

Chapter 6: Substance Abuse, Addiction, and Drugs of Abuse

After reading this chapter, the reader will be able to:

- ▶ Define tolerance, substance abuse, dependence, and addiction.
- ▶ Identify the major categories of drugs and their physiological and psychological effects.
- ▶ Identify practices related to the particular drug(s) affecting the target group.
- ▶ Describe current trends in substance abuse among young people.

Basic Facts. For quick reference, see the drug profiles at the end of this chapter that contain information on common “street” names, physical properties, effects, indications of possible misuse, methods of use, and potential for addiction of selected drugs.

Overview

This chapter provides a description of tolerance, substance abuse, dependence, and addiction. In addition, it covers various drugs of abuse and their effects as well as insights into the scope of the substance abuse problem, implications for each of the most commonly abused drugs, and recent information on national trends regarding specific alcohol, tobacco, and other drug use among children and adolescents.

Substance Abuse and Addiction

There are many negative consequences associated with substance use among youth. First, and most common, are the short-term consequences associated with substance use—either the direct physical effects of the substance(s) or the higher-risk behavior often associated

with these effects. Second are the longer-term effects of continued substance use, such as its effect on academic performance, increased exposure to deviant peers, and greater exposure to and likelihood of experimentation with other drugs. Substance use can occur without lasting negative consequences; however, it is not possible to accurately predict which individuals will progress to substance abuse or addiction. Given that the vast majority of adolescents will engage in at least some degree of substance use, it is important that prevention leaders understand the definitions of *tolerance*, *substance abuse*, *addiction*, and *dependence*. Likewise, as stated previously in this *Handbook*, an important element of substance abuse prevention is helping youth understand the negative consequences of sustained substance use, including progression to abuse and addiction.

Defining Tolerance

Tolerance is the body’s accommodation to the presence of a drug so that the same dose results in a diminished effect over time. A common example of tolerance is the ability to “hold one’s liquor,” where continued use of alcohol results in the ability to drink more with less effect. Tolerance is an element of substance abuse, addiction, and dependence (NIDA, 2004c).

Defining Substance Abuse

Characteristics of substance abuse, as defined by the American Psychiatric Association (APA) (1994), include:

- ▶ Recurrent use, resulting in failure to fulfill major obligations at work, school, or home.
- ▶ Recurrent use in situations in which it is physically hazardous (e.g., driving an automobile).

Unless otherwise indicated, the statistical information reported under the subheading “Use Among Youth” for each drug has been obtained from two sources: the NIDA-sponsored Monitoring the Future (MTF) Study 2002 and the 2002 National Survey on Drug Use and Health (NSDUH), conducted annually by the Substance Abuse and Mental Health Services Administration (SAMHSA). Likewise, unless otherwise indicated, information on the nature, use, and effects of drugs has been obtained from the NIDA Research Report series (www.nida.nih.gov/ResearchReports/ResearchIndex.html) or from NIDA InfoFacts (www.nida.nih.gov/Infobox/Infoboxindex.html). All references used in the text are listed in the reference section for this chapter.

- ▶ Recurrent substance-related legal problems.
- ▶ Continued use despite having persistent or recurrent social or interpersonal problems.

For youth, even low levels of use are viewed by many to constitute abuse. Any use of licit drugs is illegal; likewise, youth are more prone to hazardous behavior, a predisposition that encourages and is exacerbated by substance use.

Defining Addiction

Drug addiction is a chronic, relapsing illness that results in compulsive cravings and drug-seeking behaviors that continue despite negative consequences. The foundations of addiction are genetic, psychological, and environmental (Chronic Pain Mission [CPM], 2004). The two variables that underlie the development of addiction are:

- ▶ The amount of the drug taken.
- ▶ The individual's inherent vulnerability to addiction (Chambers, Taylor, & Potenza, 2003).

The physiological component of addiction is the result of changes in the reward center in the brain caused by drug use. The reward center of the brain releases the chemical dopamine in response to rewards like food, water, and sex. The brain learns that these activities are pleasurable and seeks to repeat them. Drugs provide artificial rewards to the brain, causing the release of these same chemicals, but in a more sustained way than would occur in response to natural rewards (NIDA, 2003a). Drug users enjoy the feelings that result from drug use and seek to re-create those feelings. Over time, for each individual and to a different extent for each given substance, a threshold is reached such that use of substances permanently interferes with brain functioning. This process is often likened to flipping a switch (Chambers et al., 2003). Once these changes in metabolism and brain activity occur, the brain becomes unable to produce the desired feelings in the absence of the drug. The result is drug craving, compulsive drug seeking, and drug use—despite extremely negative consequences. An additional feature of addiction is the inability to quit without assistance (NIDA, 2003a).

Those who continue to use substances—particularly those substances that have a high addictive potential—

experience increased tolerance and an enhanced risk of becoming addicted. Beyond increased use of substances, development of tolerance, and increased risk for alcoholism among those who have a family history of alcoholism, there are no reliable methods to determine which individuals will develop an addiction and which will not—further underscoring the need for prevention.

The APA's Diagnostic and Statistical Manual–IV (1994) describes a “maladaptive pattern of substance use leading to clinically significant impairment or distress” as including 3 (or more) of the following in the same 12-month period:

- ▶ The substance is often taken in larger amounts or over a longer period than intended.
- ▶ There is persistent desire or unsuccessful effort to cut down or control substance use.
- ▶ A great deal of time is spent in activities necessary to obtain the substance (e.g., visiting multiple doctors or driving long distances), use the substance (e.g., chain smoking), or recover from its effects.
- ▶ Important social, occupational, or recreational activities are given up or reduced because of substance abuse.
- ▶ Substance use continues despite knowledge of having a persistent or recurrent psychological or physical problem that is caused or exacerbated by use of the substance.
- ▶ Tolerance develops, as defined by either the need for increased amounts of the substance in order to achieve intoxication or the desired effect or a markedly diminished effect with continued use of the same amount.
- ▶ Withdrawal occurs, as manifested by either characteristic withdrawal syndrome for the substance or taking the same (or a closely related) substance to relieve or avoid withdrawal symptoms.

Defining Dependence

Drug dependence is often used as a synonym for *drug addiction*. However, scientists have drawn a distinction between the two. While drug addiction is characterized

in part by psychological components, drug dependence is characterized only by a physiological adaptation of the body to the presence of a drug. Those who are dependent on a drug—such as an opiate used to control pain—over a prolonged period of time will experience withdrawal symptoms if the drug is suddenly stopped. The difference between addiction and dependence has less to do with the drug than with the presence of the psychological and behavioral motivations for its use. Use of an opiate for purposes other than pain relief (i.e., for psychological reasons) can result in addiction. However, the development of physical dependence on an opiate used for pain relief would not result in the psychological and behavioral components of addiction. While withdrawal symptoms would occur in the absence of the drug, these would not be accompanied by cravings and overwhelming involvement in drug seeking. Because dependence is solely physiological, the withdrawal process is easier and can be managed by slowly decreasing dosages over time (CPM, 2004).

Adolescents' Vulnerability to Drug Abuse and Addiction

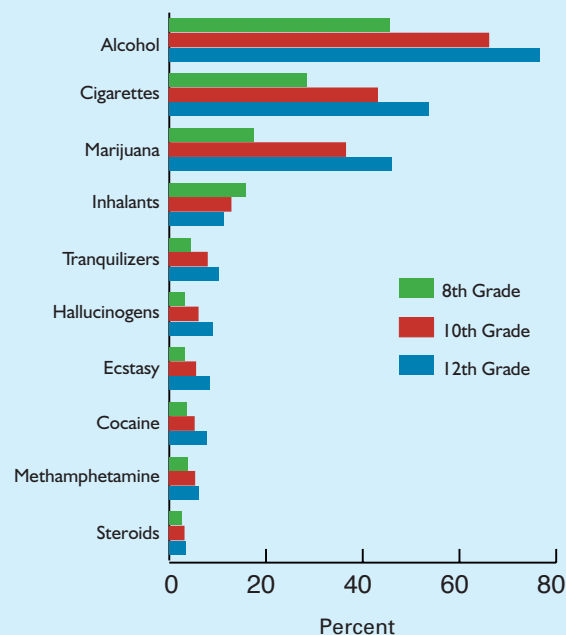
Growing evidence indicates that adolescents' experimentation with drugs is more than a sociocultural phenomenon. The same areas of the brain—those responsible for motivation and impulse control—that are affected by drug use are the very areas that undergo rapid changes during adolescence. This means that adolescents are often more motivated than children or adults to have new experiences. This, in combination with an immature system of inhibition and impulse control, can result in risky behaviors, including drug use. In turn, substance use affects these same developing regions of the brain, and addiction can occur more quickly and more permanently than in older individuals. By virtue of their neurobiological stage of development, adolescents appear to have a lower threshold for “flipping the switch” to addiction (Chambers et al., 2003).

Despite this increased vulnerability, not all youth progress from experimental to addictive drug use. However, knowing that adolescents face an increased risk of addiction further underscores the need to prevent initial use of substances and, in the case of youth who have already initiated substance use, prevent the escalation to heavier and/or more frequent use, increased tolerance, and progression to the use of other drugs.

Drugs of Abuse

The most common drugs of abuse are divided here into seven categories according to their primary effect. A separate subsection looks at drugs used in combination and “designer/club” drugs. The seven categories are:

Figure 1. Lifetime Use of Various Drugs in 2003



Source: Monitoring the future, University of Michigan, 2004.

1. **Central nervous system (CNS) depressants**—alcohol, chloral hydrate, barbiturates, benzodiazepines, hypnotic sedatives, and other tranquilizers.
2. **Stimulants**—nicotine (tobacco), cocaine, amphetamines/methamphetamine, methylphenidate (Ritalin), and other stimulants, such as diet pills.
3. **Cannabinoids (cannabis)**—marijuana, tetrahydrocannabinol (THC), and hashish.
4. **Hallucinogens (psychedelics)**—amphetamine variants (MDA, MDMA, Ecstasy), mescaline, peyote, LSD, phencyclidine and analogs, and other hallucinogens.
5. **Narcotics (opiates)**—codeine, heroin, morphine, hydrocodone (Vicodin), hydromorphone, oxycodone (OxyContin), methadone, fentanyl, and other narcotics.

6. **Inhalants**—organic solvents (gasoline, spray paint, hair spray, thinners), nitrites, and nitrous oxide (laughing gas).
7. **Steroids**—anabolics (Anabolin, Methandriol).

Central Nervous System (CNS) Depressants

CNS depressants include alcohol, barbiturates, benzodiazepines, hypnotic sedatives, and other tranquilizers. Two major subcategories are:

- ▶ Alcohol—beer, wine, and liquor.
- ▶ Other depressants—barbiturates and benzodiazepines (tranquilizers).

Alcohol

More young people use alcohol than any other drug.

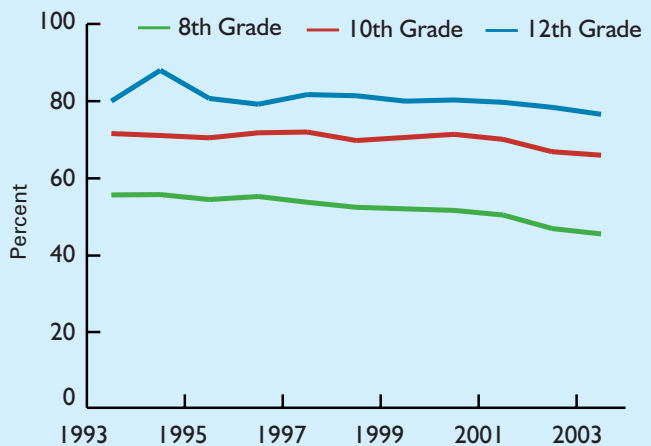
Description

Nature of the drug. The three basic types of alcoholic beverages are wine, beer, and distilled spirits (hard liquor). Fermenting and distilling fruit juices produces brandies; the addition of sugar and/or other flavorings produces liqueurs or cordials. Wine, beer, and liquor all have the same potential for intoxication and addiction. Generally speaking, a typical serving of beer, wine, or hard liquor contains an equivalent amount of alcohol, with exceptions such as fortified wines, malt liquors, wine coolers, and distilled spirits such as Everclear, all of which have higher than average proportions of alcohol relative to other alcoholic drinks (Doweiko, 2002).

Other sources of alcohol. In addition to beverages, a large number of over-the-counter (OTC) medications—antihistamines, cough syrups, mouthwash, asthma medications, and other products—contain alcohol in varying amounts, some up to 60 percent. The alcohol content of these drugs is usually of little concern because they are taken in relatively small quantities. However, if someone takes 3 tablespoons of a theophylline elixir—a type of over-the-counter cough syrup—four to five times a day, he or she is consuming the equivalent of a 12-ounce glass of beer, a 5-ounce glass of wine, or a 1.5-ounce shot of liquor.

Short-term effects. Even low doses of alcohol significantly impair the judgment and coordination required to drive a car safely. Low to moderate doses

Figure 2. Lifetime Prevalence of Alcohol Use



Source: *Monitoring the future*, University of Michigan, 2004.

Facts About Alcohol

- ▶ Alcohol continues to be the most frequently used drug among young people.
- ▶ Underage drinking causes more youth deaths than all illegal drugs combined (NIAAA, 2003b).
- ▶ Alcohol-related motor vehicle accidents are the leading cause of death among Americans aged 15 to 20 years (National Highway Traffic Safety Administration [NHTSA] in NIAAA, 2003b).
- ▶ Underage drinking contributes to suicide, sexual assault, and high-risk sex among youth (NIAAA, 2003b).
- ▶ As little as one alcoholic drink can impair coordination and thinking and the ability to drive (NIAAA, 2001).
- ▶ Children of alcoholic parents are at greater risk of beginning to drink during adolescence and to develop alcoholism (NIAAA, 1997).
- ▶ Women and girls are more vulnerable to the effects of alcohol than men and boys (NIAAA, 1999).
- ▶ Alcohol use often precedes the use of other illicit substances; however, its own negative impact on youth warrants significant attention (NIAAA, 1999).
- ▶ Adolescents who expose their brains to alcohol risk interrupting key developmental processes of brain development (NIAAA, 2003b).

of alcohol can increase the incidence of a variety of aggressive behaviors, including spousal and child abuse. Moderate to high doses of alcohol cause marked impairment of higher mental functions, severely altering a person's ability to learn and remember information. Very high doses can cause respiratory depression and death.

Long-term effects. Continued use of alcohol can lead to dependence. Consuming large quantities of alcohol long term, especially when combined with poor nutrition, can lead to permanent damage to the brain and liver and is associated with cancers, cardiovascular disease, diabetes, and dementia (NIAAA, 2003a). Chronic abuse of alcohol can lead to addiction (alcoholism). Alcohol addiction can be characterized by increased tolerance, causing the abuser to drink greater amounts to achieve the desired effect. When an alcoholic stops drinking, he or she will typically experience symptoms of withdrawal.

Protective effects. Despite the many negative consequences associated with excessive alcohol use, research has consistently found that moderate alcohol

damage and, for women, a possible increase in risk of breast cancer.

Scope of the Problem and Implications

Overview of the problem. Alcohol is the oldest and most widely used drug in the world. Nearly one-half of all Americans over the age of 12 are consumers of alcohol (SAMHSA, 2003). Although most Americans drink only moderately or occasionally, 5 to 7 percent of the population in the United States either abuse alcohol or are alcoholics, with more than 100,000 deaths each year attributed to alcohol (NIAAA, 2003a). As many as 4.5 million adolescents in the United States are alcoholics or problem drinkers.

Adolescents and accidents. Adolescents are disproportionately involved in alcohol-related automobile accidents, the leading cause of death for Americans 15 to 20 years of age (NIAAA, 2001). About one-half of all youthful deaths by drowning, fire, suicide, and homicide are alcohol related.

Youth statistics. The 2002 National Survey on Drug Use and Health (NSDUH) found that among youth aged 12 to 17, an estimated 17.6 percent used alcohol; 10.7 percent were binge drinkers; and 2.5 percent were heavy drinkers. Other studies have found even higher rates. The proportion of youth using alcohol increases with age, starting with 2 percent at age 12, growing to 6.5 percent at age 13, and continuing to rise to a peak of almost 75 percent of 17-year-olds.

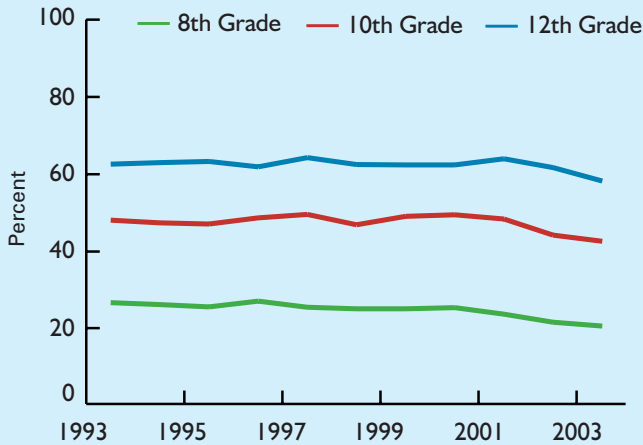
Nearly 50 percent of male high school seniors can be described as problem drinkers. Among female high school seniors, nearly 25 percent of those who have ever consumed alcohol report that they are problem drinkers.

Associations with other substance use. Adolescents who use one substance are far more likely to use another. The 1998 CASA National Survey of Teens, Teachers, and Principals reported that, compared with teenagers who had not drunk alcohol in the past month, those who had used alcohol in the past month were five times more likely to smoke cigarettes, four times more likely to smoke marijuana, and three times more likely to try an illegal drug in the future. Eighty-seven percent of those who reported associating mostly with youth who drank also had friends who smoked marijuana.

Alcohol Use Among Youth

- ▶ The peak initiation for alcohol use occurs in grades 7-11.
- ▶ In 2002, 17.6 percent of adolescents aged 12-17 years were current drinkers. Of these, 10.7 percent were binge drinkers and 2.5 percent were heavy drinkers.
- ▶ Among 10th- and 12th-grade students in 2002, males were substantially more likely to drink heavily than were females: 34 percent of 12th-grade males reported heavy drinking compared with 23 percent of 12th-grade females.
- ▶ Heavy drinking among females is slowly approaching that among males. In 1975, the differential in heavy drinking among male and female 12th graders was 23 percent; in 2002, the differential was only 11 percent.
- ▶ Among the youngest individuals surveyed, males and females were equally likely to report heavy alcohol use.
- ▶ Reports from 12th graders of having been drunk in the past 30 days declined from 34 percent in 1997 to 30 percent in 2002.
- ▶ Among 4th-, 5th-, and 6th-grade students, wine coolers, which have a higher alcohol content per ounce than beer, are often preferred over other kinds of alcohol.

use has a protective effect on the cardiovascular system; however this protective effect has been most clearly demonstrated only for older individuals and individuals otherwise at risk for cardiovascular disease (NIAAA, 2003a). Drinking an average of one to two drinks per day has the effect of inhibiting the ability of blood platelets to bind together, reducing the likelihood of heart attack and stroke. However, drinking in excess of this amount has the opposite effect, suppressing normal red blood cell formation and resulting in an increased risk of stroke and cardiovascular events (NIAAA, 2003a). Drinking more than one to two drinks per day places drinkers at greater risk for other problems, particularly alcohol-related brain

Figure 3. Lifetime Prevalence of Having Been Drunk

Source: Monitoring the future, University of Michigan, 2004.

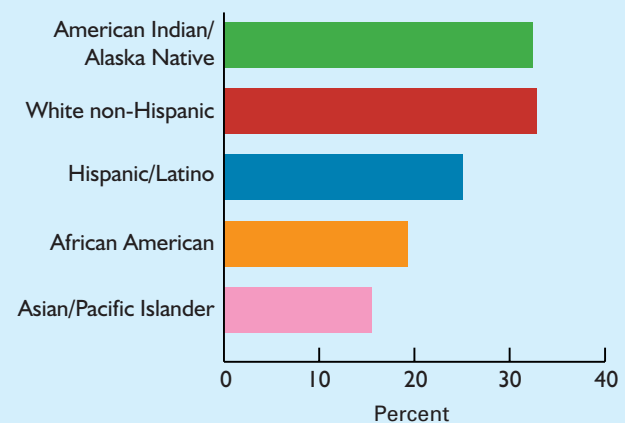
Early use of alcohol. Other research findings indicate that youth who begin drinking before age 15 are four times more likely to develop alcohol dependence compared with those who do not start drinking until age 20 or later. Likewise, youth who drink are at increased risk for motor vehicle crashes, suicide, sexual assault, high-risk sex, and interruption of brain development (NIAAA, 2003b). Likewise, drinking as a youth can interfere with puberty and bone growth (NIAAA, 1997).

Ethnic minority variations in use. Different patterns of use and abuse and varying prevalence of alcohol-related problems exist among ethnic minorities in the United States. In 2002, underage drinking (ages 12 to 20) in the past month was comparable for non-Hispanic white and American Indian/Alaska Native youth (32.8 percent and 32.4 percent, respectively), followed by Hispanic/Latino youth (25 percent), African-American youth (19.3 percent), and Asian/Pacific Islander youth (15.5 percent) (SAMHSA, 2003). Binge drinking in 2002 followed a similar pattern, with non-Hispanic white and American Indian/Alaska Native youth being more than twice as likely as African-American or Asian/Pacific Islander youth to report binge drinking.

Biological factors may play some role in the variation in alcohol use among different ethnic populations. For example, many individuals from Asian subpopulations do not have the active form of an enzyme involved in metabolizing alcohol. As a result, these individuals experience flushed skin, nausea, headache, and other discomforts when they drink alcohol. Not surprisingly,

research has demonstrated that individuals who have the less active form of this enzyme drink significantly less alcohol than those who possess the active enzyme. Likewise, some African Americans have variability in another enzyme responsible for alcohol metabolism that may be in part responsible for the disproportionate vulnerability to cirrhosis and alcohol-related fetal damage in this population (NIAAA, 2002).

Wine coolers and younger drinkers. Wine coolers, which have higher alcohol content than beer, were preferred over other alcoholic beverages by many youth in earlier grades. In 2001-2002, 4.3 percent of 4th graders, 5.8 percent of 5th graders, and 14.9 percent of 6th graders reported drinking wine coolers; for beer, the reported prevalence was 5.0 percent, 4.9 percent, and 11.0 percent, respectively (Parents Resource Institute for Drug Education [PRIDE], 2003).

Figure 4. Percentage of Youth Reporting Underage Drinking in the Past 30 Days

Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 2002.

Other Depressants

Description

Nature of the drug. CNS depressants comprise a variety of chemically unrelated compounds, all of which slow normal brain function. These drugs are sometimes referred to as sleeping pills, sedatives, hypnotics, minor tranquilizers, and antianxiety medications. Depressants are used medically to relieve anxiety and promote sleep. When they are abused or taken at high doses, however, many of these drugs can lead to unconsciousness and death.

Short- and long-term effects. The effects of depressants are in many ways similar to the effects of alcohol, and withdrawal symptoms are often indistinguishable from those of chronic alcoholism. The combination of depressants and alcohol can magnify the effects of these drugs, increasing the risks of severe intoxication.

Other Depressants: Facts

- ▶ As the dose of a tranquilizer is increased, so is sedation and impairment of mental acuity and physical coordination.
- ▶ Chronic users of tranquilizers can become both physically and psychologically dependent.
- ▶ Tranquilizers are often taken to relax or sleep after overstimulation by amphetamine and cocaine.

Unlike most other classes of drugs of abuse, depressants—except for methaqualone—are rarely produced in clandestine laboratories. Generally, these are legal pharmaceutical products that are diverted to the illicit market.

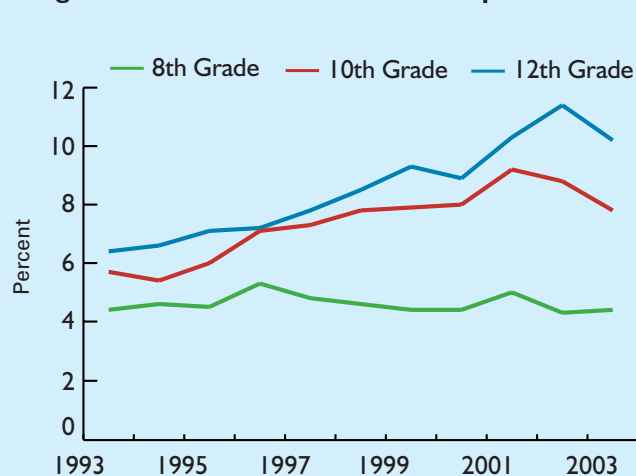
Scope of the Problem and Implications

Two major groups of depressants have dominated the licit and illicit markets for nearly a century: first, barbiturates, and now, benzodiazepines (tranquilizers). Barbiturates were very popular in the first half of the 20th century. Although many people have taken barbiturates therapeutically without harm, concern about the addiction potential of these drugs and the ever-increasing number of fatalities associated with them has led to the development of alternative medications. Today, only 20 percent of all depressant prescriptions in the United States are for barbiturates. More than 2,500 barbiturates have been synthesized, and about 50 were

marketed for human use when they were at maximum popularity. Today, only about 12 are used. Barbiturate users prefer short- and intermediate-acting barbiturates such as Nembutal, Seconal, and Amytal.

Although primary abuse of benzodiazepines is well documented, abuse of these drugs usually occurs as part of a pattern of multiple substance abuse. For example, heroin or cocaine abusers will use benzodiazepines and other depressants to augment their “high” or alter the side effects associated with overstimulation or narcotic withdrawal. Using alcohol or other depressants with benzodiazepines can be life threatening. Withdrawal from benzodiazepines is not usually life threatening; however, withdrawal from long-term use of other depressants can result in life-threatening complications.

Figure 5. Lifetime Prevalence of Tranquilizer Use



Source: Monitoring the future, University of Michigan, 2004.

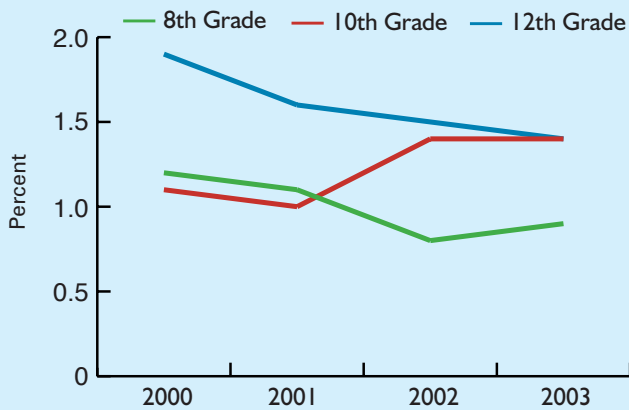
Other Depressants: Use Among Youth

- ▶ The use of tranquilizers among 8th, 10th, and 12th graders has remained relatively stable since 1998, with 2002 rates of use in the past 30 days of almost 8 percent of 12th graders and approximately 3 percent of 8th graders.
- ▶ The rate of use of gamma hydroxybutyrate (GHB) by 8th, 10th, and 12th graders during the past 30 days has remained between 1 and 2 percent since tracking of its use began in 2000.
- ▶ GHB has been implicated in several cases of sexual assault.
- ▶ Sedative use among 12th-grade students has been rising gradually since 1991, with almost 7 percent of high school seniors in 2002 reporting use in the past 30 days.

Rohypnol. Rohypnol (benzodiazepine flunitrazepam) experienced a brief period of popularity among youth in the mid-1990s. Also known as “roofies,” “rophies,” “roach,” “rope,” and the “date rape drug,” the tranquilizer is ten times more powerful than Valium and produces sedative-hypnotic effects, including muscle relaxation and amnesia. Although often used in conjunction with alcohol, Rohypnol may be lethal when mixed with alcohol and/or other depressants.

Rohypnol has been a concern in recent years because of its abuse as a “date-rape” drug. Individuals have unknowingly been given the drug, which, when mixed with alcohol, can incapacitate the victim and prevent him or her from resisting sexual assault. The drug has no taste

Figure 6. Annual Prevalence of GHB Use



Source: Monitoring the future, University of Michigan, 2004.

or odor, so the victims do not realize what is happening; victims also have no memory of what happened to them while under the drug's influence (NIDA, 2004c). Fortunately, use of the drug is on the decline, with only 1.6 percent of 12th graders and less than 1 percent of 8th and 10th graders reporting use during the past year (SAMHSA, 2003).

GHB. GHB (gamma-hydroxybutyrate) has effects somewhat similar to those of Rohypnol, and its use as a mechanism for sexual assault has surpassed that of Rohypnol (NIDA, 2004c). In 2002, use of GHB among youth was slightly greater than that of Rohypnol: 1.5 percent of 12th graders, 1.4 percent of 10th graders, and 0.3 percent of 8th graders reported use in the previous year (SAMHSA, 2003). Like Rohypnol, GHB can also have dangerous and even lethal effects, including coma and seizures, and when mixed with alcohol, nausea and difficulty breathing (NIDA, 2004c). In 2002, GHB use was cited twice as often as Rohypnol in emergency department admissions and only slightly less frequently than Ecstasy (SAMHSA, 2003).

Stimulants

Stimulants include nicotine (tobacco), cocaine (powder and crack), amphetamines and methamphetamine, methylphenidate (Ritalin), and other substances, such as diet pills.

For this discussion, stimulants have been divided into four major subcategories:

- ▶ Tobacco.
- ▶ Cocaine (powder).
- ▶ Cocaine (crack).
- ▶ Amphetamines and methamphetamine.

Tobacco

Description

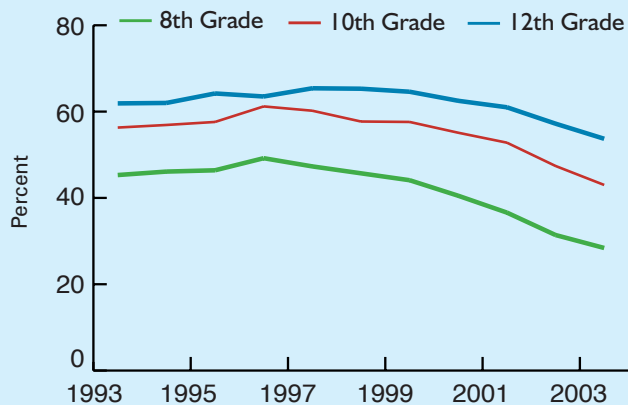
Facts About Tobacco

- ▶ Youth aged 12 to 17 who currently smoke cigarettes are eight times more likely to use illicit drugs and three times more likely to drink heavily than nonsmoking youth.
- ▶ Tobacco use results in an annual cost of over \$75 billion in direct medical costs.
- ▶ Each year, smoking kills more than 400,000 people—more than AIDS, alcohol, other drug abuse, car crashes, murders, suicides, and fires combined.
- ▶ Cigarette smoking often precedes marijuana use; 60 percent of repeat marijuana users tried cigarettes first.
- ▶ More than 6.4 million children living today will die prematurely because of their decision to smoke cigarettes.

Nature of the drug. Cigarette smoke contains some 4,000 chemicals, several of which are known carcinogens. Perhaps the most dangerous substance in tobacco smoke is nicotine—the substance that reinforces and strengthens the desire to smoke. Nicotine is both a transient stimulant and a sedative to the central nervous system.

Short-term effects. The ingestion of nicotine results in an almost immediate “kick” because it causes a discharge of epinephrine (adrenaline) from the adrenal cortex. This stimulates the central nervous system as well as the endocrine glands, which causes a sudden release of glucose. Stimulation is then followed by depression and fatigue, leading the user to seek more nicotine. Nicotine has been reported to reduce anxiety, and smokers report that they experience calming effects from smoking, most likely the result of relief from withdrawal symptoms. Nicotine is absorbed readily from tobacco smoke in the lungs; nicotine taken in by cigarette smoking takes only seconds to reach the brain and has a direct effect on the body for up to 30 minutes.

Long-term effects. With regular use, levels of nicotine accumulate in the body during the day and persist

Figure 7. Lifetime Prevalence of Cigarette Smoking

Source: Monitoring the future, University of Michigan, 2004.

overnight. Thus, daily cigarette smokers are exposed to the effects of nicotine for 24 hours each day. Because nicotine is highly addictive, users find it difficult to stop smoking. Less than 20 percent of typical smokers succeed in stopping smoking on their first try.

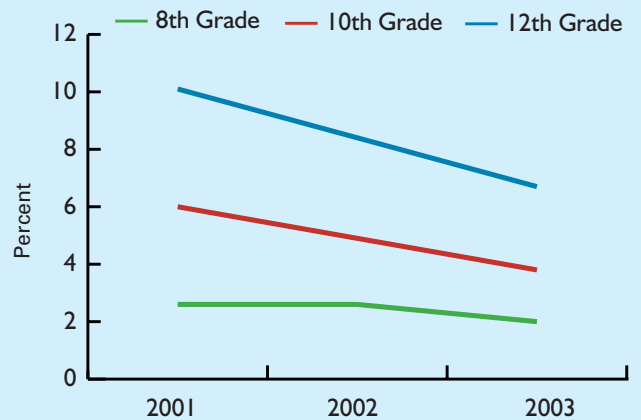
Most tobacco users develop a tolerance for nicotine and need greater amounts to produce the desired effect. Smokers become physically and psychologically dependent and suffer withdrawal symptoms when use is stopped. Physical withdrawal symptoms include changes in body temperature, heart rate, digestion, muscle tone, and appetite. Psychological symptoms include irritability, anxiety, sleep disturbances, nervousness, headaches, fatigue, nausea, and cravings for tobacco that can last for days, weeks, months, or even years.

Nicotine and tar. While nicotine is the source of reinforcement and addiction for smokers, tar is the source of the majority of the toxic effects of smoking. Research indicates that cancer risk is no different among smokers of low-, medium-, and high-tar cigarettes, primarily because smokers compensate for lower tar content by inhaling more deeply or holding smoke in their lungs for longer periods (Harris, Thun, Mondul, & Calle, 2004).

Bidis and kreteks. While cigarette use has been on the decline in recent years, alternative tobacco use has been on the rise. Bidis are small brown cigarettes, often flavored, consisting of tobacco hand-rolled in tendu or temburni leaf and tied at one end with a string. The size of a bidi can vary greatly, and this can alter the volume of smoke produced. A smaller bidi may produce less smoke

than a cigarette. However, the longer variety of bidi may allow two or three times as many puffs as an ordinary cigarette and deliver up to 40 or 50 milligrams of tar. Because they lack added burning agents, bidis must be puffed continuously to be kept alight and, thus, probably deliver a relatively high dose of tar to the smoker. In addition, bidis do not have filters, resulting in greater levels of tar delivery. They are produced in India and some Southeast Asian countries and exported to the United States. Bidis are also generally less expensive than cigarettes, costing about \$2.00 for a pack of 20.

Kreteks (clove cigarettes) and other herbal cigarettes are often thought to be safer than those containing tobacco and are frequently advertised as a safe way to quit smoking

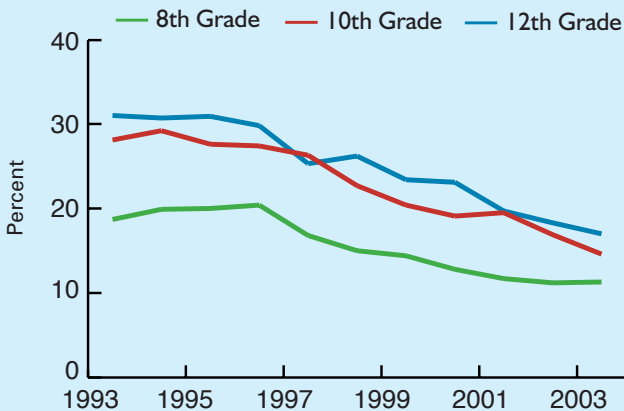
Figure 8. Lifetime Prevalence of Kretek (Clove Cigarette) Use

Source: Monitoring the future, University of Michigan, 2004.

tobacco cigarettes. However, some varieties, particularly those manufactured in China, contain tobacco. These brands have high tar and nicotine levels, varying between 11 and 15 milligrams of tar and containing around 1.5 milligrams of nicotine. Some brands have no nicotine, but their levels of tar and particulate matter are similar to those of cigarettes.

Scope of the Problem and Implications

Cigarette smoking is the single most preventable cause of premature death in the United States. After years of controversy over the dangers of smoking, a 1985 report by the U.S. Surgeon General confirmed that nicotine in tobacco products is an addictive drug comparable to heroin or morphine.

Figure 9. Lifetime Prevalence of Smokeless Tobacco Use

Source: Monitoring the future, University of Michigan, 2004.

Death and disability. Half of all cigarette smokers will either die or experience disability as a direct result of their smoking (Centers for Disease Control and Prevention [CDC], 2003). It is estimated that 6.4 million youth under the age of 18 will die prematurely from a tobacco-related disease (CDC, 2003). Cigarette smoking is responsible for more than 440,000 deaths each year, including those of approximately 3,000 nonsmokers exposed to secondhand smoke. More premature deaths can be attributed to tobacco use than to illicit drug use, alcohol, firearms, and motor vehicles combined (McGinnis & Foege, 1993). Likewise, smokeless tobacco and cigars have been associated with lethal cancers of the lung, larynx, esophagus, and mouth (CDC, 2003), and infants exposed to tobacco smoke are at greater risk for sudden infant death syndrome (SIDS) and respiratory problems.

Youth-specific issues. Cigarette smoking, alternative forms of smoking, and smokeless tobacco use are the basis of a tenacious problem among youth. Young people have relatively easy access to cigarettes, bidis, kreteks, and smokeless forms of tobacco. Further complicating the problem is the fact that youth start smoking and using smokeless tobacco on average much earlier than they start alcohol or illicit drug use (Johnston, O'Malley, & Bachman, 2003). Still, encouraging trends have been observed among adolescents in recent years. Cigarette smoking has been on the decline among 8th-, 10th-, and 12th-grade students since 1996 (Johnston et al., 2003). About half as many 8th-grade students reported smoking in 2002 as did in 1996. Likewise, past-month smoking decreased by more than 10 percentage points among 10th

and 12th graders during the same period. In 2001-2002, 2.1 percent of 4th graders, 2.4 percent of 5th graders, and 7.2 percent of 6th graders reported smoking cigarettes (PRIDE, 2003). While rates of smoking are similar for males and females, use of smokeless tobacco is primarily a male phenomenon; males aged 12 to 17 years were 16 times more likely than females to report current use of smokeless tobacco (SAMHSA, 2003).

Bidis and kreteks are also relatively popular smoking choices among youth. In 2002, approximately 6 percent of 12th graders, 3.1 percent of 10th graders, and 2.7 percent of 8th graders reported using bidis in the past year (Johnston et al., 2003). Since 2000, prevalence rates of bidi smoking have decreased among 10th and 12th graders but have remained unchanged for 8th graders. Kreteks were more popular than bidis in 2002, with 8.4 percent of 12th graders, 4.9 percent of 10th graders, and 2.7 percent of 8th graders reporting use in the previous 12 months (Johnston et al., 2003). As is the case with bidis, prevalence rates of kretek smoking have decreased since 2000 among 10th and 12th graders but have remained unchanged for 8th graders.

Tobacco Use Among Youth

- ▶ Cigarette smoking has an earlier peak initiation age than any other drug use; the peak period of initiation of smoking cigarettes is grades 6-7 and, for smokeless tobacco, grades 7-10.
- ▶ In 2002, almost 14 percent of female and 12 percent of male adolescents aged 12-17 years reported smoking cigarettes in the past 30 days.
- ▶ Cigarette smoking has been on the decline in recent years. In 2002, 11 percent of 8th graders, 18 percent of 10th graders, and 27 percent of 12th graders reported smoking cigarettes in the previous 30 days.
- ▶ Daily smoking among 12th graders has decreased from a recent high of 25 percent in 1997 to approximately 17 percent in 2002. Slightly less than 10 percent of 12th graders reported smoking half a pack or more of cigarettes per day.
- ▶ Females and males reported similar rates of daily smoking. Eight percent of 8th-grade males smoked daily, while 15 percent of 10th- and 23 percent of 12th-grade males did so. For females, rates were 9, 17, and 22 percent for 8th, 10th, and 12th graders, respectively.
- ▶ In 2002, 28 percent of American Indian/Alaska Native and 16 percent of non-Hispanic white 12th graders reported smoking in the past 30 days, compared with 10 percent of Hispanics, 7 percent of African Americans, and 4 percent of Asian Americans/Pacific Islanders.

There were significant differences in smoking rates by race/ethnicity in 2002 (SAMHSA, 2003). Current (past 30 days) cigarette smoking rates were highest among American Indians/Alaska Natives (27.7 percent), followed by non-Hispanic whites (15.6 percent), Hispanics/Latinos (10.0 percent), African Americans (6.6 percent), and Asian Americans/Pacific Islanders (3.8 percent). Smoking rates for youth aged 12 to 17 years were slightly higher for females than for males (13.6 percent and 12.3 percent, respectively). Of youth who reported cigarette smoking, 1 million (31.8 percent) were daily smokers (SAMHSA, 2003).

Smoking was more prevalent among rural youth. Adolescents aged 12 to 17 years who lived in rural, nonmetropolitan areas were almost twice as likely to report smoking in the past month as their peers in large metropolitan areas (SAMHSA, 2003).

Cocaine (Powder)

Description

Nature and brief history of the drug. Cocaine stimulates the central nervous system. It is the most powerful drug within its class and one of the most potent drugs of abuse. Cocaine was first isolated from the South American coca leaf in the late 1800s and soon became an ingredient in patent medicines (e.g., throat lozenges, tonics, etc.) and other products (e.g., Coca-Cola, from which it was later removed). Instances of addiction, psychotic behavior, convulsions, and death soon became cause for concern and, in 1914, a law was passed prohibiting the use of cocaine in over-the-counter products. Cocaine use dropped dramatically and remained at minimal levels for about half a century. In the 1960s, illicit cocaine use rebounded. By the late 1970s, cocaine use—although expensive—had become common among middle- and upper-middle-class Americans; new generations had forgotten the lessons about cocaine’s toxicity and the dangers of abuse that had been learned earlier in the century.

How it is used. Most cocaine users in the United States “snort” the powdered drug through the nose—and some dissolve it in water and inject it into a muscle or vein—to experience the drug’s short-lived “highs.”

Short-term effects. Small amounts of cocaine produce feelings of euphoria, energy, and mental alertness (NIDA, 1999). Other immediate effects include dilated pupils;

elevated blood pressure, heart rate, respiratory rate, and body temperature; loss of appetite; and insomnia. Occasional use can cause a stuffy or runny nose, while chronic use can ulcerate the mucous membrane of the nose. As use progresses, loss of interest in physical appearance, as well as frequent upper respiratory infections, may become apparent. The use of cocaine can cause death by cardiac arrest or respiratory failure (NIDA, 1999).

Long-term effects. Cocaine can cause physical and psychological dependency, and tolerance develops rapidly. Cocaine causes chemical changes in the brain that lead to intense cravings for more of the drug. Anyone who tries cocaine risks addiction; recent research suggests that of those who use cocaine at least once, approximately 21 percent will eventually become addicted (NIDA, 2002e).

Scope of the Problem and Implications

Cocaine use is not common among youth; the average age of first use of cocaine is 20 (NIDA, 2002e). That said, cocaine use among adolescents has increased in the past 10 years. In 2002, 2.3 percent of 12th graders, 1.6 percent of 10th graders, and 1.1 percent of 8th graders reported cocaine use in the past month. In 1991, rates were 1.4 percent, 0.7 percent, and 0.5 percent, respectively (Johnston et al., 2003). Overall use is 0.6 percent among youth aged 12 to 17 years and 2.0 percent for those aged 18 to 25 years (SAMHSA, 2002e).

Non-Hispanic white and Hispanic/Latino youth are much more likely than African-American youth to be current cocaine users or to have ever tried cocaine. Lifetime use for 12th graders in 2002 was 10.6 percent for Hispanic/Latino students, 8.6 percent for non-Hispanic white students, and only 1.4 percent for African-American students (Johnston et al., 2003). Thirty-day and annual prevalence followed the same pattern.

Cocaine and Crack Use Among Youth

- ▶ The peak initiation for use of illicit drugs other than marijuana generally occurs in the high school years.
- ▶ Cocaine use is relatively uncommon among adolescents; approximately 5 percent of high school seniors, 4 percent of 10th graders, and 2 percent of 8th graders reported use in the past year in 2002; 0.6 percent of 12- to 17-year-old adolescents reported use of cocaine in the past month.
- ▶ Cocaine use rates have been relatively stable since 1999.

Cocaine (Crack)

Description

Nature and use of the drug. In the 1970s, concerns in the drug-using community over the purity of cocaine led to the practice of “freebasing,” which is a method of removing impurities through the use of solvents. The freebasing process removes the water-soluble component, or “base.” This process alone is dangerous because it requires highly flammable and explosive solvents. The resulting product is then vaporized and inhaled. Crack is a product of freebasing that uses baking soda or ammonia in water instead of other solvents to remove the base. The resulting hard paste resembles rock salt and is cut into chunks (or “rocks”). Two or three of these ready-to-use portions typically sell for \$5.00 to \$20.00, but they can be purchased for as little as \$1.00.

Effects. Crack produces the same effects as powder cocaine; it is a rapidly reacting form of cocaine that has been chemically altered so that it can be smoked. The physical effects of crack include dilated pupils, increased pulse rate, elevated blood pressure, insomnia, loss of appetite, tactile hallucinations, paranoia, and seizures. Crack can damage bodily organs; damage the nasal cartilage; trigger cardiac irregularities, heart attack, and cardiac arrest; and lead to respiratory problems. Crack use can cause significant harm to the unborn babies of pregnant women who use the drug.

Scope of the Problem and Implications

Soon after crack first appeared in the early to mid-1980s, its use swept through the country. Three factors contributed to this: first, the drug was cheap and affordable; second, it was easy to smoke; and, third, its effects were rapid and intense. Smoking allows high doses of cocaine to reach the brain almost instantly. As a result, crack produces the most dramatic cocaine “high.” This rapid “high” is, however, followed by a profound “low” that becomes a door to addiction. Crack is extremely addictive; anyone who tries crack risks addiction. Crack is cheap enough to be readily available to poor and young users, which has made it an extremely marketable product.

The main danger of crack cocaine is its potency—one “hit” typically does not satisfy the craving for the feeling of euphoria desired. Crack cocaine users have said that the high obtained from the drug is so intense that there is no desire to come down. Conversely, the low is so low that there is strong motivation to avoid the feeling.

Cocaine and Crack Cocaine Facts

- ▶ Cocaine can cause heart attacks, even in young people with healthy hearts. Cocaine can also trigger brain seizures and stroke; even first-time users may experience seizures or fatal heart attacks.
- ▶ Psychological effects accompanying the use of cocaine can include violent, erratic, or paranoid behavior; hallucinations are also common.
- ▶ Heavy cocaine users may experience personality changes, impaired thinking, confusion, anxiety, or depression.
- ▶ Miscarriages or stillbirths may result from the use of cocaine or crack during the early months of pregnancy. Use at a later stage may cause premature labor or delivery.
- ▶ A “high” from cocaine lasts only about 5 to 20 minutes.
- ▶ Crack addiction develops extremely quickly.
- ▶ Preparation of crack, which involves the use of volatile solvents, can result in death or injury from fire or explosion.

Consequently, most crack users lose self-control as they crave the euphoria and ultimately require more of the drug to avoid intense withdrawal symptoms.

Crack cocaine use among 12th-grade students has remained relatively unchanged in recent years, with reported use in the past 30 days at approximately 1 percent (Johnston et al., 2003).

Amphetamines and Methamphetamine

Description

Nature and brief history of the drug. Amphetamines were first marketed in the 1930s as Benzedrine in an over-the-counter inhaler to treat nasal congestion. By 1937, amphetamines were available in tablet form by prescription and were used in the treatment of the sleeping disorder narcolepsy and the behavioral syndrome called minimal brain dysfunction (MBD), which today is called attention deficit hyperactivity disorder (ADHD). During World War II, amphetamines were widely used to keep the fighting men going; both dextroamphetamine (Dexedrine) and methamphetamine (Methedrine) became readily available. As use of amphetamines spread, so did their abuse. Amphetamines became a cure-all to help truckers complete long routes without falling asleep, as well as to control weight, help athletes perform better and train longer, and treat mild depression. Intravenous amphetamine abuse spread among a subculture known as “speed freaks.” With experience, it became evident that the dangers of abuse of these drugs outweighed most of their therapeutic uses.

Methamphetamine and Ritalin Abuse Among Youth

- ▶ Less than 2 percent of 10th and 12th graders reported use of methamphetamine in the past 30 days; use in the past year was reported by approximately 4 percent of 10th and 12th graders.
- ▶ Most of the methamphetamine-related deaths (92 percent) reported in 1994 involved methamphetamine in combination with at least one other drug—most often alcohol (30 percent), heroin (23 percent), or cocaine (21 percent).
- ▶ Males are more likely to abuse Ritalin than females.
- ▶ In 2002, annual prevalence of Ritalin abuse among 8th, 10th, and 12th graders was 2.8 percent, 4.8 percent, and 4.0 percent, respectively.

Methamphetamine is an amphetamine-like stimulant that has more dramatic effects than its predecessor.

Effects. Amphetamines, methamphetamine, methylphenidate (Ritalin), and other stimulants, such as Preludin, Tenuate, and Sandrex, can cause increased heart rate and respiration, elevated blood pressure, dilated pupils, and decreased appetite. In addition, users may experience sweating, headache, blurred vision, dizziness, sleeplessness, and anxiety. Extremely high doses can cause a rapid or irregular heartbeat, tremors, loss of coordination, and even physical collapse. An amphetamine injection creates a sudden increase in blood pressure that can result in stroke, very high fever, or heart failure. Users also report feeling restless, anxious, and moody. Higher doses intensify these effects. Those who use large amounts of amphetamines over a long period can develop an amphetamine psychosis that includes hallucinations, delusions, and paranoia. These symptoms usually disappear when drug use ceases. In comparison with cocaine, methamphetamine produces a much longer

high (8–24 hours). It takes 12 hours for the body to remove 50 percent of methamphetamine compared with only 1 hour to remove 50 percent of cocaine (NIDA, 2002b).

Ice. *Ice* is a slang term for a very pure form of methamphetamine that can be smoked. Its effects are similar to those of cocaine but longer lasting. The nickname *ice* is derived from its translucent, rock-like appearance. The ice high can last anywhere from 2 to 24 hours, depending on how much is used. After taking ice, users (especially those who binge) experience a crash or depression that can last as long as 3 days. Ice is an extremely addictive stimulant and can cause erratic, violent behavior among its users.

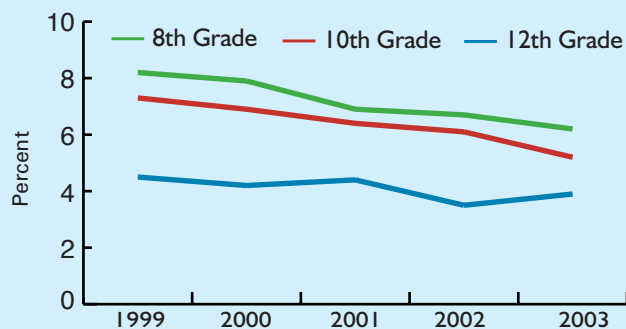
Facts About Methamphetamine and Ritalin

- ▶ Methamphetamine can cause convulsions, heart irregularities, high blood pressure, depression, restlessness, tremors, and severe fatigue.
- ▶ An overdose of methamphetamine can cause coma and death.
- ▶ When users stop taking methamphetamine, they may experience a deep depression.
- ▶ Methamphetamine causes a very jittery high, along with anxiety, insomnia, and, sometimes, paranoia.
- ▶ Indicated use of Ritalin can reduce the likelihood of later substance abuse among males.
- ▶ The toxic effects of Ritalin are greatly increased when it is snorted or injected.

Drug combinations. In addition to its use by youth who combine it with heroin (“meth speedball”), methamphetamine can also be found in “biker’s coffee”—a combination of methamphetamine and coffee popular among young, fairly affluent urbanites.

Ritalin. Ritalin is an amphetamine used as a treatment for attention deficit hyperactivity disorder (ADHD). Its indicated use has a calming effect and helps young people with this disorder focus. In recent years, abuse of Ritalin has increased among young people without ADHD who enjoy the increased focus, wakefulness, attentiveness, and feelings of euphoria that result from its use. For those without ADHD, Ritalin has stimulant properties greater than caffeine but less pronounced than those of other amphetamines. Ritalin can be taken orally but is also crushed and snorted. Some users dissolve the tablets in water and inject the drug, risking the blockage

Figure 10. Lifetime Prevalence of Methamphetamine Use



Source: Monitoring the future, University of Michigan, 2004.

of small arteries by the insoluble fibers in the tablets. Snorting or injecting the drug results in more pronounced stimulant effects.

Ephedrine. Ephedrine is the basic ingredient in amphetamines, methamphetamine, and pseudoephedrine, an over-the-counter nasal decongestant (Gill, Shield, Blazeovich, Zhou, & Weatherby, 2000; Young & Glennon, 1998). Ephedra is the plant from which ephedrine is derived. Asian versions of this plant are the source of the clandestine production of methamphetamine (Caveney, Charlet, Freitag, Maier-Stolte, & Starratt, 2001). Ephedra has been sold as an herbal supplement in many health food stores and on the Internet as “Herbal Ecstasy” or “Xphoria.” It has been marketed as a weight-loss supplement, source of energy, and/or as a way to enhance sports performance. The U.S. Food and Drug Administration (FDA) banned the sale of ephedrine in February 2004 due to concerns over its safety (U.S. FDA, 2004). Adverse consequences of ephedrine use include agitation, palpitations, fainting from the stimulant effect, and in some cases, death.

Scope of the Problem and Implications

In 2002, 6.7 percent of 12th graders, 6.1 percent of 10th graders, and 3.5 percent of 8th graders reported lifetime use of methamphetamine—more than double the reported lifetime use of cocaine (Johnston et al., 2003). Reported use of nonprescribed Ritalin was comparable to that of methamphetamine. Overall amphetamine use in the past month was reported by 11.1 percent of 12th-grade students, 10.7 percent of 10th-grade students, and 5.5 of 8th-grade students (Johnston et al., 2003). Methamphetamine use has remained relatively constant since it was first measured in 1999; in contrast, overall amphetamine use has been rising gradually over the past 10 years (Johnston et al., 2003).

Cannabinoids

Marijuana

Description

Marijuana is a green or gray mixture of dried, shredded flowers and leaves of the hemp plant (*Cannabis sativa*). It is by far the most-often-used illegal drug in this country, and in 2002, approximately 55 percent of current illicit drug users—or 10.7 million Americans—were marijuana or hashish users (SAMHSA, 2003). Marijuana use among youth aged 12 to 17 years was on the rise through

the 1990s but has declined slightly in recent years (SAMHSA, 2003).

Scope of the Problem and Implications

Marijuana continues to be the illicit drug most frequently used by youth. Among high school seniors in 2002, approximately half (47.8 percent) reported having used marijuana at least once in their lives. Current (past-30-day) marijuana use was most common among 12th-grade non-Hispanic white youth (23.3 percent), followed by Hispanic youth (20.0 percent), and then by African-American youth (16.5 percent) (Johnston et al., 2003). However, among 8th graders, Hispanic youth had the highest past-30-day prevalence of marijuana use (12.6 percent), followed by non-Hispanic white youth

Facts About Marijuana

- ▶ Marijuana is the most commonly used illicit drug.
- ▶ Even when marijuana use is discontinued, memory loss may continue for 3 to 6 months.
- ▶ Smoking a single joint impairs driving skills for at least 4 to 6 hours.
- ▶ Approximately 9 percent of marijuana users will become dependent on the drug.

(8.3 percent), and African-American youth (7.4 percent) (Johnston et al., 2003). Of youth who reported that their parents would “strongly disapprove” of their trying marijuana once or twice, only 5.5 percent had used marijuana in the past 30 days. In contrast, of those who reported that their parents would “somewhat disapprove” or “neither approve nor disapprove” of their trying marijuana once or twice, 30.2 percent reported using marijuana in the past 30 days (SAMHSA, 2003). On average, marijuana use begins at age 18 (NIDA, 2002e).

Effects on learning and development. Marijuana use among adolescents is of great concern for several reasons. The impact of marijuana use on learning is critical, and marijuana use often proves pivotal in youths’ failure to master interpersonal coping skills or make appropriate lifestyle choices. Long-term developmental effects of marijuana use by children and adolescents include apathy, loss of ambition and effectiveness, diminished ability to carry out long-term plans, difficulty in concentrating, and decline in school or work performance.

Marijuana Use Among Youth

- ▶ In 2002, slightly over 8 percent of youth aged 12 to 17 were current users of marijuana; over 36 percent of 12th-grade students, 30 percent of 10th-grade students, and 15 percent of 8th-grade students reported marijuana use in the past year.
- ▶ Use of marijuana declined significantly among 8th-grade students in 2002.
- ▶ Peak initiation of marijuana use occurs in grades 7 to 11.
- ▶ In 2002, the perceived harm in using marijuana regularly increased among 8th-, 10th-, and 12th-grade students.
- ▶ Youth engaging in delinquent behavior in 2002 were much more likely to be marijuana users than nonusers.
- ▶ In 2001, marijuana was the most frequently reported drug connected with emergency department visits in youth aged 12 to 19 years; such visits have increased 126 percent since 1994.
- ▶ Over the past 27 years, perceived availability of marijuana has undergone only slight fluctuations, with between 83 and 90 percent of high school seniors reporting that marijuana is easy or fairly easy to obtain.
- ▶ Among adolescents aged 12 to 17 years, almost 50 percent obtained marijuana free; of those who purchased marijuana, almost 15 percent did so either inside a school building or on school property.

Marijuana as a gateway drug. Marijuana's role as a gateway drug is also of major concern, since it makes subsequent use of more potent and disabling drugs more likely. Long-term studies of high school students and their patterns of drug use show that very few youth use other illegal drugs without first trying marijuana. Using marijuana provides youth with greater exposure to other drugs and an increased likelihood that they will take advantage of these additional opportunities (NIDA, 2003b). Research has determined that adolescents who

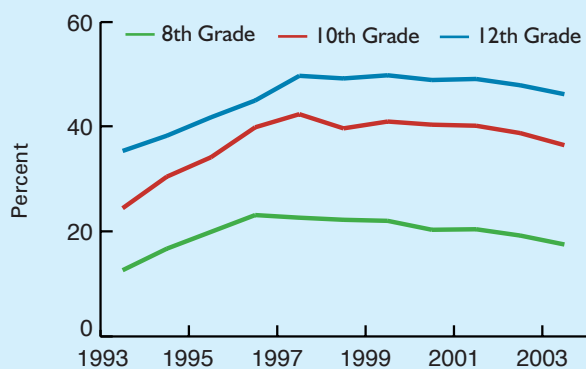
smoke marijuana are 85 times more likely to use cocaine than their non-marijuana-smoking peers (CASA, 1999).

Increased potency. Another concern is that today's marijuana is substantially more potent than that of previous decades; current levels of delta-9-tetrahydrocannabinol (THC, the active ingredient in marijuana) are reported to be from 7 to 30 times greater than those of 25 years ago. (Office of National Drug Control Policy [ONDCP], 2003).

Physical effects. Because marijuana users often inhale the unfiltered smoke deeply and then hold it in their lungs as long as possible, marijuana is damaging to the lungs and pulmonary system. Chronic marijuana smokers are prey to chest colds, bronchitis, emphysema, and bronchial asthma. Marijuana smoke contains some of the same carcinogens and toxic particulates as tobacco—sometimes in higher concentrations. Thus, persistent use of marijuana raises the risk for cancer. There is also evidence that marijuana may limit the ability of the immune system to fight infection and disease. Regular use of marijuana can delay the onset of puberty in young men and reduce sperm production. For women, regular use may disrupt normal monthly menstrual cycles and inhibit ovulation. Pregnant women who use marijuana are at risk for having low-birthweight babies, who are more likely than other babies to develop health problems. Some studies also show that children exposed to marijuana before birth may experience developmental delays.

Physical dependence. Long-term users of cannabis may develop psychological dependence and require more of the drug to get the same effect (NIDA, 2002a). Research indicates that approximately 9 percent of marijuana users will become dependent (NIDA, 2002e).

Figure 11. Lifetime Prevalence of Marijuana/Hashish Use



Source: Monitoring the future, University of Michigan, 2004.

Hallucinogens and Dissociative Drugs

Description

Nature and brief history of the drug. Hallucinogens are among the oldest known groups of drugs that have been used for their ability to alter human perception and mood. For centuries, many naturally occurring hallucinogens found in plants and fungi have been used for medical, social, and religious practices. In more recent years, a number of synthetic hallucinogens have been produced, some of which are much more potent than their naturally occurring counterparts. Hallucinogens

include amphetamine variants (MDA, MDMA, Ecstasy), mescaline, peyote, LSD, and phencyclidine (PCP) and its analogs.

The biochemical, pharmacological, and physiological basis for hallucinogenic activity is not well understood. In fact, not all hallucinogens produce hallucinations.

Effects. Taken in nontoxic dosages, these substances produce changes in perception, thought, and mood. Physiological effects include elevated heart rate, increased blood pressure, and dilated pupils. Sensory effects include perceptual distortions that vary with dose, setting, and mood. Psychic effects include disorders associated with perception of time and space. The hallucinogenic experience may be either pleasurable or extremely frightening and disturbing. The effects of hallucinogens are unpredictable. Weeks or even months after some hallucinogens have been taken, the user may experience flashbacks—fragmentary recurrences of certain bad aspects of the drug experience—without actually taking more of the drug. The occurrence of flashbacks is unpredictable, but they are more likely to occur during times of stress, and they seem to occur more frequently in younger individuals.

General trends. Hallucinogens came into popular use by youth in the United States in the mid-1960s. A subsequent decline in their use may be attributed to real

Facts About Hallucinogens and Dissociative Drugs

- ▶ Large doses of hallucinogens can cause convulsions, ruptured blood vessels in the brain, and irreversible brain damage.
- ▶ The effects of LSD are unpredictable and depend upon the amount taken, the surroundings in which the drug is used, and the user's personality, mood, and expectations.
- ▶ One use of LSD can cause multiple and dramatic behavioral changes.
- ▶ Dextromethorphan is an ingredient in over-the-counter cough syrups that can result in dissociative effects similar to those of PCP or ketamine; other ingredients in these medicines can pose great additional risk for users.
- ▶ Many people who use PCP once will not knowingly use it again; others use it consistently and regularly. Some persist in using PCP because of its addictive properties.
- ▶ One use of PCP can cause multiple and dramatic behavioral changes.
- ▶ Ketamine produces effects similar to those of PCP, only of less intensity and shorter duration.

or perceived hazards associated with taking these drugs. A resurgence of the use of hallucinogens occurred in the 1990s, especially at the junior high/middle school level; however, the most recent *Monitoring the Future* study data show hallucinogen use levels—including those for LSD—declining slightly. The most common danger of hallucinogen use is impaired judgment that often leads to rash decisions and accidents.

Patterns of use. Most people are introduced to hallucinogens by experimenting with the drugs in social situations. Use almost always occurs in intermittent episodes because the mind-altering effects of these drugs impair cognitive and perceptual functions to such an extent that the user generally has to set aside time from a daily routine to take the drug. Moreover, the frequent user may quickly develop a tolerance for the drug, which makes it virtually impossible to take enough of it on a daily basis to obtain the desired effects. For these reasons, intermittent use is far more common than dependence.

LSD

Description

Nature of the drug. LSD is one of the most potent mind-altering chemicals. It is manufactured from lysergic acid, which is found in ergot, a fungus that grows on rye and other grains. LSD is odorless and colorless, with a slightly bitter taste, and is usually taken by mouth.

Hallucinogens and Dissociative Drug Use Among Youth

- ▶ Use of hallucinogens has been decreasing after peaking in 1996.
- ▶ In 2003, 2 percent of 12th graders, 2 percent of 10th graders, and 1 percent of 8th graders reported use of hallucinogens in the past year, reflecting at least a 50 percent decrease since 2001 for all three grades.
- ▶ Approximately 40 percent of 12th graders perceived that LSD would be easy or fairly easy to obtain; approximately 48 percent reported the same for hallucinogens other than LSD.
- ▶ The most commonly used hallucinogens among 8th, 10th, and 12th graders in 2002 were Ecstasy, hallucinogens other than LSD (ketamine, dextromethorphan, psilocybin mushrooms), and PCP (with only 3 percent of seniors reporting lifetime use of PCP).
- ▶ In 2002, almost 11 percent of high school seniors reported ever having used Ecstasy.
- ▶ Use of Ecstasy has remained stable among 8th graders but has decreased in 10th and 12th graders since 2000.

LSD is usually sold as “blotter acid,” where the drug is imprinted on small, colorful sheets of paper. A single dose costs around \$4 to \$5, and the effects can last from 3 to 12 hours.

Effects. Users refer to their experience with LSD as a “trip,” and to acute adverse reactions as a “bad trip.” The user may experience panic, confusion, suspicion, anxiety, and loss of control. Most users of LSD voluntarily decrease or stop its use over time. LSD is not considered to be an addictive drug because it does not produce the compulsive drug-seeking behavior that cocaine, amphetamines, heroin, alcohol, and nicotine induce. However, like many of the addictive drugs, LSD produces tolerance, so some users who take the drug repeatedly must take progressively higher doses to achieve the state of intoxication achieved previously. This is an extremely dangerous practice given the unpredictability of the drug.

In large enough doses, LSD produces delusions and visual hallucinations. The user’s sense of time and self changes. Sensations may seem to “cross over,” giving the user the feeling of hearing colors and seeing sounds. These changes can be frightening and can cause panic attacks. Bad trips and flashbacks are only part of the risk of LSD use; LSD users may manifest relatively long-lasting psychoses, such as schizophrenia and severe depression.

Scope of the Problem and Implications

The percentage of high school seniors who reported using LSD in the past 30 days decreased from 2.3 to 0.7 percent between 2001 and 2002 (Johnston et al., 2003). The 2002 rate was five times lower than that reported in 1995 (Johnston et al., 2003).

Some implications of LSD use are: experiences of severe, terrifying thoughts and feelings; fear of losing control; fear of insanity and death; and despair. Fatal accidents have occurred during states of LSD intoxication.

MDMA/Ecstasy

Description

Nature of the drug. MDMA, more commonly known as Ecstasy, is a so-called designer drug, produced in clandestine laboratories. It has both stimulant and hallucinogenic properties.

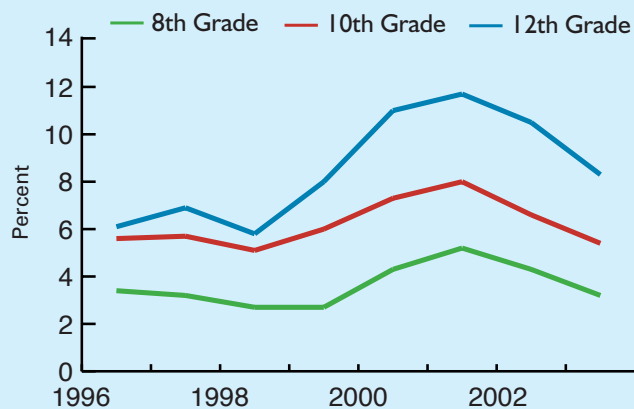
Effects. Physical symptoms of Ecstasy use include muscle tension, involuntary teeth-clenching, nausea, blurred vision, rapid eye movement, faintness, and chills or sweating. It also increases heart rate and blood pressure—a special risk for people with circulatory or heart disease. Ecstasy is usually taken orally, sometimes snorted, and on rare occasions, injected (NIDA, 2002a). Because they are produced in clandestine laboratories, Ecstasy capsules or tablets are seldom pure, and the amount of drug contained in each is likely to vary considerably.

Scope of the Problem and Implications

Ecstasy use became popular in the mid-1990s. Since then, rates of use have fluctuated, with noticeable declines in the past 3 years. In 2002, annual use of Ecstasy was reported by 7.4 percent of 12th graders, 4.9 percent of 10th graders, and 2.9 percent of 8th graders. It was the most commonly used hallucinogen among adolescents (Johnston et al., 2003).

Ecstasy has recently been found to cause brain damage, the reversibility of which is not yet known. Likewise, Ecstasy causes users to become more impulsive, increasing their risk of engaging in other dangerous behaviors (NIDA, 2002a).

Figure 12. Lifetime Prevalence of Ecstasy Use



Source: Monitoring the future, University of Michigan, 2004.

Ketamine

Description

Ketamine, also known as “Special K,” “K,” or “cat Valium,” is a dissociative anesthetic that has effects similar to those of PCP (see below), only milder.

Ketamine is used as an anesthetic in veterinary offices. It is usually evaporated to form a powder and then snorted or made into pills (NIDA, 2001a). Users experience feelings of separation from their bodies or pleasant feelings of floating. Bad ketamine experiences may include complete sensory detachment, likened by users to near-death experiences (NIDA, 2001a).

Scope of the Problem and Implications

In 2002, 2.6 percent of 12th graders, 2.2 percent of 10th graders, and 1.3 percent of 8th graders reported having used ketamine in the past year. Use levels have remained largely unchanged since tracking began in 2000 (Johnston et al., 2003).

Ketamine has also been used as a “date rape” drug because it is odorless and colorless and can be added to a victim’s drink without his or her knowledge (NIDA, 2001a).

PCP

Description

Nature of the drug. PCP was developed in the 1950s as an intravenous anesthetic. Its use in humans was discontinued in 1965 because it was found that patients often became agitated, delusional, and irrational while recovering from its anesthetic effects. Today, virtually all of the PCP encountered on the illicit market in the United States is produced in clandestine laboratories.

Use. PCP is normally used in one of three ways: snorted, smoked, or eaten. When smoked, it is often applied to a leafy material such as mint, parsley, oregano, or marijuana.

Effects. Psychological effects at moderate doses of PCP include distinct changes in body awareness similar to those associated with alcohol intoxication. At high doses, there is a drop in blood pressure, pulse rate, and respiration that may be accompanied by nausea, vomiting, blurred vision, rapid eye movement, drooling, loss of balance, and dizziness. High doses of PCP can also cause seizures, coma, and death (though death more often results from accidental injury or suicide during PCP intoxication). Psychological effects at high doses include illusions and hallucinations. PCP can cause effects that mimic the full range of symptoms of schizophrenia, such as delusions, paranoia, disordered thinking, a sensation

of distance from one’s environment, and catatonia. Mood disorders have also been reported. PCP has sedative effects, and interactions with other CNS depressants, such as alcohol and benzodiazepines, can lead to coma or accidental overdose.

Addiction potential. PCP is addictive; its use often leads to psychological dependence, craving, and compulsive PCP-seeking behavior. Some persist in using PCP because of its addictive properties; others cite feelings of strength, power, and invulnerability, and the drug’s numbing effect on the mind as reasons for their continued PCP use.

Scope of the Problem and Implications

PCP use is not common among adolescents. In 2002, 1.1 percent of high school seniors reported use of PCP in the past year; data for lower grades were not available (Johnston et al., 2003).

The use of PCP among adolescents may interfere with hormones related to normal growth and development, as well as with the learning process. Long-term use of PCP can result in memory loss, difficulties with speech and thinking, depression, and weight loss. These symptoms can persist up to a year after cessation of PCP use.

Mescaline and Peyote

Peyote is a small, spineless cactus, *Lophophora williamsii*, whose principal active ingredient is the hallucinogen mescaline. From earliest recorded time, peyote has been used by natives in northern Mexico and the southwestern United States in traditional religious ceremonies. The top of the cactus above ground consists of disc-shaped buttons that are cut from the roots and dried. These buttons are generally chewed or soaked in water to produce an intoxicating liquid. Mescaline can be extracted from peyote or produced synthetically.

Psilocybin and Psilocin

Psilocybin and psilocin are chemicals obtained from certain mushrooms found in Mexico and Central America. Like peyote, the mushrooms have been used in traditional native religious ceremonies for centuries. Dried mushrooms contain about 0.2 to 0.4 percent psilocybin and only trace amounts of psilocin. The hallucinogenic effects last about 6 hours. Both psilocybin and psilocin can be produced synthetically.

Dextromethorphan

Dextromethorphan, also known as “DXM” or “robo,” is a cough suppressant found in many over-the-counter cough syrups. When taken in high doses, it produces distorted visual perceptions, and at even higher doses, a sense of dissociation from the body (NIDA, 2001a). The effects of the drug last approximately 6 hours. Because young people use excessive doses of cough syrup to experience the effects of dextromethorphan, an additional danger results from excessive doses of antihistamines and other ingredients present in these medicines (NIDA, 2001a).

Narcotics (Opiates)

Opiates, also referred to as narcotics, are derivatives of the opium poppy (*Papaver somniferum*) and include opium, morphine, codeine, and heroin, as well as chemically similar synthetics, such as meperidine (Demerol). They are a class of drugs used medically as pain relievers, anesthetics, and cough suppressants, as well as to control acute diarrhea. Unfortunately, as a result of their powerful properties, they have a high potential for abuse. The most commonly abused narcotic is heroin.

Narcotic Use Among Youth

- ▶ Heroin use is rare among adolescents; lifetime use of heroin was less than 1 percent among 8th-, 10th-, and 12th-grade students in 2002.
- ▶ In 2002, almost 77 percent of 12th-grade students reported that they perceived great risk in taking heroin even occasionally.
- ▶ Two prescription medications have emerged as drugs of abuse in recent years: Vicodin (hydrocodone) and OxyContin (oxycodone).
- ▶ In 2002, almost 10 percent of 12th graders, 7 percent of 10th graders, and almost 3 percent of 8th graders reported Vicodin use in the past year.
- ▶ In 2002, past-year use of OxyContin was reported by 4 percent of 12th graders, 3 percent of 10th graders, and slightly over 1 percent of 8th graders.

Use. Narcotics can be administered in a variety of ways. They are taken orally or transdermally (skin patches), or may be injected. They are also available in suppositories. As drugs of abuse, they are often smoked, sniffed, or self-administered by the more direct routes of subcutaneous (“skin popping”) and intravenous (“mainlining”) injection.

Effects. The effects of narcotics depend largely on the dose, the interval between doses, route of administration, previous exposure to the drug, and the expectation, health, and personality of the user. Narcotics produce a general sense of well-being by reducing tension, anxiety, and aggression. These drugs initially produce a feeling of euphoria that is often followed by drowsiness, nausea, and vomiting. Users may also experience constricted pupils and/or watery eyes; itching; inability to concentrate, apathy, and/or lessened physical activity; dilation of

Facts About Narcotics

- ▶ Narcotics are highly addictive.
- ▶ Narcotics can be snorted, taken orally, or injected with syringes.

the subcutaneous blood vessels, causing flushing of the face and neck; constipation; and respiratory depression. An overdose may produce slow and shallow breathing, clammy skin, convulsions, coma, and, possibly, death. Except in cases of acute intoxication, there is no loss of motor coordination or slurred speech as occurs with many depressants.

Opium

Opium is the sticky sap of the poppy seed pod. There were no legal restrictions on the importation or use of opium until the early 1900s. In the United States, the unrestricted availability of opium for medical use, the influx of opium-smoking immigrants from Asia, and the invention of the hypodermic needle contributed to the more severe variety of compulsive drug abuse seen at the turn of the 20th century. In those days, medicines often contained opium but had no warning labels. Today, there are state, Federal, and international laws governing the production and distribution of narcotic substances. At present, opium is rarely used medicinally and is seldom abused in the United States. Most opium imported into the United States is broken down into its alkaloid constituents (morphine, codeine, and thebaine).

Morphine

Morphine is the principal constituent of opium. It is one of the most effective drugs known for the relief of pain and remains the standard against which new analgesics are measured. Morphine is marketed in a variety of forms, including oral solutions (Roxanol), sustained-release tablets (MSIR and MS-Contin), suppositories,

and injectable preparations. It can be administered orally, subcutaneously, intramuscularly, or intravenously—the latter method being the one most frequently used by drug abusers. Tolerance and physical dependence develop rapidly in the user. Morphine is sometimes abused by medical professionals.

Codeine

Codeine is an alkaloid found in opium in concentrations ranging from 0.7 to 2.5 percent. Most codeine used in the United States is produced from morphine. Compared with morphine, codeine produces less analgesia, sedation, and respiratory depression; it is frequently taken orally. Codeine is medically prescribed for the relief of moderate pain. It is made into tablets, either alone or in combination with aspirin or acetaminophen (Tylenol). Codeine is an effective cough suppressant and is found in a number of liquid preparations. It is by far the most widely used naturally occurring narcotic for medical treatment in the world. Codeine products are frequently encountered on the illicit market in combination with glutethimide (Doriden) or carisoprodol (Soma).

Thebaine

Thebaine, a minor constituent of opium, is chemically similar to both morphine and codeine but produces stimulatory rather than depressant effects.

Heroin

Description

Nature of the drug. Heroin is one of the semisynthetic narcotics derived by modifying the alkaloids contained in opium. Heroin is derived from morphine, which is obtained from the opium poppy.

Pure heroin is a white powder with a bitter taste. Most illicit heroin is a powder that can vary in color from white to dark brown (because of impurities left from the manufacturing process or the presence of additives). Pure heroin is rarely sold on the street. A “bag”—slang for a single dosage unit of heroin—may contain 100 milligrams of powder, only a fraction of which is heroin. Another form of heroin, “black tar,” has become increasingly available in the western United States. The color and consistency of black tar heroin results from the crude processing methods used to illicitly manufacture the substance in Mexico. This heroin is most frequently dissolved, diluted, and injected.

Use. Injection is the most practical and efficient way to administer low-purity heroin. However, recent studies indicate a shift from injecting heroin to snorting or smoking the drug because of increased purity and the misconception that these forms of use will not lead to addiction. Heroin snorting is widespread and may be increasing in those areas of the country where high-purity heroin is available—generally in the northeastern United States. This method of administration may be more appealing to new users because it eliminates both the fear of acquiring syringe-borne diseases such as HIV/AIDS and hepatitis and the historical stigma attached to intravenous heroin use (NIDA, 1999).

Effects. Heroin affects the brain’s pleasure systems and interferes with its ability to perceive pain. Heroin is a fast-acting drug, especially when injected or smoked. Injected heroin reaches the brain in 15 to 30 seconds; smoked heroin reaches the brain in 7 seconds. The effects disappear in a few hours. The high from heroin is experienced as intense pleasure. Once individuals begin using heroin, they quickly develop a tolerance for the drug and need increasing amounts to get the same effect.

Scope of the problems and implications

Heroin use is uncommon among adolescents. In 2002, 1.7 percent of high school seniors reported ever having used heroin; only 0.5 percent reported use during the past 30 days. Twice as many users snorted or otherwise ingested the drug than injected it (Johnston et al., 2003).

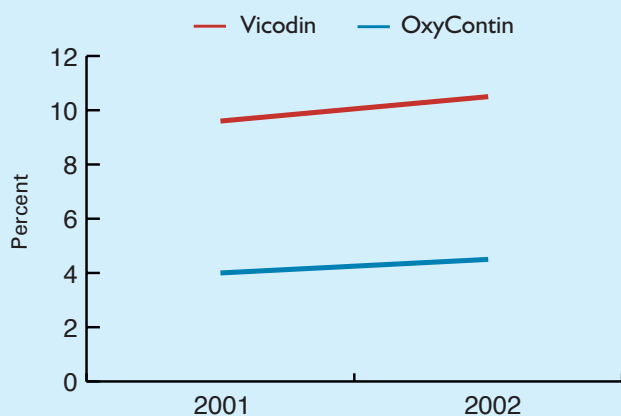
Chronic users may develop collapsed veins, infections of the heart lining and valves, abscesses, cellulitis, and liver disease. Pulmonary complications, including various types of pneumonia, may result from poor health in the abuser as well as from heroin’s depressant effect on respiration. In addition to the effects of the drug itself, street heroin may have additives that do not readily dissolve and whose presence may result in clogged blood vessels leading to the lungs, liver, kidneys, or brain. This can cause the infection or death of small patches of cells in vital organs.

Other Narcotics

Other opium derivatives prescribed for moderate to severe pain that are sometimes abused include hydromorphone (Dilaudid), oxycodone (OxyContin, Percodan, Percocet, Tylox), hydrocodone (Vicodin,

Vicoprofen, Lortab, Lorcet), and meperidine (Demerol). Sales and production of hydrocodone have increased significantly in recent years, as have diversion and illicit use. This has likewise been the case for oxycodone, particularly OxyContin, a longer-lasting, time-release

Figure 13. Annual Prevalence of 12th Graders' OxyContin and Vicodin Use



Source: *Monitoring the future*, University of Michigan, 2004.

version of the drug developed in 1995.

Methadone is a synthetic substitute for opiates that is not derived from the opium poppy. Although chemically different from morphine and heroin, methadone produces many of the same effects. This drug is primarily used today for the treatment of narcotic addiction. Methadone blocks the effects of heroin for about 24 hours. Ironically, methadone is frequently encountered on the illicit market and has been associated with a number of overdose deaths. Levo-alpha acetyl methadol (LAAM), another synthetic opiate medication used to treat heroin addiction, can block the effects of heroin for up to 72 hours.

Scope of the problems and implications

Vicodin (hydrocodone) has become a relatively popular narcotic among adolescents; in 2002, almost 10 percent of 12th graders, 6.9 percent of 10th graders, and 2.5 percent of 8th graders reported having used Vicodin in the past year. OxyContin (oxycodone) is not as popular as Vicodin, but its use levels are high enough to be worth noting: 4.0 percent of 12th graders, 3.0 percent of 10th graders, and 1.3 percent of 8th graders reported having used OxyContin in the past year (Johnston et al., 2003).

With repeated use, tolerance of narcotics develops rapidly, and dependence is likely. The development of tolerance is characterized by shortened duration and decreased intensity of analgesia, euphoria, and sedation, creating the need to administer progressively larger doses to attain the desired effect. Tolerance does not develop uniformly for all actions of these drugs, giving rise to a number of toxic effects. The most common pattern of abuse is initiated outside the therapeutic setting, in experimental or recreational use of narcotics. The majority of individuals in this category may abuse narcotics sporadically for months or even years. Heroin use among males in inner cities is generally initiated during adolescence, and dependence develops in about 1 to 2 years.

The withdrawal symptoms experienced from heroin/morphine-like addiction usually manifest shortly before the time of the next scheduled dose. Early symptoms include watery eyes, runny nose, yawning, and sweating. Restlessness, irritability, loss of appetite, tremors, and severe sneezing appear as the syndrome progresses. Severe depression and vomiting are common, and heart rate and blood pressure are usually elevated. Chills, alternating with flushing and excessive sweating, are also characteristic symptoms.

Most of the dangers of opiate abuse are associated with the use of nonsterile needles, contamination of the drug itself, and/or mixing of the drug with other substances. Eventually, opiate users may develop infections of the heart lining and valves, congestion of the lungs, and abscesses of the skin. The use of contaminated syringes may also result in the transmission of diseases such as HIV/AIDS and hepatitis. Addiction in pregnant women can lead to premature, stillborn, or addicted infants who experience severe withdrawal symptoms.

Inhalants

Description

Nature of the substance. Inhalants are common household and workplace substances that are sniffed or “huffed” (inhaled through the mouth) to give the user an immediate “head rush” or high. They include a diverse group of chemicals found in consumer products such as aerosols, plastic cement, fingernail polish remover, lighter fluid, hairspray, insecticides, and cleaning solvents. Anesthetics sometimes abused as inhalants include halothane and nitrous oxide. Inhalants are not

usually thought of as drugs because that is not their intended use.

Use. There are many different ways to sniff or huff inhalants. The fumes from organic solvents may simply be inhaled from their containers. A liquid solvent may also be poured or sprayed onto an absorbent material to increase the release of fumes. Capsules containing amyl nitrite are crushed and held beneath the nose. Butyl nitrite may be inhaled from its container or, as with organic solvents, applied to absorbent cloth or paper. Nitrous oxide may be inhaled through a mask from a tank of the compressed gas or directly from a punctured whippet (small pressurized gas cartridge). The nozzle of a whipped-cream container can also be depressed in such a way that only the nitrous oxide is discharged.

Effects. Inhalants produce a quick, temporary high, lightheadedness, and euphoria when their fumes or gases are breathed in and absorbed through the lungs. The high is sometimes compared to the sensation of being drunk. It lasts a short time—from a few minutes to about three-quarters of an hour. It may be followed by aftereffects similar to those associated with an alcohol hangover—such as drowsiness, headache, or nausea—that last for 1 to 2 hours.

The immediate negative effects of inhalants include nausea, sneezing, coughing, nosebleeds, fatigue, lack of coordination, and loss of appetite. Solvents and aerosol sprays also decrease the heart and respiratory rates and impair judgment. Amyl and butyl nitrites cause rapid pulse, headaches, and involuntary passing of urine and feces. Long-term use may result in hepatitis or brain damage.

Scope of the Problem and Implications

Studies have shown that between 12 and 14 percent of youth in the United States have tried inhalants, although the vast majority of these youth do not become chronic users (Johnston et al., 2003). Compared with other

Inhalant Use Among Youth

- ▶ Inhalant use has a relatively young initiation, with the peak period occurring in grades 6 to 9.
- ▶ In contrast to alcohol, other drug, and tobacco use, inhalant use is more common among younger adolescents; almost 8 percent of 8th graders reported using inhalants in the past year, compared with approximately 6 percent of 10th graders and 4.5 percent of 12th graders.

drugs, inhalants are readily available and relatively cheap. Many can be obtained legally, even by minors, since more than 1,000 common household products can be used to get high. For this reason, and because they are mistakenly believed to be safer than other drugs, inhalants are especially popular among children and young adolescents; the peak initiation of use occurs in grades 6 to 9. Use of inhalants decreases with age; in 2002, 7.7 percent of 8th graders, 5.8 percent of 10th graders, and 4.4 percent of 12th graders reported inhalant use in the past 12 months. Slight declines in inhalant use among high-school-aged adolescents have been noted in recent years (Johnston et al., 2003).

Among elementary-aged youth, inhalants are the third most commonly used drugs after cigarettes and alcohol. In 2001-2002, 3.3 percent of 6th-grade students and 2.7 percent of 4th-grade students reported having used inhalants (PRIDE, 2003).

Deeply inhaling vapors or using large amounts over a short time may result in disorientation, violent behavior, unconsciousness, or death. High concentrations of inhalants can cause suffocation by displacing the oxygen in the lungs or by depressing the CNS to the point where breathing stops. Long-term use can cause weight loss, fatigue, electrolyte imbalance, and muscle fatigue. Inhalants have significant negative effects on the blood, bone marrow, brain, heart, kidneys, liver, lungs, muscles, peripheral nervous system, and skin. In some instances, inhalants can cause sudden sniffing death (SSD) syndrome. This occurs when deep inhalation of the substance causes a decrease in available oxygen in the body. If the user then becomes startled or engages in sudden physical activity, the increased flow of adrenalin from the brain to the heart induces cardiac arrest, and death occurs within minutes.

Sustained use of inhalants leads to tolerance and, often, increased usage. Physical withdrawal symptoms can begin within hours to a few days of discontinuation

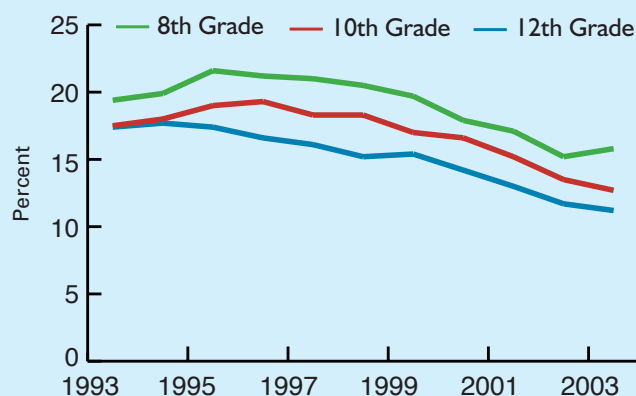
Facts About Inhalants

- ▶ Inhalants are readily available to youth who wish to use them.
- ▶ Repeated sniffing of concentrated vapors over time can permanently damage the nervous system and even cause death.

and include sweating, rapid pulse, hand tremors, insomnia, nausea, vomiting, physical agitation, anxiety, hallucinations, and grand-mal seizures. Indicators of inhalant use include chemical odor on the breath, loss of appetite, excitability, spots or sores around the mouth, and red or runny eyes and nose.

Inhalant use is commonly linked with problems in school such as falling grades, memory loss, learning problems, chronic absences, and general apathy. Because

Figure 14. Lifetime Prevalence of Inhalant Use



Source: *Monitoring the future*, University of Michigan, 2004.

of the early onset of use, inhalant users lack physical and emotional maturity and use tends to lead to disruptive, deviant, and delinquent behavior.

Anabolic Steroids

Description

Nature of the drug. Anabolic steroids are a group of powerful compounds closely related to the male sex hormone testosterone. Developed in the 1930s, steroids are rarely prescribed by physicians today. Current medical uses are limited to certain kinds of anemia, severe burns, and some types of breast cancer.

Use. Steroids are produced in tablet or capsule form for oral ingestion or as a liquid for intramuscular injection.

Effects. Taken in combination with a program of muscle-building exercise and diet, steroids can contribute to increases in body weight and muscular strength. Because of these properties, athletes in a variety of

Anabolic Steroid Use Among Youth

- ▶ In 2002, the rate of steroid use among 12th-grade students was 2.5 percent, a 10-year high.
- ▶ In 2002, 2.5 percent of 8th graders and 3.5 percent of 10th graders had used anabolic steroids at least once in their lifetimes.
- ▶ Perceived harmfulness of steroid use was at a 10-year low in 2002, with only 57 percent of 12th graders perceiving great harm in taking steroids.

sports have used steroids since the 1950s, hoping to enhance performance. Today, athletes are being joined by increasing numbers of youth seeking to accelerate their physical development.

Operating on the erroneous “more is better” theory, some athletes indulge in a practice known as “stacking”—using a combination of anabolic steroids, often in combination with other drugs such as stimulants, depressants, pain killers, anti-inflammatories, and other hormones. Many users “cycle,” taking the drugs for 6 to 12 weeks or more, stopping for several weeks, and then starting another cycle. They may do this in the belief that by scheduling their steroid intake, they can manipulate test results and escape detection. It is not uncommon for athletes to cycle over a period of months or even years (NIDA, 1999).

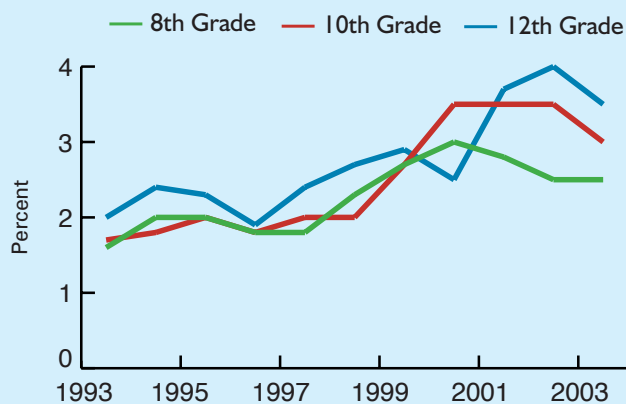
Scope of the Problem and Implications

Nonmedical use of steroids among adolescents and young adults is a growing concern. From 1992 to 2002, steroid use among youth rose slightly, particularly for 8th- and 10th-grade students. In 2002, 2.5 percent of 12th-grade students, 2.2 percent of 10th-grade students, and 1.5 percent of 8th-grade students, most of whom were male, reported steroid use in the past year; 4.0 percent of seniors reported ever having used steroids (Johnston et al., 2003). Young people who use steroids belong to different environmental settings (i.e., rural,

Facts About Anabolic Steroids

- ▶ Long-term effects of steroid use include increased cholesterol levels; high blood pressure; heart, kidney, and liver disease and/or malfunction; and increased risk of blood poisoning and infections from sharing needles.
- ▶ Psychological effects of taking steroids include irritability; uncontrollable bursts of anger (“roid rage”), which may lead to violence; severe mood swings; delusions; impaired judgment stemming from feelings of invincibility; and paranoid jealousy.

Lifetime Prevalence of Steroid Use



Source: *Monitoring the future*, University of Michigan, 2004.

urban, suburban) and socioeconomic backgrounds; they are of all races and ethnicities.

Steroid use can be addictive, and use often continues in spite of severe risks to physical and psychological health (NIDA, 2000a). The most dangerous symptom of steroid withdrawal is depression, because it sometimes leads to suicide attempts. Depressive symptoms can persist for up to a year after ceasing use (NIDA, 2000a).

Steroid users subject themselves to more than 70 side effects, ranging in severity from acne to liver cancer and including psychological as well as physical reactions. The liver and the cardiovascular and reproductive systems are the most seriously affected by steroid use. In males, use can cause withered testicles, sterility, and impotence. In females, irreversible masculine traits can develop, along with breast reduction and sterility. Psychological effects in both sexes include aggressive behavior known as “roid rage” and depression. While some side effects appear quickly, others, such as heart attacks and strokes, may not show up for years.

Signs of steroid use include quick weight and muscle gain (if used in combination with a weight-training program); behavioral changes, particularly increased aggressiveness and combativeness; jaundice or purple or red spots on the body; swelling of the feet or lower legs; trembling; unexplained darkening of the skin; and persistent unpleasant breath.

“Club” Drugs, Emerging Trends, and Drugs Used in Combination

Designer Drugs

“Designer” drugs are substances produced by illicit chemists who develop a drug combination or variant that builds on an existing drug or mimics a drug’s effect. By slightly changing the chemical composition of illegal drugs, they produce analogs that are technically legal. The result is often a more potent drug than the user may expect or, more often, a drug with varying potency due to nonprofessional production. Examples of designer drugs include analogs of the narcotics fentanyl (synthetic heroin, China White) and meperidine (MPTP, MPPP, PEPAP); analogs of hallucinogens, amphetamines, and methamphetamine (MDMA [Ecstasy, XTC, Adam Essence], MDM, PMA, DOM, DOB); and analogs of PCP (PCP, PCE, TCP). The risks associated with the use of designer drugs are often unknown to users.

Designer drugs, as well as herbal mixtures and a variety of hallucinogens, were originally used most often at concerts or in nightclub and “rave” settings—large all-night dance parties held in unusual places, such as warehouses or railroad yards, that feature computer-generated, high-volume, pulsating music—which have become increasingly popular in many areas over the last few years. Drug use patterns in this context tend to be somewhat different from those seen in other drug cultures. Typically, users are non-Hispanic white youth from middle to upper socioeconomic groups. The drugs are purchased in the club or brought to the club by the user rather than bought on the street or from a regular drug supplier. The club or rave experience revolves around music, dancing, and socializing and usually lasts through the night. The high sought, therefore, is one characterized by increased energy and alertness, feelings of euphoria and disinhibition, and sometimes, hallucinogenic effects. Club drug users often participate in “cafeteria” drug use, or a casual sampling and substitution of a variety of drugs based on availability that often involves the particularly dangerous practice of combined and consecutive drug use. Many of these drugs (e.g., ketamine, GHB, Rohypnol) are CNS depressants, which have the potential to produce respiratory depression, especially when combined with other CNS depressants like alcohol, sedatives, and/or tranquilizers (ONDCP, 1998). In recent years, the sale and use of these drugs has moved from primarily indoor to outdoor settings.

Some of the designer drugs and club drugs currently being used (and discussed in more detail above) include:

- ▶ MDMA/Ecstasy.
- ▶ Ketamine hydrochloride.
- ▶ Gamma hydroxybutyric acid, or GHB.

Emerging Trends

In 2002, law enforcement officials and drug-use ethnographers identified methamphetamine, MDMA/Ecstasy, and OxyContin as drugs that are increasing in use and availability. The Office of National Drug Control Policy conducts regular audits of law enforcement officials and ethnographers in a program known as Pulse Check. The results of Pulse Check can be viewed at <http://www.whitehousedrugpolicy.gov/drugfact/pulsechk>.

Drugs in Combination

Often, when one drug is being used, others are as well. Many drug users combine drugs to achieve different effects or to mitigate unwanted side effects. Many

drugs are used in social situations where alcohol is present and, thus, alcohol is often taken with other drugs. In addition to the drugs used in combination described above, benzodiazepine is a drug that is often taken with other drugs such as cocaine and heroin (for more information on benzodiazepine, see “Other Depressants”). Methamphetamine is another drug that is commonly used in combination with other drugs, such as alcohol, heroin, and cocaine (for more information on methamphetamine, see “Stimulants”). Other common drug combinations include injection of the mixture of heroin and cocaine (speedballing).

Drug Tables

The following pages contain tabular descriptions, compiled by the Substance Abuse and Mental Health Services Administration (1997), of the various street names, possible effects, symptoms of overdose, withdrawal syndromes, and indications of possible misuse of the substances described in this chapter.

Alcohol

Drug	Dependence Physical/Psychological	How Used	Duration (Hours) of Effects
Ethyl Alcohol	Possible/Possible	Oral	1-4
Ethanol	Possible/Possible	Oral	1-4

What Is Alcohol?	Distilled liquid product of fermented fruits, grains, and vegetables Used as solvent, antiseptic, and sedative Moderate potential for abuse
Possible Effects	Intoxication Sensory alteration Anxiety reduction
Symptoms of Overdose	Staggering Odor of alcohol on breath Loss of coordination Slurred speech, dilated pupils Fetal alcohol syndrome (in babies) Nerve and liver damage Death
Withdrawal Syndrome	Sweating Tremors Altered perception Psychosis, fear, auditory hallucinations
Indications of Possible Misuse	Confusion, disorientation, loss of motor nerve control Convulsions, shock, shallow respiration Involuntary defecation, drowsiness Respiratory depression
Street/Other Names	Booze, Juice, Brew, Vino, Hooch, Sauce
Why Alcohol Is Abused	Relaxation Sociability Cheap “high”

Depressants (Other than alcohol)

Drug	Dependence Physical/ Psychological	How Used	Duration (Hours) of Effects
Barbiturates	High/Moderate	Oral	1-16
Methaqualone	High/High	Oral	4-8
Tranquilizers	High/High	Oral	4-8
Chloral Hydrate	Moderate/Moderate	Oral	5-8
Glutethimide	High/Moderate	Oral	4-8

What Are Depressants?	<p>Drugs used medicinally to relieve anxiety, irritability, tension</p> <p>High potential for abuse, development of tolerance</p> <p>Produce state of intoxication similar to that of alcohol</p> <p>Combined with alcohol, effects increase, risks multiply</p>
Possible Effects	<p>Sensory alteration, anxiety reduction, intoxication</p> <p>Small amounts cause calmness, relaxed muscles</p> <p>Larger amounts cause slurred speech, impaired judgment, loss of motor coordination</p> <p>Very large doses may cause respiratory depression, coma, death</p> <p>Newborn babies of abusers may show dependence, withdrawal symptoms, behavioral problems, birth defects</p>
Symptoms of Overdose	<p>Shallow respiration, clammy skin, dilated pupils, weak and rapid pulse, coma, death</p>
Withdrawal Syndrome	<p>Anxiety, insomnia, muscle tremors, loss of appetite</p> <p>Abrupt cessation or reduced dose may cause convulsions, delirium, death</p>
Indications of Possible Misuse	<p>Behavior similar to alcohol intoxication (without odor of alcohol on breath)</p> <p>Staggering, stumbling, lack of coordination, slurred speech</p> <p>Falling asleep while at work, difficulty concentrating</p> <p>Dilated pupils</p>
Street/Other Names	<p>Barbiturates: Barbs, Beans, Biscuits, Blue Devils, Downers, Dragons, Greenies, Nebbies, Pink Ladies, Rainbows, Red Birds, Stumblers, Toolies, Yellow Jacket, and Yellows, among others</p> <p>Methaqualone: Quaaludes, Ludes, Mean Greens, Soapers, Soaps, and Quads, among others</p> <p>Tranquilizers: Brand names: Doral, Equanil, Halcion, Librium, Miltown, Serax, Traxene</p> <p>(Benzodiazepines): Valium and Rohypnol, among others</p> <p>Chloral Hydrate: Drops, Green Frogs, Knockout, Mickey Finn, and Peter</p> <p>Glutethimide: Hits</p>
What Do Depressants Look Like?	<p>Barbiturates: Red, yellow, blue, or red-and-blue capsules</p> <p>Methaqualone: Tablets</p> <p>Tranquilizers: Tablets or capsules</p> <p>Chloral Hydrate: Syrups or soft gelatin capsules</p>
Why Depressants Are Abused	<p>To reduce stress, allay anxiety, or induce sleep</p>

Nicotine (Tobacco)

Drug	Dependence Physical/ Psychological	How Used	Duration (Hours) of Effects
Nicotine	High/High	Smoked, Sniffed, Chewed	Direct effects for up to 30 minutes

Methods of Use	Smoked in cigarettes, cigars, and pipes; snuff, chewing tobacco
Possible Effects	Cancers of the lung, throat, mouth, and esophagus Heart disease Emphysema
Effects of Overdose	Headache and dizziness Nausea and vomiting Disturbed vision and hearing Weakness, confusion Respiratory/circulatory collapse Convulsions Death
Withdrawal Syndrome	Headache Nausea Constipation or diarrhea Falling heart rate and blood pressure Fatigue, drowsiness, and insomnia Irritability Difficulty concentrating Anxiety Depression Increased hunger and caloric intake Increased pleasantness of the taste of sweets Tobacco cravings
Indications of Use	Smell of tobacco, high carbon monoxide levels, stained teeth, bad breath
Street/Other Names	Coffin Nail, Butt, Smoke, Dip
Why Tobacco Is Abused	Pleasurable feelings Stress relief, relaxation Habit Addiction

Stimulants (other than Nicotine)

Drug	Dependence Physical/ Psychological	How Used	Duration (Hours) of Effects
Cocaine	Possible/High	Sniffed, Smoked, Injected	1-2
Amphetamines	Possible/High	Oral, Injected	2-4
Methamphetamine	Possible/High	Oral, Injected	2-4
Phenmetrazine	Possible/High	Oral, Injected	2-4
Methylphenidate	Possible/Moderate	Oral, Injected	2-4
Ritalin	Possible/Moderate	Oral, Snorted, Injected	
Other Stimulants	Possible/High	Oral, Injected	2-4
Ice	High/High	Smoked, Oral, Injected, Inhaled	4-14

What Are Stimulants?	Drugs used to increase alertness, relieve fatigue, and feel stronger and more decisive Used for euphoric effects or to counteract the “down” feeling produced by tranquilizers or alcohol
Possible Effects	Increased heart and respiratory rates, elevated blood pressure, dilated pupils, and decreased appetite High doses may cause rapid or irregular heartbeat, loss of coordination, collapse May cause perspiration, blurred vision, dizziness, a feeling of restlessness, anxiety, delusions
Symptoms of Overdose	Agitation, increase in body temperature, hallucinations, convulsions, death
Withdrawal Syndrome	Apathy, long periods of sleep, irritability, depression, disorientation
Indications of Possible Misuse	Excessive activity, talkativeness, irritability, argumentativeness, nervousness Increased blood pressure or pulse rate, dilated pupils Long periods without sleeping or eating, euphoria
Street/Other Names	Cocaine: Coke, Dust, Snow, Flake, Blow, Girl, C, Toot, Nose Candy, and The Lady Crack: Crack Cocaine, Freebase Rocks, Rock Amphetamine: Speed, Uppers, Ups, Black Beauties, Pep Pills, Copilots, Bumblebees, Hearts, Benzedrine, Dexedrine, Footballs, and Biphetamine Methamphetamine: Crystal Meth, Crank, Crystal Methedrine, Speed, and Ice Ritalin: Pellets Other Stimulants: Cylert, Preludin, Didrex, Pre-State, Voranil, Tenuate, Tepanil, Pondimin, Sandrex, Plegine, and Ionamin
What Do Stimulants Look Like?	Cocaine: White crystalline powder, often diluted with other ingredients Crack: Light brown or beige pellets or crystalline rocks that resemble coagulated soap; often packaged in small vials Amphetamine: Capsules, pills, tablets Methamphetamine: White powder, pills, rocks that resemble blocks of paraffin Other Stimulants: Pills, capsules, and tablets
Why Stimulants Are Abused	Cocaine: Carefree feeling, euphoria, relaxation, feeling of being in control Crack: Quick high, power, euphoria Methamphetamine: Temporary mood elevation, exhilaration (high), increased mental alertness, increased wakefulness Ritalin: Appetite suppressant, wakefulness, increased focus and attentiveness, euphoria

Hallucinogens

Drug	Dependence Physical/ Psychological	How Used	Duration (Hours) of Effects
Phencyclidine	Unknown/High	Smoked, Oral, Injected	Up to Several Days
Lysergic Acid Diethylamide	None/Unknown	Oral	8-12 Hours
Mescaline, Peyote	None/Unknown	Oral, Injected	8-12 Hours
Psilocybin	None/Unknown	Oral, Injected, Smoked, Sniffed	Variable
Designer Drugs	Unknown/Unknown	Oral, Injected, Smoked	Variable

What Are Hallucinogens?	<p>Drugs that produce behavioral changes that are often multiple and dramatic</p> <p>Have no known medical use, but some block sensation to pain, and use may result in self-inflicted injuries</p> <p>“Designer drugs,” made to imitate certain illegal drugs, often many times stronger than drugs they imitate</p>
Possible Effects	<p>Rapidly changing feelings, immediately and long after use</p> <p>Chronic use may cause persistent problems, depression, violent behavior, anxiety, distorted perception of time</p> <p>Large doses may cause convulsions, coma, heart/lung failure, ruptured blood vessels in the brain</p> <p>May cause hallucinations, illusions, dizziness, confusion, suspicion, anxiety, loss of control</p> <p>Delayed effects: “flashbacks” may occur long after use</p> <p>Designer drugs: One use may cause irreversible brain damage</p>
Symptoms of Overdose	<p>Longer, more intense “trip” episodes</p> <p>Psychosis, coma, death</p>
Withdrawal Syndrome	No known withdrawal syndrome
Indications of Possible Misuse	<p>Extreme changes in behavior and mood</p> <p>Sitting or reclining in a trance-like state</p> <p>Fearfulness</p> <p>Chills, irregular breathing, sweating, trembling hands</p> <p>Changes in sense of light, hearing, touch, smell, and time</p> <p>Increase in blood pressure, heart rate, and blood sugar</p>
Street/Other Names	<p>Phencyclidine: CP, Angel Dust, Loveboat, Lovely, Hog, Killer Weed, Embalming Fluid, Rocket Fuel</p> <p>Lysergic Acid Diethylamide: LSD, Acid, Green or Red Dragon, White Lightning, Blue Heaven, Sugar Cubes, Microdot</p> <p>Mescaline and Peyote: Mesc, Buttons, Cactus</p> <p>Psilocybin: Magic Mushrooms, Mushrooms</p> <p>Other Hallucinogens: Bufotenine, DMT, DET, Ibogaine, Ecstasy (designer drug)</p>
What Do Hallucinogens Look Like?	<p>Phencyclidine: Liquid, white crystalline powder, pills, capsules</p> <p>LSD: Colored tablets, impregnated blotter paper, clear liquid, thin squares of gelatin</p> <p>Mescaline and Peyote: Hard brown discs, tablets, capsules</p> <p>Psilocybin: Fresh or dried mushrooms</p>
Why Hallucinogens Are Abused	Fun; stimulation or depression; behavioral changes

Narcotics (Opiates)

Drug	Dependence Physical/Psychological	How Used	Duration (Hours) of Effects
Opium	High/High	Oral, Smoked	3-6
Morphine	High/High	Oral, Smoked, Injected	3-6
Codeine	Moderate/Moderate	Oral, Injected	3-6
Heroin	High/High	Smoked, Injected, Sniffed	3-6
Hydromorphone	High/High	Oral, Injected	3-6
Meperidine	High/High	Oral, Injected	3-6
Methadone	High/High	Oral, Injected	12-24

What Are Narcotics?	Drugs used medicinally to relieve pain High potential for abuse
Possible Effects	Euphoria Drowsiness, respiratory depression Constricted (pinpoint) pupils Relaxation, with an immediate “rush” Initial unpleasant effects: restlessness, nausea
Symptoms of Overdose	Slow, shallow breathing, clammy skin Convulsions, coma, possible death
Withdrawal Syndrome	Watery eyes, runny nose, yawning Loss of appetite, irritability, cramps, nausea Tremors, panic, chills, sweating
Indications of Possible Misuse	Scars (tracks) caused by injections Constricted (pinpoint) pupils Loss of appetite Sniffles, watery eyes, cough, nausea Lethargy, drowsiness, nodding Syringes, bent spoons, needles, etc.
Street/Other Names	Heroin: Smack, Horse, Brown Sugar, Junk, Mud, Big H, Black Tar Methadone: Dolophine, Methadose, Amidone Codeine: Empirin compound with codeine, Tylenol with codeine, codeine in cough medicines Morphine: Pectoral Syrup Opium: Paregoric, Dover’s Powder, Parepectolin Other Narcotics: Percocet, Percodan, Tussionex, Fentanyl, Darvon, Talwin, Lomotil
What Do Narcotics Look Like?	Heroin: Powder, white to dark brown; tar-like substance Methadone: Solution Codeine: Dark liquid varying in thickness, capsules, tablets Morphine: White crystals, hypodermic tablets, injectable solutions Opium: Dark brown chunks, powder Other Narcotics: Tablets, capsules, liquid
Why Narcotics Are Abused	Reduce tension Feeling of euphoria

Inhalants

Drug	Dependence Physical/Psychological	How Used	Duration (Hours) of Effects
Volatile solvents, aerosols, gases, nitrites	Possible/Possible	“Sniffing“ and “snorting” fumes from containers; spraying aerosols into the nose or mouth, “bagging”—sniffing or inhaling fumes from a plastic or paper bag; “huffing” from a soaked rag stuffed in the mouth, or inhaling balloons filled with nitrous oxide	Minutes; users often continue to inhale repeatedly to prolong the effects—a very dangerous practice

What Are Inhalants?	<p>Volatile substances that produce chemicals that can be inhaled and which produce psychoactive or mind-altering effects</p>
Possible Effects	<p>Rapid high similar to alcohol intoxication, followed by drowsiness, disinhibition, lightheadedness, and agitation</p> <p>Prolonged sniffing sessions can result in death within minutes by asphyxiation, suffocation by using a bag over the head to inhale fumes, choking by inhaling vomit, or from accidents incurred while intoxicated</p>
Symptoms of Overdose	<p>Loss of coordination; nausea and vomiting; slurred speech; dizziness</p> <p>Depressed reflexes; general muscle weakness</p>
Withdrawal Syndrome	<p>Mild withdrawal observed in long-term users</p>
Indications of Possible Misuse	<p>Sweetish, chemical smell on the clothes or body</p> <p>Difficulty coordinating movement</p> <p>Loss of feeling, vision, hearing</p> <p>Inflammation of the nostrils, frequent nosebleeds, or rash around the nose and mouth</p> <p>Poor appetite, loss of weight</p> <p>Pale, bluish skin</p> <p>Watery, bloodshot eyes with dilated pupils</p> <p>Slow, slurred speech</p> <p>Clumsy, staggering gait and drunken appearance</p>
Street/Other Names	<p>Anesthetic Gases/Nitrites/Organic Solvents</p> <p>Nitrous Oxide: Laughing Gas, Whippets</p> <p>Amyl Nitrite: Poppers, Snappers</p> <p>Butyl Nitrite: Rush, Bolt, Locker Room, Bullet, Climax</p> <p>Chlorohydrocarbons: Aerosol Sprays/Hydrocarbons; Solvents</p>
What Do Inhalants Look Like?	<p>Anesthetic Gases/Nitrites/Organic Solvents</p> <p>Nitrous Oxide: Propellant for whipped cream in aerosol spray can; small, 8-gram metal cylinder sold with a balloon or pipe (buzz bomb)</p> <p>Amyl Nitrite: Clear, yellowish liquid in ampules</p> <p>Butyl Nitrite: Packaged in small bottles</p> <p>Chlorohydrocarbons: Aerosol paint cans, containers of cleaning fluid</p> <p>Hydrocarbons: Cans of aerosol propellants, gasoline, glue, paint thinner</p>
Why Inhalants Are Abused	<p>Cheap high; quick buzz; fun</p> <p>Perceived enhancement of sexual pleasure and performance (nitrates)</p>

Anabolic Steroids

Drug	Dependence Physical/Psychological	How Used	Duration (Hours) of Effects
Dianabol	Possible/Possible	Oral	Days–Weeks
Nandrolone	Possible/Possible	Oral	Days–Weeks

What Are Anabolic Steroids?	Synthetic compounds available legally and illegally Drugs that are closely related to the male sex hormone testosterone Moderate potential for abuse, particularly among young males
Possible Effects	Increase in body weight Increase in muscle strength Enhanced athletic performance Increased physical endurance
Symptoms of Overdose	Quick weight and muscle gain Extremely aggressive behavior or “roid rage” Severe skin rashes Impotence, withered testicles In females, development of irreversible masculine traits
Withdrawal Syndrome	Significant weight loss Depression, behavioral changes Trembling
Indications of Possible Misuse	Increased combativeness and aggressiveness Jaundice Purple or red spots on body, unexplained darkness of skin Persistent unpleasant breath odor Swelling of feet or lower legs
Street/Other Names	Anabolic (male hormone—most frequently abused steroids)
What Do Steroids Look Like?	Injectable (used via syringe) Steroidal supplements taken orally, usually in capsule form
Why Anabolic Steroids Are Abused	Increase strength Increase muscle size Better muscle recovery

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