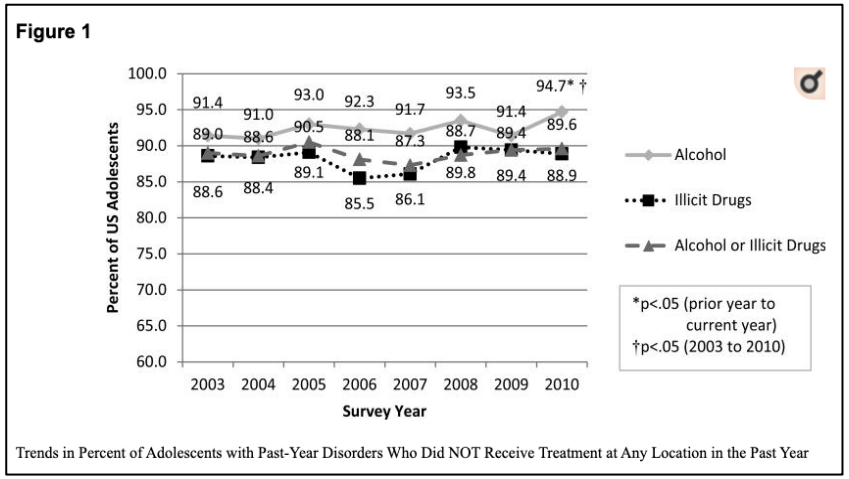
Use of MAT among persons in treatment for heroin and opioid use by age, 2013



Source: Feder et al, 2017

Critical Shortages in Youth Addiction Treatment

Of the 1.7 million teens with SUD, **90-95%** receive **no treatment**

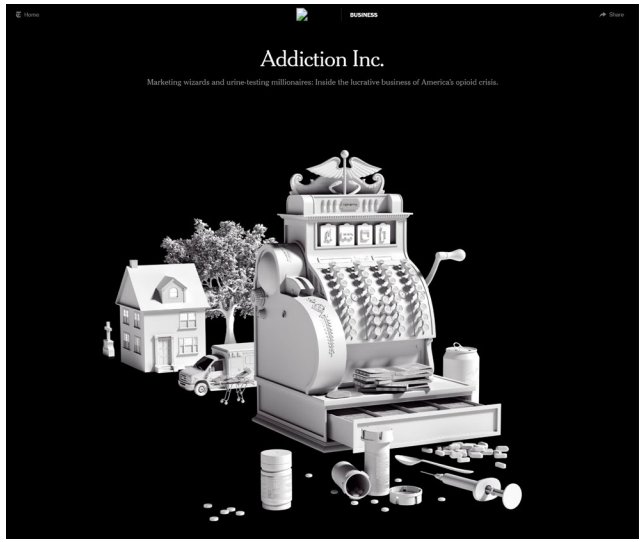


Program Availability:

- In any year between 2003 and 2010, **less than 36%** of addiction treatment programs in the U.S. offered services to adolescents, and the number of programs offering services to adolescents actually declined during that time period
- Adult addiction treatment programs often don't take into account the unique needs of adolescents and young adults
- Services offered at addiction treatment programs, esp youth programs, are often inconsistent and not necessarily evidence-based.

Mericle, 2015

We Know What Works But Fail to Act: Misinformation and Stigma



Many physicians do not think that treating this disorder with medication is any more effective than treatment without it, despite ample evidence that buprenorphine and methadone are highly effective and save lives.

Recent survey found 24% of emergency, family, and internal medicine providers believed that their practices would attract undesirable patients if they treated individuals with opioid use disorder.

- 1/2 of youth and parents perceive addiction it as a "behavioral" problem
- Less than 1/3 perceive addiction as a mental or physical disorder

-*CASA, annual report*

Half of trainee physicians (51 %) expressed interest in treating patients with OUD compared to 20 % of attending physicians.

Addiction Prevention & Treatment: The Crucial Role of the Pediatrician

↓ Stigma

- "Treating addiction in the primary care setting allows families to avoid the stigma and inconvenience they sometimes experience in a specialized drug treatment setting."- Dr. Hadland

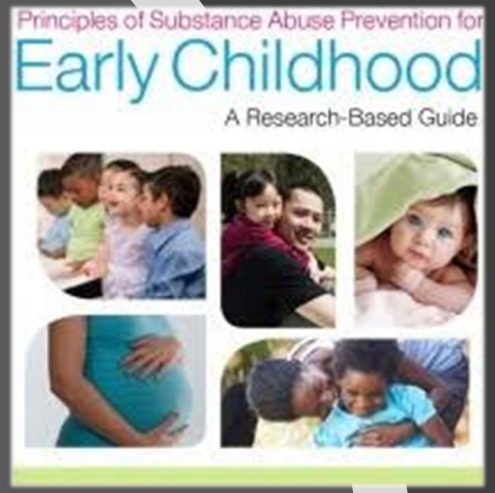
↑ Access to Care

- "Many clinicians automatically think about referring to a residential treatment program. Some kids will need this level of care, but most could do well with outpatient treatment," -Dr. Levy.
- "In our experience, many kids are "treatment seeking" but they don't know where to go to help," says Dr. Levy.

Disseminate Knowledge

- Many evidence- based resources online for parents & youth
- A growing number of free, high quality educational resources for physicians to expand knowledge and skill

Addiction is a Developmental Disorder



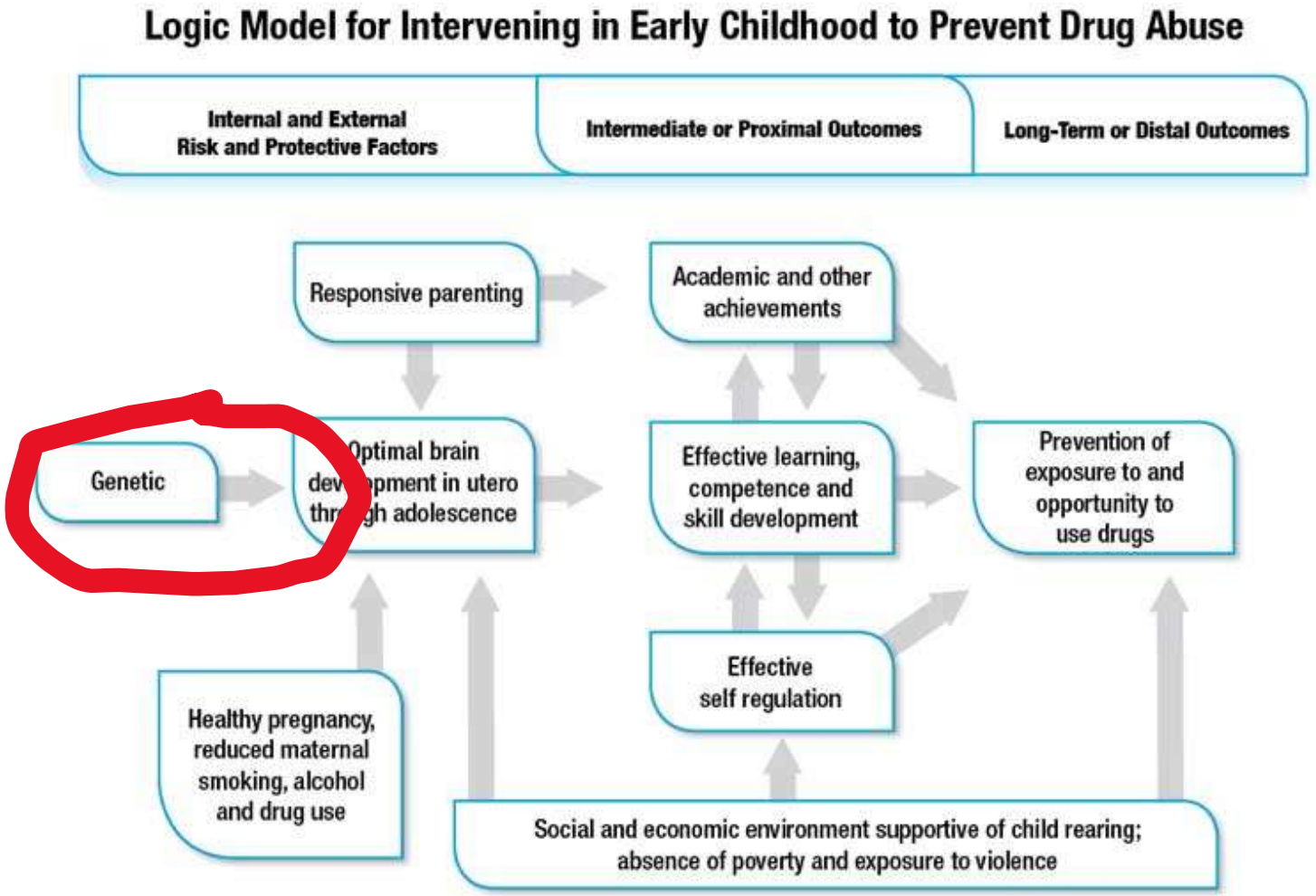
Distinct SUD Risk Factors at Each Developmental Stage

Distinct Intervention Possibilities at Various Points of Development

pre-conception in-utero infancy childhood adolescence young adulthood

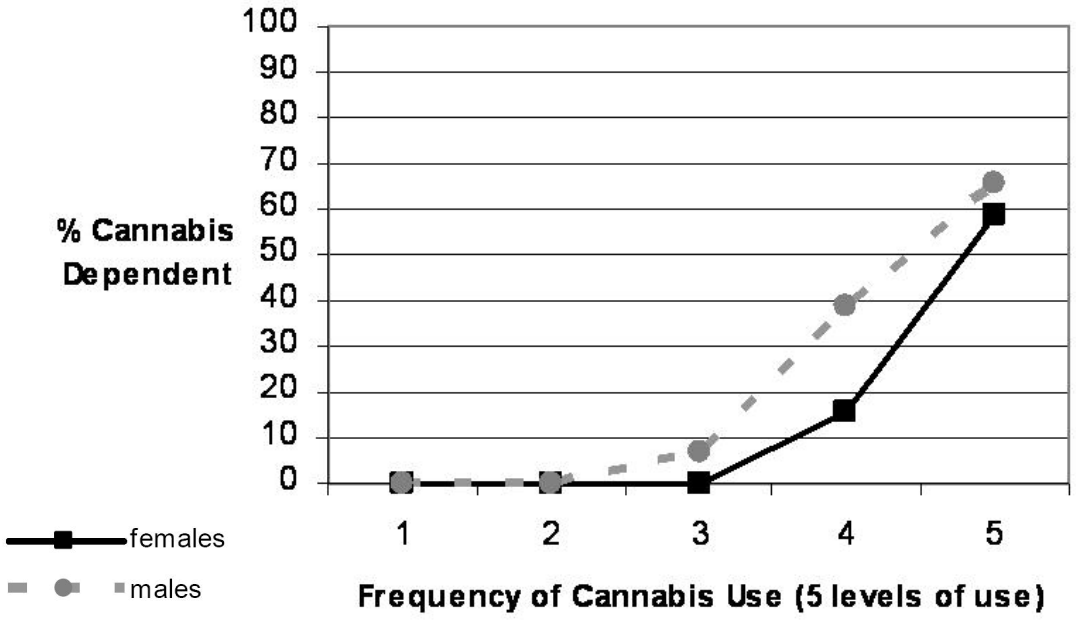
SUDs Arise Through a Combination of Environmental and Biological Determinants

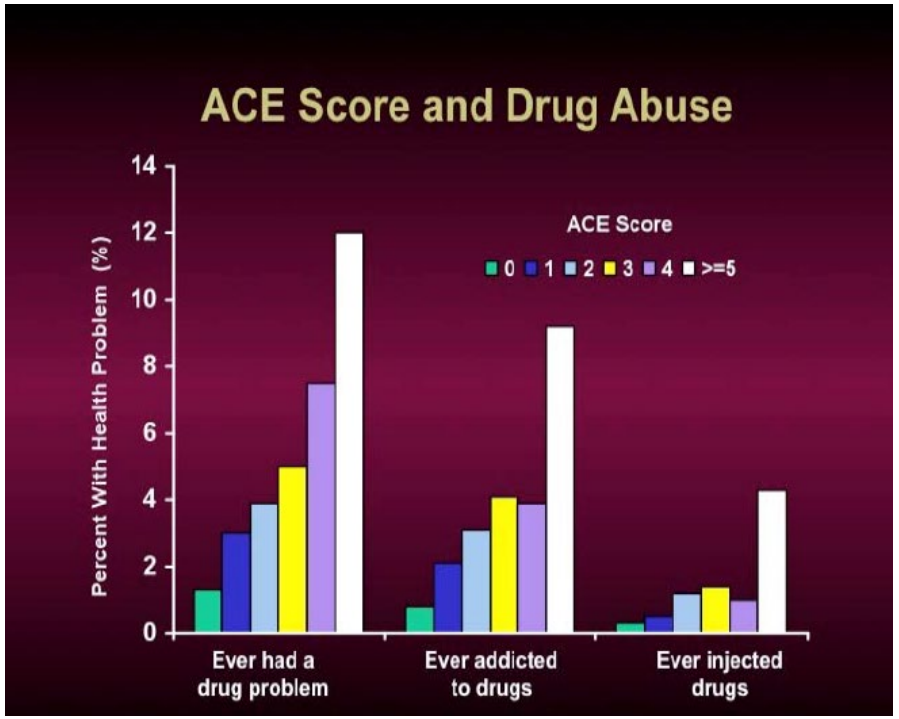
Addiction is a preventable and treatable condition involving changes to circuits involved in reward, stress, and self-control. Genetics, drug exposures, and environmental exposures contribute to the propensity to develop addiction



SUDs Arise Through a Combination of Environmental and Biological Determinants

Rates of Cannabis Dependence Across Varying Use by Sex





Interventions that Target Factors Other than SU are Supported by Neuroscience Research

Abnormal Organization of Inhibitory Control Functional Networks in Future Binge Drinkers.

Authors

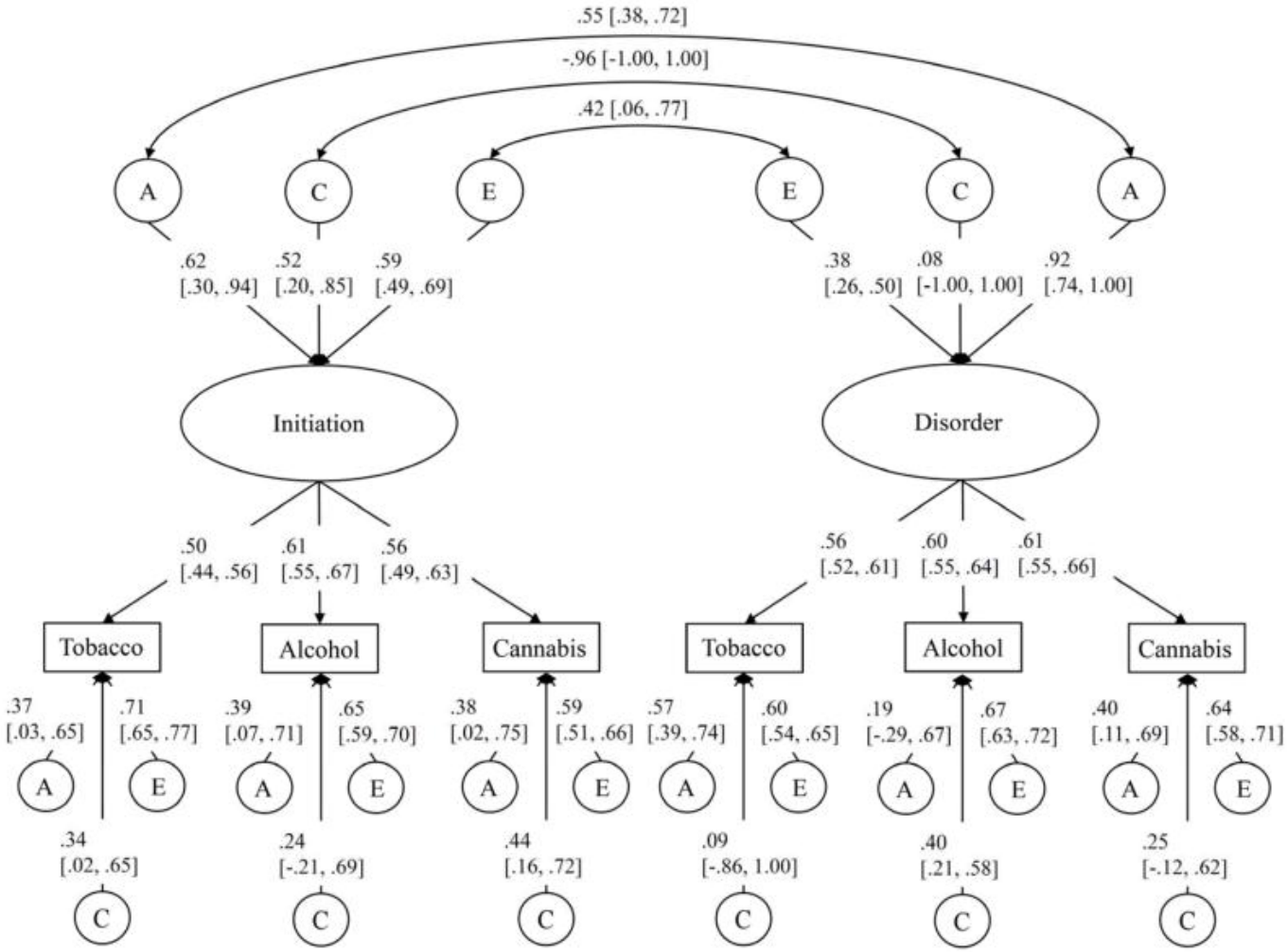
Luis F. Antón-Toro* [1, 2], Ricardo Bruña* [1, 2, 3], Isabel Suárez-Méndez [1, 2, 5], Ángeles Correas [2, 6], Luis M. García-Moreno [4], Fernando Maestú [1, 2, 3]

"For the first time, abnormalities in MEG functional networks and higher dysexecutive and impulsivity profiles were detected in alcohol-naïve adolescents who two years later became binge drinkers. **Conclusions**: These findings strongly support the idea of early neurobiological vulnerabilities for substances consumption initiation, with inhibitory functional networks' abnormalities as a relevant neurophysiological marker of subjects at risk— we hypothesize this profile is due to neurodevelopmental and neurobiological differences involving cognitive control networks and neurotransmission pathways."

Early Initiation of SU is a Marker of an At-Risk Group, Above and Beyond Direct Effects of SU

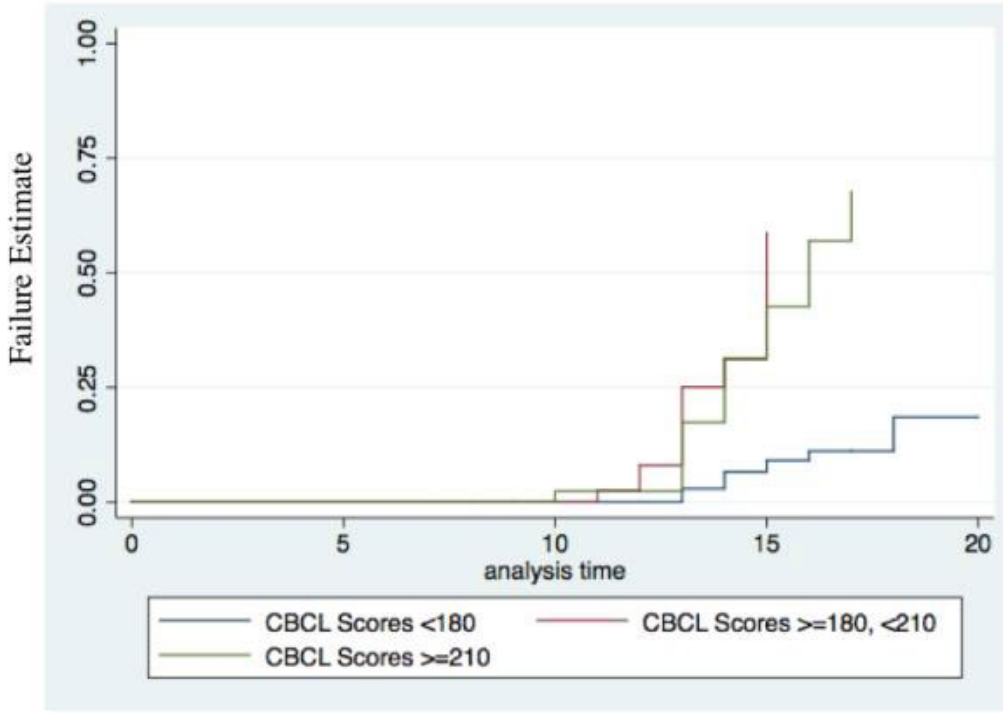
Source: Richmond-Rakerd et al, 2016

A=additive genetic, C=shared environment, E=unique environment.



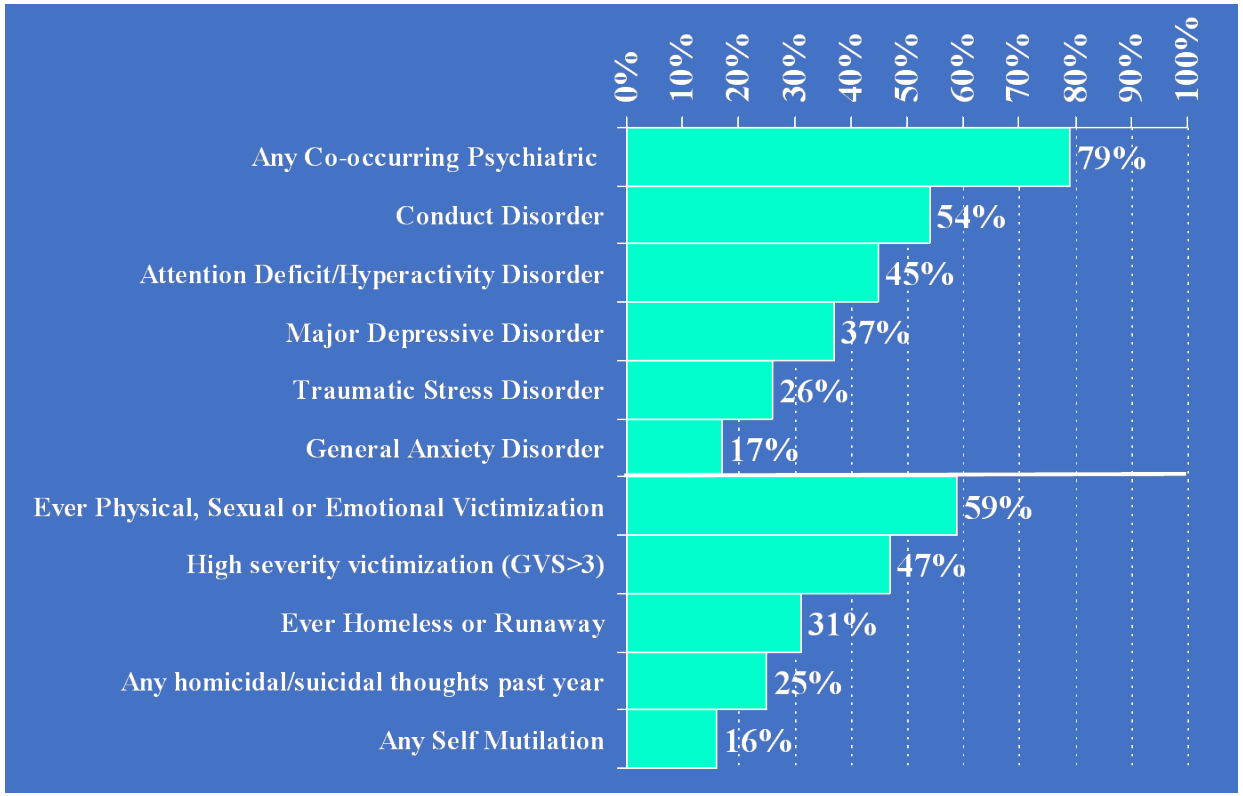
Emotional Dysregulation as a Core Risk Factor for SUD

Kaplan Meier Curve of Any Substance Use Disorders



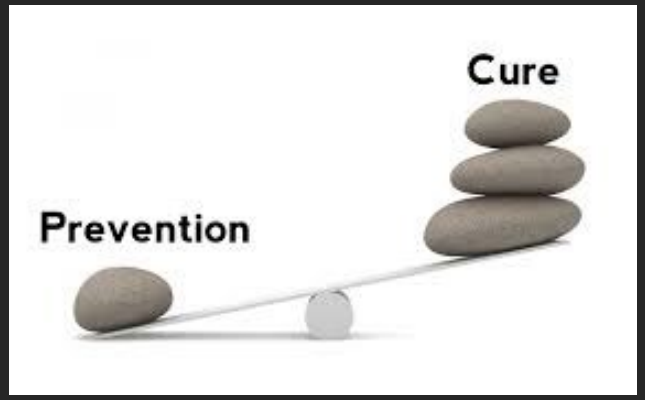
Source: Wilens et al. Drug Alcohol Dependence. 2013

Adolescents Presenting for SUD Treatment With:



Source: SAMHSA. 2013

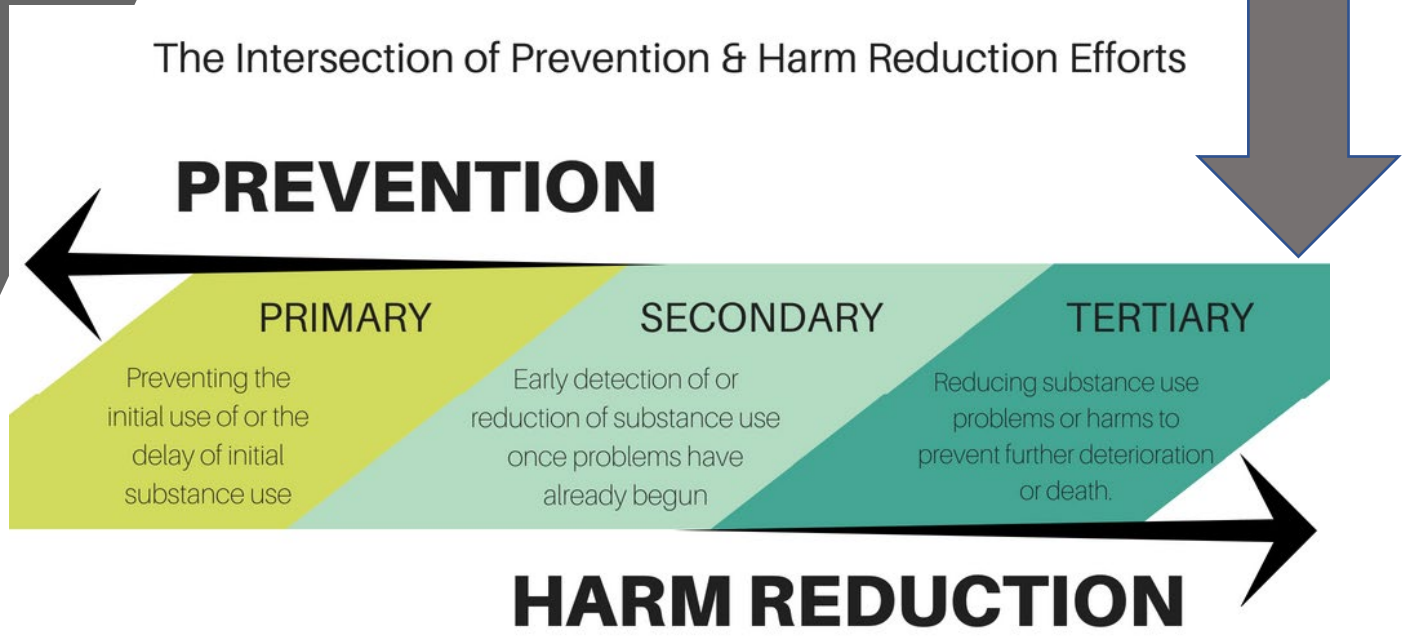
Prevention Markedly Reduces Disease Burden



Successful treatment of childhood and early adolescent MDD, bipolar disorder, & ADHD has been shown to reduce the risk of later SUD

Approaches that focus on enhancing emotional regulation, interpersonal skills, and quality of parent-child interaction have been shown to be much more effective

Most Medical Care and Interventions Occur Here



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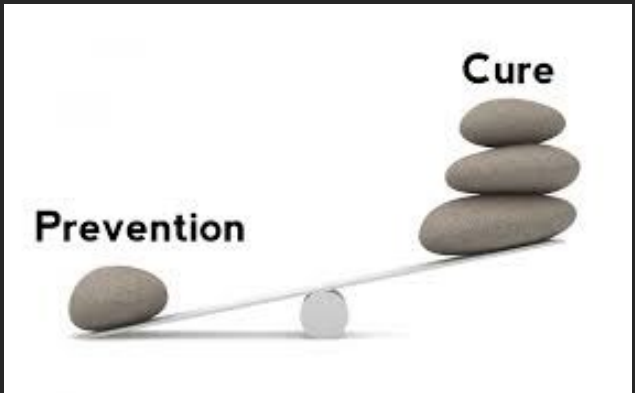

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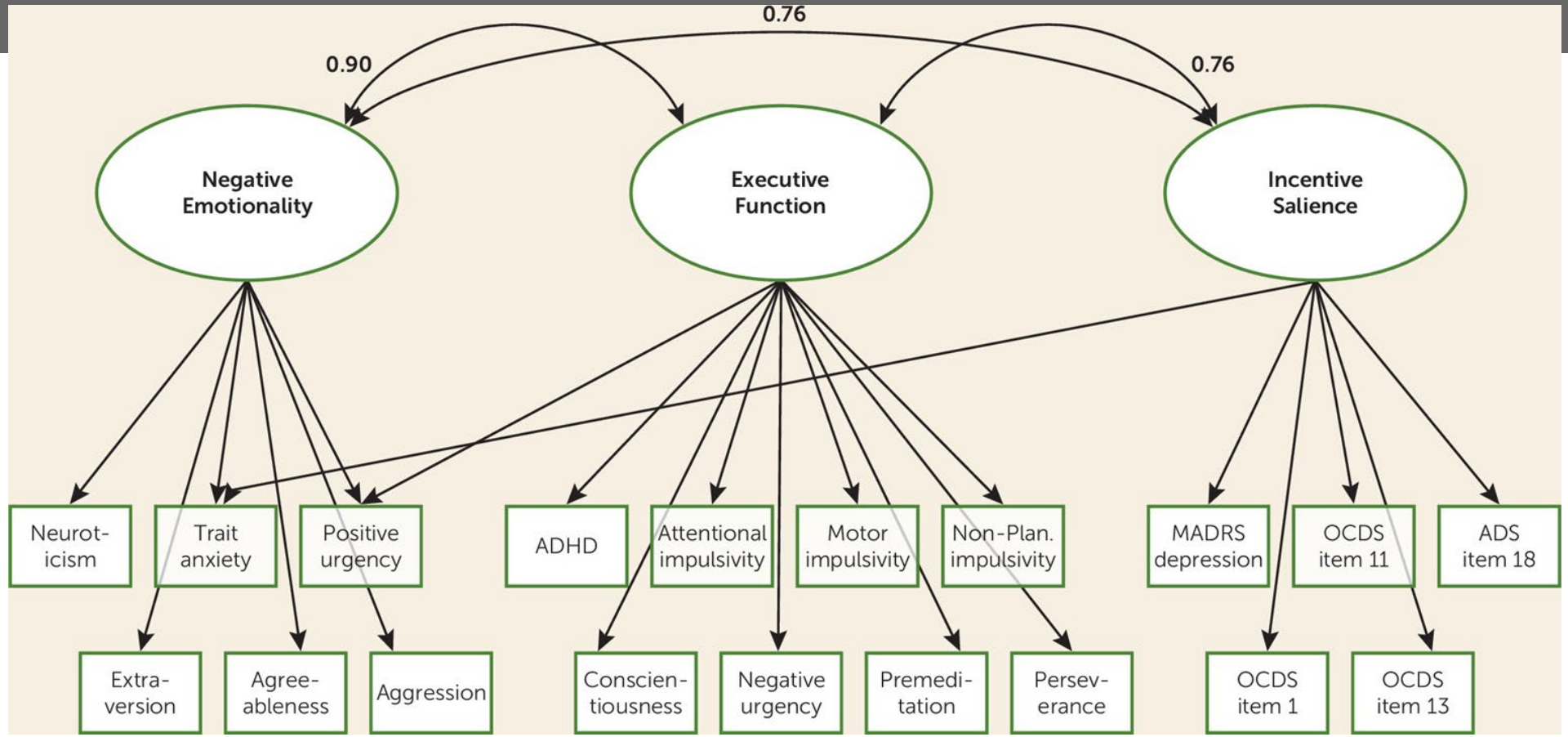
Most Medical Care and Interventions Occur Here

Institute of Medicine: “Unleashing the power of prevention is a call to action that our nation can’t afford to miss. Behavioral health problems now surpass communicable diseases as the country’s most pressing concern. Prevention is the best investment we can make, and the time to make it is now.”

The Neurofunctional Domains of SUD

1. All adolescents have developmentally normal vulnerabilities in these domains
2. Genetic and environmental factors can increase vulnerability
3. These domains represent prevention and treatment targets



Sources: Casey et al 2008, Gree et al, 2013 and Romeo et al, 2013

The Neurofunctional Domains of SUD

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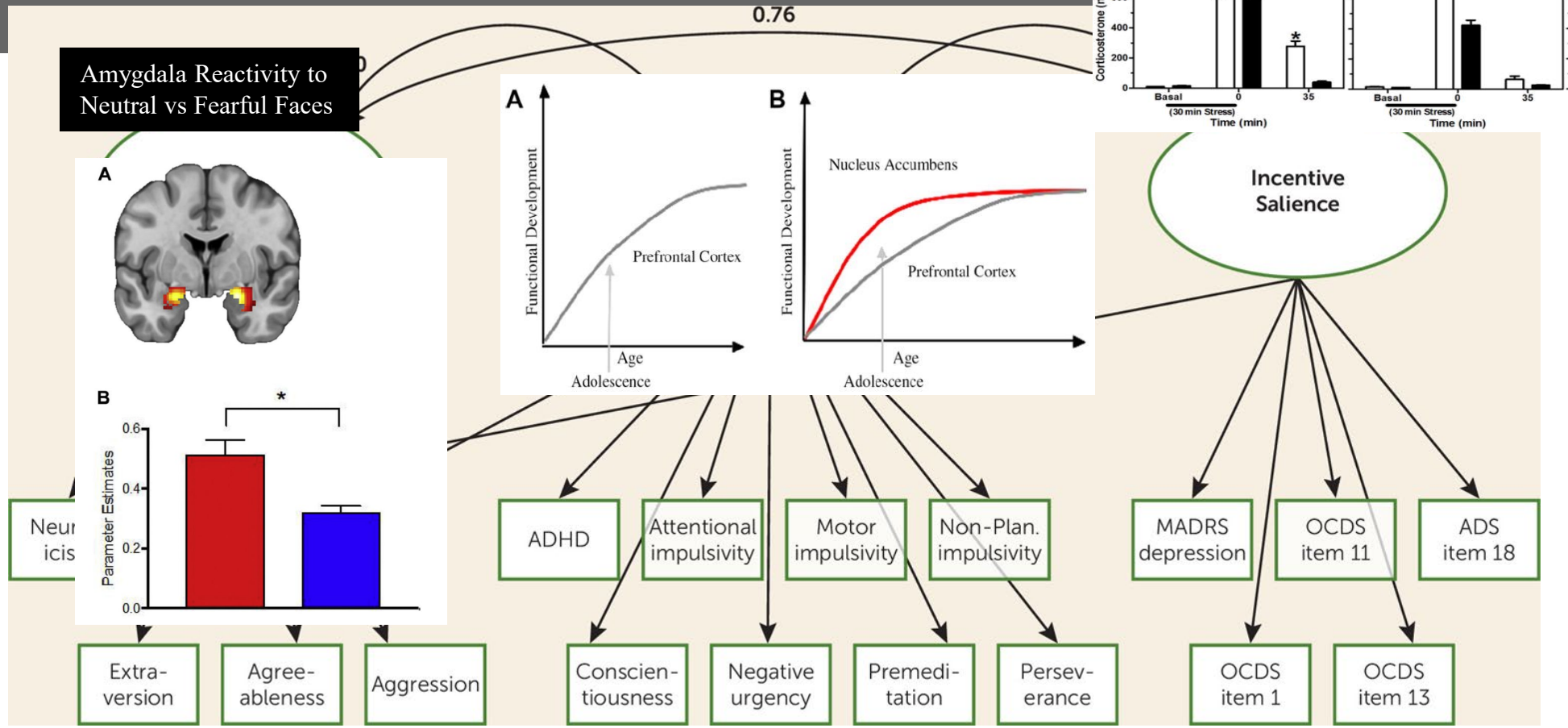
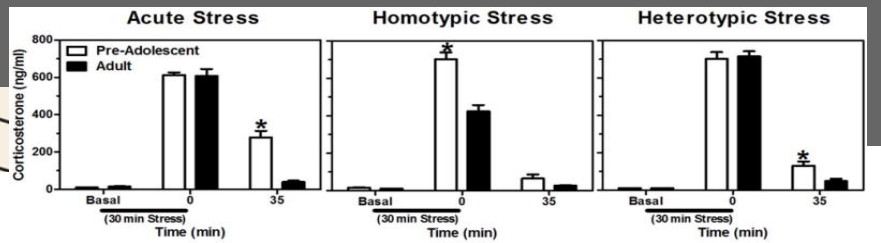




Sources: Casey et al 2008, Gree et al, 2013 and Romeo et al, 2013

U.S. Preventive Services TASK FORCE

"Screening should only be done when services for accurate diagnosis of unhealthy drug use or drug use disorders, effective treatment, and appropriate care can be offered or referred."

Screening for Unhealthy Drug Use in Adults and Adolescents

Unhealthy drug use can include illegal drugs, prescription medications, or household substances.

Population

Adults aged 18 years and older and adolescents aged 12 to 17 years who do not have a current diagnosis of any drug use disorders

USPSTF recommendation

B

The USPSTF recommends screening by asking questions about unhealthy drug use in adults age 18 years or older when services for accurate diagnosis, effective treatment, and appropriate care can be offered or referred.

I Statement

For adolescents, the USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of screening for unhealthy drug use.

SCREENING TOOLS

Adults 18+

Screening to Brief Intervention (S2BI)

Youth 12-17

Brief Screener for Tobacco, Alcohol, and other Drugs (BSTAD)

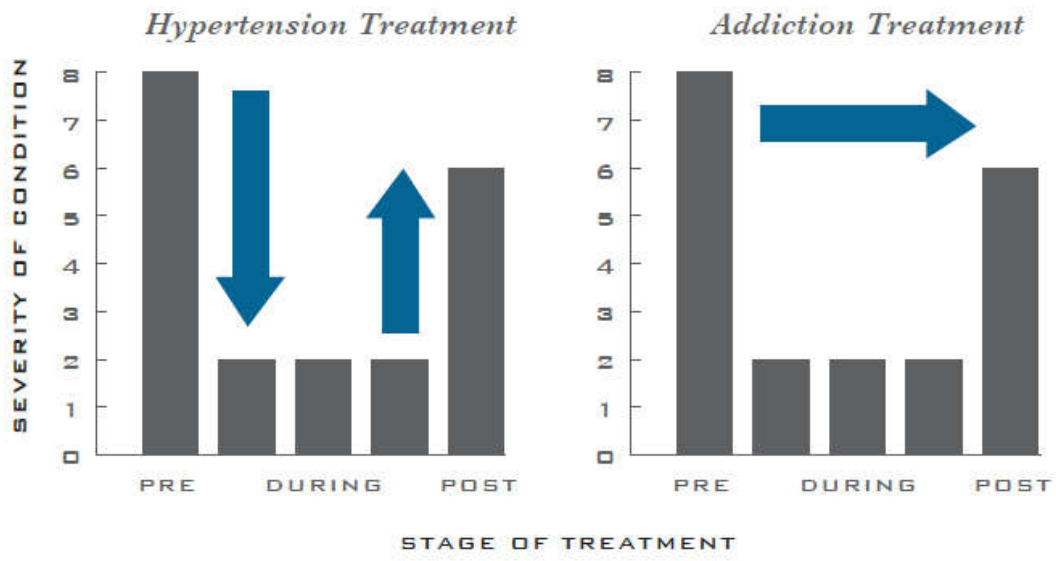
How Effective are Treatments for Youth with SUD?

- Continuing care associated with better outcomes
- High rates of relapse when treatment is stopped
- Integrated treatment of co-occurring psychiatric disorders associated with better outcomes

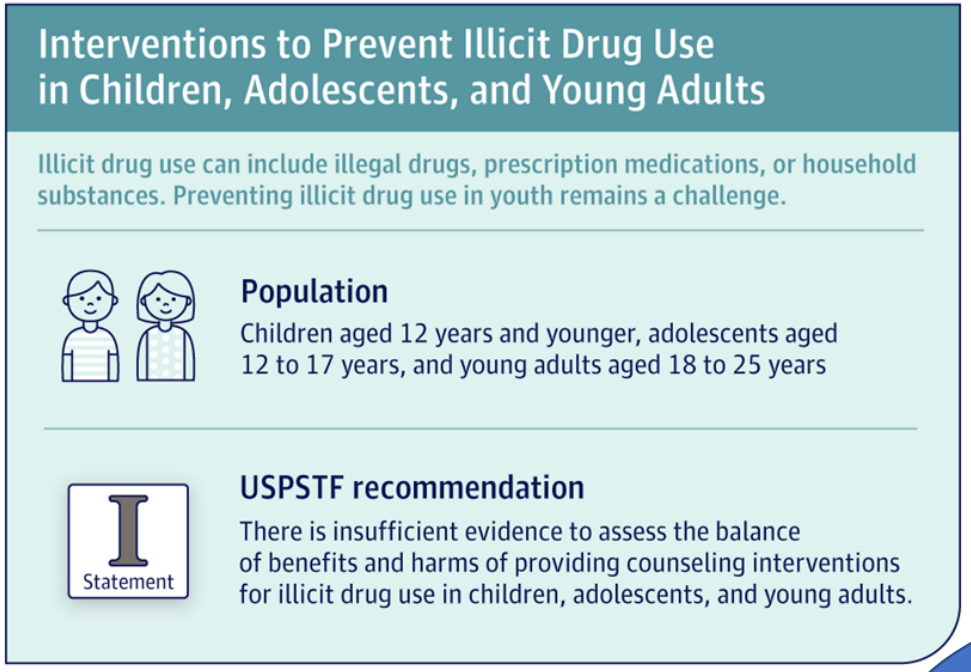
Adult SUD Outcomes ≈Youth Outcomes

≈ Chronic Illness Outcomes

-25-40% in recovery during treatment



Interventions for Youth SU in Primary Care



Several interventions such as the Familias Unidas program (a family-based intervention program focusing on Hispanic youth) and interventions that included clinician training, education, personal coaching, and continuous quality improvement components showed promise in reducing illicit drug use. More studies are needed that replicate and further refine these interventions.

Data suggest lower risk SU is more amendable to screening and BI in primary care settings, than higher risk SU

The use of MI reduces heavy alcohol use, alcohol use days, and SU-related problems in adolescents but does not reduce cannabis use days.

Source: Steele, et al , 2020 and O'Conner et al, 2020

Barriers to Effective Interventions in Primary Care

Time constraints and other treatment priorities

Perceived lack of effectiveness of interventions & stigma

Lack of training in effective intervention techniques, such as motivational interviewing.

Outdated or rigid recommendations (12 step as the only way)

Very few programs endorse use of anti-relapse medications

Iatrogenic effects:

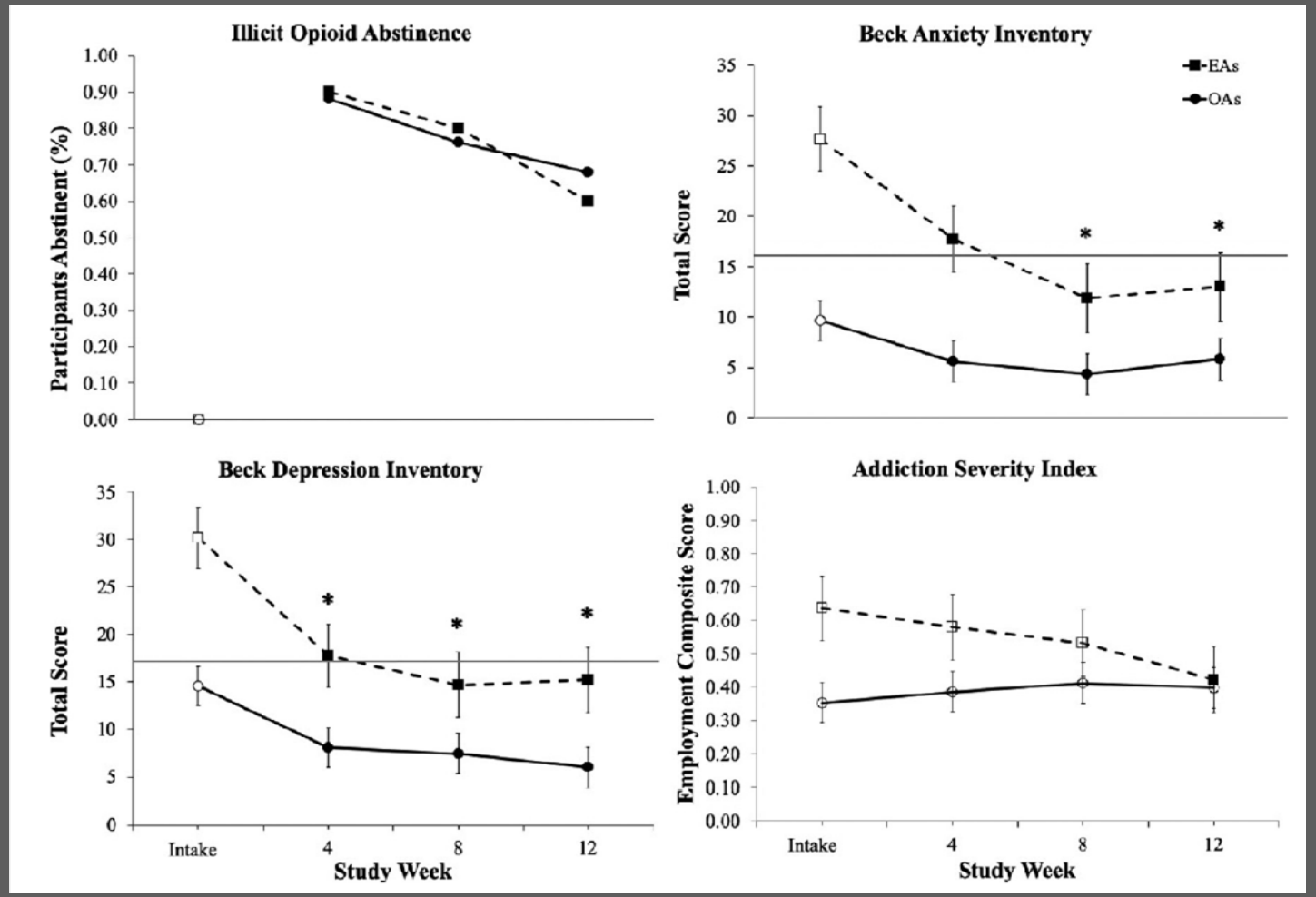
Frost *et al*. found that receipt of a brief intervention in primary care was not only ineffective, but decreased receipt of specialty substance use treatment

EA MAT Outcomes in Primary Care= Older Adult MAT Outcomes in Primary Care

35 emerging adult (EA) vs older adult (OA) on waitlist for comprehensive OUD tx program, received 12 weeks of interim buprenorphine maintenance with bi-monthly clinic visits and technology-assisted monitoring.

- At intake, EAs had more past-year IVDU & greater legal & psychiatric severity ≠
- EA = OA OUD outcomes
- Psychiatric disorder severity @ intake OUD outcomes
- EAs had greater decreases in anxiety and depression scores than older adults

Changes over time : Emerging Adults (EA) and Older Adults (OA)



Source: Peck et al, Drug and Alcohol Dependence, 2020

NOT SO BRIEF INTERVENTIONS IN YOUTH

- Longer term treatment is more effective than short-term, or high intensity treatment
- Interventions that are diverse and combine multiple intervention components and have been shown to reduce alcohol and drug use
- Family-based approaches are the gold standard, but providers may be unfamiliar or uncomfortable with this model of are

Evidence Based Treatments for Youth SUD

Therapy: CBT, MI, ACRA, and **MDFT**

Multimodal approaches are optimal

Lifestyle & Behavioral Approaches: **exercise,** Contingency Management, Mind-body approaches, employment, CRA

Medications: 1) reduce craving & relapse;

2) treat withdrawal symptoms

Peer support: Recovery Groups, Recovery High Schools and Colleges

Evidence Based Medications for Youth SUD

Medication	Number of Studies and Participants	SUD Indication	Safety/Tolerability	SUD Outcomes
Nicotine Replacement Therapy	3 (total *N*=517)	Tobacco use disorder	Positive	Mixed (most positive for patch)
Bupropion SR	3 (*N*=659)		Positive	Positive at 300mg
Varenicline	3 (*N*=493)		Positive	Mixed
Cyanimide	1 (*N*=26)	Alcohol use disorder	Positive	Positive
Disulfiram	1 (*N*=26)		Positive	Positive
Naltrexone	1 (*N*=156)		Positive	Mixed
Buprenorphine (Buprenorphine/Naloxone)	2 (*N*=188)	Opioid use disorder	Positive	Positive
N-Acetylcysteine	1 (*N*=116)	Cannabis use disorder	Positive	Positive
Topiramate	1 (*N*=66)		Negative	Mixed

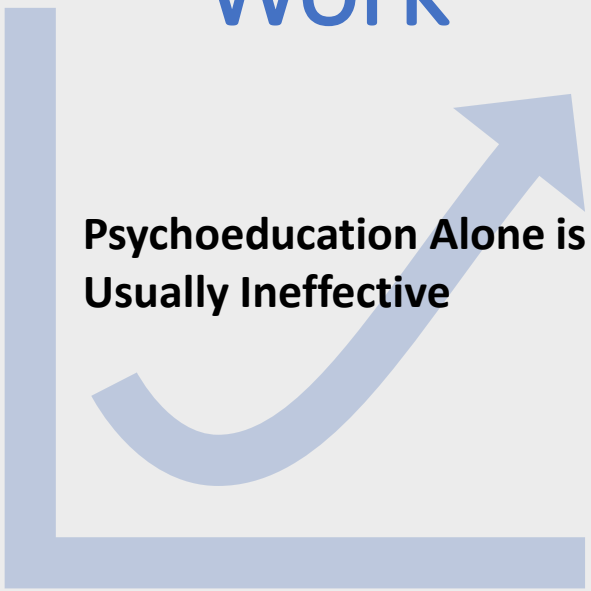
Family Based Treatment is The Most Effective Form of Non-Medication Treatment for Youth SUD

Improved youth engagement & retention

Improved youth SUD outcomes

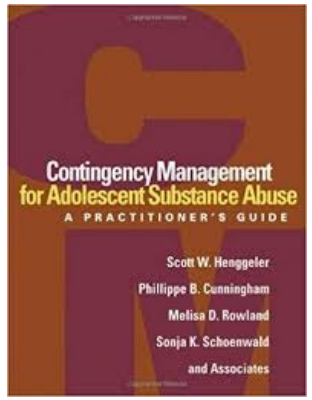
Evidence-based family treatments:
MDFT, MST, ACRA, CRAFT, & others

Mechanisms of Change: What Makes Youth SUD Treatment Work



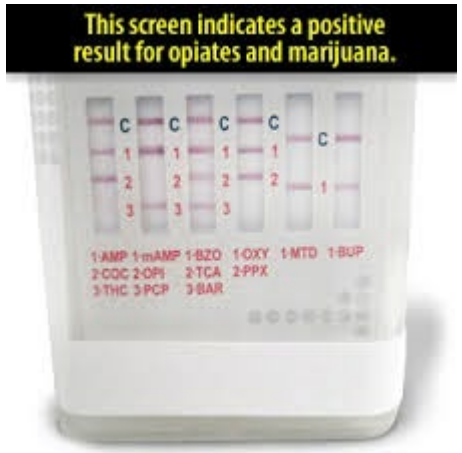
- Don’t ask the patient to change before they are ready to do so
- Higher commitment to abstinence during treatment → better outcomes.
- MI: approaches that enhance internal motivation as opposed to using extrinsic forces are most effective.
- Coercive or fear-based approaches rarely work and may increase long-term SU (youth data specifically)

Drug Tests: Monitoring Safety and Treatment Respon



Goal:
1. Monitor response to treatment and adapt tx plan as needed

2. Reward for non-drug use



Patient and Parent Contracting

CONSIDER REFERRAL TO SPECIALIZED CARE WHEN:

- A brief intervention appears to be insufficient & SUD or functioning is worsening treatment.
- The patient has a severe, or treatment-resistant, comorbid psychiatric disorder
- Pharmacological treatment are indicated but are beyond the scope of your practice
- Youth is refusing treatment or is minimally engaging in tx, and you or parents are leaning not sure how to avoid more coercive measures
- The parents are not actively involved in the treatment and efforts to engage them have failed

What (Usually) Doesn't Work

- Tough love or punishment
- Scare tactics, D.A.R.E.
- Short term, high intensity treatment ("rehab")
- One size fits all care (pt forced to do all components of treatment)
- Treatment that focuses only on the drug use

How Do I Know if My Patient is Getting Better?
Defining Meaningful Outcomes

- The most important goal, initially, is **treatment engagement and retention**

- Ask yourself, is the patient doing better than before?
  - -Don't look only at drug use, but **overall functioning and impairment**

- Many teens won't achieve total and continuous abstinence
  - -Ongoing use is common and doesn't automatically signal treatment failure
  - -Relapse is a signal to adjust treatment approach, not terminate care

- What works in the short-term may not be effective over the long-term
  - -Most longer-term (>1 yr) outcome studies in youth are equivocal, except with highest quality tx
  - -Evidence of iatrogenic harm from low quality treatment, risk greater with youth than adults