

Principles of Adolescent Substance Use Disorder Treatment: A Research-Based Guide

Introduction

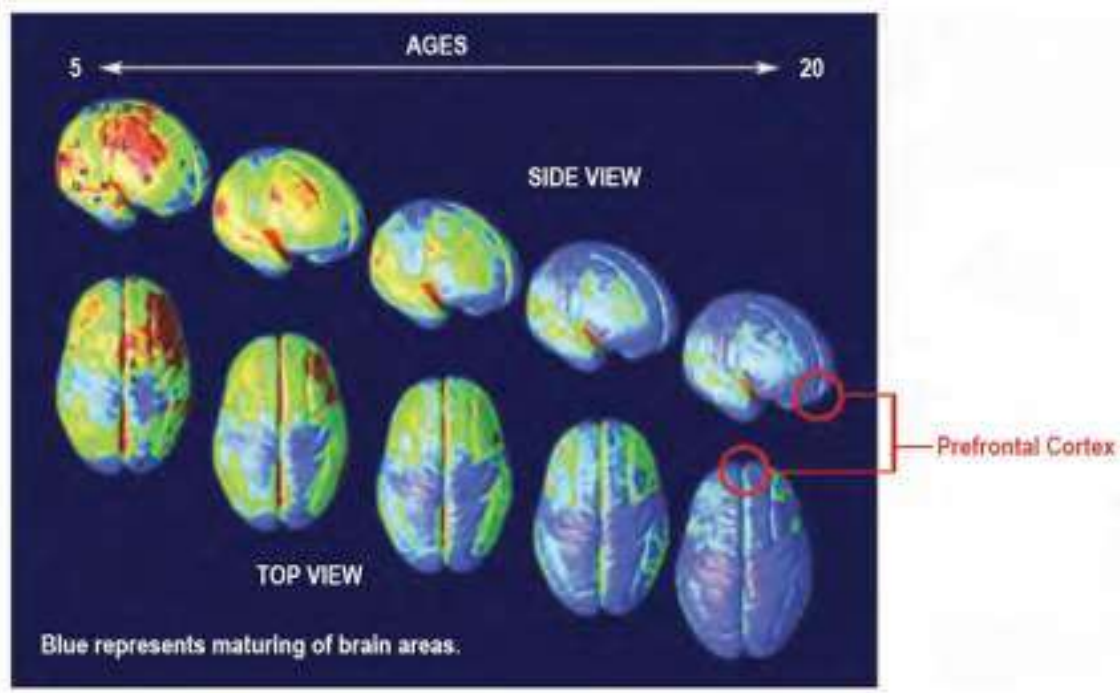
People are most likely to begin abusing drugs*—including tobacco, alcohol, and illegal and prescription drugs—during adolescence and young adulthood. †

By the time they are seniors, almost 70 percent of high school students will have tried alcohol, half will have taken an illegal drug, nearly 40 percent will have smoked a cigarette, and more than 20 percent will have used a prescription drug for a nonmedical purpose.¹ There are many reasons adolescents use these substances, including the desire for new experiences, an attempt to deal with problems or perform better in school, and simple peer pressure. Adolescents are “biologically wired” to seek new experiences and take risks, as well as to carve out their own identity. Trying drugs may fulfill all of these normal developmental drives, but in an unhealthy way that can have very serious long-term consequences.

Many factors influence whether an adolescent tries drugs, including the availability of drugs within the neighborhood, community, and school and whether the adolescent’s friends are using them. The family environment is also important: Violence, physical or emotional abuse, mental illness, or drug use in the household increase the likelihood an adolescent will use drugs. Finally, an adolescent’s inherited genetic vulnerability; personality traits like poor impulse control or a high need for excitement; mental health conditions such as depression, anxiety, or ADHD; and beliefs such as that drugs are “cool” or harmless make it more likely that an adolescent will use drugs.²

The adolescent brain is often likened to a car with a fully functioning gas pedal (the reward system) but weak brakes (the prefrontal cortex).

Images of Brain Development in Healthy Children and Teens (Ages 5-20)



The brain continues to develop through early adulthood. Mature brain regions at each developmental stage are indicated in blue. The prefrontal cortex (red circles), which governs judgment and self-control, is the last part of the brain to mature.

Source: PNAS 101:8174–8179, 2004.

The teenage years are a critical window of vulnerability to substance use disorders, because the brain is still developing and malleable (a property known as neuroplasticity), and some brain areas are less mature than others. The parts of the brain that process feelings of reward and pain—crucial drivers of drug use—are the first to mature during childhood. What remains incompletely developed during the teen years are the prefrontal cortex and its connections to other brain regions. The prefrontal cortex is responsible for assessing situations, making sound decisions, and controlling our emotions and impulses; typically this circuitry is not mature until a person is in his or her mid-20s (see [figure](#)).

The adolescent brain is often likened to a car with a fully functioning gas pedal (the reward system) but weak brakes (the prefrontal cortex). Teenagers are highly motivated to pursue pleasurable rewards and avoid pain, but their judgment and decision-making skills are still limited. This affects their ability to weigh risks accurately and make sound decisions, including decisions about using drugs. For these reasons, adolescents are a major target for prevention messages promoting healthy, drug-free behavior and giving young people encouragement and skills to avoid the temptations of experimenting with drugs. ³

Most teens do not escalate from trying drugs to developing an addiction or other substance use disorder; [#] however, even experimenting with drugs is a problem. Drug use can be part of a pattern of risky behavior including unsafe sex, driving while intoxicated, or other hazardous, unsupervised activities. And in cases when a teen does develop a pattern of repeated use, it can pose serious social and health risks, including:

- school failure
- problems with family and other relationships
- loss of interest in normal healthy activities
- impaired memory
- increased risk of contracting an infectious disease (like HIV or hepatitis C) via risky sexual behavior or sharing contaminated injection equipment
- mental health problems—including substance use disorders of varying severity
- the very real risk of overdose death

How drug use can progress to addiction.

Different drugs affect the brain differently, but a common factor is that they all raise the level of the chemical *dopamine* in brain circuits that control reward and pleasure.

The brain is wired to encourage life-sustaining and healthy activities through the release of dopamine. Everyday rewards during adolescence—such as hanging out with friends, listening to music, playing sports, and all the other highly motivating experiences for teenagers—cause the release of this chemical in moderate amounts. This reinforces behaviors that contribute to learning, health, well-being, and the strengthening of social bonds.

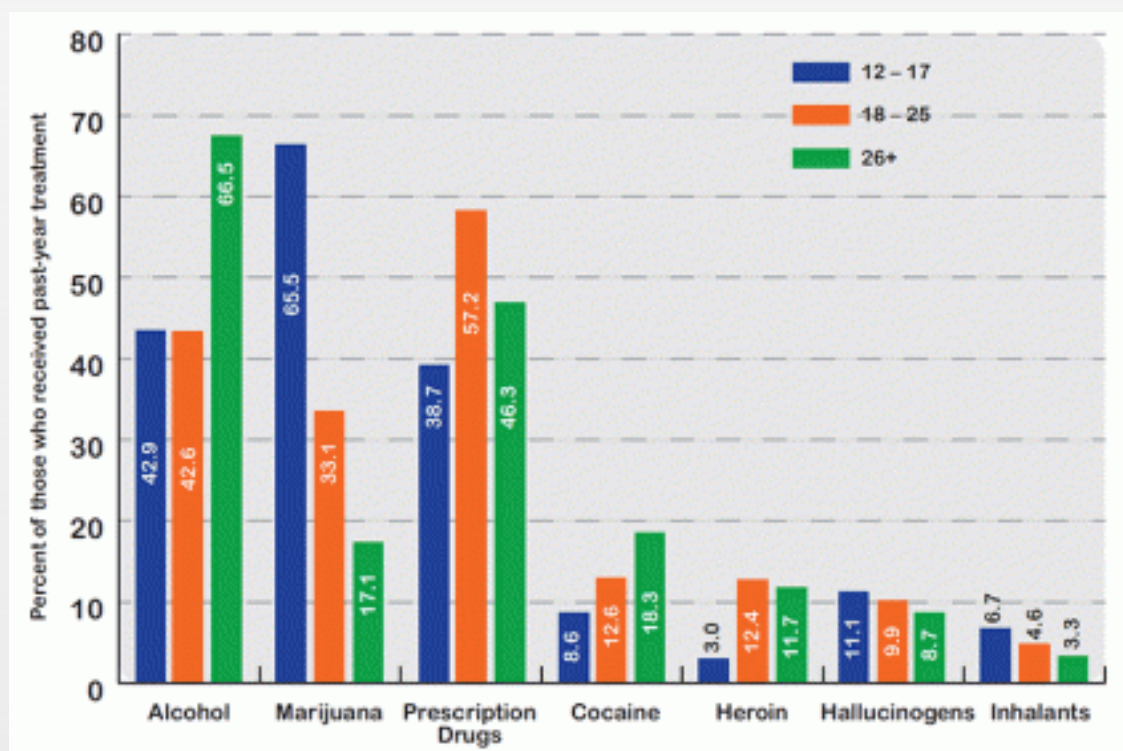
Despite popular belief, willpower alone is often insufficient to overcome an addiction. Drug use has compromised the very parts of the brain that make it possible to “say no.”

Drugs, unfortunately, are able to hijack this process. The “high” produced by drugs represents a flooding of the brain’s reward circuits with much more dopamine than natural rewards generate. This creates an especially strong drive to repeat the experience. The immature brain, already struggling with balancing impulse and self-control, is more likely to take drugs again without adequately considering the consequences.⁴ If the experience is repeated, the brain reinforces the neural links between pleasure and drug-taking, making the association stronger and stronger. Soon, taking the drug may assume an importance in the adolescent’s life out of proportion to other rewards.

The development of addiction is like a vicious cycle: Chronic drug use not only realigns a person’s priorities but also may alter key brain areas necessary for judgment and self-control, further reducing the individual’s ability to control or stop their drug use. This is why, despite popular belief, willpower alone is often insufficient to overcome an addiction.

Drug use has compromised the very parts of the brain that make it possible to “say no.”

Adolescents Differ from Adults in Substances Most Abused

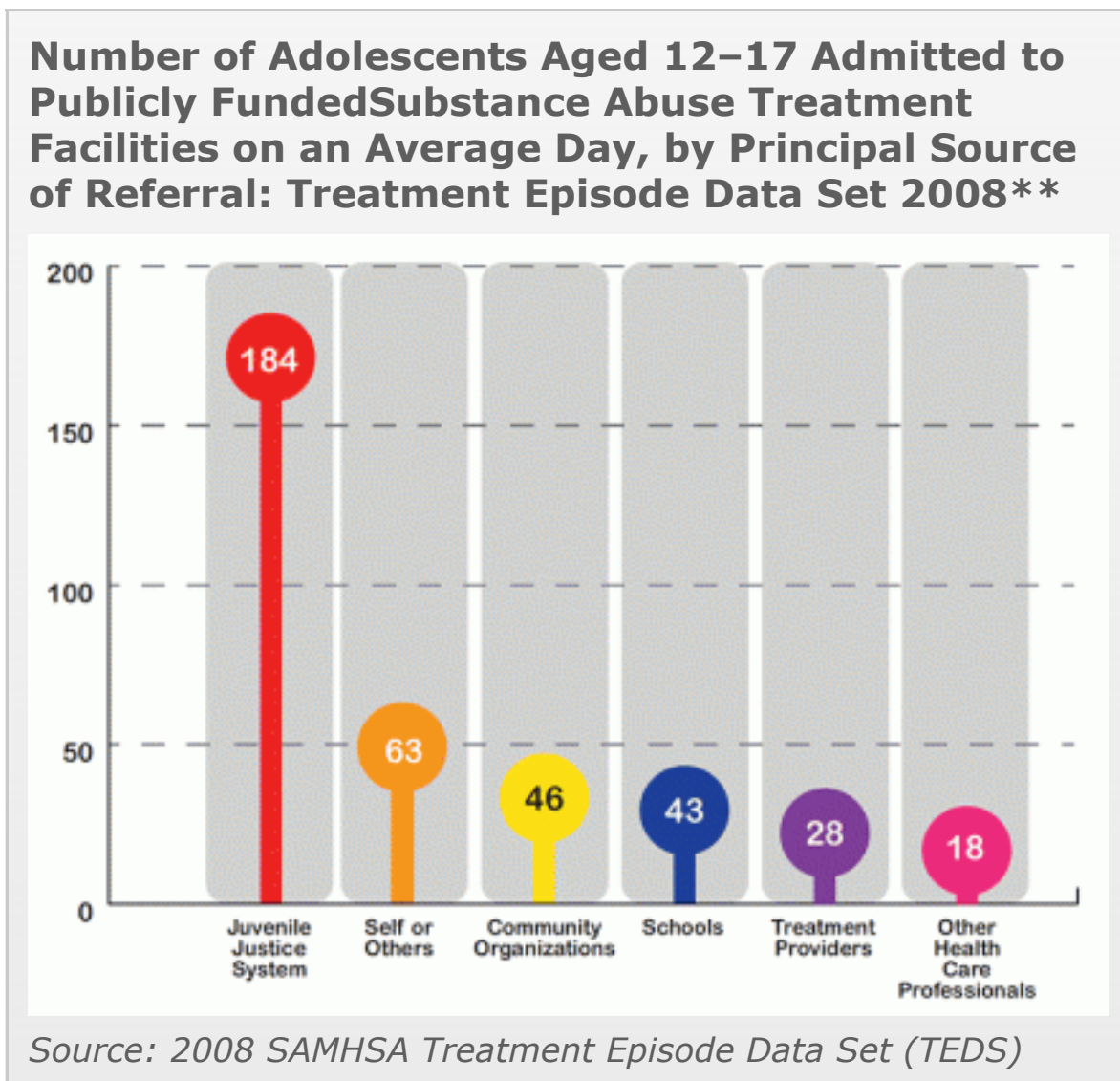


Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2013.

Not all young people are equally at risk for developing an addiction. Various factors including inherited genetic predispositions and adverse experiences in early life make trying drugs and developing a substance use disorder more likely. Exposure to stress (such as emotional or physical abuse) in childhood primes the brain to be sensitive to stress and seek relief from it throughout life; this greatly increases the likelihood of subsequent drug abuse and of starting drug use early.⁵ In fact, certain traits that put a person at risk for drug use, such as being impulsive or aggressive, manifest well before the first episode of drug use and may be addressed by prevention interventions during childhood.⁶ By the same token, a range of factors, such as parenting that is nurturing or a healthy school environment, may encourage healthy development and thereby lessen the risk of later drug use.

Drug use at an early age is an important predictor of development of a substance use disorder later. The majority of those who have a substance use disorder started using before age 18 and developed their disorder by age 20.⁷ The likelihood of developing a substance use disorder is greatest for those who begin use in their early teens. For example, 15.2 percent of people who start drinking by age 14 eventually develop alcohol abuse or dependence (as compared to just 2.1 percent of those who wait until they are 21 or older),⁸ and 25 percent of those who begin abusing prescription drugs at age 13 or younger develop a substance use disorder at some time in their lives.⁹ Tobacco, alcohol, and marijuana are the first addictive substances most people try. Data collected in 2012 found that nearly 13 percent of those with a substance use disorder began using

marijuana by the time they were 14. [10](#)



When substance use disorders occur in adolescence, they affect key developmental and social transitions, and they can interfere with normal brain maturation. These potentially lifelong consequences make addressing adolescent drug use an urgent matter. Chronic marijuana use in adolescence, for example, has been shown to lead to a loss of IQ that is not recovered even if the individual quits using in adulthood. [11](#) Impaired memory or thinking ability and other problems caused by drug use can derail a young person's social and educational development and hold him or her back in life.

The serious health risks of drugs compound the need to get an adolescent who is abusing drugs into treatment as quickly as possible. Also, adolescents who are abusing drugs are likely to have other issues such as mental health problems accompanying and possibly contributing to their substance use, and these also need to be addressed. [12](#)

Unfortunately, less than one third of adolescents admitted to substance abuse treatment who have other mental health issues receive any care for their conditions. [13](#)

Adolescents' drug use and treatment needs differ from those of adults.

Adolescents in treatment report abusing different substances than adult patients do. For example, many more people aged 12–17 received treatment for marijuana use than for alcohol use in 2011 (65.5 percent versus 42.9 percent), whereas it was the reverse for adults (see [figure](#)). When adolescents do drink alcohol, they are more likely than adults to

binge drink (defined as five or more drinks in a row on a single occasion).¹⁴ Adolescents are less likely than adults to report withdrawal symptoms when not using a drug, being unable to stop using a drug, or continued use of a drug in spite of physical or mental health problems; but they are more likely than adults to report hiding their substance use, getting complaints from others about their substance use, and continuing to use in spite of fights or legal trouble.

Adolescents also may be less likely than adults to feel they need help or to seek treatment on their own. Given their shorter histories of using drugs (as well as parental protection), adolescents may have experienced relatively few adverse consequences from their drug use; their incentive to change or engage in treatment may correspond to the number of such consequences they have experienced.¹⁵ Also, adolescents may have more difficulty than adults seeing their own behavior patterns (including causes and consequences of their actions) with enough detachment to tell they need help.

Only 10 percent of 12- to 17-year-olds needing substance abuse treatment actually receive any services.¹⁶ When they do get treatment, it is often for different reasons than adults. By far, the largest proportion of adolescents who receive treatment are referred by the juvenile justice system (see [figure](#)). Given that adolescents with substance use problems often feel they do not need help, engaging young patients in treatment often requires special skills and patience.

Many treatment approaches are available to address the unique needs of adolescents.

The focus of this guide is on *evidence-based* treatment approaches—those that have been scientifically tested and found to be effective in the treatment of adolescent substance abuse. Whether delivered in residential or inpatient settings or offered on an outpatient basis, effective treatments for adolescents primarily consist of some form of behavioral therapy. Addiction medications, while effective and widely prescribed for adults, are not generally approved by the U.S. Food and Drug Administration (FDA) for adolescents. However, preliminary evidence from controlled trials suggest that some medications may assist adolescents in achieving abstinence, so providers may view their young patients' needs on a case-by-case basis in developing a personalized treatment plan.

Whatever a person's age, treatment is not "one size fits all." It requires taking into account the needs of the whole person—including his or her developmental stage and cognitive abilities and the influence of family, friends, and others in the person's life, as well as any additional mental or physical health conditions. Such issues should be addressed at the same time as the substance use treatment. When treating adolescents, clinicians must also be ready and able to manage complications related to their young patients' confidentiality and their dependence on family members who may or may not be supportive of recovery.

Supporting Ongoing Recovery—Sustaining Treatment Gains and Preventing Relapse.

Enlisting and engaging the adolescent in treatment is only part of a sometimes long and complex recovery process.¹⁷ Indeed, treatment is often seen as part of a continuum of care. When an adolescent requires substance abuse treatment, follow-up care and recovery support (e.g., mutual-help groups like 12-step programs) may be important for helping teens stay off drugs and improving their quality of life.

When substance use disorders are identified and treated in adolescence—especially if they are mild or moderate—they frequently give way to abstinence from drugs with no further problems. Relapse is a possibility, however, as it is with other chronic diseases like diabetes or asthma. Relapse should not be seen as a sign that treatment failed but as an occasion to engage in additional or different treatment. Averting and detecting relapse involves monitoring by the adolescent, parents, and teachers, as well as follow-up by treatment providers. Although recovery support programs are not a substitute for formal evidence-based treatment, they may help some adolescents maintain a positive and productive drug-free lifestyle that promotes meaningful and beneficial relationships and connections to family, peers, and the community both during treatment and after treatment ends. Whatever services or programs are used, an adolescent’s path to recovery will be strengthened by support from family members, non-drug-using peers, the school, and others in his or her life.

* In this guide, the terms drugs and substances are used interchangeably to refer to tobacco, alcohol, illegal drugs, and prescription medications used for nonmedical reasons.

‡ Specifying the period of adolescence is complicated because it may be defined by different variables, and policymakers and researchers may disagree on the exact age boundaries. For purposes of this guide, adolescents are considered to be people between the ages of 12 and 17.

For purposes of this guide, the term addiction refers to compulsive drug seeking and use that persists even in the face of devastating consequences; it may be regarded as equivalent to a severe substance use disorder as defined by the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5, 2013). The spectrum of substance use disorders in the DSM-5 includes the criteria for the DSM-4 diagnostic categories of abuse and dependence.

** “Treatment providers” in this chart refers to “alcohol/drug abuse care providers.” Treatment providers can and do refer people to treatment if, for example, a person is transferring from one level of treatment to another and the original facility does not provide the level of treatment that the person needs, or if a person changes facilities for

some other reason. "Other health care professionals" refers to physicians, psychiatrists, or other licensed health care professionals or general hospitals, psychiatric hospitals, mental health programs, or nursing homes.

This page was last updated January 2014

NIH...Turning Discovery Into Health

Was this article helpful?

Yes

No

