

*“Mental health programs designed to reduce common psychological problems associated with child and adolescent victimization are common, but few include specific interventions delaying the onset of substance use and reducing substance abuse. . .”<sup>1</sup>*

Dean Kilpatrick, Benjamin Saunders & Daniel Smith  
*Youth Victimization: Prevalence and Implications*

---

On any given day, approximately 8% of American adolescents between the ages of 12 and 17 meet the American Psychiatric Association’s diagnostic criteria for substance abuse or dependence<sup>2</sup>, more than 5% meet the criteria for alcohol abuse or dependence<sup>2</sup>, and more than 11% show signs of “problematic use” of alcohol or drugs, defined as more than one substance-related problem during the past year.<sup>3</sup> Taken together, these data indicate that **one in five American adolescents is engaged in maladaptive or dangerous use of alcohol or drugs.**<sup>2,3</sup>

Numerous studies have documented a strong correlation between trauma exposure and substance abuse in young people. The most recent National Survey of Adolescents revealed that teens who had experienced physical or sexual abuse/assault were three times more likely to report past or current substance abuse than those without a history of trauma<sup>1</sup>, and surveys of adolescents receiving treatment for substance abuse have shown that more than 70% had a history of trauma exposure.<sup>4,5</sup> The link between trauma and substance abuse is even more striking among adolescents with PTSD: studies indicate that up to 59% of young people with PTSD subsequently develop substance abuse problems.<sup>5-8</sup>

Although recreational alcohol and drug use are more common in adults, studies have shown that **youth who engage in drug and alcohol use are at greater risk for lifelong negative consequences, especially when they start using at a young age.** Because the teenage brain is still growing and changing, alcohol and drug use at an early age have a greater potential to disrupt normal brain development. The most affected brain regions include the hippocampus—which is related to learning and memory—and the prefrontal cortex, which is responsible for critical thinking, planning, impulse control, and emotional regulation.<sup>9,10</sup> Drug and alcohol use also interfere with many other physiological processes and have been shown to destabilize mood. Thus, adolescent substance use is associated with higher rates of depression, aggression, violence and suicide.<sup>11</sup> These findings are particularly disturbing given that, for most teens, initiation of substance use tends to be at an early age. One

national survey found that **by the time they finish 8th grade, nearly one in three (29%) adolescents has experimented with illegal drugs, and 41% have consumed alcohol.**<sup>12</sup>

The earlier onset the age of first drinking, the greater the risk for lifetime alcohol abuse or dependence.<sup>13</sup>

Given these findings, it is clear that substance abuse screening should be an integral part of the services provided by agencies and individuals working with adolescents. This is particularly important in mental health service systems, where adolescents in treatment for traumatic stress and other emotional problems could benefit greatly from receiving care from clinical staff that understands the strong functional relationship between substance abuse and traumatic stress.

### **Substance Abuse and Trauma: Making the Connection**

Many researchers and providers point to the self-medication hypothesis to explain the connection between trauma exposure and substance abuse, suggesting that youth turn to psychoactive drugs and alcohol in an attempt to cope with traumatic stress or reminders of loss. Although there is much evidence to support this pathway— studies evaluating the frequency of substance abuse following trauma exposure have reported rates as high as 76%<sup>8-11</sup>—it is also true that substance abuse can increase an adolescent's risk of trauma exposure and of experiencing traumatic stress symptoms.

Epidemiological studies have found that for many adolescents (up to 66% in some studies) substance use disorders precede the onset of trauma exposure.<sup>6,7</sup> This may be due to the fact that substance abusing adolescents are more likely to engage in risky activities that could lead to harm to themselves or others.<sup>6-8</sup> For example, teens with substance abuse disorders are more likely to drive while under the influence, hitchhike, or walk in unsafe neighborhoods.<sup>2,14</sup> There is also evidence that substance use disorders decrease youths' ability to appropriately cope with new distressing and traumatic events, thus leading to the increased likelihood of developing PTSD. In one study, adolescents with substance abuse disorders were two times more likely to develop PTSD following trauma than were their non-substance abusing peers.<sup>7</sup>

Whatever the temporal relationship between trauma and the development of substance abuse, **it is clear that the negative effects and consequences of one disorder compound the problems of the other.** All individuals with substance abuse disorders are at risk of experiencing intense cravings for their substance(s) of abuse when exposed to stimuli associated with use (e.g., substance-using peers, places where they obtain drugs, time of day). In substance abusing teens with a history of trauma, such cravings can also be triggered by people, situations, places, or things that evoke past traumatic events. Research

with substance abusing adults has shown that craving increases when individuals with co-occurring trauma and substance abuse are exposed to cues of the traumatic event.<sup>15,16</sup> Among adults with cocaine dependence, for example, individuals with PTSD are more likely to use following negative experiences (such as unpleasant emotions and physical discomfort) when compared with those without PTSD.<sup>17</sup>

### **Successful treatment of adolescents with co-occurring traumatic stress and substance abuse therefore requires interventions that address the challenges of both disorders.**

Failure to provide such comprehensive treatment may significantly impair these teens' likelihood of long-term recovery. In the absence of coping strategies to manage distress associated with trauma, adolescents with co-occurring disorders are more likely to relapse and revert to maladaptive coping strategies than teens with substance abuse alone:

- In surveys of adolescents receiving substance abuse treatment, a history of victimization has consistently been associated with negative treatment outcomes<sup>4,18</sup>
- Teens with a history of physical abuse are less likely to achieve posttreatment abstinence than teens without a trauma history<sup>19</sup>
- Higher initial symptom severity among youth with co-occurring traumatic stress and substance abuse problems has been associated with more internal distress and violent behavior posttreatment<sup>18</sup>

Research in adults with co-occurring trauma and substance abuse supports the same conclusion. In studies of adults receiving substance abuse treatment, individuals with co-occurring PTSD and substance abuse had higher relapse rates than those with substance abuse problems alone<sup>20</sup>, and initial PTSD severity was a significant predictor of relapse.<sup>21,22</sup>

These findings illustrate the need for increased awareness among mental health professionals of the strong and complex relationship between substance abuse and traumatic stress. Teens battling the effects of traumatic stress and substance abuse need to acquire coping skills to manage the distress associated with either type of problem. Improvements in the ability to manage substance abuse cravings, for example, may enhance the youth's readiness to learn how to manage trauma and loss reminders.

### **Why Do Adolescents Use?**

Understanding the reasons youth start using drugs or alcohol—as well as their reasons for continuing or discontinuing use—is crucial to developing effective substance abuse interventions. A recent 30-month study of 923 teenagers receiving outpatient and residential substance abuse treatment has provided some insight into the motivations behind adolescents' substance abuse and eventual recovery.<sup>23</sup>

In this study, three quarters of the teens cited social pressures and experimentation as their reasons for initiating drug or alcohol use.

Teens may use because they see “everyone else” doing it and want to blend in, because it’s a way of spending time with friends, of being accepted, of becoming popular, of enhancing social and other activities, or because they fear that if they refuse, they might alienate potential friends. Many

adolescents reported that curiosity led to first use, while others reported that they decided to start after witnessing use by a parent or relative. Of note, only 7% reported initiating use to “cope with difficulties.”<sup>23</sup>

“If I don’t do drugs, I feel like I’m going to go insane. Because I have all these thoughts and all this pain in my heart and I can’t get rid of it, you know? Drugs is the only thing that takes that away. That’s why I do drugs. Because it keeps me, not happy, but it keeps me from being so sad that I want to die.”<sup>24</sup>

This situation changes when it comes to teens’ reasons for continuing use. When asked why they continue to use, more than half reported using drugs because it feels good (29%) or because it helps them cope with difficulties (23%). Another 7% reported that it was an addiction or “habit,” and 4% felt that drug or alcohol use enhanced their sense of self in some way (greater confidence, self esteem, etc.).<sup>23</sup> In light of these findings, it is likely that, for teens experiencing traumatic stress, continued substance use may serve as a coping strategy to deal with stress, forget unpleasant experiences, avoid negative emotions, do away with worries, or feel numb or indifferent to the challenges of daily life or the reminders of past trauma.

Among teens who quit using drugs or alcohol, the most frequently reported reasons—accounting for 57% of responses—had to do with the negative effect that using had or could have on the adolescents’ lives. Some respondents said they had tired of using (22%), others were concerned about the effect drug use could have on their overall life path (21%), and others were worried about the negative physical and psychological effects of their drug or alcohol use (14%). By comparison, external pressures accounted for less than one quarter of teens’ reasons for quitting: 14% of respondents indicated they had quit in response to external factors such as jail or mandated treatment, 4% reported quitting for family and friends, and 3% reported quitting to avoid trouble.<sup>23</sup>

## Recognizing Substance Abuse and Dependence in Adolescents

Although the reasons for initiating and continuing drug and alcohol use are varied, the signs of abuse and dependence are remarkably consistent. According to the American Psychiatric Association<sup>25</sup>, *substance abuse* is a pattern of use that leads to significant impairment or distress, manifested as one or more of the following occurring during a 12-month period:

- Recurrent use resulting in a failure to fulfill major obligations at work, school, or home
- Recurrent use in situations in which it is physically hazardous (e.g., driving while high or drunk)
- Recurrent substance-related legal problems
- Continued use despite persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of the substance (e.g., arguments with parents, fights)

*Substance dependence* (more commonly referred to as addiction) involves the same problems, with the addition of clear signs of physical and psychological dependence, as manifested by three or more of the following occurring at any time over a 12-month period:<sup>25</sup>

- **Tolerance**, defined as the need for increased amounts of the substance to achieve the desired effect, or markedly diminished effects with continued use of the same amount of the substance
- **Withdrawal**, manifested as either the characteristic withdrawal syndrome for the substance or continued use of the substance (or a closely related drug) to relieve or prevent withdrawal symptoms
- Taking the substance often in larger amounts or over a longer period than intended
- A persistent desire or unsuccessful efforts to cut down or control substance use
- Spending a great deal of time in activities necessary to obtain or use the substance or to recover from its effects
- Giving up social, occupational, or recreational activities because of substance use
- Continued use with the knowledge that it is causing or exacerbating a persistent or recurrent physical or psychological problem

Some researchers have added another category—*problematic use*—to describe adolescents who don't meet the strict diagnostic criteria for alcohol abuse or dependence, but who show two or more symptoms of alcohol dependence. The most common symptoms seen in these “diagnostic orphans” are:<sup>26</sup>

- Tolerance
- Using more or longer than intended
- Unsuccessful attempts to quit or cut down
- A considerable amount of time spent using

The specific signs and symptoms of intoxication, dependence and abuse may vary depending on the substance used (See **Table 1** and **Table 2**); however, major indicators that an adolescent may be engaged in problematic use or dependence include:<sup>25,27,28</sup>

- Difficulty sleeping
- Disruptive behavior
- Depression
- School avoidance
- Decline in academic performance
- Anxiety
- Rapid changes in mood or hostile outbursts
- Changes in peer group or failing to introduce peers to parents
- Changes in physical appearance or poor hygiene
- Secretive behaviors such as sneaking out, lying, and locking doors

### **Maria's Story\***

Maria is a 14-year-old girl who has been physically and sexually abused by her 22-year-old stepbrother for five years.

The first incident of abuse happened when she and her mother moved in with the new stepfamily, after having been evicted from their old apartment. In addition, Maria has seen her stepfather severely beat her mother several times, and is now constantly worried about her mother's safety. She also fears that someone will find out about the abuse and that she will be taken away from her mother.

Maria has become withdrawn at school and no longer participates in activities she once enjoyed. Once very popular with her peers, she has isolated herself from many of her friends and spends most of her time alone.

The only person Maria spends time with is an older cousin who lives in the neighborhood. Lately, they have been skipping school to smoke marijuana and drink alcohol.

Maria used to be an honor-roll student, but her grades have been spiraling downward. Her favorite teacher is extremely concerned and has been trying to get Maria to talk to her about what is causing such a change.

*\*"Maria" is a composite representation based on real teenage clients struggling with traumatic stress and substance abuse.*

## **Alcohol and Illicit Drugs: Prevalence Rates and General Information**

### **Alcohol**

Adolescents use alcohol more frequently than they do all other drugs combined. The National Longitudinal Study of Adolescent Health found that more than 30% of surveyed adolescents had drunk more than five drinks in a row in the past 12 months and more than 30% reported getting drunk during that same period.<sup>31,32</sup> Similarly, the most recent National Survey on Drug Use and Health found that more than **25% of underage drinkers are binge or heavy drinkers, and approximately 20%—one in five—report driving while under the influence** during

the past year.<sup>2</sup> In 2006, 63% of 8th graders and more than 80% of high-school age teens reported that alcohol was easy or very easy to obtain.<sup>12</sup>

### **Cannabinoids**

The cannabinoids are the most commonly used illegal drugs in the United States. According to the 2006 National Survey on Drug Abuse, **every day 6,000 people try marijuana for the first time and more than 63% of them—some 3,800 people—are under the age of 18.**

Overall, 6.7% of adolescents between the ages of 12 and 17 are current marijuana users.<sup>2</sup> In 2006, approximately 40% of 8th graders and three quarters of high school students reported that marijuana was easy or very easy to obtain.<sup>12</sup>

### **Cocaine**

Cocaine is a powerfully addictive central nervous system stimulant. Once the second-most commonly used illicit drug in the United States, it has recently been overtaken by prescription painkillers (see *Opioids*, below). According to the 2005 Youth Risk Behavior Surveillance Survey<sup>33</sup>, 7.6% of high school students surveyed had used cocaine at least once, and 3.4% had used within the last 30 days. Of note, the percentage of teens who report that cocaine (in any form) is easy or very easy to obtain rises with age: from approximately 20% in 8th grade to more than 50% in senior year of high school. Cocaine use in combination with alcohol is especially dangerous because it facilitates the production of cocaethylene, a cocaine metabolite that is more toxic than cocaine alone.

### **Gamma hydroxybutyrate (GHB)**

GHB was synthesized in 1960 for use as an anesthetic. In the United States, GHB has been widely abused since the early 1990s. It is often used by young and predominantly white partygoers in combination with various other drugs or alcohol at raves and other gatherings. It has been used in a number of sexual assaults and, like the drug Rohypnol (flunitrazepam), is known as a “date-rape drug” because of its ability to sedate and impair the memory of potential victims. Because it metabolizes quickly, there are often no traces of it in a victim’s bloodstream by the time the assault is remembered. GHB generally comes mixed with water or in powder form. It is commonly sold in small bottles (the size of complimentary shampoo containers supplied by hotels), which are generally inexpensive and contain about 10 “hits.”

GHB use has greatly increased in recent years, with the most prevalent use observed in the southeastern and western United States. In 2006, 0.8% of 8th graders, 0.7% of 10th graders, and 1.1% of 12th graders reported using GHB at least once in the prior year.<sup>12</sup> According to data gathered by the Drug Abuse Warning Network (DAWN), **in 2002 nearly 5,000 emergency room visits were related to use of GHB.**<sup>37</sup>

**Table 1. Common Drugs of Abuse and Their Effects**<sup>27,29,30</sup>

Category and Name	Examples of Commercial and Street Names	DEA Schedule*	How Administered**	Intoxication Effects	Potential Health Consequences
<b>Alcohol</b>	Booze, brew, hooch, sauce, forty, brewsky, hard stuff, hard A, liquor, spirits, various brand names	Not scheduled	Swallowed	Relaxation, decreased concentration, impaired judgment, coordination, and reaction time, loss of consciousness, blackouts, and memory lapses	Liver disease, ulcers, cancer (esophageal, oral, hepatic), hypertension, hypoglycemia, dependence, addiction
<b>Cannabinoids</b>				<b>Class effects</b>	
Hashish	Boom, chronic, gangster, hash, hash oil, hemp	I	Swallowed, smoked	Euphoria, slowed thinking and reaction time, confusion, impaired balance and coordination	Cough, frequent respiratory infections, impaired memory and learning, increased heart rate, anxiety, panic attacks, tolerance, addiction
Marijuana	Blunt, dope, ganja, grass, herb, joints, Mary Jane, pot, reefer, sinsemilla, skunk, weed	I	Swallowed, smoked		
<b>Depressants</b>				<b>Class Effects</b>	
Barbiturates	<i>Amytal, Nembutal, Seconal, Phenobarbital</i> : barbs, reds, red birds, phennies, tooies, yellows, yellow jackets	II, III, V	Injected, swallowed	Reduced anxiety, feeling of well-being, lowered inhibitions, slowed pulse and breathing, lowered blood pressure, poor concentration	Fatigue, confusion, impaired coordination, memory, judgment, addiction, respiratory depression and arrest, dependence, addiction, death
Benzodiazepines (other than flunitrazepam)	<i>Ativan, Halcion, Librium, Valium, Xanax</i> : candy, downers, sleeping pills, tranks	IV	Swallowed, injected	Sedation, drowsiness	Depression, unusual excitement, fever, irritability, poor judgment, slurred speech, dizziness, life-threatening withdrawal
Flunitrazepam***	<i>Rohypnol</i> : forget-me pill, Mexican Valium, R2, Roche, roofies, roofinol, rope, rophies	IV	Swallowed, snorted	Sedation, drowsiness	Dizziness
					Visual and gastrointestinal disturbances, urinary retention, memory loss for the time under the drug's effects

Category and Name	Examples of Commercial and Street Names	DEA Schedule*	How Administered**	Intoxication Effects	Potential Health Consequences
GHB***	gamma-hydroxybutyrate: G, Georgia home boy, grievous bodily harm, liquid ecstasy	I	Swallowed	Drowsiness, nausea	Vomiting, headache, loss of consciousness, loss of reflexes, seizures, coma, death
Methaqualone	<i>Quaalude, Sopor, Parest: ludes, mandrex, quad, quay</i>	I	Injected, swallowed	Euphoria	Depression, poor reflexes, slurred speech, coma
<b>Dissociative Anesthetics</b>					
<b>Class Effects</b>					
				Increased heart rate and blood pressure, impaired motor function	Memory loss, numbness, nausea, vomiting
Ketamine	<i>Ketalar SV: cat Valiums, K, Special K, vitamin K</i>	III	Injected, snorted, smoked	At high doses, delirium, depression, respiratory depression and arrest	
PCP and analogs	<i>Phencyclidine: angel dust, boat, hog, love boat, peace pill</i>	I, II	Injected, swallowed, smoked	Possible decrease in blood pressure and heart rate, panic, aggression, violence	Loss of appetite, depression
<b>Hallucinogens</b>					
<b>Class Effects</b>					
				Altered states of perception and feeling, nausea	Persisting perception disorder (flashbacks)
LSD	Lysergic acid diethylamide: acid, blotter, boomers, cubes, microdot, yellow sunshines	I	Swallowed, absorbed through mouth tissues	Increased body temperature, heart rate, and blood pressure, loss of appetite, sleeplessness, numbness, weakness, tremors, persistent mental disorders	
Mescaline	Buttons, cactus, mesc, peyote	I	Swallowed, smoked	Increased body temperature, heart rate, and blood pressure, loss of appetite, sleeplessness, numbness, weakness, tremors	
Psilocybin	Magic mushroom, purple passion, 'shrooms	I	Swallowed	Nervousness, paranoia	

**Table 1. Common Drugs of Abuse and Their Effects<sup>27,29,30</sup> (continued)**

Category and Name	Examples of Commercial and Street Names	DEA Schedule*	How Administered**	Intoxication Effects	Potential Health Consequences
<b>Opioids and Morphine Derivatives</b>					
Codeine	<i>Empirin with Codeine, Fiorinal with Codeine, Robitussin A-C, Tylenol with Codeine: Captain Cody, Cody, schoolboy (with glutethimide), doors &amp; fours, loads, pancakes and syrup</i>	II, III, IV, V	Injected, swallowed	Pain relief, euphoria, drowsiness	Nausea, constipation, confusion, sedation, respiratory depression and arrest, tolerance, addiction, unconsciousness, coma, death
Fentanyl and fentanyl analogs	<i>Actiq, Duragesic, Sublimaze: Apache, China girl, China white, dance fever, friend, goodfella, jackpot, murder 8, TNT, Tango and Cash</i>	I, II	Injected, smoked, snorted	Less analgesia, sedation, and respiratory depression than morphine	
Heroin	<i>diacetylmorphine: brown sugar, dope, H, horse, junk, skag, skunk, smack, white horse</i>	I	Injected, smoked, snorted	Staggering gait	
Morphine	<i>Roxanol, Duramorph: M, Miss Emma, monkey, white stuff</i>	II, III	Injected, swallowed, smoked		
Opium	<i>laudanum, paregoric: big O, black stuff, block, gum, hop</i>	II, III, V	Swallowed, smoked		
Oxycodone HCL	<i>OxyContin: Oxy, O.C., killer</i>	II	Swallowed, snorted, injected		
Hydrocodone bitartrate, acetaminophen	<i>Vicodin: vike, Watson-387</i>	II	Swallowed		

Category and Name	Examples of Commercial and Street Names	DEA Schedule*	How Administered**	Intoxication Effects	Potential Health Consequences
<b>Stimulants</b>				<b>Class Effects</b>	
Amphetamine	<i>Biphphetamine, Dexedrine:</i> bennies, black beauties, crosses, hearts, LA turnaround, speed, truck drivers, uppers	II	Injected, swallowed, smoked, snorted	Increased heart rate, blood pressure, metabolism; feelings of exhilaration, energy, increased mental alertness Rapid breathing	Rapid or irregular heart beat, reduced appetite, weight loss, nervousness, insomnia, heart failure Tremor, loss of coordination, irritability, anxiousness, restlessness, delirium, panic, paranoia, impulsive behavior, aggressiveness, tolerance, addiction, psychosis
Cocaine	<i>Cocaine hydrochloride:</i> blow, bump, C, candy, Charlie, coke, crack, flake, rock, snow, toot	II	Injected, smoked, snorted	Increased temperature	Chest pain, respiratory failure, nausea, abdominal pain, strokes, seizures, headaches, malnutrition, panic attacks
MDMA (methylenedioxy-methamphetamine)	Adam, clarity, ecstasy, Eve, lover's speed, peace, STP, X, XTC	I	Swallowed	Mild hallucinogenic effects, increased tactile sensitivity, empathetic feelings	Impaired memory and learning, hyperthermia, cardiac toxicity, renal failure, liver toxicity
Methamphetamine	<i>Desoxyn:</i> chalk, crank, crystal, fire, glass, go fast, ice, meth, speed	II	Injected, swallowed, smoked, snorted	Aggression, violence, psychotic behavior	Memory loss, cardiac and neurological damage, dental decay and damage, impaired memory and learning, tolerance, addiction
Methylphenidate (safe and effective for treatment of ADHD)	<i>Ritalin:</i> JIF, MPH, R-ball, Skippy, the smart drug, vitamin R	II	Injected, swallowed, snorted		
Nicotine	Cigarettes, cigars, smokeless tobacco, snuff, spit tobacco, bidis, chew	Not scheduled	Smoked, snorted, taken in snuff and spit tobacco		Additional effects attributable to tobacco exposure: adverse pregnancy outcomes, chronic lung disease, cardiovascular disease, stroke, cancer, tolerance, addiction

**Table 1. Common Drugs of Abuse and Their Effects<sup>27,29,30</sup> (continued)**

Category and Name	Examples of Commercial and Street Names	DEA Schedule*	How Administered**	Intoxication Effects	Potential Health Consequences
<b>Other Compounds</b>					
Anabolic steroids	Anadrol, Oxandrin, Durabolin, Depo-Testosterone, Equipoise: roids, juice	III	Injected, swallowed, applied to skin	None	Hypertension, blood clotting and cholesterol changes, liver cysts and cancer, kidney cancer, hostility and aggression, acne. In adolescents, premature stoppage of growth. In males, prostate cancer, reduced sperm production, shrunken testicles, breast enlargement. In females, menstrual irregularities, development of beard and other masculine characteristics
Dextromethorphan (DXM)	Found in some cough and cold medications, Robotripping, Robo, Triple C	Not scheduled	Swallowed	Dissociative effects, distorted visual perceptions to complete dissociative effects	For effects at higher doses see "dissociative anesthetics"
Inhalants	Solvents (paint thinners, gasoline, glues), gases (butane, propane, aerosol propellants, nitrous oxide), nitrites (isoamyl, isobutyl, cyclohexyl), laughing gas, poppers, snappers, whippets	Not scheduled	Inhaled through nose or mouth	Stimulation, loss of inhibition, headache, nausea or vomiting, slurred speech, loss of motor coordination, wheezing	Unconsciousness, cramps, weight loss, muscle weakness, depression, memory impairment, damage to cardiovascular and nervous systems, sudden death

\*Schedule I and II drugs have a high potential for abuse. They require greater storage security and have a quota on manufacturing, among other restrictions. Schedule I drugs are available for research only and have no approved medical use; Schedule II drugs are available only by prescription (unrefillable) and require a form for ordering. Schedule III and IV drugs are available by prescription, may have five refills in six months, and may be ordered orally. Some Schedule V drugs are available over the counter.

\*\*Taking drugs by injection can increase the risk of infection through needle contamination with staphylococci, HIV, hepatitis, and other organisms.

\*\*\*Associated with sexual assaults

**Sources:** National Institute on Drug Abuse. (2007). *Commonly Abused Drugs*. Bethesda, MD: National Institute on Drug Abuse, National Institutes of Health. Retrieved April 28, 2008 from <http://www.nida.nih.gov/DrugPages/DrugsofAbuse.html>; Saitz, R. (2007). Treatment of alcohol and other drug dependence. *Liver Transpl*, 13(11 Suppl 2), S59-64; Saitz, R. (2005). Clinical practice. Unhealthy alcohol use. *N Engl J Med*, 352(6), 596-607.

## **Hallucinogens**

Hallucinogens are a class of illicit drugs that alter perception and, in some cases, produce euphoria. Hallucinogen use is generally rare in the overall population, although higher among teens and young adults. In 2006, reported lifetime use of any hallucinogen was less than 4% among 8th graders, approximately 6% among 10th graders, and slightly more than 8% among 12th graders. Reported lifetime use was even lower for LSD: 1.6%, 2.7%, and 3.3% among 8th, 10th, and 12th graders, respectively.

## **Inhalants**

Inhalants are breathable chemical vapors that produce psychoactive effects. Sniffing inhalants is often referred to as “huffing.” Inhalants can also be used by placing the inhalant in a bag and then sniffing into the bag or putting the bag over the head (“bagging”). Inhalants are very easy to find, are not illegal, and are less expensive than most drugs.

According to the most recent National Survey on Drug Use and Health, inhalants are the second most frequently used illicit drug among 12- to 13-year-olds, third among 14- and 15-year-olds, and fourth among 16- and 17-year-olds.<sup>2</sup> Most inhalant users start using before their 16th birthday.<sup>2</sup>

## **MDMA (Ecstasy)**

MDMA acts as both a stimulant and a hallucinogen. It is among the most frequently reported “club drugs.” In the 2006 National Survey on Drug Use and Health, approximately 500,000 teens between the ages of 12 and 17 reported using MDMA within the last 30 days.<sup>2</sup> Overall use rates increase with age, from less than 2% among 8th graders to more than 4% in 12th graders.<sup>12</sup> Perceived availability of MDMA also increases with age: less than 15% of 8th graders report that it is easy or very easy to obtain, versus approximately 25% of 10th to 12th graders.<sup>12</sup>

## **Methamphetamine**

Methamphetamine is an addictive stimulant closely related to amphetamine. It has longer lasting and more toxic effects on the central nervous system than amphetamine, and is often made in small, illegal laboratories called “meth labs,” using relatively inexpensive over-the-counter ingredients. Methamphetamine has a high potential for abuse and addiction. Methamphetamine users may experience unpredictable mood swings, as well as tooth decay caused by dry mouth and excessive tooth grinding. Users commonly have the sensation that insects are crawling on their skin, and many users will scratch themselves raw, causing lacerations on their face and arms.

During 2006, 731,000 people age 12 or older in the United States reported current use of methamphetamine, with highest rates of use among older adolescents and young adults.<sup>2</sup> Less than 2% of 8th and 10th graders reported using during the past year, versus 2.5% of 12th graders.<sup>12</sup>

## **Nicotine**

Nicotine is one of the most frequently used addictive drugs. In the 2006 National Survey on Drug Use and Health, 12.9% of 12- to 17-year-olds—3.3 million teens—reported using some form of tobacco during the past month. The number of current cigarette smokers increases with age, from a low of 2% among 12- to 13-year-olds to a high of 20% among 16- and 17-year-olds.<sup>2</sup> Such high prevalence rates may be accounted for by research that suggests **adolescents are more susceptible to rapid development of nicotine addiction**, with measurable symptoms of dependence observable after only a few weeks of casual use.<sup>38</sup>

## **Opioids**

Opioids are the most powerful known pain relievers, and their analgesic and euphoric effects have been known since 4000 BC. In the United States, heroin use has increased over the last decade, particularly among adolescents, although overall heroin use remains low. In 2006, 1.4% of 8th graders, 10th graders, and 12th graders reported using heroin at least once in their lifetime. The same survey found that less than 1% of youth in each of these grades reported using heroin in the year prior to the survey.<sup>12</sup>

By contrast, the abuse of prescription painkillers—particularly narcotics such as Vicodin, OxyContin, Percocet, Demerol, and Darvon—has risen dramatically. The overall incidence of emergency department visits related to narcotic abuse has been increasing in the U.S. since the mid-1990s and has more than doubled between 1994 and 2001.<sup>39</sup> According to emergency department data, **in 2005 nearly 50,000 youth between the ages of 12 and 17 presented to the emergency department because of non-medical uses of prescription painkillers**. Nationally, an estimated 14% of high school seniors have used prescription drugs for nonmedical reasons at least once in their lifetime, making prescription drugs the second-most commonly abused illegal substance by teenagers, after marijuana.<sup>2</sup>

## **Steroids**

Anabolic steroids were originally developed in the late 1930s to treat hypogonadism (a condition in which the testes do not produce sufficient testosterone for normal growth, development, and sexual functioning); steroids are legal by prescription but are often abused. According to the 2006 Monitoring the Future survey, most teen anabolic steroids users are male.<sup>12</sup> Among male students, use of steroids during the past year was reported by approximately 1% of 8th graders and 10th graders, and nearly 2% of 12th graders. Adolescents may be more likely to abuse anabolic steroids if they have experienced muscle dysmorphia, a history of physical or sexual abuse, or a history of engaging in high-risk behaviors.<sup>40</sup>

**Table 2: Sources of Additional Information on Specific Drugs of Abuse**

Drug Class/Drug	Source	URL
<b>Alcohol</b>		
	NIAAA	<a href="http://www.niaaa.nih.gov">http://www.niaaa.nih.gov</a>
	Leadership to Keep Children Alcohol Free	<a href="http://www.alcoholfreechildren.org/">http://www.alcoholfreechildren.org/</a>
<b>Cannabinoids</b>		
	DEA	<a href="http://www.usdoj.gov/dea/concern/marijuana.html">http://www.usdoj.gov/dea/concern/marijuana.html</a>
	NIDA	<a href="http://www.drugabuse.gov/PDF/InfoFacts/Marijuana06.pdf">http://www.drugabuse.gov/PDF/InfoFacts/Marijuana06.pdf</a>
<b>Depressants</b>		
Rohypnol/GHB	DEA	<a href="http://www.usdoj.gov/dea/concern/ghb_factsheet.html">http://www.usdoj.gov/dea/concern/ghb_factsheet.html</a>
	NIDA	<a href="http://www.drugabuse.gov/PDF/Infofacts/Rohypnol06.pdf">http://www.drugabuse.gov/PDF/Infofacts/Rohypnol06.pdf</a>
<b>Hallucinogens</b>		
General	DEA	<a href="http://www.usdoj.gov/dea/concern/hallucinogens.html">http://www.usdoj.gov/dea/concern/hallucinogens.html</a>
	NIDA	<a href="http://www.drugabuse.gov/PDF/RRHalluc.pdf">http://www.drugabuse.gov/PDF/RRHalluc.pdf</a>
LSD	DEA	<a href="http://www.usdoj.gov/dea/concern/lisd.html">http://www.usdoj.gov/dea/concern/lisd.html</a>
<b>Inhalants</b>		
	DEA	<a href="http://www.usdoj.gov/dea/concern/inhalants.html">http://www.usdoj.gov/dea/concern/inhalants.html</a>
	NIDA	<a href="http://www.nida.nih.gov/Infofacts/inhalants.html">http://www.nida.nih.gov/Infofacts/inhalants.html</a>
<b>Opioids</b>		
Heroin	DEA	<a href="http://www.usdoj.gov/dea/concern/heroin.html">http://www.usdoj.gov/dea/concern/heroin.html</a>
	NIDA	<a href="http://www.nida.nih.gov/Infofacts/heroin.html">http://www.nida.nih.gov/Infofacts/heroin.html</a>
OxyContin	DEA	<a href="http://www.usdoj.gov/dea/concern/oxycontin.html">http://www.usdoj.gov/dea/concern/oxycontin.html</a>
Prescription Pain Medications	NIDA	<a href="http://www.nida.nih.gov/Infofacts/Painmed.html">http://www.nida.nih.gov/Infofacts/Painmed.html</a>
<b>Stimulants</b>		
Cocaine/crack	DEA	<a href="http://www.usdoj.gov/dea/concern/cocaine.html">http://www.usdoj.gov/dea/concern/cocaine.html</a>
	NIDA	<a href="http://www.nida.nih.gov/Infofacts/cocaine.html">http://www.nida.nih.gov/Infofacts/cocaine.html</a>
MDMA (Ecstasy)	DEA	<a href="http://www.usdoj.gov/dea/concern/mdma.html">http://www.usdoj.gov/dea/concern/mdma.html</a>
	NIDA	<a href="http://www.nida.nih.gov/Infofacts/ecstasy.html">http://www.nida.nih.gov/Infofacts/ecstasy.html</a>
Methamphetamine	DEA	<a href="http://www.usdoj.gov/methawareness/">http://www.usdoj.gov/methawareness/</a>
	NIDA	<a href="http://www.nida.nih.gov/Infofacts/methamphetamine.html">http://www.nida.nih.gov/Infofacts/methamphetamine.html</a>
Nicotine	NIDA	<a href="http://www.nida.nih.gov/infofacts/tobacco.html">http://www.nida.nih.gov/infofacts/tobacco.html</a>
<b>Steroids</b>		
	DEA	<a href="http://www.usdoj.gov/dea/concern/steroids.html">http://www.usdoj.gov/dea/concern/steroids.html</a>
	NIDA	<a href="http://www.nida.nih.gov/Infofacts/Steroids.html">http://www.nida.nih.gov/Infofacts/Steroids.html</a>

DEA=Drug Enforcement Agency, NIAAA=National Institute on Alcohol Abuse and Alcoholism, NIDA=National Institute on Drug Abuse

## Recognizing Withdrawal

Regular users of alcohol and drugs may eventually develop tolerance and need larger amounts of the substance to achieve the same effect. When the body adjusts to having the substance present, users may feel emotionally and physically ill when they discontinue use (withdrawal).

Substance use initially may serve as a means to find pleasure or relief from emotional distress, but once physiological dependence develops, substance use becomes a way to manage cravings and withdrawal symptoms (see **Table 3** below). Adolescents exhibiting signs of withdrawal require medical as well as mental health intervention to prevent severe (or, in the case of alcohol, potentially fatal) physiological reactions.

**Table 3. Signs and Symptoms of Withdrawal**

Substance	Withdrawal Symptoms
<b>Alcohol</b>	Craving for alcohol, insomnia, vivid dreams, anxiety, hypervigilance, agitation, irritability, loss of appetite (i.e., anorexia), nausea, vomiting, headache, sweating, tremors, tactile and auditory hallucinations, seizures, delirium tremens
<b>Cannabinoids</b> (marijuana, hashish)	Irritability, anxiety and physical tension, decreases in appetite and mood
<b>Cocaine</b> (crack)	Agitation/irritability, depression and/or anxiety, intense cravings, angry outbursts, lack of motivation, fatigue, nausea/vomiting, shaking
<b>GHB</b> (date rape drug)	Profuse sweating, anxiety attacks, high blood pressure and pulse, hallucination, rapid pulse
<b>Inhalants</b> (paint thinner, gasoline, glues, laughing gas, poppers, snappers, whippets)	Hand tremors, excess sweating, constant headaches, nervousness
<b>Methylenedioxymethamphetamine</b> (MDMA, Ecstasy, X, XTC, etc.)	Depression, anxiety, including panic attacks, depersonalization/derealization, paranoid delusions, sleeplessness
<b>Methamphetamine</b>	Irritability, moderate-to-severe depression, psychotic reactions, anxiety
<b>Nicotine</b>	Irritability/aggression, depression, poor concentration, increased appetite, light-headedness, restlessness, night-time awakenings, craving
<b>Opioids and Morphine Derivatives</b> (codeine, fentanyl, heroin, morphine, opium, oxycodone, hydrocodone)	Nausea/vomiting, insomnia, diarrhea, irritability, loss of appetite, shaking, tremors, panic, chills or profuse sweating
<b>Steroids</b>	Nausea/vomiting/diarrhea, joint/muscle pain or weakness, weight loss, fever, headache and fatigue, low blood pressure

## Substance Use Problems: Risks and Protective Factors

In order to provide appropriate, effective care to teens with—or at risk for—substance abuse disorders, it is important to recognize and evaluate the various factors that can enhance or mitigate risk. These factors can have a profound impact on how teenagers cope with difficulties, and on long-term treatment outcomes. For example, studies have shown that adolescents who use positive coping strategies such as good decision-making skills, assertiveness, and cognitive mastery, are less likely to use substances or engage in delinquent behavior.<sup>41</sup> Conversely, adolescents who engage in avoidant stress coping and have difficulty in managing temptations are more likely to use drugs and alcohol.<sup>42</sup>

Gender is an important factor in the use and effects of alcohol and other drugs of abuse. Boys tend to have opportunities for use earlier in life and thus tend to initiate at younger ages.<sup>43</sup> However, once girls have the opportunity to experiment, they are just as likely as boys are to use.<sup>44</sup> Data from the 2006 Monitoring the Future survey suggest that there are similar trends for substance use among boys and girls, but that boys are more likely to consume marijuana, steroids, and smokeless tobacco, whereas girls are more likely to abuse amphetamines and methamphetamine.<sup>12</sup> Rates of drug use for both genders have been converging over the past decade.<sup>45</sup>

Research indicates that there are few differences in the type or amount of substances that male and female adolescents use; however, the effects of substances on their emotional and physiological health can vary. Substance abuse stemming from traumatic events and/or psychological problems is more common in females than in males. Additionally, female substance abusers are more vulnerable to some of the physiological effects and psychological difficulties that can result from substance use. Research has also shown that females have a greater chance of developing neurological problems associated with alcohol abuse.<sup>46</sup>

In addition to varying by gender, adolescent drug and alcohol use also tends to vary by population. For example, rates of current drug use among American Indian/Alaska Native Youth are approximately twice the rate among teens overall.<sup>2</sup>

Much research has been devoted to identifying common risks and protective factors associated with adolescent substance use. **Table 4** outlines some of the factors that are associated with the individual, family, peer, school, and community domains of an adolescent's life. In general, teens are less likely to succumb to external pressures toward drug use if they have a strong sense of attachment to parents who clearly communicate their disapproval of substance use and antisocial behaviors<sup>47-49</sup> and a strong commitment to doing well in school.<sup>50,51</sup> Conversely, associating with substance abusing peers<sup>41,48,52-55</sup>, and limited availability of educational and recreational opportunities<sup>56</sup> are associated with increased risk of substance abuse.

**Table 4: Risks and Protective Factors Associated with Adolescent Substance Use**

Domain	Risk Factors	Protective Factors
Individual	<p>Aggressive behavior</p> <p>Genetic vulnerability</p> <p>Low self-esteem</p> <p>Academic failure</p> <p>Risk-taking propensity</p> <p>Impulsivity</p>	<p>Self-control</p> <p>Positive relationships with adults (e.g., parents, teachers, doctors, law enforcement officers, etc.)</p> <p>Involvement in extracurricular activities</p> <p>Positive future plans</p>
Family	<p>Lack of parental supervision</p> <p>Family member with a history of alcohol or other drug abuse</p> <p>Lack of clear rules and consequences regarding alcohol and other drug use</p> <p>Family conflict/abuse</p> <p>Loss of employment</p>	<p>Parental monitoring</p> <p>Close family relationships</p> <p>Education valued and encouraged; parents actively involved</p> <p>Clear expectations and limits regarding alcohol and other drug use</p> <p>Shared family responsibilities including chores and decision making</p> <p>Nurturing family members who support each other</p>
Peer	<p>Substance abuse</p> <p>Ties to deviant peers/gang involvement</p> <p>Inappropriate sexual activity among peers</p>	<p>Academic competence</p> <p>Involvement in substance-free activities</p> <p>Negative view of alcohol and other drug use among peers</p>
School	<p>Drug availability</p> <p>Students lack commitment or sense of belonging at school</p> <p>High numbers of students who fail academically at school</p> <p>Parents and community members not actively involved</p>	<p>Antidrug use policies</p> <p>Positive attitudes toward school and regular school attendance promoted</p> <p>Goal-setting, academic achievement, and positive social development encouraged</p> <p>Tutoring made available</p> <p>Leadership and decision-making opportunities for students provided</p> <p>Substance-free events sponsored</p>
Community	<p>Poverty</p> <p>Alcohol and other drugs readily available</p> <p>Laws and ordinances unclear or inconsistently enforced</p> <p>Norms unclear or encourage use of drugs</p> <p>Lack of sense of connection to community</p> <p>High unemployment</p> <p>Youths' activities not monitored</p>	<p>Laws and ordinances consistently enforced</p> <p>Norms and policies encourage nonuse of drugs</p> <p>Strong sense of connection to neighborhood</p> <p>Jobs and other resources (e.g., housing, healthcare, childcare, community service opportunities, recreation; religious organizations) available</p>

## **Conclusion**

Youth services providers should always be aware of the links between adolescent traumatic stress and substance abuse problems. The traditional division between mental health and substance abuse service systems, the limited availability of evidence-based integrated approaches, and the difficulties associated with having separate sources of funding available for these types of problems all can pose many challenges to providing integrated and coordinated care. However, a coordinated approach offers the best hope of lasting recovery in teens struggling with the effects of traumatic stress and substance abuse.

## References

1. Kilpatrick, D. G., Saunders, B. E., and Smith, D. W. (2003). *Youth victimization: Prevalence and implications. NIJ research in brief*. Washington, DC: U.S. Department of Justice, Office of Justice Programs, National Institute of Justice. Retrieved April 16, 2008 from <http://www.ncjrs.gov/pdffiles1/nij/194972.pdf>.
2. Substance Abuse and Mental Health Services Administration. (2007). *Results from the 2006 National Survey on Drug Use and Health: National findings*. Rockville, MD: Department of Health and Human Services. Retrieved April 7, 2008 from <http://www.oas.samhsa.gov/nsduh/2k6nsduh/2k6Results.pdf>.
3. Knight, J. R., Harris, S. K., Sherritt, L., Van Hook, S., Lawrence, N., Brooks, T., et al. (2007). Prevalence of positive substance abuse screen results among adolescent primary care patients. *Arch Pediatr Adolesc Med*, 161(11), 1035–41.
4. Funk, R. R., McDermeit, M., Godley, S. H., and Adams, L. (2003). Maltreatment issues by level of adolescent substance abuse treatment: The extent of the problem at intake and relationship to early outcomes. *Child Maltreat*, 8(1), 36–45.
5. Deykin, E. Y., and Buka, S. L. (1997). Prevalence and risk factors for posttraumatic stress disorder among chemically dependent adolescents. *Am J Psychiatry*, 154(6), 752–7.
6. Clark, D. B., Lesnick, L., and Hegedus, A. M. (1997). Traumas and other adverse life events in adolescents with alcohol abuse and dependence. *J Am Acad Child Adolesc Psychiatry*, 36(12), 1744–51.
7. Giaconia, R. M., Reinherz, H. Z., Hauf, A. C., Paradis, A. D., Wasserman, M. S., and Langhammer, D. M. (2000). Comorbidity of substance use and post-traumatic stress disorders in a community sample of adolescents. *Am J Orthopsychiatry*, 70(2), 253–62.
8. Perkonig, A., Kessler, R. C., Storz, S., and Wittchen, H. U. (2000). Traumatic events and post-traumatic stress disorder in the community: Prevalence, risk factors and comorbidity. *Acta Psychiatr Scand*, 101(1), 46–59.
9. De Bellis, M. D., Narasimhan, A., Thatcher, D. L., Keshavan, M. S., Soloff, P., and Clark, D. B. (2005). Prefrontal cortex, thalamus, and cerebellar volumes in adolescents and young adults with adolescent-onset alcohol use disorders and comorbid mental disorders. *Alcohol Clin Exp Res*, 29(9), 1590–600.
10. Zeigler, D. W., Wang, C. C., Yoast, R. A., Dickinson, B. D., McCaffree, M. A., Robinowitz, C. B., et al. (2005). The neurocognitive effects of alcohol on adolescents and college students. *Prev Med*, 40(1), 23–32.
11. Diamond, G., Panichelli-Mindel, S. M., Shera, D., Dennis, M., Tims, F., and Ungemack, J. (2006). Psychiatric syndromes in adolescents with marijuana abuse and dependency in outpatient treatment. *Journal of Child & Adolescent Substance Abuse*, 15(4), 37–54.

12. Johnston, L. D., O'Malley, P. M., Bachman, J. G., and Schulenberg, J. E. (2007). *Monitoring the Future: National results on adolescent drug use: Overview of key findings, 2006*. Bethesda, MD: National Institute on Drug Abuse. Retrieved April 16, 2008 from <http://www.monitoringthefuture.org/pubs/monographs/overview2006.pdf>.
13. DeWit, D. J., Adlaf, E. M., Offord, D. R., and Ogborne, A. C. (2000). Age at first alcohol use: A risk factor for the development of alcohol disorders. *Am J Psychiatry*, *157*(5), 745–50.
14. Kann, L., Kinchen, S. A., Williams, B. I., Ross, J. G., Lowry, R., Grunbaum, J. A., et al. (2000). Youth risk behavior surveillance—United States, 1999. *MMWR CDC Surveill Summ*, *49*(5), 1–96.
15. Coffey, S. F., Saladin, M. E., Drobles, D. J., Brady, K. T., Dansky, B. S., and Kilpatrick, D. G. (2002). Trauma and substance cue reactivity in individuals with comorbid posttraumatic stress disorder and cocaine or alcohol dependence. *Drug Alcohol Depend*, *65*(2), 115–27.
16. Saladin, M. E., Drobles, D. J., Coffey, S. F., Dansky, B. S., Brady, K. T., and Kilpatrick, D. G. (2003). PTSD symptom severity as a predictor of cue-elicited drug craving in victims of violent crime. *Addict Behav*, *28*(9), 1611–29.
17. Waldrop, A. E., Back, S. E., Verduin, M. L., and Brady, K. T. (2007). Triggers for cocaine and alcohol use in the presence and absence of posttraumatic stress disorder. *Addict Behav*, *32*(3), 634–9.
18. Titus, J. C., Dennis, M. L., White, W. L., Scott, C. K., and Funk, R. R. (2003). Gender differences in victimization severity and outcomes among adolescents treated for substance abuse. *Child Maltreat*, *8*(1), 19–35.
19. Grella, C. E., and Joshi, V. (2003). Treatment processes and outcomes among adolescents with a history of abuse who are in drug treatment. *Child Maltreat*, *8*(1), 7–18.
20. Read, J. P., Brown, P. J., and Kahler, C. W. (2004). Substance use and posttraumatic stress disorders: Symptom interplay and effects on outcome. *Addict Behav*, *29*(8), 1665–72.
21. Brown, P. J. (2000). Outcome in female patients with both substance use and post-traumatic stress disorders. *Alcoholism Treatment Quarterly*, *13*(3), 127–135.
22. Ouimette, P. C., Brown, P. J., and Najavits, L. M. (1998). Course and treatment of patients with both substance use and posttraumatic stress disorders. *Addict Behav*, *23*(6), 785–95.
23. Titus, J. C., Godley, S. H., and White, M. K. (2006). A post-treatment examination of adolescents' reasons for starting, quitting, and continuing the use of drugs and alcohol. *Journal of Child & Adolescent Substance Abuse*, *16*(2), 31–49.
24. Gardner, D. (2002). Skid Row high. *The Ottawa Citizen*. April 21, 2002.
25. American Psychiatric Association. (2000). *Diagnostic and Statistical Manual of Mental Disorders, DSM-IV-TR* (Text Revision) 4th ed. Washington, DC: American Psychiatric Publishing, Inc.

26. Pollock, N. K., and Martin, C. S. (1999). Diagnostic orphans: Adolescents with alcohol symptoms who do not qualify for DSM-IV abuse or dependence diagnoses. *Am J Psychiatry*, 156(6), 897–901.
27. National Institute on Drug Abuse. (2007). *Commonly Abused Drugs*. Bethesda, MD: National Institute on Drug Abuse, National Institutes of Health. Retrieved April 28, 2008 from <http://www.nida.nih.gov/DrugPages/DrugsofAbuse.html>.
28. Hawkins, J. D., Catalano, R. F., and Miller, J. Y. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. *Psychol Bull*, 112(1), 64–105.
29. Saitz, R. (2007). Treatment of alcohol and other drug dependence. *Liver Transpl*, 13(11 Suppl 2), S59–64.
30. Saitz, R. (2005). Clinical practice. Unhealthy alcohol use. *N Engl J Med*, 352(6), 596–607.
31. Udry, J. R. E. (2003). *The National Longitudinal Study of Adolescent Health (Add Health), Waves I & II, 1994–1996; Wave III, 2001–2002*. Chapel Hill, NC: Carolina Population Center, University of North Carolina at Chapel Hill. Retrieved from <http://www.cpc.unc.edu/projects/addhealth>.
32. Bartlett, R., Holditch-Davis, D., and Belyea, M. (2007). Problem behaviors in adolescents. *Pediatr Nurs*, 33(1), 13–18.
33. Eaton, D. K., Kann, L., Kinchen, S., Ross, J., Hawkins, J., Harris, W. A., et al. (2006). Youth risk behavior surveillance—United States, 2005. *MMWR Surveill Summ*, 55(5), 1–108.
34. Lepere, B., and Charbit, B. (2002). Cardiovascular complications of cocaine use: Recent points on cocaethylene toxicity. *Ann Med Interne (Paris)*, 153(3 Suppl), 1S45–6.
35. McCance-Katz, E. F., Kosten, T. R., and Jatlow, P. (1998). Concurrent use of cocaine and alcohol is more potent and potentially more toxic than use of either alone—a multiple-dose study. *Biol Psychiatry*, 44(4), 250–9.
36. Wilson, L. D., Jeromin, J., Garvey, L., and Dorbandt, A. (2001). Cocaine, ethanol, and cocaethylene cardiotoxicity in an animal model of cocaine and ethanol abuse. *Acad Emerg Med*, 8(3), 211–22.
37. Drug Abuse Warning Network. (2004). *The DAWN Report: Club drugs, 2002 update*. Rockville, MD: Substance Abuse and Mental Health Services Administration, Office of Applied Studies. Retrieved May 1, 2008 from [http://dawninfo.samhsa.gov/old\\_dawn/pubs\\_94\\_02/shortreports/files/DAWN\\_tdr\\_club\\_drugs02.pdf](http://dawninfo.samhsa.gov/old_dawn/pubs_94_02/shortreports/files/DAWN_tdr_club_drugs02.pdf).
38. National Institute on Drug Abuse. (2006). *NIDA research report series: Cigarettes and other tobacco products*. Rockville, MD: National Institute on Drug Abuse, US Department of Health and Human Services, National Institutes of Health. Retrieved from <http://www.nida.nih.gov/pdf/infofacts/Tobacco06.pdf>.

39. Substance Abuse and Mental Health Services Administration Office of Applied Studies. (2007). *Drug Abuse Warning Network, 2005: National Estimates of Drug-Related Emergency Department Visits*. Rockville, MD: U.S. Department of Health & Human Services. Retrieved May 1, 2008 from <http://dawninfo.samhsa.gov/files/DAWN-ED-2005-Web.pdf>.
40. National Institute on Drug Abuse. (2007). *NIDA Info Facts: Steroids (Anabolic-Androgenic)*. Rockville, MD: National Institute on Drug Abuse. Retrieved April 28, 2008, from <http://www.nida.nih.gov/PDF/Infofacts/Steroids07.pdf>.
41. Griffin, K. W., Botvin, G. J., Scheier, L. M., Doyle, M. M., and Williams, C. (2003). Common predictors of cigarette smoking, alcohol use, aggression, and delinquency among inner-city minority youth. *Addict Behav*, 28(6), 1141–8.
42. Wagner, E. F., Myers, M. G., and McIninch, J. L. (1999). Stress-coping and temptation-coping as predictors of adolescent substance use. *Addict Behav*, 24(6), 769–79.
43. Van Etten, M. L., Neumark, Y. D., and Anthony, J. C. (1999). Male-female differences in the earliest stages of drug involvement. *Addiction*, 94(9), 1413–9.
44. Van Etten, M. L., and Anthony, J. C. (2001). Male-female differences in transitions from first drug opportunity to first use: Searching for subgroup variation by age, race, region, and urban status. *J Womens Health Gen Based Med*, 10(8), 797–804.
45. Wallace, J. M., Jr., Bachman, J. G., O'Malley, P. M., Schulenberg, J. E., Cooper, S. M., and Johnston, L. D. (2003). Gender and ethnic differences in smoking, drinking and illicit drug use among American 8th, 10th and 12th grade students, 1976–2000. *Addiction*, 98(2), 225–34.
46. Brady, T., and Ashley, O. E. (2005). *Women in substance abuse treatment: Results from the Alcohol and Drug Services Study (ADSS)*. Rockville, MD: Substance Abuse and Mental Health Services Administration, Office of Applied Studies. Retrieved May 1, 2008 from <http://www.oas.samhsa.gov/WomenTX/WomenTX.htm>.
47. Kostelecky, K. L. (2005). Parental attachment, academic achievement, life events and their relationship to alcohol and drug use during adolescence. *Journal of Adolescence*, 28, 665–669.
48. Bahr, S. J., Hoffmann, J. P., and Yang, X. (2005). Parental and peer influences on the risk of adolescent drug use. *Journal of Primary Prevention*, 26, 529–551.
49. Herrenkohl, T. I., Tajima, E. A., Whitney, S. D., and Huang, B. (2005). Protection against antisocial behavior in children exposed to physically abusive discipline. *Journal of Adolescent Health*, 36, 457–465.
50. Kumpfer, K. L., and Turner, C. W. (1990–1991). The social ecology model of adolescent substance abuse: Implications for prevention. *The International Journal of the Addictions*, 25, 435–463.
51. O'Donnell, J., Hawkins, J. D., and Abbott, R. D. (1995). Predicting serious delinquency and substance use among aggressive boys. *Journal of Consulting and Clinical Psychology*, 63, 529–437.

52. Kuntsche, E., and Jordan, M. D. (2006). Adolescent alcohol and cannabis use in relation to peer and school factors: Results of multilevel analyses. *Drug and Alcohol Dependence*, 84, 167–174.
53. Oetting, E. R., and Beauvais, F. (1986). Peer cluster theory: Drugs and the adolescent. *Journal of Counseling and Development*, 65, 17–22.
54. Brook, J. S., Brook, D. W., Arencibia-Mireles, O., Richter, L., and Whiteman, M. (2001). Risk factors for adolescent marijuana use across cultures and across time. *Journal of Genetic Psychology*, 162, 357–374.
55. Stormshak, E. A., Comeau, C. A., and Shepard, S. A. (2004). The relative contribution of sibling deviance and peer deviance in the prediction of substance use across middle childhood. *Journal of Abnormal Child Psychology*, 32, 635–649.
56. McIntosh, J., MacDonald, F., and McKeganey, N. (2005). The reasons why children in their pre and early teenage years do or do not use illegal drugs. *International Journal of Drug Policy*, 16, 254–261.

*This project was funded by the Substance Abuse and Mental Health Services Administration (SAMHSA), U.S. Department of Health and Human Services (HHS). The views, policies, and opinions expressed are those of the authors and do not necessarily reflect those of SAMHSA or HHS.*