

---

# Diagnosis & Treatment of Drug Abuse in Family Practice

---

This American Family Physician monograph is made possible with federal funds from the National Institute on Drug Abuse. The information presented and opinions expressed herein are those of the authors and do not necessarily represent the views of the sponsor or its parent agencies, the National Institutes of Health or the United States Public Health Service; American Family Physician, or its publisher, the American Academy of Family Physicians. Any recommendation made by the authors must be weighed against the physician's own clinical judgment, based on but not limited to such factors as the patient's condition, benefits versus risks of suggested treatment and comparisons with recommendations of pharmaceutical compendia and other authorities.



■ Index	p 1
■ Introduction	p 2
■ Definitions	p 3
■ Epidemiology	p 4
■ Pathophysiology	p 7
■ Assessment	p 8
■ Treatment	p10
■ Prevention	p14
■ Final Comment	p16
■ References	p16

Cover illustration by  
Carol Donner, Tucson, Arizona

---

**Alan I. Trachtenberg, M.D., M.P.H.**

Medical Officer, Science & Policy Analysis Branch  
Office of Science Policy, Education & Legislation  
National Institute on Drug Abuse  
National Institutes of Health  
Rockville, Maryland

**Michael F. Fleming, M.D., M.P.H.**

Director of the Office of Alcohol and Addiction Studies  
Department of Family Medicine and Practice  
University of Wisconsin, Madison, Medical School  
Madison, Wisconsin

Prepared by Health Science Communications, Inc., New York, N.Y., based on interviews with and reviews by Alan I. Trachtenberg, M.D., M.P.H., and Michael F. Fleming, M.D., M.P.H. This American Family Physician monograph has been funded with federal funds from the National Institute on Drug Abuse, National Institutes of Health, under Contract No. N01DA3-2400.

---

The cover above depicts a stimulant drug (in green) such as cocaine or amphetamine penetrating the blood-brain barrier and causing an increase of extracellular dopamine (in white) in the nucleus accumbens. This causes behavioral reinforcement of drug self-administration.

---

For additional information about NIDA, send e-mail to  
[information@nida.nih.gov](mailto:information@nida.nih.gov).

# Introduction

Abuse of drugs (including alcohol and tobacco) is the number one cause of preventable illness and death in the United States [1]. In the past 15 years, the ever-increasing number of cases of acquired immunodeficiency syndrome (AIDS) has forced the medical consequences of substance abuse into the public's consciousness. Yet AIDS is only the highly visible tip of an enormous iceberg. Each year, more than 500,000 deaths - or over one in four - in the United States are attributable to abuse of alcohol, tobacco or other drugs [2].

Equally devastating is the morbidity caused by the use of illegal and legal drugs (*Table 1 below*). In terms of demands on health care resources and loss of productivity, the cost of substance abuse is tremendous, whether attributable to cancer and cardiopulmonary disease from tobacco, cirrhosis and vehicular crashes from alcohol, falls and oversedation from misuse of prescription drugs, or bacterial and viral infections (including human immunodeficiency virus) associated with injection of illicit drugs.

**TABLE 1**  
**Complications of Injection Drug Use**

### Pulmonary complications

<ul style="list-style-type: none"> <li>● <b>HIV-related or increased in incidence with HIV infection</b> <ul style="list-style-type: none"> <li>○ Pneumocystis</li> <li>○ Bacterial pneumonias</li> <li>○ Opportunistic infections, e.g., <i>Rhodococcus equi</i>, <i>Nocardia</i></li> <li>○ Tuberculosis, especially involving strains resistant to multiple drugs</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>● <b>Cocaine-related</b> <ul style="list-style-type: none"> <li>○ Focal air-space disease</li> <li>○ Atelectasis</li> <li>○ Alveolar hemorrhage</li> <li>○ Pneumothorax and mediastinum</li> <li>○ Bronchiolitis obliterans</li> <li>○ Pulmonary edema</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>● <b>Focal infections and injection complications</b></li> </ul>
<ul style="list-style-type: none"> <li>● <b>Pneumothorax</b> <ul style="list-style-type: none"> <li>○ Hemothorax and pyopneumothorax</li> <li>○ Cellulitis, abscess, or pseudoaneurysm</li> <li>○ Septic thrombophlebitis with pulmonary emboli or endocarditis</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>● <b>Microemboli, due to nonsoluble additives</b> <ul style="list-style-type: none"> <li>○ Starch, talc-producing pulmonary granuloma and angiothrombosis and emphysema</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>● <b>Complications of inhalation</b> <ul style="list-style-type: none"> <li>○ Reduced pulmonary function in intravenous drug users who are cigarette smokers</li> <li>○ Pulmonary aspergillosis in users of contaminated marijuana</li> </ul> </li> </ul>

### Cardiovascular complications

<ul style="list-style-type: none"> <li>● <b>Cocaine-associated</b> <ul style="list-style-type: none"> <li>○ Coronary artery constriction with angina and myocardial infarction</li> <li>○ Cardiomyopathy</li> <li>○ Rhabdomyolysis with chest pain mimicking anginal pain</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>● <b>Endocarditis</b></li> </ul>

### Musculoskeletal

<ul style="list-style-type: none"> <li>● <b>Rheumatologic prodrome of hepatitis B antigenemia</b></li> </ul>
<ul style="list-style-type: none"> <li>● <b>Chronic amyloidosis</b></li> </ul>
<ul style="list-style-type: none"> <li>● <b>Bone and joint infections in injecting drug users (IDUs), especially due to <i>Candida</i> and gram-negative bacilli (particularly <i>Pseudomonas</i>)</b></li> </ul>
<ul style="list-style-type: none"> <li>● <b>Muscle and skin infarction</b></li> </ul>
<ul style="list-style-type: none"> <li>● <b>Rhabdomyolysis, sometimes accompanied by shock and renal failure</b></li> </ul>
<ul style="list-style-type: none"> <li>● <b>Small-vessel angiitis</b></li> </ul>

### Septicemia and disseminated infections

<ul style="list-style-type: none"> <li>● <b>Group A, beta-hemolytic streptococci</b></li> </ul>
<ul style="list-style-type: none"> <li>● <b><i>Candida albicans</i> fungemia syndrome</b></li> </ul>
<ul style="list-style-type: none"> <li>● <b>Fungal ophthalmitis</b></li> </ul>
<ul style="list-style-type: none"> <li>● <b>Fungal brain abscess</b></li> </ul>
<ul style="list-style-type: none"> <li>● <b>HIV-related</b> <ul style="list-style-type: none"> <li>○ Aspergillosis</li> <li>○ <i>Rhodococcus equi</i> infection</li> <li>○ Listeriosis</li> <li>○ Nocardiosis</li> <li>○ Salmonellosis</li> <li>○ Pyomyositis</li> <li>○ <i>Borrelia</i> infection</li> <li>○ Pericarditis due to <i>Bacillus cereus</i></li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>● <b>Cocaine sinusitis</b> <ul style="list-style-type: none"> <li>○ <i>Clostridium botulinum</i> infection</li> <li>○ Pott puffy tumor</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>● <b>Syphilis</b></li> </ul>
<ul style="list-style-type: none"> <li>● <b>Hepatitis</b></li> </ul>
<ul style="list-style-type: none"> <li>● <b>Renal disease</b></li> </ul>

Adapted from Cherubin CE and Sapira JD. The medical complications of drug addiction and the medical assessment of the intravenous drug user: 25 years later. *Ann Intern Med* 1993;119:1017-46. Used with permission.

Fortunately, treatment can be effective, probably to a greater degree when substance abuse disorders are identified early. In this regard, family physicians can play a pivotal role. They are well positioned to make the diagnosis because patients frequently seek medical care for the complications of drug and alcohol abuse. In addition, family physicians have an expanding role in the treatment of substance abuse as a result of recent advances in the understanding and pharmacologic management of addictive disorders.

This monograph highlights the lessons derived from the past 20 years of research concerning the diagnosis and treatment of drug abuse and addictive disorders. Because a great deal remains to be learned, however, family physicians must continue to use their best clinical judgment in areas where definitive answers are not established. In drug abuse, it is especially important to remain abreast of new developments that substantiate or refute current clinical practice.

## Definitions

Formal attempts to standardize the definitions of terms used to describe drug and alcohol disorders have not been entirely successful for a variety of reasons. Nevertheless, a common vocabulary is needed. The following are working definitions often employed by health care professionals who specialize in drug and alcohol disorders. More exacting, criteria-based definitions, which are more suitable for research purposes, can be found in the Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised (DSM-III-R), of the American Psychiatric Association.

### Psychoactive Substance Use

Drugs may be used in a socially accepted or medically sanctioned manner to modify or control mood or state of mind. Examples include having a drink with a friend or taking an antianxiety agent for an acute anxiety state in accordance with a physician's prescription.

### Psychoactive Substance Abuse (Or Problematic Use)

The use of a substance to modify or control mood or state of mind in a manner that is illegal or harmful to oneself or others is considered problematic use, or abuse. Examples of the potential consequences of harmful use include accidents or injuries, blackouts, legal problems and sexual behavior that increases the risk for HIV infection.

### Addiction

Addiction is characterized by the repeated, compulsive seeking or use of a substance despite adverse social, psychologic and/or physical consequences. A wide range of substances, both legal and illegal, can be abused addictively (see Common Substances of Abuse) [3-14].

Addiction is often (but not always) accompanied by physical dependence, a withdrawal syndrome and tolerance. *Physical dependence* is defined as a physiologic state of adaptation to a substance, the absence of which produces symptoms and signs of withdrawal.

*Withdrawal syndrome* consists of a predictable group of signs and symptoms resulting from abrupt removal of, or a rapid decrease in the regular dosage of, a psychoactive substance; the syndrome is often characterized by overactivity of the physiologic functions that were suppressed by the drug and/or depression of the functions that were stimulated by the drug.

*Tolerance* is a state in which a drug produces a diminishing biologic or behavioral response; in other words, higher doses are needed to produce the same effect that the user experienced initially.

It is possible to be physically dependent on a drug without being addicted to it, and conversely, it is possible to be addicted without being physically dependent [15]. An example of physical dependence without addiction is the patient with cancer who becomes tolerant of and physically dependent on the opiates prescribed to control pain. Such a patient may undergo withdrawal with discontinuation of the usual dose but will not experience social, psychologic or physical harm from using the drug and would not seek out the drug if it were no longer needed for analgesia [16]. In comparison, addiction without physical dependence may be seen in a person who uses marijuana to such a degree that it interferes with psychosocial functioning but the person does not experience physical discomfort with discontinuation. Addiction is also still present in the newly detoxified heroin addict who no longer suffers from withdrawal or tolerance but nevertheless craves the opiate high and will invariably relapse

to active heroin abuse without further treatment.

Factors contributing to the development of addiction include the reinforcing properties and availability of the drug, family and peer influences, sociocultural environment, personality and existing psychiatric disorders. Genetic heritage appears to influence susceptibility to alcohol addiction, and possibly addiction to tobacco and other drugs as well [17].

## Detoxification

Detoxification is the process by which an individual who is physically dependent on a substance is withdrawn from it, often by gradual administration of decreasing doses of the drug of dependence or of a cross-tolerant drug. The primary objective of detoxification is to relieve withdrawal symptoms while the patient adjusts to a drug-free state. It is not, in itself, a treatment for addiction, because it does not affect the long-term course of addiction.

## Relapse

The return to drug use after a significant period of abstinence is termed relapse. It is a characteristic of addiction. Relapses may occur over a period of years, because continued recovery requires a series of profound behavioral, social, psychologic and physiologic changes.

## Epidemiology

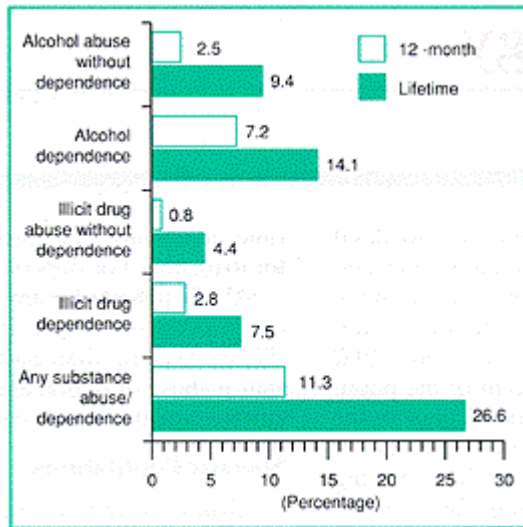
Although use of alcohol, tobacco and illicit drugs has been declining, a significant percentage of the U.S. population uses at least one of these substances [1]. Alcohol is the most commonly used psychoactive substance; in a 1992 survey, approximately 48 percent of the population surveyed had consumed alcohol in the past month and 26 percent smoked tobacco [5]. Approximately 11 percent acknowledged using illicit drugs in the past 12 months (See Table 3 below) [6].

**TABLE 3: Estimated Percentage of Illicit Drug Usage in the United States Population According to Gender, Age and Race**

	Ever Used	Used Past Year	Used Past Month
<b>Total Population</b>	36.2 %	11.1 %	5.5 %
<b>Gender</b>			
<b>Male</b>	41.0 %	13.4 %	7.1 %
<b>Female</b>	31.7 %	9.0 %	4.1 %
<b>Age (Years)</b>			
<b>12 - 17</b>	16.5 %	11.7 %	6.1 %
<b>18 - 25</b>	51.7 %	26.4 %	13.0 %
<b>26 - 34</b>	60.8 %	18.3 %	10.1 %
<b>35 +</b>	28.0 %	5.1 %	2.2 %
<b>Race</b>			
<b>Caucasians</b>	37.7 %	11.3 %	5.5 %
<b>Hispanics</b>	29.2 %	10.8 %	5.3 %
<b>African Americans</b>	33.6 %	11.5 %	6.6 %

Source: National Household Survey on Drug Abuse: Population Estimates 1992 [6]

The prevalence of heavy use in the general population - in terms of prevalence, heavy use appears to be more stable than mild or moderate use [1] - has been the subject of many studies. The most recent and representative study was conducted in 1991 with a complex sample representing the entire noninstitutionalized U.S. population aged 15 to 54 years in the 48 contiguous states [18]. Using face-to-face interviews to evaluate more than 8,000 people according to the DSM-III-R criteria for substance abuse or dependence, the investigators found a lifetime prevalence of approximately 7.5 percent for drug abuse or dependence and of approximately 27 percent for any substance-use disorder in persons between 15 and 54 years of age (See Figure 1 below). Less than half of those with substance abuse or dependence had ever received any treatment for these conditions.



**FIGURE 1: Prevalence of substance abuse and dependence in the general population.**

[Adapted from Kessler RC, McGonagle KA, Zhai S et al. Lifetime and 12 month prevalence of DSM-III-R psychiatric disorders in the United States: results from the National Comorbidity Survey. Arch Gen Psychiatry 1994; 51:8-19]

## Specific Populations

Although addictive disorders are widespread in the general population, their manifestations and the opportunities provided for specific interventions may vary widely among certain demographic groups. An understanding of these specifics is helpful for ensuring diagnosis and treatment.

### Adolescents and Young Adults

Persons between 18 and 25 years of age are the most likely to use illicit drugs. The age at which an adolescent begins using alcohol and illicit drugs is a powerful predictor of later alcohol and drug problems, especially if use begins before age 15 [1].

Teenagers use alcohol and tobacco more than any other drug. The incidence of heavy use of alcohol - defined as having five or more drinks in a row during the previous two weeks - peaked at 41 percent among high school seniors in the early 1980s. Since then, it has dropped to 29.8 percent, which is still quite high [19].

Use of most illicit drugs by adolescents increased significantly in 1993, reversing the downward trend that had been observed for several years [20]. Among high school seniors, the current lifetime prevalence of any illicit drug use is 42.9 percent, and the prevalence of any illicit drug use in the past year is 31 percent. In particular, use of marijuana, lysergic acid diethylamide (LSD) and inhalants increased in 1993. Current data indicate that marijuana has been used at least once by 12.6 percent of eighth graders and by 35.3 percent of high school seniors. About 3.5 percent of eighth graders and 10.3 percent of seniors have used LSD. Of particular concern is the finding that inhalants such as glues and solvents have been tried by 19.4 percent of eighth graders and by 17.4 percent of seniors. The powder form of cocaine has been used by 2.9 percent of eighth graders and 6.1 percent of seniors; crack has been tried by 1.7 percent of eighth graders and by 2.6 percent of seniors.

Typically, the adolescent whose drug involvement progresses to substance abuse begins with commercially available drugs such as alcohol and tobacco, progresses to using marijuana and goes on to using other drugs or combinations of drugs. For this reason, cigarettes and alcohol are sometimes

called "gateway" drugs. Polydrug use is more common among adolescents than adults [21]. Among tobacco smokers 12 to 17 years of age, two-thirds have also used an illegal drug, and among those smoking more than one pack per day, four-fifths have used an illegal drug.

The leading cause of death among people between 15 and 24 years of age is violence, including accidents, homicides and suicides; many of these deaths can be attributed to the use of drugs and alcohol [22]. Nevertheless, young people are rarely aware of or concerned about the dangers of drug abuse. This is typical of adolescents' attitudes toward most risky behaviors: they are unwilling to appreciate the long-term consequences of many of their actions, particularly when admonished by their parents or other authority figures. However, if a trusting therapeutic relationship has been established, the family physician may have a unique opportunity to advise the preadolescent or teenager on the dangers of substance abuse. Health guidance should be given annually to all adolescent patients to promote avoidance of tobacco, alcohol and other abusable substances [23].

## **Pregnant Women**

During pregnancy, at least 25 percent of women use nicotine, and 5 to 8 percent are at risk for alcohol-related prenatal problems; the prevalence of illicit drug use in pregnant women is unclear, but it appears to be lower than that of nicotine and alcohol use [24]. Women who use drugs during pregnancy have increased rates of meconium staining, fetal-monitor abnormalities, precipitous delivery, abruptio placentae and premature delivery [25]. Infants born to addicts may be more likely to have birth defects, because most addicted mothers also abuse alcohol, a known teratogen. Even occasional use of alcohol, tobacco or illicit drugs should be identified and discouraged in pregnant women.

It is particularly important to avoid fetal exposure to teratogens during the first trimester. However, if drug exposure has occurred, it is inappropriate to discontinue treatment efforts on the grounds that the "damage has already been done." Good nutrition and abstinence from drugs (except those prescribed by the physician) through the second and third trimesters often allow the fetus to "catch up" with normal growth and development, at least to some degree [26]. Likewise, a nurturing and stimulating environment may provide similar benefits to the infant after birth.

Treatment of addicted pregnant women should include prenatal care, parenting and childbirth classes and home visits by public health nurses, as well as treatment of chemical dependence. However, referral to a treatment program is possible only when the physician is attuned to the signs of addiction in pregnant women. These may be elicited during careful history-taking and physical examination. In addition, urinary toxicologic testing may be a useful means of confirming drug abuse suggested by findings in the history or physical examination, such as no or late prenatal care or the presence of multiple sexually transmitted diseases. Care should be taken so that urine testing does not initiate a cascade of events leading automatically to criminal penalties or loss of child custody. This can generally be achieved by handling urine specimens in the usual clinical way, which does not document the chain of custody required for legal evidence, and by physician advocacy for the benefit of the maternal-fetal unit and family.

Treatment of heroin addiction during pregnancy is particularly important. The street drug can produce wide swings in blood levels, from intoxication to withdrawal, that can lead to premature labor, spontaneous abortion and other severe adverse effects. In addition, heroin is often contaminated with teratogenic substances [27]. The indicated treatment for heroin addiction during pregnancy is methadone maintenance, which produces a fairly constant and safe physiologic effect. Pregnancy increases methadone metabolism, and some patients require two doses per day to maintain stable blood levels as pregnancy progresses.

Infants born to mothers maintained with methadone may be physically dependent on opioids; however, they are not addicted and are easily treated in the nursery. Unmonitored intrauterine withdrawal is much more dangerous. While lower doses of methadone are less likely to cause withdrawal symptoms in the neonate, the most important dosing consideration is giving the patient an amount sufficient to prevent relapse to heroin, with all its associated risks to mother and fetus. Prescribed methadone use is compatible with breast-feeding. However, maternal infection with HIV or human T-cell lymphotropic virus I/II often precludes breast-feeding by women who have injected heroin.

## **The Elderly**

With age comes a higher incidence of chronic painful physical disorders that may be treated with substances that have the potential for abuse. Vulnerability to addiction may be increased by feelings of anger, depression, anxiety, resentment at being dependent and frustration with deteriorating vision, hearing and agility [28]. Undiagnosed chronic depression may predispose to benzodiazepine use and subsequent long-term abuse and addictive problems in later life [29].

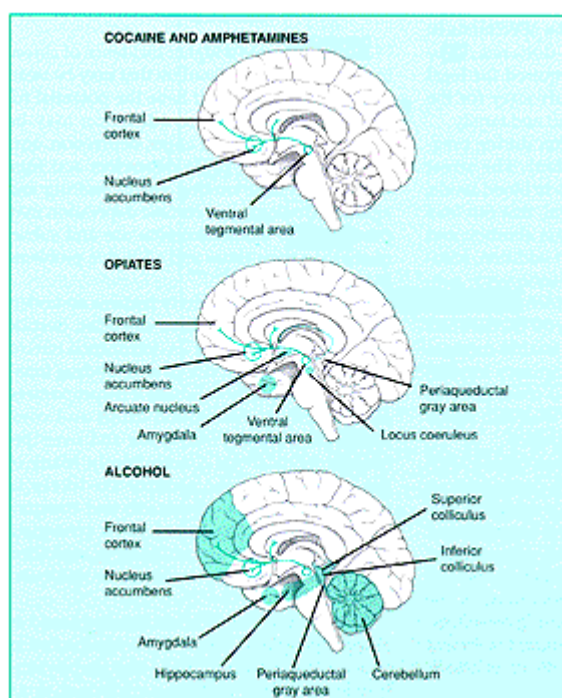
Alcoholism in the elderly remains an underreported and often hidden disorder, despite increasing awareness of its detrimental effects. These include a high risk of alcohol-drug interactions. The elderly

consume a disproportionate amount of prescription drugs and commonly use several prescription and over-the-counter medications concomitantly. Many of the medications the elderly are likely to take - including antidepressants and tranquilizers - interact with alcohol, often synergistically. Such interactions can result in aspiration pneumonia, falls, hip fractures or vehicular accidents [30]. Substance abuse is often misdiagnosed in elderly people, because such symptoms as changes in cognition, behavior or physical functioning tend to be misattributed to an underlying medical condition or simply old age. A thorough understanding of what constitutes normal age-related changes will help family physicians make the correct diagnosis [28].

## Pathophysiology

The primary factor in the development of addiction is neurophysiologic reinforcement (reward). One specific mesolimbic "reward pathway" has been identified in the brain [31], and others may exist. This pathway involves dopaminergic neurons that originate in the ventral tegmental area (VTA) and project into the forebrain, particularly the nucleus accumbens (See Figure 2 below). The dopaminergic neurons are probably under continuous inhibition in the VTA, perhaps by gamma-aminobutyric acid (GABA). Release of dopamine from these neurons onto the dopamine receptors in the nucleus accumbens produces positive reinforcement.

**FIGURE 2: Reward Pathways in the Brain.** Animal studies suggest the existence of at least one central reward-reinforcement pathway for drug self-administration in the human brain. The stimulant-reward system (*top*) directly influences the neurons using dopamine that connect from the ventral tegmental area (VTA) to the nucleus accumbens (NA) and thereafter to the frontal cortex. The opioid system (*middle*) appears to involve structures such as the periaqueductal gray area, arcuate nucleus, amygdala and locus coeruleus, which use peptides that mimic the action of drugs such as heroin and morphine and indirectly influence the NA in a manner similar to that of stimulants. Alcohol and other sedative-hypnotics (*bottom*) also indirectly affect the VTA-NA reward system. This effect is mediated by GABA receptors, which are distributed widely and which influence the central dopaminergic reward system through mechanisms that include opioid pathways.



(Adapted from Brain concepts: drugs and the brain. Washington, DC: Society for Neuroscience, 1992.)

Most stimulants - including cocaine, amphetamines and nicotine - exert their actions by elevating the synaptic levels of dopamine, norepinephrine and serotonin. Cocaine inhibits the monoamine reuptake mechanism, which is the primary mechanism for terminating transmitter action. Chronic cocaine self-administration appears to alter receptor sensitivities in the nucleus accumbens and other parts of the reward/reinforcement system [32]. Amphetamine stimulates the release of dopamine and norepinephrine and blocks their reuptake. Nicotine appears to exhibit its central effects through an interaction with nicotinic acetylcholine receptors that contain an integral transmembrane sodium channel [33]. Agonist binding leads to channel opening and depolarization responses.

Alcohol and sedatives such as the benzodiazepines and barbiturates are mood-altering drugs that depress the level of central nervous system arousal. They are believed to enhance the actions of the inhibitory neurotransmitter GABA, which are mediated by the GABAA receptor [33]. When GABA is released in the synaptic cleft, it binds to its receptor and opens chloride channels; this, in turn, hyperpolarizes the membranes, thereby lowering cell excitability. The long-term cellular changes

engendered by this recurring process seem to interact with the reinforcement pathways through mechanisms that include the endogenous opioid systems, since craving for alcohol can be at least partially blocked by the opiate antagonist naltrexone (Trexan). Benzodiazepines and barbiturates also open the chloride channels through their actions at specific receptors. Ethanol does not appear to have a specific receptor, but it also interacts with the GABAA receptor complex.

The etiology of opioid addiction seems to involve at least some of the same final pathways (opioid systems to VTA to nucleus accumbens). Physical dependence and withdrawal syndromes are mediated by separate anatomical pathways and are now understood not to be a central feature of addiction. However, physical dependence and withdrawal syndromes are nonetheless clinically relevant and are related to changes in the reactivity of transmitter systems such as norepinephrine under tonic inhibition by endogenous opioid peptides or exogenous opiates. Thus, the opiate withdrawal syndrome includes a strong component of central adrenergic overflow. Physical dependence appears to be less of a problem with some drugs of abuse, including anabolic steroids, the cannabinoids, phencyclidine (PCP) and hallucinogens.

The potential for relapse in alcohol and drug addiction appears to persist indefinitely. The addicted person and the physician must be aware of this enduring risk. The acute craving may disappear after several weeks or months, but the relapse trigger may occur spontaneously at any time. Triggers may be purely internal or may be environmental, as in turning a corner and seeing a place or a person associated with addictive behavior in the past.

## Assessment

### History

Screening for alcohol and drug disorders can either be incorporated into routine history taking or can be done when a patient presents with specific problems associated with problematic use of drugs or alcohol (*Table 1 and Table 4 (below)*). Most patients should be asked whether they use tobacco and about how much alcohol they use. This flows naturally as part of taking a social history or immediately after reviewing the patient's allergies and use of prescribed medications, OTC preparations, vitamins and supplements, alcohol, tobacco and then other drugs. Few patients will be found to abuse other drugs who are not also tobacco addicts.

---

**TABLE 4**  
**Common Psychosocial Manifestations of**  
**Mild to Moderate Drug Disorders**

#### **Psychological/Behavioral**

Agitation, irritability, dysphoria, difficulty in coping, mood swings, hostility, violence, psychosomatic symptoms, hyperventilation, generalized anxiety, panic attacks, depression, psychosis

#### **Family**

Chronic stable family dysfunction, marital problems, behavioral problems and decline in school performance in children, anxiety and depression in family members, divorce, abuse and violence

#### **Social**

Alienation and loss of old friends, gravitation toward others with similar lifestyle

#### **Work/School**

Decline in performance, frequent job changes, frequent absences (especially on Mondays), requests for work excuses, initial preservation of work or school function among highly motivated groups such as professionals in practice or training

#### **Legal**

Arrests for disturbing the peace or driving while intoxicated, stealing, drug dealing

#### **Financial**

Borrowing or owing money, selling personal or family possessions

*Adapted from Brown RL. Identification and office management of alcohol and drug disorders. In: Fleming MF, Barry KL, eds. Addictive disorders. St. Louis: Mosby Year Book 1992. Used with Permission.*

---

The patient is far more likely to respond to questions regarding drug use if the physician remains empathic, respectful and nonjudgmental. When utilizing a direct approach, the physician should ask specifically about the amounts and frequency of alcohol use and other drug use in the past month, week and day. If the patient denies recent use, it is appropriate to ask about previous history to determine whether the patient has ever abused alcohol or used other drugs. Even currently abusing patients in denial may be able to reveal excessive substance use in the distant past. If the patient currently uses alcohol, the physician should determine how many days per week, on average, the patient has done so during the past three months, how much alcohol was consumed on each occasion and, especially, whether the patient ever consumes five or more drinks at a time. In addition, the physician should ask whether the patient has used marijuana more than five times in his or her life; statistically, use of marijuana on more than five occasions seems to correlate with an increased likelihood of substance abuse. Use of prescriptions from multiple doctors and use of illicit drugs should be specifically investigated.

If the patient's answers raise concern, the physician should try to elicit information about the effects of the alcohol or drug use on the patient's life. Problems may exist with his or her health, family, job or financial status or with the legal system. The patient may admit to a history of blackouts or motor vehicle crashes. Also, the patient may be aware that a family member or friend has been affected by the patient's drinking or drug use.

This line of questioning provides the physician with a quick means of learning the extent and consequences of the patient's drug and alcohol use. The disadvantage is that the physician may have difficulty estimating the true extent of the problem if the patient gives vague or deceptive responses. If the physician is unable to get a sense of the patient's problem from these unstructured questions, an alternative approach is to ask the following four "CAGE" questions:

Have you felt that you ought to cut down on your drinking or drug use?

Have people Annoyed you by criticizing your drinking or drug use?

Have you felt bad or Guilty about your drinking or drug use?

Have you ever had a drink or used drugs first thing in the morning (Eye Opener) to steady your nerves, to get rid of a hangover or to get the day started?

Any positive answer should be pursued. For example, if the patient admits to feeling guilty about drinking, an attempt should be made to find out specifically why. A positive answer to two or more of these questions suggests the need for additional assessment of drug or alcohol problems.

If the physician senses that the patient may feel threatened by this direct approach, a more subtle style of questioning may be indicated. The physician can first obtain a general social history to assess the potential consequences of alcohol or drug use. It is useful to begin with open-ended questions such as "What brought you here?" or "What's going on in your life?" Use of standard interview techniques such as paraphrasing the patient's responses and acknowledging their emotional content will help build rapport and minimize the patient's defensiveness. Eventually, the patient may reveal problems such as marital difficulties or legal or financial trouble, which may signal a drug or alcohol problem. Responding to these difficulties with a sympathetic, nonjudgmental attitude can encourage a considerable degree of openness in the patient. Then, when the questions about drug and alcohol use are asked, the patient may give more honest answers than he or she would have otherwise.

The disadvantage of this approach is that it can be relatively time-consuming. For family physicians who want to utilize a routine method of screening for drug abuse with all new patients, the 10-question Drug Abuse Screening Test (DAST-10) may be a useful form to include in patient questionnaires.

### **Physical Exam and Laboratory Tests**

Early drug abuse disorders are rarely diagnosed on physical examination. A few cases of alcohol abuse are signaled by labile or refractory hypertension or mild upper abdominal tenderness. Some cases of cocaine snorting can be identified by damaged nasal mucosa and some instances of injection drug abuse by hypodermic marks. The single most useful examination is of the eyes. Nystagmus is often seen in abusers of sedatives/hypnotics or cannabis. Mydriasis is often seen in persons under the influence of stimulants or hallucinogens or in withdrawal from opiates. Miosis is a classic hallmark of opioid effect. Evidence of multiple minor (or past major) injuries can also be an indication of substance abuse.

Most laboratory tests for alcohol abuse identify end-organ damage (e.g., impaired liver function and hematologic disorders) rather than the primary disorder [34]. However, sometimes spot checks of urine or breath may reveal the presence of alcohol that would not have otherwise been noticed by the

clinician. Likewise, urine testing for drugs of abuse can be very helpful when positive, but the limited slice of time reflected by urine tests for most drugs, other than the lipid-soluble cannabinoids, renders urine testing relatively insensitive for intermittent drug abuse. Testing of hair for drugs of abuse may eventually become a useful adjunct because hair content reflects drug use over a longer period of time; however, false positives due to environmental exposure and false negatives due to various technical problems are common.

### **Barriers to Diagnosis**

Denial is the major barrier to the diagnosis of addictive disorders [34]. Some patients may not recognize their denial, whereas others intentionally refuse to acknowledge an addiction because they are apprehensive about being able to satisfy their drug craving and afraid of the consequences of discovery. Thus, persuading the patient to acknowledge the addictive disorder can be difficult. It is generally counterproductive to tell the patient flatly that he or she has a problem, since this can elicit defensiveness. An alternative is an expression of concern that the drug use may be causing some difficulties. Some patients who already suspect they have a problem will confirm the diagnosis. Others may respond with astonishment, insincere acceptance or outright hostility.

Physicians should not argue with patients who deny drug use. Instead, in the context of the role of a health care professional, they can stress the negative effects of drug use on the patient's physical, psychosocial and economic well-being. It is essential to keep the lines of communication open so that additional discussions can continue during future visits. Because accepting a diagnosis of substance abuse is difficult and painful, patients often take months or years before they do so. Family members and friends may likewise deny even obvious substance abuse in a patient. Because addictive disorders are viewed negatively, loved ones may refuse to admit that the patient could fall into such an undesirable category. This denial can reinforce the patient's refusal to acknowledge a problem. However, family and friends are often willing to discuss their concerns if given the opportunity in a nonthreatening environment.

Identification of an addictive disorder may also be impaired by the physician's attitudes. Pessimism about the likelihood of recovery may make a physician reluctant to undertake what he or she might feel is a hopeless task. A judgmental attitude may likewise hinder diagnosis and treatment by leading a physician to indicate overtly or subliminally that a patient with such problems should keep them under cover.

## **Treatment**

Providing treatment requires an understanding of the natural history of recovery from addiction. Recovery from drug addiction and/or alcoholism is a long-term process that often requires multiple attempts and many behavioral changes. Most people relapse several times before achieving long-term abstinence, regardless of whether the drug of abuse is nicotine, cocaine, heroin or other addictive substances. People who do achieve long-term abstinence can, in stressful situations, relapse after years of abstinence. The long-term relationships between family physicians and patients and their families may make a significant difference in supporting a patient's recovery efforts.

In discussing options with the patient, the physician should recommend a comprehensive treatment plan. Some patients may resist those choices, often preferring a less intensive approach. Others may refuse all outside help, insisting that they can "kick the habit" on their own - which represents another form of denial. In either case, negotiation with the patient is more effective than a protracted discussion. Sometimes, it is possible to enter a contract in which the patient agrees to undertake a more intensive approach if the first set of treatment options - those preferred by the patient - fails. Regardless of which approach the patient chooses, the physician should be supportive.

### **Brief Interventions**

Illicit drug abusers may sometimes respond to brief interventions such as those used for smoking or alcohol abuse. In some cases, this approach may successfully modify the patient's behavior by itself. In many others, failure may be used as a springboard to convince the patient of the need for more extensive treatment.

The goal of a brief intervention is to provide the patient with information about the disorder and suggestions to help modify his or her behavior. The physician should stress the possible negative consequences of the patient's drug use, both currently and in the future. Giving the patient educational materials may help reinforce these points. Then the physician can make a specific recommendation for cutting down or stopping. The patient can return in a month to report progress. If the patient has been able to control the habit sufficiently to reverse the negative consequences, no further treatment may be necessary. However, if the patient cannot stay within the agreed-upon limits, a more intensive therapeutic strategy is warranted, such as participation in a 12-step program or other self-help groups.

## **Detoxification**

Many drug-dependent patients can safely undergo withdrawal as outpatients. This approach is less expensive and less disruptive of the patient's life than inpatient therapy. Moreover, it allows withdrawal to be completed in the same environment in which the patient must continue to live, work and remain abstinent.

To qualify for outpatient detoxification, the patient must clearly agree to abstain from using any mood-altering agent, other than those prescribed by the treating physician. He or she must also agree to participate in a treatment program. The choice of program depends on personal finances and community resources. During the first few days, the patient also needs a sober and responsible family member or friend who will encourage participation in a program, watch for serious signs of withdrawal, assist with medications, get the patient to the physician's office and dispose of any alcohol or drugs in the patient's home.

The physician should evaluate the patient every day until he or she has started a treatment rehabilitation program and the risk of withdrawal is minimal. This interval may range from three days for alcohol abuse to 10 days for methamphetamines, opioids and cocaine. Physician monitoring is essential on the weekend, when the risk of relapse is greatest. No more than a two- to three-day supply of medication should be dispensed at any visit, to preclude the misuse of medication and possible overdose.

If the criteria for outpatient therapy are not met, inpatient or residential therapy may be indicated. This has the advantage of placing the patient in a protected setting where access to substances of abuse is restricted (although not necessarily eliminated). The withdrawal process may be quicker and safer because the patient can be monitored more closely and treatment can be more finely tuned. Hospital treatment is more likely to be needed for withdrawal from sedative drugs, such as alcohol, barbiturates and benzodiazepines. Withdrawal from these drugs can be life-threatening. Hospital treatment is also indicated for patients who have a very high tolerance for the substance of abuse or who developed seizures, delirium or psychosis during a previous withdrawal. Medical indications for inpatient therapy include a history of recent head trauma or cerebrovascular accident, acute abdominal pain, jaundice, liver failure, electrolyte imbalance, pneumonia, sepsis, dehydration, AIDS, arrhythmias, angina, ischemic heart disease, hypertension, severe respiratory disease and age greater than 65 years.

Hospitalization is almost never indicated for opiate detoxification, which is best accomplished through an outpatient methadone program. Hospital recovery programs of fixed stays of 14 to 28 days have been overutilized, with scant evidence of benefit for any but a few carefully selected patients. Safe detoxification (outpatient or inpatient) is labor-intensive, and physicians often find it difficult to obtain commensurate reimbursement. That is why many state and local governments have created specialized facilities or programs for low-income patients who need these services. Each state receives "block grant" funding from the Public Health Service to help meet these needs. A call to the local public health department, state drug abuse and/or mental health agency or the national hotline will lead the family physician to whatever services are available locally. Admission can often be facilitated by the family physician who agrees to continue seeing the patient for other medical problems in coordination with the public program. In areas where there are no other services, the family physician may be the only qualified provider, and telephone consultations may become vital. The patient's family and peers can be used as a therapeutic network to join the patient at intervals in therapy sessions [35].

## **Hospital Treatment**

With admission to the hospital for withdrawal, the patient should undergo an evaluation, including urine drug screens, to determine whether he or she has been using other drugs not previously mentioned [36]. Detoxification is initiated to withdraw the patient from the substance of abuse and to restore cognitive ability. No other treatment goals should be addressed until both goals are achieved. At that point, a major goal of therapy is to help the patient identify the consequences of his or her experiences and to understand the risks of relapse. Another goal is to address emotional issues such

as hopelessness and despair over the seemingly inevitable progress of the addiction and grief and remorse associated with comprehension of past behavior. Barriers to recovery are identified, including internal barriers such as the patient's personality or personal resources and external barriers such as the home or work environment. The patient is protected from self-destructive or other violent behaviors.

Because dishonesty, violence and risk-taking are survival skills in active addiction but become self-destructive in recovery, new sets of behaviors are introduced. Twelve-step and other recovery programs describe a set of new behaviors that allow the addict to deal with the consequences of the past and the problems of the present. Involvement with groups such as Alcoholics, Narcotics or Cocaine Anonymous, Rational Recovery or Women for Sobriety should begin during hospitalization and be maintained after discharge; decreasing use of such support groups often leads to relapse. Short-term hospitalization is useful as a means of facilitating entry into long-term treatment. By itself, however, hospitalization has no demonstrable effect on long-term recovery [37].

## **Pharmacotherapy**

Traditionally, the physician's role in pharmacologic treatment of drug abuse has largely been limited to the management of withdrawal symptoms and medical complications. However, clinical and neuropharmacologic advances provide a greater opportunity for family physicians to use their therapeutic expertise in the collaborative treatment of addictive disorders.

### **Sedative Withdrawal**

When someone has been taking central nervous system depressants for a long time and the use is no longer medically indicated, or when there are signs of abuse or addiction (such as a pattern of increasing use, periods of intoxication, psychoactive prescriptions from multiple doctors, functional impairment and unsuccessful attempts to decrease or discontinue the dose), detoxification may be necessary.

Sedatives associated with withdrawal include alcohol, both short- and long-acting benzodiazepines, barbiturates, methaqualone (which is no longer legally available in the United States), glutethimide, chloral hydrate and meprobamate.

The prototypic withdrawal syndrome occurs with cessation of alcohol use; the patterns seen with other sedatives represent small variations on alcohol withdrawal. Minor (stage 1) withdrawal is characterized by restlessness, anxiety, sleeping problems, agitation and tremor; other signs include tachycardia, low-grade fever, diaphoresis and elevated blood pressure. Major (stage 2) withdrawal involves the signs and symptoms associated with minor withdrawal plus visual or auditory hallucinations. Whole-body tremor, pulse exceeding 100 per minute, diastolic pressure exceeding 100 mm Hg, pronounced diaphoresis and vomiting may also be present. Delirium tremens (stage 3) may be accompanied by a temperature exceeding 37.8 degC (100 degF) and disorientation to time, place and person, as well as global confusion and inability to recognize familiar objects or persons. This is a medical emergency, with a mortality of 2 to 5 percent [38] and should prompt a thorough medical evaluation for other physical problems.

Alcohol withdrawal seizures may occur 12 to 48 hours after the last drink; seizures from barbiturates usually occur within 72 hours after the last use. Withdrawal from long-acting benzodiazepines may not manifest for up to a week or more.

Detoxification of patients dependent on sedatives should be done with extreme care, because abrupt withdrawal may be associated with potentially life-threatening effects. Detoxification involves either supervised stepwise dose reduction or substitution with a cross-tolerant, longer-acting substance (such as diazepam or phenobarbital) that has less risk of severe withdrawal symptoms. The cross-tolerated drug is given in gradually tapering doses. The goals of treatment are to relieve symptoms, prevent stage 2 or 3 withdrawal, prevent seizures, minimize the chance of a new dependency on the medication used for withdrawal and minimize the toxicity of the medication. It should be noted that the triazolobenzodiazepines (e.g., triazolam [Halcion] and alprazolam [Xanax]) may not be completely cross-tolerant with other sedatives. Patients dependent on alprazolam require a particularly gradual tapering from their initial dosage [39].

### **Stimulant Withdrawal**

Risk factors for severe withdrawal from stimulants include use of cocaine or methamphetamines and smoking the drug or using it parenterally. Stimulant withdrawal syndrome is characterized by depression, hypersomnia, fatigue, headache, irritability, poor concentration, restlessness and, in severe cases, suicide attempts. Drug craving is prolonged and intense. Paranoia and acute psychosis may occur. Most often, no treatment other than support is needed for the initial phase of stimulant withdrawal.

Pharmacotherapy is determined by the specific symptoms. Haloperidol (Haldol) and thioridazine (Mellaril) are the drugs of choice for treating a patient with symptoms of paranoid psychosis. An antidepressant such as desipramine (Norpramin) or fluoxetine (Prozac) may be useful in treating depressive symptoms; this therapy should be continued for three to six months, but because of the risk that the drug may be used in a suicide attempt, no more than one week's supply should be given at a time. Panic attacks may be treated with an antidepressant or a benzodiazepine. Drugs being investigated for the treatment of generalized withdrawal symptoms include adrenergic agonists and calcium channel blockers.

### **Opiate Withdrawal**

The severity of opiate withdrawal may be placed into one of four categories. Grade 0 opiate withdrawal is characterized by drug craving, anxiety and intense drug-seeking behavior; grade 1 by yawning, sweating, lacrimation and rhinorrhea; grade 2 by mydriasis, gooseflesh, muscle twitching and anorexia; and grade 3 by insomnia, increased pulse, respiratory rate and blood pressure, abdominal cramps, vomiting, diarrhea and weakness.

The preferred drug in the treatment of opiate withdrawal is methadone, if an opiate agonist is to be used; if methadone is not available, some symptomatic relief may be obtained with clonidine (Catapres). Clonidine is a centrally acting alpha-adrenergic agonist familiar to most physicians as an antihypertensive agent. As an agent for opiate withdrawal, clonidine suppresses restlessness, lacrimation, rhinorrhea and sweating. Because of the ease with which clonidine tablets can be sold on the street for self-treatment of opiate withdrawal, many physicians prefer the use of clonidine patches for this indication. Because clonidine does not treat some of the symptoms associated with severe withdrawal, other nonscheduled medications may be indicated when attempting to manage opiate withdrawal without the benefit of methadone. These include promethazine (Anergan, Phenergan, etc.) or hydroxyzine (Atarax, Vistaril, etc.) for nausea and vomiting, loperamide (Imodium, Kaopectate, etc.) for diarrhea, and methocarbamol (Robaxin) for muscle cramps and joint pain.

## **12-Step Programs**

After detoxification, almost every addict will need a combination of professional (group or individual) counseling plus attendance at a self-help group to maintain sobriety. The self-help support approach to treatment of alcohol and drug dependence began in 1935 with the development of Alcoholics Anonymous (AA), the first and largest 12-step group. Millions of people believe they have maintained sobriety and health through these programs [40]. Narcotics Anonymous (NA), Cocaine Anonymous (CA) and other offshoots of AA use the same 12-step model.

In general, any patient who has continued alcohol or drug use despite significant consequences (e.g., family and health problems) may benefit from a 12-step approach. The main message of these programs is that addiction is a chronic relapsing disorder with no cure, and recovery is an ongoing process that needs continual work. Physicians can encourage the patient to participate and can facilitate the family's efforts to support the patient and participate in family-support groups. The physician should also frequently review the patient's progress with him or her.

The physician as well as the patient must understand that 12-step programs are not religious organizations. References to God and the Higher Power are generic spiritual terms that do not refer to a particular religion. The higher power may be conceptualized as nothing more than the group itself.

## **Other Self-Help Groups**

For those who still are unable to "resonate" with the spiritual approach of AA or NA, other self-help groups are available such as Rational Recovery (RR), which emphasizes a self-actualizing cognitive-behavioral approach, or any of the other groups listed in Resources of Information About Drug Abuse.

## **Outpatient Therapy**

Another facet in the physician's role is to prescribe adjunctive pharmacotherapy in cooperation with an outpatient treatment program, or to continue to follow patients in consultation with such programs. Opioid-dependent patients can benefit markedly from structured programs that include the use of drug agonists or cross-tolerant drugs, which are less harmful than the primary drug. The only legal medications for this indication are methadone and levomethadyl acetate (Orlaam). The most commonly used agent is methadone, a synthetic mu-opioid agonist with a sufficiently long duration of action so that it may be given once a day. Usually patients receive the daily dose in a clinic. Some

patients may be given take-home doses to avoid the disruption associated with visiting a clinic every day. However, this is inappropriate for poorly stabilized and/or poorly monitored patients, who may self take-home doses of methadone.

Methadone maintenance has been effectively and safely used to treat opioid addiction for about 25 years [41]. Patients develop nearly complete tolerance for the analgesic, sedative and euphoric effects of methadone at an established maintenance dosage. Thus, a methadone-maintained patient requires and should receive additional analgesics to treat pain that would require such treatment in a nonaddict. Nonnarcotic analgesics are indicated if the pain is not severe. Pure opioid-agonist drugs are appropriate for more severe pain. Mixed agonist/antagonist drugs such as pentazocine or butorphanol should be avoided. The quantity and duration of treatment must be closely monitored. However, such patients should be expected to require higher doses and sometimes more frequent dosing intervals because of the high tolerance induced by good methadone dosing practices.

Like methadone, levomethadyl can produce stable opioid effects when ingested orally. The U.S. Food and Drug Administration (FDA) recently approved the use of this synthetic opiate for the treatment of patients with heroin addiction. Its long duration of action may permit dosing three times a week, thereby eliminating the need for take-home doses. In clinics that already dispense methadone, levomethadyl will be increasingly available. For full activity, this narcotic agonist requires first-pass hepatic activation; therefore, it is pharmacokinetically unique among the currently marketed opioids in that it has a slower effect when injected than when taken orally.

Clinics licensed to treat narcotic addiction are the only facilities legally allowed to prescribe and dispense opiates (methadone or levomethadyl) for the treatment of addiction. However, office-based physicians can sometimes obtain approval from the FDA and the Drug Enforcement Administration to prescribe methadone to a limited number of patients, especially in areas where there are no licensed programs. Methadone can be administered to hospitalized patients if they are already enrolled in methadone maintenance or are being detoxified with methadone. Hospitalized patients on methadone maintenance should seldom be withdrawn from opiates, and then only in close consultation with their program's physician. Outpatient treatment programs without medication are most useful for patients addicted to drugs other than opiates. Family physicians may find the long-acting opiate antagonist naltrexone (Trexan) useful for highly motivated patients who have someone to directly observe them taking medication several days a week.

## **Long-Term Residential Treatment**

For patients who are not candidates for methadone maintenance or not successful with short-term detoxification followed by long-term outpatient treatment, another treatment option is a long-term residential therapeutic community (TC) or other types of long-term residential treatment programs. The TC is the most well established among residential drug treatment modalities; its success is related to the fact that it offers a unique form of stability and an opportunity for the patient to deal with the more complex problems of recovery [42]. The efficacy of the TC varies widely; in general, residents who participate for at least three months improve markedly. This treatment can be effective for the polydrug abuser. In patients who have participated in a TC program, the incidence of criminal activity is reduced and full-time employment increased three to five years after program completion.

## **Prevention**

A key focus of the family physician should be prevention of addictive disorders. Primary prevention involves helping at-risk individuals avoid the development of addictive behaviors. Secondary prevention consists of uncovering potentially harmful substance use prior to the onset of overt symptoms or problems. Finally, tertiary prevention involves treating the medical consequences of drug abuse and facilitating entry into treatment so further disability is minimized. Family physicians may also help prevent relapse, so that people who have been treated successfully are maintained in remission.

### **Primary Prevention**

In family practice, primary prevention should be directed at children and adolescents at risk. A good approach is to emphasize the realistic risks of drug and alcohol abuse; this can provide an understanding of the problem. The physician should also support any reluctance the child expresses about giving in to peer pressure to smoke or drink.

There seems to be an association between domestic violence and substance abuse. Children who have been physically or sexually abused are at very high risk for substance abuse as adults [43]. Increased risk is also seen in children of substance-abusing parents and in children with attention-deficit disorder or school problems such as a developmental reading disorder. Preventive interventions may include the usual child protection and referral activities, plus an explanation of the consequences of smoking and substance abuse, preferably at a point when the child is receptive to such information but is not yet being pressed by peers to join them in such activities.

Programs such as the Students Taught Awareness and Resistance (STAR) program, in which schoolchildren are taught skills to avoid high-risk activities, or the Strengthening Families program for drug-abusing parents and their children may also be beneficial. The effectiveness of any existing prevention programs in the school or community can be markedly improved by reinforcement from the physician. Bonding with a stable, caring adult may be the most important protective factor for high-risk children.

For family physicians who want to utilize a validated method of screening for drug abuse as well as developmental risk factors in children, the Problem Oriented Screening Instrument for Teenagers (POSIT) is available through the National Clearinghouse for Alcohol and Drug Abuse Information [44]. Nicotine addiction, which is generally the first addiction to occur in children, appears to develop over a two-year period. This presents a window of opportunity when intervention may be particularly effective. Adolescent males who are active in sports should also be targeted for inquiry about their use of anabolic steroids, with special attention paid to sports that require weight and strength, such as football.

Primary prevention may also be needed for an adult patient who the physician realizes is entering a risky situation - e.g., a close relationship with a person who abuses alcohol or drugs. With women of childbearing age, it is crucial to emphasize the extreme risks associated with substance abuse during pregnancy. This may involve encouraging use of effective birth control for a woman who insists on drinking or smoking and intensive counseling about the risks of substance abuse (including the risk for HIV and other infectious disease) during pregnancy for women who intend to become or are pregnant. Women suffering from postpartum depression should be warned about the dangers of self-treatment with alcohol or stimulants. Many other psychiatric disorders such as panic attacks increase the risk for substance abuse unless diagnosed and treated appropriately.

## **Secondary and Relapse Prevention**

Maintaining alertness for early signs of drug abuse or a history suggestive of drug abuse is the main way that physicians can detect the early stages of disease or relapse. Because addiction is a chronic relapsing disorder [45], the person in recovery from addiction remains at risk for relapse or for developing problems with another substance. This is less likely for successful patients still in methadone maintenance than for patients who are completely drug-free. However, some patients on methadone maintenance do abuse multiple drugs, especially if the prescribed dose of methadone is too low.

If at all possible, use of benzodiazepines should be avoided in patients with any substance abuse history; if not, only small amounts (with no refills) for a short course of therapy should be provided. Remember, however, that recovering addicts may have legitimate physical conditions that require opiate analgesics for pain management or may have other legitimate indications for psychotropic medications. Withholding such indicated treatment may cause an even greater risk for relapse than giving an appropriate prescription for controlled amounts of opiates. When in doubt, it is best (with the patient's permission) to contact the program where he or she is being treated or consult with another physician experienced in the treatment of pain, addiction and mental disorders.

Although specialized group therapy approaches to relapse prevention are becoming more available, the most common means of relapse prevention for the family physician will probably continue to be frequent monitoring and counseling, plus environmental and family encouragement of abstinence. It is important to keep track of patients with addictive disorders and to discuss their progress in recovery during clinical visits for unrelated issues. Changes in the patient's life may jeopardize their sobriety, and new temptations may emerge; it may become necessary to recommend additional counseling at such times.

---

## Final Comment

Drug and alcohol disorders can occur in any patient seen in family practice, and they are present in many more patients than are diagnosed. Physician awareness of the potential for such problems is the first step in detecting, evaluating and treating patients who are substance abusers. In some cases, treatment is possible in the office setting. In others, the physician oversees inpatient treatment or makes referrals and provides long-term collaborative follow-up, all of which are essential if the patient is to avoid a relapse. Treatment should be considered part of an ongoing process designed first to help the patient discontinue the self-destructive behavior and then to maintain abstinence from illegal or problematic drug use.

Another role for physicians is that of medical review officer (MRO) for a drug testing program. Screening employees for drugs is required in some regulated industries such as interstate trucking, air transportation, nuclear energy plants and maritime and railroad industries. Drug testing programs regulated by the Department of Transportation and other federal programs are required to employ MROs, who must be licensed physicians with a knowledge of substance abuse disorders and of possible alternative medical explanations for positive urine drug test results. It is likewise recommended that non-federally regulated drug testing programs employ an MRO.

The MRO generally functions as a safeguard against wrongful accusations; therefore, the MRO must thoroughly investigate each positive screen [46]. If a prospective or current employee has an acceptable medical explanation for a positive result, the MRO would report to the employer that the result was negative. Other issues involved in the duties of the MRO include documenting the chain of evidence of clinical samples, reporting verified positive test results and recommending a rehabilitation program for the employee. The duties of an MRO are outlined in booklets published by SAMHSA and the U.S. Department of Transportation.

Before becoming an MRO, a family physician should carefully weigh practical and personal issues [47]. Charting and office policies may need to be modified to meet legal requirements. Because the MRO serves as an adviser to the employer, the physician-patient relationship differs from that in conventional patient care. Moreover, the MRO may be sued by a patient who loses a job or experiences employment problems because of a positive test result. Therefore, becoming certified by one of the organizations that offers courses in this area is highly recommended. Nevertheless, family physicians may find interesting opportunities in the field of occupational drug testing.

---

## References

1. Institute for Health Policy, Brandeis University. Substance abuse: the nation's number one health problem; key indicators for policy. Princeton, N.J.: Robert Wood Johnson Foundation, October 1993.
2. McGinnis JM, Foege WH. Actual causes of death in the United States. *JAMA* 1993;270:2207-12.
3. Jaffee J. Opiates: clinical aspects. In: Lowinson JH, Ruiz P, Millman RB, Langrod JG, eds. *Substance Abuse: A Comprehensive Textbook*. 2nd ed. Baltimore: Williams & Wilkins, 1992.
4. Gold MS. Cocaine (and crack): clinical aspects. In: Lowinson JH, Ruiz P, Millman RB, Langrod JG, eds. *Substance Abuse: A Comprehensive Textbook*. 2nd ed. Baltimore: Williams & Wilkins, 1992.
5. King GR, Ellinwood EH. Amphetamines and other stimulants. In: Lowinson JH, Ruiz P, Millman RB, Langrod JG, eds. *Substance Abuse: A Comprehensive Textbook*. 2nd ed. Baltimore: Williams & Wilkins, 1992.
6. National household survey on drug abuse: population estimates 1992. Rockville, Md: Substance Abuse and Mental Health Services Administration, US Department of Health and Human Services; 1993.
7. Wesson DR, Smith DE, Seymour RB. Sedative-hypnotics and tricyclics. In: Lowinson JH, Ruiz P, Millman RB, Langrod JG, eds. *Substance Abuse: A Comprehensive Textbook*. 2nd ed. Baltimore: Williams & Wilkins, 1992.
8. Grinspoon L, Bakalar JB. Marijuana. In: Lowinson JH, Ruiz P, Millman RB, Langrod JG, eds. *Substance Abuse: A Comprehensive Textbook*. 2nd ed. Baltimore: Williams & Wilkins, 1992.
9. Zukin SR, Zukin RS. Phencyclidine. In: Lowinson JH, Ruiz P, Millman RB, Langrod JG, eds. *Substance Abuse: A Comprehensive Textbook*. 2nd ed. Baltimore: Williams & Wilkins, 1992.

10. Monitoring the Future Study. National Institute on Drug Abuse, Rockville, Md. HHS News, January 31, 1994.
11. Daghesiani AN, Schnoll SH. Phencyclidine. In: Galanter M, Kleber HD, eds. *The American Psychiatric Press Textbook of Substance Abuse Treatment*. Washington, DC: American Psychiatric Press, 1994.
12. Difranza JR, Richards JW, Paulman PM, et al. RJR Nabisco's cartoon camel promotes Camel cigarettes to children. *JAMA* 1991;266:3149-53.
13. Hall SM, Munoz RF, Reus VI, Sees KL. Nicotine, negative affect, and depression. *J Consult Clin Psychol* 1993;61:761-67.
14. Sharp CW. Introduction to inhalant abuse. In: Sharp CW, Beauvais F, Spence R, eds. *Inhalant Abuse: A Volatile Research Agenda*. Rockville, Md. NIDA Research Monograph 129, 1992;1-10.
15. Nelson JE, Pearson HW, Sayers M, Glynn TJ. Research issues 26: guide to drug abuse research terminology. Rockville, Md: National Institute on Drug Abuse, Public Health Service, US Department of Health and Human Services;1982, Publication # ADM 82-1237.
16. Jacox A, Carr DB, Payne R, et al. Management of cancer pain. Clinical practice guideline No. 9. AHCPR Publication No. 94-0592. Rockville, Md: Agency for Health Care Policy and Research, Public Health Service, US Department of Health and Human Services, March 1994.
17. Goldstein A. *Addiction: from biology to drug policy*. New York: WH Freeman, 1994.
18. Kessler RC, McGonagle KA, Zhao S, et al. Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States: results from the National Comorbidity Survey. *Arch Gen Psychiatry* 1994;51:8-19.
19. O'Malley PM, Johnston LD, Bachman JG. Adolescent substance use and addictions: epidemiology, current trends, and public policy. In: *Adolescent Medicine: State of the Art Reviews*. Philadelphia: Hanley & Belfus, 1993;4:227-49.
20. HHS News. Rockville, Md: US Department of Health and Human Services; January 31, 1994.
21. Morrison MA. Addiction in adolescents. *West J Med* 1990;152:543-46.
22. MacDonald DI. Patterns of alcohol and drug use among adolescents. *Pediatr Clin North Am* 1987;34:275-88.
23. Elster AB, Kuznets NJ. *AMA Guidelines for Adolescent Preventive Services (AMA-GAPS)*. Baltimore: Williams & Wilkins, 1994.
24. Ewing H. Care of women and children in the perinatal period. In: Fleming MF, Barry KL, eds. *Addictive Disorders*. St Louis: Mosby Year Book, 1992.
25. Behnke M, Eyler FD. The consequences of prenatal substance abuse for the developing fetus, newborn, and young child. *Int J Addict* 1993;28:1341-91.
26. Jessup M. The treatment of perinatal addiction: identification, intervention, advocacy. *West J Med* 1990;152(special issue):553-58.
27. Hoegerman G, Wilson CA, Thurmond E, et al. Drug-exposed neonates. *West J Med* 1990;152(special issue):559-64.
28. Gambert SR. Substance abuse in the elderly. In: Lowinson JH, Ruiz P, Millman RB, eds. *Substance Abuse: A Comprehensive Textbook*. 2nd ed. Baltimore: Williams & Wilkins, 1992.
29. King CJ, Hasselt VB, Segal DL, Hersen M. Diagnosis and assessment of substance abuse in older adults. *Addict Behav* 1994;19(1):41-55.
30. Closser MH, Blow FC. Special populations: women, ethnic minorities, and the elderly. *Psychiatr Clin North Am* 1993;16:199-209.
31. Goldstein A. Heroin addiction: neurobiology, pharmacology, and policy. *J Psychoactive Drugs* 1991;23:123-34.
32. Trujillo KA, Herman JP, Schaumlfer MK-H, et al. Drug reward and brain circuitry: recent advances and future directions. In: Korenman SG, Barchas JD, eds. *Biological Basis of Substance Abuse*. New York: Oxford University Press, 1993.
33. Pratt JA. Psychotropic drug tolerance and dependence: common underlying mechanisms? In: Pratt E, ed. *The Biological Bases of Drug Tolerance and Dependence*. London: Academic Press, Harcourt Brace Jovanovich, 1991.
34. Brown RL. Identification and office management of alcohol and drug disorders. In: Fleming MF, Barry KL, eds. *Addictive Disorders*. St Louis: Mosby Year Book, 1992.
35. Galanter M. Network therapy for addiction: a model for office practice. *Am J Psychiatry* 1993;150(1):28-36.
36. Warner ML, Mooney AJ III. The hospital treatment of alcoholism and drug addiction. *Prim Care* 1993;20:95-105.
37. Institute of Medicine. Extent and adequacy of insurance coverage for substance abuse services. Vol I. A study of the evolution, effectiveness, and financing of public and private

drug treatment systems. US Department of Health and Human Services, Drug Abuse Services Research Series No. 2. 1992.

38. Fleming MF. Pharmacologic management of nicotine, alcohol, and other drug dependence. In: Fleming MF, Barry KL, eds. Addictive Disorders. St Louis: Mosby Year Book, 1992.
39. Alexander B, Perry PJ. Detoxification from benzodiazepines: schedules and strategies. *J Subst Abuse Treat* 1991;8:9-17.
40. Schultz J, Barry KL. Alcohol and drug treatment and role of 12-step programs. In: Fleming MF, Barry KL, eds. Addictive Disorders. St Louis: Mosby Year Book, 1992.
41. Zweben JE, Payte JT. Methadone maintenance in the treatment of opioid dependence - a current perspective. *West J Med* 1990;152:588-99.
42. O'Brien WB, Biase DV. Therapeutic Community (TC): a coming of age. In: Lowinson JH, Ruiz P, Millman RB, Langrod JG, eds. Substance Abuse: A Comprehensive Textbook. 2nd ed. Baltimore: Williams & Wilkins, 1992.
43. Drug use among youth: no simple answers to guide prevention. Washington, DC: US General Accounting Office, December 1993, GAO/HRD-94-24.
44. The Adolescent Assessment/Referral System Manual. DHHS Publication No. (ADM)91-1735. Rockville, Md: National Institute on Drug Abuse, US Department of Health and Human Services, 1991.
45. Fleming MF, Barry KL. Clinical overview of alcohol and drug disorders. In: Fleming MF, Barry KL, eds. Addictive Disorders. St Louis: Mosby Year Book, 1992.
46. Clark HW. The role of physicians as medical review officers in workplace drug testing programs. *West J Med* 1990;152:514-524.
47. Floren AE. Urine drug screening and the family physician. *Am Fam Phys* 1994;49:1441-1447.