Chapter 9

Conditions Related to Substance Use

All major population groups since before the beginning of recorded time have developed their own knowledge and use of substances that alter states of consciousness (Weatherall, 2001). Substance use for medicinal, social, psychological, and religious purposes has been part of most cultures and civilizations. Over the years, a wide array of substances, including plants or plant derivatives, alcohol, nicotine, caffeine, inhalants, and tonics, have been condoned and used by different cultures for therapeutic, ritualistic, religious, or recreational purposes (Fabricant & Farnsworth, 2001).

Examples of substance use throughout the ages are numerous. People in ancient civilizations considered alcohol—and wine in particular—as a gift from the gods. Opium has been cultivated for more than 6000 years and was used both for medicinal purposes, such as pain relief, and for psychological effects, such as sedation and euphoria. As early as 2000 B.C., marijuana use has been reported for a variety of medical problems as well as for its hallucinogenic properties. In some cultures, marijuana use was believed to assist religious men to have visions of the gods and reveal future events. Psychedelic plants were also used in ancient religious ceremonies.

In the Middle Ages, various psychoactive substances were used widely by medieval witches and medicine men as a poison for adversaries, as an analgesic for pain, and as a hallucinogen to generate prophesies (Fabricant & Farnsworth, 2001). In addition, stimulants were often used in the Middle Ages, when resources were scarce, to combat fatigue and hunger in soldiers (Inaba & Cohen, 1993).

Tobacco, which was widely unknown in Europe, was introduced by Columbus in 1492 after he noted Native Americans smoking. The practice of smoking the dried leaves of the tobacco plant, *Nicotiana*, was brought to England by Sir Walter Raleigh in the sixteenth century primarily for medicinal use; however, it's use as a social drug quickly spread (Weatherall, 2001).

During the 1800s, inhaled nitrous oxide, also called "laughing gas," was discovered and used for medicinal purposes as well as for recreation. It was frequently used both as anesthetic and as an intoxicant (Fairley, 1978). The hypodermic needle was developed in the 1860s, but its use was soon expanded from medical purposes to injecting heroin. It's availability created an ever-growing population of individuals who used the drug compulsively and became addicted (Inaba & Cohen, 1993). The twentieth century brought about a number of patented medications that could be purchased over the counter and that were used for medicinal purposes as well as becoming sources of abuse (Abbott & Fraser, 1998).

As use and abuse of various substances became viewed as problematic, regulation or prohibition of a number of substances was attempted in an effort to control or prevent their use. When society becomes ambivalent toward use of a substance, when it determines such use to be inappropriate, or when substance use becomes uncontrolled, hazardous, or disruptive to individuals or to others, then substance use is considered to be pathological and in some instances illegal. Pathological use of substance use is referred to in the *DSM-IV-TR* as *substance-related disorders* (American Psychiatric Association, 2000).

Substance-related disorders reflect a complex interaction of biological, psychological, social, cultural, and environmental factors and may involve substances that are *licit, illicit*, *prescribed*, or *not prescribed* (American Psychiatric Association, 2000). The etiology and treatment of substance-related disorders entail a complex interface among all these factors; no one factor explains the development of substance-related disorders.

Just as all chronic illnesses and disabilities affect physical, social, psychological, and vocational aspects of individuals' lives, so too do conditions related to substance use. Like other chronic, relapsing conditions, substance-related conditions produce a variety of impairments. Implications of these conditions must be evaluated in the context of theindividual's specific situation. Conditions related to substance use can occur alone or in combination with one or more other physical or psychiatric disabilities. The effects of substance use combined with manifestation of another disability can cause additional physical, psychological, and social complications, adding to the disabling effects of both.

INTOXICATION

Intoxication is a term that describes reversible behavioral or psychological changes related to the effect of a substance on the nervous system (American Psychiatric Association, 2000). The level of intoxication from the substance is determined by the concentration of the substance in the blood. The concentration, in turn, is determined by the amount of substances taken into the body as well as the rate at which the substance is absorbed into the bloodstream. The rate at which substances are absorbed into the bloodstream depends on the route of administration. For instance, substances that are injected directly into a vein (*intravenous injection IV*) have an immediate effect, whereas substances that are ingested orally take longer to be absorbed into the bloodstream and, consequently, exert their effects more slowly. The rate of absorption of substances taken orally is also affected by the presence or absence of food in the stomach and the rate of gastric emptying. Body size also affects concentration of substances in the blood. For instance, blood alcohol levels are proportionately lower in large individuals than in small individuals, even though both might consume equal amounts of alcohol under similar conditions. In addition, gender affects concentration of substances in the blood. Females typically have less of a substance called *alcohol dehydrogenase* than do males, and consequently women are unable to metabolize alcohol (ethanol) as quickly as men. Thus, women would show higher blood alcohol levels than men even though both had consumed the same amount of alcohol.

SUBSTANCE ABUSE AND DEPENDENCE

Our culture condones the use of a number of substances, and use of these socially sanctioned substances may have no harmful effects when they are used appropriately and in moderation. Misuse or overuse of substances or use of illegal substances, however, can have severe physical, psychological, or social conse-

quences. Two concepts describing the negative effects of substance use are substance abuse and substance dependence (American Psychiatric Association, 2000). In 2004, approximately 22.5 million people in the United States (9.4% of the population) were classified as engaging in either substance abuse or substance dependence. Some 3.4 million members, of this group was classified as being dependent on or abusing both alcohol and illicit drugs (Substance Abuse and Mental Health Services Administration, 2005).

Substance abuse is defined as a maladaptive pattern of substance use that results in recurrent and significant negative consequences of substance use. These consequences may include any of the following:

- Disruption of work or school, such as repeated absences or declining performance
- Neglect of family obligations
- Repeated hazardous behavior, such as driving a motor vehicle or operating machinery while under the influence of the substance
- Recurrent disorderly conduct or problems with interpersonal relationships owing to substance use
- Recurrent legal problems related to use of the substance
- Continued use of the substance despite the negative consequences related to that use

Substance dependence refers to substance use that results in physical or psychological distress related to substance tolerance, withdrawal, or a pattern of compulsive substance use.

Tolerance

When individuals continue to use a substance over time, they may begin to experience diminished effects with the use of the same amount of the substance. Consequently, the amount of the substance taken to achieve the same effects must be increased. This phenomenon is called **tolerance.** The degree of tolerance experienced varies from individual to individual and with the specific substance being used.

Individuals using substances chronically may adapt their behavior so that they are able to continue functioning at work, at home, or in social situations, even though they are under the influence of a substance. Although tolerance is not always an indication of dependence, it is commonly observed in individuals with substance-related conditions. Furthermore, individuals who develop a tolerance for one substance may also develop higher tolerance for related substances, a condition known as **cross-tolerance.**

Withdrawal

Toxic effects of large concentrations of a substance cause physical disturbances to occur when the amount of the substance is decreased or suspended. As a result, when the substance is absent from the body or when the amount is decreased, individuals experience **withdrawal.** Withdrawal is characterized by physiological or cognitive manifestations and/or maladaptive behavior change resulting in impairment in function. The manifestations of withdrawal depend on the substance and on individual factors, such as the presence of additional medical or psychiatric conditions, and the amount and duration of substance dependence.

Compulsive Behaviors

Substance dependence may also be marked by compulsive substance use or substance-seeking behavior, in which individuals become so preoccupied with the substance that much of their daily activity revolves around using and/or obtaining it. Despite the negative consequences of substance use that individuals with

substance dependence may have experienced, such as loss of a job or family, they may persist in using the substance.

Addiction

Although the American Psychiatric Association uses the term "dependence" rather than "addiction," the term *addiction* emphasizes the behavioral component of a substance-related condition rather than physical dependence (Maddux & Desmond, 2000). Addiction comprises a chronic, neurobiological condition that is influenced by psychosocial, genetic, and environmental factors and that is characterized by compulsive substance-seeking behaviors, impaired control over drug use, and continued use of the substance despite negative consequences (Ruiz, Strain, & Langrod, 2007; Adinoff, 2004). The physical and psychological craving for the substance becomes so all-consuming that individuals expend tremendous effort, energy, and financial resources to obtain it, often at the expense of the safety and well-being of themselves and others.

In addiction, substance use evolves into more than merely "wanting" or "liking" the substance. The nervous systems of individuals who are addicted become hypersensitized, which causes pathological craving for the substance, independent of physical signs of withdrawal (Robinson & Berridge, 2001). Compulsive substance-seeking and substance-taking behavior is facilitated by difficulties in decision making and the ability to judge consequences of drug-seeking and drug-taking actions (Robinson & Berridge, 2003).

Several factors appear to predispose individuals to addiction. For instance, a growing body of evidence indicates a genetic predisposition in some individuals for development of alcohol-related conditions as well as dependence on other substances such as nicotine, cocaine, and opioids (Ruiz et al., 2007). Personality traits such as risk-taking or novelty-seeking traits have also been found to be more prevalent in individuals who abuse or are dependent on drugs (Helmus, Downey, Arfken, Henderson, & Schuster, 2001). Individuals with psychiatric disorders—especially schizophrenia, bipolar disorder, and depression—have an increased risk of substance abuse (Leikin, 2007). Individuals with dual diagnosis have also been shown to have a more unfavorable prognosis in terms of management and outcome (Kavanagh, McGrath, Saunders, Dore, & Clark, 2002).

WITHDRAWAL

Consumption of large amounts of alcohol or other drugs at frequent intervals for prolonged periods creates a state of physical dependence so that cessation or reduction in the amount consumed produces distressful and incapacitating symptoms, known as substance withdrawal. The symptoms experienced during withdrawal vary in severity. The initial symptoms, regardless of the substance, may consist of dysphoria (exaggerated feelings of depression and unrest), insomnia, anxiety, irritability, nausea, agitation, tachycardia (fast heartbeat), and hypertension (high blood pressure).

Individuals with mild to moderate withdrawal symptoms who have no preexisting conditions and who have adequate social support may have withdrawal managed on an outpatient basis. It is important for health professionals managing withdrawal to know the type of substance abused as there are substantial differences in complications as well as management of withdrawal from specific substances. Individuals who develop more serious withdrawal symptoms such as *delirium tremens* (DTs) associated with alcohol, those who experince psychotic symptoms with withdrawal from stimulants or opioids, or those who have coexisting psychiatric or medical conditions usually require inpatient management of withdrawal (Kosten & O'Connor, 2003).

DETOXIFICATION

Detoxification is the first step in treatment of substance abuse and dependence. The goal of detoxification is to initiate abstinence, reduce symptoms of withdrawal, prevent complications, and retain individuals in treatment (Kosten & O'Connor, 2003). During the detoxification process and when undergoing withdrawal, individuals may experience nausea and vomiting, tachycardia, hypertension fever, and **diaphoresis** (profuse sweating). In more severe withdrawal, individuals may experience disorientation, hallucinations, delirium tremens, and, in some instances, seizures. Withdrawal from some substances, such as alcohol and other sedatives, can be fatal.

Risk factors for more severe withdrawal are older age (40 years or older), high tolerance, other health problems (such as diabetes or cardiovascular disease), and poor nutrition. Individuals who are in lower-risk groups may undergo detoxification at community health settings; by contrast, individuals at higher risk usually require hospitalization. During the detoxification process, medical management may consist of providing adequate hydration, restoring electrolyte balance, providing thiamine and other vitamins, administration of sedatives, and monitoring for possible complications (Brown, 2007). After detoxification, treatment may include medications that act as substitutes for the abused substances. The goal in providing these medications is to gradually reduce the dosage, thereby eventually eliminating dependency.

SUBSTANCE USE AND CHRONIC ILLNESS AND DISABILITY

Individuals with other chronic illnesses and disabilities can also have a condition related to substance use. In some instances, substance abuse may have been a factor in the acquisition of the chronic illness or disability, such as injury sustained in a motor vehicle accident caused by driving under the influence or HIV infection acquired by sharing contaminated needles. Substance abuse and dependence may also be a maladaptive coping mechanism for an individual who is trying to adjust to chronic illness or disability. In other instances, individuals may become dependent on substances, that were originally prescribed to treat symptoms such as pain or anxiety. Whether substance abuse or dependence was a precursor of an acquired chronic illness or disability, or a coping mechanism employed after chronic illness or disability, a diagnosis of two disabling conditions makes management of both conditions more complex.

A number of factors may place individuals with chronic illness or disability at higher risk for substance-related conditions:

- Medical factors such as easy access to prescription medication to alleviate symptoms, such as chronic pain, making it easier to use the medication excessively; or unnecessary or unwarranted prescription of medication for symptoms that could have been treated by alternative means
- Psychological factors such as depression, boredom, or frustration, so that substances are used as a means of escape from reality
- Social factors such as oppression or alienation, so that substances are used recreationally in an attempt to gain acceptance and normalization (Greer, Roberts, & Jenkins, 1990; Watson, Franklin, Ingram, & Eilenberg, 1998)

The coexistence of a substance-related condition with other chronic illness or disability can exacerbate and accentuate manifestations of the condition as well as increase individuals' vulnerability to medical complications, leading to acquisition of additional disability. Although substance abuse can coexist with any disability, comorbidity between substance

abuse and psychiatric disability (*dual diagnosis*) is very common (Allen Doyle-Pita, 2001; Volkow, 2001). Whether a substance-related condition is the primary disability or a secondary disability, appropriate intervention and treatment of substance abuse and dependence are necessary if individuals are to reach their full rehabilitation potential.

MEDICAL COMPLICATIONS OF ALCOHOL ABUSE AND DEPENDENCE

The effect of alcohol on the body, like the effect of any drug, depends on the interaction between properties of the specific pharmacologic agent and characteristics of a specific individual. Evidence suggests that women tend to be more sensitive to the effects of alcohol and more susceptible to adverse effects of excessive alcohol consumption than are men (Scott-Lennox, Rose, Bohlig, & Lennox, 2000; Kandall, 1996; Harley, 1995; Blume, Counts, & Turnbull, 1992). A wide range of physical and psychiatric complications is associated with alcohol dependence (Ruiz et al., 2007). Medical complications resulting from alcohol abuse and/or dependence result both from direct effects of alcohol on body tissues and from adaptive responses of the body to excessive exposure to alcohol.

Alcohol has a direct pharmacologic effect on the nervous system; it is a powerful central nervous system depressant. Initially, alcohol acts as a stimulant by suppressing the central nervous system's inhibitory systems. As the alcohol level increases in the body, however, it has a sedative effect and causes **ataxia** (difficulty with muscle coordination) and impaired psychomotor performance (Holdstock & deWit, 1998). Alcohol is rapidly absorbed into the bloodstream from the stomach and intestines and rapidly metabolized, making it a fast-acting drug. Because alcohol diffuses quickly into the water content of all body tissues, blood concentration of alcohol is an accurate reflection of the concentration of alcohol in other body tissues.

Some alcohol is eliminated through the kidneys and lungs, but the liver metabolizes most of this substance. Although a moderate dose of alcohol is normally cleared from the blood in approximately one hour, only a fixed amount of alcohol can be metabolized at a time. When the rate of alcohol consumption exceeds the body's ability to metabolize it, alcohol accumulates in the bloodstream, elevating the blood alcohol concentration.

The intoxicating effects of alcohol correlate roughly with the alcohol concentration in the blood, which in turn reflects the alcohol concentration in the brain. At low levels of intoxication (0.05%), alcohol may produce a sense of relaxation and well-being. As the concentration of alcohol increases (0.11% to 0.20%), neurological signs of ataxia (especially affecting voluntary movement) occur. Judgment may also be impaired. Continued elevation of blood alcohol concentration (0.31% to 0.41%) can produce confusion, mild stupor, and, ultimately, coma. A blood alcohol level of 0.51% or higher usually leads to death from depression of the respiratory center located in the brain.

Another effect in the spectrum of neurological disturbances associated with intensive alcohol intoxication is the occurrence of blackouts. These periods of amnesia are characterized by an inability to remember events during the time of the blackout.

Alcohol withdrawal can be complicated by seizures and delirium. The most severe form of alcohol withdrawal is delirium tremens. Individuals with delirium tremens experience significant restlessness, gross disorientation, cognitive disruption, elevation of temperature and pulse rate, and, in some instances, psychosis. Although delirium tremens can be fatal, its course is often self-limiting. The acute period of delirium tremens usually lasts from 2 to10

days, but can be more prolonged in case of severe withdrawal.

The withdrawal syndrome may be treated medically by the administration of a cross-tolerant drug, such as a sedative. Initially, sedatives are given in large doses to suppress the withdrawal symptoms. The dose is then reduced, or the interval between doses is increased, or both, so that the dosage progressively tapers off to zero. Because of wide variations in drug tolerance, treatment is individualized.

Management of Alcohol Dependence

Alcohol dependence is a chronic, lifelong condition. It requires long-term management that extends beyond the initial period of detoxification and generally involves a wide variety of services, including individual, group, and family therapy. In addition, self-help groups, such as *Alcoholics Anonymous (AA*) for alcohol-dependent individuals and *Alanon* and *Alateen* for their families, are widely recommended.

Typically, the goal of treatment is abstinence from alcohol and other mood-altering substances. In some circumstances, drugs are used to discourage and inhibit the use of alcohol. One such drug, an aversive substance called disulfiram (Antabuse), interferes with the normal metabolism of alcohol so that individuals who ingest alcohol after taking Antabuse experience severe gastrointestinal distress. Although it has not been shown to have a lasting long-term benefit, this agent may facilitate abstinence in the early recovery phase for individuals prone to impulsive drinking (Brown, 2007). Other drugs, such as naltrexone (ReVia) and acamprosate (Campral), help to reduce cravings for alcohol. A new drug, Baclofen, has recently been developed for both the management of alcohol withdrawal and relapse prevention (Addolorato, Leggio, Abenavoli, et al., 2006; Addolorato, Leggio, Agabio, Colombo, & Gasbarrini, 2006).

Effective management of alcohol dependence consists of both pharmacologic and psychosocial interventions. Psychosocial interventions in the form of counseling, psychoeducational, negotiating behavior change, and specific behavioral agreements are frequently used. Most successful interventions have been demonstrated to consist of a combination of medical, psychosocial counseling, and support networks (Brown, 2007).

Alcohol-Related Illness

Medical conditions that can result from chronic alcohol abuse, other than those caused by trauma due to intoxication are generally caused by dietary insufficiency, the direct toxic effects of alcohol on body tissue, or both. These conditions can involve all organ systems. The prognosis of alcohol-related medical illness depends on the nature of the illness and its severity. Although some alcohol-related medical illnesses are reversible, almost no alcohol-related illness can be cured if the individual continues to abuse alcohol.

Nervous System Conditions

Korsakoff's Syndrome

Associated with an excessive intake of alcohol, chronic malnutrition, and a deficiency of the B vitamins (thiamine, in particular), *Korsakoff's syndrome* is characterized by short-term memory impairment. The use of **confabulation**, in which individuals make up experiences to fill in memory gaps, is a common characteristic of those with Korsakoff's syndrome. In addition to abstinence, treatment consists of the administration of *thiamine*. Some cognitive improvement is possible, but full recovery is unlikely. Several months may be required before improvement is noticeable.

Wernicke's Encephalopathy (Wernicke's Disease)

Wernicke's encephalopathy is a condition caused by thiamine deficiency. Although it can occur in other conditions, it is most commonly associated with chronic alcohol abuse (Agro-

nin, 2007). This potentially life-threatening condition is characterized by the sudden onset of confusion, **nystagmus** (involuntary eye movements), and ataxia. Management of Wernicke's encephalopathy consists of the replacement of thiamine. Early intervention is mandatory to prevent permanent deficits. Prompt intervention resolves many of the symptoms.

Wernicke's encephalopathy often occurs in combination with Korsakoff's syndrome. *Wernicke–Korsakoff's syndrome* is characterized by learning and memory impairment that persists. This syndrome is observed when the initial symptoms are not treated rapidly (Agronin, 2007).

Peripheral Neuropathy

Although many causes of peripheral neuropathy exist (see Chapter 4), a number of individuals who chronically abuse alcohol develop disorders of the **peripheral nerves** (nerves outside the central nervous system).

Peripheral neuropathy associated with chronic alcohol abuse is thought to be the result of inadequate nutrition—specifically, inadequate amounts of thiamine and the other B vitamins. This condition affects the extremities and includes symptoms such as numbness, painful sensations, weakness, and muscle cramps. Burning pain of the feet may also occur. Good nutrition and the administration of supplemental B vitamins can bring about improvement, albeit slowly.

Cardiovascular System Conditions

Cardiomyopathy

Alcoholic cardiomyopathy occurs after long-term, chronic use of alcohol. It results from the direct toxic effects of alcohol on the heart muscle itself. The heart may become enlarged (**cardiomegaly**), and the heart muscle may become more fibrous. The heart's ability to pump effectively may be compromised so that symptoms of congestive heart failure, such as difficulty in breathing and swelling (see Chapter 13), may occur as the cardiac damage progresses.

Beriberi Heart Disease

A deficiency in thiamine is thought to contribute to the development of beriberi heart disease. Individuals with this condition have a high cardiac output, even at rest, because of the dilation of the peripheral small blood vessels. Beriberi heart disease responds well to the administration of supplemental thiamine.

Alterations in Heart Rate and Rhythm

Alcohol can affect both the speed at which the heart beats and the rhythm that it maintains. The direct, long-term effect on blood pressure varies, however. Withdrawal from alcohol dependence can put a heavy load on the heart, sometimes compromising cardiac function so severely during detoxification that death can result. Consequently, detoxification should be conducted under careful medical supervision.

Hypertension

Individuals who drink excessively may develop hypertension (high blood pressure). Hypertension can bring about serious consequences such as stroke or **myocardial infarction** (heart attack). (See Chapter 13.)

Alterations in Blood

Alcohol can have a direct and adverse effect on the development of red blood cells, white blood cells, and platelets, resulting in anemia, lower resistance to infection, and interference with blood clotting. One of the mechanisms by which alcohol affects blood cell formation is by altering with the use of folic acid, a nutritional substance that bone marrow requires to manufacture healthy cells effectively.

Megaloblastic anemia (the presence of large abnormal red blood cells) with *leukopenia* (an abnormal decrease in the number of white

blood cells) and *thrombocytopenia* (an abnormal decrease in the number of platelets) occurs frequently in individuals with low folic acid intake. Treatment with the administration of supplemental folate, proper nutrition, and abstinence from alcohol can generally reverse these abnormalities.

Respiratory System Conditions

Alcohol has a direct toxic effect on lung tissue. In combination with cigarette smoking, a higher incidence of *chronic obstructive pulmonary disease* (COPD; see Chapter 14) can result from chronic alcohol abuse. In addition, because chronic alcohol abuse affects some of the lungs' natural defenses, individuals who abuse alcohol have a greater tendency to develop lung infections.

Musculoskeletal System Conditions

Regardless of the person's nutritional status, alcohol has a direct toxic effect on skeletal muscle by destroying muscle fibers, leading to weakness, pain, tenderness, and swelling of affected muscles. **Myopathy** (disease of the muscles) related to alcohol abuse may be acute or chronic. The more common form is *chronic alcoholic myopathy,* which evolves over months to years. Pain may be less severe in chronic myopathy, although muscle cramps can occur. In addition, muscles may **atrophy** (shrink or become smaller) and weaken. Most manifestations of myopathy improve with the cessation of alcohol abuse, whereas continued alcohol abuse leads to continued deterioration. Excessive alcohol consumption can also contribute to **osteoporosis** (a reduction in bone mass), causing bones to become weakened, fragile, and easily broken (see Chapter 16). Osteoporosis occurs not only because calcium intake is insufficient, but also because alcohol interferes with the absorption of calcium from the intestines.

In addition to having a direct effect on the musculoskeletal system, alcohol can contribute to major injury. Individuals under the influence of alcohol may have decreased balance and coordination as well as demonstrate impaired judgment. As a result, individuals may experience injuries in falls, fires, or motor vehicle or pedestrian accidents.

Gastrointestinal System Conditions

Alcohol may affect almost every organ of the gastrointestinal tract. Individuals who consume alcohol excessively have an increased incidence of cancer of the throat and esophagus (see Chapter 12) as well as colorectal cancer (Cho, Smith-Warner, Ritz, van den Brandt, Colditz, & Folsom, 2004). Whether the increased incidence of cancer is attributable to direct contact of alcohol with the tissues, the presence of carcinogenic substances in some alcoholic beverages, or a combination of the two is unknown. Despite the fact that alcohol is considered a **hepatotoxin** (a substance that is harmful to the liver), individuals who chronically abuse alcohol differ widely in their susceptibility to liver disease.

Esophagitis and Gastritis

Esophagitis and **gastritis** are inflammations of the esophagus and of the stomach respectively. Both can occur with acute or chronic abuse of alcohol. The severity of these conditions depends on the individual. In some instances, these conditions produce only mild discomfort; in other instances, the irritation and inflammation lead to ulceration and bleeding. Intervention is directed toward reducing the inflammation. Obviously, abstinence from alcohol is a major treatment objective.

Alcoholic Hepatitis

During the process of alcohol metabolism, fat is deposited in the liver. When individuals consume excessive amounts of alcohol, accumulation of fat enlarges the liver, a condition called *fatty liver.* If individuals continue to consume alcohol, liver cells may die, causing the liver

to become inflamed. This inflammatory condition, in which the liver is usually enlarged and painful, is known as *alcoholic hepatitis*. Alcoholic hepatitis is an inflammation of the liver brought about by alcohol; it is *not* a contagious form of hepatitis.

Abstinence from alcohol can reverse the effects of both fatty liver and alcoholic hepatitis. Individuals who continue to abuse alcohol, however, have a high chance of developing cirrhosis.

Cirrhosis

Cirrhosis is a condition that involves **fibrosis** (formation of fibrous tissue) of the liver. It can be caused by a variety of conditions, but is most frequently attrituable to either hepatitis C or alcoholism (Ginés, Cárdenas, Arroyo, & Rodés, 2004). When alcohol injures the liver repeatedly over an extended period of time, fibrous tissue replaces liver cells. Circulation within the liver becomes less efficient, resulting in obstructions and ultimately increasing pressure in the vessels.

All blood from the gastrointestinal tract, spleen, pancreas, and gallbladder is carried to the heart through the liver by the *portal system*. As a result of the fibrous changes that occur in the liver with cirrhosis, pressure increases in the portal vein, a condition known as *portal hypertension*. The backflow of blood results in the enlargement of the spleen (**splenomegaly**), accumulation of fluid in the abdominal cavity (**ascites**), and development of esophageal varices (discussed in the next section).

Some individuals with cirrhosis experience no symptoms, especially in the disease's early stages. As the condition progresses, however, individuals may experience weakness, nausea, loss of appetite (**anorexia**), and **jaundice** (yellow discoloration of the skin and whites of the eyes from to the accumulation of bile pigments in the blood).

Diagnosis of cirrhosis is based on symptoms; results of blood tests; imaging via ultrasound, CT, or MRI; and liver biopsy. When standard medical therapy has failed to control the complications of cirrhosis, individuals may be referred for liver transplantation. Several scores have been developed to categorize the severity of cirrhosis and consequently allocation of transplantation (Heidelbaugh & Sherbondy, 2006). The *Child–Pugh* score incorporates three laboratory values and two clinical features experienced by the individual. The Child–Pugh score of cirrhotic severity may be used as an indication of whether individuals should be referred for liver transplantation evaluation. The MELD *(Model for End-stage Liver Disease)* score is also used as an indication of severity of liver damage in individuals being considered for liver transplantation.

Treatment of cirrhosis is largely symptomatic, but abstinence from alcohol is a necessity for survival. Individuals with cirrhotic changes in the liver have an increased risk of liver cancer as well as a higher risk of a number of other complications. Those who continue to abuse alcohol despite cirrhotic changes in the liver or other complications have a significantly decreased survival rate.

Esophageal Varices

Esophageal varices is a condition in which veins in the esophagus become dilated and tortuous as a result of portal hypertension, a complication of cirrhosis of the liver. Approximately 60 to 80% of individuals with cirrhosis develop esophageal varices (Chen & Jutabha, 2007; Heidelaugh & Sherbondy, 2006). Varices may bleed periodically and then stop spontaneously. Individuals with esophageal varices may experience **hematemesis** (vomiting of blood) and **melena** (dark, tarry bowel movements caused by digestion of swallowed blood). Bleeding esophageal varices can be life-threatening. High portal pressure may cause them to burst, resulting in hemorrhage and requiring emergency attention to stop the bleeding.

Management is directed toward controlling hemorrhage. The two major interven-

tions for esophageal varices involve *endoscopy*, in which a tube is inserted into the esophagus. The most common of the two, *endoscopic band ligation,* involves placing elastic bands around the esophageal varices (Heidelbaugh & Sherbondy, 2006; Krige, Kotze, Bornman, Shaw, & Klipin, 2006). The other procedure, *endoscopic sclerotherapy* involves injection of a substance into the varices, that *scleroses* (hardens) and stops the bleeding. In instances in which endoscopic procedures do not stop the bleeding, more invasive surgical intervention may be needed. In some instances, a temporary measure to control acute bleeding may involve insertion of a special tube (*Sengstaken-Blakemore tube*) into the esophagus. A balloon on the tube is then inflated to exert pressure against the bleeding vein.

Pancreatitis

A variety of conditions other than alcohol abuse may cause **pancreatitis** (inflammation of the pancreas). *Alcoholic pancreatitis*, however, is a form of pancreatitis that develops in susceptible individuals after chronic alcohol abuse. In this condition, the pancreatic ducts become obstructed. Normally, the pancreas secretes enzymes into the small intestine to aid in digestion. In alcoholic pancreatitis, however, the enzymes become active while they are still in the pancreas (see Chapter 12) so that the pancreas essentially begins to digest itself, causing progressive degeneration with scarring and calcification of pancreatic tissues. Pancreatic function is often severely curtailed. Chronic pancreatitis can lead to severe disability from pain, malaborption of nutrients resulting in weight loss, and diabetes mellitus secondary to the destruction of cells in the pancreas that secrete insulin *(islets of Langerhans)* (see Chapter 11).

Management of pancreatitis is directed toward halting destruction of tissue and alleviating the manifestations. As with other conditions affecting the gastrointestinal tract, effective management requires that individuals abstain from alcohol. If they no longer consume alcohol, many will recover from alcoholic pancreatitis to live a normal life. If they continue to drink, however, the prognosis is generally poor.

Reproductive System Conditions

Excessive alcohol use has been found to lower the level of the male hormone *testosterone*, which in turn has been related to decreased libido and, in some instances, impotence. Excessive alcohol intake also increases the level of *epinephrine* and other hormones.

The toxic effects of alcohol on the developing fetus during pregnancy can result in a deformity of the infant called **fetal alcohol syndrome**. The amount of alcohol that pregnant women must consume before the fetus is injured is unknown and appears to vary with the individual. Fetal alcohol syndrome is characterized by prenatal and postnatal growth retardation, **microcephaly** (abnormal smallness of the head), abnormalities of the nervous system, and facial disfiguration. Other congenital anomalies may include mental retardation, musculoskeletal abnormalities, and cardiac abnormalities.

USE AND ABUSE OF OTHER SUBSTANCES

Caffeine

Although *caffeine* is not commonly thought of as a substance of abuse and dependence, individuals who consume large amounts may exhibit signs of dependence on caffeine including tolerance and withdrawal symptoms (Juliano & Griffiths, 2004; American Psychiatric Association, 2000). Caffeine is commonly obtained from coffee or tea, but it may also be consumed in soft drinks, chocolate, and over-the-counter drugs, such as weight loss aids and antidrowsiness medications.

Caffeine acts primarily as a stimulant (Chou, 1992). Low to moderate doses of caffeine have been shown to produce subjective effects that

include positive effects such as increased alertness, greater energy, and feelings of well-being (Strain & Griffiths, 1995). While moderate caffeine use appears to pose few health risks for most healthy individuals, overuse of caffeine can produce caffeine intoxication, which can lead to symptoms of anxiety, insomnia, tachycardia (rapid heartbeat), hypertension (elevated blood pressure), and gastric distress (American Psychiatric Association, 2000). Caffeine can also exacerbate existing disabling conditions and may aggravate preexisting conditions, such as ulcer disease, hypertension, or heart conditions (Ochs, Holmes, & Karst, 1992). It's use can be associated with several psychiatric syndromes, such as caffeine-induced sleep disorder, caffeine-induced anxiety disorder, and caffeine dependence (Ruiz, Strain, & Langrod, 2007; American Psychiatric Association, 2000).

Caffeine also interacts with a number of medications and can interfere with their effectiveness. For example, caffeine and sedative drugs such as benzodiazepines have antagonistic effects, so that the sedative effect of a drug, such as Valium, may be blocked when taken with caffeine. Caffeine has also been shown to interfere with metabolism of some antipsychotic drugs and brochodilating drugs, interfering with their effectiveness (Ruiz et al., 2007).

If caffeine use is found to cause or exacerbate medical or psychiatric problems or interfere with medication efficiency, individuals may need to reduce or eliminate their use of this stimulant. Individuals with caffeine dependence may experience withdrawal symptoms such as fatigue and difficulty concentrating. Gradual reduction of caffeine consumption along with social support can be helpful in this regard. The availability of a large number of decaffeinated products makes it possible to decrease caffeine consumption, if necessary.

Nicotine

Nicotine has been identified as the most widely used substance of abuse (Maseeh & Kwatra, 2005). This substance is a highly dependence-producing drug found in tobacco and tobacco products (Christen & Christen, 1994). Although tobacco use in the United States has decreased in recent years, many individuals in the general population remain dependent on it. In addition, individuals with psychiatric disability and/or substance use disorders have a prevalence of tobacco use that is two to four times more than the prevalence in the general population (Lasser et al., 2000).

Nicotine dependence, like other conditions characterized by dependence, is viewed as a chronic disease that requires ongoing attention (Tinsley, 2007). Nicotine consumed through smoking, chewing, or snuffing tobacco is absorbed through the mucous membranes or surfaces of the lung, producing an immediate reward effect (Maseeh & Kwatra, 2005). When taken into the body, nicotine produces initial stimulation, followed by sedation. In addition, many individuals who smoke cigarettes become dependent on the ritual of smoking, which includes the process of opening the cigarette packet, lighting the cigarette, and seeing and smelling the smoke (Peters & Morgan, 2002).

The health consequences of tobacco use can be severe. It is well documented that tobacco use increases risk of heart disease, cancer, lung disease, and a number of other chronic, disabling, and fatal conditions (Ruiz, Strain, & Langrod, 2007; Kalman, Morissette, & George, 2005). Tobacco use has also been linked to higher infant mortality and lower birth weights (Kellogg, 2002). In a study of all causes of death in the United States in 2000, the leading cause of death was tobacco, which accounted for 18.1% of total deaths (Mokdad,

Marks, Stroup, & Gerberding, 2004). Cigarette smoking, in particular, has been found to be the leading cause of death and disability in the United States (USDHHS, 2004).

Nicotine dependence can interfere with treatment of other smoking-related diseases. A 1985 study reported that at least 50% of individuals recovering from surgery for a smoking-related condition such as lung cancer or cardiovascular disease continued to smoke while they were hospitalized or resumed smoking shortly after they were discharged (Burling, Stitzer, Bigelow, & Mead, 1985). Although smoking was once socially acceptable, pressure from various groups and public awareness of the health hazards of smoking have resulted in sanctions on public smoking behavior.

Individuals who have developed nicotine dependence experience both physiological and psychological withdrawal symptoms within hours after they are deprived of nicotine (Brown, Lejuez, Kahler, Strong, & Zvolensky, 2005). These withdrawal symptoms can include insomnia, irritability, anxiety, depressed mood, increased appetite, and weight gain. Although most manifestations associated with withdrawal are related to deprivation of nicotine, a number of social factors, such as conditioning and expectancy, also contribute to perception of manifestations and craving for nicotine (Ruiz, et al., 2007).

Interventions for nicotine dependence vary widely and consist of pharmacologic and psychosocial approaches.

Pharmacologic Approaches

Pharmacologic approaches include a number of medications used in nicotine replacement therapy. *Nicotine gum* contains small amounts of nicotine and requires a special chewing technique to derive optimal therapeutic effect. The gum is used by individuals regularly throughout the day to provide one-third to two-thirds the level of nicotine that would have been obtained through smoking.

Nicotine patches are transdermal patches that are placed on the skin and are designed to release nicotine slowly and steadily. Patches are available in different strengths of dosage and deliver the dosage over the course of 16 to 24 hours. Patches are generally used over a period of 8 weeks, with a gradual tapering of the dose of nicotine.

Of all other nicotine replacement therapies, *nicotine nasal sprays* provide the most immediate and highest level of nicotine, albiet not as high as would be obtained from cigarettes. Individuals usually initially use the spray one to two times per hour, and then gradually titrate the dose up to a maximum of 40 mg of nicotine per day for 6 to 8 weeks. After this time, there is a gradual tapering off of use over the next 3 to 6 months.

Oral forms of pharmacologic therapy include *nicotine tablets,* which are placed under the tongue, and *nicotine lozenges,* which are sucked until a strong taste is emitted and then placed between gum and cheek until the flavor fades. Both are absorbed directly into the mucous membranes of the mouth; neither should be chewed or swallowed. Because tablets deliver a lower dose of nicotine, they can be taken more frequently than the lozenges. On average, individuals use seven to eight lozenges per day, with a maximum of 25 lozenges per day. The program lasts about 12 weeks, with gradual tapering of use of lozenges.

Non-nicotine drugs, such as Bupropion, nortriptyline, and other antidepressant drugs are also used to treat nicotine dependence. In some instances, antidepressants may be used to reduce the symptoms associated with withdrawal.

Psychosocial Approaches

Counseling to help individuals reduce the stress associated with smoking cessation and a number of behavioral approaches have been used in smoking-cessation programs. Cognitive-behavioral therapies that identify cues for smoking and then develop techniques to break the association between the cues and smoking are frequently used. In addition, a number of alternative interventions, including acupuncture and exercise programs, have been used with varying success (Maseeh & Kwatra, 2005).

Overall, the success rates for pharmacologic and psychosocial approaches to cessation of tobacco use appears to be directly related to the smoker's motivation to stop. Nicotine withdrawal is a major obstacle to smoking cessation (Tinsley, 2007). However, emerging evidence suggests that the factor significantly affecting an individual's ability to stop smoking is how he or she responds to discomfort and distress related to withdrawal, rather than the physical withdrawal symptoms alone (Brown et al., 2005).

Sedatives

Sedation implies calmness and tranquility. *Sedatives* are classified according to the pharmacologic action they produce—namely, depression of the central nervous system. Examples of sedative drugs are alcohol, barbiturates, and benzodiazepines such as diazepam (Valium), and alprazolam (Xanax). If taken in higher doses to produce sleep, these medications are called *hypnotics*. Whether they have been prescribed for treatment of a specific condition or symptom, or whether they have been obtained illegally, sedatives may be associated with abuse, tolerance, and dependence.

Individuals commonly combine substances—for example, they may use sedatives with alcohol, or opiates with stimulants. Commonly abused sedatives include barbiturates (e.g., secobarbital and amobarbital sodium), benzodiazepines (e.g., chlordiazepoxide hydrochloride [Librium], diazepam [Valium], and chlorzepate dipotassium [Tranzene]), as well as other central nervous system depressants (e.g., methaqualone [Quaalude] and ethchlorvynol [Placidyl]).

Withdrawal from sedatives is similar to withdrawal from alcohol. Some sedatives, such as benzodiazepines, may have a delayed withdrawal effect, beginning several days after the person stops taking the drug. If individuals have become sedative dependent on lower doses of the drug, withdrawal symptoms may consist of only irritability, sleep disturbance, and generalized anxiety. If, however, individuals became dependent on higher doses, withdrawal can be life-threatening (Tinsley, 2007). Sudden withdrawal, especially in the face of barbiturate dependence, can result in acute psychosis, seizures, and death.

Therapeutic withdrawal from a sedative, like therapeutic withdrawal from alcohol, usually involves administration of a cross-tolerant drug to suppress withdrawal symptoms with gradual tapering of the dosage. The drug being withdrawn determines the length of time required for tapering. For some sedatives 7 to 10 days is sufficient for detoxification. Longer-acting drugs that have been used at high dosages may require 14 or more days for detoxification.

Opioids

Because *opioids* (narcotic drugs such as morphine, meperidine [Demerol], hydromorphone [Dilaudid], oxycodone [OxyContin], and codeine) are frequently prescribed for pain, addiction can occur through regular prescription use. In other instances, these medications are obtained illegally. One commonly used illegal opioid is heroin.

In addition to delivering pain relief, narcotics produce euphoria, sedation, and a feeling of tranquility. At first, individuals may take illegal

narcotics primarily for the feeling of euphoria. Repeated administration rapidly produces tolerance and intense physical dependence. Eventually, as the dosage and/or frequency of drug administration increases, individuals need to continue to take the drug regularly to avoid manifestations of withdrawal.

Numerous negative health consequences are related to opiate use, and especially long-term use of heroin (Gonzalez, Oliveto, & Kosten, 2002; Fiellin & O'Connor, 2002), including lethal respiratory depression with overdose. Drugs that are injected increase individuals' risk of contracting HIV infection or hepatitis C, if needles are shared (Cunningham, Sohler, Berg, Shapiro, & Heller, 2006). Addition of adulterants to substances or use of nonsterile techniques of injection may also produce medical complications (Ponton & Scott, 2004). Skin abscesses, **cellulitis** (inflammation of tissues), **thrombophlebitis** (inflammation of a vein with associated clot formation), **septicemia** (presence of toxins in the blood), and bacterial **endocarditis** (inflammation of the inner lining of the heart) are all potential complications.

Withdrawal symptoms vary in severity and duration, depending on the particular drug abused. Withdrawal from narcotics is generally not life-threatening. Many manifestations of withdrawal are flu-like, although manifestations may also include anxiety, irritability, and restlessness.

Opiate substitution drugs are sometimes used in treatment of opiate addiction and may be used for either detoxification or maintenance. *Methadone*, an opiate, and Clonidine (Catapres), a non-opiate, may be used during the detoxification process to help block withdrawal symptoms. When used for detoxification, the drug dosage is gradually tapered during the withdrawal period.

Methadone maintenance is a mainstay of treatment to reduce use of illicit opiates and high-risk behaviors associated with such drug use (Fudala et al., 2003; O'Connor, 2000). It is provided only in a strictly regulated environment in which the medication is taken under clinical observation and supervision (Clark, 2003). Methadone maintenance has been found to be effective in decreasing risk of HIV and hepatitis acquired through needle sharing, reducing criminal activity associated with drug-seeking behavior, and helping individuals return to a socially rehabilitated state (Tinsley, 2007).

Buprenorphine is a new product that has been recently approved for opiate addiction. Although the extent of its effectiveness in treating opiate addiction is not known at this time, one potential advantage of buprenorphine is that it can be prescribed by office-based clinicians (Brown, 2007; Mintzer, Eisenberg, Terra, MacVane, Himmmelstein, & Woolhandler, 2007; Moore et al., 2007; Donaher & Welsh, 2006).

Cocaine and Other Stimulants

Acting directly on the central nervous system, *stimulants* create an increased state of arousal and concentration, and speed up mental and motor activity. Individuals may take stimulants for such effects as increased alertness, increased sense of well-being, increased confidence, reduction of fatigue, or decrease in appetite. Amphetamines (e.g., Benzedrine or Dexedrine), methylphenidate (Ritalin), cocaine, and caffeine are all stimulants. In addition to exerting their central nervous system effects, stimulants have generalized systemic effects, including an increase in heart rate, an increase in blood pressure, a rise in body temperature, and the constriction of peripheral blood vessels (Sarnyai, Shaham, & Heinrichs, 2001).

Cocaine is a highly addictive neurostimulant (Pilon & Scheiffle, 2006; Chan, Camprodon, Kane, & Scott-Coombes, 2004). Although it has been used medically as a local anesthetic (especially for ear, nose, and throat procedures), cocaine also is a drug of wide abuse and an

important public health hazard (Leikin, 2007). As with other stimulants, its physical effects may include elevated heart rate, elevated blood pressure (Tinsley, 2007), and increased respiratory rate (Kloner & Rezkalla, 2003). Immediate effects of cocaine produce subjective feelings of increased alertness and energy, enhanced confidence, and enhanced physical and mental ability (Ruiz et al., 2007).

In recent years, cocaine has become one of the most widely abused stimulants in the United States (Leikin, 2007). It may be taken orally, used intranasally (snorted), smoked, or injected intravenously. The technique of *free-basing* cocaine, which gained popularity in the 1980s, involves heating a flammable solvent such as petroleum or ether, and then using it to heat the cocaine. This process "frees" cocaine hydrochloride from its salts and adulterants, converting it to a form of cocaine that will vaporize. The free-base cocaine can then be inhaled or smoked, usually with a water pipe, for direct absorption through the alveoli in the lungs. The technique rapidly delivers high concentrations of cocaine to the brain and results in blood levels as high as those achieved with injection.

The free-basing technique can cause additional disability due to burns from fires started during the free-basing process. Because of the concerns regarding the dangers of combustion and injury in free-basing, *crack cocaine* has become increasingly popular.

Crack, a solid form of free-base cocaine is an alkaloid form of cocaine obtained by "cooking" cocaine hydrochloride with bicarbonate of soda (Baldwin et al., 2002). Dependence occurs very rapidly with this form of the drug. Crack is smoked rather than sniffed. Its concentrated form and its route of administration make its potency many times greater than that of cocaine alone. The euphoric effect produced by crack lasts only a matter of minutes, however. To achieve the same euphoria, users may engage in repeated use or binge on large quantities followed by periods of non-use (Henskens, Mulder, Garretsen, Bongers, & Sturmans, 2005; Hope, Hickman, & Tilling, 2005). Crack cocaine can also be injected, and it is frequently injected in combination with other drugs such as heroin. Crack cocaine is associated with a number of criminal and health-related problems (Holloway, Bennett, & Lower, 2004), and crack cocaine injections are associated with increased risk of transmitting HIV and hepatitis C (Judd et al., 2005).

Individuals using cocaine, especially at higher dosages, may use depressant drugs in an attempt to counterbalance the former substance's stimulant effects. For example, alcohol and cocaine are commonly combined for this purpose. The simultaneous injection of cocaine and heroin (*speedballing*) is another combination used by some individuals.

Aside from its psychological, social, and vocational consequences, cocaine use can have serious medical consequences. Free-basing or smoking crack cocaine can lead to pulmonary complications, including hemorrhage in the lungs (Baldwin et al., 2002). Chronic use of intranasal cocaine may cause ulceration or perforation of the nasal septum. Cocaine intoxication can produce neurological effects, such as confusion, anxiety, hyperexcitability, agitation, and violence.

More serious effects are the result of acute *cocaine toxicity*, which is dose related, in which individuals can experience stroke or seizures, severe **hyperthermia** (increased body temperature), **arrhythmia** (irregular heartbeat) (Hsue et al., 2007), **myocardial infarction** (heart attack), and, in some instances, sudden death. Another side effect of excessive cocaine use, *cocaine psychosis*, is manifested as paranoia, panic, hallucinations, insomnia, and picking at the skin. The psychotic episode can last from 24 to 36 hours. Individuals with this condition are usually hospitalized and treated with antipsychotic medication.

The substances sometimes added to adulterate cocaine to increase its weight, thereby increasing profit on its sale, may cause additional medical complications. Problems can result from the nature of the substance used to mix with the cocaine or from the dosage taken. Adulterants such as talc or cornstarch can cause complications ranging from inflammation to **embolus** (matter traveling in the blood) (Low, Jenkins, & Prendergast, 2006).

Adverse behavioral effects are also common with cocaine use. For example, a high prevalence of anger, impulsivity, and violence is associated with cocaine addiction (Goldstein et al., 2005), and chronic use can result in paranoid psychosis (Floyd, Boutros, Struve, Wolf, & Oliwa, 2006; Camí & Farré, 2003).

Procaine, PCP, or heroin, which also may be added to cocaine, may potentiate the drug's effects. Because the user can never be certain of the cocaine's potency, however, the effects are not always predictable. The withdrawal syndrome from cocaine consists of a craving for more cocaine, depression, irritability, sleep disturbances, gastrointestinal disturbances, headaches, and, possibly, suicidal ideation. Because it is not unusual for individuals who are cocaine dependent to be dependent on other drugs as well, a withdrawal reaction from other substances may also be experienced.

Amphetamines are used in medical settings to treat conditions such as attention-deficit disorders. The potential for abuse of these prescribed drugs is continually present. A newer street drug classified as an amphetamine is *crystalline methamphetamine (ice)*, which is highly addictive, both physically and psychologically (Lukas, 1997). Like crack, ice can be heated and inhaled in a technique similar to that used when smoking free-base cocaine. Ice has greater strength and longer duration of effects, lasting from 8 to 24 hours. Methamphetamine increases energy and alertness and decreases appetite. Its greater stimulation of the brain makes it more dangerous mentally, creating craving that can continue for years after cessation of use (Wermuth, 2000). Toxic levels can produce severe paranoid thinking with hallucinations. There is also greater risk of suicidal depression. Chronic use of methamphetamine in any form can result in serious psychiatric, cardiovascular, metabolic, and neuromuscular changes. Side effects include shaking, seizures, *cardiac arrhythmias* (irregular heartbeat), and hyperthermia (elevated body temperature). Long-term use can lead to a feeling that skin is "crawling," anxiety, and insomnia, as well as addiction (Leikin, 2007).

Management of stimulant abuse, and crack/cocaine abuse in particular, involves management of the manifestations, rather than alternative prescribing options such as those available for opiate abuse. Antidepressants are sometime prescribed if the person has manifestations of depression, and sedatives such as benzodiazepines are sometimes prescribed for manifestations of agitation and insomnia. Because of their potential for addiction, these medications are used sparingly and for short periods of time (Harniman, 2006).

Psychosocial interventions include counseling such as motivational interviewing, cognitive-behavioral therapy, and group and family counseling. Other psychosocial interventions such as stress management skills training and support groups are beneficial as well.

Cannabis

When *cannabis* (*marijuana*) is smoked, the psychoactive compound (THC) that it contains produces euphoria, relaxation, dream-like states, and sleepiness. It can also impair cognitive function and performance of psychomotor tasks (Camí & Farré, 2003). Some individuals report enhanced perceptions of colors, tastes, and textures.

The use of marijuana for medicinal purposes remains controversial, although it has

been reported to reduce pain, spasms, nausea, and a variety of other symptoms in a number of medical conditions, including multiple sclerosis (Page & Verhoef, 2006).

The psychoactive response to the drug depends to a great extent on the dose, the personality and experience of the user, and the environment in which the drug is used. Often, users report a sense of the slowing of time and impairment in their ability to learn new facts while they are under the influence of this drug.

Overdose can produce anxiety, panic states, and psychosis (Hall & Solowij, 1998). On a systemic level, cannabis produces an increase in heart rate, dilation of the bronchioles, and dilation of the peripheral blood vessels. Because of its stimulatory effect on the heart, cannabis use may also lead to cardiac complications in individuals with heart disease (Fisher, Ghuran, Vadamalai, & Antonios, 2005).

Chronic smoking of cannabis produces inflammatory changes in the lungs that contribute to the development of chronic conditions such as emphysema (see Chapter 14). Furthermore, the use of other drugs, including alcohol and tobacco, may compound the adverse effects of cannabis. For example, the combination of tobacco and cannabis use is thought to increase the risk of development of lung cancer. Chronic marijuana use on its own or in association with other drugs may also cause alterations in liver enzymes (Borini, Guimaraes, & Borini, 2004)

Although cannabis is usually smoked, it may be ingested orally. Oral consumption can delay its effects for up to an hour, and the effects are less potent. *Hashish*, the concentrated form of THC, is also smoked and has considerably higher potency than cannabis.

Some individuals use cannabis only on special occasions, but others become compulsively preoccupied with its daily use. The long-term effects of cannabis use remain controversial. The degree to which cannabis creates physical dependence has not been established; however, it is possible to develop psychological dependence (Hall & Solowij, 1998). Symptoms of withdrawal including restlessness, irritability, and insomnia have been noted in heavy users (Budney, Hughes, Moore, & Novy, 2001).

There is no specific medical treatment for cannabis abuse. When cannabis use severely hampers individuals' functioning, treatment most often involves psychotherapeutic techniques directed at underlying problems. Because cannabis may be abused in combination with other drugs, management may be multifocal in nature.

Hallucinogens

Sometimes called *psychedelics*, *hallucinogens* are drugs that, at some dosage, produce hallucinations or distortions in perceptions or thinking. Individuals under the influence of hallucinogens report increased awareness of sensory input and a subjective feeling of enhanced mental activity. Common hallucinogens are LSD, psilocybin, PCP (angel dust), and mescaline.

Substance analogues, or *designer drugs,* can have dangerous, permanent effects. Users of one class of these drugs, the methamphetamines, which include MDMA (ecstasy) and MDEA (Eve), may be especially susceptible to permanent brain damage because the amount that produces psychological effects is not far from the dosage that produces neural damage (Liechti, Kuntz, & Kupferschmidt, 2005). The designer drug MPPP is associated with a parkinsonian syndrome (see Chapter 4) in some individuals. Designer derivatives of amphetamines produce euphoria, but can also have hallucinogenic effects, and may cause cardiac arrhythmias (irregular heartbeat), *cerebral hemorrhage* (stroke), hyperthermia (elevated body temperature), altered mental status, panic, and psychosis. Individuals with PCP intoxication are especially prone to agitation and violence (Leiken, 2007).

Hallucinogens are usually taken orally. Although the use of these substances has declined somewhat in recent years, patterns of their use vary widely. Their use is now often concurrent with the use of other drugs. One of the most powerful hallucinogens is *LSD* (*lysergic acid diethylamide*). Its effects vary with the individual, the dose, and the environment in which the drug is used. Generally, the effects develop within several hours and last as long as 12 hours. Individuals may report heightened sensitivity and clarity, increased insights, a sense of time moving more slowly, and distortions of visual images. Some individuals experience adverse effects from LSD, such as a panic state with severe anxiety.

The physical consequences of abuse of most hallucinogens in and of themselves are not significant. The psychological consequences, however, can be severe. Adverse effects of hallucinogens vary from acute psychosis to self-mutilation or suicide. Accidents can result from misjudgment or impairment. Some individuals experience "flashbacks" in which hallucinations reappear briefly even months after the last drug dose. An overdose of hallucinogens can result in exceedingly high body temperatures, seizures, and shock.

Because hallucinogens produce no physical dependence, no specific medical regimen for treatment exists. Adverse effects such as panic episodes are usually treated with a supportive environment and observation.

Inhalants

Substances that cause perceptible changes in brain function when they are administered through inhalation are called *inhalants*. Inhalants are generally classified into four categories:

- Aerosols
- Gases
- Solvents
- Nitrites (Ballard, 1998)

A wide variety of substances are abused in this way, often because they are readily accessible and inexpensive. For example, commonly used inhalants include airplane glue, typewriter correction fluid, marking pencils, industrial and household chemicals, paint thinners, gasoline, nitrites (poppers, snappers, or rush), and nitrous oxide. Although individuals of all age groups practice inhalant abuse, it is especially prevalent among adolescents and preadolescents (Leikin, 2007).

Although the effects of inhalants are brief, they can be serious, especially with prolonged or long-term use. Adverse effects of inhalants vary according to the type of substance inhaled. Organic solvents such as airplane glue can produce cardiac arrhythmia, bone marrow depression, damage to the kidney and liver, and, in some instances, death.

Prolonged use of *nitrites* is thought to suppress the immune system, thereby increasing the individual's susceptibility to infection. Nitrites are frequently used to enhance sexual pleasure; consequently, individuals who use nitrites in this way and engage in unsafe sex practices may be at greater risk for developing HIV infection owing to the suppression of the immune system and subsequent increased vulnerability to infection.

Chronic abuse of *nitrous oxide* can result in nerve damage, seizures, bone marrow changes, respiratory depression, or death. Because nitrous oxide distorts the senses, driving during intoxication with this substance is hazardous. Even though the effects of inhalants are brief, their use can result in dependence. No specific medical treatment is usually indicated for inhalant abuse, although specific psychotherapeutic measures may be used to prevent relapse and to help individuals discontinue inhalant use.

OxyContin

Although addiction is often assumed to be associated with illicit or illegal drugs, a grow-

ing number of people have become addicted to legal or prescription drugs (Smith, 2005). OxyContin (oxycodone) is one medication that is prescribed for pain control, but it has become increasingly more popular as a drug of abuse and addiction. Its popularity is, in part, due to its availability; it also provides an instant euphoria and is cheaper than drugs such as heroin. The medication is taken orally for prescription purposes, but those individuals using the drug for illicit reasons tend to crush it and then swallow or snort the powder, or inject the drug after it has been dissolved in water.

MEDICAL CONSEQUENCES OF SUBSTANCE ABUSE AND DEPENDENCE

Not only does substance abuse cause psychological, social, and vocational impairments, but it can also lead to criminal activity as users try to obtain drugs or get money to buy additional drugs. Substance abuse also has serious medical consequences.

Dermatologic Complications

Many of the medical complications related to drug abuse result from nonsterile injections or from adulterants, rather than from the drug itself.

Abscess

Bacterial infection may cause pus to collect in the tissues, forming an abscess. In association with drug use, improper cleansing of the skin before injection or the use of a nonsterile needle may lead to an abscess. In this situation, skin at the site becomes warm, red, swollen, and painful with a **purulent** (pus) discharge. Skin around the area frequently becomes **necrotic** (dies). If the abscess goes untreated, individuals may develop systemic symptoms of fever, loss of appetite, and fatigue. Infection may spread to the bloodstream, creating a generalized systemic infection (**bacteremia**).

Treatment of an abscess consists of draining the purulent material and **debriding** (removing) the area of dead tissue. Antibiotics are usually prescribed, especially if individuals demonstrate systemic symptoms.

Cellulitis

An acute inflammation of the tissues without **necrosis** (tissue death) is called cellulitis. When associated with intravenous drug abuse, cellulitis is caused by the invasion of a variety of organisms or by irritation of the tissues from the drug itself. The tissue becomes red and tender, and **adenopathy** (swelling of lymph nodes) may occur.

Treatment of cellulitis depends on the cause. Occasionally, cellulitis progresses to abscess formation.

Other Dermatologic Complications

Injections with nonsterile needles or injections of drugs that have been contaminated by adulterants may leave needle track scars. Injections cause a mild inflammatory reaction and, with subsequent injections, produce scarring at the injection site. Injection of a drug into an artery instead of a vein can cause an extreme reaction of intense pain, swelling, and coldness of an extremity. If this condition is not treated properly, gangrene may develop, necessitating amputation.

Cardiovascular Complications

Other than direct effects on the heart from the drug itself, most cardiovascular complications that result from drug use are related to the use of nonsterile injection techniques or to contamination of the drug with adulterants. One potential complication is **endocarditis** (inflammation of the inner lining of the

heart), which affects the valves of the heart and can have potentially serious consequences (see Chapter 13).

Some drugs have a direct toxic effect on the heart muscle or directly affect heart rhythm. In some instances, inflammation of the veins with clot formation (thrombophlebitis) may occur because of the toxic effects of the drug.

Pulmonary Complications

The intravenous injection of drugs to which adulterants such as talc, starch, or baking soda has been added may result in pulmonary complications. Because these "filler" substances do not dissolve, they circulate in the blood and may become lodged in lung tissue. The lodged particles cause an inflammatory reaction in the lungs, resulting in **fibrosis** of the lung tissue. If the fibrous changes are extensive, they may affect the oxygen-exchanging ability of the lungs. Symptoms similar to those of emphysema may develop. Changes in lung elasticity can eventually result in pulmonary hypertension and subsequent heart failure. (See Chapter 14 for a discussion of the manifestations of emphysema and Chapter 13 for a discussion of pulmonary hypertension and heart failure.)

Lung infections or lung abscesses may occur if infectious organisms become localized in the lungs after the nonsterile injection of a substance. *Aspiration pneumonia,* an inflammation of the lungs, may result from the inhalation of foreign substances or chemical irritants. Aspiration of gastric contents is also a common cause of aspiration pneumonia. Individuals who become unconscious because of a drug overdose may, in their unconscious state, vomit and subsequently inhale the vomitus. If they inhale a large quantity, the results can be fatal.

Individuals, who abuse drugs, including alcohol, may also develop *tuberculosis* (see Chapter 14). Rather than being a direct result of drug use, tuberculosis is more likely to be the consequence of the general lifestyle and living conditions of individuals who abuse drugs. Malnourishment, poor hygiene, and overcrowding all contribute to development of this infectious disease. In addition, because some drugs have an immunosuppressant effect, individuals may be more susceptible to the infection. An overdose of narcotics or sedative/hypnotics can severely depress the respiratory center, causing cessation of breathing and consequent death. Overdoses of narcotics have also been associated with development of severe **pulmonary edema** (collection of fluid in the lungs), which, without treatment, can result in death.

Gastrointestinal Complications

Because the liver acts as the detoxification center for the body, individuals who chronically abuse drugs may damage this organ. Some substances appear to be more directly harmful to the liver than others. Chronic, excessive abuse of solvents, for example, can cause liver **necrosis** (tissue death). Other substances may cause liver abnormalities such as inflammation or fibrosis.

Hepatitis is a common complication of drug abuse. *Hepatitis A* may be related to poor hygiene habits and poor environmental conditions. More commonly, *hepatitis B* (*serum hepatitis*) occurs as the result of nonsterile or contaminated intravenous injections. (See Chapter 12 for a discussion of hepatitis A and hepatitis B.)

Hepatitis C is caused by infection with the hepatitis C virus (HCV). HCV causes what was previously called *non-A, non-B hepatitis* and is transmitted through infected blood. Consequently, individuals who use intravenous drugs and share needles are at high risk for developing this disease. Hepatitis C generally

becomes a chronic disease and can predispose the individual to development of cirrhosis (Ginés et al., 2004). The only treatment currently used for hepatitis C consists of injections of interferon and ribavirin; even with treatment, approximately half of all patients will experience a relapse.

Neurological Complications

Seizures may result from an overdose of drugs or a hypersensitivity to adulterants. They are especially prevalent after an overdose of amphetamines or cocaine. In some instances, stroke may also accompany an overdose. Toxic effects of adulterants on the nervous system can lead to blindness and peripheral nerve damage.

Other Complications

The chronic use of some drugs may result in **nystagmus** (involuntary eye movement). Use of solvents can produce bone marrow changes and aplastic anemia (see Chapter 10). An overdose of drugs can result in acute renal failure, which can progress to permanent kidney damage (see Chapter 15). Individuals who abuse drugs also have a higher incidence of venereal disease, such as gonorrhea, syphilis, and chlamydia related to their general lifestyle and sexual practices. One of the most serious and hazardous complications of drug use is infection with HIV (see Chapter 10), a risk that is related to both intravenous drug use and unsafe sexual practices. Heavy use of some drugs, such as ecstasy, has been shown to induce vulnerability for cognitive disorders, and in some cases affective and anxiety disorders that may persist for more than five months after cessation of the drug's use (Thomasius, Petersen, Zapletalova, Wartberg, Zeichner, & Schmoldt, 2005).

Drug abuse during pregnancy has serious implications for the offspring. Some fetal hazards are related to lifestyle of the drug-abusing mother, which tends to result in poor prenatal care, poor nutrition, and a generally poor health status. The direct toxic effects of drugs on the developing fetus (tetratogenic effects) can include neurological and/or physical abnormalities, as well as pose dangers related to withdrawal syndrome to the infant after birth.

DIAGNOSTIC PROCEDURES

Diagnosis of a substance use disorder is often delayed or symptoms overlooked, contributing to the disorder's continued disabling effects, development of medical complications, and progression of dependence. Denial and resistance to acknowledging the problem are universal manifestations of substance abuse/dependence. Consequently, even if family members or associates have identified a substance use problem, the individual who abuses substances may not acknowledge the condition and refuse to seek treatment.

Conditions related to substance use are frequently associated with health and personal concerns. Consequently, many individuals presenting at health or counseling facilities may have coexisting or secondary substance use problems that have not been identified or diagnosed. Some professionals may feel uncomfortable questioning or confronting individuals about substance use disorders, so that diagnosis or management of the problem is further delayed. Undetected substance use problems have significant effects on the health and well-being of individuals as well as the health and well-being of their family and others.

Screening Instruments

Routine screening of individuals presenting for health care or counseling helps professionals determine whether a problem exists and whether a more in-depth assessment is needed. Several types of screening instruments are available for this purpose. One of the best-known

and widely used instruments is *CAGE*. Others include *MAST (Michigan Alcoholism Screening Test), T-ACE*, TWEAK, Alcohol Use Disorders Identification Test (AUDIT), *Substance Abuse Life Circumstances Evaluation (SALCE), MacAndrew Scale (MAC*) and *MacAndrew Scale—Revised (MAC-R),* and the *Substance Abuse Subtle Screening Inventory (SASSI*) (Piazza, Martin, & Dildine, 2000). Each screening test has its own benefits and limitations. The type of screening test used should be based on the circumstances under which the test is used as well as on specific factors related to the individual.

Direct Drug Screening

Direct testing for the presence of the substance in the body may involve *breath analyzers* and *blood alcohol tests*. Both tests serve as a measurement of intoxication, but they do not reveal the extent of abuse or dependence. Screening of blood or urine samples is also used to verify suspected substance use. As with any laboratory test, there is a possibility of false-negative or false-positive results. Newer screening methods are designed to be more sensitive and produce more accurate results.

Drug testing results are valid only if the testing is accomplished under strictly controlled conditions. Many individuals who abuse or are dependent on drugs are aware of a variety of methods to invalidate test results, such as substituting a specimen from a drug-free individual for their own specimen. The appropriate methods and times of drug screening are highly controversial. Routine screening for drugs without the individual's knowledge and consent evokes a variety of legal and ethical concerns.

Medical Evaluation

Medical diagnosis of substance use may rely on information obtained from several sources. Physical manifestations of substance abuse/dependence may include a variety of conditions. Questions about substance use practices should be routinely asked in the examination of individuals with gastrointestinal disturbances, hypertension or heart disease, liver disease, neurological changes, or a history of traumatic injuries. Blood cell abnormalities, such as a decreased number of platelets or signs of bone marrow depression (see Chapter 10), or other indirect clinical laboratory signs, such as elevated levels of *gamma-glutamyltransferase (GGT)*, *gamma-glutamyltranspeptidase (GGTP)*, and elevated *red blood cell mean corpuscular volume (MCV)* may suggest problems with substance abuse. Elevated levels of enzymes such as *serum glutamic oxaloacetic transaminase* and (SGOT) *serum glutamic pyruvic transaminase* (SGPT) may also be associated with substance abuse, although increased concentrations of SGOT and SGPT can be associated with other conditions (e.g., myocardial infarction) as well.

Behavioral and Psychological Screening

Investigation of subtle psychological or behavioral symptoms is also important in diagnosis of a substance use disorder. Depression, hyperactivity, sleeps disturbances, anxiety, sexual problems, or personality changes are common manifestations of substance use disorders. In addition, the incidence of accidents and injury is often increased.

MANAGEMENT OF SUBSTANCE USE DISORDERS

The first step in the management of a substance-related disorder is the identification and acknowledgment of the problem. Screening may be hampered by several barriers:

- Denial of the problem by the individual or family members
- Reluctance of medical and mental health personnel to confront or discuss the problem

Once the problem is identified and confronted, individuals should be assessed for the medical and psychosocial problems that typically accompany it and the level of the individual's motivation for change determined (O'Connor, 2000). Successful intervention for substance use disorders generally requires more than one level of care during the long recovery process. Specifically, intervention may involve outpatient or inpatient care along with continued outpatient care. Most individuals receiving intervention for substance use consider themselves as "recovering," denoting the long-term, chronic nature of the recovery process. Relapse is a common part of recovery. Rather than being thought of as failure, it can be viewed as an opportunity for learning and growth (American Academy of Pediatrics, 2000).

Many individuals with substance-related conditions eventually experience physical, social, or psychological crises that require inpatient or residential treatment. The precise treatment received varies greatly from facility to facility and depends on the particular type of crisis experienced. Some facilities provide treatment for substance use disorders solely on an outpatient basis. Others provide a combination of inpatient or residential and outpatient intervention.

Management usually begins with detoxification, which may or may not involve inpatient or residential intervention, depending on the individual, the specific substance of abuse, and the presence of additional complications. Detoxification is merely the initial step in the management of substance use disorders, however. Ongoing therapy that includes a variety of rehabilitation strategies, such as psychotherapy, family therapy, and self-help programs (e.g., *Alcoholics Anonymous* or *Narcotics Anonymous),* is often necessary to prevent relapse. Several psychotherapeutic approaches to the management of substance abuse exist. The specific type of therapy used often depends on the facility in which the individual is being treated and the overall philosophy of the professionals conducting the intervention. In almost all instances, however, abstinence is a management goal.

In some instances, drugs are prescribed in the ongoing management of substance dependence. Antabuse and methadone (or another opiate substitute), which were discussed earlier, are drugs commonly used in the management of alcohol dependence and opiate dependence, respectively.

Individuals with a substance use disorder may also require ongoing medical intervention for any medical complications that have resulted from the substance use. Because nutritional deficiencies frequently accompany substance use disorders, most detoxification centers and residential facilities provide nutrition therapy as a part of the management plan. Educational programs that stress the importance of nutrition and other aspects of a healthy lifestyle are often incorporated into the general management program.

PSYCHOSOCIAL AND VOCATIONAL ISSUES IN SUBSTANCE ABUSE AND DEPENDANCE

Psychosocial Issues

The extent to which psychological disability is the direct *result* of a substance-related disorder versus the *cause* of the disorder is not easily determined. Individuals with substance use disorders frequently have low self-esteem and experience depression. They may have feelings of inadequacy, loneliness, and isolation that lead to increased substance use. Individuals, when influenced and controlled by the substance used, may rely on it rather than on their own resources. They may doubt that they have the ability to cope without the substance. Consequently, their self-confidence and self-esteem may be eroded even more.

Individuals who are psychologically dependent on a substance feel a need and longing for the substance and become irritable, depressed, anxious, and resentful when the substance is not available. Individuals with a psychological craving for a substance may attribute their need to a personal flaw in their character or may consider their need to be a negative reflection on themselves. Either interpretation further contributes to lowered self-esteem and self-deprecation.

Individuals may use denial or rationalization as a form of self-protection and as a way to minimize substance use problems. They may deny that a substance use problem exists, or they may rationalize their behavior by redefining their substance use so that it appears to be acceptable. Some individuals become aggressive or perform violent acts when they are under the influence of certain substances. Those who are predisposed to this type of reaction may become involved in criminal acts, such as brawls, homicide, rape, or child abuse.

As individuals become increasingly dependent on the substance, the concept of living without it produces fear and dread. Individuals interpret removal of the substance as removal of all joy and excitement from life. As with all types of perceived loss, individuals may experience grief and bereavement.

Recovery from a substance use disorder involves restoration of self-esteem and confidence, and it requires a willingness to accept responsibility for one's personal behavior. Individuals need assistance to accept losses that they have experienced and to develop skills for coping in the future. Recovery is a continuing process that incorporates long-term vigilance and a continuing commitment to remain drug-free.

A substance-related condition affects every aspect of an individual's daily life. As dependence on the substance becomes more pronounced; individuals may lose interest in self-care, show a decreased desire for food, and experience a variety of sleep disturbances, resulting in sleep deprivation. Daily activities may become focused on obtaining more of the substance. Activities once enjoyed may offer little joy or inspire little interest.

Substance use can also affect individuals' ability to drive a motor vehicle. Poor driving performance can result in accidents or arrests, which can in turn lead to the loss of the person's driver's license. Therefore, transportation may become a problem if individuals must depend on others for their transportation needs.

Sexual dysfunction is common in individuals with substance use disorders. Women may experience decreased libido or become promiscuous. Men may experience not only decreased libido, but also adverse effects on sexual performance, including impotence—a common side effect of chronic alcohol abuse. Individuals recovering from a substance use disorder may need to learn or relearn components of a healthy lifestyle such as self-care, including hygiene and grooming, proper diet, and the importance of exercise. These aspects of daily living may be a vital part of an individual's rehabilitation.

Social effects of substance-related disorders are widespread, touching family relationships, relationships with friends and associates, and general functioning as a member of society. Individuals' ability to function as a member of a social group may gradually deteriorate as substance use increases. To some extent, social factors may determine the social implications of substance use. For example, the availability of substances within a group or as part of a social event may determine whether individuals with a condition related to substance use participate in the activity.

The extent of social tolerance of individuals' behavior while intoxicated may either curtail or enhance substance use at first. As individuals become increasingly dependent on the substance, however, the substance takes on an

increasing importance. Conversely, the importance assigned to individuals' social contacts and activities declines.

Individuals with a substance-related condition may be unable to function within their social network. Repeated, heavy use of the substance often leads to upheavals in relationships. Social and family relationships are strained and often destroyed if individuals become abusive, or violent, or if they engage in socially unacceptable behavior while under the influence of the substance. Individuals' behavior often alienates others, leading to social isolation. Decreasing reliability in performance of social roles and inability to maintain commitments cause those affected by the individual's deterioration in behavior to feel disappointed and angry. Others in the social environment may have to alter their own roles to assume duties that the individual once fulfilled. This shifting of responsibilities places additional burdens on all concerned and may eventually lead to resentment or even banishment of the individual from the group. Family members and associates may begin to withdraw from the individual emotionally. As individuals become increasingly more isolated, feelings of self-loathing, guilt, and shame may develop. Feeling rejected by family and associates, individuals may limit their social contacts to relationships with others who also engage in substance use.

The broader social consequences of substance-related conditions may have legal and even criminal implications. As mentioned earlier, there is a strong correlation between substance use disorders and a variety of accidents rates. Motor vehicle accidents, for example, can lead to physical disability not only for the individual with the substance use disorder, but also for others. Thus the loss of a driver's license and the threat of more serious criminal charges are potential outcomes of substance use disorders. Furthermore, individuals who become dependent on illegal substances may engage in illegal activities to obtain money with which to purchase additional drugs. Even if individuals do not face criminal charges, they can become overly focused on obtaining the drug rather than on functioning in a productive social role.

In some cases, family and social relationships can be salvaged in the recovery process. In other instances, loss of these relationships is permanent. Depending on individual circumstances, therapeutic recovery may involve the development of new social roles and relationships or the reestablishment of old ones.

Vocational Issues

In the early stages of a substance-related condition, individuals may be concerned that the use of the substance will interfere with their work. If substance uses progresses to abuse or dependence, however, concern may be reversed such that individuals become more concerned that their work will interfere with their use of the substance. The substance assumes a penultimate role in the person's life, drastically affecting his or her work performance.

Although early identification of and intervention with workers with a substance use disorder are most desirable, the problem may not be recognized until a progressive deterioration of work performance, increased absenteeism, or an increase in job-related accidents occurs. Fear that they will lose their jobs if their employers become aware of these indicators may motivate individuals with a substance use disorder to seek treatment.

The ability of individuals to return to their former employment after intervention for a substance use disorder depends on the circumstances. In some instances, the stress and tension associated with the job may be beyond individuals' stress tolerance and coping ability. It may be beneficial to find a less stressful work setting, especially in the early stages of recovery, until the individual's tolerance for

stress gradually increases. Physical disability resulting from a substance use disorder must also be considered when evaluating vocational potential.

It is essential to identify past work problems, which may extend beyond issues of substance abuse/dependence. Some individuals may need to learn social skills, work-appropriate behaviors, or good hygiene or grooming practices; some need to improve their work skills. Individuals who began abusing substances at an early age may not have developed sufficient work skills or work history to obtain employment. These individuals in particular may require additional education or job training. If individuals return to the same work setting that originally precipitated feelings of inadequacy, which in turn contributed to development of substance abuse/dependence, the return to work may increase the risk of relapse. In some cases, learning new skills or coping strategies may enable individuals to return successfully to the same work setting. In other instances, however, a new work environment may be necessary.

Loss of a driver's license because of a substance-related condition may make transportation to and from work more difficult. In addition, if driving a motor vehicle had been part of the former employment, job restructuring or job change may be necessary. Some occupations require professional licensure, therefore, revocation of an individual's license as a result of a substance use disorder may limit his or her ability to work in that occupation. Many professional licensing boards have provisions for the reinstatement of licensure after documented rehabilitation. If the professional license is reinstated, there may be a probationary period in which the individual's work performance is closely observed and monitored.

Conviction on criminal charges—especially felony charges—may disqualify individuals from employment in some occupations. Although decisions may be made on a case-by-case basis, such charges and their impact on employment in different fields and in different locations must be considered. As with most disabilities, the attitudes and concerns of employers must be addressed, especially given the social stigma that is often attached to substance use disorders. Employers may require particular encouragement to reinstate or hire individuals who have been convicted of criminal charges. Recognizing the potential for rejection by employers based on these attitudes, recovering individuals may be reluctant to share their complete history with employers or may become defensive when asked questions about substance use. Fear of rejection because of prejudice must be considered when the individual returns to work. With increasing awareness of substance use disorders, and with educational efforts directed toward employers, however, individuals may encounter decreasing levels of prejudice.

Many individuals who are recovering from substance use disorders return to their original employment and lead full productive lives. In all instances, however, abstinence is a prerequisite for continuing productivity. Ongoing long-term treatment or involvement with self-help groups may also be necessary to prevent relapse.

CASE STUDIES

Case 1

Mr. K. is a 42-year-old male with a high school education. He is a construction worker who has been a social drinker since his early twenties. His drinking has gradually intensified over the years, and family and friends have repeatedly confronted him about his drinking. On several occasions, Mr. K. was inebriated on the job, and his employer asked him

not to return to work. He is divorced from his first wife, with whom he has two children, and is responsible for child support. His second wife of five years recently left him and is seeking a divorce. After being convicted on a DUI charge and being arrested for disorderly conduct, Mr. K. was referred to a residential treatment facility. He is now in outpatient treatment.

1. When working with Mr. K. to develop a rehabilitation plan, which significant factors would you consider about Mr. K.'s situation?
2. How will social factors influence Mr. K.'s effective rehabilitation?
3. Which additional information would you want to know about Mr. K. to work with him on his rehabilitation plan?
4. Which types of services might be effective for Mr. K.'s rehabilitation?

Case 2

Ms. B. is a 27-year-old schoolteacher who began using cocaine several years ago when she started dating her current boyfriend. Her use of the drug increased, and she has begun to use crack cocaine along with alcohol. Ms. B. was recently dismissed from her job when she was caught stealing money from her office mate's purse. She sought treatment and is currently in counseling. She is very concerned about her future with regard to work.

1. Which factors would you consider when working with Ms. B.?
2. Given Ms. B.'s education and past work history, which specific issues must you consider?
3. What specific information might you want to obtain when helping Ms. B. develop a rehabilitation plan?

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