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Substance use disorder:

Screening adolescents in primary care

Abstract: Adolescence is a time for experimentation, often leading to impulsive decision-making and risky behavior that can cause harm. Many primary care clinicians lack training in managing positive substance use screens. Screening adolescent patients in primary care can help identify, prevent, and treat substance use disorder.

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Tobacco and substance use usually begins in adolescence, with alcohol first, followed closely by marijuana and cigarettes.[1] The likelihood of developing substance use disorder (SUD) increases when individuals initiate alcohol and drug use during adolescence.[1] According to the *Diagnostic and Statistical Manual of Mental Disorders*, 5th edition, "substance use disorder describes a problematic pattern of using alcohol or another substance that results in impairment in daily life or noticeable distress."[2] This article provides primary care providers with the information and tools they need to identify potential issues in adolescent patients and possibly prevent substance use before dependence and addiction can occur.

SUD has become a major public health concern. In 2018, an estimated 164.8 million Americans age 12 and older (62% of the population) used tobacco,

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alcohol, or illicit drugs in the past month. This includes 139.8 million Americans age 12 or older who used alcohol, 58.8 million who used a tobacco product, and 31.9 million who used illicit drugs.[3] Approximately 2.2 million adolescents ages 12 to 17 (9% of adolescents) drank alcohol in the past month, and approximately 4.2 million adolescents ages 12 to 17 were past year illicit drug users, which corresponds to about 1 in 6 adolescents (16.7%), in 2018.[3] By graduation, 38% of high school students have tried illicit drugs.[4]

Adolescents are particularly vulnerable to developing substance-related problems.[1,5] Males are more likely than females to use illicit drugs and alcohol. However, substance use in girls is increasing and is rapidly approaching if not exceeding boys. Girls are more likely to use prescription drugs. Girls respond differently to drugs than boys and will require different interventions and recovery support.[6,7]

Adolescence is the time between childhood and adulthood characterized by major physiologic, psychological, and neurodevelopmental changes.[7] Adolescents also experience increased emotional intensity. Adolescence is also a time for experimentation and socialization with heightened sensation-seeking and immature self-regulation, leading to impulsive decision-making and risky behavior that can result in injury and death.[6,7] Poor cognitive control and risky behavior are frequently cited as the primary causes of death in adolescents.[8]

Risky behavior is thought to be exacerbated by substance use.[4] Multiple theories suggest that chemical imbalances in the brain perpetuate impulsive decisions that focus on reward rather than long-term outcomes.[1,9] Morin and colleagues studied over 3,500 adolescents and found prolonged cognitive deficits involving memory and perception from alcohol and marijuana use.[10] The long-term effect of substance use appears to be linked to the amount of drug use and the individual's vulnerability to the substance.[10] Problematic substance use in this age-group has shifted the focus from diagnosis and treatment to increasing awareness by disseminating evidence-based prevention, universal screening assessment, and treatment interventions.[1]

Risky behaviors during adolescence, such as the initiation of substance use, are a major source of morbidity and mortality.

Statistical data show that the prevalence of substance use fluctuates from year to year. Since 1971, the Substance Abuse and Mental Health Services Administration (SAMHSA) has administered the annual National Survey on Drug Use and Health to evaluate the prevalence and patterns of drug, alcohol, and tobacco use in Americans age 12 and older.[3] The National Institute on Drug Abuse conducts the Monitoring the Future Survey annually to review 8th, 10th, and 12th graders in private and public schools across the nation to track drug, alcohol, cigarette use, and vaping as well as related attitudes about substances.[4] The 2019 Monitoring the Future Survey indicated that alcohol use declined slightly and illicit drug use remained constant in 8th and 10th graders but decreased by 1% to 2% in 12th graders. However, of concern is the increase in vaping in 8th to 12th graders from 2018 to 2019.[4] Twenty-five percent of the students in 12th grade reported vaping of nicotine and 14% reported vaping marijuana in the past month.[4] While cigarette use is declining, marijuana use is steadily increasing.[4]

The adolescent brain

During adolescence, developmental changes occur in the brain. The prefrontal cortex is responsible for higher-order functions such as language, spatial learning, conscious thought, judgment, and decision-making.[8] The prefrontal cortex enables rational decision-making and overrides impulsive urges, but when the prefrontal cortex is not functioning correctly, the opposite occurs.[8] This area of the brain matures slowly whereas the reward system develops rapidly, leading to developmental asynchrony. The reward system is our survival system that reacts to stimuli such as water, food, and sex. When activated, the reward system triggers the release of dopamine, creating a pleasurable sensation.[11] This asynchrony is often invoked as an explanation for heightened risk-taking during adolescence relative to childhood or adulthood.[12] Adolescents are more likely to repeat behaviors that trigger this response. Unfortunately, drugs trigger the reward response and its desired sensation, which can lead to addiction.

Addiction causes actual changes in the prefrontal cortex. These changes account for two characteristics of addiction: impulsivity and compulsivity.[8]

Risky behaviors during adolescence, such as the initiation of substance use or reckless driving, are a major source of morbidity and mortality. Pehlivanova and colleagues reported that evidence from a large sample of youths showed that diminished cortical thickness in specific structural brain networks was associated with impulsive choice.[13] The areas of the brain most associated with impulsivity are the ventromedial, prefrontal, and orbitofrontal cortices. The prefrontal cortex enables control over impulsive urges. Horvath describes the prefrontal cortex as the brain's brakes.[11] Addiction causes changes in the prefrontal cortex, removing the control. The prefrontal cortex connects with other brain regions and can impact memory, emotion, and stress regulation.[11] A commonly used index of impulsive choice is delay discounting, a behavioral measure of impulsivity where one chooses between a smaller reward delivered sooner and a larger reward delivered later.[11]

Screening in primary care

Adolescence is a time for discovery of self and the environment. Personal, sexual, and environmental factors can significantly impact an individual's decision to participate in substance use.[14] Influencing factors may include the availability of drugs, family environment, genetics, social peer pressure, friendship with teens using drugs, personality traits, and mental illness such as depression, attention-deficit hyperactivity disorder (ADHD), and anxiety.[14]

The National Institute on Drug Abuse reports that many adolescents are seen in a pediatric or primary care office.[4] Although screening is critical, less than 50% of pediatricians or primary care physicians screen their adolescent patients for substance use.[15] Many pediatricians and primary care providers report that they are not comfortable performing a comprehensive assessment in adolescent patients and lack training in managing positive screenings. Providers also lack the time needed to perform screenings and are unfamiliar with screening tools. Screening may also be complicated by parents' refusal to leave the room to allow for privacy during interviews.[15,16] The lack of screening and preventive services is even more prevalent among younger adolescents ages 11 to 14 and socioeconomically disadvantaged youth.[17]

To decrease the health burden associated with SUD, and to be able to identify at-risk individuals, SAMHSA recommends universal screening for all patients as part of the intake process.[18] Screening, Brief Intervention, and Referral to Treatment (SBIRT), which is evidence-based practice and used to identify, reduce, and prevent problematic use, SUD, and dependence on alcohol and illicit drugs, should become a part of routine healthcare.[18] SBIRT shifts the focus from treatment to early intervention for those at risk. The screening component of SBIRT assesses risky substance use behavior.

Primary care provides an ideal opportunity for screening adolescent patients and identifying those at risk for alcohol and drug use while continuing a trusting patient-provider relationship. Given today's environment, with health disparities, underserved areas, and increased access to illicit substances, all adolescents should be considered vulnerable to substance use problems. Poor performance in school and worsening mental health issues need to be identified early and addressed to allow for appropriate intervention.[19] Screening does not provide a diagnosis but offers providers insight into each patient's level of risk and can guide the decision-making process.

State laws govern minor patient rights to confidentiality of information shared with healthcare providers about alcohol and drug use. However, state laws vary as to whether a minor can confidentially receive drug treatment services.[20] The provider should explain their state's confidentiality policy to the adolescent at the beginning of the assessment. If the adolescent is amenable to the screening, it may help to explain the confidentiality policy to the adolescent and parent together.[20]

Screening tools

Several validated tools are available for the screening and assessment of alcohol and substance use as well as prescription drug use. Providers should use a reliable, age-appropriate standardized tool.

CRAFFT. Several quick screening tools for adolescents are available and can easily be incorporated into standard office visits. Many of the tools are validated for use as self-administered on paper or electronically or can be clinician-administered. The Car, Relax, Alone, Forget, Family/Friends, Trouble (CRAFFT) screening tool is highly predictive of the presence of

substance abuse or dependence.[15,16] It is frequently used for adolescents age 14 and older and comprises six questions developed to screen adolescents for high-risk alcohol and other drug use disorders simultaneously. The tool is easy to administer and incorporate into the SBIRT algorithm. CRAFFT begins with three opening questions. (See *The CRAFFT Interview [version 2.1]*). If the individual answers no to all three questions, the provider should then ask the "Car" question (Have you ever ridden in a CAR driven by someone [including yourself] who was "high" or had been using alcohol or drugs?) to identify associated potential risk. If the individual answers yes to any of the first three questions in Part A, the six questions from Part B should be asked. The number of positive responses determines the level of risk. Adolescents who answer no to all of the opening questions and deny driving or riding in a car with a friend driving under the influence of substances are considered low risk.[20] Even adolescents with low risk benefit from positive reinforcement and brief advice to help them identify the negative consequences of substance use. When healthy choices are made, the provider should always provide positive feedback in support of the patient's decisions to abstain.

Adolescents are considered at moderate risk for problems if they respond positively to the use of alcohol or drugs and score 1 on the CRAFFT tool.[21] Adolescents who respond positively to the "Car" question need alternatives to riding with friends or peers under the influence.

When an adolescent scores 1 on CRAFFT, the risk is considered moderate and a brief intervention is needed. Advice from primary care providers or pediatricians is a crucial component of interventions that has been shown to significantly reduce or delay the initiation of drinking and increase cessation rates for alcohol and marijuana use among adolescents.[1]

A CRAFFT score of 2 or higher is a "positive" screen and indicates that the adolescent is at high risk for having an alcohol or drug-related disorder, which necessitates further evaluation.[21] These patients need a referral for further assessment to determine the extent of the problem. Primary care providers can be instrumental in discussing and facilitating the referral during a brief intervention.[21]

ASSIST. The Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST) is an eight-item screening tool developed for the World Health Organization (WHO).[22] It takes approximately 5 to 10 minutes to administer and screens for alcohol, tobacco, opioids, benzodiazepines, and illicit drugs.[22] The questions ask

The CRAFFT Interview [version 2.1]

To be orally administered by the clinician

Begin: "*I'm going to ask you a few questions that I ask all my patients. Please be honest. I will keep your answers confidential.*"

Part A

During the PAST 12 MONTHS, on how many days did you:

1. Drink more than a few sips of beer, wine, or any drink containing **alcohol**? Say "0" if none. ☐ # of days
2. Use any **marijuana** (weed, oil, or hash, by smoking, vaping, or in food) or "**synthetic marijuana**" (like "K2," "Spice") or "vaping" **THC oil**? Put "0" if none. ☐ # of days
3. Use **anything else to get high** (like other illegal drugs, prescription or over-the-counter medications, and things that you sniff, huff, or vape)? Say "0" if none. ☐ # of days

Did the patient answer "0" for all questions in Part A?

Yes ☐ → **Ask CAR question only, then stop**

No ☐ → **Ask all six CRAFFT* questions below**

Part B		No	Yes
C	Have you ever ridden in a **CAR** driven by someone (including yourself) who was "high" or had been using alcohol or drugs?	☐	☐
R	Do you ever use alcohol or drugs to **RELAX**, feel better about yourself, or fit in?	☐	☐
A	Do you ever use alcohol or drugs while you are by yourself, or **ALONE**?	☐	☐
F	Do you ever **FORGET** things you did while using alcohol or drugs?	☐	☐
F	Do your **FAMILY** or **FRIENDS** ever tell you that you should cut down on your drinking or drug use?	☐	☐
T	Have you ever gotten into **TROUBLE** while you were using alcohol or drugs?	☐	☐

***Two or more YES answers suggest a serious problem and need for further assessment. See back for further instructions →**

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about frequency of use in the past 3 months, frequency of desire or urges to use a substance, problems that have occurred because of substance use, if the person ever tried to stop, if they ever injected a substance, and if so how often.[22]

Question 1 asks if the person has ever used any of the following substances: tobacco, alcohol, cannabis, cocaine, amphetamines, inhalants, sedatives, hallucinogens, opioids, and other. If the answer is yes, the person proceeds to the next seven questions. ASSIST provides a more in-depth look at the level of risk associated with an individual's substance use. ASSIST can identify the level of risk for each substance and includes family and other social problems.[22] Of note, at this time the ASSIST has only been validated for use in adults.

BSTAD and S2BI. The Brief Screener for Tobacco, Alcohol, and other Drugs (BSTAD) and Screening to Brief Intervention (S2BI) are electronic screening tools that can be self- or clinician-administered and include one question each for tobacco, alcohol, and marijuana use to triage the level of risk in adolescents ages 12 to 17.[23] If there is a positive response to any of the three substances, then questions about additional types of substances used are asked. Levels of risk can be determined for each substance. The BSTAD asks on how many days the respondent has used tobacco, alcohol, and marijuana in the past year; the S2BI asks how many times the respondent has used tobacco, alcohol, and marijuana in the past year.[23] The difference in the phrasing of the questions on the two tools can affect the accuracy of the responses. For example, binging might be overlooked if the patient has binged only one time in the past year but neglected to say the episode lasted for 5 to 6 days.

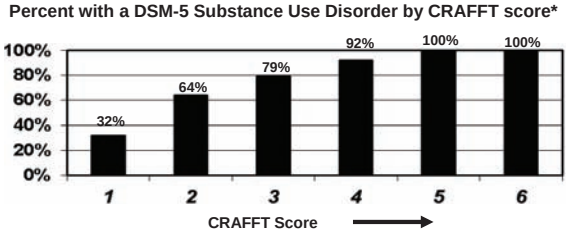
Alcohol Use Disorders Identification Test (AUDIT) and AUDIT-C. AUDIT and AUDIT-C (consumption questions), developed by the WHO, are valid for screening adolescents to identify hazardous alcohol behavior or alcohol use disorder. The AUDIT-C is a short three-item version of the AUDIT (which is a 10-question instrument) that addresses the quantity and frequency of alcohol use. AUDIT-C is scored on a scale of 0 to 12. Males scoring 4 or greater and females scoring 3 or greater is a positive result, indicating the need for additional screening. The tools can be self-administered, on paper or electronically, or in face-to-face interviews.[24]

Brief intervention

Brief intervention is a structured, person-centered counseling approach.[25] The provider's role in a brief

The CRAFFT Interview [version 2.1]

1. Show your patient his/her score on this graph and discuss level of risk for a substance use disorder.



*Data source: Mitchell SG, Kelly SM, Gryczynski J, Myers CP, O'Grady KE, Kirk AS, & Schwartz RP. The CRAFFT cut-points and DSM-5 criteria for alcohol and other drugs: a reevaluation and reexamination. *Substance Abuse*. 2014;35(4):376-80.

2. Use these talking points for brief counseling.

1. **REVIEW** screening results
   For each "yes" response: *"Can you tell me more about that?"*
2. **RECOMMEND** not to use
   "As your doctor (nurse/health care provider), my recommendation is not to use any alcohol, marijuana or other drug because they can: 1) Harm your developing brain; 2) Interfere with learning and memory, and 3) Put you in embarrassing or dangerous situations."
3. **RIDING/DRIVING** risk counseling
   "Motor vehicle crashes are the leading cause of death for young people. I give all my patients the Contract for Life. Please take it home and discuss it with your parents/guardians to create a plan for safe rides home."
4. **RESPONSE** elicit self-motivational statements
   Non users: *"If someone asked you why you don't drink or use drugs, what would you say?"* Users: *"What would be some of the benefits of not using?"*
5. **REINFORCE** self-efficacy
   "I believe you have what it takes to keep alcohol and drugs from getting in the way of achieving your goals."

3. Give patient Contract for Life. Available at www.crafft.org/contract

intervention is to engage the patient in a discussion, build trust, increase awareness on the negative aspects of substance use, and assess readiness to change the behavior.[25] A brief intervention is limited to 5 to 15 minutes of effort involving one to two conversations to provide information or advice, increase motivation to avoid substance use, or teach behavior change skills.[25] In some cases, a brief intervention may encourage a patient at severe risk to accept a referral for further assessment and possible treatment. The primary goal is to open a dialogue about substance use, which may help the adolescent patient gain the strength needed to decide to change his or her behavior. Occasionally, the patient may not want to talk or may become agitated. Reflection and active listening may help reduce the tension and move the conversation forward and allow the patient the opportunity to be heard. A brief intervention is designed to guide the patient and enhance self-efficacy to initiate change. The approach can be as simple as raising the subject and openly discussing substance use, providing feedback from a medical provider perspective, and outlining the dangers of continued substance use. Feedback should be straightforward and nonjudgmental.

A brief intervention is designed to guide the patient and enhance self-efficacy to initiate change.

Motivational interviewing as a brief intervention is a patient-centered clinical strategy used to explore and resolve uncertainty when considering initiating change. When the patient participates in goal setting, compliance with the planned change increases. During the discussion about the plan, providers should consider offering several options, for instance, reducing substance use by 50% or limiting the number of days the substance is used. Change is a gradual and challenging process with many ups and downs. Setbacks should be seen as learning experiences, not failure.[26,27] Even if the patient resists and is not ready to change, motivational interviewing can serve as a prelude to future therapeutic interventions.[27] If the patient is not able to achieve or maintain the established goals or the provider develops concerns about the patient during the interaction, a referral to a mental health professional may be the best course of action.

Substance use and mental health problems

Screening for mental health disorders is the standard of care for SUD, and the tools are readily available. Comorbidity is highly prevalent between SUDs and mood and anxiety disorders; posttraumatic stress disorder (PTSD) and ADHD are also risk factors.[28] Studies have shown that anxiety and behavioral disorders in adolescence are associated with the first use of alcohol and other substances.[29] Conway and colleagues reported that 37.7% of adolescents had a preexisting mental health condition before they started to use alcohol, and the number rose to 66.6% before they reached alcohol abuse.[29] By age 18, one-third of adolescents with mental disorders have consumed alcohol regularly or have used illicit drugs.[29] The rates of alcohol and illicit drug use are highest among adolescents with anxiety and behavior disorders.[29]

Co-occurrence of substance use and mental health problems among adolescents shows that these problems can and often do overlap.[3] Mood disorders are exacerbated by or linked to substance use.[29] Several anxiety disorders are highly comorbid with SUD.[29]

National resources

National Institute on Drug Abuse for Teens Drug Facts: Alcohol provides facts, videos, blog posts, and more for adolescents who want to learn about alcohol use.
https://teens.drugabuse.gov/drug-facts/alcohol

SAMHSA's National Helpline is a free, confidential, 24/7 treatment information and referral service for individuals and family members facing substance use and mental health issues. You can call anytime for information in English and Spanish and referrals to local treatment centers, support groups, and community-based organizations.
1-800-662-HELP

Underage Drinking: Myths vs. Facts, from SAMHSA, provides facts about alcohol use and gives adolescents information about what to do if they or a friend has an alcohol problem.
https://store.samhsa.gov/product/Underage-Drinking-Myths-vs-Facts/sma18-4299

Anxiety can be associated with withdrawal symptoms and can be a result of substance use, thereby confounding the relationship. The management of comorbid conditions can be complicated and should be referred to the appropriate mental health provider.

Discussion

The goal of screening is to identify adolescents at risk for developing SUD. One of the major advantages of screening in primary care is the ability to follow up on the next visit.[25] The relationships that develop in primary care make it possible to intervene when needed. When the screen is negative, the opportunity to reinforce health promotion and prevention is possible.[25]

Comorbid conditions need to be identified. If a condition is suspected, screening and a referral to a mental health provider are appropriate. There is not one specific tool for all patients. It is up to the provider to choose the tool best suited to their population. Literacy levels and cultural values may play a key role in choosing a tool. Instead of electronic tools or self-administered questionnaires, face-to-face interviews may provide the most information.

Conclusion

Substance use often begins in adolescence. The brief intervention is most effective in alcohol and tobacco use.[25,30] There is a growing body of evidence to support the efficacy of screening in reducing illicit drug use among adolescents.[25,30] Research has shown a link between adolescent-initiated drug use and social or personal problems.[1] Further, the three leading causes of death in adolescence are accidents, homicide, and suicide, all of which frequently involve substance use.[31] Adolescents are growing up in an environment that is tolerant of various forms of substance use, both medical and nonmedical.[1] They often experiment with a wider variety of drugs than adults and are less likely to see substance use as a problem or seek treatment on their own. ADHD, conduct disorder, depression, anxiety, and PTSD should be considered as possible comorbid conditions linked to substance use.[31]

Substance use is a complex problem with no easy solution, and substances can often mask the symptoms of an underlying condition. Screening can help identify issues and help prevent addiction, and a brief intervention designed to highlight the negative effects of substance use may prevent major complications in the future. Substance use in adolescents is a serious problem and it requires a proactive approach that includes understanding, education, and early intervention strategies to reduce the tremendous burden placed on the patient, family, and the healthcare system. NP

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