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Block 4:
Treatment – Beginning to Explore the Many Facets of Treatment

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DayOne

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Opioid Response Network

Department of Health and Human Services

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Disclosure

Today's speakers have no relevant financial relationships with the manufacturer(s) of any commercial product(s) and/or provider of commercial services discussed in this CME activity

Presenters

Kevin M. Simon, MD
Chief Behavioral Health Officer, *City of Boston*
Child, Adolescent, and Adult Psychiatrist & Addiction Medicine Specialist, *Boston Children's Hospital*

Dr. Kevin Simon was appointed the first Chief Behavioral Health Officer for the City of Boston. In addition, he is an Attending Psychiatrist at Boston Children's Hospital, an Instructor in Psychiatry at Harvard Medical School, a Commonwealth Fund Fellow in Health Policy at Harvard University, and a Medical Director of Wayside Youth & Family Support Network. Dr. Simon practices as a Pediatric & Adult Psychiatrist and Addiction Medicine specialist through the Adolescent Substance use & Addiction Program at Boston Children's Hospital.

Adolescent OUD/SUD & Co-Occurring Mental Illness

March 16, 2023

Kevin M. Simon, M.D.

Child, Adolescent, and Adult Psychiatrist & Addiction Medicine Specialist

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Instructor of Psychiatry, Harvard Medical School

Attending Psychiatrist, Boston Children's Hospital

Boston Children's Hospital Adolescent Substance Use & Addiction Program

Boston Children's Hospital

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Opioid Response Network

Working with communities.

- The SAMHSA-funded *Opioid Response Network (ORN)* assists states, organizations and individuals by providing the resources and technical assistance they need locally to address the opioid crisis and stimulant use.

- Technical assistance is available to support the evidence-based prevention, treatment and recovery of opioid use disorders and stimulant use disorders.

Funding for this initiative was made possible (in part) by grant no. 1H79TI083343 from SAMHSA. The views expressed in written conference materials or publications and by speakers and moderators do not necessarily reflect the official policies of the Department of Health and Human Services; nor does mention of trade names, commercial practices, or organizations imply endorsement by the U.S. Government.

Working with communities.

- The *Opioid Response Network (ORN)* provides local, experienced consultants in prevention, treatment, and recovery to communities and organizations to help address this opioid crisis and stimulant use.
- *ORN* accepts requests for education and training.
- Each state/territory has a designated team led by a regional Technology Transfer Specialist (TTS), who is an expert in implementing evidence-based practices.

Contact the Opioid Response Network

- To ask questions or submit a request for technical assistance:
  - Visit www.OpioidResponseNetwork.org
  - Email orn@aaap.org
  - Call 401-270-5900

Disclosures

- City of Boston
- Boston Children's Hospital
- National Institute of Drug Abuse

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Learning Objectives

- Describe the adolescent brain development, the chronic disease model of mental illness & SUD, and the impact of substances on the brain.
- Explain the laws and best practices regarding incorporating confidential conversations and confidential documentation of adolescent substance abuse and the boundaries of confidentiality in medical care.
- Review evidence of pharmacologic treatment of adolescent substance use disorder.

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Adolescent Neurodevelopment

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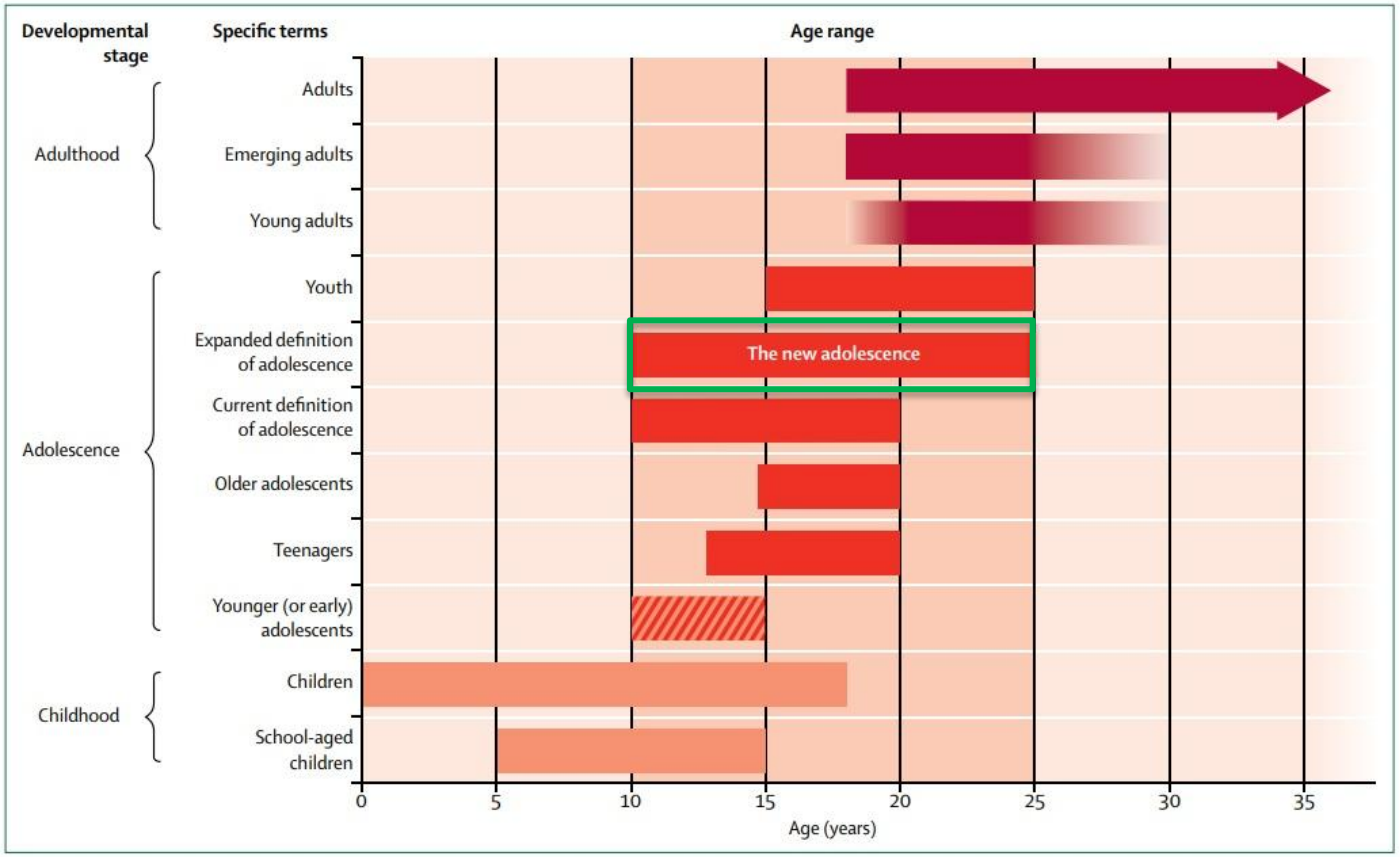
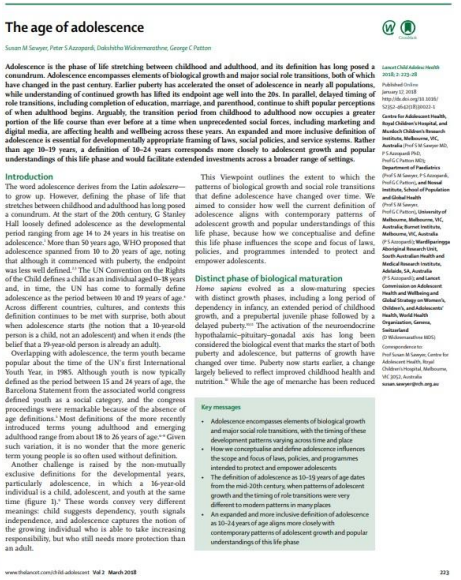
Adolescence





The age of adolescence

Susan M Sawyer, Peter S Azzopardi, Dakshitha Wickremarathne, George C Patton

Adolescence is the phase of life stretching between childhood and adulthood, and its definition has long posed a conundrum. Adolescence encompasses elements of biological growth and major social role transitions, both of which have changed in the past century. Earlier puberty has accelerated the onset of adolescence in nearly all populations, while understanding of continued growth has lifted its endpoint age well into the 20s. In parallel, delayed timing of role transitions, including completion of education, marriage, and parenthood, continue to shift popular perceptions of when adulthood begins. Arguably, the transition period from childhood to adulthood now occupies a greater portion of the life course than ever before at a time when unprecedented social forces, including marketing and digital media, are affecting health and wellbeing across these years. An expanded and more inclusive definition of adolescence is essential for developmentally appropriate framing of laws, social policies, and service systems. Rather than age 10–19 years, a definition of 10–24 years corresponds more closely to adolescent growth and popular understandings of this life phase and would facilitate extended investments across a broader range of settings.

Introduction

The word adolescence derives from the Latin adolescere—to grow up. However, defining the phase of life that stretches between childhood and adulthood has long posed a conundrum. At the start of the 20th century, G Stanley Hall loosely defined adolescence as the developmental period ranging from age 14 to 24 years in his treatise on adolescence.[1] More than 90 years ago, WHO proposed that adolescence spanned from 10 to 20 years of age, noting that although it commenced with puberty, the endpoint was less well defined.[2] The UN Convention on the Rights of the Child defines a child as an individual aged 0–18 years and, in time, the UN has come to formally define adolescence as the period between 10 and 19 years of age.[3] Across different countries, cultures, and contexts this definition continues to be met with surprise, both about when adolescence starts (the notion that a 10-year-old person is a child, not an adolescent) and when it ends (the belief that a 19-year-old person is already an adult).

Overlapping with adolescence, the term youth became popular about the time of the UN's first International Youth Year, in 1985. Although youth is now typically defined as the period between 15 and 24 years of age, the Barcelona Statement from the associated world congress defined youth as a social category, and the congress proceedings were remarkable because of the absence of age definitions.[4] Most definitions of the more recently introduced terms young adulthood and emerging adulthood range from about 18 to 26 years of age.[5,6] Given such variation, it is no wonder that the more generic term young people is so often used without definition.

Another challenge is raised by the non-mutually exclusive definitions for the developmental years, particularly adolescence, in which a 16-year-old individual is a child, adolescent, and youth at the same time (figure 1).[6] These words convey very different meanings: child suggests dependency, youth signals independence, and adolescence captures the notion of the growing individual who is able to take increasing responsibility, but who still needs more protection than an adult.

This Viewpoint outlines the extent to which the patterns of biological growth and social role transitions that define adolescence have changed over time. We aimed to consider how well the current definition of adolescence aligns with contemporary patterns of adolescent growth and popular understandings of this life phase, because how we conceptualise and define this life phase influences the scope and focus of laws, policies, and programmes intended to protect and empower adolescents.

Distinct phase of biological maturation

Homo sapiens evolved as a slow-maturing species with distinct growth phases, including a long period of dependency in infancy, an extended period of childhood growth, and a prepubertal juvenile phase followed by a delayed puberty.[7,8] The activation of the neuroendocrine hypothalamic–pituitary–gonadal axis has long been considered the biological event that marks the start of both puberty and adolescence, but patterns of growth have changed over time. Puberty now starts earlier, a change largely believed to reflect improved childhood health and nutrition.[9] While the age of menarche has been reduced

Key messages

- Adolescence encompasses elements of biological growth and major social role transitions, with the timing of these development patterns varying across time and place
- How we conceptualise and define adolescence influences the scope and focus of laws, policies, and programmes intended to protect and empower adolescents
- The definition of adolescence as 10–19 years of age dates from the mid-20th century, when patterns of adolescent growth and the timing of role transitions were very different to modern patterns in many places
- An expanded and more inclusive definition of adolescence as 10–24 years of age aligns more closely with contemporary patterns of adolescent growth and popular understandings of this life phase

Lancet Child Adolesc Health 2018; 2: 223–28

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Figure 1: **Commonly used age definitions of specific terms of relevance for adolescence that span or overlap with the developmental periods of childhood, adolescence, and adulthood**

Colour shading highlights variation in the lower and upper age limits of the term. Stripes denote a term that sits within more than one developmental stage.

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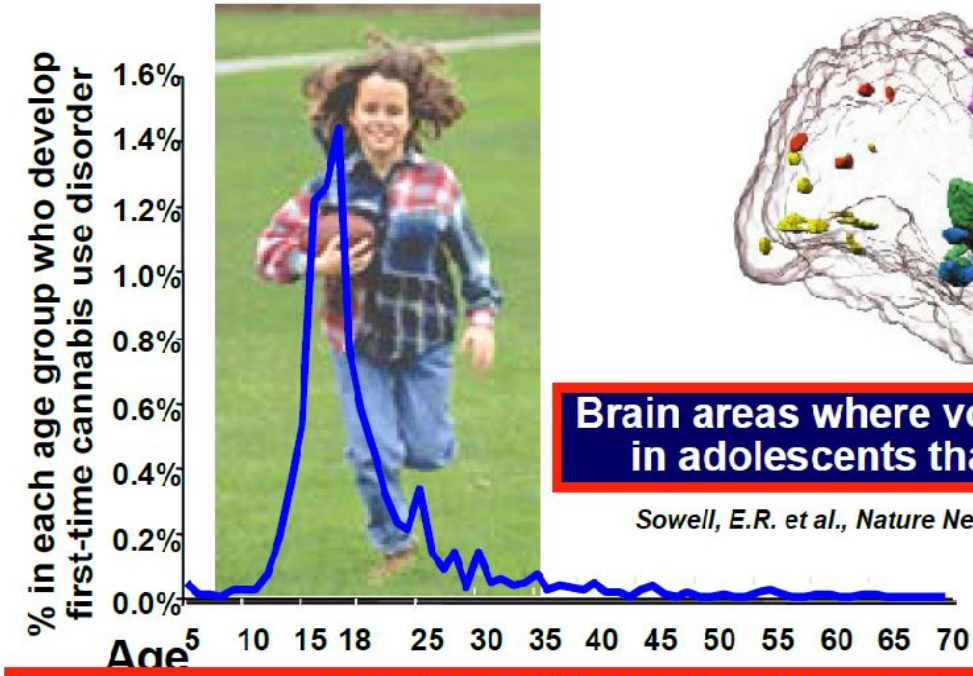
Addiction Begins in Adolescence

ADDICTION IS A DEVELOPMENTAL DISEASE
starts in adolescence and childhood



Brain areas where volumes are smaller in adolescents than young adults

Sowell, E.R. et al., Nature Neuroscience, 2, 859-861, 1999.

Age at cannabis use disorder as per DSM IV

NIAAA National Epidemiologic Survey on Alcohol and Related Conditions, 2003.

NIH

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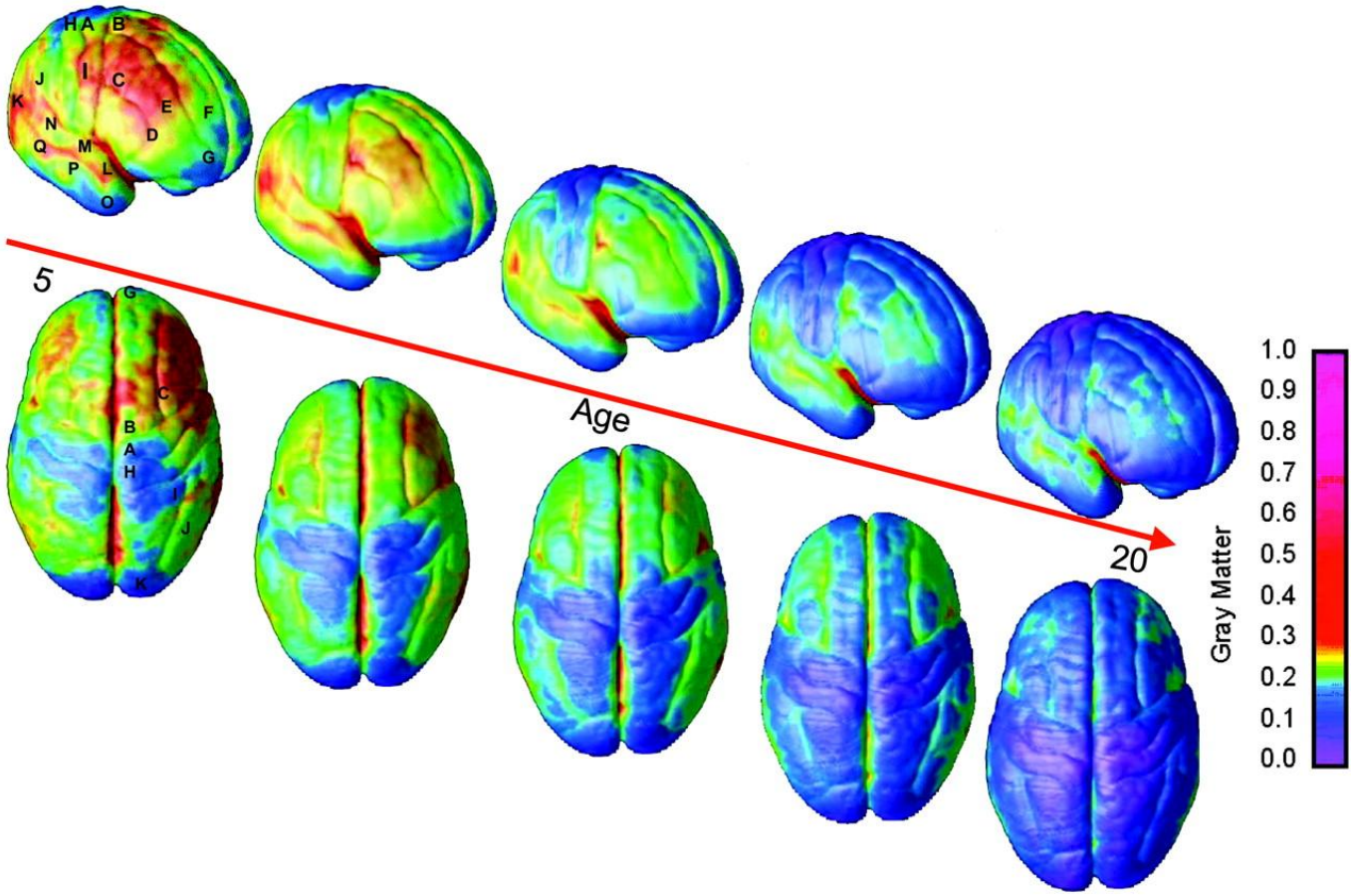
Brain Maturation



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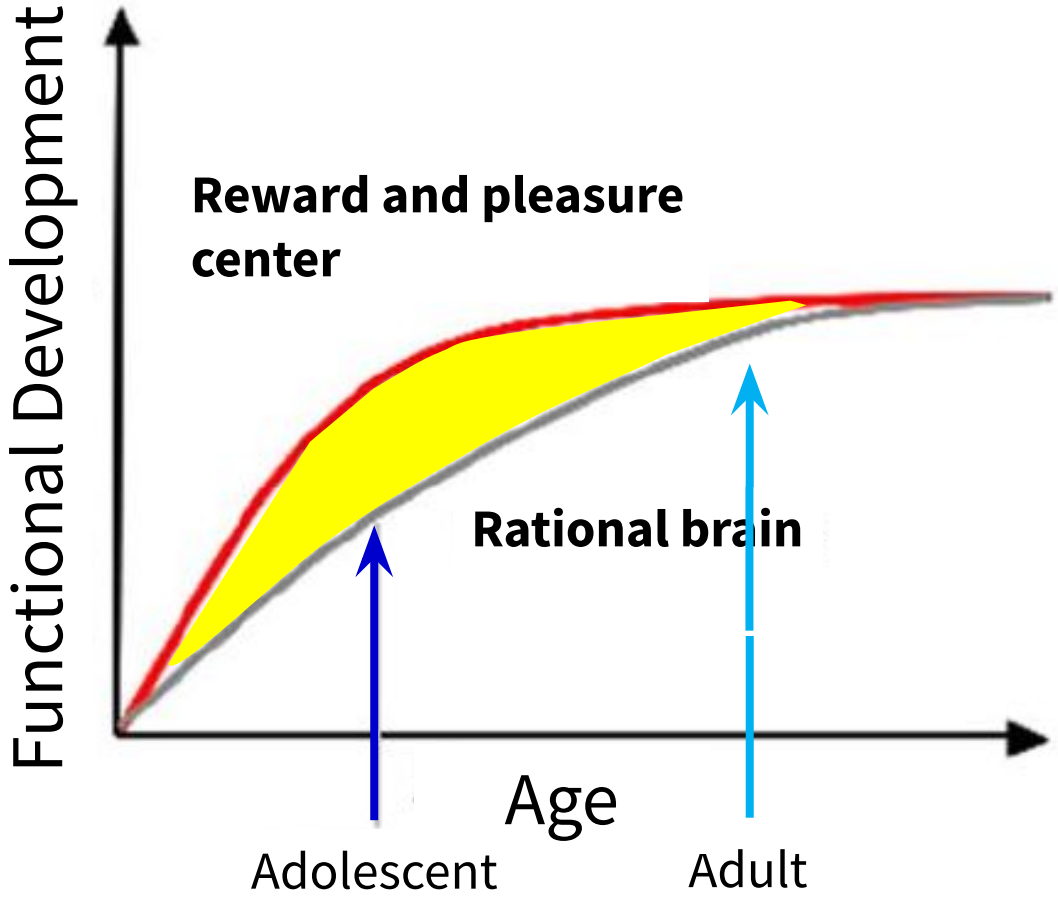
Rational Thinking Gap



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Neurobiology & Chronic Disease Model of SUD

Neurobiology of Addiction

The NEW ENGLAND JOURNAL of MEDICINE

REVIEW ARTICLE

Dan L. Longo, M.D., *Editor*

Neurobiologic Advances from the Brain Disease Model of Addiction

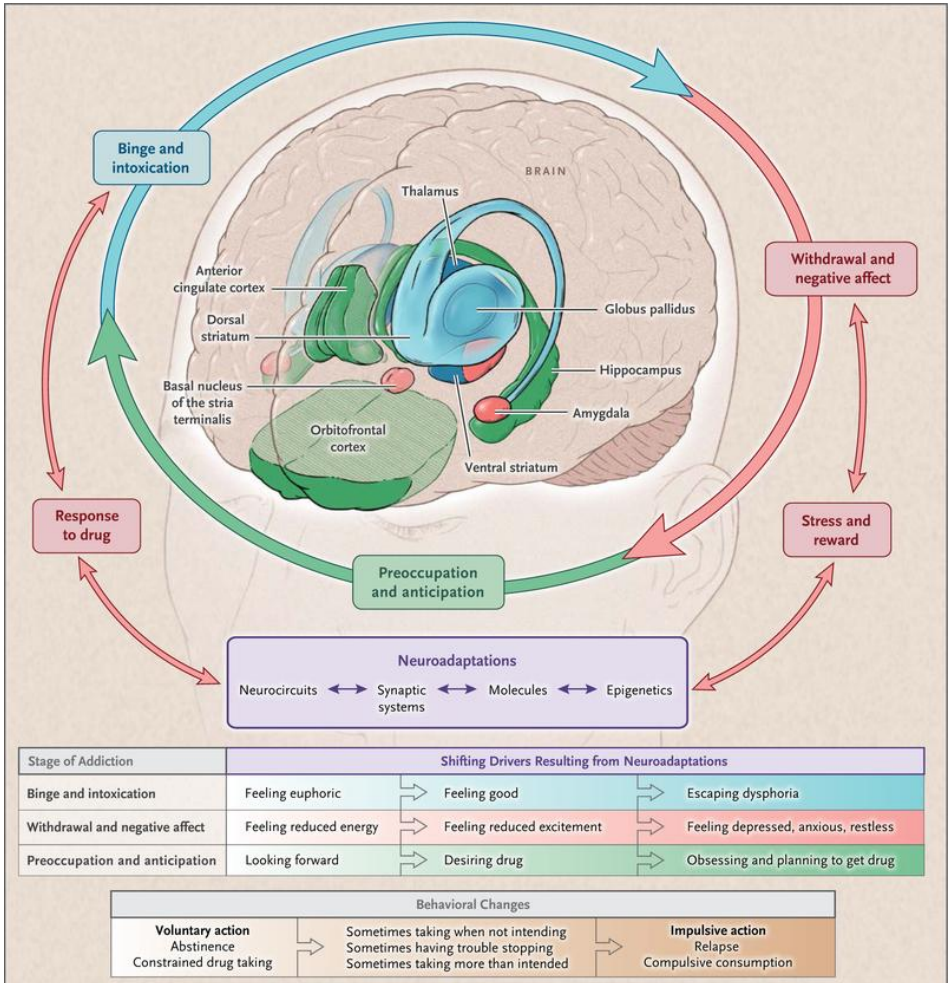
Nora D. Volkow, M.D., George F. Koob, Ph.D., and A. Thomas McLellan, Ph.D.

From the National Institute on Drug Abuse (N.D.V.) and the National Institute of Alcohol Abuse and Alcoholism (G.F.K.) — both in Bethesda, MD; and the Treatment Research Institute, Philadelphia (A.T.M.). Address reprint requests to Dr. Volkow at the National Institute on Drug Abuse, 6001 Executive Bld., Rm. 5274, Bethesda, MD 20892, or at nvolkow@nida.nih.gov.

N Engl J Med 2016;374:363-71.
DOI: 10.1056/NEJMra1511480

THIS ARTICLE REVIEWS SCIENTIFIC ADVANCES IN THE PREVENTION AND treatment of substance-use disorder and related developments in public policy. In the past two decades, research has increasingly supported the view that addiction is a disease of the brain. Although the brain disease model of addiction has yielded effective preventive measures, treatment interventions, and public health policies to address substance-use disorders, the underlying concept of substance abuse as a brain disease continues to be questioned, perhaps because the aberrant, impulsive, and compulsive behaviors that are characteristic of addiction have not been clearly tied to neurobiology. Here we review recent advances in the neurobiology of addiction to clarify the link between addiction and brain function and to broaden the understanding of addiction as a brain disease. We review findings on the desensitization of reward circuits, which dampens the ability to feel pleasure and the motivation to pursue everyday activities; the increasing strength of conditioned responses and stress reactivity, which results in increased cravings for alcohol and other drugs and negative emotions when these cravings are not sated; and the weakening of the brain regions involved in executive functions such as decision making, inhibitory control, and self-regulation that leads to repeated relapse. We also review the ways in which social environments, developmental stages, and genetics are intimately linked to and influence vulnerability and recovery. We conclude that neuroscience continues to support the brain disease model of addiction. Neuroscience research in this area not only offers new opportunities for the prevention and treatment of substance addictions and related behavioral addictions (e.g., to food, sex, and gambling) but may also improve our understanding of the fundamental biologic processes involved in voluntary behavioral control.

In the United States, 8 to 10% of people 12 years of age or older, or 20 to 22 million people, are addicted to alcohol or other drugs.[1] The abuse of tobacco, alcohol, and illicit drugs in the United States exacts more than $700 billion annually in costs related to crime, lost work productivity, and health care.[2-4] After centuries of efforts to reduce addiction and its related costs by punishing addictive behaviors failed to produce adequate results, recent basic and clinical research has provided clear evidence that addiction might be better considered and treated as an acquired disease of the brain (see Box 1 for definitions of substance-use disorder and addiction). Research guided by the brain disease model of addiction has led to the development of more effective methods of prevention and treatment and to more informed public health policies. Notable examples include the Mental Health Parity and Addiction Equity Act of 2008, which requires medical insurance plans to provide the same coverage for substance-use disorders and other mental illnesses that is provided for other illnesses,[5] and the proposed bipartisan Senate legislation that



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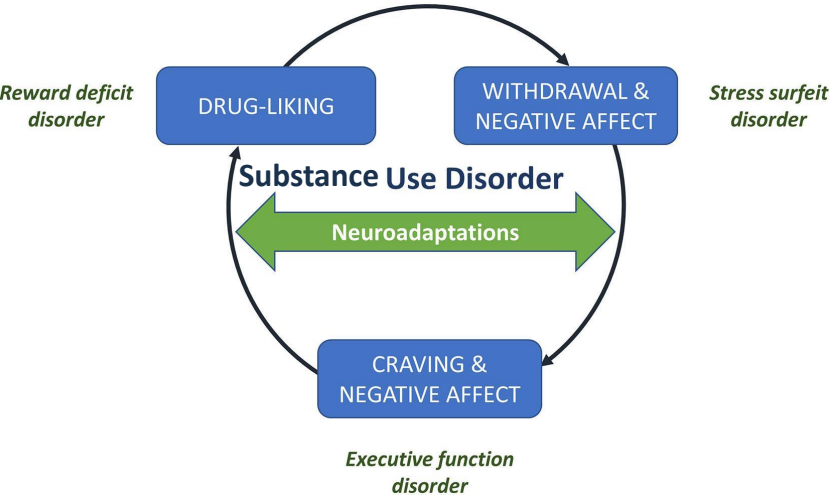
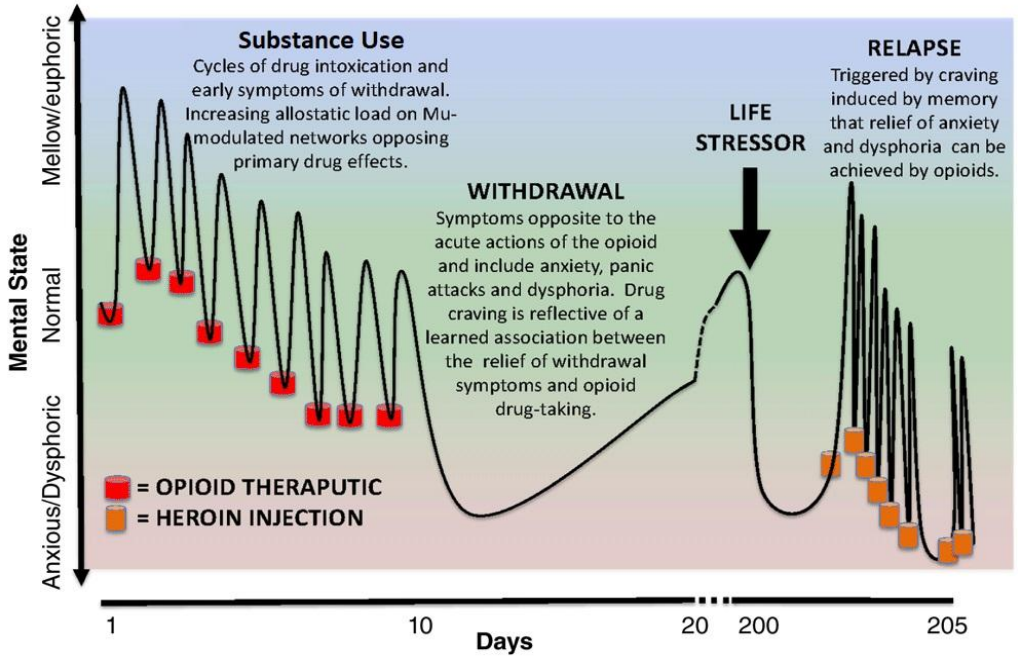
Behavioral Response of Addiction





Mental Health

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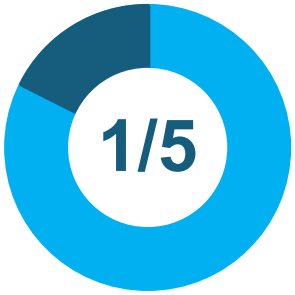
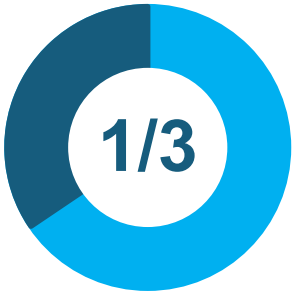
A Public Health Crisis: Pediatric Mental Health

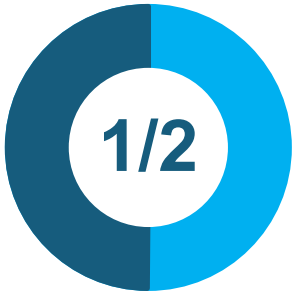
Child & Adolescent Psychiatric Disorders



Experienced a psychiatric disorder **within the past year**



Experience a psychiatric disorder **within their lifetime**



Of psychiatric disorders **begin** by age 14 and three-quarters by age 25

Of children with psychiatric disorders **receive treatment**

Average delay between symptom onset & treatment initiation

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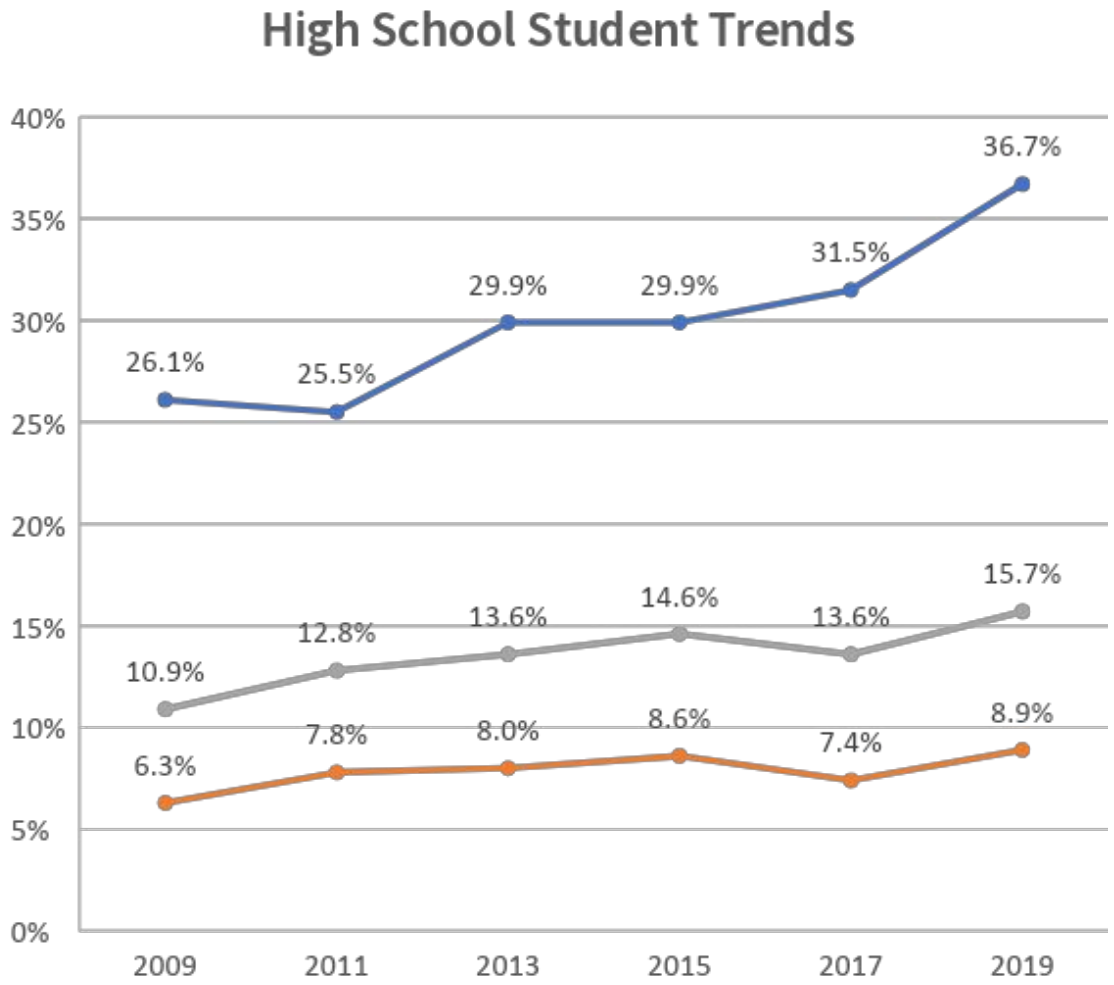
Mental Health Trends in Teens

Experienced persistent feelings of sadness

Made a suicide plan

Attempted suicide



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Tenfold Increase in Boarded Days

Boarding Rare Event

Pre-2000

735 Boarded Days

2012-2013

SCLC boarding crisis presentation

3,617 Boarded Days

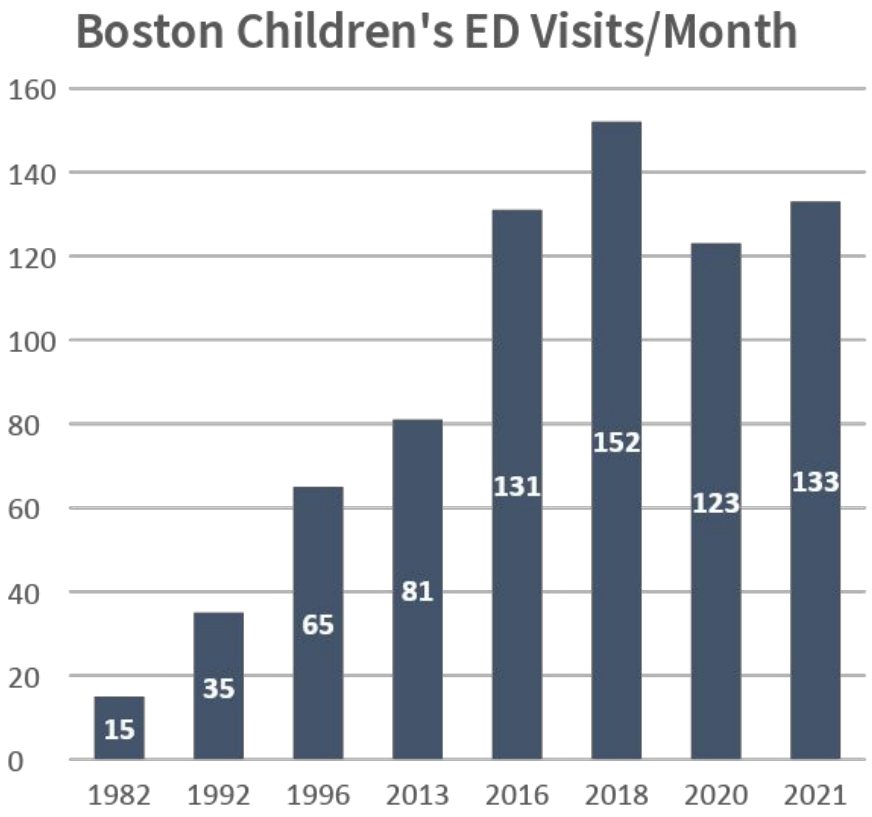
2018-2019

~30 boarders/day Pre-COVID

7,816 Boarded Days

2020-2021

~50 boarders/day COVID



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Substance Use

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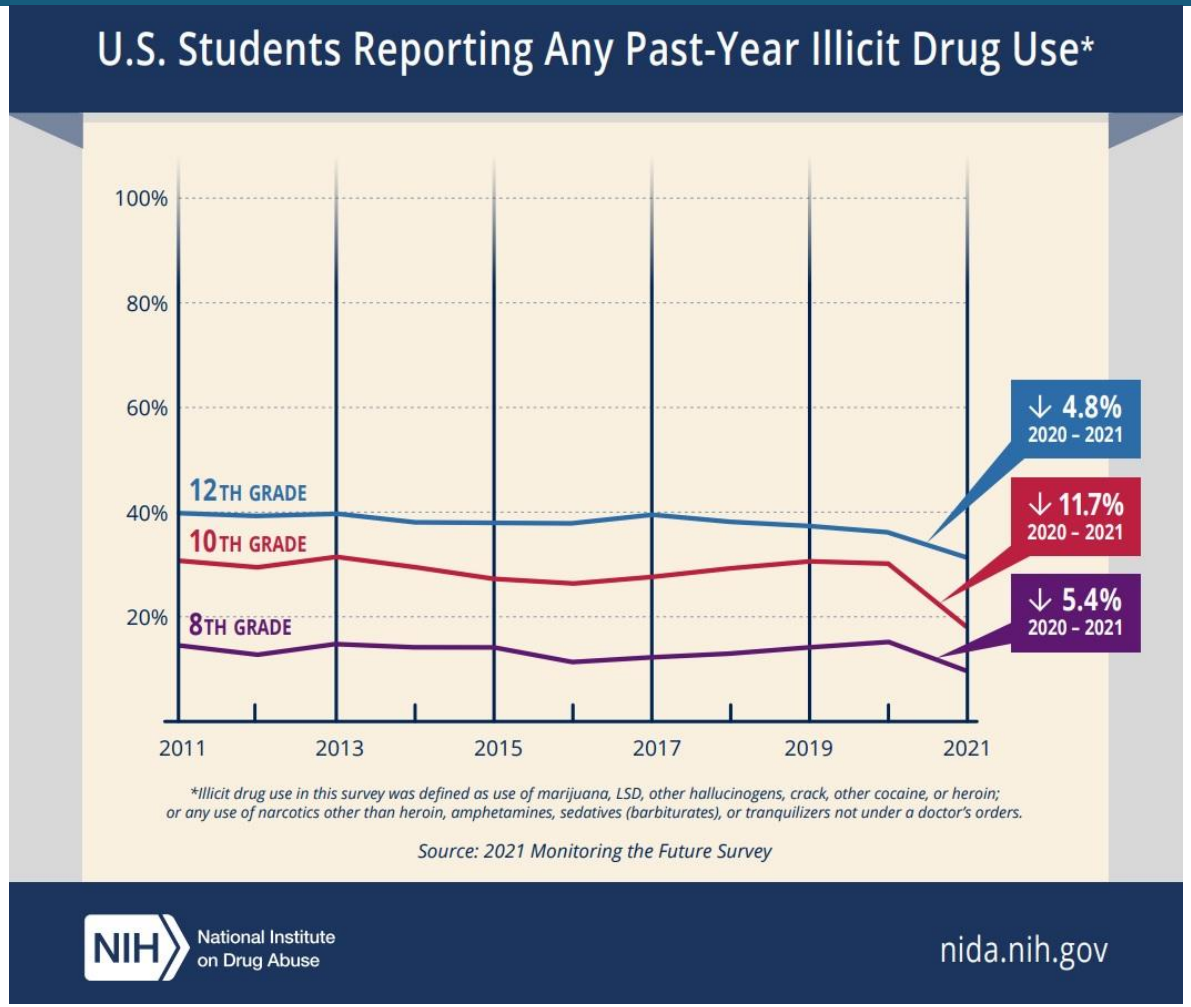
A Public Health Crisis: Adolescent Substance Use???



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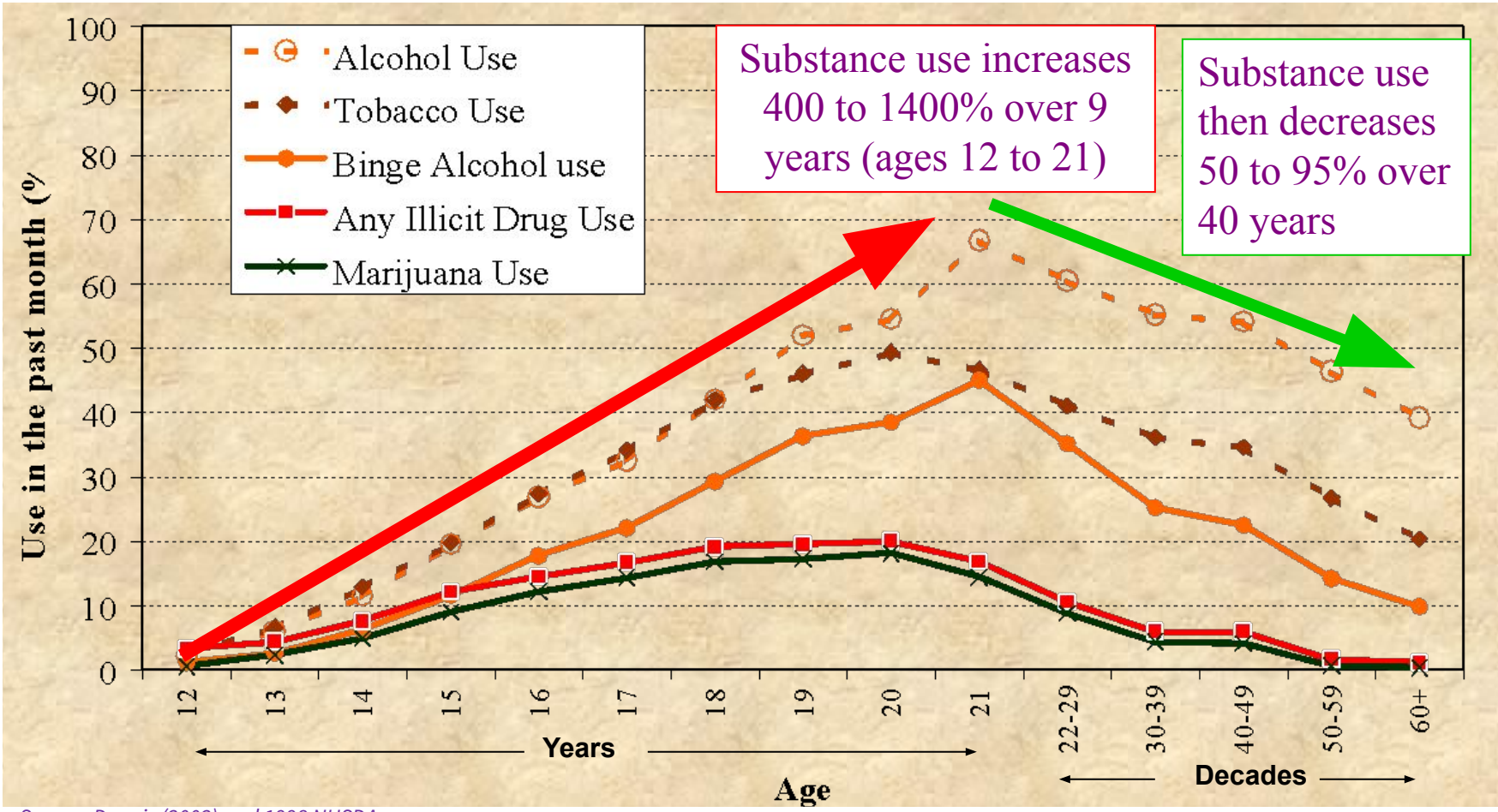
Course of Substance Use by Age



Source: Dennis (2002) and 1998 NHSDA.

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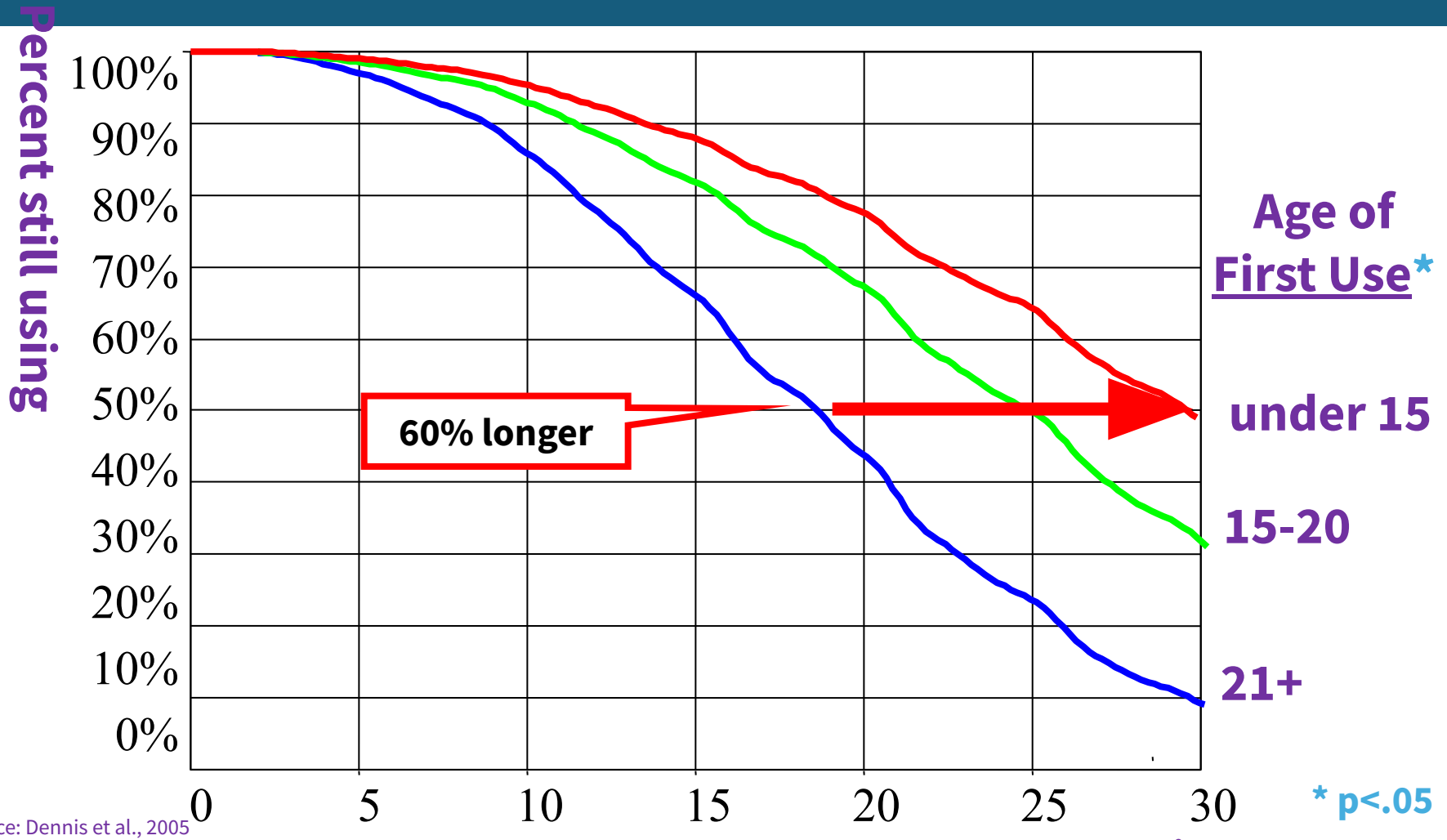
Younger Start, Longer Use



Source: Dennis et al., 2005

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Maine Adolescent Substance Use

- ME teens are 47.44% more likely to have used substances last month than average teens.
- 12% 12-17yo reported substance use last month
  - 90% 12-17yo reported marijuana use last month
- 18% 12-17yo reported marijuana use last year
- 10% 12-17yo reported ETOH use last month
- 1.1% 12-17yo reported cocaine use last year
- 0.6% 12-17yo reported heroin use last year

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Co-occurring Disorders

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Adolescents with SUD…

- Are largely undiagnosed
- Are distributed across diverse health & social service systems
- Have histories of child abuse, neglect, and sexual abuse;
- Have high co-morbidity with psychiatric conditions;

Simon et. al, NEJM 2022

Co-occurring Disorders Stats

- The majority of adolescents with SUDs will have other mental illnesses.
- 37- 80% of adolescents with SUDs have at least one mental illness.
- Most common is ADHD (30-70%)
- The relationship b/w psych sxs & substance use is bidirectional
- 40-90% have experienced trauma

Simon et. al, NEJM 2022

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Substance Use Disorder – Criteria

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The 5 C's of Addiction

1. Craving and preoccupation with non-therapeutic use
2. Compulsive opioid use
3. Loss of Control over opioid use
4. Continued use of opioids despite harm
5. Chronic maladaptive behaviors associated with use

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DSM-5 Substance (Opioid) Use Disorder Criteria

- "A problematic pattern of substance use leading to clinically significant impairment or distress, as manifested by at least 2 of the following, occurring within a 12 month period…"

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DSM-5 Substance (Opioid) Use Disorder Criteria

- Impaired Control
  1. Use in larger amount or longer than intended
  2. Desire or unsuccessful effort to cut down
  3. Great deal of time using or recovering
  4. Craving or strong urge to use*

- Social Impairment
  5. Role obligation failure
  6. Continued use despite social / interpersonal problems
  7. Sacrificing activities to use or because of use

- Risky Use
  8. Use in situations where it is hazardous
  9. Continued use despite knowledge of having physical or psychological problem caused or exacerbated by use

- Neuroadapative / Physiologic
  10. Tolerance
  11. Withdrawal

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Oral Case Discussions

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Consent

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Confidentiality Laws & Rules

- Substance use disorder treatment program records
  - 42 C.F.R. Part 2
- HIPAA Privacy Rule
  - 45 C.F.R. Parts 160 and 164
- Maine health care information confidentiality law
  - 22 M.R.S. § 1711-C
- Records of licensed mental health agencies or facilities
  - 34-B M.R.S. § 1207
  - *Rights of Recipients of Mental Health Services*
  - *Right of Recipients of Mental Health Services Who Are Children in Need of Treatment*

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Consent

- AMA Code of Medical Ethics Opinion 8.08, *Informed Consent*
  - *"Patient's right of self-decision[:]" "The physician's obligation is to present the medical facts accurately to the patient . . . and to make recommendations for management in accordance with good medical practice."*

- Key elements
  - Nature & purpose of the treatment
  - Risk & consequences involved in the treatment
  - Alternative courses of treatment, including the consequences of no treatment
  - An opportunity for the patient to ask questions

Sensitive Type of Treatment

- *All minors (under 18yo) may give consent to certain sensitive types of treatment where an obligation of parental consent may be an obstacle to treatment and therefore, may not be in the best interest of the minor.*
  - Family planning services – 22 M.R.S.A. sec. 1908
  - Treatment of venereal disease or drug or alcohol abuse by a physician – 32 M.R.S.A. secs. 2595 & 3292
  - Treatment of drug or alcohol abuse or for emotional or psychological problems – 22 M.R.S.A. sec. 1502
  - Certain services provided by alcohol & drug counselors, social workers, or psychologists – 32 M.R.S.A. secs. 6221, 7004, & 3817
  - Treatment of venereal disease or drug or alcohol abuse in the hospital setting, ***but parental consent is required if hospitalization continues for more than 16 hours*** – 22 M.R.S.A. sec. 1823.

State Policies on Substance Use During Pregnancy

STATE POLICIES ON SUBSTANCE USE DURING PREGNANCY							
STATE	SUBSTANCE USE DURING PREGNANCY CONSIDERED:		WHEN DRUG USE DIAGNOSED OR SUSPECTED, STATE REQUIRES:		DRUG TREATMENT FOR PREGNANT INDIVIDUALS		
	Child Abuse	Grounds for Civil Commitment	Reporting	Testing	Targeted Program Created	Pregnant People Given Priority Access in General Programs	Pregnant People Protected from Discrimination in Publicly Funded Programs
Alabama	X[~]					X	X
Alaska			X				
Arizona	X		X			X	
Arkansas	X		X		X	X	
California			X		X		
Colorado	X				X[5]		
Connecticut					X		
Delaware						X	
District of Columbia	X		X			X	
Florida	X				X		X
Georgia						X	
Illinois	X		X		X[5]	X	X
Indiana	X[†]			X	X		
Iowa	X		X	X		X	X
Kansas						X	X
Kentucky	X		X	X	X	X	X
Louisiana	X		X	X			
Maine			X			X	
Maryland					X		
Massachusetts			X				
Michigan			X				
Minnesota	X	X	X	X	X		
Missouri	X[Ω]				ξ	X[‡]	X
Montana			X				
Nebraska							
Nevada	X		X				
New York					X		
North Carolina					X		
North Dakota	X		X	X			
Ohio	X		X		X[5]	X	X
Oklahoma			X			X	X
Oregon					ξ		
Pennsylvania			X		X		
Rhode Island	X		X	X			
South Carolina	X[~]				X		
South Dakota	X	X	X	X			
Tennessee					X[5]	X	X
Texas	X						
Utah	X		X			X	
Virginia	X		X		X[5]		
Washington	X				X[5]		
West Virginia						X[¶]	
Wisconsin	X	X	X		X	X[#]	
TOTAL	23+DC	3	25+DC	8	19	17+DC	10

Oral Case Discussions

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Evidence-based behavioral interventions for adolescent SUD

- Motivation Interviewing / Motivational Enhancement Therapy
- Cognitive Behavioral Therapy
- Family-based Therapy
- Multisystemic Therapy
- Adolescent - Community Reinforcement Approach (A-CRA)

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Purpose of Family Involvement

- Learn about the child from family members
- Mutual education and redefinitions
- Define substance use in the family context
- Establish/re-establish parental influence
- To decrease family resistance to treatment

Parental Guidance

- The C's of Parental Guidance
  - Cash (Debit & Credit cards)
  - Cars (Privileges)
  - Cellphone (Privileges)
  - Chores (Incentives)
  - Communication (Open Frame)
  - Companions (Friends & Peers)
  - Computer (Online & Social Media)
  - Curfew (Incentive & Trust)

Pharmacologic Treatment Evidence

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RCT of Med for Adolescent SUD

Alcohol

SUD	Meds	Study	Participants	Methods	Results
AUD	Naltrexone	Miranda '13	22 non-tx seeking adolescents who consumed ETOH ≥ 2x in the 30 days pre- recruitment. Age range: 15 – 19 Gender: 12 F Race: 72% White, 18% AAAPI	Tx: Naltrexone 50mg Control: Placebo	Naltrexone: ↓ Drinking & heavy drinking ($p < 0.003$) ↓ Craving in the lab & natural environment ($p < 0.04$) ↓ Subjective responses to alcohol consumption ($p < 0.01$)
AUD	Naltrexone	O'Malley '15	128 non-tx seeking emerging adults who reported ≥4 heavy drinking days (≥4 drinks W & ≥5 drinks M) in the 4 wks before study enrollment. Age range: 18 – 25 Gender: 68.8% M Race: 77% W, 8% AA	Tx: Naltrexone 50mg Control: Placebo All received psychosocial interventions	Naltrexone: No grp diff b/w heavy drinking days & % days abstinent ↓ # of drinks per drinking day & % of drinking days w/ est BAC ≥ 0.08

RCT of Med for Adolescent SUD

Tobacco

SUD	Meds	Study	Participants	Methods	Results
TUD	NRT	Hanson '03	100 tx-seeking youth who smoked ≥ 10 CPD for ≥ 6 mo Age range: 13 – 19 Gender: 43% male Race: 87% white	Tx: Nicotine patch (21, 14, 7mg/d) Control: placebo patch All received CBT & CM	NRT: ↓ craving scores and overall withdrawal symptoms Safe and effective as monotherapy or when combined with counseling, not as effective as in adult who smoke
TUD	NRT	Moolchan '05	120 tx-seeking adolescents who smoked ≥ 10 CPD for ≥ 6 mo Age range: 13 – 17 Gender: 70% F Race: 73% W	Tx: active patch (21, 14, 7mg/d) & placebo gum or active gum (2 or 4mg) & placebo patch Control: placebo patch All received CBT	Confirmed prolonged abstinence rates of active-patch group (18%) vs. placebo (2.5%). Abstinence rates for the active gum condition (6.5%) did not differ by condition
TUD	NRT	Roddy '06	98 tx-seeking youth who smoked daily Age range: 11 – 21 Gender: 42% male Race: not reported	Tx: Nicotine patch (15, 10, 5mg/d) Control: placebo patch All received wkly individual & grp counseling	NRT: At 4 wks, 5% patch grp was abstinent vs. 2% placebo At 13 wks, 0% patch & placebo were abstinent

RCT of Med for Adolescent SUD

Tobacco

SUD	Meds	Study	Participants	Methods	Results
TUD	NRT	Rubinstein '08	40 adolescent who smoked ≥5 CPD for ≥ 6 mo Age range: 15 – 18 Gender: 54% female Race: "less than half being white"	Tx: Nicotine nasal spray (1 mg total) for 6 wks Control: none All participants received eight sessions of American Lung Association's Not On Tobacco curriculum.	No grp diff in cessation rates (p = 0.16), number of CPD (p = 0.22), or cotinine levels at 12 wks (p = 0.16).
TUD	NRT	Scherphorf '14	257 tx-seeking Dutch adolescents who smoked ≥ 7 CPD. Age range: 12 - 18 Gender: 53% female Race: not reported	Tx: 21, 14, 7 mg nicotine patch based on number of CPD at time of enrollment Control: placebo patch	NRT: Doubled abstinence rates after 2 weeks (OR = 2.02, 95% CI = 1.11– 3.69), but no diff at end of tx. End-of-tx abstinence rates ↑ in high-compliant (OR = 1.09, 95% CI = 1.01–1.17) and not in low compliant participants.

RCT of Med for Adolescent SUD

Tobacco

SUD	Meds	Study	Participants	Methods	Results
TUD	**Bupropion**	Killen '04	211 tx-seeking adolescents who (1) smoked ≥10 CPD, (2) smoked for ≥ 6 mo, (3) had 1+ failed quits. Age: 15 – 18 Gender: 69% M Race: 50% W, 12% Hispanic, 7% Asian	Tx: nicotine patch & bupropion SR (150 mg QD) Control: nicotine patch & placebo All participants received wkly grp skills training.	No diff b/w abstinence rates at 10 or 26 wks (1) patch & bupropion 23% and 8%, (2) patch & placebo 28% and 7%
TUD	**Bupropion**	Muramoto '04	312 tx-seeking adolescents who smoke ≥6 CPD, exhaled CO level of ≥ 10 ppm, 2 quit attempts. Age: 14 – 17 Gender: 54% male Race: 74% W, 15% Hispanic	Tx: Bupropion SR 150mg QD or 300mg QD Control: placebo All participants received wkly brief counseling.	6 wks: Cotinine-confirmed 7- day point prevalence abstinence rates: placebo, 5.6%; 150 mg, 10.7%; and 300 mg, 14.5% (p = 0.03, 300 mg vs placebo). 26 wks: Confirmed point prevalence abstinence rates: placebo, 10.3%; 150 mg, 3.1%; and 300 mg, 13.9% (p = 0.049).

RCT of Med for Adolescent SUD

Tobacco

SUD	Meds	Study	Participants	Methods	Results
TUD	**Bupropion**	Gray '11	134 tx-seeking adolescents who smoke ≥ 5 CPD w/ baseline urine cot > 100 ng/mL. Age: 12 – 21 Gender: 58% male Race: 89% W	Tx: (1) bupropion SR + CM (2) bupropion SR alone Control: (3) placebo + CM (4) Placebo alone	Combined bupropion SR + CM yielded significantly superior abstinence rates during active treatment when compared with placebo and no CM treatment: bupropion SR and CM 27%, bupropion SR without CM 8%, placebo and CM 10%, and placebo and non-CM 9%.
TUD	**Varenicline**	Gray '19	29 tx-seeking adolescents who smoke ≥ 5 CPD Age range: 12 – 21 Gender: 58% M Race: not reported	Interventions: Varenicline (≤2mg) vs. bupropion sustained release (150–300 mg) Control: none	Varenicline (relative to bupropion): ↓ cigarettes smoked per day from 14.1 ± 6.3 to 0.9 ± 2.1 and those receiving bupropion XL reduced from 15.8 ± 4.4 to 3.1 ± 4.0. Compared with placebo, varenicline was well tolerated but did not support improved end-of-treatment abstinence for adolescent smokers.

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RCT of Med for Adolescent SUD

Cannabis

SUD	Meds	Study	Participants	Methods	Results
CUD	NAC	Gray '12	116 treatment-seeking adolescents who met criteria for DSM-IV cannabis dependence Age range: 13 – 21 Gender: 72.4% male Race: 83% white	Tx: NAC 1200 mg QD Control: Placebo BID All received CM and wkly brief individual smoking cessation counseling.	NAC: 2x the odds of submitting negative urine cannabinoid tests during treatment (OR 2.4, 1.1–5.2, p = 0.029), with detectable differences within the first week of treatment. Time to first negative urine cannabinoid test and end-of- treatment abstinence favored NAC but non-significant.
TUD	Topiramate	Miranda '19	66 tx-seeking adolescents using cannabis ~ 2x wkly in 30 days before study participation & experienced ≥ 1 sxs of cannabis abuse or dependence (DSM-IV). Age range: 15 – 24 Gender: 54% female Race: 50% white	Tx: Topiramate 25mg, titrated by 25 – 50mg over 4 wks to 200 mg/day for the last 2 wks of study. Control: Placebo All participants received biweekly MET for treating cannabis use among adolescents.	Topiramate: No improvement in abstinence rates. ↓ the # of grams of marijuana smoked per use day

RCT of Med for Adolescent SUD

Opioids

SUD	Meds	Study	Participants	Methods	Results
OUD	**Buprenorphine**	Marsch '05	36 self-referred treatment-seeking adolescents who met DSM-IV criteria for opioid dependence. Age range: 13 – 18 Gender: 39% male Race: 97% white	Tx: Outpt detox w/bup (≤8 mg) + placebo patch vs. clonidine (≤3 mg) patch + placebo tablets Control: none All received counseling	↑ Retention in bup grp (72%) vs. clonidine (39%) ($p < 0.05$) ↑ Percentage of opioid negative urine tests (64% vs. 32%, $p = 0.01$).
OUD	**Buprenorphine/Naloxone**	Woody '08	66 tx-seeking adolescents using cannabis ~ 2x wkly in 30 days before study participation & experienced ≥ 1 sxs of cannabis abuse or dependence (DSM-IV). Age range: 15 – 24 Gender: 54% female Race: 50% white	Tx: 14-day outpt detox (≤14 mg of bup) vs. 12-week bup/nal (≤24 mg) Control: none All received wkly individual & grp counseling	Compared to detox grp, participants in the 12-wk bup/nal grp showed the following: ↓ Opioid-positive urine tests at wk 4 (26% vs. 61%) & 8 (23% vs. 54%), but not at wk 12 (43% vs. 51%). ↓ reported opioid use before wk6 ($p < .001$) ↓ reported injections before wk 6 ($p = .01$) ↓ cocaine & marijuana use
OUD	**Buprenorphine**	Marsch '16	53 adolescents who met DSM-IV opioid dependence criteria Age range: 16 – 24 Gender: 58% male Race: 70% white	Tx: 28- day or 56-day buprenorphine/nal oxone detoxification and followed over a 63-day study period.	Participants who received a 56-day bup taper were retained in tx 11 days longer on avg than participants who received a 28-day bup taper. Participants who received a 56-day bup taper had a ↑ percentage of opioid-negative scheduled urine tests compared with participants who received a 28-day bup taper (35 vs. 17%).

RCT of Med for Adolescent SUD

Methamphetamine

SUD	Meds	Study	Participants	Methods	Results
OUD	**Bupropion**	Heinzerling '13	19 youth with DSM-IV methamphetamine abuse or dependence and low frequency of methamphetamine use (use on ≤18/30 days). Age range: 14 – 21 Mean age: 17.6 ± 1.4 Gender: 47% male Race: 70% white	Intervention: Bupropion SR 150 mg twice daily Control: placebo All participants receive group drug counseling	Adolescents receiving bupropion and females provided significantly fewer methamphetamine-free urine tests compared to participants receiving a placebo ($p = 0.043$) and males ($p = 0.005$), respectively, compared to placebo.

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Conclusions

- Adolescent substance use is a serious problem with potentially life-threatening consequences

- Pediatric healthcare providers can have a significant impact on this problem by:
  - Screening their patients for substance use
  - Using caution in prescribing
  - Counseling patients and parents about prescription drug misuse
  - Supporting medication for patients with severe substance use disorders

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PCSS MAT Training

Providers' Clinical Support System for POUD

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Prize Winner!!!!!

Breakfast at a Bakery

Choice of:

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Cafe | Bakery | Deli

or

TANDEM COFFEE ROASTERS

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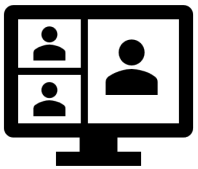
Next Live Webinar

Date

April 20th, 2023

12pm-1pm



Topic

Co-Occurring Medical Illness

Speaker

Emily Nields, DO

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Save the Date!

Half-Day In-Person Session

June 22nd, 2023

8:00am-1pm

Topics

Evidence-Based Practices for Adolescence and Substance Use Disorders

Getting Started with the Patient

Acute Toxidromes

Speakers

Jesse Hinckley, MD, PhD

Elizabeth Samuels, Md, MPH, MHS

Jason Reynolds, MD, PhD

Amy Mayhew, Md, MPH

Dylan McKenney, MD

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Thank you!

Please fill out our brief survey

https://tinyurl.com/Mar-Simon

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