

Substance Abuse and Dependence



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““””

“Nothing and Nobody Comes Before My Coke”

She had just caught me with cocaine again after I had managed to convince her that I hadn't used in over a month. Of course I had been tooting (snorting) almost every day, but I had managed to cover my tracks a little better than usual. So she said to me that I was going to have to make a choice—either cocaine or her. Before she finished the sentence, I knew what was coming, so I told her to think carefully about what she was going to say. It was clear to me that there wasn't a choice. I love my wife, but I'm not going to choose anything over cocaine. It's sick, but that's what things have come to. Nothing and nobody comes before my coke.

—From Weiss & Mirin, 1987, p. 55

THESE COMMENTS FROM EUGENE, A 41-YEAR-OLD ARCHITECT, UNDERSCORE THE POWERFUL effects that drugs like cocaine can have on people's lives. Our society is flooded with psychoactive substances that alter the mood and twist perceptions—substances that lift you up, calm you down, and turn you upside down. Many young people start using these substances because of peer pressure or because their parents and other authority figures tell them not to. For Eugene, as for many others who become addicted to drugs, the pursuit and use of drugs takes center stage in their lives and becomes even more important than family, work, or their own welfare.

In this chapter we examine the physiological and psychological effects of the major classes of drugs. We explore how mental health professionals classify substance-related disorders and where we draw the line between use and abuse. We then examine contemporary understandings of the origins of these disorders and how mental health professionals help people who struggle to combat them.

CLASSIFICATION OF SUBSTANCE-RELATED DISORDERS

Under certain conditions, the use of substances that affect mood and behavior is normal, at least as gauged by statistical frequency and social standards. It is normal to start the day with caffeine in the form of coffee or tea, to take wine or coffee with meals, to meet friends for a drink after work, and to end the day with a nightcap. Many of us take prescription drugs that calm us down or ease our pain. Flooding the bloodstream with nicotine by means of smoking is normal in the sense that about 1 in 5 Americans do it. However, some psychoactive substances, such as cocaine, marijuana, and heroin, are illegal and are used illicitly. Others, such as anti-anxiety drugs (such as Valium and Xanax) and amphetamines (such as Ritalin), are available by prescription for legitimate medical uses. Still others, such as tobacco (which contains nicotine, a mild stimulant) and alcohol (a depressant), are available without prescription, or over-the-counter. Ironically, the most widely and easily accessible substances—tobacco and alcohol—cause more deaths through sickness and accidents than all illicit drugs combined.

The classification of substance-related disorders in the *DSM* system is not based on whether a drug is legal or not, but rather on how drug use impairs the person's physiological and psychological functioning. The *DSM-IV* classifies substance-related disorders into two major categories: substance use disorders and substance-induced disorders.

Substance-induced disorders are disorders induced by using psychoactive substances, such as intoxication, withdrawal syndromes, mood disorders, delirium, dementia, amnesia, psychotic disorders, anxiety disorders, sexual dysfunctions, and sleep disorders. Different substances have different effects, so some of these disorders may be induced by one, a few, or nearly all substances. Let us consider the example of intoxication.

TRUTH or FICTION

Heroin accounts for more deaths than any other drug. (p. 291)

You cannot be psychologically dependent on a drug without also being physically dependent on it. (p. 295)

More teenagers and young adults die from alcohol-related motor vehicle accidents than from any other cause. (p. 297)

It is safe to let someone who has passed out from drinking just “sleep it off.” (p. 301)

Even moderate use of alcohol increases the risk of heart attacks. (p. 303)

Coca-Cola originally contained cocaine. (p. 306)

Breast cancer is the leading cause of cancer deaths among U.S. women. (p. 307)

People who can “hold their liquor” better than most stand a lower risk of becoming problem drinkers. (p. 312)

A widely used treatment for heroin addiction involves substituting another addictive drug. (p. 318)

TRUTH or FICTION

Heroin accounts for more deaths than any other drug.

FALSE. Two legally available substances, alcohol and tobacco, cause far more deaths.

substance-induced disorders Disorders, such as intoxication, that can be induced by using psychoactive substances.



Two of the many faces of alcohol use—and abuse. Alcohol is our most widely used—and abused—drug. Many people use alcohol to celebrate achievements and happy occasions, as in the photograph on the left. Unfortunately, like the man in the photograph on the right, some people use alcohol to drown their sorrows, which may only compound their problems. Where exactly does substance use end and abuse begin? According to the *DSM*, use becomes abuse when it leads to damaging consequences.

intoxication A state of drunkenness.

Substance **intoxication** refers to a state of drunkenness or being “high.” This effect largely reflects the chemical actions of the psychoactive substances. The particular features of intoxication depend on which drug is ingested, the dose, the user’s biological reactivity, and—to some degree—the user’s expectations. Signs of intoxication often include confusion, belligerence, impaired judgment, inattention, and impaired motor and spatial skills. Extreme intoxication from use of alcohol, cocaine, opioids, (narcotics) and PCP can even result in death (yes, you can die from alcohol overdoses), either because of the substance’s biochemical effects or because of behavior patterns—such as suicide—that are connected with psychological pain or impaired judgment brought on by use of the drug.

substance use disorders Disorders characterized by maladaptive use of psychoactive substances (e.g., substance dependence).

Substance use disorders are patterns of maladaptive use of psychoactive substances. These disorders, which include *substance abuse* and *substance dependence*, are the major focus of our study.

substance abuse The continued use of a psychoactive drug despite the knowledge that it is causing a social, occupational, psychological, or physical problem.

Substance Abuse and Dependence

Where does substance use end and abuse begin? According to the *DSM*, **substance abuse** is a pattern of recurrent use that leads to damaging consequences. Damaging consequences may involve failure to meet one’s major role responsibilities (e.g., as student, worker, or parent), putting oneself in situations where substance use is physically dangerous (e.g., mixing driving and substance use), encountering repeated problems with the law arising from substance use (e.g., multiple arrests for substance-related behavior), or having recurring social or interpersonal problems because of substance use (e.g., repeatedly getting into fights when drinking).

When people repeatedly miss school or work because they are drunk or “sleeping it off,” their behavior may fit the definition of substance abuse. A single incident of excessive drinking at a friend’s wedding would not qualify. Nor would regular consumption of low to moderate amounts of alcohol be considered abusive so long as it is not connected with any impairment in functioning. Neither the amount nor the type of drug ingested, nor whether the drug is illicit, is the key to defining substance abuse according to the *DSM*. Rather, the determining feature of substance abuse is whether a pattern of drug-using behavior becomes repeatedly linked to damaging consequences.

substance dependence Impaired control over the use of a psychoactive substance; often characterized by physiological dependence.

Substance abuse may continue for a long period of time or progress to **substance dependence**, a more severe disorder associated with physiological signs of dependence (tolerance or withdrawal syndrome) or compulsive use of a substance. People who

TABLE 9.1

Diagnostic Features of Substance Dependence

Substance dependence is defined as a maladaptive pattern of use that results in significant impairment or distress, as shown by the following features occurring within the same year:

1. Tolerance for the substance, as shown by either
 - a. the need for increased amounts of the substance to achieve the desired effect or intoxication, or
 - b. marked reduction in the effects of continuing to ingest the same amounts.
2. Withdrawal symptoms, as shown by either
 - a. the withdrawal syndrome that is considered characteristic for the substance, or
 - b. the taking of the same substance (or a closely related substance, as when methadone is substituted for heroin) to relieve or to prevent withdrawal symptoms.
3. Taking larger amounts of the substance or for longer periods of time than the individual intended (e.g., person had desired to take only one drink, but after taking the first, continues drinking until severely intoxicated).
4. Persistent desire to cut down or control intake of substance or lack of success in trying to exercise self-control.
5. Spending a good deal of time in activities directed toward obtaining the substance (e.g., visiting several physicians to obtain prescriptions or engaging in theft), in actually ingesting the substance, or in recovering from its use. In severe cases, the individual's daily life revolves around substance use.
6. The individual has reduced or given up important social, occupational, or recreational activities due to substance use (e.g., person withdraws from family events in order to indulge in drug use).
7. Substance use is continued despite evidence of persistent or recurrent psychological or physical problems either caused or exacerbated by its use (e.g., repeated arrests for driving while intoxicated).

Note: Not all of these features need be present for a diagnosis to be made.

Source: Adapted from the *DSM-IV-TR* (APA, 2000).

become compulsive users lack control over their drug use. They may be aware of how their drug use is disrupting their lives or damaging their health, but feel helpless or powerless to stop using drugs, even though they may want to. By the time they become dependent on a given drug, they've given over much of their lives to obtaining and using it. The cocaine user whose words opened this chapter would certainly fit this definition. The diagnostic features of substance dependence are listed in Table 9.1.

Repeated use of a substance may alter the body's physiological reactions, leading to the development of tolerance or a physical withdrawal syndrome (see Table 9.1). **Tolerance** is a state of physical habituation to a drug, resulting from frequent use, such that higher doses are needed to achieve the same effect. A **withdrawal syndrome** (also called an *abstinence syndrome*) is a cluster of symptoms that occur when a dependent person abruptly stops using a particular substance following heavy, prolonged use. People who experience a withdrawal syndrome often return to using the substance to relieve the discomfort associated with withdrawal, which thus serves to maintain the addictive pattern. Withdrawal symptoms vary with the particular type of drug. With alcohol dependence, typical withdrawal symptoms include dryness in the mouth, nausea or vomiting, weakness, increased heart rate, anxiety, depression, headaches, insomnia, elevated blood pressure, and fleeting hallucinations.

In some cases of chronic alcoholism, withdrawal produces a state of *delirium tremens*, or DTs. DTs are usually limited to chronic, heavy users of alcohol who dramatically lower their intake of alcohol after many years of heavy drinking. DTs involve intense autonomic hyperactivity (profuse sweating and tachycardia) and *delirium*—a state of mental confusion characterized by incoherent speech, disorientation, and extreme restlessness. Terrifying hallucinations—frequently of creepy, crawling animals—may also be present.

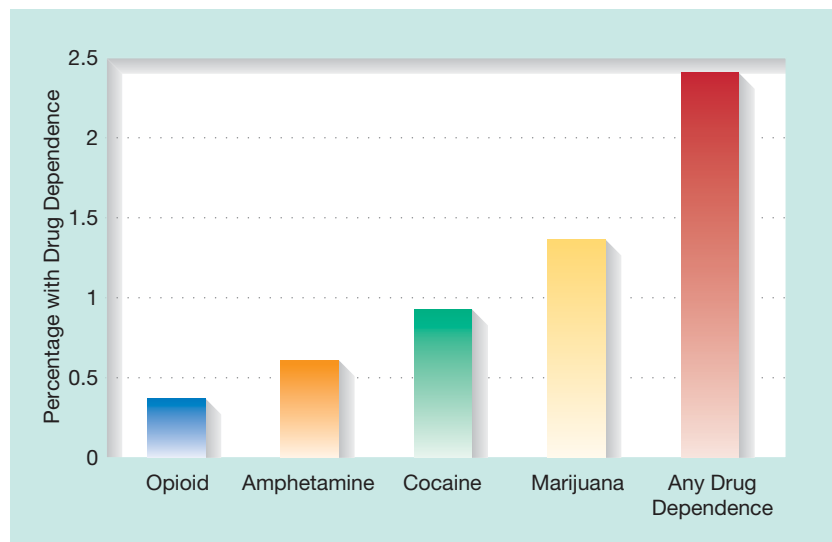
Substances that may lead to withdrawal syndromes include—in addition to alcohol—opioids, cocaine, amphetamines, sedatives and barbiturates, nicotine, and

tolerance Physical habituation to a drug such that with frequent use, higher doses are needed to achieve the same effects.

withdrawal syndrome A characteristic cluster of symptoms following the sudden reduction or cessation of use of a psychoactive substance after physiological dependence has developed.

FIGURE 9.1 Lifetime prevalence of drug dependence disorder by type of illicit drug. Drug dependence disorders involving illicit drugs affect nearly 3 in 100 adults in the United States. Marijuana (cannabis) dependence is the most common type.

Source: Conway et al., 2006.



antianxiety agents (minor tranquilizers). Marijuana and hallucinogens such as LSD are not recognized as producing a withdrawal syndrome, because abrupt withdrawal from these substances does not produce clinically significant withdrawal effects (APA, 2000).

Substance dependence is often, but not always, associated with the development of physiological dependence. It sometimes involves a pattern of compulsive use without physiological or chemical dependence. For example, people may become compulsive users of marijuana, especially when they rely on the drug to help them cope with the stresses of daily life. Yet they may not require larger amounts of the substance to get “high” or experience distressing withdrawal symptoms when they cease using it. In most cases, however, substance dependence and physiological features of dependence occur together. Despite the fact that the *DSM* considers substance abuse and dependence to be distinct diagnostic categories, the borderline between the two is not always clear.

Unfortunately, substance abuse and dependence disorders are common problems in our society (Adelson, 2006). An estimated 10.3% of adults in the United States develop drug (substance) use disorders on an illicit drug at some point in their lives, with about 7.7% developing a drug abuse disorder and about 2.5% developing a drug dependence disorder (Compton et al., 2005). About 8% of adult Americans develop alcohol abuse or dependence disorders (Lemonick, 2007). People with one drug use disorder, such as alcohol dependence disorder, often present with another, such as cocaine dependence disorder (Stinson et al., 2005). In Figure 9.1 we see the percentages of U.S. adults who develop drug dependence disorders on various types of illicit drugs.

Addiction and Other Forms of Compulsive Behavior

The *DSM* uses the terms *substance abuse* and *substance dependence* as categories of substance use disorders. It does not use the term *addiction* to describe these problems. Yet the concept of addiction is widespread among professionals and laypeople alike. Even some leading professionals believe the word “addiction” should replace the word “dependence” in the diagnostic manual (O’Brien, Volkow, & Li, 2006). But what does the term “addiction” mean? Before we proceed to discuss drugs of abuse, let us define the terms we will be using.

We lack any universally accepted definition of addiction. For our purposes, we define **addiction** as compulsive use of a drug accompanied by signs of physiological dependence. People become compulsive users when they have impaired control over their use of a drug. In effect, they feel compelled to continue using the drug despite the negative consequences that continued use of the drug entails. By **physiological dependence**, we mean that a person’s body has changed as a result of the regular use of a psychoactive drug in such a way that it comes to depend on having a steady supply of the substance. The major signs of physiological dependence are the development of tolerance and a withdrawal syndrome.

addiction Impaired control over the use of a chemical substance, accompanied by physiological dependence.

physiological dependence A condition in which the drug user’s body comes to depend on a steady supply of the substance.

People can also develop **psychological dependence** on a drug without becoming physiologically or chemically dependent. These individuals come to compulsively use a drug to meet psychological needs. We can think of someone who compulsively uses marijuana to cope with daily stress, but is not physiologically dependent on the drug. On the other hand, a person may become physiologically dependent on a drug but not become a compulsive user. For example, people recuperating from surgery are often given narcotics derived from opium as painkillers. Some develop signs of physiological dependence, such as tolerance and a withdrawal syndrome, but do not develop impaired control over the use of these drugs.

Other forms of compulsive behavior, such as compulsive gambling, shopping, or even Internet use, can be likened to forms of nonchemical addiction. Whether we label such behavioral patterns as addictions depends on how we define the concept of addiction (see Chapter 13 for a discussion of compulsive gambling). In this chapter, we focus on chemical forms of dependence.

Racial and Ethnic Differences in Substance Use Disorders

Despite the popular stereotype that drug dependence is more frequent among ethnic minorities, this belief is not supported by evidence. To the contrary, African Americans and Latinos have comparable or even lower rates of substance use disorders than do European Americans (non-Hispanic Whites) (Breslau et al., 2005; Compton et al., 2005). Moreover, African American adolescents are much less likely than European American adolescents to develop substance abuse or dependence problems (Kilpatrick et al., 2000). In a later section we shall examine evidence on racial/ethnic group differences in alcohol use and abuse.

Pathways to Drug Dependence

Although the progression to substance dependence varies from person to person, one common pathway involves a progression through the following stages (Weiss & Mirin, 1987):

1. *Experimentation.* During the stage of experimentation, or occasional use, the drug temporarily makes users feel good, even euphoric. Users feel in control and believe they can stop at any time.
2. *Routine use.* During the next stage, a period of routine use, people begin to structure their lives around the pursuit and use of drugs. Denial plays a major role at this stage, as users mask the negative consequences of their behavior to themselves and others. Values change. What had formerly been important, such as family and work, comes to matter less than the drugs.

The following clinical interview illustrates how denial can mask reality. This 48-year-old executive was brought for a consultation by his wife. She complained his once-successful business was jeopardized by his erratic behavior, he was grouchy and moody, and he had spent \$7,000 in the previous month on cocaine.

CLINICIAN: Have you missed many days at work recently?

EXECUTIVE: Yes, but I can afford to, since I own the business. Nobody checks up on me.

CLINICIAN: It sounds like that's precisely the problem. When you don't go to work, the company stays open, but it doesn't do very well.

EXECUTIVE: My employees are well trained. They can run the company without me.

CLINICIAN: But that's not happening.

EXECUTIVE: Then there's something wrong with them. I'll have to look into it.

CLINICIAN: It sounds as if there's something wrong with you, but you don't want to look into it.

EXECUTIVE: Now you're on my case. I don't know why you listen to everything my wife says.

CLINICIAN: How many days of work did you miss in the last two months?

EXECUTIVE: A couple.

CLINICIAN: Are you saying that you missed only two days of work?

EXECUTIVE: Maybe a few.

psychological dependence Compulsive use of a substance to meet a psychological need.

TRUTH or FICTION

You cannot be psychologically dependent on a drug without also being physically dependent on it.

FALSE. You can become psychologically dependent on a drug without developing a physiological dependence.

CLINICIAN: Only three or four days?
 EXECUTIVE: Maybe a little more.
 CLINICIAN: Ten? Fifteen?
 EXECUTIVE: Fifteen.
 CLINICIAN: All because of cocaine?
 EXECUTIVE: No.
 CLINICIAN: How many were because of cocaine?
 EXECUTIVE: Less than fifteen.
 CLINICIAN: Fourteen? Thirteen?
 EXECUTIVE: Maybe thirteen.
 CLINICIAN: So you missed thirteen days of work in the last two months because of cocaine. That's almost two days a week.
 EXECUTIVE: That sounds like a lot but it's no big deal. Like I say, the company can run itself.
 CLINICIAN: How long have you been using cocaine?
 EXECUTIVE: About three years.
 CLINICIAN: Did you ever use drugs or alcohol before that in any kind of quantity?
 EXECUTIVE: No.
 CLINICIAN: Then let's think back five years. Five years ago, if you had imagined yourself missing over a third of your workdays because of a drug, and if you had imagined yourself spending the equivalent of \$84,000 a year on that same drug, and if you saw your once-successful business collapsing all around you, wouldn't you have thought that that was indicative of a pretty serious problem?
 EXECUTIVE: Yes, I would have.
 CLINICIAN: So what's different now?
 EXECUTIVE: I guess I just don't want to think about it.

—From Weiss & Mirin, 1987, pp. 79–80

As routine drug use continues, problems mount. Users devote more resources to drugs. They ravage family bank accounts, seek “temporary” loans from friends and family for trumped-up reasons, and sell family heirlooms and jewelry for a fraction of their value. Lying and manipulation become a way of life to cover up the drug use. The husband sells the TV set and forces the front door open to make it look like a burglary. The wife claims to have been robbed at knifepoint to explain the disappearance of a gold chain or engagement ring. Family relationships become strained as the mask of denial shatters and the consequences of drug abuse become apparent: days lost from work, unexplained absences from home, rapid mood shifts, depletion of family finances, failure to pay bills, stealing from family members, and missing family gatherings or children's birthday parties.

3. *Addiction or dependence.* Routine use becomes addiction or dependence when users feel powerless to resist drugs, either because they want to experience their effects or to avoid the consequences of withdrawal. Little or nothing else matters at this stage, as we saw in the case of Eugene with which we opened the chapter.

Now let us examine the effects of different types of drugs of abuse and the consequences associated with their use and abuse.

DRUGS OF ABUSE

Drugs of abuse are generally classified within three major groupings: (a) depressants, such as alcohol and opioids; (b) stimulants, such as amphetamines and cocaine; and (c) hallucinogens.

Depressants

depressant A drug that lowers the level of activity of the central nervous system.

A **depressant** is a drug that slows down or curbs the activity of the central nervous system. It reduces feelings of tension and anxiety, slows movement, and impairs cognitive processes. In high doses, depressants can arrest vital functions and cause death.

The most widely used depressant, alcohol, can cause death when taken in large amounts because of its depressant effects on breathing. Other effects are specific to the particular kind of depressant. For example, some depressants, such as heroin, produce a “rush” of pleasure. Here let us consider several major types of depressants.

Alcohol Alcohol is the most widely abused substance in the United States and worldwide. You might not think of alcohol as a drug, perhaps because it is so common, or perhaps because it is ingested by drinking rather than by smoking or injection. But alcoholic beverages—such as wine, beer, and hard liquor—contain a depressant drug called *ethyl alcohol* (or *ethanol*). The concentration of the drug varies with the type of beverage (wine and beer have less pure alcohol per ounce than distilled spirits such as rye, gin, or vodka). Alcohol is classified as a depressant because it has biochemical effects similar to those of a class of antianxiety agents or minor tranquilizers, the *benzodiazepines*, which includes the well-known drugs *diazepam* (Valium) and *chlordiazepoxide* (Librium). We can think of alcohol as an over-the-counter tranquilizer.

Most American adults drink alcohol at least occasionally and do so in moderation. But many people develop significant problems with alcohol. Many lay and professional people use the terms **alcoholism** and alcohol dependence interchangeably, as we will. We use either term to refer to a pattern of impaired control over the use of alcohol in someone who has become physiologically dependent on the drug. An estimated eight million U.S. adults suffer from alcoholism (Kranzler, 2006).

The most widely held view of alcoholism is the disease model, the belief that alcoholism is a medical illness or disease. From this perspective, once a person with alcoholism takes a drink, the biochemical effects of the drug on the brain create an irresistible physical craving for more. The disease model holds that alcoholism is a chronic, permanent condition. The peer-support group Alcoholics Anonymous (AA) subscribes to this view, which is expressed in their slogan, “Once an alcoholic, always an alcoholic.” AA views people suffering from alcoholism as either drinking or “recovering,” never “cured.” However, later in this chapter we shall see that some professionals, including the psychologists Linda and Mark Sobell, adopt a different perspective. Their research shows that some alcohol abusers can learn skills of controlled social drinking that enables them to drink moderately without “falling off the wagon.” The contention that some people with alcohol problems can learn to drink moderately remains controversial.

The personal and social costs of alcoholism exceed those of all illicit drugs combined. Alcohol abuse is connected with lower productivity, loss of jobs, and downward movement in socioeconomic status. Alcohol plays a role in many violent crimes, including assaults and homicides, and more than 180,000 rapes and sexual attacks annually in the United States (Bartholow & Heinz, 2006; Buddie & Testa, 2005; O’Farrell, Fals-Stewart, & Murphy, 2005). About 1 in 3 suicides in this country and about the same proportion of deaths due to unintentional injury (such as from motor vehicle accidents) are linked to alcohol use (Dougherty et al., 2004; Sher, 2005; Shneidman, 2005). More teenagers and young adults die from alcohol-related motor vehicle accidents than from any other cause. Despite increased awareness about the risks of drinking and driving, fatal alcohol-related motor vehicle accidents are on the rise (O’Donnell, 2003). All told, an estimated 100,000 people in the United States die from alcohol-related causes each year, mostly from motor vehicle crashes and alcohol-related diseases (Society for Neuroscience, 2005b).

Despite the popular image of the person who develops alcoholism as a skid-row drunk, only a small minority of people with alcoholism fit the stereotype. The great majority of people with alcoholism are quite ordinary—your neighbors, coworkers, friends, and members of your own family. They are found in all walks of life and every social and economic class. Many have families, hold good jobs, and live fairly comfortably. Yet alcoholism can have just as devastating an effect on the well-to-do as on the indigent, leading to wrecked careers and marriages, to motor vehicle and other accidents, and to severe, life-threatening physical disorders, as well as exacting an enormous emotional toll. Alcoholism is also linked to higher levels of domestic violence and greater risk of divorce (Marshall, 2003).

alcoholism An alcohol dependence disorder or addiction that results in serious personal, social, occupational, or health problems.

TRUTH or FICTION

More teenagers and young adults die from alcohol-related motor vehicle accidents than from any other cause.

TRUE. Alcohol-related motor vehicle accidents are the leading cause of death among teenagers and young adults.

QUESTIONNAIRE

Are You Hooked?



Are you dependent on alcohol? If you shake and shiver and undergo the tortures of the damned (our editor insisted on changing this word to maintain the decorum of a textbook) when you go without a drink for a while, the answer is clear enough. However, sometimes the clues are more subtle.

The following questions, adapted from the National Council on Alcoholism's self-test, can shed some light on the question. Simply place a check mark in the "yes" or "no" column for each item. Then check the key at the end of the chapter.

	YES	NO
1. Do you sometimes go on drinking binges?	_____	_____
2. Do you tend to keep away from your family or friends when you are drinking?	_____	_____
3. Do you become irritated when your family or friends talk about your drinking?	_____	_____
4. Do you feel guilty now and then about your drinking?	_____	_____
5. Do you often regret the things you have said or done when you have been drinking?	_____	_____
6. Do you find that you fail to keep the promises you make about controlling or cutting down on your drinking?	_____	_____
7. Do you eat irregularly or not at all when you are drinking?	_____	_____
8. Do you feel low after drinking?	_____	_____
9. Do you sometimes miss work or appointments because of drinking?	_____	_____
10. Do you drink more and more to get drunk?	_____	_____

Source: Adapted from *Newsweek*, February 20, 1989, p. 52.

No single drinking pattern is exclusively associated with alcoholism. Some people with alcoholism drink heavily every day; others binge only on weekends. Others can abstain for lengthy periods of time, but periodically "go off the wagon" and engage in episodes of binge drinking that last for weeks or months.

Alcohol, not cocaine or other drugs, is the drug of choice among young people today and the leading drug of abuse. Drinking has become so integrated into college life that it is essentially normative, as much a part of the college experience as attending a weekend football or basketball game. Alcohol, not cocaine, heroin, or marijuana, is the BDOC—big drug on campus (Johnston et al., 2004). Yet drinking often begins before young people reach college age. About 1 in 5 eighth-graders report having had a drink within the past month, along with more than 1 in 3 tenth graders and about half of twelfth graders (The Center on Alcohol Marketing and Youth, 2005).

Drinking among college students tends to be limited to weekends and to be heavier early in the semester when academic requirements are relatively light (Del Boca et al., 2004). As a group, young adults in the 18- to 24-year age range show the highest rates of alcohol use and the highest proportions of problem drinking (Ham & Hope, 2003). College students drink more than their peers who do not attend college (Slutske, 2005). Researchers describe a continuum of alcohol-related problems among college students, ranging from mild problems, such as missing class, to extreme problem behaviors, such as arrests resulting from drinking (Ham & Hope, 2003). In the *A Closer Look* section, we focus on a particular form of problem drinking that has become a leading problem on college campuses today—binge drinking.

Risk Factors for Alcoholism A number of factors place people at increased risk for developing alcoholism and alcohol-related problems. These include the following:

- Gender.** Men are more than twice as likely as women to develop alcoholism (Hasin et al., 2007). One possible reason for this gender difference is sociocultural; perhaps tighter cultural constraints are placed on women. Yet it may also be that alcohol hits women harder, and not only because women usually weigh less than men. Alcohol seems to "go to women's heads" more rapidly than men's. This is apparently because women have less of an enzyme that metabolizes alcohol in the stomach than men do (Lieber, 1990). Ounce for ounce, women absorb more alcohol into their bloodstreams than do men. As a result, they are likely to become inebriated on less alcohol than men. Consequently, women's bodies may put the brakes on excessive drinking more quickly than men's.
- Age.** The great majority of cases of alcohol dependence develop in young adulthood, typically between the ages of 20 and 40. Although alcohol use disorders tend to develop somewhat later in women than in men, women who develop these problems experience similar health, social, and occupational problems by middle age as their male counterparts.
- Antisocial personality disorder.** Antisocial behavior in adolescence or adulthood increases the risk of later alcoholism. On the other hand, many people with alcoholism showed no antisocial tendencies in adolescence, and many antisocial adolescents do not abuse alcohol or other drugs as adults.
- Family history.** The best predictor of problem drinking in adulthood appears to be a family history of alcohol abuse. Family members who drink may act as models ("set a poor example"). Moreover, the biological relatives of people with alcohol dependence may also inherit a predisposition that makes them more likely to develop problems with alcohol.



Women and alcohol. Women are less likely to develop alcoholism, in part because of greater cultural constraints on excessive drinking by women, and perhaps because women absorb more pure alcohol into the bloodstream than men, making them more biologically sensitive to the effects of alcohol at the same level of intake as men.

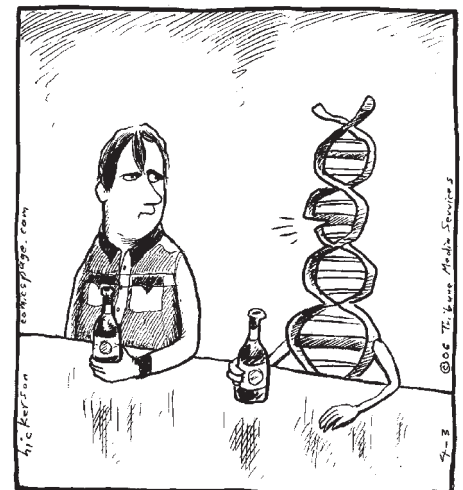
5. *Sociodemographic factors.* Alcohol dependence is generally more common among people of lower income and educational levels, as well as among people living alone (Anthony et al., 1994).

Ethnicity and Alcohol Use and Abuse Rates of alcohol use and alcoholism vary among American ethnic and racial groups. Some groups—Jews, Italians, Greeks, and Asian—have relatively low rates of alcoholism, largely as the result of tight social controls placed on excessive and underage drinking. Asian Americans, in general, drink less heavily than other population groups (Adelson, 2006; Wong, Klinge, & Price, 2004). Not only do Asian families place strong cultural constraints on excessive drinking, but an underlying biological factor may be at work in curbing alcohol use. Asian Americans are more likely than other groups to show a flushing response to alcohol. Flushing is characterized by redness and feelings of warmth on the face, and, at higher doses, nausea, heart palpitations, dizziness, and headaches. Genes that control the metabolism of alcohol are believed to be responsible for the flushing response (Luczak, Glatt, & Wall, 2006). Because people like to avoid these unpleasant experiences, flushing may serve as a natural defense against alcoholism by curbing excessive alcohol intake.

Hispanic American men and non-Hispanic White men have similar rates of alcohol consumption and alcohol-related physical problems. Hispanic American women, however, are much less likely to use alcohol and to develop alcohol use disorders than non-Hispanic White women. *Why?* An important factor may be cultural expectations. Traditional Hispanic American cultures place severe restrictions on the use of alcohol by women, especially heavy drinking. However, with increasing acculturation, Hispanic American women in the United States apparently are becoming more similar to Euro American women with respect to alcohol use and abuse.

Alcohol abuse is taking a heavy toll on African Americans. For example, the prevalence of *cirrhosis*, a degenerative, potentially fatal liver disease, is nearly twice as high in African Americans as in non-Hispanic White Americans. Yet African Americans are much less likely than non-Hispanic White Americans to develop alcohol abuse or dependence (Grant et al., 1994). Why, then, do African Americans suffer more from alcohol-related problems?

Socioeconomic factors may help explain these differences. African Americans are more likely to encounter the stresses of unemployment and economic hard-



"I'm the gene that causes alcoholism. I figured I'd cut out the middle man."



Alcohol and ethnic diversity. The damaging effects of alcohol abuse appear to be taking the heaviest toll on African Americans and Native Americans. The prevalence of alcohol-related cirrhosis of the liver is nearly twice as high among African Americans than among White Americans, even though African Americans are less likely to develop alcohol abuse or dependence disorders. Jewish Americans have relatively low incidences of alcohol-related problems, perhaps because they tend to expose children to the ritual use of wine in childhood and impose strong cultural restraints on excessive drinking. Asian Americans tend to drink less heavily than most other Americans, in part because of cultural constraints and possibly because they have less biological tolerance of alcohol, as shown by a greater flushing response to alcohol.

ship, and stress may compound the damage to the body caused by heavy alcohol consumption. African Americans also tend to lack access to medical services and may be less likely to receive early treatment for the medical problems caused by alcohol abuse.

Although rates of alcohol abuse and dependence vary from tribe to tribe, Native American overall have high rates of alcoholism and suffer more from alcohol-related problems than any other ethnic group—problems such as cirrhosis of the liver, fetal abnormalities, and automobile and other accident-related fatalities (Hasin et al., 2007; Hawkins et al., 2004; Mitchell et al., 2006).

Many Native Americans believe the loss of their traditional culture is largely responsible for their high rates of drinking-related problems (Beauvais, 1998). The disruption of traditional Native American culture caused by the appropriation of Indian lands and by attempts by European American society to sever Native Americans from their cultural traditions while denying them full access to the dominant culture resulted in severe cultural and social disorganization (Kahn, 1982). Beset by such problems, Native American adults are also prone to child abuse and neglect. Abuse and neglect contribute to feelings of hopelessness and depression among adolescents, who may seek escape from their feelings by using alcohol and other drugs.

Psychological Effects of Alcohol The effects of alcohol or other drugs vary from person to person. By and large they reflect the interaction of (a) the physiological effects of the substances, and (b) our interpretations of those effects. What do most people expect from alcohol? People frequently hold stereotypical expectations that alcohol will reduce tension, enhance pleasurable experiences, wash away worries, and enhance social skills. But what *does* alcohol actually do?

At a physiological level, alcohol appears to work like the benzodiazepines (a family of antianxiety drugs), by heightening activity of the neurotransmitter GABA (see Chapter 6). Because GABA is an inhibitory neurotransmitter (it tones down nervous system activity), increasing GABA activity produces feelings of

PREPARE YOURSELF
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ALCOHOLISM:

The Case of Chris

"Toughest thing I ever did was admitting I had a problem."





A CLOSER LOOK

Binge Drinking, a Dangerous College Pastime

A major problem receiving a great deal of attention on college campuses today is binge drinking. About 4 in 10 college students today report engaging in binge drinking (Ham & Hope, 2003)—drinking 5 or more drinks (for men) or 4 or more drinks (for women) on a single occasion.

Concerns about binge drinking are well placed. Binge drinking is linked to increased risks of serious motor vehicle and other accidents, violent and aggressive behavior, poor grades, sexual promiscuity, and development of substance abuse and dependence (Chassin et al., 2002; Naimi et al., 2003; Sink, 2004). Consider the tragic case of Leslie, a young college student at the University of Virginia. An art major whose work her professors found promising, Leslie had maintained a 3.67 GPA and was completing her senior essay on a Polish-born sculptor (Winerip, 1998). But she never finished it, because one day after binge drinking, she fell down a flight of stairs and died. We may hear more about the deaths of young people due to heroin or cocaine overdoses, but hundreds of college students, like Leslie, die from alcohol-related causes such as overdoses and accidents each year (Li et al., 2001).

In a recent review article, Lindsay Ham and Debra Hope (2003) identified two general subtypes of college students who appear most clearly at risk of becoming problem drinkers. The first type includes students who drink mostly for social or enjoyment purposes. They tend to be male, Anglo-American, and participate in Greek organizations or other social organizations in which heavy drinking is socially acceptable. The second type includes students who drink due to pressures to conform or who use alcohol to soothe negative feelings. They more often tend to be female and to be troubled by problems with anxiety or depression. Generating these profiles may help counselors and health-care providers identify young people at increased risk of developing problem drinking patterns.

Binge drinking and related drinking games (beer chugging) can place people at significant risk of death from alcohol overdose. Many students who play these games don't stop until they become too drunk or too sick to continue (Johnson, 2002). What should you do if you see a friend or acquaintance become incapacitated or pass out from heavy drinking? Should you just let the person sleep it off? Can you tell whether a person has had too much to drink? Should you just mind your own business or turn to others for help?

You cannot tell simply by looking at a person whether the person has overdosed on alcohol. But a person who becomes unconscious or unresponsive is in need of immediate medical attention. Don't assume that the person will simply "sleep it off": He or she may never wake up. Be aware of the signs of potential overdose, such as the following (adapted from Nevid & Rathus, 2007).

- Nonresponsive when talked to or shouted at
- Nonresponsive to being pinched, shaken, or poked

- Unable to stand up on his or her own
- Failure to wake up or gain consciousness
- Purplish color or clammy-feeling skin
- Rapid pulse rate or irregular heart rhythms, low blood pressure, or difficulty breathing.

If you suspect an overdose, do not leave the person alone. Summon medical help or emergency assistance and remain with the person until help arrives. If possible place the person on the side or have the person sit up with his or her head bowed. Do not give the person any food or drink or induce vomiting. If the person is responsive, find out if he or she had taken any medication or other drugs that might be interacting with the effects of the alcohol. Also, find out whether the person has an underlying illness that may contribute to the problem, such as diabetes or epilepsy.

It may be easier to just pass by without taking action. But ask yourself what you would like someone else to do if you showed signs of overdosing on alcohol. Wouldn't you want one of your friends to intervene to save your life?



A dangerous pastime. Beer chugging and binge drinking can quickly lead to an alcohol overdose, a medical emergency that can have lethal consequences. Many college officials cite binge drinking as *the* major drug problem on campus.

relaxation. As people drink, their senses become clouded, and balance and coordination suffer. Still higher doses act on the parts of the brain that regulate involuntary vital functions, such as heart rate, respiration rate, and body temperature.

People may do many things when drinking that they would not do when sober, in part because of expectations concerning the drug, in part because of the drug's effects on the brain. For example, they may become more flirtatious or sexually aggressive or say or do things they later regret. Their behavior may reflect their expectation that alcohol has liberating effects and provides an external excuse for questionable behavior. Later, they can claim, "It was the alcohol, not me." The drug may also impair the brain's ability to curb impulsive, risk-taking, or violent behavior, perhaps by interfering with information-processing functions. Investigators find strong links between alcohol use and violent behavior (Boles & Miottoa,

TRUTH or FICTION

It is safe to let someone who has passed out from drinking just "sleep it off."

✓ **FALSE.** Sadly, the person may never wake up. Passing out from drinking needs to be treated as a medical emergency.

2003), including domestic violence and sexual assaults (Abbey et al., 2004; Fals-Stewart, 2003; Marshal, 2003).

Although alcohol makes people feel more relaxed and self-confident, it also impairs judgment, which can lead them to make choices they would ordinarily reject, such as engaging in risky sex. Chronic alcohol abuse can impair cognitive abilities, such as memory, problem solving, and attention (Ratti et al., 2002).

One of the lures of alcohol is that it induces short-term feelings of euphoria and elation that can drown self-doubts and self-criticism. Alcohol also makes people less capable of perceiving the unfortunate consequences of their behavior.

Alcohol use can dampen sexual arousal or excitement and impair sexual performance. As an intoxicant, alcohol also hampers coordination and motor ability. These effects help explain why alcohol use is implicated in about one in three accidental deaths in the United States.

Physical Health and Alcohol Chronic, heavy alcohol use affects virtually every organ and body system, either directly or indirectly. Heavy alcohol use is linked to increased risk of many serious health concerns, including liver disease, increased risk of some forms of cancer, coronary heart disease, and neurological disorders. Two of the major forms of alcohol-related liver disease are *alcoholic hepatitis*, a serious and potentially life-threatening inflammation of the liver, and *cirrhosis of the liver*, a potentially fatal disease in which healthy liver cells are replaced with scar tissue.

Habitual drinkers tend to be malnourished, which can put them at risk of complications arising from nutritional deficiencies. Chronic drinking is thus associated with such nutritionally linked disorders as cirrhosis of the liver (linked to protein deficiency) and *alcohol-induced persisting amnesic disorder* (connected with vitamin B deficiency). This condition, also known as *Korsakoff's syndrome*, is characterized by glaring confusion, disorientation, and memory loss for recent events (see Chapter 15).

Mothers who drink during pregnancy place their fetuses at risk for infant mortality, birth defects, central nervous system dysfunctions, and later academic problems. Children whose mothers drink during pregnancy may develop *fetal alcohol syndrome* (FAS), a syndrome characterized by facial features such as a flattened nose, widely spaced eyes, and underdeveloped upper jaw, as well as mental retardation and social skills deficits (Carroll, 2003; O'Connor et al., 2006). FAS affects from 1 to 3 of every 1,000 live births.

We don't know whether a minimum amount of alcohol is needed to produce FAS. Although the risk is greater among women who drink heavily during pregnancy, FAS has been found among children of mothers who drank as little as a drink and a half per week (Carroll, 2003). Although the question of whether there is any safe dose of alcohol during pregnancy continues to be debated, the fact remains that FAS is an entirely preventable birth defect. The safest course for women who know or suspect they are pregnant is not to drink. *Period.*

Moderate Drinking: Is There a Health Benefit? Despite this list of adverse effects associated with heavy drinking, evidence shows that moderate use of alcohol (1 to 2 drinks per day for women, 2 to 4 drinks for men) is linked to lower risks of heart attacks and strokes, as well as lower death rates overall (Di Castelnuovo et al., 2006; Mukamal et al., 2003; Reynolds et al., 2003). Higher doses of alcohol are associated with higher mortality (death) rates. Researchers suspect that alcohol may help prevent the formation of blood clots that can clog arteries and lead to heart attacks. Alcohol also appears to increase the levels of HDL cholesterol, the so-called good cholesterol that sweeps away fatty deposits along artery walls (Goldberg et al., 2001). Although moderate use of alcohol may have a protective effect on the heart and circulatory system, public health officials have not endorsed using alcohol for this reason, based largely on concerns that such an endorsement may increase the risks of problem drinking. Health promotion efforts might be

better directed toward finding safer ways of achieving the health benefits associated with moderate drinking than by encouraging alcohol consumption, such as by quitting smoking, lowering dietary intake of fat and cholesterol, and exercising more regularly.

Barbiturates About 1% of adult Americans develop a substance abuse or dependence disorder involving the use of barbiturates, sleep medication (hypnotics), or antianxiety agents at some point in their lives. **Barbiturates** such as *amobarbital*, *pentobarbital*, *phenobarbital*, and *secobarbital* are depressants, or *sedatives*. These drugs have several medical uses, including easing anxiety and tension, dulling pain, and treating epilepsy and high blood pressure. Barbiturate use quickly leads to psychological dependence and physiological dependence in the form of both tolerance and development of a withdrawal syndrome.

Barbiturates are also popular street drugs because they are relaxing and produce a mild state of euphoria, or “high.” High doses of barbiturates, like alcohol, produce drowsiness, slurred speech, motor impairment, irritability, and poor judgment—a particularly deadly combination of effects when their use is combined with operation of a motor vehicle. The effects of barbiturates last from 3 to 6 hours.

Because of synergistic effects, a mixture of barbiturates and alcohol is about 4 times as powerful as either drug used by itself. A combination of barbiturates and alcohol is implicated in the deaths of the entertainers Marilyn Monroe and Judy Garland. Even such widely used antianxiety drugs as Valium and Librium, which have a wide margin of safety when used alone, can be dangerous and lead to overdoses when combined with alcohol (APA, 2000).

Physiologically dependent people need to be withdrawn carefully, and only under medical supervision, from sedatives, barbiturates, and antianxiety agents. Abrupt withdrawal can produce states of delirium that may involve visual, tactile, or auditory hallucinations and disturbances in thinking processes and consciousness. The longer the period of use and the higher the doses used, the greater the risk of severe withdrawal effects. Epileptic (grand mal) seizures and even death may occur if the individual undergoes untreated, abrupt withdrawal.

Opioids Opioids are classified as **narcotics**—addictive drugs that have pain-relieving and sleep-inducing properties. Opioids include both naturally occurring opiates (morphine, heroin, codeine) derived from the juice of the poppy plant and synthetic drugs (e.g., Demerol, Darvon) that have opiate-like effects. The ancient Sumerians named the poppy plant *opium*, meaning “plant of joy.”

Opioids produce a *rush*, or intense feelings of pleasure, which is the primary reason for their popularity as street drugs. They also dull awareness of one’s personal problems, which is attractive to people seeking a mental escape from stress. Their pleasurable effects derive from their ability to directly stimulate the brain’s pleasure circuits—the same brain networks responsible for feelings of sexual pleasure or pleasure from eating a satisfying meal (Begley, 2001b).

The major medical application of opioids—natural or synthetic—is the relief of pain, or *analgesia*. Medical use of opioids, however, is carefully regulated because overdoses can lead to coma and even death. Street use of opioids is associated with many fatal overdoses and accidents. In a number of American cities, young men are more likely to die of a heroin overdose than in an automobile accident (Alter, 2001).

About 3 million Americans have used heroin and nearly 1 million are believed to be addicted to the drug (Krantz & Mehler, 2004). Once dependence sets in, it usually becomes chronic, relieved by brief periods of abstinence (APA, 2000).

Adding to the problem is that prescription opioids too, used medically for pain relief, can become drugs of abuse when they are used illicitly as street drugs (Friedman, 2006). Recent estimates indicate that about 7% of college students have used the prescription opioid Vicodin without a prescription (Whitten, 2006). Among twelfth graders, about 5.5% report using another opioid, OxyContin, and 9.5% report taking

TRUTH or FICTION

Even moderate use of alcohol increases the risk of heart attacks.

FALSE. Findings from recent studies show that moderate intake of alcohol is associated with a lower risk of heart attacks and lower death rates.

barbiturates Sedative drugs which are depressants with high addictive potential.

narcotics Drugs that are used medically for pain relief but that have strong addictive potential.

Vicodin (MTF Survey, 2006). Eric, an 18-year-old living in San Francisco, explains how he is able to get Vicodin so easily, although he underestimates its risks:

“I can get prescription drugs from different places and don’t ever have to see a doctor. . . . I have friends whose parents are pill addicts, and we ‘borrow’ from them. Other times I have friends who have ailments who get lots of pills and sell them for cheap. As long as prescription pills are taken right, they’re much safer than street drugs.”

—Cited in Friedman, 2006, p. 1148

endorphins Natural substances that function as neurotransmitters in the brain and are similar in their effects to morphine.

Two discoveries made in the 1970s show that the brain produces chemicals of its own that have opiatelike effects. One was that neurons in the brain have receptor sites that opiates fit like a key in a lock. The second was that the human body produces its own opiatelike substances that dock at the same receptor sites as opiates do. These natural substances, or **endorphins**, play important roles in regulating natural states of pleasure and pain. Opioids mimic the actions of endorphins by docking at receptor sites intended for them, which in turn stimulates the brain centers that produce pleasurable sensations.

The withdrawal syndrome associated with opioids can be severe. It begins within 4 to 6 hours of the last dose. Flulike symptoms are accompanied by anxiety, feelings of restlessness, irritability, and cravings for the drug. Within a few days, symptoms progress to rapid pulse, high blood pressure, cramps, tremors, hot and cold flashes, fever, vomiting, insomnia, and diarrhea, among others. Although these symptoms can be uncomfortable, they are usually not devastating, especially when other drugs are prescribed to relieve them. Moreover, unlike withdrawal from barbiturates, the withdrawal syndrome rarely results in death.

morphine A strongly addictive narcotic derived from the opium poppy that relieves pain and induces feelings of well-being.

Morphine Morphine—which receives its name from Morpheus, the Greek god of dreams—was introduced at about the time of the U.S. Civil War. Morphine, a powerful opium derivative, was used liberally to deaden pain from wounds. Physiological dependence on morphine became known as the “soldier’s disease.” There was little stigma attached to dependence until morphine became a restricted substance.

heroin A narcotic derived from morphine that has strong addictive properties.

Heroin Heroin, the most widely used opiate, is a powerful depressant that can create a euphoric rush. Users of heroin claim that it is so pleasurable it can eradicate any thought of food or sex. Heroin was developed in 1875 during a search for a drug that would relieve pain as effectively as morphine, but without causing addiction. Chemist Heinrich Dreser transformed morphine into a drug believed to have “heroic” effects in relieving pain without addiction, which is why it was called *heroin*. Unfortunately, heroin does lead to physiological dependence.

Estimates are that some 3 million Americans have used heroin, which is the most widely used and abused opioid, and nearly 1 million are addicted (Krantz & Mehler, 2004). Heroin is usually injected either directly beneath the skin (skin popping) or into a vein (mainlining). The positive effects are immediate. There is a powerful rush that lasts from 5 to 15 minutes and a state of satisfaction, euphoria, and well-being that lasts from 3 to 5 hours. In this state, all positive drives seem satisfied. All negative feelings of guilt, tension, and anxiety disappear. With prolonged usage, addiction can develop. Many physiologically dependent people support their habits through dealing (selling heroin), prostitution, or selling stolen goods. Heroin is a depressant, however, and its chemical effects do not directly stimulate criminal or aggressive behavior.



Shooting up. Heroin users often inject the substance directly into their veins. Heroin is a powerful depressant that provides a euphoric rush. Users often claim that heroin is so pleasurable that it obliterates any thought of food or sex.

Stimulants

Stimulants are psychoactive substances that increase the activity of the central nervous system, which enhances states of alertness and can produce feelings of pleasure or even euphoric highs. The effects vary with the particular drug.

Amphetamines The **amphetamines** are a class of synthetic stimulants. Street names for stimulants include speed, uppers, bennies (for *amphetamine sulfate*; trade name Benzedrine), “meth” (for *methamphetamine*; trade name Methedrine), and dexies (for *dextroamphetamine*; trade name Dexedrine).

Amphetamines are used in high doses for their euphoric rush. They are often taken in pill form or smoked in a relatively pure form called “ice” or “crystal meth.” The most potent form of amphetamine, liquid methamphetamine, is injected directly into the veins and produces an intense and immediate rush. Some users inject methamphetamine for days on end to maintain an extended high. Eventually such highs come to an end. People who have been on extended highs sometimes “crash” and fall into a deep sleep or depression. Some people commit suicide on the way down. High doses can cause restlessness, irritability, hallucinations, paranoid delusions, loss of appetite, and insomnia.

Almost 3 times as many people have used “meth” as have used heroin (Bonné, 2001). About 5% of Americans age 12 or older report using “meth” and about 0.2% (2 in a thousand) report current (past-month) use (SAMHSA, 2006). This amounts to more than 12 million Americans who have used “meth” at some point in their lives (Jefferson, 2005). Physiological dependence can develop from using amphetamines, leading to an abstinence syndrome characterized by depression and fatigue, as well as by unpleasant, vivid dreams, insomnia or hypersomnia (excessive sleeping), increased appetite, and either a slowing down of motor behavior or agitation (APA, 2000). Psychological dependence is seen most often in people who use amphetamines as a way of coping with stress or depression.

Methamphetamine abuse can cause brain damage, producing deficits in learning and memory in addition to other effects (Thompson et al., 2004; Toomey et al., 2003; Volkow et al., 2001). Violent behavior may also occur, especially when the drug is smoked or injected intravenously. The hallucinations and delusions of **amphetamine psychosis** mimic those of paranoid schizophrenia, which has encouraged researchers to study the chemical changes induced by amphetamines as possible clues to the underlying causes of schizophrenia.

Ecstasy The drug *ecstasy*, or MDMA (3,4-methylenedioxymethamphetamine) is a designer drug, a chemical knockoff similar in chemical structure to amphetamine. It produces mild euphoria and hallucinations and has become especially popular on college campuses and in clubs and “raves” in many cities (Hernandez, 2000; Strote & Wechsler, 2002). On the other hand, teen use of ecstasy dropped significantly in the early years of the new millennium (“Fewer Teens,” 2004). Perhaps the message about the dangers of ecstasy are beginning to get across to young people.

Ecstasy can produce adverse psychological effects, including depression, anxiety, insomnia, and even paranoia and psychosis. The drug may also impair cognitive functioning, including learning ability and attention, and may have long-lasting effects on memory (Reneman, et al., 2001). Scientists suspect that the drug may kill dopamine-using neurons in the brain, which can have long-lasting effects on the ability to experience pleasure in everyday life experiences (Ricaurte et al., 2002). Physical side effects include higher heart rate and blood pressure, a tense or chattering jaw, and body warmth and/or chills (Braun, 2001). The drug can be lethal when taken in high doses. Despite its risks, many users—including most teens—believe (mistakenly) that it is relatively safe (“Teens See Little Risk,” 2003).

Cocaine It might surprise you to learn that the original formula for Coca-Cola contained an extract of **cocaine**. In 1906, however, the company withdrew cocaine

stimulants Psychoactive substances that increase the activity of the nervous system.

amphetamines A class of stimulants that activate the central nervous system, producing heightened states of arousal and feelings of pleasure.

amphetamine psychosis A psychotic state induced by ingestion of amphetamines.

cocaine A stimulant derived from the leaves of the coca plant.



Ecstasy. Recreational use of the drug ecstasy has become popular in many clubs catering to young people. Yet even occasional use of the drug may affect cognitive functioning, such as learning, memory, and attention. High doses can be lethal.

TRUTH or FICTION

Coca-Cola originally contained cocaine.

✓ **TRUE.** The original formula for Coca-Cola contained an extract of cocaine.

crack The hardened, smokable form of cocaine.

from its secret formula. The drink was originally described as a “brain tonic and intellectual beverage,” in part because of its cocaine content. Cocaine is a natural stimulant extracted from the leaves of the coca plant—the plant from which the soft drink obtained its name. Coca-Cola is still flavored with an extract from the coca plant, one that is not known to be psychoactive.

It was long believed that cocaine was not physically addicting. However, the drug produces a tolerance effect and an identifiable withdrawal syndrome, which is characterized by depressed mood and disturbances in sleep and appetite (APA, 2000). Intense cravings for the drug and loss of ability to experience pleasure may also be present. Withdrawal symptoms are usually brief in duration and may involve a “crash,” or period of intense depression and exhaustion, following abrupt withdrawal.

Cocaine is usually snorted in powder form or smoked in the form of **crack**, a hardened form of cocaine that may be more than 75% pure. Crack “rocks”—so called because they look like small white pebbles—are available in small ready-to-smoke amounts and considered to be the most habit-forming street drug available. Crack produces a prompt and potent rush that wears off in a few minutes. The rush from snorting powdered cocaine is milder and takes a while to develop, but it tends to linger longer than the rush of crack.

Freebasing also intensifies the effects of cocaine. In freebasing, cocaine in powder form is heated with ether, freeing the psychoactive chemical base of the drug, and then smoked. Ether, however, is highly flammable.

Next to marijuana, cocaine is the most widely used illicit drug in the United States. Nearly 14% of Americans age 12 and older have used cocaine and about 0.8% are current (past-month) users (SAMHSA, 2006).

Effects of Cocaine Like heroin, cocaine directly stimulates the brain’s reward or pleasure circuits. It also produces a sudden rise in blood pressure and an accelerated heart rate that can cause potentially dangerous, even fatal, irregular heart rhythms. Overdoses can produce restlessness, insomnia, headaches, nausea, convulsions, tremors, hallucinations, delusions, and even sudden death due to respiratory or cardiovascular collapse. Regular snorting of cocaine can lead to serious nasal problems, including ulcers in the nostrils.

Repeated use and high-dose use of cocaine can lead to depression and anxiety. Depression may be severe enough to prompt suicidal behavior. Both initial and routine users report episodes of “crashing” (feelings of depression after a binge), although crashing is more common among long-term high-dose users. Psychotic behaviors, which can be induced by cocaine use as well as by use of amphetamines, tend to become more severe with continued use. Cocaine psychosis is usually preceded by a period of heightened suspiciousness, depressed mood, compulsive behavior, faultfinding, irritability, and increasing paranoia. The psychosis may also include intense visual and auditory hallucinations and delusions of persecution.

Nicotine Habitual smoking is not merely a bad habit: It is also a physical addiction to a stimulant drug, nicotine, found in tobacco products including cigarettes, cigars, and smokeless tobacco (American Cancer Society, 2004). Smoking is also deadly, claiming more than 400,000 lives in the United States alone, most from lung cancer and other lung diseases, as well as cardiovascular (heart and artery) disease (Teo et al., 2006; Zickler, 2004). Smoking doubles the risk of dying in midlife (prior to age 70) (Doll et al., 2004; Vollset, Tverdal, & Gjessing, 2006). Figure 9.2 shows the percentages of deaths due to smoking associated with several of the leading causes of death.

The World Health Organization estimates that 1 billion people worldwide smoke and more than 3 million die each year from smoking-related causes. The good news is that the percentage of Americans who smoke declined from 42% in 1966 to about 21% today (CDC, 2005; TIPS, 2005). The bad news is that 21% of Americans still smoke and that rates of teenage smoking are on the rise, portending increased rates of adult smoking and premature deaths in the years ahead.

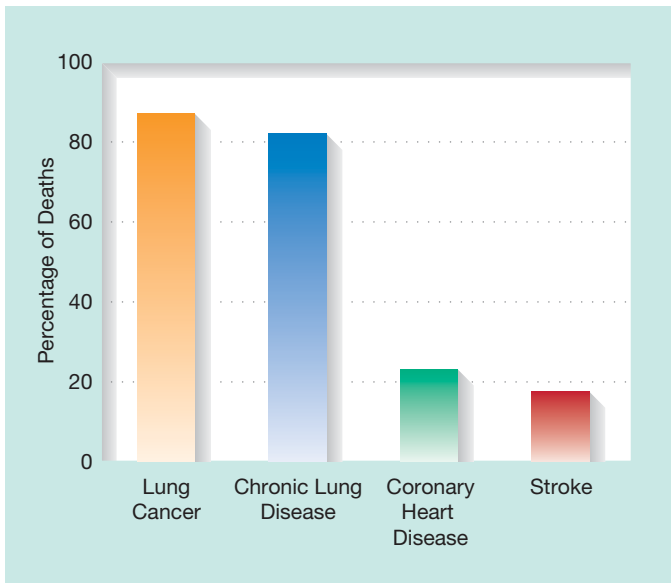


FIGURE 9.2 Smoking-related causes of death, by type of disease.

Cigarette smoking accounts for nearly 90% of deaths due to lung cancer, about 80% of deaths due to chronic lung diseases, especially emphysema, and about 20% of deaths due to coronary heart disease and stroke.

Sources: U.S. Department of Health and Human Services. Reducing the Health Consequences of Smoking: 25 Years of Progress. A Report of the Surgeon General. Public Health Service, Centers for Disease Control, DHHS Publication No. (CDC) 89-8411, 1989; and Smoking. American Lung Association of Texas. <http://www.texaslung.org>, updated May 2004.

It may surprise you to learn that more women die of lung cancer than any other type of cancer, including breast cancer (Springen, 2004). Although quitting smoking clearly has health benefits for women and men, it unfortunately does not reduce the risks to normal (nonsmoking) levels. The lesson is clear: If you don't smoke, don't start; if you do smoke, quit.

Ethnic differences in smoking rates are shown in Figure 9.3. With the exception of Native Americans (American Indian/Alaskan Native), women in each ethnic group are less likely to smoke than their male counterparts. Smoking is also becoming increasingly concentrated among people at lower income and educational levels.

TRUTH or FICTION

Breast cancer is the leading cause of cancer deaths among U.S. women.

FALSE. Lung cancer has surpassed breast cancer as the leading cancer killer among women. It is also the leading cancer killer among men. Cigarette smoking is the culprit in the great majority of cases.

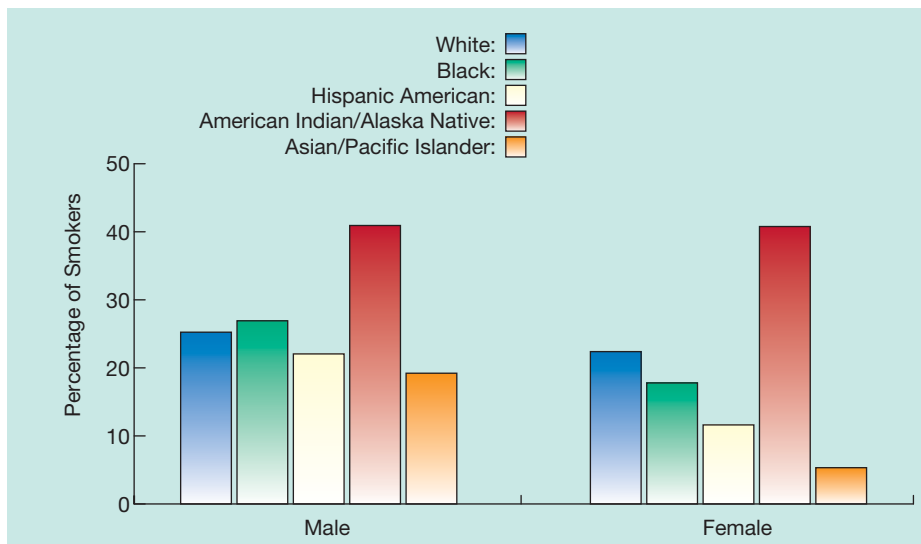


FIGURE 9.3 Ethnic and gender differences in rates of cigarette smoking among U.S. adults.

Smoking rates are higher among Native Americans (American Indian and Alaska Native) than other major racial/ethnic groups in the United States. Women in each ethnic group (with the exception of Native Americans) are less likely to smoke than their male counterparts.

Source: Cigarette Smoking Among Adults—United States, 2004. *Morbidity and mortality weekly report*, 54 (November 11, 2005).

Nicotine is delivered to the body through the use of tobacco products. As a stimulant it increases alertness but can also give rise to cold, clammy skin, nausea and vomiting, dizziness and faintness, and diarrhea—all of which account for the discomforts of novice smokers. Nicotine also stimulates the release of epinephrine, a hormone that generates a rush of autonomic nervous system activity, including rapid heartbeat and release of stores of sugar into the blood. Nicotine quells the appetite and provides a psychological “kick.” Nicotine also leads to the release of endorphins, the opiate-like hormones produced in the brain. This may account for the pleasurable feelings associated with tobacco use.

Habitual use of nicotine leads to physiological dependence on the drug. Nicotine dependence is associated with both tolerance (intake rises to a level of a pack or two a day before leveling off) and a characteristic withdrawal syndrome. The withdrawal syndrome for nicotine includes such features as lack of energy, depressed mood, irritability, frustration, nervousness, impaired concentration, lightheadedness and dizziness, drowsiness, headaches, fatigue, irregular bowels, insomnia, cramps, lowered heart rate, heart palpitations, increased appetite, weight gain, sweating, tremors, and craving for cigarettes (APA, 2000). It is nicotine dependence, not cigarette smoking per se, that is classifiable as a mental disorder in the *DSM* system. The great majority of regular smokers (80% to 90%) meet diagnostic criteria for nicotine dependence (APA, 2000).

Hallucinogens

hallucinogens Substances that cause hallucinations.

Hallucinogens, also known as *psychedelics*, are a class of drugs that produce sensory distortions or hallucinations, including major alterations in color perception and hearing. Hallucinogens may also have additional effects, such as relaxation and euphoria or, in some cases, panic.

Hallucinogens include lysergic acid diethylamide (LSD), psilocybin, and mescaline. Psychoactive substances that are similar in effect to psychedelic drugs are marijuana (*cannabis*) and *phencyclidine* (PCP). Mescaline is derived from the peyote cactus and has been used for centuries by Native Americans in the Southwest, Mexico, and Central America in religious ceremonies, as has psilocybin, which is derived from certain mushrooms. LSD, PCP, and marijuana are the most commonly used hallucinogens in the United States.

Although tolerance to hallucinogens may develop, we lack evidence of a consistent or clinically significant withdrawal syndrome associated with their use (APA, 2000). However, cravings following withdrawal may occur.

LSD LSD is the acronym for *lysergic acid diethylamide*, a synthetic hallucinogenic drug. In addition to the vivid parade of colors and visual distortions produced by LSD, users have claimed it “expands consciousness” and opens new worlds—as if they were looking into some reality beyond the usual reality. Sometimes they believe they have achieved great insights during the LSD “trip,” but when it wears off they usually cannot follow through or even summon up these discoveries.

The effects of LSD are unpredictable and depend on the amount taken as well as the user’s expectations, personality, mood, and surroundings. The user’s prior experiences with the drug may also play a role, as users who have learned to handle the effects of the drug through past experience may be better prepared than new users.

Some users have unpleasant experiences with the drug, or “bad trips.” Feelings of intense fear or panic may occur. Users may fear losing control or sanity. Some experience terrifying fears of death. Fatal accidents have sometimes occurred during LSD trips. *Flashbacks*, typically involving a reexperiencing of some of the perceptual distortions of the “trip,” may occur days, weeks, or even years afterward. Flashbacks tend to occur suddenly and often without warning. Perceptual distortions may involve geometric forms, flashes of color, intensified colors, afterimages, or appearances of halos around objects, among others (APA, 2000). They may stem from chemical changes in

the brain caused by the prior use of the drug. Triggers for flashbacks include entry into darkened environments, drug use, anxiety or fatigue states, or stress. Psychological factors, such as underlying personality problems, may also explain why some users experience flashbacks. In some cases, a flashback may involve an imagined reenactment of the LSD experience.

Phencyclidine (PCP) *Phencyclidine*, or PCP—which is referred to as “angel dust” on the streets—was developed as an anesthetic in the 1950s but was discontinued as such when its hallucinatory side effects were discovered. A smokable form of PCP became popular as a street drug in the 1970s. However, its popularity has since waned, largely because of its unpredictable effects.

The effects of PCP, like most drugs, are dose related. In addition to causing hallucinations, PCP accelerates the heart rate and blood pressure and causes sweating, flushing, and numbness. PCP is classified as a *deliriant*—a drug capable of producing states of delirium. It also has dissociating effects, causing users to feel as if there is some sort of invisible barrier between themselves and their environments. Dissociation can be experienced as pleasant, engrossing, or frightening, depending on the user’s expectations, mood, setting, and so on. Overdoses can give rise to drowsiness and a blank stare, convulsions, and, now and then, coma; paranoia and aggressive behavior; and tragic accidents resulting from perceptual distortion or impaired judgment during states of intoxication.

Marijuana *Marijuana* is derived from the *Cannabis sativa* plant. Marijuana is generally classified as a hallucinogen because it can produce perceptual distortions or mild hallucinations, especially in high doses or when used by susceptible individuals. The psychoactive substance in marijuana is *delta-9-tetrahydrocannabinol*, or, thankfully, THC for short. THC is found in branches and leaves of the plant but is highly concentrated in the resin of the female plant. *Hashish*, or “hash,” also derived from the resin, is more potent than marijuana but has similar effects.

Use of marijuana exploded throughout the so-called swinging 1960s and the 1970s, but the drug then lost some (but not all) of its cachet. Still, marijuana remains our most widely used illegal drug, and abuse of marijuana is the most common of all the substance abuse disorders involving illicit drugs (Compton et al., 2004). That said, the prevalence of use and abuse of marijuana doesn’t compare with that of alcohol.

About 40% of Americans 12 years of age and older report having used marijuana or hashish in their lives, and about 6% are current (past-month) users (SAMHSA, 2006). About 1.5% of the U.S. adult population suffers from a marijuana abuse or dependence disorder (Compton et al., 2004). Males are more likely than females to develop a marijuana abuse or dependence disorder, and rates of these disorders are greatest among people age 18 to 30 (APA, 2000).

Low doses of the drug can produce relaxing feelings similar to drinking alcohol. Some users report that at low doses the drug makes them feel more comfortable in social gatherings. Higher doses, however, often lead users to withdraw into themselves. Some users believe the drug increases their capacity for self-insight or creative thinking, although the insights achieved under its influence may not seem so insightful once the drug’s effects have passed. People may turn to marijuana, as to other drugs, to help them cope with life problems or to help them function when they are under stress. Strongly intoxicated people perceive time as passing more slowly. A song of a few minutes may seem to last an hour. There is increased awareness of bodily sensations, such as heartbeat. Smokers also report that strong intoxication heightens sexual sensations. Visual hallucinations may occur.

Strong intoxication can cause smokers to become disoriented. If their moods are euphoric, disorientation may be construed as harmony with the universe. Yet some smokers find strong intoxication disturbing. An accelerated heart rate and sharpened awareness of bodily sensations cause some smokers to fear their hearts will “run away” with them. Some smokers are frightened by disorientation and fear they will not “come back.” High levels of intoxication now and then induce nausea and vomiting.

marijuana A hallucinogenic drug derived from the leaves and stems of the plant *Cannabis sativa*.

Cannabis dependence is associated more with patterns of compulsive use or psychological dependence than with physiological dependence. Although tolerance to many of the drug's effects may occur with chronic use, some users report reverse tolerance, or *sensitization*. Although a clear-cut withdrawal syndrome has not been reliably demonstrated, recent evidence identified a definable withdrawal syndrome among long-term, heavy users who stopped using the drug abruptly (Budney et al., 2004). We have also learned that long-term use can lead to problems with both learning and memory (Messinis et al., 2006; Solowij et al., 2002).

Evidence also links marijuana use to later use of harder drugs such as heroin and cocaine (Kandel, 2002, 2003). Whether marijuana use is a causal factor leading to use of harder drugs remains unclear. We do know that marijuana impairs perception and motor coordination and thus makes driving and the operation of other heavy machinery dangerous. Although marijuana use induces positive mood changes in many users, some people report anxiety and confusion; there are also occasional reports of paranoia or psychotic reactions (Johns, 2001). Marijuana elevates heart rate and blood pressure and is linked to an increased risk of heart attacks in people with heart disease. And like cigarettes, smoking marijuana can cause respiratory diseases, including chronic bronchitis (Zickler, 2006).

THEORETICAL PERSPECTIVES

People begin using psychoactive substances for various reasons. Some adolescents start using drugs because of peer pressure or because they believe drugs make them seem more sophisticated or grown up. Some use drugs as a way of rebelling against their parents or society at large. Regardless of why people get started with drugs, they continue to use them because drugs produce pleasurable effects or because they find it difficult to stop. Most adolescents drink alcohol to “get high,” not to establish that they are adults. Many people smoke cigarettes for the pleasure they provide. Others smoke to help them relax when they are tense and, paradoxically, to give them a kick or a lift when they are tired. Many would like to quit but find it difficult to break their addiction.

People who are anxious about their jobs or social lives may be drawn to the calming effects of alcohol, marijuana (in certain doses), tranquilizers, and sedatives. People with low self-confidence and self-esteem may be drawn to the ego-bolstering effects of amphetamines and cocaine. Many poor young people attempt to escape the poverty, anguish, and tedium of inner-city life through using heroin and similar drugs. More well-to-do adolescents may rely on drugs to manage the transition from dependence to independence and major life changes concerning jobs, college, and lifestyles.

In the next sections we consider several major theoretical perspectives on substance abuse and dependence.

Biological Perspectives

We are beginning to learn more about the biological underpinnings of drug use and addiction. Much of the recent research has focused on neurotransmitters, especially dopamine, and on the role of genetic factors.

Neurotransmitters Many psychoactive drugs, including nicotine, alcohol, heroin, marijuana, and especially cocaine and amphetamines, increase levels of the neurotransmitter dopamine in the brain's pleasure or reward circuits—the networks of neurons responsible for producing feelings of pleasure or states of euphoria (Nestler, 2005; Pierce & Kumaresan, 2006; Society for Neuroscience, 2005c; Volkow et al., 2005; Zangen et al., 2006). Over time, regular use of these drugs reduces the brain's own production of dopamine. Consequently, the brain's natural reward system—the “feel good” circuitry that produces states of pleasure associated with the ordinarily rewarding activities of life, such as consuming a satisfying meal and engaging in pleasant activities—becomes blunted (Dubovsky, 2006). In effect, the addict's brain comes to depend on having the drug available to produce feelings of pleasure or satisfaction (Denizet-Lewis, 2006). Without drugs, life may not seem to be worth living.

PRENTICE HALL
mypsych lab

SUBSTANCE ABUSE:

Therapist Jean
Obert

“Being addicted to heroin is one of the most difficult things to kick.”



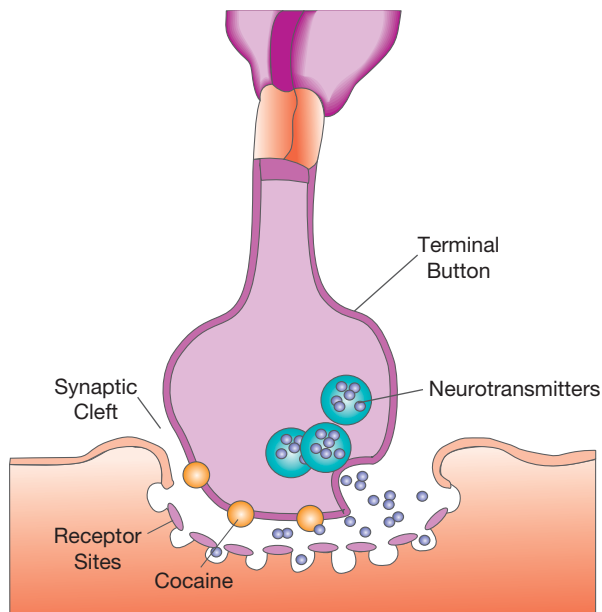


FIGURE 9.4 Cocaine's effects in the brain. Neurotransmitters are released into the synapse (synaptic cleft or gap) from terminal buttons at the end of axons. Normally, excess molecules of neurotransmitters are reabsorbed by the terminal buttons of the transmitting neuron in a process called *reuptake*. Cocaine, as represented here by the orange circles, blocks this process of reuptake, allowing more neurotransmitter molecules to remain in the synapse, which creates a euphoric high by overstimulating receiving neurons in brain networks regulating feelings of pleasure.

Changes in the dopamine system may help explain the intense cravings and anxiety that accompany drug withdrawal and the difficulty people have maintaining abstinence. Although investigators highlight the role of dopamine in helping us understand the biochemical bases of substance abuse and dependence, they recognize that other neurotransmitters, including serotonin and endorphins, also play a role (Addolorato et al., 2005; Buchert et al., 2004).

Figure 9.4 shows the effects of cocaine in the brain. Use of the drug increases the availability of neurotransmitters norepinephrine and dopamine by interfering with the process by which excess molecules of these chemicals are reabsorbed by the transmitting neuron through a process called *reuptake*. High levels of these neurotransmitters therefore remain active in the synaptic gaps between neurons within brain networks that control feelings of pleasure, thereby magnifying and extending feelings the pleasurable effects of the drug (see Figure 9.4).

Endorphins are a class of neurotransmitters that have pain-blocking properties similar to those of opioids such as heroin. Endorphins and opiates dock at the same receptor sites in the brain. Normally, the brain produces a certain level of endorphins that maintains a psychological steady state of comfort and potential to experience pleasure. However, when the body becomes habituated to a supply of opioids, it may stop producing endorphins. This makes the user dependent on opiates for comfort, relief from pain, and pleasure. When the habitual user stops using heroin or other opiates, feelings of discomfort and little aches and pains may be magnified until the body resumes adequate production of endorphins. This discomfort may account, at least in part, for the unpleasant withdrawal symptoms that opiate addicts experience. However, this model remains speculative, and more research is needed to document direct relationships between endorphin production and withdrawal symptoms.

Genetic Factors Evidence links genetic factors to various forms of substance use and abuse, including alcohol abuse and dependence, heroin dependence, and even cigarette smoking (nicotine dependence) (Feng et al., 2004; Hampton, 2006; Liu et al., 2004; Xu et al., 2004). Investigators have begun the hunt for specific genes involved in alcohol and drug abuse and dependence (e.g., Audrain-McGovern et al., 2004; Drakenberg et al., 2006). We focus on alcohol dependence, because this has been the area of greatest research interest.

Alcoholism tends to run in families (APA, 2000). The closer the genetic relationship, the greater the risk. Familial patterns provide only suggestive evidence of genetic factors, because families share a common environment as well as common genes. More definitive evidence comes from twin and adoptee studies.

Monozygotic (MZ) twins have identical genes, whereas fraternal or dizygotic (DZ) twins share only half of their genes. If genetic factors are involved, we would expect MZ twins to have higher concordance (agreement) rates for alcoholism than DZ twins. Evidence of higher concordance rates for alcoholism is found among MZ twins than DZ twins, although the results are more consistent for male samples than female samples (Wood et al., 2001).

A limitation of twin studies is that MZ twins may share more environmental as well as genetic similarity than DZ twins. That is, they may be treated more alike than DZ twins. However, evidence also shows that male adoptees whose biological parents suffered from alcoholism have an increased risk of developing alcoholism themselves, even if they are raised in nondrinking homes (Gordis, 1995). Among women, however, the rate of alcoholism in adopted-away daughters of parents with alcoholism is only slightly higher than that for adopted-away daughters of nonalcoholics, thus casting doubt on a strong genetic linkage to alcoholism in women (Svikis, Velez, & Pickens, 1994). All in all, genetic factors are believed to play a moderate role in male alcoholism and a modest role in female alcoholism (McGue, 1993).

If alcoholism or other forms of substance abuse and dependence are influenced by genetic factors, what exactly is inherited? Some clues are emerging (Corbett et al., 2005; Edenberg et al., 2005; Radel et al., 2005). Alcoholism, nicotine dependence, and opioid addiction are linked to genes that determine the structure of dopamine receptors in the brain. As we've noted, dopamine is involved in regulating states of pleasure, so one possibility is that genetic factors enhance feelings of pleasure derived from alcohol. The genetic vulnerability to alcoholism most probably involves a combination of factors, such as reaping greater pleasure from alcohol and a capacity for greater biological tolerance for the drug. People who can tolerate larger doses of alcohol without incurring upset stomachs, dizziness, and headaches may have difficulty knowing when to stop drinking. Thus people who are better able to "hold their liquor" may thus be at greater risk of developing drinking problems. They may need to rely on other cues, such as counting their drinks, to limit their drinking. Other people whose bodies more readily "put the brakes" on excess drinking may be less likely to develop problems in moderating their drinking.

Whatever the role of heredity in alcohol dependence and other forms of substance dependence, genes do not dictate behavior; they interact with environmental factors (Kendler, Jacobson et al., 2003). For example, being raised in an environment free of parental alcoholism is associated with a lower risk of alcohol-related disorders in people at high genetic risk of these disorders (Jacob et al., 2003). In sum, addiction experts believe that multiple genes acting together with social, cultural, and psychological factors contribute to the development of alcoholism and other forms of substance dependence (e.g., Dick et al., 2001).

TRUTH or FICTION

People who can "hold their liquor" better than most stand a lower risk of becoming problem drinkers.

FALSE. A high physical tolerance for liquor may lead a person to drink excessively, which may set the stage for problem drinking.

Learning Perspectives

Learning theorists propose that substance-related behaviors are largely learned and can, in principle, be unlearned. They focus on the roles of operant and classical conditioning and observational learning. Substance abuse problems are not regarded as symptoms of disease but rather as problem habits. Although learning theorists do not deny that genetic or biological factors may increase susceptibility to substance abuse problems, but they emphasize the role of learning in the development and maintenance of these problem behaviors (McCrary, 1993, 1994). They also recognize that people who suffer from depression or anxiety may turn to alcohol as a way of relieving these troubling emotional states, however briefly. Evidence shows that emotional stress, such as anxiety or depression, often sets the stage for the development of substance abuse (Dixit & Crum, 2000; McGue, Slutske, & Iacono, 1999).

Drug use may become habitual because of the pleasure (positive reinforcement) or temporary relief (negative reinforcement) from negative emotions, such as anxiety and depression, which drugs can produce. With drugs like cocaine, which appear capable of directly stimulating pleasure mechanisms in the brain, the positive reinforcement is direct and powerful.

Operant Conditioning People may initially use a drug because of social influence, trial and error, or social observation. In the case of alcohol, they learn that the drug can produce reinforcing effects, such as feelings of euphoria, and reductions in anxiety and tension. Alcohol may also reduce behavioral inhibitions. Alcohol can thus be reinforcing when it is used to combat depression (by producing euphoric feelings, even if short lived), to combat tension (by functioning as a tranquilizer), or to help people sidestep moral conflicts (for example, by dulling awareness of moral prohibitions). Substance abuse may also provide social reinforcers, such as the approval of drug-abusing companions and, in the cases of alcohol and stimulants, the (temporary) overcoming of social shyness.

Alcohol and Tension Reduction Learning theorists have long maintained that one of the primary reinforcers for using alcohol is relief from states of tension or unpleasant states of arousal. According to the *tension-reduction theory*, the more often one drinks to reduce tension or anxiety, the stronger or more habitual the habit becomes. We can think of some uses of alcohol and other drugs as forms of *self-medication*—as a means of using the pill or the bottle to ease psychological pain, at least temporarily (Bolton et al., 2006; Tomlinson et al., 2006). We can see this pattern of negative reinforcement (relief from psychological pain) in the following case example.

“Taking Away the Hurt I Feel”

“I use them (the pills and alcohol) to take away the hurt I feel inside.” Joceyln, a 36-year-old mother of two, was physically abused by her husband, Phil. “I have no self-esteem. I just don’t feel I can do anything,” she told her therapist. Joceyln had escaped from an abusive family background by getting married at age 17, hoping that marriage would offer her a better life. The first few years were free of abuse, but things changed when Phil lost his job and began to drink heavily. By then, Jocelynn had two young children and felt trapped. She blamed herself for her unhappy family life, for Phil’s drinking, for her son’s learning disability. “The only thing I can do is drink or do pills. At least then I don’t have to think about things for awhile.” Although drug use temporarily dulled her emotional pain, it came with a greater long-term cost in terms of the burden of addiction.

—From the Author’s Files

Although nicotine, alcohol, and other drugs may temporarily alleviate emotional distress, they cannot resolve underlying personal or emotional problems. Rather than learning to resolve these problems, people who turn to alcohol or other drugs as forms of self-medication often find themselves facing additional substance-related problems.



Self-medication? People who turn to other drugs or alcohol to quell disturbing emotions can compound their problems by developing a substance use disorder.

Negative Reinforcement and Withdrawal Once people become physiologically dependent, negative reinforcement comes into play in maintaining the drug habit. In other words, people may resume using drugs to gain relief from unpleasant withdrawal symptoms. In operant conditioning terms, relief from unpleasant withdrawal symptoms is a negative reinforcer for resuming drug use (Higgins, Heil, & Lussier, 2004). For example, the addicted smoker who quits cold turkey may shortly return to smoking to fend off the discomfort of withdrawal.

The Conditioning Model of Cravings Classical conditioning may help explain drug cravings. In this view, cravings reflect the body's need to restore high blood levels of the addictive substance and thus have a biological basis. But they also come to be associated with environmental cues associated with prior use of the substance (Kilts et al., 2004). These cues, such as the sight or aroma of an alcoholic beverage or the sight of a needle and syringe, become conditioned stimuli that elicit a conditioned response: strong cravings for the drug. For example, socializing with certain companions (“drinking buddies”) or even passing a liquor store may elicit conditioned cravings for alcohol. In support of this theory, alcoholic subjects show distinctive changes in brain activity in areas of the brain that regulate emotion, attention, and appetitive behavior when shown pictures of alcoholic beverages (George et al., 2001). Social drinkers, by comparison, do not show this pattern of brain activation.

Sensations of anxiety or depression that are paired with the use of alcohol or drugs may also elicit cravings. The following case illustrates conditioned cravings to environmental cues.

A Case of Conditioned Drug Cravings

A 29-year-old man was hospitalized for the treatment of heroin addiction. After 4 weeks of treatment, he returned to his former job, which required him to ride the subway past the stop at which he had previously bought his drugs. Each day, when the subway doors opened at this location, [he] experienced enormous craving for heroin, accompanied by tearing, a runny nose, abdominal cramps, and gooseflesh. After the doors closed, his symptoms disappeared, and he went on to work.

—From Weiss & Mirin, 1987, p. 71

Similarly, some people are primarily “stimulus smokers.” They reach for a cigarette in the presence of smoking-related stimuli, such as seeing someone smoke or smelling smoke. Smoking becomes a strongly conditioned habit because it is paired repeatedly with many situational cues—watching TV, finishing dinner, driving in the car, studying, drinking or socializing with friends, sex, and, for some, using the bathroom.

The conditioning model of craving receives support from research showing that people with alcoholism tend to salivate more than others at the sight and smell of alcohol (Monti et al., 1987). Pavlov's classic experiment conditioned a salivation response in dogs by repeatedly pairing the sound of a bell (a conditioned stimulus) with the presentation of food powder (an unconditioned stimulus). Salivation among people who develop alcoholism can also be viewed as a conditioned response to alcohol-related cues. People with drinking problems who show the greatest salivary response to alcohol cues may be at highest risk of relapse. They may also profit from conditioning-based treatments designed to extinguish responses to alcohol-related cues.

In one treatment occurring over a series of sessions, called *cue exposure training*, the person is seated in front of alcohol-related cues, such as open alcoholic beverages, but prevented from imbibing (Dawe et al., 2002). The pairing of the cue (alcohol bottle) with nonreinforcement (by dint of preventing drinking) may lead to extinction of the conditioned craving. However, cravings can, and often do, return after treatment when people go back to their usual environments (Collins & Brandon, 2002; Havermans & Jansen, 2003).

Observational Learning Modeling or observational learning plays an important role in determining risk of substance abuse problems. Parents who model inappropriate or excessive drinking or use of illicit drugs may set the stage for maladaptive drug use in their children (Kirisici, Vanyukov, & Tarter, 2005). Evidence shows that adolescents who have a parent who smokes face a substantially higher risk of smoking than do their peers in families where neither parent smokes (Peterson et al., 2006). Other investigators find that having friends who smoke influences adolescents to begin smoking (Bricker et al., 2006).

Cognitive Perspectives

Evidence supports the role of cognitive factors in substance abuse and dependence, especially the role of expectancies. Expectancies about the perceived benefits of using alcohol or other drugs and smoking cigarettes clearly influence the decision to use these substances (Cable & Sacker, 2006; Mitchell et al., 2006; Park, 2004). Outcome expectancies in teens—what they expect a drug’s effects will be—are strongly influenced by the beliefs of their peers. The degree to which friends hold positive attitudes toward alcohol use is thus an important factor in alcohol use in adolescents (Wood et al., 2001). Public health campaigns appear to be having some impact in changing attitudes of young people toward cigarette smoking. Adolescents in a Midwestern community showed more negative attitudes toward smoking than did adolescents a generation earlier (Chassin et al., 2003).

Alcohol or other drug use may also boost *self-efficacy expectations*—personal expectancies we hold about our ability to successfully perform tasks. If we believe we need a drink or two (or more) to “get out of our shell” and relate socially to others, we may come to depend on alcohol in social situations.

Expectancies may account for the “one-drink effect”—the tendency of chronic alcohol abusers to binge once they have a drink. Psychologist G. Alan Marlatt (1978) explained the one-drink effect as a type of self-fulfilling prophecy. If people with alcohol-related problems believe that just one drink will cause a loss of control, they may perceive the outcome as predetermined when they drink. Having even one drink may thus escalate into a binge. This type of expectation is an example of what Aaron Beck calls *absolutist thinking*. When we insist on seeing the world in black and white rather than shades of gray—as either complete successes or complete failures—we may interpret one bite of dessert as proof we are off our diets, or one cigarette as proof we are hooked again. Rather than telling ourselves, “Okay, I goofed, but that’s it. I don’t have to have more,” we encode our lapses as catastrophes and transform them into relapses. Still, alcohol-dependent people who believe they may go on a drinking binge if they have just one drink are well advised to abstain.

Psychodynamic Perspectives

According to traditional psychodynamic theory, alcoholism reflects an *oral-dependent personality*. Psychodynamic theory also associates excessive alcohol use with other oral traits, such as dependence and depression, and traces the origins of these traits to fixation in the oral stage of psychosexual development. Excessive drinking or smoking in adulthood symbolizes an individual’s efforts to attain oral gratification.

Research support for these psychodynamic concepts is mixed. Although people who develop alcoholism often show dependent traits, it is unclear whether dependence contributes to or stems from problem drinking. Chronic drinking, for example, is connected with loss of employment and downward movement in social status, both of which would render drinkers more reliant on others for support. Moreover, an empirical connection between dependence and alcoholism does not establish that alcoholism represents an oral fixation that can be traced to early development.

Then too, many—but certainly not all—people who suffer from alcoholism have antisocial personalities characterized by independence seeking as expressed through rebelliousness and rejection of social and legal codes. All in all, there doesn’t appear to be any single alcoholic personality (Wood et al., 2001).

Sociocultural Perspectives

Drinking is determined, in part, by where we live, whom we worship with, and the social or cultural norms that regulate our behavior. Cultural attitudes can encourage or discourage problem drinking. As we have already seen, rates of alcohol abuse vary across ethnic and religious groups. Let us note some other sociocultural factors. Church attendance, for example, is generally connected with abstinence from alcohol. Perhaps people who are more willing to engage in culturally sanctioned activities, such as churchgoing, are also more likely to adopt culturally sanctioned prohibitions against excessive drinking. Rates of alcohol use also vary across cultures.

Peer pressure and exposure to a drug subculture are important influences in determining substance use among adolescents and young adults (Dishion & Owen, 2002; Hu, Davies, & Kandel, 2006). Kids who start drinking before age 15 stand a fivefold higher risk of developing alcohol dependence in adulthood than do teens who began drinking at a later age (Kluger, 2001). Yet studies of Hispanic and African American adolescents show that support from family members can reduce the negative influence of drug-using peers on the adolescent's use of tobacco and other drugs (Farrell & White, 1998; Frauenglass et al., 1997).

TREATMENT OF SUBSTANCE ABUSE AND DEPENDENCE

There is a vast array of nonprofessional, biological, and psychological approaches to substance abuse and dependence. However, treatment has often been a frustrating endeavor. In many, perhaps most, cases, people with drug dependencies really do not want to stop and do not seek treatment on their own. When people do come for treatment, helping them through the withdrawal syndrome is usually straightforward enough, as we shall see. However, helping them pursue a life devoid of their preferred substances is more problematic. Treatment takes place in a setting—such as the therapist's office, a support group, a residential center, or a hospital—in which abstinence is valued and encouraged. Then the individual returns to the work, family, or street settings in which abuse and dependence were instigated and maintained. The problem of relapse can thus be more troublesome than the problems involved in initial treatment.



Peer pressure. Peer pressure is a major influence on alcohol and drug use among adolescents.

Another complication is that many people with substance abuse problems have other psychological disorders as well. However, most clinics and treatment programs focus on the drug or alcohol problem, or the other psychological disorders, rather than treating all these problems simultaneously. This narrow focus results in poorer treatment outcomes, including more frequent rehospitalizations among those with these *dual diagnoses*.

Biological Approaches

An increasing range of biological approaches is used in treating problems of substance abuse and dependence. For people with chemical dependencies, biological treatment typically begins with **detoxification**—that is, helping them through withdrawal from addictive substances.

Detoxification Detoxification is often more safely carried out in a hospital setting. In the case of addiction to alcohol or barbiturates, hospitalization allows medical personnel to monitor and treat potentially dangerous withdrawal symptoms such as convulsions. Antianxiety drugs, such as the benzodiazepines Librium and Valium, may help block severe withdrawal symptoms such as seizures and delirium tremens. Detoxification to alcohol takes about a week. Detoxification is an important step toward staying clean, but it is only a start. Approximately half of all drug abusers relapse within a year of detoxification (Cowley, 2001b). Continuing support and structured therapy, such as behavioral counseling, plus possible use of therapeutic drugs, increase the chances of long-term success.

A number of therapeutic drugs are used in treating people with chemical dependencies, and more chemical compounds are in the testing stage. Here we survey some of the major drugs in use today.

Disulfiram The drug *disulfiram* (brand name Antabuse) discourages alcohol consumption because the combination of the two produces a violent response consisting of nausea, headache, heart palpitations, and vomiting. In some extreme cases, combining disulfiram and alcohol can produce such a dramatic drop in blood pressure that the individual goes into shock or even dies. Although disulfiram has been used widely in alcoholism treatment, its effectiveness is limited because many patients who want to continue drinking simply stop using the drug. Others stop taking the drug because they believe that they can remain abstinent without it. Unfortunately, many return to uncontrolled drinking. Another drawback is that the drug has toxic effects in people with liver disease, a frequent ailment of people who suffer from alcoholism. Little evidence supports the efficacy of the drug in the long run.

Antidepressants Antidepressants may help reduce cravings for cocaine following withdrawal. These drugs stimulate neural processes that promote feelings of pleasure derived from everyday experiences. If cocaine users can feel pleasure from non-drug-related activities, they may be less likely to return to using cocaine. However, antidepressants have yet to produce consistent results in reducing relapse rates for cocaine dependence, so it is best to withhold judgment concerning their efficacy. The antidepressant drug *bupropion* (trade name Zyban) is used to blunt cravings for nicotine in much the same way that other antidepressants are being used to reduce cocaine cravings. The drug has a modest benefit in helping people quit smoking successfully (Croghan et al., 2007). Another drug, *varenicline*, may be more effective than bupropion for smoking cessation (Barclay & Vega, 2006). Several recent controlled studies show that varenicline produces significant benefits in aiding smokers in quitting relative to placebo (Gonzales et al., 2006; Jorenby et al., 2006; Klesges, Johnson, & Somes, 2006; Tonstad et al., 2006). The drug works by binding to nicotine receptors in the brain to blunt the reward value of smoking and to prevent withdrawal symptoms.

Nicotine Replacement Therapy Most regular smokers, perhaps the great majority, are nicotine dependent. The use of nicotine replacements in the form of prescription gum (brand name Nicorette), transdermal (skin) patches, and nasal sprays can help smokers avoid unpleasant withdrawal symptoms and cravings for cigarettes (Strasser

detoxification The process of ridding the system of alcohol or other drugs under supervised conditions.



Is the path to abstinence from smoking skin deep? Forms of nicotine replacement therapy, such as nicotine transdermal (skin) patches and chewing gum that contains nicotine, allow people to continue to take in nicotine when they quit smoking. Although nicotine replacement therapy is more effective than a placebo in helping people quit smoking, it does not address the behavioral components of addiction to nicotine, such as the habit of smoking while drinking alcohol. For this reason, nicotine replacement therapy may be more effective if it is combined with behavior therapy that focuses on changing smoking habits.

methadone An artificial narcotic that is used to help people who are addicted to heroin to abstain from it without a withdrawal syndrome.

TRUTH or FICTION

A widely used treatment for heroin addiction involves substituting another addictive drug.

✓ **TRUE.** Methadone, a synthetic narcotic, is widely used in treating heroin addiction.

naltrexone A drug that blocks the high from alcohol as well as from opiates.

et al., 2005; Shiffman et al., 2002). After quitting smoking, ex-smokers can gradually wean themselves from the nicotine replacement. Evidence supports the therapeutic benefits of nicotine replacement therapy, although men seem to benefit more from treatment than women (Cepeda-Benito, Reynoso, & Erath, 2004; Strasser et al., 2005).

Although nicotine replacement can help quell the physiological components of withdrawal, it has no effect on the behavioral patterns of addiction, such as the habit of smoking while drinking alcohol or socializing. As a result, nicotine replacement may be ineffective in promoting long-term changes unless it is combined with behavioral therapy that focuses on fostering adaptive behavioral changes.

Methadone Maintenance Programs **Methadone** is a synthetic opiate that blunts cravings for heroin and helps curb the unpleasant symptoms that accompany withdrawal. Because methadone in normal doses does not produce a high or leave the user feeling drugged, it can help heroin addicts hold jobs and get their lives back on track (Schwartz et al., 2006). However, like other opioids, methadone is highly addictive. For this reason, people treated with methadone are, in effect, substituting dependence on one drug for dependence on another. Yet because most methadone programs are publicly financed, they relieve people addicted to heroin of the need to engage in criminal activity to support their drug habit. Methadone programs need to be strictly monitored because overdoses can be lethal, and the drug can become abused as a street drug (Belluck, 2003). Some 200,000 heroin addicts in the United States participate in methadone programs (Markel, 2002).

Since the introduction of methadone treatment, the annual death rate from opioid dependence declined from 21 per 1,000 to 13 per 1,000 (Krantz & Mehler, 2004). One frequent criticism of methadone treatment is that many participants continue to take the drug indefinitely, potentially even for a lifetime, rather than be weaned from it. However, proponents of methadone treatment point out that the measure of success should be whether people are able to take care of themselves and their families and act responsibly, not how long they continue to receive treatment (Marion, 2005). Even so, not everyone succeeds in treatment. Some patients turn to other drugs, such as cocaine, to get high or return to using heroin. Others drop out of methadone programs.

Still another synthetic opiate drug that is chemically similar to morphine, *buprenorphine*, blocks withdrawal symptoms and cravings without producing a strong narcotic high (Fiellin et al., 2006). Many treatment providers prefer buprenorphine to methadone because it produces less of a sedative effect and can be taken in pill form only three times a week, whereas methadone is given in liquid form daily. Another synthetic antiopiate, *levomethadyl*, also lasts longer than methadone and can be dispensed three times a week (Krantz & Mehler, 2004). For maximum effectiveness, pharmacotherapy with methadone or similar drugs should be combined with psychological counseling and psychosocial rehabilitation (P.G. O'Connor, 2000; E. O'Connor, 2001a).

Naltrexone **Naltrexone** is a drug that blocks the high produced by alcohol and by opioids, such as heroin. The drug doesn't prevent the person from taking a drink or using heroin, but seems to blunt cravings for these drugs. Evidence shows that naltrexone and similar drugs are useful in treating alcohol and opiate dependence (Anton et al., 2006; Comer et al., 2006; Garbutt et al., 2005a, 2005b; Kranzler, 2006). By blocking the pleasure produced by alcohol, the drug can help break the vicious cycle in which one drink creates a desire for another, leading to episodes of binge drinking.

A nagging problem with drugs such as naltrexone, disulfiram, and methadone is that people with substance abuse problems may simply stop using them and return to their substance-abusing behavior. Nor do such drugs provide alternative sources of positive reinforcement that can replace the pleasurable states produced by drugs of abuse. These drugs are effective only in the context of a broader treatment program consisting of psychological counseling and life-skills components, such as job training, and stress-management training. These treatments provide people with the skills they need to embark on a life in the mainstream culture and to find drug-free outlets for coping with stress (Fouquereau et al., 2003; Miller & Brown, 1997).

Culturally Sensitive Treatment of Alcoholism

Members of ethnic minority groups may resist traditional treatment approaches because they feel excluded from full participation in society. Native American women, for example, tend to respond less favorably to traditional alcoholism counseling than White women (Rogan, 1986). Hurlburt and Gade (1984) attribute this difference to the resistance of Native American women to “White man’s” authority. They suggest that Native American counselors might be more successful in overcoming this resistance.

The use of counselors from the client’s own ethnic group is an example of a *culturally sensitive treatment approach*. Culturally sensitive programs address all facets of the human being, including racial and cultural identity, that nurture pride and help people resist the temptation to cope with stress through chemicals (Rogan, 1986). Culturally sensitive treatment approaches have been extended to other forms of drug dependence, including programs for smoking cessation (Nevid & Javier, 1997; Nevid, Javier, & Moulton, 1996).

Treatment providers may also be more successful if they recognize and incorporate indigenous forms of healing into treatment. For example, spirituality is an important aspect of traditional Native American culture, and spiritualists have played important roles as natural healers. Seeking the assistance of a spiritualist may improve the counseling relationship. Likewise, given the importance of the church in African American and Hispanic American cultures, counselors working with people with alcohol use disorders from these groups may be more successful when they draw on clergy and church members as resources.

Nonprofessional Support Groups

Despite the complexity of the factors contributing to substance abuse and dependence, these problems are frequently handled by laypeople or nonprofessionals. Such people often have or had the same problems themselves. For example, self-help group meetings are sponsored by organizations such as Alcoholics Anonymous, Narcotics Anonymous, and Cocaine Anonymous. These groups promote abstinence and provide members an opportunity to discuss their feelings and experiences in a supportive group setting. More experienced group members (sponsors) support newer members during periods of crisis or potential relapse. The meetings are sustained by nominal voluntary contributions.

The most widely used nonprofessional program, Alcoholics Anonymous (AA), is based on the belief that alcoholism is a disease, not a sin. The AA philosophy holds that that people suffering from alcoholism will never be cured, regardless of how long they abstain from alcohol, rather, people with alcoholism who remain “clean and sober” are seen as “recovering alcoholics.” It is also assumed that people who suffer from alcoholism cannot control their drinking and need help to stop drinking. AA has more than 50,000 chapters in North America. AA is so deeply embedded in the consciousness of helping professionals that many of them automatically refer newly detoxified people to AA as the follow-up agency. About half of AA members have problems with illicit drugs as well as alcohol.

The AA experience is in part spiritual, in part group supportive, in part cognitive. AA follows a 12-step approach that focuses on accepting one’s powerlessness over alcohol and turning one’s will and life over to a higher power. This spiritual component may be helpful to some participants but distasteful to others. (Other lay organizations, such as Rational Recovery, adopt a nonspiritual approach.) The later steps focus on examining one’s character flaws, admitting one’s wrongdoings, being open to a higher power for help to overcome one’s character defects, making amends to others, and, in step 12, bringing the AA message to other people suffering from alcoholism. Members are urged to pray or meditate to help them get in touch with their higher power. The meetings themselves provide group support. So does the buddy, or sponsor, system, which encourages members to call each other for support when they feel tempted to drink.

The success rate of AA remains in question, in large part because AA does not keep records of its members, but also because of an inability to conduct randomized clinical



Culturally sensitive treatment. Culturally sensitive therapy or treatment addresses all aspects of the person, including ethnic factors and the nurturance of pride in one’s cultural identity. Ethnic pride may help people resist the temptation to cope with stress through alcohol and other substances.



SUBSTANCE ABUSE:

Therapist Louise Roberts

“You try to make sense out of an addiction that doesn’t make sense.”

trials in AA settings. However, we do have evidence that participation in AA is linked to lower frequency and intensity of drinking (Ferri et al., 2006). However, many people drop out of AA, as well as from other treatment programs. People who are more likely to do well with AA tend to be those who make a commitment to abstinence, who express intentions to avoid high-risk situations associated with alcohol use, and who stay longer with the program (McKellar, Stewart, & Humphreys, 2003; Moos & Moos, 2004; Morgenstern et al., 2002).

Al-Anon, begun in 1951, is a spin-off of AA that supports the families and friends of people suffering from alcoholism. Another spin-off of AA, Alateen, provides support to children whose parents have alcoholism, helping them see that they are not to blame for their parents' drinking and are thus undeserving of the guilt they may feel.

Residential Approaches

A residential approach to treatment requires a stay in a hospital or therapeutic residence. Hospitalization is recommended when substance abusers cannot exercise self-control in their usual environments, cannot tolerate withdrawal symptoms, or behave self-destructively or dangerously. Less-costly outpatient treatment is indicated when withdrawal symptoms are less severe, clients are committed to changing their behavior, and support systems, such as families, can help clients make the transition to a drug-free lifestyle. The great majority of alcohol-dependent patients are treated on an outpatient basis.

Most inpatient programs use an extended 28-day detoxification period. For the first few days, treatment focuses on helping clients with withdrawal symptoms. Then the emphasis shifts to counseling about the destructive effects of alcohol and combating distorted ideas or rationalizations. Consistent with the disease model, abstinence is the goal.

Most people with alcohol use disorders do not require hospitalization. A classic review article showed that outpatient and inpatient programs achieved about the same relapse rates (Miller & Hester, 1986). However, because medical insurance does not always cover outpatient treatment, many people who might benefit from outpatient treatment admit themselves for inpatient treatment instead.

A number of residential therapeutic communities are also in use. Some have part- or full-time professional staffs. Others are run entirely by laypeople. Residents are expected to remain free of drugs and take responsibility for their actions. They are often challenged to take responsibility for themselves and to acknowledge the damage caused by their drug abuse. They share their life experiences to help one another develop productive ways of handling stress.

As with AA, we lack evidence from controlled studies demonstrating the efficacy of residential-treatment programs. Also like AA, therapeutic communities have high numbers of early dropouts. Moreover, many residents relapse upon returning to the world outside.

Psychodynamic Approaches

Psychoanalysts view substance abuse and dependence as symptoms of conflicts rooted in childhood experiences. The therapist attempts to resolve the underlying conflicts, assuming that abusive behavior will then subside as the client seeks more mature forms of gratification. Although there are many successful psychodynamic case studies of people with substance abuse problems, there is a dearth of controlled and replicable research studies. The effectiveness of psychodynamic methods for treating substance abuse and dependence thus remains unsubstantiated.

Behavioral Approaches

Behavioral approaches to treating substance abuse and dependence focus on modifying abusive and dependent behavior patterns. The key question to behaviorally oriented therapists is not whether substance abuse and dependence are diseases but whether abusers can learn to change their behavior when they are faced with temptation.

Self-Control Strategies *Self-control training* helps abusers develop skills they can use to change their abusive behavior. Behavior therapists focus on three components—the “ABCs”—of substance abuse:

1. The *antecedent* cues or stimuli (As) that prompt or trigger abuse
2. The abusive *behaviors* (Bs) themselves
3. The reinforcing or punishing *consequences* (Cs) that maintain or discourage abuse

Table 9.2 shows the kinds of strategies used to modify the ABCs of substance abuse.

TABLE 9.2

Self-Control Strategies for Modifying the “ABCs” of Substance Abuse

1. Controlling the As (Antecedents) of Substance Abuse

People who abuse or become dependent on psychoactive substances become conditioned to a wide range of external (environmental) and internal stimuli (bodily states). They may begin to break these stimulus-response connections by:

- Removing drinking and smoking paraphernalia from the home—including all alcoholic beverages, beer mugs, carafes, ashtrays, matches, cigarette packs, lighters, etc.
- Restricting the stimulus environment in which drinking or smoking is permitted by using the substance only in a stimulus-deprived area of their homes, such as the garage, bathroom, or basement. All stimuli that might be connected to using the substance are removed from this area—e.g., there is no TV, reading materials, radio, or telephone. In this way, substance abuse becomes detached from many controlling stimuli.
- Not socializing with others with substance abuse problems, by avoiding situations linked to abuse—bars, the street, bowling alleys, etc.
- Frequenting substance-free environments—lectures or concerts, a gym, museums, evening classes; and by socializing with nonabusers, eating in restaurants without liquor licenses.
- Managing the internal triggers for abuse. This can be done by practicing self-relaxation or meditation and not taking the substance when tense; by expressing angry feelings by writing them down or self-assertion, not by taking the substance; by seeking counseling not alcohol, pills, or cigarettes, for prolonged feelings of depression.

2. Controlling the Bs (Behaviors) of Substance Abuse

People can prevent and interrupt substance abuse by:

- Using response prevention—breaking abusive habits by physically preventing them from occurring or making them more difficult (e.g., by not bringing alcohol home or keeping cigarettes in the car).
- Using competing responses when tempted; by being prepared to handle substance-related situations with appropriate ammunition—mints, sugarless chewing gum, etc.; by taking a bath or shower, walking the dog, walking around the block, taking a drive, calling a friend, spending time in a substance-free environment, practicing meditation or relaxation, or exercising when tempted, rather than using the substance.
- Making abuse more laborious—buying one can of beer at a time; storing matches, ashtrays, and cigarettes far apart; wrapping cigarettes in foil to make smoking more cumbersome; pausing for 10 minutes when struck by the urge to drink, smoke, or use another substance and asking oneself, “Do I really need *this* one?”

3. Controlling the Cs (Consequences) of Substance Abuse

Substance abuse has immediate positive consequences such as pleasure, relief from anxiety and withdrawal symptoms, and stimulation.

People can counter these intrinsic rewards and alter the balance of power in favor of nonabuse by:

- Rewarding themselves for nonabuse and punishing themselves for abuse.
- Switching to brands of beer and cigarettes they don’t like.
- Setting gradual substance-reduction schedules and rewarding themselves for sticking to them.
- Punishing themselves for failing to meet substance-reduction goals. People with substance abuse problems can assess themselves, say, 10 cents for each slip and donate the cash to an unpalatable cause, such as a brother-in-law’s birthday present.
- Rehearsing motivating thoughts or self-statements—such as writing reasons for quitting smoking on index cards. For example:
 - Each day I don’t smoke adds another day to my life.
 - Quitting smoking will help me breathe deeply again.
 - Foods will smell and taste better when I quit smoking.
 - Think how much money I’ll save by not smoking.
 - Think how much cleaner my teeth and fingers will be by not smoking.
 - I’ll be proud to tell others that I kicked the habit.
 - My lungs will become clearer each and every day I don’t smoke.

Smokers can carry a list of 20 to 25 such statements and read several of them at various times throughout the day. They can become parts of one’s daily routine, a constant reminder of one’s goals.

Contingency Management Programs Learning theorists believe that our behavior is shaped by rewards and punishments. Consider how virtually everything you do, from attending class to stopping at red lights to working for a paycheck, is influenced by the flow of reinforcements or rewards (money, praise, approval) and punishments (traffic tickets, rebukes). *Contingency management* (CM) programs provide reinforcements (rewards) contingent on performing desirable behaviors, such as producing drug-negative urine samples (Petry et al., 2005; Poling et al., 2006; Roll et al., 2006). In one example, one group of patients had the opportunity to draw from a bowl and win monetary rewards or prize money (rewards) ranging from \$1 to \$100 in value (Petry & Martin, 2002). The monetary reward was contingent on submitting clean urine samples for cocaine and opioids. On average, the contingency management (reward) group achieved longer periods of continual abstinence than the standard methadone treatment group. Investigators are finding that even modest rewards for abstinence can help improve therapeutic outcomes in treating substance abusers (Higgins, Heil, & Lussier, 2004; Higgins, 2006).

Aversive Conditioning In *aversive conditioning*, painful or aversive stimuli are paired with substance abuse or abuse-related stimuli to condition a negative emotional response to drug-related stimuli. In the case of problem drinking, tasting alcoholic beverages is usually paired with drugs that cause nausea and vomiting or with electric shock. As a consequence, alcohol may come to elicit an unpleasant emotional or physical reaction. Unfortunately, aversive conditioning effects are often temporary and fail to generalize to real-life settings in which aversive stimuli are no longer administered. However, it may be useful as a treatment component in a broader-based treatment program.

Social Skills Training Social skills training helps people develop effective interpersonal responses in social situations that prompt substance abuse. Assertiveness training, for example, may be used to train alcohol abusers to fend off social pressures to drink. Behavioral marital therapy seeks to improve marital communication and problem-solving skills with the goal of relieving marital stresses that can trigger abuse. Couples may learn how to use written behavioral contracts. For example, the person with a substance abuse problem might agree to abstain from drinking or to take Antabuse, while the spouse agrees to refrain from commenting on past drinking and the probability of future lapses. Evidence suggests that social skills training and behavioral marital therapy are useful in treating alcoholism (Finney & Monahan, 1996; O’Farrell et al., 1996).

Controlled Drinking: A Viable Goal? According to the disease model of alcoholism, people who suffer from the disease who have just one drink will lose control and go on a binge. Some professionals argue that behavior modification self-control techniques can teach many people with alcohol abuse or dependence to engage in *controlled drinking*—to have a drink or two without necessarily falling off the wagon (Sobell & Sobell, 1973a, 1973b, 1984). This contention remains controversial. The proponents of the disease model of alcoholism, who wield considerable political strength, strongly oppose attempts to teach controlled social drinking.

Controlled drinking programs may represent a pathway to abstinence for people who would not otherwise enter abstinence-only treatment programs (Marlatt et al., 1993). That is, a controlled drinking program can be a first step toward giving up drinking completely. By offering moderation as a treatment goal, controlled drinking programs may reach many people who refuse to participate in abstinence-only treatment programs (Marlatt et al., 1993). In the accompanying *Controversies in Abnormal Psychology*, Mark and Linda Sobell speak about what it was like to be in the eye of the storm of controversy over the issue of controlled drinking.

Relapse-Prevention Training

The word *relapse* derives from Latin roots meaning “to slide back.” Between 50% to 90% of people who are successfully treated for substance abuse problems eventually relapse (Leary, 1996). Because of the prevalence of relapse, cognitive-behavioral therapists have devised a number of methods referred to as *relapse-prevention training*. This training is designed to help substance abusers identify high-risk situations and learn effective coping for handling



CONTROVERSIES IN ABNORMAL PSYCHOLOGY

In the Eye of the Storm: The Controlled Drinking Controversy

MARK AND LINDA SOBELL, IN THEIR OWN WORDS

Our careers began before we had our doctorates. In 1969, we began summer jobs at Patton State Hospital (CA). Within weeks, that evolved into an unusual opportunity to conduct federally funded alcohol research. We were in the right place at the right time. The field of behavioral therapy was in its infancy and witnessing some exciting advances. The scientific study of alcohol problems was also in its infancy. Early research at the hospital had demonstrated that severely dependent alcohol abusers could limit their drinking (e.g., drink just 1 to 3 drinks) in a supervised hospital environment. Furthermore, we found several published studies that suggested that some alcohol abusers could learn to drink moderately without losing control of their drinking. This led us to conduct our highly controversial study, "Individualized Behavior Therapy for Alcoholics" (Sobell & Sobell, 1973b).

Patients were evaluated for their eligibility for a moderate drinking goal, and those who qualified were randomly assigned either to an inpatient-based, broad-spectrum behavioral treatment program that had a controlled drinking goal or to a control group (i.e., standard hospital treatment with an abstinence goal). Those ineligible for a moderation goal were randomized to the behavioral treatment or the standard hospital treatment, both with an abstinence goal. Follow-up was conducted for 2 years (Sobell & Sobell, 1976); an independent double-blind third-year follow-up was also conducted (Caddy, Addington, & Perkins, 1978). Although both experimental groups had superior outcomes relative to their control groups, the moderate drinking group's superiority was maintained over a 3-year period, whereas differences between the abstinence goal groups were no longer significant after the 1-year follow-up. The moderate drinking group had more than twice as many "functioning well" days (i.e., not drinking or drinking just a few drinks) and twice as many abstinent days as their control group. The findings of our rigorous study challenged, as no other study had, the traditional view that only abstinence goals were effective.

In 1982 our careers almost ended when the journal *Science* published an article challenging the study's findings. Although the allegations were veiled in the article, in media interviews the authors claimed we had falsified our data (Marlatt, 1983). Fortunately, we had retained our original data (e.g., drivers' records, arrest records, tape-recorded interviews with clients). When the allegations were released, they triggered a media frenzy tantamount to a witch hunt. Several investigations eventually vindicated us. The first, a blue ribbon committee in Toronto, where we were employed, examined our data and concluded, "The Committee finds the Sobell's published data to be accurate, and concludes unequivocally that there is no evidence of fraud, deception, dishonesty or unethical behavior" (Dickens et al., 1982, p. 9). Shortly thereafter, there was a congressional investigation followed by an investigation by the National Institutes of Health and two ethics investigations by the American Psychological Association. In all instances, we were vindicated, as no investigation found evidence of fraud or deception. Nevertheless, the allegations traveled fast among traditional alcohol treatment programs and the public, leading many to the unquestioning assumption that controlled drinking had been "debunked." Unfortunately, because vindications are not as newsworthy as are allegations of fraud, many still are not aware of our vindication.

Why did the attack happen? In our published response to the attack (Sobell & Sobell, 1984) we interpreted what had occurred as a reflection of a scientific revolution. The alcohol field's prevailing view that abstinence was the only legitimate treatment goal was seriously threatened, and it was defended at all costs. Our accusers' objective, as stated in media interviews, was to expunge our work from the literature. Although this did not occur, it was clear that those pursuing moderate-drinking research did so at their own professional peril.

Replication is at the core of the scientific process. In the intervening years between the attack and now, many studies have demonstrated that low-risk or moderate drinking can be achieved in treating many problem drinkers (persons with low- to moderate-severity alcohol problems) (Sobell & Sobell, 1995). Research also shows that even chronic alcohol abusers treated with behavior therapy and a moderate drinking goal did better than control patients who were treated in a traditional abstinence-oriented program (Caddy et al., 1978; Sobell & Sobell, 1973a, 1973b, 1976). That's not to say that chronic alcohol abusers treated in moderate-drinking programs are problem free. Rather, we think of the outcomes of these programs in terms of *harm reduction*, meaning that participants suffer fewer negative consequences than control patients treated in traditional abstinence programs. An important legacy of our work was that it raised serious questions about the efficacy of traditional treatments, questions that remain largely unanswered.

Critical Thinking

- Do you believe that chronic alcohol abusers can learn to drink responsibly? Why or why not?
- What is the basis for determining when alcohol use becomes abuse or dependence? Have you or someone you know crossed the line between use and abuse?



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these situations without turning to alcohol or drugs skills (Witkiewicz & Marlatt, 2004). High-risk situations include negative mood states, such as depression, anger, or anxiety; interpersonal conflict (e.g., marital problems or conflicts with employers); and socially conducive situations such as "the guys getting together" (Chung & Maisto, 2006). Participants learn to cope with these situations, for example, by learning relaxation skills to counter anxiety and by learning to resist social pressures to drink. They also learn to avoid practices that might prompt a relapse, such as keeping alcohol on hand for friends.

Relapse prevention training also focuses on preventing *lapses* from turning into full-blown *relapses*. Clients learn about the importance of their *interpretations* of any lapses or

slips that may occur, such as smoking a first cigarette or taking a first drink following quitting. They are taught not to overreact to a lapse by changing how they think about lapses. For example, they learn that people who lapse are more likely to relapse if they attribute their slip to personal weakness, and experience shame and guilt, than if they attribute the slip to an external or transient event. For example, consider a skater who slips on the ice (Marlatt & Gordon, 1985). Whether the skater gets back up and continues to perform depends largely on whether the skater sees the slip as an isolated and correctable event or as a sign of complete failure. Because lapses in ex-smokers often occur in response to withdrawal symptoms, it is important to help smokers develop ways of coping with these symptoms without resuming smoking (Piasecki et al., 2003). Participants in relapse-prevention training programs learn to view lapses as temporary setbacks that provide opportunities to learn what kinds of situations lead to temptation and to either avoid them or learn to cope with them. If they can learn to think, “Okay, I had a slip, but that doesn’t mean all is lost unless I believe it is,” they are less likely to relapse.

All in all, efforts to treat people with substance abuse and dependence problems have had mixed results at best. Many abusers really do not want to discontinue use of these substances, although they would prefer, if possible, to avoid their negative consequences. Yet many treatment approaches, including 12-step and cognitive-behavioral approaches, can work well when they are well delivered and when individuals desire change (Miller & Brown, 1997; Moos & Moos, 2005; Project MATCH Research Group, 1997).

Effective treatment programs include multiple approaches that match the needs of substance abusers and the range of problems with which they often present, including co-occurring psychiatric problems, such as depression and personality disorders (Grant et al., 2004; Nunes & Levin, 2004). *Comorbidity* (co-occurrence) of substance use disorders and other psychological disorders, especially mood disorders, have become the rule in treatment facilities rather than the exception (Morris, Stewart, & Ham, 2005; Quello, Brady, & Sonne, 2005). Not surprisingly, drug abuse treatment is often complicated by the presence of other serious psychological problems. As noted in this first-person narrative, the co-occurrence of substance abuse greatly complicates the treatment of other psychological disorders.

“T”

“Surely They Can’t Mean Beer!”

Six years ago, at the age of 24, I was diagnosed with manic-depression. Learning to live with this mental illness has been extremely difficult. I have been in a series of different hospitals. After suffering a manic episode and being hospitalized, I would attempt to recover, but within 90 days or so I would end up in a hospital again. I never really had a fair chance of recovering from my manic depression because I had been suffering from alcoholism, another illness, at the same time. The alcoholism wasn’t being treated. After being discharged from hospitals I would resume drinking and then within a matter of a few months I would be back in another hospital having suffered another manic episode. It was strongly suggested to me when I was first diagnosed with manic depression that I should stop drinking. I remember my response clearly. “Surely they can’t mean beer!”

My drinking escalated when I first joined a program known as Alcoholics Anonymous. During those years I was in complete denial of what alcohol was doing to the chemical make-up of my body. I drank in order to suppress the negative feelings of mania and depression. I had to live with double trouble and the more I drank the sicker I became. I simply refused to address my alcoholism problem because alcohol had become my best friend. Denial runs deep!

It took a family crisis where my parents told me they would no longer support me emotionally or financially if I ended up in the hospital and alcohol was involved. This scared me to the point where I called Alcoholics Anonymous and began attending AA meetings. It takes time but AA seems to be working for me. I have arrested my drinking problem through total abstinence. Now the medication I take has a chance to work the way it was intended. Stopping drinking alcohol is only part of the solution. For me, working with doctors who understand my manic depressive illness and getting the proper medication is the key to a successful recovery.

—From Adam White, reprinted with permission of New York City Voices

TYING IT TOGETHER

Substance abuse and dependence are complex patterns of behavior that reflect the interplay of biological, psychological, and environmental factors. These problems are best approached by investigating the distinctive constellation of factors that apply to each individual case. No single model or set of factors will explain each case, which is why we need to understand each individual's unique characteristics and personal history and direct treatment accordingly. The accompanying *Concept Map for Abnormal Psychology* illustrates key causal factors and major treatment approaches, along with a conceptual model for understanding how these causal factors interact.

Genetic factors can create a predisposition or diathesis for substance abuse and dependence. Some people may be born with a greater tolerance for alcohol, which can make it difficult for them to regulate use of alcohol—to know “when to say when.” Others have genetic tendencies that can lead them to become unusually tense or anxious. Perhaps they turn to alcohol or other drugs to quell their nervousness. Genetic predispositions can interact with environmental factors to increase the potential for drug abuse and dependence—factors such as pressure from peers to use drugs, parental modeling of excessive drinking or drug use, and family disruption that results in a lack of effective guidance or support. Cognitive factors, especially positive drug expectancies (e.g., beliefs that using drugs will enhance one's social skills or sexual prowess), raise the potential for alcohol or drug use problems. In adolescence and adulthood, these positive expectations, together with social pressures and a lack of cultural constraints, affect the young person's decision to begin using drugs and to continue to use them. Patterns of regular use can lead to abuse and dependence. Once physiological dependence develops, people use the substance to avoid withdrawal symptoms.

Sociocultural and biological factors are also included in this matrix of factors: the availability of alcohol and other drugs; the presence or absence of cultural constraints; the glamorizing of drug use in popular media; and genetic tendencies (such as among Asians) to “flush” more readily following alcohol intake (Luczak, Glatt, & Wall, 2006).

Learning factors also play important roles. Drug use may be *positively* reinforced by pleasurable effects (mediated perhaps by release of dopamine in the brain or by activation of endorphin receptors). It may also be *negatively* reinforced by the reduction of tension and anxiety that depressant drugs such as alcohol, heroin, and tranquilizers can produce. In a sad but ironic twist, people who become dependent on drugs may continue to use them solely because of the relief from withdrawal symptoms and cravings they encounter when they go without the drug.

Although effective treatment programs are available, only a minority of people with alcohol dependence ever receive treatment, even when we define treatment broadly enough to include AA (Kranzler, 2006). A recent study in Canada echoed these findings. In a sample of more than 1,000 people in Ontario, Canada, with alcohol abuse or dependence disorders, only about one in three had ever received any treatment for their disorder (Cunningham & Breslin, 2004). Clearly more needs to be done to help people whose use of alcohol and other drugs puts them at risk.

In the case of inner-city youth who have become trapped within a milieu of street drugs and hopelessness, culturally sensitive drug counseling and job training would be of considerable benefit in helping them assume more productive social roles. The challenge is clear: to develop cost-effective ways of helping people recognize the negative effects of substances and forgo the powerful and immediate reinforcements they provide.

SUMMING UP

Classification of Substance-Related Disorders

How does the DSM distinguish between substance abuse disorders and substance dependence disorders? According to the *DSM*, a substance abuse disorder is a pattern of recurrent use of a substance that repeatedly leads to damaging consequences. Substance dependence disorders involve impaired control over use of a substance and often include features of physiological

dependence on the substance, as manifest by the development of tolerance or an abstinence syndrome.

What do we mean by the terms “addiction” and “psychological dependence”? Although different people use the term *addiction* differently, it is used here to refer to the habitual or compulsive use of a substance combined with the development of physiological dependence. Psychological dependence is the

compulsive use of a substance, with or without the development of physiological dependence.

Drugs of Abuse

What are depressants? Depressants are drugs that depress or slow down nervous system activity. They include alcohol, sedatives and minor tranquilizers, and opioids. Their effects include intoxication, impaired coordination, slurred speech, and impaired intellectual functioning. Chronic alcohol abuse is linked to alcohol-induced persisting amnesic disorder (Korsakoff's syndrome), cirrhosis of the liver, fetal alcohol syndrome, and other physical health problems. Barbiturates are depressants or sedatives that have been used medically for short-term relief of anxiety and treatment of epilepsy, among other uses. Opioids such as morphine and heroin are derived from the opium poppy. Others are synthesized. Opioids are used medically for relief of pain and are strongly addictive.

What are stimulants? Stimulants increase the activity of the central nervous system. Amphetamines and cocaine are stimulants that increase the availability of neurotransmitters in the brain, leading to heightened states of arousal and pleasurable feelings. High doses can produce psychotic reactions that mimic features of paranoid schizophrenia. Habitual cocaine use can lead to a variety of health problems, and an overdose can cause sudden death. Repeated use of nicotine, a mild stimulant found in cigarette smoking, leads to physiological dependence.

What are hallucinogens? Hallucinogens are drugs that distort sensory perceptions and can induce hallucinations. They include LSD, psilocybin, and mescaline. Other drugs with similar effects are cannabis (marijuana) and phencyclidine (PCP). Although these drugs may not lead to physiological dependence, psychological dependence may occur.

Theoretical Perspectives

How do the major theoretical perspectives view the causes of substance abuse and dependence? The biological perspective

focuses on uncovering the biological pathways that may explain mechanisms of physiological dependence. The biological perspective spawns the disease model, which posits that alcoholism and other forms of substance dependence are disease processes. Learning perspectives view substance abuse disorders as learned patterns of behavior, with roles for classical and operant conditioning and observational learning. Cognitive perspectives focus on roles of attitudes, beliefs, and expectancies in accounting for substance use and abuse. Sociocultural perspectives emphasize the cultural, group, and social factors that underlie drug-use patterns, including the role of peer pressure in determining adolescent drug use. Psychodynamic theorists view problems of substance abuse, such as excessive drinking and habitual smoking, as signs of an oral fixation.

Treatment of Substance Abuse and Dependence

What treatment approaches are used to help people overcome problems of substance abuse and dependence?

Biological approaches to substance abuse disorders include detoxification; the use of drugs such as disulfiram, methadone, naltrexone, and antidepressants; and nicotine replacement therapy. Residential treatment approaches include hospitals and therapeutic residences. Nonprofessional support groups, such as Alcoholics Anonymous, promote abstinence within a supportive group setting. Psychodynamic therapists focus on uncovering the inner conflicts originating in childhood that they believe lie at the root of substance abuse problems. Behavior therapists focus on helping people with substance-related problems change problem behaviors through such techniques as self-control training, aversive conditioning, and skills training approaches. Regardless of the initial success of a treatment technique, relapse remains a pressing problem in treating people with substance abuse problems. Relapse-prevention training employs cognitive-behavioral techniques to help recovering substance abusers cope with high-risk situations and prevent lapses from becoming relapses by interpreting lapses in less damaging ways.

KEY TERMS

substance-induced disorders (p. 291)
 intoxication (p. 292)
 substance use disorders (p. 292)
 substance abuse (p. 292)
 substance dependence (p. 292)
 tolerance (p. 293)
 withdrawal syndrome (p. 293)
 addiction (p. 294)
 physiological dependence (p. 294)

psychological dependence (p. 295)
 depressant (p. 296)
 alcoholism (p. 297)
 barbiturates (p. 303)
 narcotics (p. 303)
 endorphins (p. 304)
 morphine (p. 304)
 heroin (p. 304)
 stimulants (p. 305)

amphetamines (p. 305)
 amphetamine psychosis (p. 305)
 cocaine (p. 305)
 crack (p. 306)
 hallucinogens (p. 308)
 marijuana (p. 309)
 detoxification (p. 317)
 methadone (p. 318)
 naltrexone (p. 318)

KEY FOR “ARE YOU HOOKED?” QUESTIONNAIRE

Any yes answer suggests you may be dependent on alcohol. If you have answered any of these questions in the affirmative, we suggest you seriously examine what your drinking means to you.

MEDIA TOOLS

A variety of digital and online learning tools are available to enrich your learning experience and help you succeed in the course. These resources include:

- **MyPsychLab**, an online learning system for your course in abnormal psychology that allows you to test your mastery of concepts in the book by using chapter-by-chapter diagnostic tests. Results from the diagnostic tests help you build a customized study plan. To access **MyPsychLab**, visit www.prenhall.com/mypsychlab and follow the instructions on the site.
- **“SPEAKING OUT” PATIENT INTERVIEWS**, a set of video case examples of actual patients you can access on the companion CD-ROM included with the text. Icons in the margins of the chapter highlight the video case examples included on the CD-ROM.
- **COMPANION WEB SITE**, an online study center that offers computer-scored quizzes you can use to test your knowledge, along with other study tools and links to related sites to enhance your learning of abnormal psychology. To access the companion web site, visit www.prenhall.com/nevid and use the various tabs and links on the site to access these learning resources.

Substance-Related Disorders



A Biopsychosocial Model of Substance Abuse and Dependence

