

# SUBSTANCE USE DISORDERS

---

## Introduction

### *Recent Changes from the DSM-IV to the DSM-5*

## Categories

## Prevalence

## Causes and Risk Factors

## Comorbidity

## Screening and Assessment

## Treatments

### *Psychological Treatments*

### *Pharmacological Treatments*

### *Unproven Treatments*

## Cultural Considerations

## Overview for Families

## Introduction

It is not uncommon for adolescents to experiment with a variety of substances, both legal and illegal. However, drug and alcohol use is a leading cause of morbidity and mortality among adolescents, and experimentation can lead to substance use disorder. An estimated 1.2 million adolescents aged 12 to 17 had a substance use disorder in 2015, which represents 5.0 percent of adolescents, or about 1 in 20 adolescents (Center for Behavioral Health Statistics and Quality, 2016). In addition, in 2015, 5.3 million young adults aged 18 to 25 had a substance use disorder.

Studies have shown that children who experiment with substances at a young age are more likely to use other drugs later in life. Data from the Substance Abuse and Mental Health Services Administration (SAMHSA) Treatment Episode Data Set (TEDS) revealed that 74 percent of adults participating in a substance abuse treatment program had initiated alcohol or drug use before the age of 17. Those who began at a very young age (11 years old or younger) were more likely to have multiple substance dependencies when compared to those who waited until they were 25 years and older (SAMHSA, 2014). These findings highlight the need to prevent drug initiation among adolescents and children or delay it for as long as possible.

### ***Recent Changes from the DSM-IV to the DSM-5***

*Information in this section is taken from the American Psychiatric Association (APA, 2013).*

In 2013, the American Psychiatric Association (APA) released the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)* to replace the fourth text revision (*DSM-IV-TR*). Previously, the *DSM-IV-TR* identified two separate substance use disorders. The first of these was substance abuse, which referred to the maladaptive use of a substance and required just one criterion of maladaptive use be met over a one-year period. The second was substance dependence, which referred to physiological and/or psychological addiction and required three criterion of addictive use be met over a one-year period. The *DSM-5* collapsed these two distinct disorders into one condition, substance use disorder. Substance use disorder criteria include all symptoms in the *DSM-IV-TR* for substance abuse and

substance dependence, with the exception of the removal of “recurrent legal problems” and the addition of “craving.” Like the *DSM-IV-TR*, the *DSM-5*, identifies substance-induced disorders, including intoxication, withdrawal, and substance or medication-induced mental disorders.

Substance use disorders also have a severity scale, which is measured by the number of criteria met. The severity scale, as set forth in the *DSM-5*, is as follows:

- Two to three criteria indicate a mild disorder
- Four to five criteria indicate a moderate disorder
- Six or more criteria indicate a severe disorder

New withdrawal categories identified in the *DSM-5* include cannabis withdrawal and caffeine withdrawal.

The *DSM-5* also specifies the following remission criteria:

- Early remission entails at least three but less than 12 months without substance use disorder criteria (except craving)
- Sustained remission is defined as at least 12 months without criteria (except craving)

The *DSM-5* is a manual for assessment and diagnosis of mental health disorders and does not include information for treatment of any disorder. In the future, more evidence supporting treatments of disorders with *DSM-5* classifications will be available as clinical studies utilizing *DSM-5* criteria are conducted. As a result, this *Collection* will reference studies that utilize *DSM-IV* diagnostic criteria to explain symptoms and treatments.

## **Categories**

*Unless otherwise cited, information in this section is taken from APA (2013).*

Disorders collected under the title of substance-related disorders in the *DSM-IV-TR* are now collected under the name of substance-related and addictive disorders in the *DSM-5*. Specific criteria for substance abuse and substance addiction have been combined into the name of “substance use disorders.”

The main evidence of the existence of a substance use disorder is the cluster of cognitive, behavioral, and physiological symptoms that reflect the persistence of use despite substance-related problems. (J. Aaron, personal communication, October 17, 2017). The symptoms of substance use disorder can be grouped into four categories: impaired control, social impairment, risky use, and pharmacological criteria.

Pharmacological criteria include tolerance and withdrawal. Tolerance is the need for larger amounts of the substance to achieve the desired intoxication effects. Withdrawal is an intense and unpleasant cluster of physiological and cognitive symptoms. Withdrawal symptoms generally vary across substances. While youth may continue substance use for many reasons, those with physiological addiction may continue their use despite negative consequences in order to either avoid or relieve withdrawal symptoms.

The specific criteria used to diagnose substance use disorder are common across the classes of substances. Substance use disorder is diagnosed when there is a problematic pattern of substance use leading to clinically significant impairment or distress, as manifested by at least two of the following, occurring within a 12-month period:

- The substance is taken in larger amounts or over a longer period than originally intended.
- There are multiple unsuccessful attempts to stop usage, despite a strong desire to do so.
- A great deal of time is spent obtaining, using, or recovering from the effects of the substance.
- The individual experiences cravings or strong desire to use the substance.
- Recurrent use results in failure to fulfill major obligations at work, school, or home.

- Use continues despite persistent social or interpersonal problems caused by use.
- Important social, occupational, or recreational activities are given up or reduced because of use.
- Use continues in situations in which use is physically hazardous.
- Use continues despite knowing one has a physical or psychological problem that is likely to be caused or exacerbated by the substance.
- Tolerance, defined as requiring a markedly increased dose to achieve the desired effect, develops.
- Withdrawal symptoms occur, which lead the individual to use the substance in order to relieve the symptoms.

The severity of substance use disorder is estimated by the number of criteria present. An estimated two or three symptoms is mild, four or five is moderate, and six or more is severe.

The *DSM-5* divides substances into the following ten classes:

1. Alcohol
2. Caffeine
3. Cannabis
4. Hallucinogens
  - Phencyclidine (PCP)
  - Other hallucinogens
5. Inhalants
6. Opioids
7. Sedatives, hypnotics, and anxiolytics
8. Stimulants
9. Tobacco
10. Other substances

Substance use disorder is a possible diagnosis in every class except caffeine. These classes are described in the paragraphs that follow.

### **Alcohol**

Alcohol use disorder is characterized by a cluster of behavioral and physical symptoms, which can include withdrawal, tolerance, and craving. Withdrawal develops approximately four to 12 hours after the reduction of intake following prolonged, heavy alcohol ingestion. Once a pattern of repetitive and intense use develops, individuals with alcohol use disorder may devote substantial periods of time to obtaining and consuming alcoholic beverages. Withdrawal is unpleasant and triggers some individuals to continue consuming alcohol to avoid or reduce withdrawal symptoms. In addition, withdrawal can trigger life-threatening seizures in some people. Alcohol cravings, indicated by a strong desire to drink, can incite individuals to use alcohol in physically hazardous ways, such as while driving or swimming. Resulting damage from alcohol use disorder can include poor school performance, social and interpersonal problems, blackouts, depression, and liver disease and other serious health problems.

Studies have also shown that one form of substance abuse, binge drinking, damages the adolescent brain more than the adult brain. Examination of differences in the effects of alcohol on receptor activity in the hippocampus of adolescents and adults reveals the impact of alcohol on these age groups (White, 2004). These differences suggest that adolescents are more vulnerable than adults to the impact of alcohol on learning and memory. Heavy drinking in early or middle adolescence, with resulting cortical damage, can also lead to diminished control over cravings for alcohol and to poor decision-making (White).

## **Caffeine**

Caffeine can be found in coffee, tea, caffeinated soft drinks, energy drinks and similar aids, over-the-counter analgesics and cold remedies, weight-loss aids, chocolate and, increasingly, vitamins and food products. Symptoms of caffeine intoxication include restlessness, nervousness, excitement, insomnia, flushed face, diuresis, and gastrointestinal complaints. Symptoms at higher doses include muscle twitching, rambling thoughts and speech, tachycardia or cardiac arrhythmia, periods of seemingly unlimited energy, and psychomotor agitation. These signs may not occur in those who have developed a tolerance. Caffeine withdrawal symptoms include headache with marked fatigue or drowsiness, dysphoric or depressed mood, irritability, difficulty concentrating, nausea, vomiting, or muscle pain and stiffness.

## **Cannabis**

Cannabis, also known as marijuana, is used in several forms, including plant form and a concentrated extraction called hashish. It is typically smoked (via pipes or water pipes, in cigarette form, or in paper from hollowed out cigars) or ingested. A new intake method, called vaporizing, involves heating plant material to release psychoactive cannabinoids for inhalation. Synthetic formulations are available in pill or capsule form for medical indications such as relieving nausea and vomiting from chemotherapy or stimulating appetite in individuals with AIDS. Cannabis has also been used to control seizures in persons with epilepsy who do not respond to other interventions.

Cannabis intoxication typically begins with a “high” feeling, followed by euphoria, inappropriate laughter and grandiosity, sedation, and lethargy. Additional symptoms include short-term memory impairment, difficulty completing complex mental processes, impaired judgment, distorted sensory perceptions, impaired motor performance, and the sensation that time is passing slowly. At times, cannabis use is accompanied by anxiety, dysphoria, or social withdrawal. Physical signs develop within two hours of cannabis use, including conjunctival injection (red, bloodshot eyes), increased appetite, dry mouth, and tachycardia.

The *DSM-5* recognizes the potential of cannabis withdrawal syndrome, symptoms of which include irritability, anger or aggression, anxiety, depressed mood, restlessness, difficulty sleeping, and decreased appetite or weight loss.

Although cannabis use disorder can co-occur with other substance use disorders, this is uncommon.

## **Hallucinogens**

### **Phencyclidine (PCP)**

Phencyclidine (PCP or angel dust) and similar substances are referred to as dissociative hallucinogens. They produce feelings of separation from the mind and body in small doses, and stupor and coma can result at high doses. These substances include phencyclidine, ketamine, cyclohexamine, and dizocilpine. They are often smoked or taken orally, but they can also be snorted or injected. While these drugs are often used in an illicit manner, ketamine is also used to help treat major depressive disorder.

The primary effects of PCP last for a few hours, but the drug stays in the body eight days or more. The *DSM-5* separates PCP intoxication from intoxication by other hallucinogens. Common symptoms of PCP intoxication include disorientation, confusion without hallucination, hallucinations or delusions, catatonic-like state, and coma of varying severity.

### **Other hallucinogens**

Many hallucinogens are chemically different from one another but, as a group, they produce similar perception, mood, and cognition alterations in users. These substances are typically taken orally, but they

are sometimes smoked. Duration of hallucinogenic effects varies depending upon the substance taken, and some substances have a long half-life, extending the effects even further. This is important because the effects of a substance with a longer half-life persist longer than those with a shorter half-life. Tolerance may develop to hallucinogens, but hallucinogen tolerance does not create a cross-tolerance with other drug categories, such as amphetamines or cannabis.

Hallucinogen use may lead to hallucinogen persisting perception disorder, characterized by a sober individual re-experiencing perceptual disturbances. These persistent disturbances can happen either episodically or almost continually, and may last for weeks, months, or years. The disturbances are typically visual, including geometric hallucinations, false perceptions of movement in peripheral vision, intensified or flashing color, and trails of visual images. Additional disturbances include hallucinating entire objects, experiencing positive after-images and halos, and misperceiving the size of images.

The *DSM-5* does not include hallucinogenic withdrawal syndrome as a criteria for abuse or as a diagnosis because clinically significant withdrawal syndrome has not been consistently documented in humans. However, there is some evidence of hallucinogenic and stimulant withdrawal symptoms associated with MDMA (also called ecstasy or molly).

### ***Inhalants***

Inhalants are volatile hydrocarbons: toxic gases from glues, fuels, paints, and other volatile compounds. Inhalant intoxication develops during or immediately following volatile hydrocarbon substance inhalation, and the intoxication ends several minutes to several hours after inhalation. At times, inhalation is completed by inhaling substances within a closed container, like a plastic bag over the head. Inhalation may cause unconsciousness, anoxia, and death. Sudden death may also occur, often from cardiac arrhythmia or arrest or from the toxicity of the substance inhaled.

Inhalant use disorder exists when use persists even when the user knows the substance is causing serious problems. Lingering odors and peri-oral or peri-nasal rash may suggest the presence of the disorder. Medical complications like brain white matter pathology and rhabdomyolysis, in which muscle fibers break down and release into the bloodstream, is also a possible indication of inhalant use disorder.

### ***Opioids***

Opioids relieve pain and induce euphoria. Some opioids are illegal, such as heroin, while others are used by medical professionals to treat pain and are available by prescription. The brain also manufactures natural opioids, which human beings naturally crave (Rosenblatt & Catlin, 2012). This natural craving, combined with the intense pleasure opioids can induce, can be a dangerous combination that can lead to abuse.

Opioid use disorder is the compulsive, prolonged self-administration of opioids for no legitimate medical purpose, or the use of opioids in great excess of what is needed to treat a medical condition. Prescription forms of opioids are sometimes acquired by falsifying or exaggerating medical conditions or by visiting several physicians for the same disorder (called “doctor shopping”). In addition, prescription opioids are sometimes easily accessible in the family home, which poses a significant risk to youth and adolescents.

Symptoms of opioid intoxication include initial euphoria followed by apathy, dysphoria, and psychomotor agitation or impairment. Impaired judgment also occurs. Most individuals with opioid use disorder have developed significant tolerance to the drugs, and discontinuation causes withdrawal symptoms. Withdrawal can also occur independently of opioid use disorder and regardless of whether use is medical or recreational. In addition, other disorders can be induced by opioid use, such as opioid-induced depressive disorder, opioid-induced anxiety disorder, opioid-induced sleep disorder, and opioid-induced sexual dysfunction.

In 2015, an estimated 276,000 adolescents aged 12 to 17 were current misusers of opioids, which corresponds to 1.1 percent of adolescents (Center for Behavioral Health Statistics and Quality, 2016). Moreover, the prescribing rates for opioids among adolescents and young adults nearly doubled from 1994 to 2007 (American Society of Addiction Medicine [ASAM], 2016). Abuse of prescription medication can lead to abuse of drugs such as heroin. In 2014, an estimated 21,000 adolescents had used heroin in the past year, an estimated 5,000 were current heroin users, and an estimated 6,000 had a heroin use disorder (ASAM).

To learn more about the risks associated with opioid medications, physicians can utilize the Updated Medication Guides available for each brand of opioid, patient counseling documents, and the Extended-Release and Long-Acting Opioid Analgesics Risk Evaluation and Mitigation Strategy (REMS) website (FDA, 2017). The FDA has also released a blueprint for prescriber education regarding extended-release/long-acting opioids. This blueprint outlines key information about different brands of opioids and contains guidance about patient assessment, initiating and managing opioid therapy, and counseling patients about the dangers of opioids (FDA).

### ***Sedatives, Hypnotics, and Anxiolytics***

Several drug types are included in the sedatives, hypnotics, and anxiolytics category. These include benzodiazepines, benzodiazepine-like drugs, carbamates, barbiturates, barbiturate-like hypnotics, all prescription sleeping medications, and almost all prescription anti-anxiety medications. One type of substance omitted from this category is nonbenzodiazepine anti-anxiety medications because they are not significantly misused.

These drugs are brain depressants and act similarly to alcohol. Individuals who misuse sedatives, hypnotics, or anxiolytics typically crave the substance and may mix it with other medicines and substances. Symptoms of intoxication associated with a substance use disorder include inappropriate sexual or aggressive behavior, marked fluctuation of mood, and impaired judgment. Additionally, intoxication may include slurred speech, lack of coordination to the level of causing falls or difficulty driving, unsteady gait, cognitive impairment, and stupor or coma. Clinicians can also look for nystagmus, or fast, uncontrollable eye movements. As with all substance use disorders, impaired social or occupational functioning also results.

Tolerance and withdrawal can occur with sedative, hypnotic, or anxiolytic use and can be very significant. However, tolerance and withdrawal that occurs as a result of appropriate medical use does not meet the criteria for a substance use disorder. Sedatives, hypnotics, and anxiolytics are often prescribed to offset or alleviate effects of other substance use disorders. Nevertheless, with regular use, tolerance develops, and the affected individual must take more of the substance to reach desired effects.

Withdrawal from sedatives, hypnotics, and anxiolytics typically occurs after several weeks of use, and it is similar to alcohol withdrawal. Symptoms include increased heart and respiratory rate, elevated blood pressure or body temperature, and sweating, along with hand tremors, nausea occasionally with vomiting, insomnia, and anxiety. Another possible symptom of withdrawal is psychomotor agitation, which is unintentional motor activity manifested as fidgeting, pacing, and hand-wringing (Leventhal & Zimmerman, 2010). As many as 20 to 30 percent of individuals treated for sedative, hypnotic, or anxiolytic withdrawal may experience grand mal seizures. The time between last dose and onset of withdrawal symptoms depends upon the substance. For example, withdrawal symptoms from triazolam can begin within a few hours, while withdrawal symptoms from diazepam (which lasts much longer in the body) may take one to two days to develop.

## **Stimulants**

Stimulants include amphetamines and amphetamine-type substances (such as cocaine, crack cocaine, and methamphetamine). Stimulants are typically taken orally, intravenously, or by being inhaled. Stimulant medications are often prescribed for obesity, attention-deficit/hyperactivity disorder (ADHD), and narcolepsy. Stimulant use disorder can develop within one week of onset of use, and tolerance occurs regardless of whether a substance use disorder develops. Stimulants stimulate the central nervous system and produce psychoactive and sympathomimetic effects. Dopamine levels increase in the brain, causing intense pleasure and increased energy or, in some cases, anxiety and paranoia. With repeated use, stimulants can disrupt the dopamine system, reducing an individual's ability to feel pleasure (National Institute on Drug Abuse [NIDA], 2014). Long term effects include panic attacks, paranoid psychosis, increased risk for heart attacks and, for intravenous users who share needles, infection with HIV (NIDA).

Withdrawal symptoms include hypersomnia (excessive daytime sleepiness or prolonged nighttime sleep), increased appetite, and dysphoria (National Institute of Neurological Disorders and Stroke (NINDS), 2013). Occasionally, vivid and unpleasant dreams will also occur, and appetite will increase. Additionally, intense depressive symptoms that resolve within one week often signal stimulant withdrawal.

## **Tobacco**

Tobacco use disorder typically occurs in those who smoke or use tobacco products daily, but not in those who do not use tobacco daily or who use nicotine medications such as smoking cessation aids. Individuals who are not used to using tobacco often feel nausea and dizziness upon use, symptoms that are more pronounced with the first use of tobacco each day. Those with tobacco use disorder typically do not experience these symptoms. Most tobacco users report strong cravings when they do not use tobacco for several hours, and many tobacco users chain smoke (smoke cigarettes all day with no break between). Tobacco users may forego social events for a lack of tobacco-friendly areas.

When tobacco use is stopped, very distinct withdrawal symptoms occur. These symptoms are much stronger in users who smoke or use smokeless tobacco than in those who use nicotine medications. The symptomatic discrepancy is potentially because of the higher levels of nicotine in cigarettes and smokeless tobacco in comparison to levels in nicotine medications. People who have ceased tobacco use often experience a heart rate decline of five to 12 beats per minute and a weight increase of four to seven pounds.

## **Unknown or Other Substance Use Disorder**

The *DSM-5* provides for diagnostic criteria for a substance use disorder with unknown origin unrelated to the substances listed above. The following substances meet this criterion:

- Anabolic steroids
- Nonsteroidal anti-inflammatory drugs
- Cortisol
- Antiparkinsonian medications
- Antihistamines
- Nitrous oxide
- Anyl-butyl- or isobutyl-nitrites
- Betel nut, chewed in many cultures for mild euphoria and a floating sensation
- Kava, often taken for sedation, incoordination, weight loss, mild hepatitis, and lung abnormalities
- Cathinones, which produce a stimulant effect

Unknown substance use disorder is associated with an intoxicant the individual cannot identify or with new illegal drugs that are not yet identified.

Intoxication by unknown substances is challenging to diagnose. Clinicians may ask for patient history to determine whether the youth experienced similar symptoms in the past and if the youth knows a street name for the substance.

**Prevalence**

The prevalence of substance use disorders varies among the substances used. Table 1 outlines the 12-month prevalence rates of substance use disorders among various populations. At this time, available prevalence rates do not capture substance use by youth younger than 12 years of age.

**Table 1  
Prevalence Rates of Substance Use Disorders**

| Substance Use Disorder                | Youth 12–17  | Males 12–17 | Females 12–17 | Adults 18+                 | Males 18+ | Females 18+ |
|---------------------------------------|--|-------------|---------------|----------------------------|-----------|-------------|
| Alcohol                               | 4.6%   |             |               | 8.5%                       | 12.4%     | 4.9%        |
| Cannabis                              | 3.4%   | 3.8%        | 3.0%          | 1.5%                       | 2.2%      | 0.8%        |
| Caffeine                              | Unclear: estimates of 7% of U.S. population may experience five or more symptoms with functional impairment consistent with a diagnosis of caffeine intoxication |             |               |                            |           |             |
| Phencyclidine                         | 0.3% have ever used  |             |               | 1.3% – 2.9% have ever used |           |             |
| Other hallucinogens                   | 0.5%   | 0.4%        | 0.6%          | 0.1%                       | 0.2%      | 0.1%        |
| Inhalants                             | 0.4%   |             |               |                            |           |             |
| Opioids                               | 1.0%   |             |               | 0.37%                      | 0.49%     | 0.26%       |
| Heroin                                | 0.1%   |             |               |                            |           |             |
| Analgesics                            | 1.0%   |             |               |                            |           |             |
| Sedatives, Hypnotics, and Anxiolytics | 0.3%   | 0.2%        | 0.4%          | 0.2%                       | 0.3%      | 0.29%       |
| Stimulants                            |  |             |               |                            |           |             |
| Amphetamine                           | 0.2%   | 0.3%        | 0.1%          | 0.2%                       | 0.2%      | 0.2%        |
| Cocaine                               | 0.2%   | 0.4%        | 0.1%          | 0.3%                       | 0.4%      | 0.1%        |
| Nicotine Dependence                   |  |             |               | 13%                        | 14%       | 12%         |

Source: APA, 2013.

The following is taken from APA (2013). Recent studies indicate that there may be an increase in phencyclidine (PCP) use among 12<sup>th</sup> graders, from 1.8 percent to 2.3 percent having ever used, and from 1.0 percent to 1.3 percent having used within the past year. Of the 12<sup>th</sup> graders who have used phencyclidine, 57 percent have used it within the past 12 months. Use of ketamine in the past year is

stable in 12<sup>th</sup> graders at a rate of 1.6 to 1.7 percent. The rate of hallucinogenic use is significantly higher than that of hallucinogenic abuse, with as many as 3.1 percent of 12 to 17 year olds having used hallucinogens within the past 12 months. There is no gender difference in usage rates for 12 to 17 year olds.

Monitoring the Future (MTF) is a long-term study of American adolescents, college students, and adult high school graduates through age 55. It has been conducted since 1975. Results from the 2016 study found that annual prevalence of the use of any illicit drug, excluding marijuana, was 5 percent, 10 percent, and 14 percent for youth in 8<sup>th</sup>, 10<sup>th</sup>, and 12<sup>th</sup> grades, respectively (Johnston et al., 2017). This report noted that psychotherapeutic drugs warrant special attention, given that they now make up a significantly larger part of the overall U.S. drug problem than was true over ten years ago. The survey also revealed that between 48 and 50 percent of students had tried illicit drugs by the time they left high school (Johnston et al). Alcohol remains the substance most widely used by adolescents. Despite recent declines, six out of every 10 students (61 percent) have consumed alcohol by the end of high school, and about a quarter (23 percent) have done so by 8<sup>th</sup> grade. Nearly half (46 percent) of 12<sup>th</sup> graders and one in 11 (9 percent) 8<sup>th</sup> graders in 2016 reported having been drunk at least once in their life. Among 12<sup>th</sup> graders, the annual prevalence of marijuana use was over 35 percent in 2016 (Johnston et al.).

Table 2 outlines substance use trends among youth.

**Table 2**  
**Substance Use Among Youth Ages 12 to 17**

| Substance                   | Past Month Use |
|-----------------------------|----------------|
| Alcohol                     | 9.6%           |
| Cigarettes                  | 4.2%           |
| Smokeless tobacco           | 1.5%           |
| Heroin                      | 0.1%           |
| Sedatives                   | 0.1%           |
| Tranquillizers              | 0.7%           |
| Stimulants                  | 0.5%           |
| Marijuana                   | 7.0%           |
| Prescription pain relievers | 1.1%           |
| Psychotherapeutic drugs     | 2.0%           |
| Inhalants                   | 0.7%           |
| Methamphetamine             | 0.1%           |
| Cocaine                     | 0.2%           |
| Hallucinogens               | 0.5*%          |

Source: Center for Behavioral Health Statistics and Quality, 2016

\*In 2015, the National Survey on Drug Use and Health (NSDUH) estimate of any hallucinogen use was expanded to include the use of ketamine, DMT/AMT/Foxy, and salvia divinorum.

Another study that includes substance use prevalence in Virginia provides additional insight. Table 3 outlines prevalence rates in Virginia.

**Table 3**  
**Youth Substance Use in Virginia Ages 12 to 17**

| Substance                                     | Past Month Use | Past Year Use |
|---|----------------|---------------|
| Illicit drugs                                 | 7.4%           |               |
| Cigarettes                                    | 5.0%           |               |
| Binge alcohol use among individuals 12-20     | 13.4%          |               |
| Nonmedical use of prescription pain relievers |                | 4.8%          |

Source: SAMHSA, Behavioral Health Barometer Virginia, 2015.

These findings are alarming because substance use among youth has been associated with a number of negative consequences, including physical aggression, academic and occupational problems, delinquency and criminal behavior, developmental problems, and long-term health problems (U.S. Department of Health and Human Services, 2007). In addition, children and adolescents who become chronic substance users often develop psychological or social problems. There is evidence that supports the relationship between substance abuse and criminal behaviors in youth. Juvenile offenders demonstrate elevated rates of substance abuse in comparison to non-offending youth. Substance abuse often increases recidivism and reflects a deeper involvement in the juvenile justice system (Carter, 2012). Drug and alcohol use also increases the likelihood that a youthful offender will have prolonged interaction with the juvenile justice system. Severe substance abuse is associated with increased rates of offending and more serious offenses. Furthermore, in general, the younger the child is at the onset of substance use, the greater the probability of severe and chronic offending (Carter).

### **Causes and Risk Factors**

There are a number of factors that place youth at a higher risk for initiating and continuing substance use. A combination of physiological and environmental factors influences risk for addiction (National Institute on Drug Abuse, 2016). In addition, adolescent substance use itself is a known risk factor for the development of later alcohol and substance use problems, as well as related externalizing disorders such as antisocial personality disorder (Meyers & Dick). Understanding the early risk factors and trajectories that make these youths vulnerable to substance use disorders is crucial to the development of effective strategies for prevention.

### ***Biological Process of Addiction***

Addiction is a brain disease that develops over time. Long-term substance use causes profound changes in brain structure and function, which result in uncontrollable, compulsive drug or alcohol craving, seeking, and substance using (Leshner, 2001).

According to Harvard Medical School (2011), addiction occurs when substances of abuse hijack the reward center of the brain. The brain is designed to encourage life-sustaining and healthy activities through the release of the chemical dopamine. Substances of abuse flood the brain's dopamine circuits with much more dopamine than natural rewards generate (addictive drugs can release two to 10 times the amount of dopamine as do natural rewards). This causes feelings of intense pleasure. However, the presence of excess dopamine causes the brain to adapt by producing and absorbing less dopamine. This process is called "tolerance." As an individual develops tolerance to a drug, he or she must take more of it to obtain the same "high." The pleasure associated with the drug eventually subsides, but because dopamine is also involved in learning and memory, the memory of that pleasure remains extremely salient, causing intense craving. Eventually, the addicted individual becomes biologically and psychologically compelled to take the drug.

### **Physiological Risk Factors**

Several physiological factors can make it more likely that an individual will become addicted to a substance. The later stages of puberty, regardless of chronological age, is in itself a risk factor, and adolescents entering puberty at an earlier age also enter the risk period earlier (Patton et al., 2005). Young people entering puberty who also have sensation-seeking traits may have an increased likelihood of substance use, while youth who exhibit impulse control seem to have a reduced likelihood of substance use (Castellanos-Ryan et al., 2013).

Having a mental health disorder also places youth at a higher risk for developing a substance use disorder (Bukstein, 1998; Conway, 2016). The presence of a childhood conduct disorder is a major risk factor for substance abuse (Brook et al., as cited by Kamon, Budney, & Stanger, 2005; Meyers & Dick, 2010). Substance abuse and conduct problems share risk factors, including family conflict, poor parental monitoring, parental substance use, academic problems, and association with delinquent peers (Anderson et al., as cited by Kamon, Budney, & Stanger). More than half of adolescents with substance abuse problems also experience conduct problems, which can make treatment of substance abuse particularly challenging (Kaminer et al., as cited by Kamon, Budney, & Stanger). Genetic influences can also be risk factors for substance abuse. Although there is no single gene that makes an individual more susceptible to substance abuse, there are multiple genes of subtle effects that interact to make the individual more vulnerable to a host of behaviors and disorders. These genetic vulnerabilities work in tandem with the individual's dynamic environment to become risk factors (NIDA, 2014).

Twin methodology has been used to study the contribution of genetic and environmental influences on a particular trait or disease state. Twin studies provide an estimation of a trait's heritability in a population. Heritability of substance use disorders varies among substances (and the measure of substance use), populations, age, and sex (Meyers & Dick, 2010). A 2006 meta-analysis of twin studies showed that the heritability of all addictive substances ranges from 40 to 60 percent (Goldman, Oroszi, & Ducci, as cited by Meyers & Dick). Heritability in the range of 30 to 60 percent are also observed for illicit drug use.

A study utilizing the Virginia Twin Registry sample to identify common genetic factors underlying the major class of psychiatric and substance use disorders found that a common genetic factor was shared across alcohol dependence, illicit drug dependence, adult antisocial behavior, and childhood conduct disorder (Kendler et al., as cited by Meyers & Dick). Several other studies have found that a common genetic factor, broadly termed the externalizing factor, accounts for the significant portion of the variance in alcohol dependence, abuse/dependence on other drugs, adult antisocial behavior, and childhood conduct disorder (Meyers & Dick, 2010).

Studies have also linked cAMP response element-binding protein (CREB) in the process of substance tolerance, dependence, and withdrawal symptoms (Davis, 2004). Various immunoblotting data have shown that CREB protein or activated CREB is regulated by various drugs of abuse within brain regions implicated in addiction (Ekanem, Sunday, & Gaim, 2016). The precise role of CREB in mediating addiction-related behaviors is still unclear.

### **Environmental Factors**

Buu (2009) examined the long-term effects of family and neighborhood risk factors on adolescent substance use. The study found that parental substance use disorders, family socioeconomic status, family mobility, neighborhood residential instability, and neighborhood environmental change placed adolescents at risk for developing substance use disorders. Adolescents with a history of physical and/or sexual abuse were also more likely to be diagnosed with substance use disorders (Shane et al., as cited by NIDA, 2014). Many other risk factors, including prenatal exposure to alcohol or other drugs, lack of parental supervision or monitoring, and association with drug-using peers also play an important role (Nash, McQueen, & Bray, as cited by NIDA).

One study found that youth exposed to traumatic events had a greater likelihood of using substances (Carliner et al., 2016). Exposure to any traumatic event before age 11 years was reported by 36 percent of the study participants and was associated with higher risk for use of marijuana, cocaine, prescription drugs, other drugs, and multiple drugs (Carliner et al.). A significant finding was that exposure to interpersonal violence was associated with all drug use outcomes. Traumatic accidents were associated with higher risk for marijuana, cocaine, and prescription drug use. The researchers concluded that traumatic events in childhood are associated with risk for illicit drug use among U.S. adolescents. The results also highlight that adolescents with a trauma history are a high-risk group for illicit drug use and may benefit from trauma-focused prevention efforts that specifically address traumatic memories and coping strategies for dealing with stressful life events.

It is important to note that environmental and social risk factors may differ significantly during different phases of the youth's development. Parental and peer influences are often critical in early phases of substance use, while the influence of peers may increase as the child gets older (SAMHSA, 1999). In addition, a youth's vulnerability to these influences also influences their risk of using substances. Studies have found that a child's or adolescent's level of susceptibility or vulnerability to risk factors (in other words, their level of sensitivity to their environments) influences the likelihood of developing a substance use disorder (Leshner, 2001; McGue, & Iacono, 2008).

### **Comorbidity**

Existing regional and community studies have shown that the majority of youth with substance use disorders have a comorbid conduct disorder (CD), oppositional defiant disorder (ODD), or depression, and also that prior psychiatric conditions during adolescence may predict substance use disorders later in life (Conway et al., 2016). Another study showed that childhood ADHD, ODD, CD, and depression increase the risk of developing substance use disorders (Groenman et al., 2017).

An investigation by Conway et al. (2016) found that over 37 percent of adolescents experienced at least one mental health disorder before their first use of alcohol, over 47 percent before regular alcohol use, and over 66 percent before alcohol abuse. For drug categories, over 41 percent of adolescents met criteria for at least one mental disorder before having the opportunity to use drugs, over 53 percent before first drug use, and over 66 percent before drug abuse. Regarding specific mental disorders, higher rates across the stages of alcohol and illicit drug use were typically observed for adolescents with anxiety or behavior disorders, whereas the lowest rates were observed for individuals with phobia or eating disorders. In particular, the rates of alcohol abuse were much higher among adolescents with prior anxiety disorders (17.3 percent) and behavior disorders (15.6 percent) than their counterparts with prior phobia disorders (8.5 percent) or eating disorders (9.7 percent). Nearly one-fourth of adolescents with a prior behavior disorder and one-fifth of adolescents with an anxiety disorder developed illicit drug abuse. The findings confirm that the burden of substance use disorders in adolescence is disproportionately concentrated among youth with prior mental disorders, and that this burden is not limited to treated samples. The risk posed by prior mental disorders also varied considerably by stages of substance use.

A separate analysis found that comorbidity with ADHD, mood, or anxiety disorders is very common among U.S. adolescents who have substance use disorders (Zorick, 2012). Again, these data reinforce and extend many previous studies conducted in regional sample populations, demonstrating that substance use disorders among adolescents are highly comorbid with behavioral, mood, and anxiety disorders. A representative sample of 4,000 adolescents found that comorbid psychiatric conditions were associated with worse psychosocial functioning than those diagnosed with only a substance use disorder. Increased severity of addiction was also associated with an increased risk of psychiatric comorbidity (Zorick). These study findings show that adolescent behavioral disorders tend to be highly associated with the propensity to develop substance use disorders (Zorick).

Finally, epidemiologic studies find that it is not uncommon for individuals to abuse more than one substance. Instead, polysubstance abuse/dependence is the norm, with high rates of comorbidity across various drug classes (Meyers & Dick, 2010). Specific to cannabis use, comorbidity can include use of additional drugs, including opioids and cocaine. Along with co-occurring drug use, psychological conditions include depression, anxiety, suicide, and conduct disorder, along with decreased life satisfaction and increased mental health treatment and hospitalization (APA, 2013). Adolescents who use hallucinogens, including ecstasy, are more likely to have other substance use disorders and antisocial personality disorder (APA).

### Screening and Assessment

*The following is taken from Yaghmaie and Weinstock (2012).* The goal of comprehensive clinical assessment of adolescent addiction is to accurately identify signs and symptoms of problematic substance use so that prevention and early intervention can take place. Unlike screening, clinical assessment is a more comprehensive process in which the diagnosis of substance use disorders and other comorbid psychiatric conditions is established via clinical interview and focused physical examination. If consent is provided, additional information can be obtained from lab testing, past medical records, other clinicians, and from parents or other people who know the adolescent. Several structured and semi-structured interviews for evaluation of substance abuse are available that can identify substance abuse problems with greater validity than a non-structured clinical assessment. However, structured interviews can sometimes misinterpret special situations and miss important details better identified in comprehensive clinical interviews. It is important to supplement structured interviews with more in-depth clinical inquiries and interviewing. A comprehensive evaluation of adolescent substance use should cover a variety of elements. These are outlined in Figure 1.

When assessing youth suspected of co-occurring disorders, the primary goal is to determine whether substance use also exists and whether it fits the established criteria for substance use disorders (Bukstein, 1998). If a clinician has concerns about substance abuse during screening, assessment for substance abuse should proceed (Bukstein, 2005). This can be assessed using diagnostic instruments such as the Kiddie-Schedule for Affective Disorders and Schizophrenia and Lifetime Version or the Diagnostic Interview Schedule for Children. This determination should also be based on a comprehensive developmental, social, and medical history. Evaluators should obtain the necessary information from a variety of sources, including the youth, parents, family members, school personnel, previous treatment records, and perhaps other involved agencies (SAMHSA, 1997; Bukstein, 2005). Additionally, toxicology testing should be a part of ongoing assessment and treatment of substance use disorder in youth (Bukstein). Once clinicians have established that the youth is using substances, they must then determine the nature of the use pattern.

**Figure 1**  
**Domains to Assess When Evaluating for Addiction**

|                                       |  |
|---------------------------------------|--|
| History of substance abuse            | Family history                             |
| History of problematic behavior       | Home environment/peer relationships        |
| Psychiatric history                   | Developmental issues, trauma/abuse history |
| Medical history                       | Academic and vocational history            |
| Physical and mental status evaluation | Legal history                              |
| Sexual history                        | Motivation and capacity for change         |

Source: Yaghmaie & Weinstock, 2012.

Recognition of co-occurring substance use and mental health disorders is often difficult, and clinicians should consider several issues when conducting the evaluation. The youth may display denial, distortion, and minimization when discussing substance use; therefore, the details provided by them may not be reliable. Furthermore, in cases of co-occurring mental health disorders, the youth and family may not fully understand the reasons for the distressing symptoms and behaviors. Therefore, the information provided during the evaluation may not be particularly revealing (Bukstein, 1998). Moreover, reports of substance use may be distorted by the cognitive and emotional aspects of any underlying mental health disorder, further decreasing the validity of self-reporting (Mueser, Drake, & Miles, 1997).

Clinicians must also consider that youth with co-occurring mental health and substance use disorders often present different symptoms than substance abusers who do not have a mental health disorder (Mueser, Drake, & Miles, 1997). They may use lower amounts of alcohol and/or drugs and experience different consequences from use. Based on these differences, standard instruments may not identify the substance use disorder in these youth and the clinician may have to rely primarily on clinical interviews and patient histories.

There are a number of screening and assessment tools specifically designed to measure diagnostic criteria for substance use disorders, the nature of substance use, and impairment in functioning among adolescents:

**Adolescent Diagnostic Interview** (ADI; Winters & Henly, 1993) is a structured interview that assesses *DSM-IV* criteria for substance use disorders and measures the adolescent's level of functioning across several domains (e.g. peers, school behavior, and home behavior). The test-retest and interrater reliability is well-established for this instrument (Winters, 1999).

**Adolescent Drug Abuse Diagnosis** (ADAD; Friedman & Utada, 1989) instrument is a structured comprehensive interview that assesses substance use and nine life problems and can be used for both treatment planning and assessing behavioral change over time. ADAD is reliable among raters and test-retest processes, and its external validity is adequate for most of the nine life problems scales (Winters, 1999).

**Adolescent Self-Assessment Profile** (ASAP; Wanberg, 1992) is a self-report instrument that provides a differential assessment for an adolescent's substance use and psychosocial adjustment. It can be used in treatment to assess behavior and adjustment changes across time, and it has excellent reliabilities and good content and construct validity (Winters, 1999).

**American Drug and Alcohol Survey** (ADAS; Oetting, Beauvais, & Edwards, 1985) is a self-report instrument that assesses levels of substance use. This instrument can assess the magnitude of substance use among youth and is most useful at the local level.

**Chemical Dependency Assessment Profile** (CDAP; Harrell, Honaker, & Davis, 1991) is a multiple-choice and true-false self-report measure. It assesses history of chemical use, patterns of use, reinforcement mechanisms, perception of situational stressors, and attitudes related to treatment, self-concept, and interpersonal relations. Psychometric properties for this measure could not be found (Winters, 1999).

**The Center for Adolescent Substance Abuse Research Screening Tool** (CRAFFT; Center for Adolescent Substance Abuse Research, 2016) is a six-question behavioral health screening tool to screen adolescents for high risk alcohol and other drug use disorders simultaneously. It has been recommended by the American Academy of Pediatrics' Committee on Substance Abuse for use with adolescents under the age of 21.

**Juvenile Automated Substance Abuse Evaluation (JASAE;** ADE, Inc., 1987) is a computer-assisted screening and assessment instrument that assesses substance use and abuse among juveniles, as well as attitude and life stressors. It is a brief assessment and is often used in conjunction with more extensive interviews (Miller, 1999; Winters, 1999).

**Personal Experience Inventory (PEI;** Winters & Henly, 1989) is a comprehensive assessment that assesses substance use and related problems, problem severity, and psychosocial risk factors. The scales have been found to be reliable and valid for assessing substance use disorders in African American, Latino, Asian American, and Native American populations (Winters, 1999).

Table 4 lists the assessment tools that may be used for substance use disorder.

**Table 4**  
**Suggested Screening and Assessment Tools for Substance Use Disorder**

| Name of Measure   | Measure Type       | Who Completes                   | Generated Information                                      |
|---|--------------------|---------------------------------|--|
| Kiddie-Schedule for Affective Disorders (K-SADS) and Schizophrenia and Lifetime Version | Clinical interview | Clinician with youth and parent | Diagnosis  |
| Diagnostic Interview Schedule (DISC)  | Clinical interview | Clinician with youth and parent | Diagnosis  |
| Adolescent Diagnostic Interview (ADI)   | Clinical interview | Youth                           | Diagnosis  |
| Adolescent Drug Abuse Diagnosis (ADAD)  | Clinical interview | Youth                           | Symptom ratings  |
| Adolescent Self-Assessment Profile (ASAP)   | Self-rating scale  | Youth                           | Symptom ratings  |
| American Drug and Alcohol Survey (ADAS)   | Self-rating scale  | Youth                           | Symptom ratings  |
| Chemical Dependency Assessment Profile (CDAP)   | Self-rating scale  | Youth                           | Symptom ratings  |
| The Center for Adolescent Substance Abuse Research Screening Tool (CRAFFT)              | Self-rating scale  | Clinician with youth and parent | Initial screen to determine if risky behaviors are present |
| Juvenile Automated Substance Abuse Evaluation (JASAE)                                   | Self-rating scale  | Youth                           | Symptom ratings  |
| Personal Experience Inventory (PEI)   | Self-rating scale  | Youth                           | Symptom ratings  |

Sources: Commission on Youth Graphic of citations provided in text.

## Treatments

Treatment for substance use disorders is delivered at varying levels of care in many different settings (NIDA, 2014). Because no single treatment is appropriate for every youth or adolescent, treatments must

be tailored for the individual. Based on the consensus of drug treatment experts, the American Society of Addiction Medicine (ASAM) has developed guidelines for determining the appropriate intensity and length of treatment for adolescents with substance abuse problems, based on an assessment involving the following six areas:

1. Level of intoxication and potential for withdrawal
2. Presence of other medical conditions
3. Presence of other emotional, behavioral, or cognitive conditions
4. Readiness or motivation to change
5. Risk of relapse or continued drug use
6. Recovery environment (e.g., family, peers, school, legal system) (ASAM, as cited by NIDA)

With a substance use disorder, as with any other medical condition, treatment must be long enough and strong enough to be effective. Substance abuse treatment must continue for a sufficient length of time to treat the disease. Undertreating a substance use disorder—providing lower than the recommended level of care or a shorter length of treatment than recommended—will increase the risk of relapse and could cause the youth, their family members, or the referring system to lose hope in the treatment because they will see it as ineffective (NIDA, 2014).

The information in the following paragraphs is taken from NIDA (2014) and details the settings in which adolescent substance use treatment most often occurs.

**Outpatient/Intensive Outpatient:** Child and adolescent substance abuse treatment is most commonly offered in outpatient settings. When delivered by well-trained clinicians, this can be highly effective. Outpatient treatment is traditionally recommended for adolescents with less severe addictions, few additional mental health problems, and a supportive living environment, although evidence suggests that more severe cases can be treated in outpatient settings as well. Outpatient treatment varies in the type and intensity of services offered and may be delivered on an individual basis or in a group format. Low- or moderate-intensity outpatient care is generally delivered once or twice a week. Intensive outpatient services are delivered more frequently, typically more than twice a week for at least three hours per day. Outpatient programs may offer substance use prevention programming focused on deterring further drug use or other behavioral and family interventions.

**Partial Hospitalization:** Youth with more severe substance use disorders but who can still be safely managed in their home living environment may be referred to a higher level of care called partial hospitalization or “day treatment.” This setting offers adolescents the opportunity to participate in treatment four to six hours a day at least five days a week while living at home.

**Residential/Inpatient Treatment:** Residential treatment is a resource-intensive high level of care, generally for youth and adolescents with severe levels of addiction whose mental health and medical needs and addictive behaviors require a 24-hour structured environment to make recovery possible. These adolescents may have complex psychiatric or medical problems or family issues that interfere with their ability to avoid substance use. One well-known long-term residential treatment model is the therapeutic community (TC). TCs use a combination of techniques to “resocialize” the adolescent and enlist all the members of the community, including residents and staff, as active participants in treatment. Treatment focuses on building personal and social responsibility and developing new coping skills. Such programs offer a range of family services and may require family participation if the TC is sufficiently close to where the family lives. Short-term residential programs also exist.

Once the treatment setting has been determined, numerous methods are used to treat children and adolescents with substance use disorders. These treatments are discussed in the following paragraphs and are outlined in Table 5.

**Table 5**  
**Summary of Treatments for Substance Use Disorder**

| <b>What Works</b>   |  |
|---|--|
| Cognitive behavioral therapy (CBT)  | A structured therapeutic approach that involves teaching youth about the thought-behavior link and working with them to modify their thinking patterns in a way that will lead to more adaptive behavior in challenging situations.  |
| Family therapy<br>Multidimensional family therapy (MDFT)<br>Functional family therapy (FFT) | Family-based therapy is aimed at providing education, improving communication and functioning among family members, and reestablishing parental influence through parent management training. MDFT views drug use in terms of networks of influences (individual, family, peer, community) and encourages treatment across settings in multiple ways. FFT is best used in youth with conduct and delinquent behaviors along with substance use disorders combining relationship with CBT interventions to change relationship patterns and improve the family’s functioning. |
| Multisystemic therapy (MST)   | An integrative, family-based treatment with a focus on improving psychosocial functioning for youth and families.  |
| <b>What Seems to Work</b>   |  |
| Behavioral therapies  | Behavioral therapies focus on identifying specific problems and areas of deficit and working on improving these behaviors.   |
| Motivational interviewing (MI)<br>Motivational enhancement therapy (MET)                    | MI is a brief treatment approach aimed at increasing motivation for behavior change. It is focused on expressing empathy, avoiding argumentation, rolling with resistance, and supporting self-efficacy. MET is an adaptation of MI that includes one or more client feedback sessions in which normative feedback is presented and discussed.   |
| Pharmacological treatments  | Some medication can be used for detoxification purposes, as directed by a doctor. Medication may also be used to treat co-existing mental health disorders.  |
| <b>Not Adequately Tested</b>  |  |
| Multifamily educational intervention (MEI)  | MEI combines psycho-educational and family interventions for troubled adolescents and their families.  |
| Adolescent group therapy (AGT)  | The AGT intervention incorporates adolescent therapy groups on stress management, developing social skills, and building group social support.   |
| Interpersonal and psychodynamic therapies   | Interpersonal and psychodynamic therapies are methods of individual counseling that are often incorporated into the treatment plan and focus on unconscious psychological conflicts, distortions, and faulty learning.   |

*Continued next page*

**Table 5 (continued)  
Summary of Treatments for Substance Use Disorder**

|                           |   |
|---------------------------|---|
| Client-centered therapies | A type of therapy focused on creating a non-judgmental environment, such that the therapist provides empathy and unconditional positive regard. This facilitates change and solution making on behalf of the youth. |
| Psychoeducation           | Programs aimed at educating youth on substance use and may cover topics like peer pressure and consequences of substance use.   |
| Project CARE              | A program aimed at raising awareness about chemical dependency among youth through education and training.  |
| Twelve-step programs      | A twelve-step program that uses the steps of Alcoholics Anonymous as principles for recovery and treating addictive behaviors.  |
| Process groups            | A type of psychotherapy that is conducted in a small group setting. Groups can be specialized for specific purposes and therapy utilizes the group as a mechanism of change.  |

### ***Psychological Treatments***

Numerous psychological treatments are used to treat youth with substance use disorders. These are discussed below.

#### **Cognitive Behavioral Therapy (CBT)**

The goal of CBT is the identification and modification of maladaptive thinking patterns to reduce negative thoughts, feelings, and behavior. For substance abusers, the focus of this intervention is generally relapse prevention (NIDA, 2014; Becker & Curry, 2008; Leukefeld et al., 2015). CBT can help the adolescent develop greater self-control; identify environmental and internal triggers leading to relapse; and develop strategies for dealing with stressors, triggers, and lapses into substance use. The role of clinicians is to aid the youth in anticipating the problems that they are likely to meet and to help them to develop effective coping strategies. The two main elements of CBT are functional analysis, identifying the thoughts and feelings before and after substance use, and skills building, such as ways to overcome peer pressure and increase pleasant activities (Effective Child Therapy, 2012). CBT also addresses social skills, anger control, and problem-solving (Bukstein, 2005; American Psychological Association [APA] Division 53, 2012).

Several research studies support CBT as effective in treating a wide range of substance use disorders (Miller & Wilbourne, 2002; Stephens, Roffman & Curtin, 2000; Waldron et al., 2001). Studies have also indicated that CBT also has positive effects with adolescents treated for mental health disorders such as depression (Bukstein, 1998). In addition, studies have shown that CBT is effective for adolescents diagnosed with conduct disorder and co-occurring substance abuse disorders (Kazdin, as cited by Bukstein, 2005).

#### **Family Therapy**

Although family therapy is considered an important modality in the treatment of adolescents with substance use disorders (Bukstein, 1998), clinicians and consumers should be aware that family therapy is a very broad term that encompasses a large number of treatment programs. Not all of these family therapies have been tested with children and adolescents with substance use disorder. Thus, it is important

and relevant to ask “what kind of family therapy” when family therapy is recommended. Common elements across most family therapies include:

- Engaging the family (versus working with the child alone);
- Focusing on education about substance use and abuse;
- Emphasizing communication skills to improve family functioning; and
- Reestablishing parental influence through parent management training (Bukstein, 1998).

Though family therapy is important, it may be contraindicated if family members actively abuse substances, are violent, deny that the youth’s substance use is problematic, or remain unreasonably angry (SAMHSA, 2012).

One program with empirical support is Multidimensional Family Therapy (MDFT), an outpatient, family-based treatment for adolescents with serious substance abuse issues (Liddle, 2009; APA Division 53, 2012; Leukefeld et al., 2015). This approach views drug use in terms of a network of influences (individual, family, peer, community) and encourages treatment across settings in multiple ways. Sessions may be held in a clinic, home, court, school, or other community locations. For the child or adolescent, the emphasis of treatment is on skill-building, and the treatment plan often incorporates practicing developmental tasks such as decision-making, negotiation, problem-solving, performing vocational skills, communication, and dealing with stress (Liddle, 2009; APA Division 53). Parallel sessions are held with family members, in which parents examine their parenting style, learn to distinguish influence from control, and learn to have a positive and developmentally appropriate influence on their child. Research supports the use of this type of therapy for adolescents with substance use disorders (Leukefeld et al.; NIDA, 2014).

Another well-established therapy method is Functional Family Therapy (FFT). FFT is best used in youth with conduct and delinquent behaviors along with substance abuse (APA Division 53, 2012). This short-term process combines relationship with CBT interventions to change relationship patterns and improve the family’s functioning (APA Division 53). FFT is specifically designed for youth ages 12 to 18, and is successful across locations and ethnic groups (APA Division 53). The effects of FFT endure years after treatment, at times into adulthood, and can positively impact siblings of affected youth as well (APA Division 53).

A method of strategic family therapy has also been tested and found effective with substance using adolescents. Szapocznik et al. (1989) tested their strategic model against usual methods. The model included educational information for the parents and youth, communication skills training, and cultural training to integrate a family’s cultural practices into treatment. Brief Strategic Family Therapy (BSFT) attempts to reduce negative behaviors, promote positive behaviors such as school attendance and performance, and improve family functioning. Clinicians typically administer 12 to 16 family sessions in convenient locations, at times even in the family home (APA Division 53, 2012).

### **Multisystemic Therapy (MST)**

One promising intervention program for youth with co-occurring substance use and mental health disorders is MST. MST aims to address the multifaceted nature of antisocial behavior at the individual, family, and community levels (Ouimette, 2007). This form of therapy is intended to address serious antisocial behavior in children and adolescents who abuse substances. Therapeutic efforts target the child’s behavior within the context of the family environment, the school environment, and the neighborhood and community (NIDA, 2012; APA Division 53, 2012). MST helps develop a support network of extended family, neighbors, and friends to help caregivers achieve and maintain such changes (APA Division 53). Treatment occurs in each of the child’s natural settings. Research has shown that MST significantly reduces adolescent drug use during treatment and for at least six months after treatment

(NIDA, 2014). It has also been found to reduce the number of juvenile incarcerations and out-of-home placements (NIDA, 2012).

MST is associated with significant, long-term reduction of aggressive behaviors in chronic and violent juvenile offenders (Henggeler & Brondino, 2002). Several research studies have reported that MST is associated with decreases in arrest and substance use rates (Borduin et al., 1990; Borduin et al., 1995). Clinical trials indicate that MST is an effective intervention for substance-abusing youth, particularly for marijuana abstinence (Henggeler & Brondino).

### **Behavioral Therapies**

The core of behavioral therapy is that behavior is learned and can be unlearned (University of North Carolina Greensboro [UNCG] Center for Youth, Family, and Community Partnerships, 2008). Behavioral therapies with research support include goal monitoring, contingency management, and skill-building approaches. The underlying goal of a goal monitoring approach is to allow the youth and the treatment provider to identify specific problems and areas of deficit and to work on improving these behaviors (Bukstein, 1998). Therapeutic activities are then designed to achieve these goals and may include fulfilling specific assignments, rehearsing desired behaviors, and recording and reviewing progress (NIDA, 2012). Contingency management (CM) interventions are sometimes used separately or in conjunction with a goal monitoring approach. In CM approaches, positive reinforcers are provided at intervals based on specific behaviors from the youth. Both goal monitoring and CM approaches are often incorporated into inpatient, residential, or partial hospitalization programs (Bukstein).

In community-based care, caregivers are taught to monitor goals and/or more effectively manage contingencies. Research shows that, when consistently applied, this type of therapy helps adolescents become drug-free and increases their ability to maintain abstinence after treatment ends (Azrin et al., 1996; NIDA, 2014). Participants have also been found to show improvement in areas such as employment, school attendance, family relationships, depression, and institutionalization (NIDA).

### **Motivational Enhancement Therapy (MET) and Motivational Interviewing (MI)**

MI is a directive, client-centered counseling style for eliciting behavior change by helping clients to explore and resolve their ambivalence and achieve lasting changes for a range of problematic behaviors. This intervention has been extensively tested in treatment evaluations of alcohol and other drug use/misuse. MI is a brief treatment approach that aims to increase motivation for behavior change in addicted and related problematic behaviors. It is based on five core principles, including the expression of empathy, highlighting discrepancies, avoiding argumentation, rolling with resistance, and supporting self-efficacy (Evans et al., 2005). Motivational approaches are accepting of ambivalence and uncertain motivation, and work on exploring these ambivalences. There has been ample support for the efficacy of MI in treating substance use disorders among adults (Burke, Arkowitz, & Menchola, 2003).

MET is an adaptation of MI that includes one or more client feedback sessions in which normative feedback is presented and discussed in an explicitly non-confrontational manner (Improving Practices, 2017). Research examining MET and MI among youth has found support for the efficacy of motivational interviewing in reducing substance related behaviors (Improving Practices; Leukefeld et al., 2015; Monti et al., 1999).

### **Pharmacological Treatments**

The target areas for the use of pharmacotherapy among adolescents with substance use disorders include treating withdrawal symptoms or substituting a legal drug for an illicit substance during prolonged withdrawal or maintenance, counteracting the physiological and subjective effects of abused substances, and treating comorbid psychiatric disorders (Bukstein, 1998). Clinicians should, however, use caution in

considering pharmacological treatment for adolescents with comorbid substance use disorders and psychiatric disorders. The presence of substance use may increase the potential for intentional or unintentional overdose with some medications, especially in combination with some substances of abuse (Bukstein, 2005). When medication is utilized for the treatment of a co-occurring mental health disorder, a cautious approach, as well as an integrated treatment strategy, is crucial (J. Aaron, personal communication, October 17, 2017).

Accordingly, NIDA recommends that medication should be pursued only as a last resort in this population due to the potential for misuse and overdose (2014). This is particularly relevant for drugs that are likely to be abused (J. Aaron, personal communication, October 17, 2017). Furthermore, medications should be prescribed only to those children and adolescents who displayed psychiatric symptoms prior to the substance use or only if the symptoms are present during periods of abstinence (NIDA). A definitive assessment requires that the youth abstain from the use of substances for a specified period, typically several weeks. Finally, if medication is prescribed, it is critical that the youth's physician closely monitors the medication regimen with the awareness that the youth may still be using other illicit substances.

Several medications have been found to be effective in treating addiction to opioids, alcohol, and nicotine in adults, although none of these medications have been approved by the FDA to treat adolescents (NIDA, 2014). In most cases, only preliminary evidence exists for the effectiveness and safety of these medications in people under 18, and there is no evidence on the neurobiological impact of these medications on the developing brain. However, despite the relative lack of evidence, some health care providers do use medications when treating adolescents (especially older adolescents) who are addicted to opioids, nicotine, or alcohol. Newer compounds continue to be studied for possibly treating substance use disorders in adults and adolescents. Note that there are currently no FDA-approved medications to treat addiction to cannabis, cocaine, or methamphetamine in any age group (NIDA).

According to the American Society of Addiction Medicine (ASAM), clinicians should consider treating adolescents who have opioid use disorder using the full range of treatment options, including pharmacotherapy (ASAM, 2015). Opioid agonists (methadone and buprenorphine) and antagonists (naltrexone) may be considered for treatment of opioid use disorder in adolescents (ASAM). Age is a consideration in treatment, and federal laws and FDA approvals need to be considered for patients under age 18. More research is needed to identify which psychosocial treatments, alone and in combination with pharmacotherapy, are best suited for use with adolescents.

### ***Unproven Treatments***

Two peer-led interventions—Multifamily Educational Intervention (MEI) and Adolescent Group Therapy (AGT)—were tested against the efficacy of MDFT treatment intervention described previously (Leukefeld et al., 2015). MEI combined psycho-educational and family interventions for troubled adolescents and their families. AGT incorporated adolescent therapy groups on stress management, developing social skills, and building group social support. Although each of the adolescents in these three treatment approaches demonstrated some improvement, the adolescents in the AGT and MEI treatments had higher drop-out rates, higher substance use, lower academic performance, and showed less family functioning compared to MDFT. Given the efficacy of MDFT and the more limited success of AGT compared to MEI, a critical aspect of successful treatment is the concurrent focus on the adolescent and his/her family in individualized-tailored treatment (Leukefeld et al.).

*The following information is from the 2007 Biennial Report of the Hawaii Department of Health (Chorpita & Daleiden, 2007). For the treatment of substance abuse, studies have found no support for the following treatments: client-centered therapy, education, group therapy, Project CARE, or 12-step programs. Moreover, these findings also indicate that group therapy and Project CARE treatment*

approaches may negatively affect treatment outcomes for substance abuse. However, some group therapy approaches may be appropriate, as described here, while others may be counterproductive.

According to NIDA, many youth have poor compliance in participating in aftercare interventions and resist involvement in 12-step programs and other post-treatment recovery activities (2015). Adolescents do not wish to be stigmatized as having a disease or being in recovery. They also may not view their addiction as a disease. As a result, up to 85 percent of adolescents relapse within one year of receiving treatment. An interactive mobile texting aftercare program has shown promise as a means to help youth and adolescents engage in post-treatment recovery activities and avoid relapse. In a pilot study, one program called Educating & Supporting Inquisitive Youth in Recovery (ESQYIR), reduced young people’s odds of relapsing by half compared with standard aftercare (NIDA). Additional research is needed to learn more about the effectiveness of this intervention.

### Cultural Considerations

Research indicates that there may be ethnic differences in risk factor profiles and that cultural differences should be taken into account when considering how risk factors predict substance use problems (Vega et al., 1993). The *DSM-5* specifies marked differences in prevalence rates across racial and ethnic subdivisions. These differences are outlined in Table 6.

**Table 6**  
**Twelve Month Substance Abuse Prevalence Across Race/Ethnic Subgroups in US Population**

| Substance                            | Age Group* | Hispanics | Native Americans & Alaska Natives | Caucasians | African Americans | Asian Americans & Pacific Islanders |
|--------------------------------------|------------|-----------|-----------------------------------|------------|-------------------|-------------------------------------|
| Alcohol                              | Youth      | 6.0%      | 5.7%                              | 5.0%       | 1.8%              | 1.6%                                |
|                                      | Adults     | 7.9%      | 12.1%                             | 8.9%       | 6.9%              | 4.5%                                |
| Cannabis                             | Youth      | 4.1%      | 7.1%                              | 3.4%       | 2.7%              | 0.9%                                |
|                                      | Adults     | 1.2%      | 3.4%                              | 1.4%       | 1.8%              | 1.2%                                |
| Hallucinogens                        | Youth      | 0.6%      | 1.2%                              | 0.6%       | 0.2%              | 0.2%                                |
|                                      | Adults     | 0.2%      | 0.2%                              | 0.2%       | 0.03%             | 0.07%                               |
| Sedatives, Hypnotics, or Anxiolytics | Youth      | 0.2%      | 0.1%                              | 0.3%       | 0.2%              | 0.1%                                |
|                                      | Adults     | 0.2%      | 0.8%                              | 0.2%       | 0.2%              | 0.1%                                |
| Stimulants<br>Amphetamine            | Youth      | 0.1%      | 0.0%                              | 0.3%       | 0.3%              | 0.01%                               |
|                                      | Adults     | 0.2%      | 0.6%                              | 0.2%       | 0.0%              | 0.0%                                |
| Cocaine                              | Youth      | 0.2%      | 0.0%                              | 0.2%       | 0.2%              | 0.2%                                |
|                                      | Adults     | 0.3%      | 0.8%                              | 0.2%       | 0.4%              | 0.1%                                |
| Nicotine dep.                        | Adults     | 6.0%      | 23.0%                             | 14.0%      | 10.0%             | 6.0%                                |

\*Youth=12-17 years of age; Adults=18 years of age and older  
Source: APA, 2013.

In addition, research cited by Walton (2001) suggests that females may enter substance abuse treatment with unique needs. Females present symptoms of greater psychological distress, such as low self-esteem and depression, and are much more likely to report prior physical and/or sexual abuse than their male

counterparts. These issues must be effectively addressed within the context of treatment in order to improve outcomes.

Walton (2001) also cites research that has found that females and minorities often enter treatment with fewer financial resources and positive social supports. Studies have found that many African Americans are at a higher risk of relapse because they may face more difficult social situations following treatment, such as high-stress and low-support environments.

## **Overview for Families**

Adolescents often have a hard time seeing the consequences of their actions. They frequently lack the ability to consider the lifelong physical, psychological, and social effects of substance abuse, which can lead to experimentation with drugs and alcohol. Alcohol, tobacco, and drug use have negative health effects (American Academy of Child & Adolescent Psychiatry AACAP, 2013). Substance use is associated with a variety of negative consequences including poor judgment, school failure, and alterations in brain structure, function, and neurocognition (AACAP, 2013; Squeglia, 2009).

Families should be aware of potential warning signs of drug use in adolescents. The first changes families often notice are in behavior and mannerisms (Ali et al., 2011). However, there are many warning signs, some of which include:

- Fatigue
- Red and glazed eyes
- Lasting cough
- Sudden mood changes
- Irresponsible behavior
- Poor judgment
- Depression
- Breaking rules and withdrawing from the family
- Negative attitude
- Drop in grades
- New friends that are less interested in standard home and school activities
- General discipline problems (AACAP, 2013)

Parents should talk to their children about drugs, be on the lookout for warning signs, and be good role models (AACAP). These conversations should take place at an early age and include discussions of alcohol and tobacco.

Some adolescents experiment with substance use, or use substances occasionally, without significant problems, while others become dependent. These youth often move to more dangerous drugs and can cause significant harm to themselves and others (AACAP, 2013).

While nobody knows which youth will develop serious substance use problems, certain adolescents are at higher risk for developing substance use disorder. These youth include those:

- With a family history of substance use disorders;
- Who are depressed or anxious;
- Who have low self-esteem; and/or
- Who feel like they don't fit in or are out of the mainstream (AACAP, 2013).

Figure 2 outlines additional risk factors, including those associated with the individual and the family. While none of these factors guarantee an adolescent will develop substance use disorder, families should be cognizant of the potential risks.

**Figure 2**  
**Risk Factors for Substance Use Disorder**  
**in Adolescents and Teens**

|  |
|--|
| <p>Family Risk Factors:</p> <ul style="list-style-type: none"><li>• Inadequate supervision from the family</li><li>• Inconsistent or severe discipline from the family</li><li>• Poor communication</li><li>• Family tension and conflicts</li><li>• Broken homes</li><li>• Family history of parental alcohol or drug abuse</li></ul> <p>Individual Risk Factors:</p> <ul style="list-style-type: none"><li>• History of early childhood negative and aggressive behavior or physical or sexual abuse</li><li>• Being an older adolescent Caucasian male</li><li>• Emotional, social, or academic problems</li><li>• Poor impulse control or thrill-seeking behaviors</li><li>• Emotional instability</li><li>• Very low perception of the dangers inherent in drug use</li></ul> <p>Other Risk Factors:</p> <ul style="list-style-type: none"><li>• Low socioeconomic status</li><li>• Level of education</li><li>• Living in a high crime and drug-use neighborhood</li><li>• Ease of drug availability</li><li>• Peer-group pressure</li><li>• History of mental illness</li></ul> |
|--|

Source: Ali et al., 2011.

There are a variety of illegal drugs and legal substances that youth utilize. Legally available drugs include alcohol, prescribed medications, inhalants (fumes from glues, aerosols, and solvents), and over-the-counter cough, cold, sleep, and diet medications. The most commonly used illegal drugs are marijuana (pot), stimulants (such as cocaine, crack, meth, and speed), LSD, PCP, opiates, heroin, and designer drugs (such as MDMA, also called ecstasy or molly) (AACAP, 2013).

Illegal drug use is growing, especially among young teens; first marijuana use is typically at the age of 14, and drinking alcohol can start before age 12 (AACAP, 2013). A variety of negative consequences result from substance use, including an increased risk of serious drug use later in life, school failure, and poor judgment, which puts teens at risk for accidents, violence, unplanned and unsafe sex, and suicide (AACAP). Families who talk to youth about drugs, have open communication, are positive role models, encourage responsible behavior, and recognize developing problems are most likely to curtail or prevent drug use (AACAP).

## **Resources and Organizations**

### **American Academy of Pediatrics Committee on Substance Abuse**

Substance Use Screening, Brief Intervention, and Referral to Treatment for Pediatricians

<http://pediatrics.aappublications.org/content/pediatrics/early/2011/10/26/peds.2011-1754.full.pdf>

### **Food and Drug Administration (FDA)**

Risk Evaluation and Mitigation Strategy (REMS) (Extended-Release and Long-Acting Opioid Analgesics)

<http://er-la-opioidrems.com/IwgUI/remshome.action>

### **Mental Health America (MHA) (formerly National Mental Health Association)**

<http://www.mentalhealthamerica.net/>

### **National Alliance for the Mentally Ill (NAMI)**

<https://www.nami.org/>

### **National Institute on Alcohol Abuse and Alcoholism (NIAAA)**

<https://www.niaaa.nih.gov/>

### **National Institute on Drug Abuse (NIDA)**

<https://www.drugabuse.gov/>

### **Office of Juvenile Justice and Delinquency Prevention (OJJDP)**

<https://www.ojjdp.gov/>

### **Stop Underage Drinking (Portal of Federal Resources)**

<https://casaa.unm.edu/ctn/ctn%20mod%20to%20ol%20kit/Prevention/Stop%20Underage%20Drinking%20%20Portal%20of%20Federal%20Resources.htm>

### **Substance Abuse and Mental Health Services Administration (SAMHSA)**

<https://www.samhsa.gov/>

### **The GAINS Center for Behavioral Health and Justice Transformation**

<https://www.samhsa.gov/gains-center>

### **Virginia Department of Behavioral Health and Developmental Services (DBHDS)**

<http://www.dbhds.virginia.gov/>

## **References**

- ADE, Inc. (1987). *Juvenile Automated Substance Abuse Evaluations (JASAE)*. Clarkston, MI: ADE.
- Ali, S., Mouton, C., Jabeen, S., Ofoemezie, E. K., Bailey, R., Shahid, M., & Zeng, Q. (2011). Early detection of illicit drug use in teenagers. *Innovations in Clinical Neuroscience*, 8(12), 24–28.
- American Academy of Child & Adolescent Psychiatry (AACAP). (2013). Facts for families: Teens: Alcohol and other drugs. [http://www.aacap.org/App\\_Themes/AACAP/docs/facts\\_for\\_families/03\\_teens\\_alcohol\\_and\\_other\\_drugs.pdf](http://www.aacap.org/App_Themes/AACAP/docs/facts_for_families/03_teens_alcohol_and_other_drugs.pdf)
- American Psychiatric Association (APA). (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.) (DSM-IV-TR). Washington, DC: Author.
- American Psychiatric Association (APA). (2006). *APA practice guidelines for the treatment of psychiatric disorders compendium 2006*. Washington, DC: Author.
- American Psychological Association (APA). (2012). Substance abuse. Retrieved from <http://effectivechildtherapy.com/content/substance-abuse>. *Not available December 2017*.
- American Psychiatric Association (APA). (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.) (DSM-5). Washington, DC: Author.
- American Society of Addiction Medicine (ASAM). (2015). *National practice guideline for the use of medications in the treatment of addiction involving opioid use*. Retrieved from <https://www.asam.org/docs/default-source/practice-support/guidelines-and-consensus-docs/asam-national-practice-guideline-supplement.pdf?sfvrsn=24#search=%22adolescent>
- American Society of Addiction Medicine (ASAM). (2016). Opioid addiction 2016 facts & figures. Retrieved from <https://www.asam.org/docs/default-source/advocacy/opioid-addiction-disease-facts-figures.pdf>
- Azrin, N., Acierno, R., Kogan, K., Donohue, B., Besalel, V., & McMahan, P. (1996). Follow-up results of supportive versus behavioral therapy for illicit drug use. *Behaviour Research and Therapy*, 34(1), 41-46.

- Becker, S., & Curry, J. (2008). Outpatient interventions for adolescent substance abuse: A quality of evidence review. *Journal of Consulting and Clinical Psychology, 76*(4), 531-43.
- Bogt, T., Gabhainn, S., Simons-Morton, B., Ferreira, M., Hublet, A., Godeau, E., ... Richter, M. (2012). Dance is the new metal: Adolescent music preferences and substance use across Europe. *Substance Use & Misuse, 47*(2), 130-142.
- Borduin, C., Henggeler, S., Blaske, D., & Stein, R. (1990). Multisystemic treatment of adolescent sexual offenders. *International Journal of Offender Therapy and Comparative Criminology, 35*, 105-114.
- Borduin, C., Mann, B., Cone, L., Henggeler, S., Fucci, B., Blaske, D., & Williams, R. (1995). Multisystemic treatment of serious juvenile offenders: Long-term prevention of criminality and violence. *Journal of Consulting and Clinical Psychology, 63*, 569-578.
- Bukstein, O. (1998). Summary of the practice parameters for the assessment and treatment of children and adolescents with substance use disorder. *Journal of the American Academy of Child and Adolescent Psychiatry, 36* (suppl), 140S-156S.
- Bukstein, O. (2005). Practice parameter for the assessment and treatment of children and adolescents with substance use disorders. *Journal of the American Academy of Child & Adolescent Psychiatry, 44*(6), 609-621.
- Burke, B., Arkowitz, H., & Menchola, M. (2003). The efficacy of motivational interviewing: A meta-analysis of controlled trials. *Journal of Consulting and Clinical Psychology, 60*, 9784-9979.
- Buu, A., Dipiazza, C., Wang, J., Puttler, L., Fitzgerald, H., & Zucker, R. (2009). Parent, family, and neighborhood effects on the development of child substance use and other psychopathology from preschool to the start of adulthood. *Journal of Studies on Alcohol and Drugs, 70*(4), 489-498.
- Carliner, H., Keyes, K. M., McLaughlin, K. A., Meyers, J. L., Dunn, E. C., & Martins, S. S. (2016). Childhood trauma and illicit drug use in adolescence: A population-based national comorbidity survey replication-adolescent supplement study. *Journal of the American Academy of Child and Adolescent Psychiatry, 55*(8), 701-708.
- Carter, S. (2012). The relationship between substance abuse and teen crime. Retrieved from <http://reclaimingfutures.org/blog/2012/10/15/substance-abuse-among-teen-offenders/>
- Castellanos-Ryan, N., Parent, S., Vitaro, F., Tremblay, R., & Séguin, J. R. Pubertal development, personality, and substance use: A 10-year longitudinal study from childhood to adolescence. *Journal of Abnormal Psychology, 122*(3), 782-796.
- Center for Adolescent Substance Abuse Research. (2016). The CRAFFT screening tool. Retrieved from <http://www.ceasar-boston.org/clinicians/crafft.php>
- Center for Behavioral Health Statistics and Quality. (2016). Key substance use and mental health indicators in the United States: Results from the 2015 national survey on drug use and health (HHS Publication No.SMA 16-4984, NSDUH Series H-51). Retrieved from [https://www.samhsa.gov/data/sites/default/files/NSDUH-FFR1-2015/NSDUH-FFR1-2015.pdf](https://www.samhsa.gov/data/sites/default/files/NSDUH-FFR1-2015/NSDUH-FFR1-2015/NSDUH-FFR1-2015.pdf)
- Chorpita, B., & Daleiden, E. (2007). 2007 biennial report: Effective psychosocial interventions for youth with behavioral and emotional needs. Child and Adolescent Mental Health Division, Hawaii Department of Health.
- Conway, K. P., Swendsen, J., Husky, M. M., He, J., & Merikangas, K. R. (2016). Association of lifetime mental disorders and subsequent alcohol and illicit drug use: Results from the national comorbidity survey—adolescent supplement. *Journal of the American Academy of Child & Adolescent Psychiatry, 55*(4), 280-288.
- Davis, J. (2004). Researchers identify alcoholism gene. WebMD Medical News. Retrieved from <https://www.webmd.com/mental-health/addiction/news/20040526/researchers-identify-alcoholism-gene>
- Ekanem, P., Sunday, D., & Gaim, K. (2016). CREB protein expressed differently in the frontal cortices of datura stramonium treated rats: Implication for addiction and neurodegeneration. *Journal of Behavioral and Brain Science, 6*, 209-218.
- Evans, D., Foa, E., Gur, R., Hendin, H., O'Brien, C. Seligman, M., & Walsh B. (2005). *Treating and preventing adolescent mental health disorders: What we know and what we don't know*. New York, Oxford University.
- Friedman, A., & Utada, A. (1989). A method for diagnosing and planning the treatment of adolescent drug abusers: The Adolescent Drug Abuse Diagnosis (ADAD) Instrument. *Journal of Drug Education, 19*(4), 285-312.
- Groenman, A. P., Janssen, T. W. P., & Oosterlaan, J. (2017). Childhood psychiatric disorders as risk factor for subsequent substance abuse: A meta-analysis. *Journal of the American Academy of Child & Adolescent Psychiatry, 56*(7), 556-569.
- Harrell, T., Honaker, L., & Davis, E. (1991). Cognitive and behavioral dimensions of dysfunction in alcohol and polydrug abusers. *Journal of Substance Abuse, 3*, 415-426.
- Hartz, S. M., Pato, C. N., Medeiros, H., Cavazos-Rehg, P., Sobell, J., Knowles, J., Bierut, L., & Pato, M. (2014). Comorbidity of severe psychotic disorders with measures of substance use. *JAMA Psychiatry, 71*(3), 248-254.

- Harvard Medical School. (2011). How addiction hijacks the brain. Harvard Mental Health Letter. Retrieved from [https://www.health.harvard.edu/newsletter\\_article/how-addiction-hijacks-the-brain](https://www.health.harvard.edu/newsletter_article/how-addiction-hijacks-the-brain)
- Henggeler, S., & Brondino, M. (2002). Four-year follow-up of multisystemic therapy with substance-abusing and substance-dependent juvenile offenders. *Journal of the American Academy of Child and Adolescent Psychiatry*, 41, 868-874.
- Improving Practices. (2017). Motivational enhancement/motivational interviewing. Retrieved from <https://www.improvingmipractices.org/practice-areas/motivational-enhancement-motivational-interviewing>
- Johnston, L. D., O'Malley, P. M., Miech, R. A., Bachman, J. G., & Schulenberg, J. E. (2017). 2016 Overview, key findings on adolescent drug use. Monitoring the future—National survey results on drug use, 1975-2016. Ann Arbor, MI: Institute for Social Research, the University of Michigan. Retrieved from <http://www.monitoringthefuture.org/pubs/monographs/mtf-overview2016.pdf>
- Kamon, J., Budney, A., & Stanger, C. (2005). A contingency management intervention for adolescent marijuana abuse and conduct problems. *Journal of the American Academy of Child and Adolescent Psychiatry*, 44(6), 513-521.
- Leshner, A. (2001). Addiction is a brain disease—and it matters. *Issues in Science and Technology*, 17-19.
- Leukefeld, C. G., Marks, K. R., Stoops, W. W., Reynolds, B., Lester, C., Sanchez, L., & Martin, C. A. (2015). Substance misuse and abuse. In T. P. Gullota, R. W. Plant, & M. A. Evans (Eds.), *Handbook of adolescent behavioral problems* (2<sup>nd</sup> ed.) (pp. 495-513). New York: Springer.
- Leventhal, A., & Zimmerman, M. (2010). The relative roles of bipolar disorder and psychomotor agitation in substance dependence. *Psychology of Addictive Behaviors*, 24(2), 360-365.
- Liddle, H. (2009). Treating adolescent substance abuse using multidimensional family therapy. In J. R. Weisz & A. E. Kazdin (Eds.), *Evidence-based psychotherapies for children and adolescents* (2<sup>nd</sup> ed.). New York: Guilford.
- McGue, M., & Iacono, W. G. (2008). The adolescent origins of substance use disorders. *International Journal of Methods in Psychiatric Research*, 17(1 Suppl), S30-S38.
- Meyers, J. L., & Dick, D. M. (2010). Genetic and environmental risk factors for adolescent-onset substance use disorders. *Child and Adolescent Psychiatric Clinics of North America*, 19(3), 465-477.
- Miller, G. (1999). Learning the language of addiction counseling. Boston: Allyn & Bacon.
- Miller, W., & Wilbourne, P. (2002). Mesa Grande: A methodological analysis of clinical trials of treatments for alcohol use disorders. *Addiction*, 97(3), 265-277.
- Monti, M., Colby, S., Barnett, N. P., Spirito, A., Rohsenow, D. J., Myers, M., ... Lewander, W. (1999). Brief intervention for harm reduction with alcohol-positive older adolescents in a hospital emergency department. *Journal of Consulting and Clinical Psychology*, 67(6), 989-994.
- Mueser, K., Drake, R., & Miles, K. (1997). The course and treatment of substance use disorder in persons with severe mental illness. In L. S. Onken, J. D. Blane, S. Genser, & A. M. Horton (Eds.), *Treatment of drug-dependent individuals with comorbid mental disorders*. National Institute on Drug Abuse Research Monograph 172: USDHHS.
- Mulder, J., Ter Bogt, T., Raaijmakers, Q., Gabhainn, S., Monshouwer, K., & Vollebergh, W. (2009). The soundtrack of substance use: Music preference and adolescent smoking and drinking. *Substance Use & Misuse*, 44(4), 514-531.
- Nagoshi, J., Marsiglia, F., Parsai, M., & Castro, F. G. (2011). The moderating effects of ethnic identification on the relationship between parental monitoring and substance use in Mexican heritage adolescents in the Southwest United States. *Journal of Community Psychology*, 39(5), 520-533.
- National Institute on Drug Addiction (NIDA). (2014). *Principles of adolescent substance use disorder treatment: A research-based guide*. Retrieved from <https://www.drugabuse.gov/publications/principles-adolescent-substance-use-disorder-treatment-research-based-guide/acknowledgements>
- National Institute on Drug Addiction NIDA. (2015). Text messaging aftercare intervention cuts youths' risk for relapse. Retrieved from <https://www.drugabuse.gov/news-events/nida-notes/2015/06/text-messaging-aftercare-intervention-cuts-youths-risk-relapse>
- National Institute on Drug Abuse (NIDA). (2012). *Principles of drug addiction treatment: A research-based guide*. NIH Publication No. 12-4180.
- National Institute on Drug Abuse (NIDA). (2016). Understanding drug use and addiction. Retrieved from <https://www.drugabuse.gov/publications/drugfacts/understanding-drug-use-addiction>
- National Institute of Neurological Disorders and Stroke (NINDS). (2013). Hypersomnia information page. Retrieved from <https://www.ninds.nih.gov/Disorders/All-Disorders/Hypersomnia-Information-Page>
- Oetting, E., Beauvais, F., & Edwards, R. (1985). The American drug and alcohol survey. Ft. Collins, CO: RMBSI.

- Ouimette, P. (2007). Co-occurring mental health & substance abuse disorders. Washington State University Spokane, the Washington Institute for Mental Illness Research & Training. Retrieved from <http://www1.dshs.wa.gov/pdf/hrsa/mh/cobestpract.pdf>. *Not available December 2017*.
- Patton, G., McMorris, J., Taumbaourou, W., Hemphill, S., Donath, S., & Catalano, R. (2005). Puberty and the onset of substance use and abuse. *Journal of the American Academy of Child and Adolescent Psychiatry, 44*(5), 460.
- Rosenblatt, R., & Catlin, M. (2012). Opioids for chronic pain: First do no harm. *Annals of Family Medicine, 10*(4), 300-301.
- Squeglia, L. M., Jacobus, J., & Tapert, S. F. (2009). The influence of substance use on adolescent brain development. *Clinical EEG and Neuroscience, 40*(1), 31-38.
- Stephens, R., Roffman, R., & Curtin, L. (2000). Comparison of extended versus brief treatments for marijuana use. *Journal of Consulting and Clinical Psychology, 68*, 898-908.
- Stetka, B., & Correll, C. (2013). A guide to DSM-5. Medscape. Retrieved from [https://www.medscape.com/viewarticle/803884\\_9?pa=NrH8czbAILKBTaXhQjkw0YVhvd3DWe0wwjIQzGPBN0lkRHr%2F5h71joaH4vi%2FxFICJyGvMX%2Fu%2BWdIXoARf%2FT0zw%3D%3D](https://www.medscape.com/viewarticle/803884_9?pa=NrH8czbAILKBTaXhQjkw0YVhvd3DWe0wwjIQzGPBN0lkRHr%2F5h71joaH4vi%2FxFICJyGvMX%2Fu%2BWdIXoARf%2FT0zw%3D%3D)
- Substance Abuse and Mental Health Services Administration (SAMHSA). (1997). Improving services for individuals at risk of, or with, co-occurring substance-related and mental health disorders: A SAMHSA conference report and a national strategy. U.S. Department of Health and Human Services.
- Substance Abuse and Mental Health Services Administration (SAMHSA). (1999). The relationship between mental health and substance abuse among adolescents. Office of Applied Studies. U.S. Department of Health and Human Services.
- Substance Abuse and Mental Health Services Administration (SAMHSA). (2007). National Survey on Drug Use and Health, 2007. ICPSR23782-v5. Ann Arbor, MI: Inter-university Consortium for Political and Social Research.
- Substance Abuse and Mental Health Services Administration (SAMHSA). (2008). Treatment improvement protocol (TIP) series, no. 32. SMA12-4080.
- Substance Abuse and Mental Health Services Administration (SAMHSA). (2012). 2011-2012 national survey on drug use and health: Model-based prevalence estimates (50 states and the District of Columbia). Retrieved from <https://archive.samhsa.gov/data/NSDUH/2k12State/Tables/NSDUHsaeTables2012.pdf>
- Substance Abuse and Mental Health Services Administration (SAMHSA). (2014). Age of substance use initiation among treatment admissions aged 18 to 30. The TEDS report. Retrieved from [https://www.samhsa.gov/data/sites/default/files/WebFiles\\_TEDS\\_SR142\\_AgeatInit\\_07-10-14/TEDS-SR142-AgeatInit-2014.htm](https://www.samhsa.gov/data/sites/default/files/WebFiles_TEDS_SR142_AgeatInit_07-10-14/TEDS-SR142-AgeatInit-2014.htm)
- Substance Abuse and Mental Health Services Administration (SAMHSA). (2015). *Behavioral Health Barometer: Virginia, 2015*. HHS Publication No. SMA-16-Baro-2015-VA. Rockville, MD: Author. Retrieved from <https://store.samhsa.gov/shin/content/SMA16-BARO-2015/SMA16-BARO-2015-VA.pdf>
- Szapocznik, J., Rio, A., Murray, E., Cohen, R., Scopetta, M., Rivas-Vazquez, A., ... Kurtines, W. (1989). Structural family versus psychodynamic child therapy for problematic Hispanic boys. *Journal of Consulting and Clinical Psychology, 57*, 571-578.
- University of North Carolina Greensboro (UNCG) Center for Youth, Family, and Community Partnerships. (2008). Evidence-based practice for adolescent substance abuse: A primer for providers and families. North Carolina Adolescent Substance Abuse Treatment Project.
- U.S. Department of Health and Human Services. (1999). Mental health: A report of the Surgeon General. Rockville, MD: Author.
- U.S. Department of Health and Human Services. (2007). The Surgeon General's call to action to prevent and reduce underage drinking. U.S. Department of Health and Human Services, Office of the Surgeon General.
- U.S. Food and Drug Administration. (FDA). (2013). FDA blueprint for prescriber education for extended-release and long-acting opioid analgesics. Updated May 2017. Retrieved from <https://www.fda.gov/downloads/Drugs/DrugSafety/InformationbyDrugClass/UCM515636.pdf.%5bOctober>
- U.S. Food and Drug Administration (FDA). (2017). FDA blueprint for prescriber education for extended-release and long-acting opioid analgesics. Retrieved from <https://www.fda.gov/downloads/Drugs/DrugSafety/InformationbyDrugClass/UCM515636.pdf.%5bOctober>
- Vega, W., Zimmerman, R., Warheit, G., Apospori, E., & Gil, A. (1993). Risk factors for early adolescent drug use in four ethnic and racial groups. *American Journal of Public Health, 3*(2), 185-189.
- Waldron, H., Slesnick, N., Brody, J., Turner, C., & Peterson, T. (2001). Treatment outcomes for adolescent substance abuse at 4- and 7-month assessments. *Journal of Consulting and Clinical Psychology, 69*, 802-813.

- Wanberg, K. (1992). Adolescent Self-Assessment Profile. Arvada, CO: Center for Alcohol/Drug Abuse Research and Evaluation.
- Walton, M. (2001). Diversity in relapse prevention needs: Gender and race comparisons among substance abuse treatment patients. *American Journal of Drug and Alcohol Abuse*, 27, 225-240.
- White, A. (2004). Alcohol and the adolescent brain. Department of Psychiatry, Duke Medical Center. Retrieved from <http://www.duke.edu/~amwhite/Adolescence/adolescent5.html>. Not available December 2017.
- Winters, K. (1999). Screening and assessing adolescents for substance use disorders. Treatment Improvement Protocol (TIP) Series 31. Rockville, MD: Substance Abuse and Mental Health Services Administration.
- Winters, K., & Henly, G. (1989). Personal Experience Inventory (PEI) test and manual. Los Angeles, CA: Western Psychological Services.
- Winters, K., & Henly, G. (1993). Adolescent Diagnostic Interview schedule and manual. Los Angeles, CA: Western Psychological Services.
- Yaghmaie, F., & Weinstock, R. (2012). Clinical assessment of addiction in adolescents. In *Clinical handbook of adolescent addiction* (pp. 27-35). Chichester, UK; John Wiley & Sons.
- Zorick, Todd. (2012). Psychiatric comorbidities in adolescent substance use disorders. *Clinical handbook of adolescent addiction* (pp. 88-98). Chichester, UK; John Wiley & Sons.

**DISCLOSURE STATEMENT**

The information contained herein is strictly for informational and educational purposes only and is not designed to replace the advice and counsel of a physician, mental health provider, or other medical professional. If you require such advice or counsel, you should seek the services of a licensed mental health provider, physician, or other medical professional. The Commission on Youth is not rendering professional advice and makes no representations regarding the suitability of the information contained herein for any purpose.