Substance Use and Use Disorders in Adolescents

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No disclosures or conflicts of interest

Objectives

- Understand features and patterns of adolescent substance use
- Examine the unique qualities of adolescent substance use diagnosis and psychosocial treatment
- Describe evidence-based pharmacological treatment for adolescent Substance Use Disorders, including Opioid-, Alcohol-, and Cannabis Use Disorders

Case Studies

To consider as we learn

- 17-year-old male in ED for medically supervised withdrawal from opioids
  - UDS is positive for cannabis only
  - VSS; irritable, diaphoretic, aching muscles, insomnia
  - Taking 5-6 “Roxicodone” pills IN daily for last six months, 2 lifetime overdoses, no lifetime IV use
  - Cannabis – vaping 1-2 dabs per day
  - Alcohol - six 12oz beers at a time once to twice per week
  - Benzodiazepines – one Xanax bar about once every two weeks

- Attempting to maintain his job as a fast food worker; missing shifts and not fulfilling tasks. Kicked out of mom’s house for his substance use and disrespectful behavior.

- On Psych ROS, prominent PTSD symptoms (hyperarousal, flashbacks, avoidance, irritability, VH of shadows) from physical abuse by his father as a child and witnessing IPV

Developmental history:

- Struggled in school with attention, grades, and behavior, especially getting along with peers, but he never had an IEP

Additional:

- No longer in school
- Mother retains custody
- Now lives between his sister’s and friends’ apartments
- Alone and unable to contact mother for collateral

- 16-year-old female in clinic with S2BI notable for nicotine, cannabis use weekly + alcohol use monthly
  - Smoking and vaping cannabis 2-3x per week – mostly with friends, occasionally by self
  - Vaping nicotine 1-2x per day; two cartridges per week
  - Binge drinking 5-6 liquor mixed drinks at larger parties

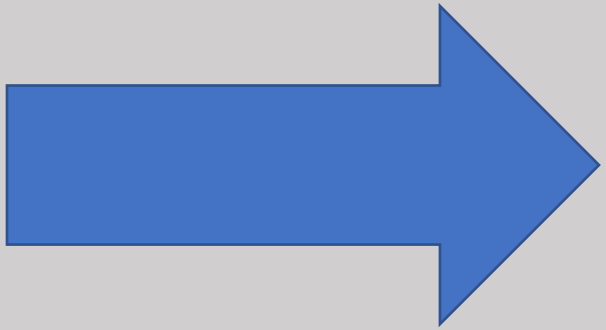
- Using “just for fun…makes school [and suburb] less boring.”

- Making As and Bs. Plays volleyball and on yearbook committee; planning to stop yearbook next year. Limited chores/responsibilities at home; denying conflict among family members.

- Parents aware of nicotine vaping, but they think she “only tried it a few times” before disposing of vape pen.

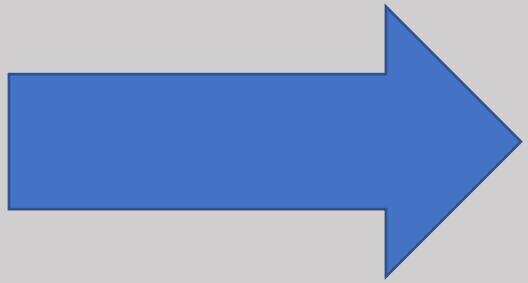
What do we know about adolescent substance use?

Continuum



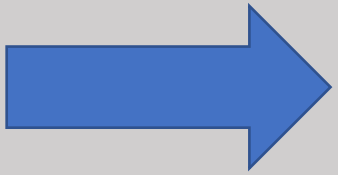
Experimentation

early, infrequent use that does not lead to problems



Problematic substance use

Recurrent use that leads to consequences but does not rise to a Substance Use Disorder



Substance Use Disorder

DSM criteria

i.e., cravings (and other physiologic changes), (loss of) control, consequences

Recent Epidemiologic Trends

- Alcohol
  - Decreasing in popularity for underage drinking
    - Drinking in last month: 18% in 2002 to 9% in 2019
  - And binge drinking
    - Binge drinking episode in last month: 6% in 2015 to 5% in 2019
- Cannabis
  - Decreasing among adolescents
    - Use in last year: 16% in 2002 to 13% in 2019
  - However, increasing for all ages
- Cigarettes
  - Decreasing in popularity
  - Smoking daily: 22% in 2002 to 8% in 2015

Specifically

In 2021, substance use experienced a “broad…steep and atypical” decline among adolescents????

	8th Grade	10th Grade	12th Grade
Alcohol (any)	7.3	13.1	25.8
Alcohol (been drunk)	2.0	5.4	15.5
Marijuana	4.1	10.1	19.5
Vaping Nicotine	7.6	13.1	19.6
Cigarettes	1.1	1.8	4.1
Smokeless Tobacco	1.6	1.7	2.2
* Inhalants	1.8	0.9	0.7
Hallucinogens	0.4	0.8	1.0

Why do young people use substances?

Even though we tell them to “just say no”

Developmental Considerations

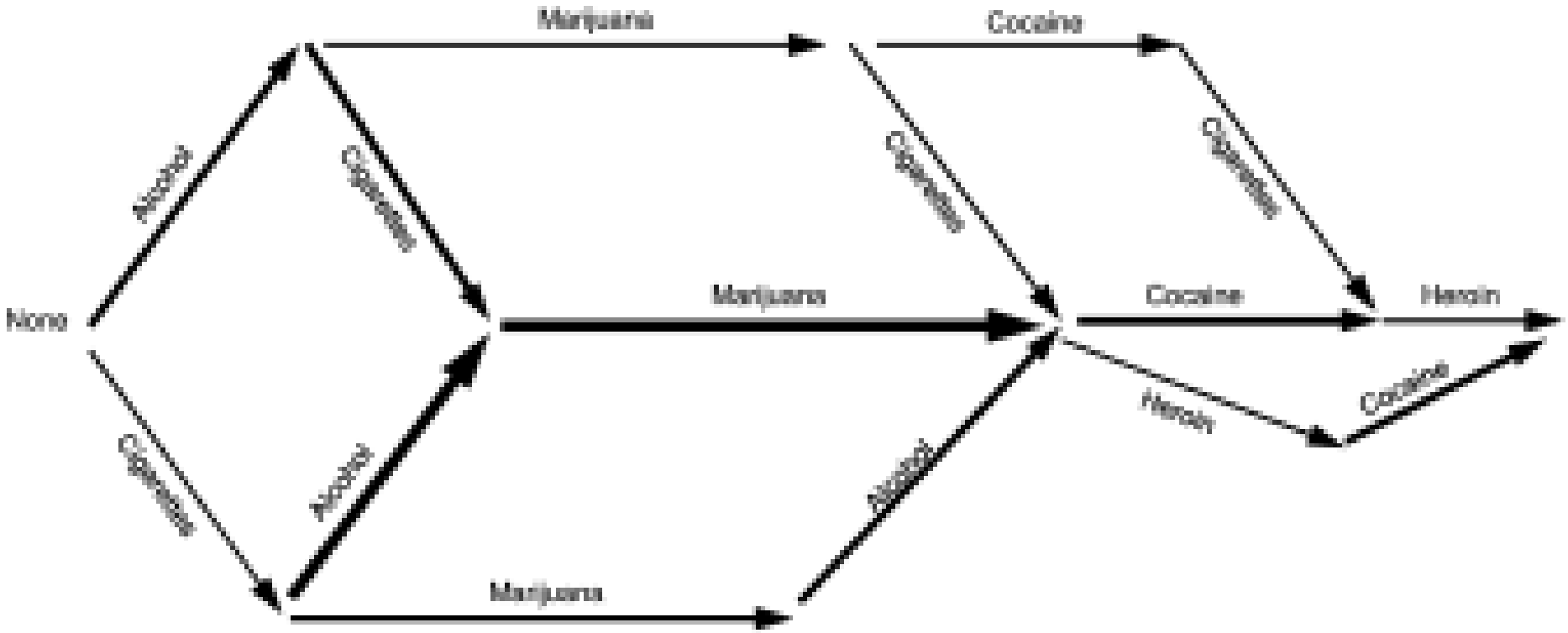
Stages	Psychosocial Crises	Significant Relationships	Basic Strengths	Basic Antipathies
I Infancy	Basic Trust vs. Basic Mistrust	Maternal Person	Hope	Withdrawal
II Early Childhood	Autonomy vs. Shame, Doubt	Parental Persons	Will	Compulsion
III Play Age	Initiative vs. Guilt	Basic Family	Purpose	Inhibition
IV School Age	Industry vs. Inferiority	"Neighborhood," School	Competence	Inertia
V Adolescence	Identity vs. Identity Confusion	Peer Groups and Outgroups, Models of Leadership	Fidelity	Repudiation
VI Young Adulthood	Intimacy vs. Isolation	Partners in friendship, Competition, Cooperation	Love	Exclusivity
VII Adulthood	Generativity vs. Stagnation	Divided Labor and Shared Household	Care	Rejectivity
VIII Old Age	Integrity vs. Despair	"Humankind" "My Kind"	Wisdom	Disdain

Adapted from Erikson, J. M. (1998). The life cycle completed Erik H. Erikson: Extended version. New York, NY: W. W. Norton.

Why do we worry?

More developmental considerations

Gateway Theory



Kandel & Kandel, 2015

Neurobiology

- Connections are changing
- Limbic system almost fully developed
  - Reward
  - Prefrontal cortex lags behind
- Re: neurobiology of addiction

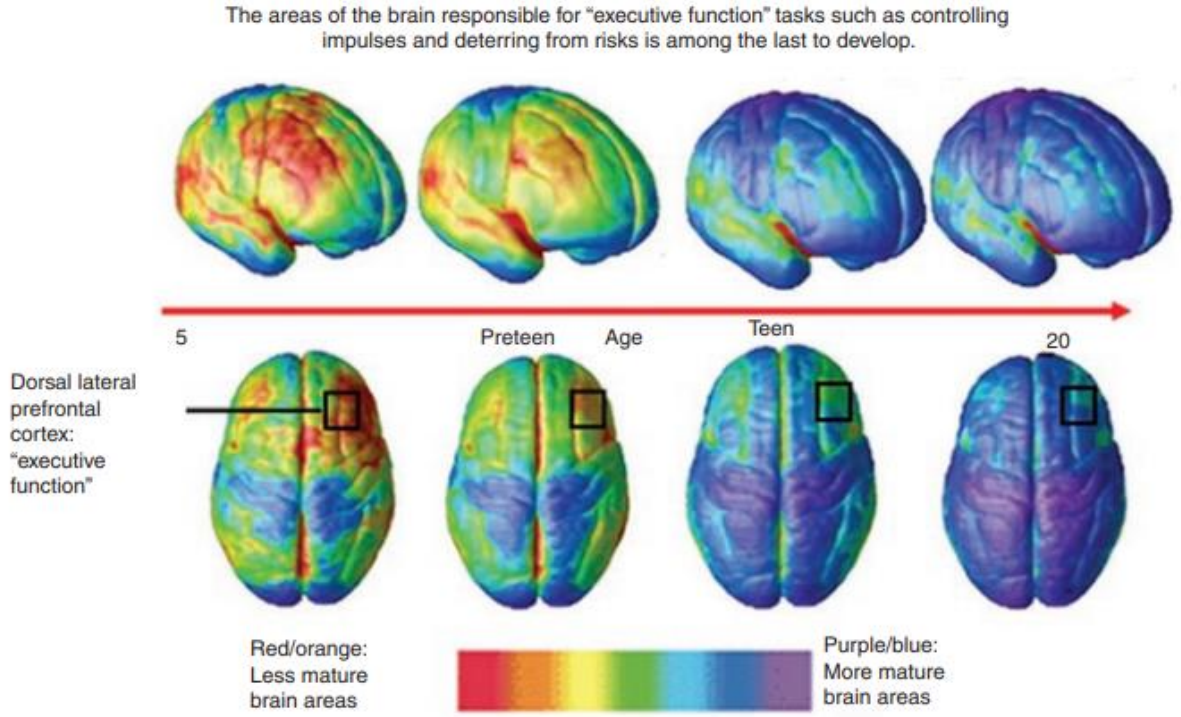


Fig. 2.1 Dynamic sequences of cortical GM maturation in healthy children ages 4–22 demonstrating the normal lagged development of the dorsal lateral prefrontal cortex. (Used with permission of Elsevier and adapted from Gogtay and Thompson [4])

Welsh & Hadland, 2019

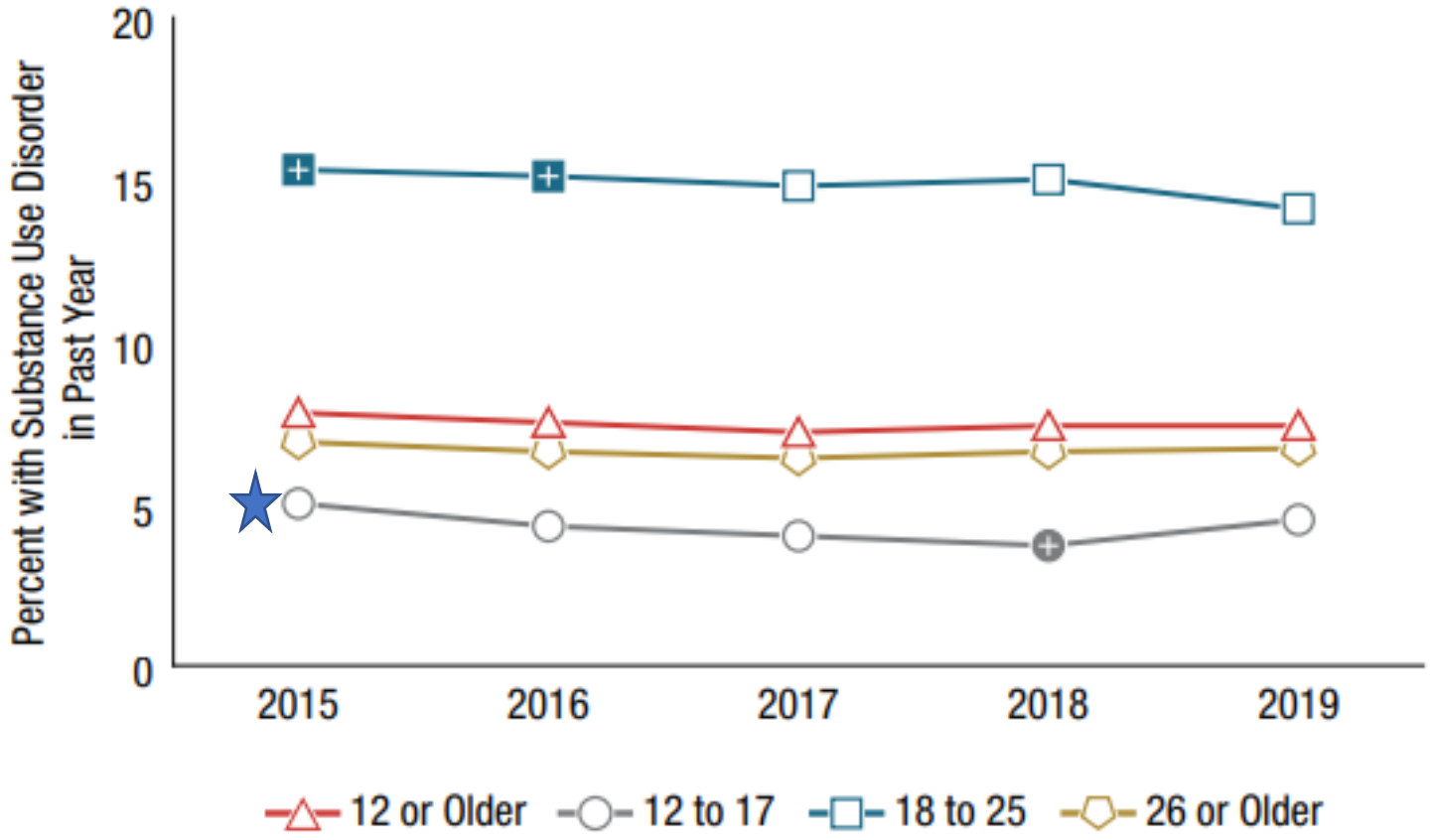
Impacts of Substance Use

- Academic and intellectual performance
- Structural brain changes
  - Pruning in overdrive
- Mortality
  - What are the leading causes of death?
- Risk for development of Use Disorders
  - Now AND later

What do we know about adolescent substance use *disorders?

Prevalence

Figure 45. Substance Use Disorder in the Past Year among People Aged 12 or Older: 2015-2019



National Survey on Drug Use and Health, SAMHSA, 2019.

Individual Risk Factors

- Genetics
  - 40-60% heritable
  - On par with physical health conditions

Individual Risk Factors

- Childhood temperament
  - High behavioral disinhibition
  - Impulsivity

Individual Risk Factors

- Mental health disorders
  - During childhood and/or co-occurring in adolescence
  - Both internalizing and externalizing
    - Biggest risk is untreated externalizing disorders

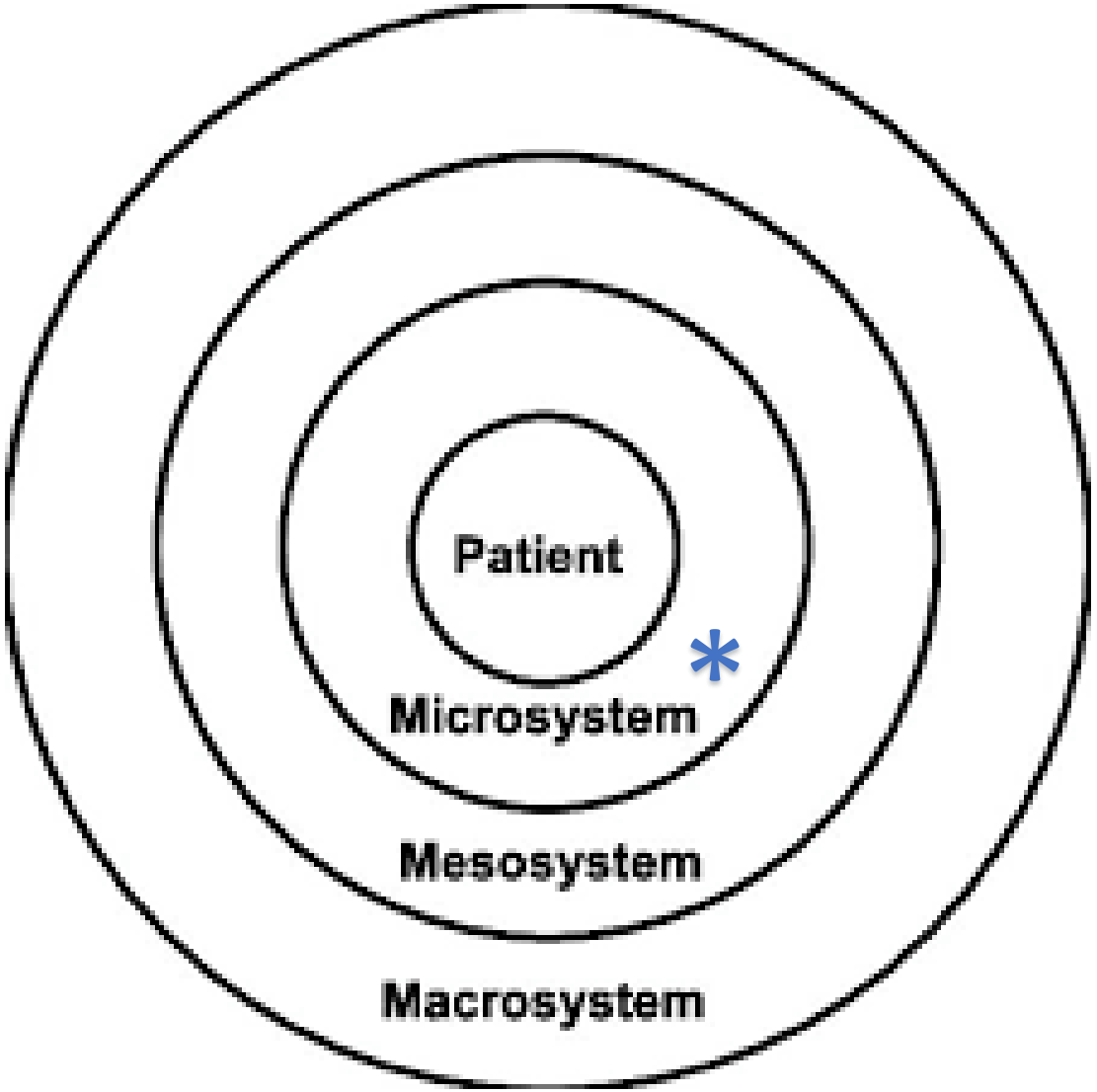
ACEs

Table 5. Number of categories of adverse childhood exposure and the prevalence and risk (adjusted odds ratio) of health risk factors including alcohol or drug abuse, high lifetime number of sexual partners, or history of sexually transmitted disease

Health problem	Number of categories	Sample size (N)[a]	Prevalence (%)[b]	Adjusted odds ratio[c]	95% confidence interval
Considers self an alcoholic	0	3,841	2.9	1.0	Referent
	1	1,993	5.7	2.0	(1.6–2.7)
	2	1,042	10.3	4.0	(3.0–5.3)
	3	586	11.3	4.9	(3.5–6.8)
	4 or more	540	16.1	7.4	(5.4–10.2)
	Total	8,002	5.9	—	—
Ever used illicit drugs	0	3,856	6.4	1.0	Referent
	1	1,998	11.4	1.7	(1.4–2.0)
	2	1,045	19.2	2.9	(2.4–3.6)
	3	589	21.5	3.6	(2.8–4.6)
	4 or more	541	28.4	4.7	(3.7–6.0)
	Total	8,029	11.6	—	—
Ever injected drugs	0	3,855	0.3	1.0	Referent
	1	1,996	0.5	1.3	(0.6–3.1)
	2	1,044	1.4	3.8	(1.8–8.2)
	3	587	2.3	7.1	(3.3–15.5)
	4 or more	540	3.4	10.3	(4.9–21.4)
	Total	8,022	0.8	—	—

Felitti et al., 1998

Environmental Risk Factors



*Protective too!

How do we reduce the likelihood that adolescents develop Substance Use Disorders?

Prevention is key

The first goal with adolescents

Community-, school-, caregiver- led interventions have some support for efficacy

Positive Reinforcement

PROSPER PARTNERSHIPS

The model for healthy kids!

MM™

Michigan Model for Health

GUIDING GOOD CHOICES®

Where clinicians enter the picture:

Screening, assessment, diagnosis, treatment

Ensure (conditional) confidentiality

Policy Statement

Confidentiality in Adolescent Health Care

This statement was approved as policy by the following organizations: the American Academy of Pediatrics; the American Academy of Family Physicians; the American College of Obstetricians and Gynecologists; NAACOG-The Organization for Obstetric, Gynecologic, and Neonatal Nurses; and the National Medical Associations.

Adolescents tend to underutilize existing health care resources. The issue of confidentiality has been identified, by both providers and young people themselves, as a significant access barrier to health care.

Adolescents in the United States, while generally considered healthy, have a range of problems, including some of such severity as to jeopardize their development and health, their future opportunities and even their lives. To illustrate, there is an urgent need to reduce the incidence of adolescent suicide, substance abuse, and sexually transmitted diseases and unintended pregnancy.

As the primary providers of health care to adolescents, we urge the following principles for the guidance of our professional members and for broad consideration in the development of public policy:

1. Health professionals have an ethical obligation to provide the best possible care and counseling to respond to the needs of their adolescent patients.

2. This obligation includes every reasonable effort to encourage the adolescent to involve parents, whose support can, in many circumstances, increase the potential for dealing with the adolescent's problems on a continuing basis.

3. Parents are frequently in a patient relationship with the same providers as their children or have been exercising decision-making responsibility for their children with these providers. At the time providers establish an independent relationship with adolescents as patients, the providers should make this new relationship clear to parents and adolescents with regard to the following elements:

- The adolescent will have an opportunity for examination and counseling apart from parents, and the same confidentiality will be preserved between the adolescent patient and the provider as between the parent/adult and the provider.
- The adolescent must understand under what circumstances (eg., life-threatening emergency), the provider will abrogate this confidentiality.
- Parents should be encouraged to work out means to facilitate communication regarding appointments, payment, or other matters consistent with the understanding reached about confidentiality and parental support in this transitional period when the adolescent is moving toward self-responsibility for health care.

4. Providers, parents, and adolescents need to be aware of the nature and effect of laws and regulations in their jurisdictions that introduce further constraints on these relationships. Some of these laws and regulations are unduly restrictive and in need of revision as a matter of public policy. Ultimately, the health risks to the adolescents are so impelling that legal barriers and deference to parental involvement should not stand in the way of needed health care. ■

Ensure (conditional) confidentiality

- Say it at the start
  - Risky behavior continues
- Consider when confidentiality needs to be broken
  - Role of clinical judgment
  - How to approach?

Screening

- AAP recommends yearly for all adolescents
- CRAFFT and S2BI
- Accuracy of self-report?
- UDS and other lab results may be beneficial too

Please answer all questions honestly; your answers will be kept confidential.

Part A

During the PAST 12 MONTHS, did you:	No	Yes
1. Drink any alcohol (more than a few sips)?	☐	☐
2. Smoke any marijuana or hashish?	☐	☐
3. Use anything else to get high? "Anything else" includes illegal drugs, over the counter and prescription drugs, and things that you sniff or "huff".	☐	☐

If you answered NO to ALL (A1, A2, A3) answer **only B1** below, then STOP.

If you answered YES to ANY (A1, to A3) answer **B1 to B6** below.

Part B

	No	Yes
1. Have you ever ridden in a CAR driven by someone (including yourself) who was "high" or had been using alcohol or drugs?	☐	☐
2. Do you ever use alcohol or drugs to RELAX, feel better about yourself, or fit in?	☐	☐
3. Do you ever use alcohol or drugs while you are by yourself, or ALONE?	☐	☐
4. Do you ever FORGET things you did while using alcohol or drugs?	☐	☐
5. Do your FAMILY or FRIENDS ever tell you that you should cut down on your drinking or drug use?	☐	☐
6. Have you ever gotten into TROUBLE while you were using alcohol or drugs?	☐	☐

In the past year, how many times have you used

Tobacco?

- ○ Never
- ○ Once or twice
- ○ Monthly
- ○ Weekly or more

Alcohol?

- ○ Never
- ○ Once or twice
- ○ Monthly
- ○ Weekly or more

Marijuana?

- ○ Never
- ○ Once or twice
- ○ Monthly
- ○ Weekly or more

STOP if answers to all previous questions are "never." Otherwise, **continue** with questions on the right.

In the past year, how many times have you used

Prescription drugs that were not prescribed for you (such as pain medication or Adderall)?

- ○ Never
- ○ Once or twice
- ○ Monthly
- ○ Weekly or more

Illegal drugs (such as cocaine or Ecstasy)?

- ○ Never
- ○ Once or twice
- ○ Monthly
- ○ Weekly or more

Inhalants (such as nitrous oxide)?

- ○ Never
- ○ Once or twice
- ○ Monthly
- ○ Weekly or more

Herbs or synthetic drugs (such as salvia, "K2", or bath salts)?

- ○ Never
- ○ Once or twice
- ○ Monthly
- ○ Weekly or more

When concern arises

DSM Criteria for Adolescents?

DSM V Diagnostic Criteria: Substance Use Disorder ***SEVERITY:*** *2-3: mild 4-5: moderate 6 or more: severe*
1. Taking the substance in larger amounts or for longer than you meant to.
2. Wanting to cut down or stop using the substance but not managing to do so.
3. Spending a lot of time getting, using, or recovering from use of the substance
4. Cravings and urges to use the substance
5. Not managing to do what you should at home, work, or school because of substance use
6. Continuing to use, even when it causes problems in relationships
7. Giving up important social, occupational, or recreational activities because of substance use
8. Using substances again and again, even when it puts you in danger
9. Continuing to use, even if you have a physical or psychological problem that could have been caused or made worse by the substance
*10. Needing more of the substance to get the effect you want (tolerance)
*11. Development of withdrawal symptoms, which can be relieved by taking more of the substance
*Criteria not met if taking prescribed drugs under supervision

?

+ blackouts
+ sexually risky behavior

Assessment

+ blackouts
+ sexually risky behavior
+ using multiple substances

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Safety First: Medically Supervised Withdrawal

Opioids, Alcohol, Benzodiazepines

In general, same principles as with adults

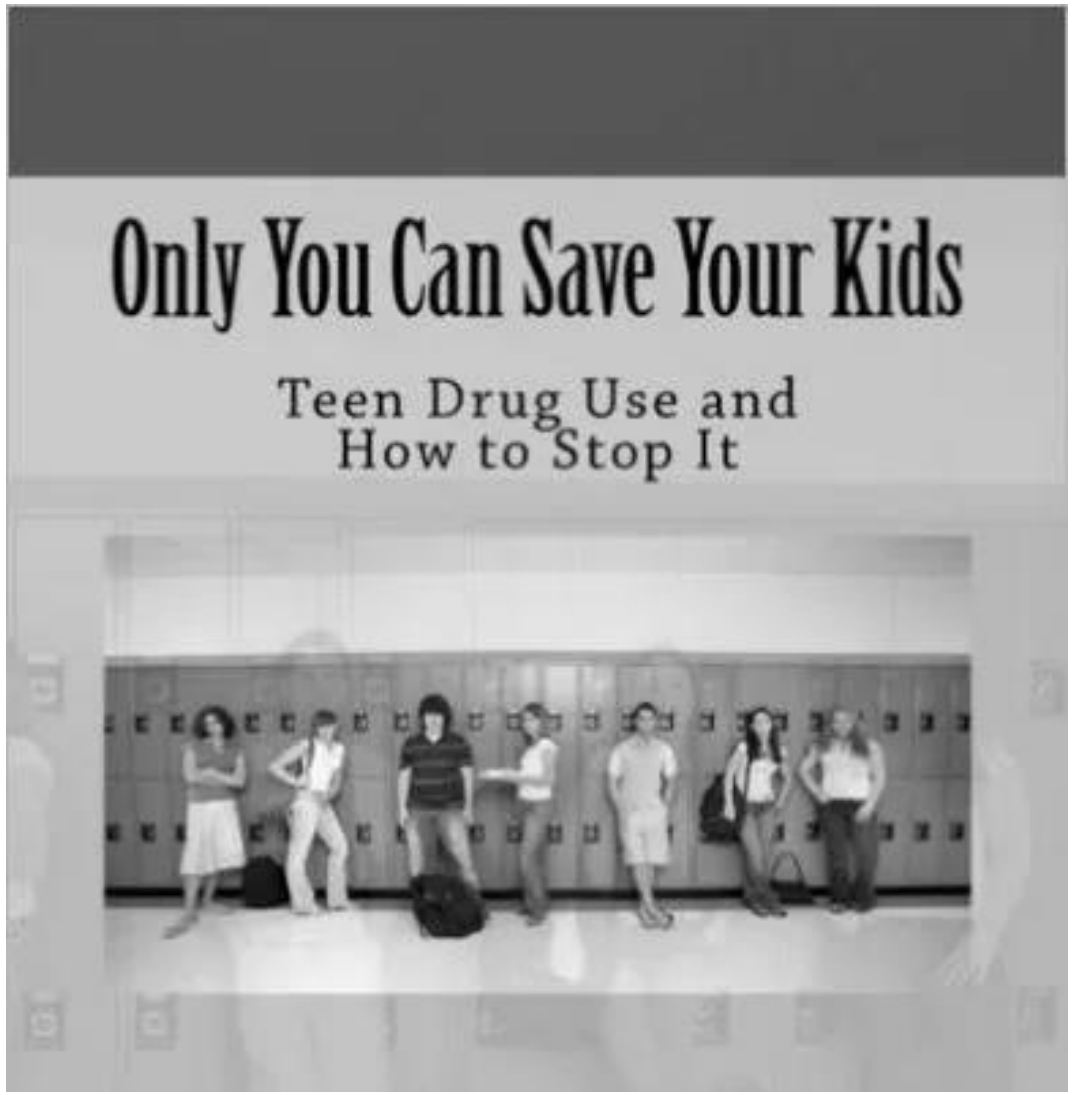
ASAM Patient Placement Criteria

Choosing a Level of Care

Table 4.1 Multidimensional components of a thorough safety assessment

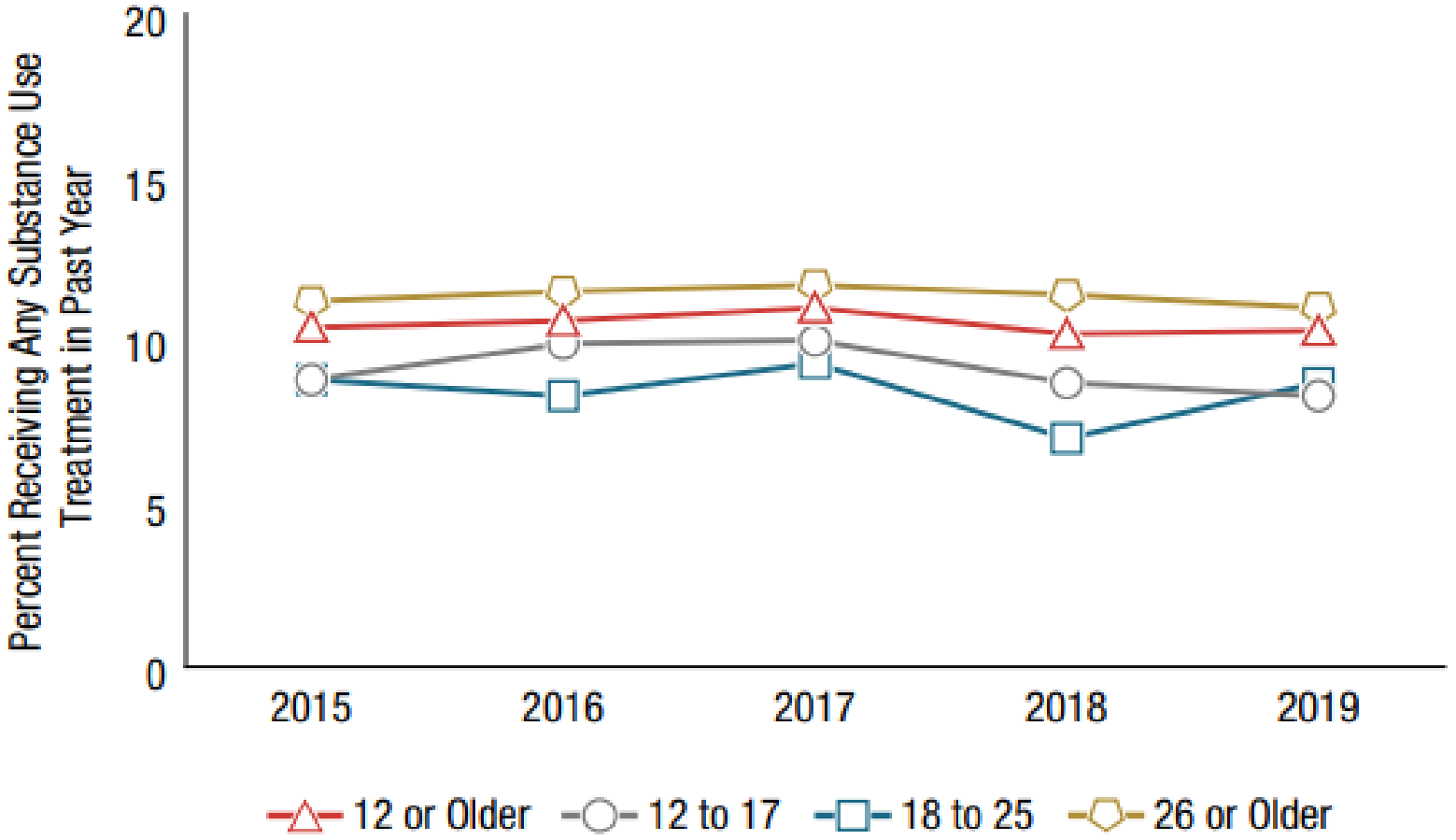
	Degree of impairment		
Risk factors	Mild	Moderate	Severe
Frequency of use	Monthly or less	Weekly	Daily or near-daily
Intoxication/ withdrawal	None, or only mild symptoms	Moderate symptoms	Severe/life-threatening
Co-occurring medical conditions	None, or mild	Moderate (stable and/or controlled medical conditions)	Severe (unstable and/or uncontrolled medical conditions)
Comorbid psychiatric illness/ suicidality	None, or mild	Moderate (stable comorbid illnesses)	Severe (ongoing suicidality, borderline personality disorder, bipolar illness, PTSD)
Ambivalence	Low (very motivated for treatment)	Moderate (some ambivalence)	High (denial of difficulties and/or strong ambivalence)
Family/social environment	Supportive and resourceful family, stable school environment	Mildly supportive, fewer resources, school difficulties	Nonsupportive (homelessness, child and family services involvement, out of school)
Likelihood of relapse/ unintentional overdose	Low (steady use patterns with single substance)	Moderate (use of multiple substance types)	High (intravenous drug use, opioid use, methamphetamine use, use of multiple substances)

Welsh & Hadland, 2019


Only You Can Save Your Kids
Teen Drug Use and
How to Stop It

Treatment > No Treatment

Figure 67. Received Any Substance Use Treatment in the Past Year among People Aged 12 or Older Who Had a Substance Use Disorder in the Past Year: 2015-2019



What does *effective* treatment look like for youth with Substance Use Disorders?

Psychosocial Treatment

Multiple therapeutic modalities

MET, CBT, CM

Multiple therapeutic delivery systems

Group, individual, family*

Combined treatments

Effects of Psychosocial Treatment

- In the short term, effective
- After one year,
  - About one-third remain abstinent
  - About half have decreased use
- Vital to stay in treatment

TENN. CODE ANN. § 63-6-220 (2012). TREATMENT OF JUVENILES; DRUG ABUSERS	Physicians may treat juvenile drug abusers without prior parental consent.
	(b) A physician may use the physician's own discretion in determining whether to notify the juvenile's parents of such treatment.

Pharmacotherapy for Relapse Prevention

For those with most severe impairment

Safety and efficacy cannot be assumed

Always pair with psychosocial interventions

Pharmacotherapy for Relapse Prevention

Only buprenorphine-naloxone is FDA approved

- For OUD
- 16 and older

POLICY STATEMENT Organizational Principles to Guide and Define the Child Health Care System and/or Improve the Health of all Children

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN

Medication-Assisted Treatment of Adolescents With Opioid Use Disorders

COMMITTEE ON SUBSTANCE USE AND PREVENTION

Under Review

This policy automatically expired and is under review by the authorship team.

abstract

Opioid use disorder is a leading cause of morbidity and mortality among US youth. Effective treatments, both medications and substance use disorder counseling, are available but underused, and access to developmentally appropriate treatment is severely restricted for adolescents and young adults. Resources to disseminate available therapies and to develop new treatments specifically for this age group are needed to save and improve lives of youth with opioid addiction.

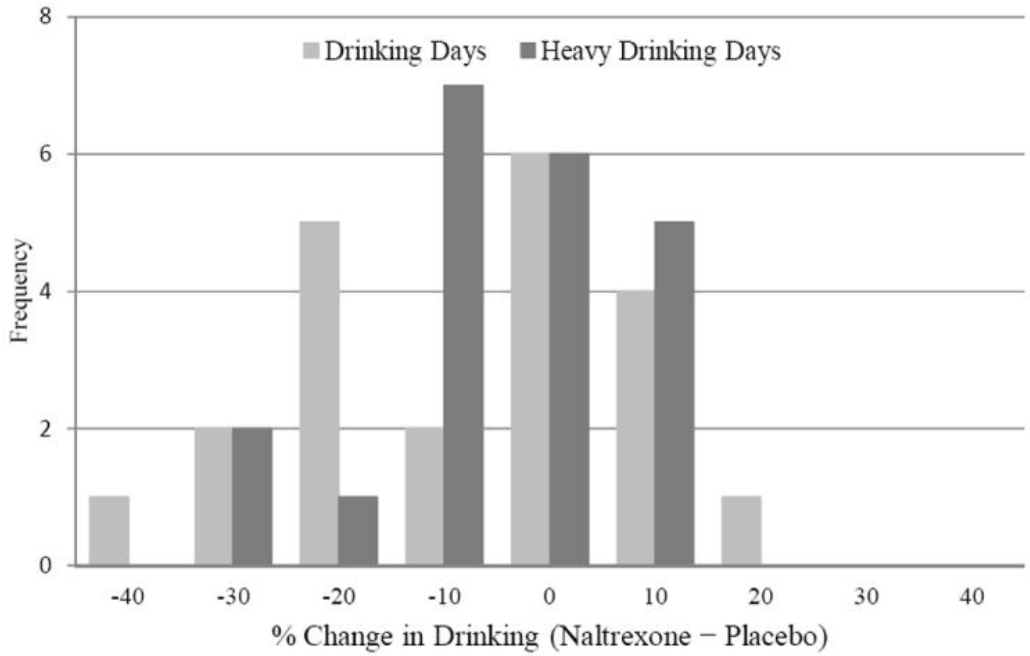
Evidence for

- Nicotine replacement therapy for TUD
- Bupropion SR for TUD
- Naltrexone for AUD
- N-acetylcysteine for CUD

Known to be ineffective

- Bupropion SR in youth with Stimulant (methamphetamine) Use Disorder

Naltrexone in AUD



Miranda et al., 2014

Table 2. Alcohol Consumption Outcomes by Medication Condition

	Naltrexone (n = 61)		Placebo (n = 67)		
Variable	Intake	Treatment	Intake	Treatment	P^a
Percent days abstinent, mean (SD)	43.3 (21.77)	56.6 (22.52)	49.5 (14.69)	62.5 (15.75)	.39
Percent heavy drinking days, mean (SD)[b]	34.3 (16.76)	21.6 (16.05)	33.4 (13.68)	22.9 (13.20)	.58
No. of drinks per drinking day, mean (SD)	6.7 (2.90)	4.9 (2.28)	6.8 (2.51)	5.9 (2.51)	.009
Percentage of drinking days with estimated BAC ≥ 0.08 g/dL, mean (SD)[c]	…	35.4 (28.40)	…	45.7 (26.80)	.04
Estimated BAC per drinking day, mean (SD), g/dL[c]	…	0.077 (0.047)	…	0.095 (0.043)	.03

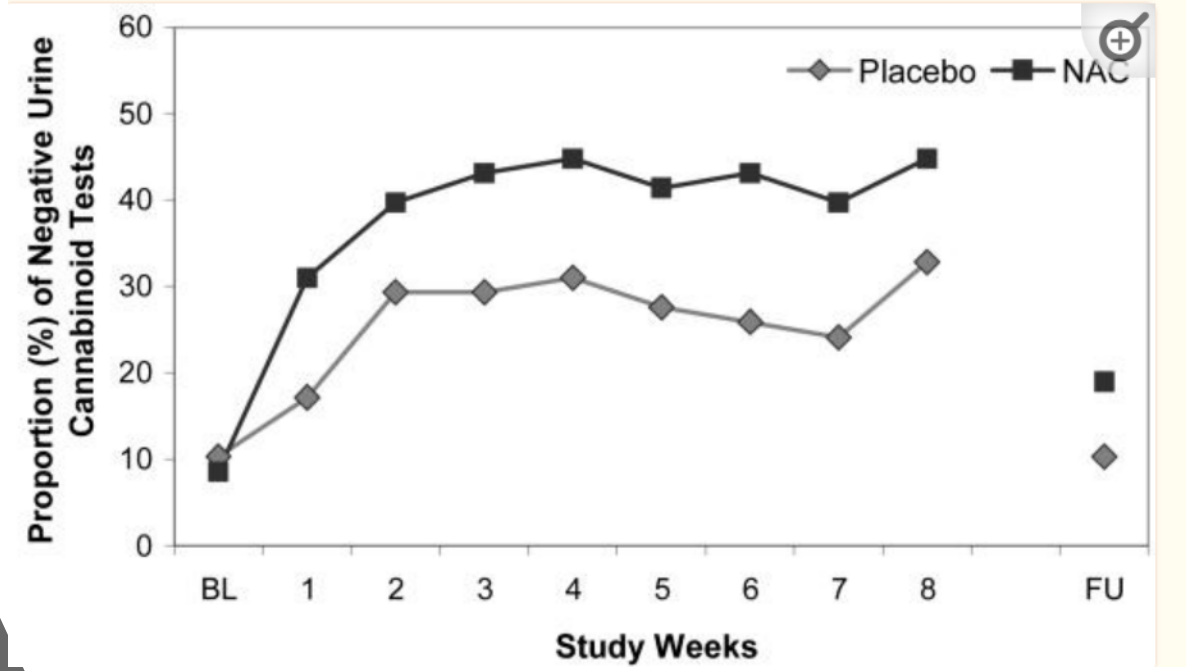
[a] *P* value is for the comparison of naltrexone and placebo during treatment. The analysis of percent days abstinent covaried for baseline percent days abstinent, which differed at baseline ($P = .06$). Baseline values were not included in the remaining analyses.
[b] Heavy drinking = 5 or more standard drinks for men and 4 or more standard drinks for women. A standard drink contains 0.6 gms of absolute alcohol (eg, 12 oz beer, 5 oz wine, or 1.5 oz of 80-proof liquor).
[c] Estimated BAC values were derived using data from the daily diaries and were based on the number of drinks consumed, the duration of drinking, and total body water (based on gender, age, height, and weight) using Curtin's formula.[28]
Abbreviation: BAC = blood alcohol concentration.
Symbol: … = Not available at baseline because diaries were completed for a limited and inconsistent period prior to randomization.

O'Malley et al., 2015

N-Acetyl Cysteine in CUD

A double-blind randomized controlled trial of *N*-acetylcysteine in cannabis-dependent adolescents

Kevin M. Gray, M.D.,[1,*] Matthew J. Carpenter, Ph.D.,[1,2] Nathaniel L. Baker, M.S.,[3] Stacia M. DeSantis, Ph.D.,[3] Elisabeth Kryway, P.A.-C.,[1] Karen J. Hartwell, M.D.,[1,4] Aimee L. McRae-Clark, Pharm.D.,[1] and Kathleen T. Brady, M.D., Ph.D.[1,4]



*Note on Treatment

Treat co-occurring mental health conditions

Integrated care is vital

Let’s revisit our case studies

Applying what we've learned

- 17-year-old male in ED for medically supervised withdrawal from opioids
  - UDS is positive for cannabis only
  - VSS; irritable, diaphoretic, aching muscles, insomnia
  - Taking 5-6 “Roxicodone” pills IN daily for last six months, 2 lifetime overdoses
  - Cannabis – vaping 1-2 dabs per day.
  - Alcohol - six 12oz beers at a time once to twice per week.
  - Benzodiazepines – one Xanax bar about once every two weeks
- Started using opioids at 14. Presented for medically supervised withdrawal x3. Suboxone for two weeks where maintained sobriety. Two overdoses. No lifetime injection use.
- Attempting to maintain his job as a fast food worker; missing shifts and not fulfilling tasks. Kicked out of mom’s house for his substance use and disrespectful behavior.

Psych history:

- On ROS, prominent PTSD symptoms (hyperarousal, flashbacks, avoidance, irritability, VH of shadows) from physical abuse by his father as a child and witnessing IPV

Developmental history:

- Struggled in school with attention, grades, and behavior, especially getting along with peers, but he never had an IEP

Additional:

- No longer in school
- Mother retains custody
- Now lives between his sister’s and friends’ apartments
- Alone and unable to contact mother for collateral

Considerations

- Withdrawal presentation
- Diagnosis of a substance use disorder
- MOUD
  - Buprenorphine-naloxone, methadone, neither
- Treatment of other substance use/SUDs
- Co-occurring psychiatric diagnosis
- Maternal custody
- Risk factors contributing

- 16-year-old female in clinic with S2BI notable for nicotine, cannabis use weekly + alcohol use monthly
- Smoking and vaping cannabis 2-3x per week – mostly with friends, occasionally by self. Vaping nicotine 1-2x per day; two cartridges per week. Binge drinking 5-6 liquor mixed drinks at larger parties.
- Using “just for fun…makes school [and suburb] less boring.”
- Making As and Bs. Plays volleyball and on yearbook committee; planning to stop yearbook next year. Limited chores/responsibilities at home; only child; denying conflict among family members.
- Parents aware of nicotine vaping, but think she “only tried it a few times” before disposing of vape pen.
- Denies all on Psych ROS. Psych and developmental history unremarkable.

Considerations

- Confidentiality
  - How much to involve parents
- Normative vs problematic use
- Underreporting
  - Vaping 1-2x per day, but 2 nicotine cartridges per week
- Diagnosis of a substance use disorder
- Level of Care

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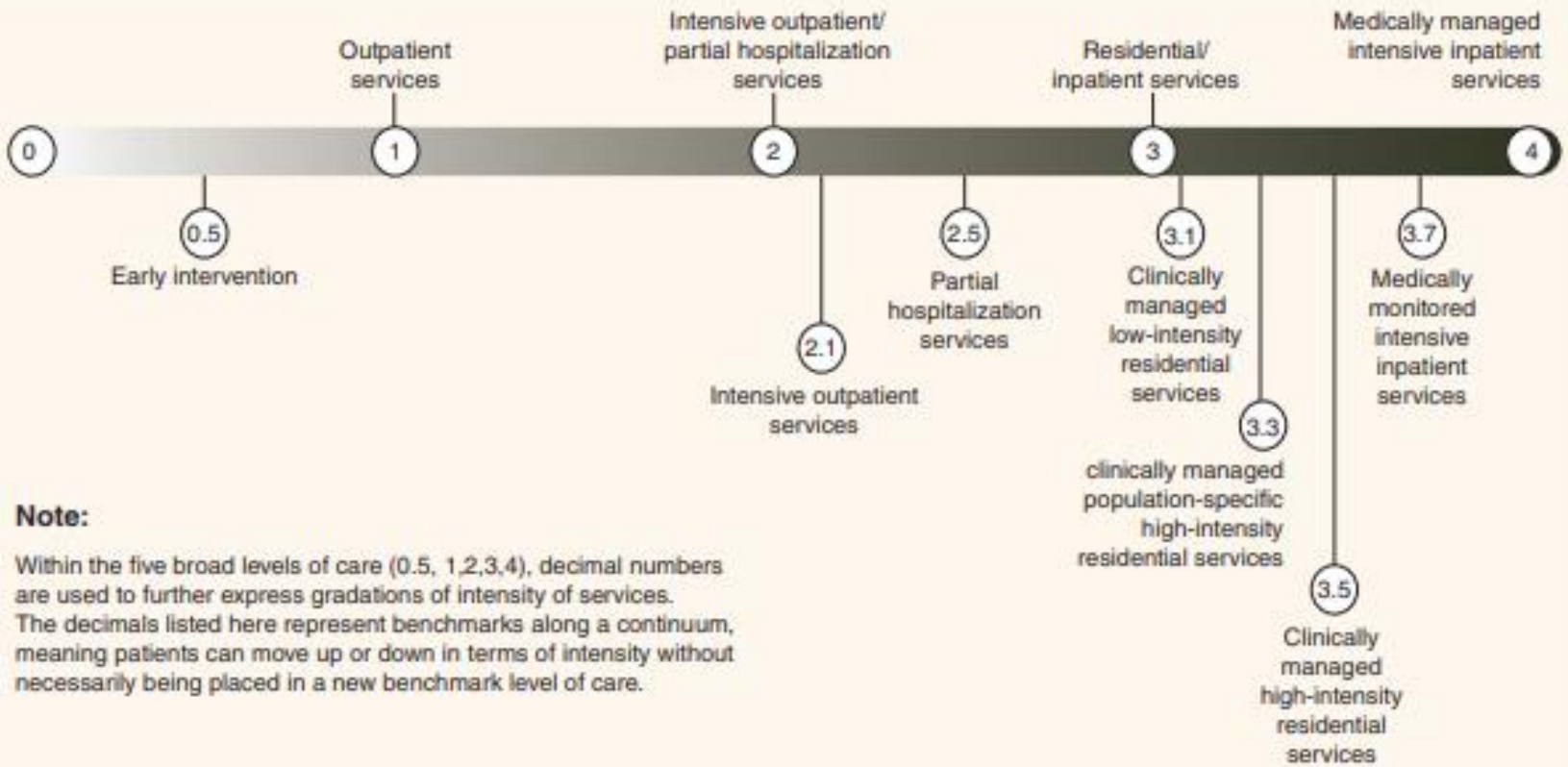
Referral to Treatment

- Which substances?
- Frequency and amount?
- Impairment?

Reflecting a continuum of care



Note:

Within the five broad levels of care (0.5, 1,2,3,4), decimal numbers are used to further express gradations of intensity of services. The decimals listed here represent benchmarks along a continuum, meaning patients can move up or down in terms of intensity without necessarily being placed in a new benchmark level of care.