Advances in the Screening and Treatment of Harmful Alcohol Use in Adolescent Girls

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Disclosure Information

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- No Disclosures
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Learning Objectives

- Summarize alcohol use and related harms among adolescents and understand new sex-based differences.
- Explain why adolescence is a critical period for the development of harmful alcohol use.
- Describe key features of the best available interventions for adolescents.
- Understand the utility and acceptability of computer-based interventions to support clinical care.

Adolescent Alcohol Use

- Alcohol use often begins during adolescence, especially for those who go on to develop alcohol use disorder.
- One in 100 adolescents ages 12 or 13 report drinking alcohol in the past month; 1 in 200 engage in binge drinking.
- By ages 16 and 17, roughly 1 in 5 report drinking, and about 1 in 10 report binge drinking.

SAMHSA, 2023

Raising the Glass Ceiling: Girls are Outdrinking Boys

- Girls are now more likely to drink and binge drink, flipping an historic pattern.
- Girls ages 12 to 17 report more alcohol use (7.9% for girls vs. 6.0% for boys) and binge drinking (4.5% for girls vs. 3.3% for boys).
- This shift is driven by alcohol use among boys declining more for boys than girls.

SAMHSA, 2023

What's the harm?

ALCOHOL USE DURING ADOLESCENCE IS ASSOCIATED WITH HOST OF ADVERSE ACUTE AND LONG-TERM CONSEQUENCES

Socio-Economic

- Lower income
- Unemployment
- Lower educational attainment & higher dropout

Medical

- Cognitive impairments
- Mental health
- HIV and other diseases

Self-Harm & Suicide

- Leading causes of death among youth (i.e., accidents, homicide, suicide)
- Nonfatal self-harm

Addiction

- Onset & persistence of alcohol use disorder

Developmental Perspective on Addiction

Biological

Brain changes
Sleep changes
Emotional & behavioral regulation

Neurocognitive

Decision-making
Working memory
Executive functions

Social-Emotional

Family relationships
Peer relationships
Romantic relationships & sexuality

Transitions

Living arrangements
Educational settings
Work settings

Addiction: Brain Disease that Targets Youth

- Adolescents are hypersensitive to alcohol's pleasurable effects and less sensitive to its unpleasant effects.
  - Compared to adult rats and mice, adolescent animals drink 2-3 times more alcohol.
  - Less sensitive to the aversive, sedative, and motor impairing effects of alcohol.
  - More sensitive to alcohol's stimulatory and social-facilitating effects.
- Preclinical findings translate to human adolescents.

Spear, 2018; Miranda et al. 2014

Co-Occurring Disorders

Mental Health

Substance Use

Scope of the Problem

Girls

4%
487,000 girls
Past-year alcohol use disorder

93%
Untreated
Only 7% Treated

1 or 2
Girls
IN EVERY HIGH SCHOOL CLASS IS STRUGGLING WITH ALCOHOL USE DISORDER

Boys

2%
270,000 boys
Past-year alcohol use disorder

93%
Untreated
Only 7% Treated

< 1
Boy
IN EVERY HIGH SCHOOL CLASS IS STRUGGLING WITH ALCOHOL USE DISORDER

Lu et al., 2023; SAMHSA, 2023

WHY SCREEN?

Teen substance use

is common, and most teens who need professional help never receive it.

Prevent harmful effects

that are both acute and far reaching, including long-term struggles .

Early intervention

is key and teens who drink earlier have poorer outcomes.

Uncertainty about what to do

if something is wrong and some type of intervention in the moment is needed.

Concern about a false positive or negative

causing worry and mistrust or risk missing something.

Lack of referral options

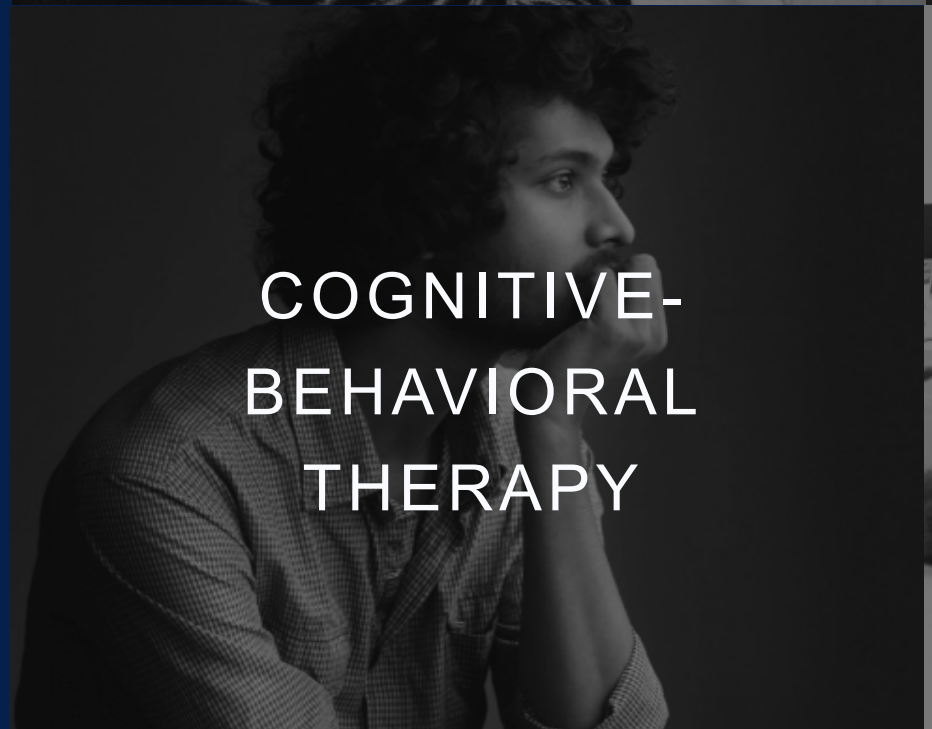
for specialty care.

How to Screen for Substance Use

Screening Tool	Population	Substance Type	Languages	Costs	Features
Single-Item	Validated with teens	All substances	English, Spanish	Free, publicly available	Past-year substance use frequency
Screening to Brief Intervention (S2Bi)	Validated with teens	All substances	English Spanish	Free, publicly available	Qualitative estimate of the frequency of use days; 2-min
Brief Screener for Tobacco, Alcohol, & Other Drugs (BSTAD)	Validated with teens	All substances	English Spanish	Free, publicly available	Qualitative estimate of the frequency of use days; 2-min
CRAFFT 2.1	12-21 years	All substances	20+ languages	Free, publicly available	Problematic substance use

Does Treatment Work?

Non-Pharmacological Treatments



Does Treatment Work?

Pharmacological Treatments

Why medication?

- Teaching skills is inadequate for some youth.
- Self-regulation is still developing, making medication particularly salient for youth.
- Can be more accessible than psychotherapy.

Developmental considerations

- Cannot assume what works for adults will work for adolescents

Candidate Pharmacotherapies

RECENT ADOLESCENT CLINICAL TRIALS

N-acetylcysteine

- Mixed evidence for cannabis
- Results for alcohol are not promising

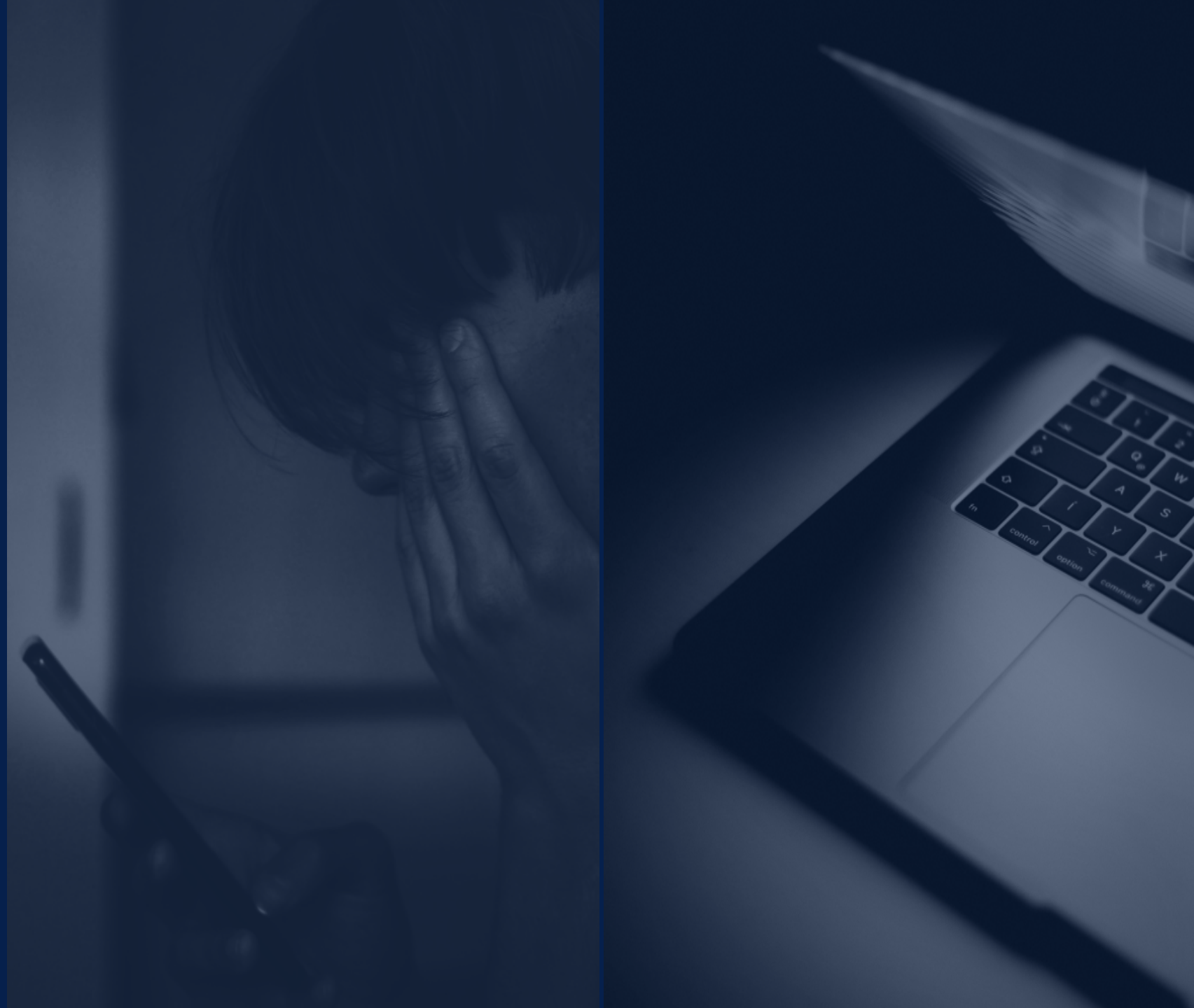
Our Team

- Atomoxetine (K24AA026326)
- Lamotrigine (R21AA028394)
- Naltrexone (R21AA017273)
- Topiramate (R01AA007850)

Carpenter et al, 2022; Kirkland et al., 2023; Miranda et al., 2014, Miranda & Treloar, 2016

Expanding Access

Digital Health Innovations



Smart Solutions: Mobile Health Innovations for Alcohol

- Extraordinary growth in computer science and mobile connectivity has potential to transform alcohol treatment.
- Unobstructed by barriers to traditional treatments, computer and smartphone-based interventions can provide point-of-need care in far-reaching and unprecedented ways.
- While numerous clinical trials demonstrate the efficacy of mobile health interventions for adults with alcohol use disorder, developmentally tailored interventions for adolescents are needed.

Carroll et al., 2008, 2009; Kiluk et al., 2018

Smart Solutions: Mobile Health Innovations for Alcohol (Path180)

- Objective: Translated MET-CBT protocol to adolescents in the context of clinical trials and our nationally recognized clinical service.
- Approach: Adhered to best-practice principles shown to improve computer-based learning.
- A priority was to ensure all aspects of the platform were developmentally tailored to adolescents. Throughout the iterative design process, from initial concept to beta testing, we consulted with service providers with expertise in working with youth as well as adolescents and their parents. Providers spanned master-level clinicians, social workers, clinical psychologists, nurses, pediatricians, and child psychiatrists.

SAMHSA, 2021; Scott et al., 2017; Fitzgerald et al., 2022, Miranda, 2022

Seven Interactive Modules

- Making Decisions
- Thinking about Drinking
- Strategies for Change
- Tackling Triggers
- Overcoming Obstacles
- Reviewing Progress
- Considering Next Steps

R21AA028394, K24AA026326

Sample Characteristics

		Females (n = 44)	Males (n = 35)	*p*
Age, M (SD)		19.6 (1.39)	19.2 (1.08)	ns
Race, % White		52.3%	74.2%	ns
Ethnicity, % Hispanic/Latinx		21.0%	20.0%	ns
AUD Severity, %				ns
	Mild	27.3%	23.0%	
	Moderate	38.6%	29.6%	
	Severe	34.1%	46.7%	
Age of AUD Onset, M (SD)		18.0 (1.24)	17.6 (1.52)	ns
Percent Drinking Days (Past Month), M (SD)		36.0 (16.5)	36.7 (13.7)	ns
Drinks/Drinking Day (Past Month), M (SD)		4.0 (1.4)	5.3 (2.0)	.036

Sample Characteristics

		Females (n = 44)	Males (n = 35)	*p*
Importance of Change, *M (SD), (0 – 10)*		5.48 (2.19)	5.11 (2.02)	ns
Motivated for Change, *M (SD), (0 – 10)*		6.07 (2.47)	5.51 (2.34)	ns
Ready for Change, *M (SD), (0 – 10)*		6.55 (2.20)	6.11 (2.19)	ns
Confidence to Change, *M (SD), (0 – 10)*		7.00 (1.84)	6.83 (2.19)	ns
Drinking Goal, %				ns
	Cut Down, Not Stop	91.0%	80.0%	
	Occasional Drinking	4.4%	5.6%	
	Temporary Abstinence	2.3%	8.8%	
	Total Abstinence	2.3%	5.6%	

Overall Acceptability

- The majority (82%) rated the quality of the platform as "good" or "excellent," and most (76%) found the activities and worksheets to be understandable and useful.
- Most youth (80%) indicated it was helpful to learn strategies to meet their drinking goals, and most (75%) said it helped them understand something new about their drinking.
- Most (80%) reported that it was an excellent way to think more about their drinking and decide whether a change is right for them.
- Most (90%) felt it met one or more of their needs regarding their alcohol use, and two-thirds (67%) said they would recommend it to other teens looking to change their drinking.

Girls Found Path180 More Helpful

	Females (n = 44)	Males (n = 35)	
	M (SD)	M (SD)	*p*
1. Path180 helped me understand drinking	2.82 (1.06)	2.71 (1.25)	.001
2. Helped me decide to change my drinking.	4.07 (0.66)	3.66 (1.21)	<.001
3. Helped me change my drinking	3.93 (0.76)	3.43 (1.17)	.002
4. Felt supported in changing my drinking	3.91 (0.89)	3.09 (1.15)	.013
5. Enjoyed Path180	3.48 (0.90)	2.89 (1.23)	.014
6. Satisfied with Path180	3.07 (0.66)	2.69 (0.87)	.035
7. Path180 helped me learn helpful strategies	4.09 (0.71)	3.71 (1.10)	.005

Girls Found Path180 More Helpful

	Females (n = 44)	Males (n = 35)	
	M (SD)	M (SD)	*p*
1. Decisional balance (drinking)	3.48 (0.90)	2.89 (1.23)	.012
2. Decisional balance (change)	2.82 (1.06)	2.71 (1.25)	.008
3. Helped learn about the harms of drinking	4.02 (0.73)	3.49 (1.15)	<.001
4. Quick Guide	3.80 (0.90)	3.49 (1.17)	.043
5. Helped develop change plan	4.16 (0.81)	3.46 (1.31)	<.001
6. Learning specific strategies	4.23 (0.71)	3.71 (1.13)	.010
7. Planning for triggers	3.52 (0.88)	3.14 (1.26)	.035
8. Planning for obstacles or barriers to change	3.91 (0.74)	3.34 (1.03)	.011
9. Tracking drinking	3.80 (0.93)	2.83 (1.07)	.008

Final Takeaways/Summary

- Adolescence is a key development period for the onset and escalation of alcohol use and associated harms.
- Youth experience heightened sensitivity to the stimulatory (positive reinforcing) effects of alcohol, and they are less sensitive to the unpleasant effects, creating the perform storm for addiction.
- Girls are overcoming boys in their levels of alcohol use, binge drinking, and alcohol use disorder.
- Evidence-based interventions exist, however, very few teens—girls or boys— access specialty care.

Final Takeaways/Summary

- Our preliminary work provides strong support for the feasibility and acceptability of Path180 with treatment-seeking adolescents with alcohol use disorder.
- Girls found Path180 and its skill-driven focus more helpful than boys.
- Given compelling evidence that computer-based interventions can significantly augment computer-based alcohol and other substance use disorder treatment in adults, it appears Path180 may be a beneficial and highly scalable adjunct to treatment for young people, especially girls.

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