Uppers, Downers, All Arounders

Physical and Mental Effects of Psychoactive Drugs

Fifth Edition

Darryl S. Inaba, Pharm.D.
William E. Cohen

Includes Student Study Guide CD-ROM
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Psychoactive Drugs: History & Classification

This poppy field in Afghanistan and others like it were used to produce 70% of the world’s opium. Before the Taliban government fell, it banned opium growing and for a brief period none was grown. It has since resumed. The vast profits from opium growing and heroin processing in Afghanistan and other countries, such as Myanmar (Burma), have funded wars, insurgencies, and terrorism activities throughout recent world history.

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CHAPTER PROFILE

INTRODUCTION
• Five themes of drug use become apparent when studying history:
  1. a basic need of human beings to cope with their environment and existence;
  2. the natural vulnerability of brain chemistry to psychoactive drugs;
  3. government and business involvement in selling and taxing drugs;
  4. technological advances in refining and synthesizing drugs;
  5. development of more efficient and faster methods of putting drugs in the body.

HISTORY OF PSYCHOACTIVE DRUGS
• Prehistory & the Neolithic Period (8500–4000 B.C.): The earliest human uses of psychoactive drugs involved plants and fruits whose mood-altering qualities were accidentally discovered and then deliberately cultivated.
• Ancient Civilizations (4000 B.C.–A.D. 400): Sumerian, Egyptian, Indian, Chinese, South American tribes, and other ancient cultures used opium, alcohol, Cannabis (marijuana), peyote, psilocybin mushrooms, and coca leaves.
• Middle Ages (400–1400): Psychoactive plants, such as belladonna and psilocybin mushrooms, were used by witches, shamans, and medicine men for healing and spiritual purposes.
• Renaissance & the Age of Discovery (1400–1700): Tobacco, coffee, tea, distilled alcohol, and opium smoking spread along the trade routes. Governments and merchants controlled much of the trade.
• Age of Enlightenment & the Early Industrial Revolution (1700–1900): New refinement techniques (e.g., morphine from opium), new delivery methods (e.g., hypodermic needle), and new manufacturing techniques (e.g., cigarette-rolling machines) increased use, abuse, and addiction liability. Temperance and prohibition movements also spread.
• Twentieth Century: Wider distribution channels, improved refinement technology, new synthetic drugs, and social/political changes increased legal and illegal use. Defining addiction as a disease and as a biochemical imbalance helped expand treatment options.
• Today & Tomorrow: The geopolitics of growing, refining, smuggling, and selling drugs affects the national security of dozens of countries. Alcohol, tobacco, marijuana, heroin, cocaine, and methamphetamines are still the drugs of choice but old and new rave club drugs are showing increased popularity, e.g., MDMA (ecstasy), GHB, ketamine, LSD, Salvia divinorum, and nitrous oxide. Finally federal and state drug policy is shifting from supply reduction to demand reduction.
• Conclusions: The history of man reflects the integral part psychoactive drugs have played in the social, economic, and emotional development of civilizations and while the current drug of choice often changes, the reasons for drug use remain the same. The “war on terrorism” and the so-called war on drugs both need long-term strategies that require imagination, resolve, patience, and intelligence.

CLASSIFICATION OF PSYCHOACTIVE DRUGS
• What Is a Psychoactive Drug? Psychoactive drugs can be identified by their street name, chemical name, or trade name. This book classifies most drugs by their general effects.
• Major Drugs
  ◇ Uppers: Stimulants, such as cocaine, amphetamines, caffeine, and nicotine, force the release of energy chemicals. The strongest stimulants, cocaine and amphetamines, can produce an intense rush and ecstatic feelings.
  ◇ Downers: Depressants include opioids (e.g., heroin), sedative-hypnotics, and alcohol. They depress circulatory, respiratory, and muscular systems; they control pain; they lower inhibitions; and they can induce euphoria.
  ◇ All Arrounders: Psychedelics, e.g., marijuana, LSD, MDMA (ecstasy), can cause some stimulation but mostly they alter sensory input and can cause illusions, delusions, and hallucinations.
• Other Drugs & Addictions
  ◇ Inhalants include organic solvents, volatile nitrates, and nitrous oxide (laughing gas) and can induce the full range of upper, downer, or psychedelic effects depending on the specific substance and the amount used.
  ◇ Anabolic Steroids and other sports drugs are used to enhance athletic performance by increasing endurance, muscle size, and/or aggression.
  ◇ Psychiatric Medications include antidepressants, antipsychotics, and antianxiety drugs. They are prescribed to rebalance brain chemistry when there are mental problems.
  ◇ Compulsive Behaviors, such as overeating, anorexia, bulimia, compulsive gambling, sexual compulsion, Internet addiction, compulsive shopping, and even codependency, affect many of the same areas of the brain influenced by psychoactive drugs.
• Controlled Substances Act of 1970: This act consolidated and updated most drug laws. Its aim was to reduce the availability, use, and abuse of psychoactive drugs.
INTRODUCTION

Athenian: “Let us then simply censure the gift of Dionysus as bad and unfit to be received into the State. For wine has many excellences . . . . Shall we begin by enacting that boys shall not taste wine at all until they are eighteen years of age; we will tell them that fire must not be poured upon fire, whether in the body or in the soul.”

Plato, 360 B.C., The Laws

Even 2,363 years ago societies had to grapple with the same positive and negative aspects of alcohol and other psychoactive drugs that the world struggles with in the twenty-first century. Whether it has been to alter states of consciousness, reduce pain, forget harsh surroundings, alter a mood, explore feelings, promote social interaction, escape boredom, medicate a mental illness, stimulate creativity, or enhance the senses, throughout history some people have chosen to alter their perception of reality with substances. Which drugs are used, how they are used, and how abuse is punished, treated, or prevented have varied from culture to culture and from century to century but certain themes transcend time and cultural makeup.

Early man lived in a dangerous and mysterious environment that could inflict pain and death in an instant. Brutal weather, carnivorous animals, aggressive enemies, abusive relatives, and life-threatening diseases could wound, maim, or kill. Primitive and eventually civilized human beings have continually searched for ways to control these dangers. They drew cave pictures of animals 20,000 years ago in France to help in the hunt. They built the city of Jericho 10,000 years ago so they could grow and control their supply of food and protect themselves from their enemies. They worshipped hundreds of gods, praying for divine intervention that would let them survive. They fasted, danced incessantly, practiced self-hypnosis, chanted, inflicted pain on themselves, went without sleep, meditated, and used other...
United States, led to increased bouts of drunkenness, violence, and public disruption. The first temperance movement in the United States was started about 1785 by Dr. Benjamin Rush, a noted physician and reformer who warned against overuse of alcohol but praised limited amounts for health reasons. The disease concept of alcohol was suggested by the early writings of Rush (Goodwin & Gabrielli, 1997).

"Strong liquor is more destructive than the sword. The destruction of war is periodic, whereas alcohol exerts its influence upon human life at all times and in all seasons."

Benjamin Rush, 1788

The first national temperance organization, the American Temperance Society, was created in 1826 and it was supported by businessmen who needed sober and industrious workers (Langton, 1995). The growth of these societies to more than 1,000 four years later did not stem the increased use of alcohol. Consumption peaked in 1830 in the United States with a yearly per capita consumption of 7.1 gallons of pure alcohol vs. 1.8 gallons today. In fact at Andrew Jackson's inauguration in 1833 the new President’s staff stopped serving alcohol because they were afraid drunken revelers would destroy the White House.

It wasn’t until 1851 that Maine passed the first prohibition law. Within 4 years one-third of the states had laws controlling the sale and use of alcohol and consumption fell to one-third of pre-Prohibition and Temperance levels. The Civil War stalled and in some cases reversed the Prohibition movement but after the war the Women’s Crusade, the Women’s Christian Temperance Union, and the Anti-Saloon League (1893) led the Temperance movement, which later became the Prohibition movement, into the twentieth century.

The first facility that treated alcoholism opened in 1841 in Massachusetts.

OPIATES & COCAINE IN PATENT MEDICINES & PRESCRIPTION DRUGS

Over-the-counter medicines sold at the turn of the twentieth century had imaginative names, such as Mrs. Winslow’s Soothing Syrup, Roger’s Cocaine Pile Remedy, Lloyd’s Cocaine Toothache Drops, and McMunn’s Elixir of Opium, all loaded with opium, morphine, cocaine, Cannabis, and usually alcohol (Armstrong & Armstrong, 1991). Needless to say, patent medicines were very popular in all strata of society and were used as a cure for any illness from lumbago to depression, much like nepenthe, theriac, and laudanum centuries before. The manufacturers of these tonics did not need to list ingredients or back up their claims regarding the medical usefulness of these products. Therefore many took tonics thinking they were more like medicine rather than potentially dangerous substances.

"It may strike you as strange that I who have had no pain—no acute suffering to keep down from its angles—should need opium in any shape. But I have had restlessness till it made me almost mad... So the medical people gave me opium—a preparation of it, called morphine, and ether—and ever since I have been calling it my amræeta... my elixir."

Elizabeth Barrett Browning, 1837 (Aldrich, 1994)

One of the finest poets of the nineteenth century, Elizabeth Barrett Browning, became dependent on opium and morphine in much the same way that other middle- and upper-class European and American women of that era did, through their male physicians.
The key provisions were to classify all psychoactive drugs, to control their manufacture, sale, and use, to limit imports and exports, and to define criminal penalties. Five levels or schedules of drugs were defined based on abuse liability, its value as a medication, its history of use and abuse, the risk to public health, and in a few cases, political considerations.

- Schedule I includes heroin, LSD, marijuana, peyote, psilocybin, mescaline, and MDMA. These drugs have a high abuse potential and supposedly no accepted medical use.
- Schedule II substances have a high abuse potential with severe psychic or physical dependence liability even though there are medical uses for the drugs. They include cocaine, methamphetamine, opium, morphine, hydromorphone, codeine, meperidine, oxycodone, and methylphenidate (Ritalin®).
- Schedule III substances have less abuse potential and include Schedule II drugs when used in compounds with other drugs. Schedule III drugs include Tylenol® with codeine, some barbiturate compounds, and paregoric.
- Schedule IV drugs have even less abuse potential and include chloral hydrate, meprobamate, fenfluramine, diazepam (Valium®) and the other benzodiazepines, and phenobarbital.
- Schedule V substances have very low abuse potential because they contain very limited quantities of narcotic and stimulant drugs. Examples of Schedule V are Robitussin AC® (DXM), and Lomotil®. Some of these drugs are sold over the counter.

**CHAPTER SUMMARY**

**INTRODUCTION**

1. Psychoactive drugs and drug-seeking behaviors have always been extremely influential in all aspects of human endeavors. Historically five themes have affected the use and abuse of these substances:
   - A basic need of human beings to cope with their environment;
   - A brain chemistry that can be affected by certain substances to induce an altered state of consciousness;
   - Government and business involvement in growing, manufacturing, distributing, taxing, and prohibiting drugs;
   - Technological advances in refining and synthesizing drugs;
   - Development of more efficient and faster methods for putting drugs into the body.

**HISTORY OF PSYCHOACTIVE DRUGS**

**Prehistory & the Neolithic Period (8500–4000 B.C.)**

2. More than 4,000 plants yield psychoactive substances. Their use dates back 50,000 years or more.
3. Psychoactive drugs have been used throughout history as a shortcut to an altered consciousness, to relieve pain, and for spiritual rituals.

**Ancient Civilizations (4000 B.C.–A.D. 400)**

4. Drugs and methods of use gradually spread as contact among different cultures increased.
5. Alcohol (beer and wine), opium, Cannabis, peyote cacti, psychedelic mushrooms, coca, and tobacco were the earliest psychoactive drugs employed by ancient civilizations.
6. Alcohol was considered a gift from the gods and it was used as a food, a reward, a medicine, and for sacred or shamanic rituals. It is often mentioned in the Bible with warnings about overindulgence.
7. Opium has been used to stop pain, control diarrhea, stop coughs, lessen anxiety, promote sleep, and induce euphoria.
8. Cannabis was used in China and India as a medicine, a food, a fiber, and an euphoriant.
9. Amanita mushrooms were used in Asia and Mesoamerica for visions and sacred ceremonies.
10. The peyote and San Pedro cacti (mescaline), the coca leaf (cocaine), the Psilocybe mushroom (psilocybin), and tobacco (nicotine) were used in Mesoamerica before the birth of Christ and that use continues to this day. Other stimulant alkaloids from plants include betel nut, coffee, khat, and ephedra.

**Middle Ages (400–1400)**

11. Psychedelic plants from the nightshade family (e.g., datura, belladonna, henbane, mandrake) were employed in religious, magic, or social ceremonies throughout history and especially in the Middle Ages. Their active ingredients include scopolamine and atropine.
12. Psychedelic mold on infected rye plants (which produced LSD-like symptoms) caused ergot poisonings in the Middle Ages and beyond.
13. A psychoactive substance can be a medicine, a drug, and a poison depending on the dose. Sometimes it can be a food or drink.
14. During the Middle Ages distillation was discovered. It increased the alcoholic content of beverages through evaporation and condensation. Before distillation about 14% alcohol was the strongest alcohol available.
15. In many Islamic countries, tobacco, hashish, and especially coffee...
Heredity, Environment, Psychoactive Drugs

the axon, which varies from a fraction of a millimeter between brain cells, a foot between the tooth and brain, to several feet between the spinal cord and toe. Terminals of one nerve cell do not touch the adjoining nerve cell because a microscopic gap, called a "synaptic gap" or "synaptic cleft," exists between them. This gap is 15–50 nm wide. A nanometer (nm) is one billionth of a meter. A million synaptic gap widths added together barely total 1 inch.

The message is transmitted electrically within the neuron but when it arrives at the synaptic cleft it almost always jumps this gap from the presynaptic terminal to the postsynaptic receptor, not as an electrical signal but as microscopic bits of messenger chemicals called "neurotransmitters" (Fig. 2-11). These bits of chemicals have been synthesized within the neuron and stored in tiny sacs called "vesicles." This chemical signal is then converted back to an electrical signal and travels to the next synapse where it’s again converted to a chemical signal. This complete transmission process across the gap between nerve cells is called a "synapse." Electrical and chemical signals alternate until the message reaches the appropriate section of the brain or body. Some synaptic gaps are one-tenth the width of normal synapses. At these junctures the signal is transmitted electrically. Our focus is on the synapses that need neurotransmitters to jump the gap.

**NEUROTRANSMITTERS & RECEPTORS**

Although the first neurotransmitters were discovered in the 1920s (acetylcholine) and 1930s (norepinephrine), it was the discovery in the mid-1970s of endorphins and enkephalins, which produce the same effects as opioid drugs, that finally gave an understanding of how psychoactive drugs work in the brain and body. For the first time, reaction and addiction to psychoactive drugs could be described in terms of specific naturally occurring chemical and biological processes.

Endorphins and enkephalins are called "endogenous opioids.” Endogenous means “originating or produced within the body or organism.”

Morphine, heroin, and other opium derivatives or synthetics are called “exogenous opioids.” Exogenous means “originating or produced outside the organism.”

Once the existence of endorphins and enkephalins was confirmed, the search for other natural neurochemicals that mimic psychoactive drugs began in earnest. Over the next 20–30 years researchers were able to identify and then correlate dozens of psychoactive drugs
the old brain, are similar to those of most other mammals. The difference is that in humans it usually takes a combination of heredity, environment, and psychoactive drug use to increase compulsive use.

To help understand the interrelationship of heredity, environment, and the use of psychoactive drugs in human beings, we have developed a graphic representation of the ways that a user might advance from experimentation to addiction.

Since every person is unique, every person starts with a different genetic susceptibility. Those with low genetic susceptibility or predisposition have more room for drug experimentation or environmental stressors than those with high genetic predisposition. The susceptibility is most often reflected by the brain’s structure and neurochemical composition. The important point is that more and more studies confirm that there is at least some heredity influence to any addiction, even compulsive overeating, smoking, and gambling (Brownell & Wadden, 1992; Carmelli, Swan, Robinet, & Fabstiz, 1992; Eisen et al., 1998). The contribution of heredity to drug addiction in our society is only an educated guess but researchers have estimated figures of anywhere from 10% to 60% (Fig. 2-24).

Once a person is born with their genetic makeup, environmental influences, particularly stressors, have the greatest effect on susceptibility. These influences include lack of bonding with a caregiver, physical/emotional/sexual abuse (especially during adolescence), poor nutrition, or societal attitudes that permit drug use (Peele & Brodsky, 1991; Zinberg, 1984). Again, a person may have experienced low, medium, or high environmental contributions towards drug addiction (Fig. 2-25).

The final factor that will push a person to addiction is the use of psychoactive drugs. The practice of compulsive behaviors, such as gambling, can also push one along the curve (Fig. 2-26). Therefore a person who starts with a low inherited susceptibility and low environmental stress might need...
Snorting Cocaine

The early 1900s gave rise to a popular new form of cocaine use, snorting the powder into the nostrils. Called “tooting,” “blowing,” or “horning,” this method gets the drug to the nasal mucosa and into the brain within 3–5 minutes. Peak effects take a few more minutes to occur.

“What snorting I have done burns the nose terribly and is very uncomfortable. It’s much delayed where shooting is quicker. In fact after 20 minutes I was still getting higher to the point where I did not want to be.”

26-year-old recovering cocaine addict

Snorting cocaine is a self-limiting method of using cocaine. This occurs because cocaine constricts the capillaries that absorb the drug, so the more that is snorted, the slower the absorption. The blood level of cocaine is much less than when used intravenously. As the constricting effect of cocaine wears off, the nasal tissues swell, causing a runny sniffing nose characteristic of cocaine snorters. In addition chronic use can kill nasal tissues and in a few cases perforate the nasal septum that divides the nostrils (Smith & Seymour, 2001).

Mucosal & Contact Absorption

Besides absorption through mucosa in the nose, gums, and cheeks, cocaine can be absorbed through mucosal tissue in the rectum and the vagina and act as a topical anesthetic. Rectal application is used in parts of the gay male community (Karch, 1996). Cocaine can also be absorbed through the outer skin (epidermis) but not at levels high enough to cause effects, merely to be detectable in the bloodstream (and cause problems in drug testing).

Smoking

In 1914 Parke-Davis Pharmaceuticals introduced cigarettes that contained refined cocaine but the high temperature (195°C or 383°F) needed to convert cocaine hydrochloride to smoke resulted in the destruction of many of the psychoactive properties of the drug. Thus chewing, drinking, injecting, and snorting cocaine remained the principal routes of administration until the mid-1970s when street chemists converted cocaine hydrochloride to freebase cocaine. This process lowered the vaporization point to 98°C and made the drug smokable. Unlike the cocaine hydrochloride cigarettes introduced in 1914, freebase cocaine could be smoked without destroying most of its psychoactive properties. In the early and mid-1980s an easier method of making freebase cocaine (called “dirty basing”) was developed setting the stage for another cocaine epidemic. This new form of smokable cocaine was called “crack.”

When absorbed through the lungs, cocaine reaches the brain within only 5–8 seconds compared to the 15–30 seconds it takes when injected through the veins. The smokable cocaine reaches the brain so quickly it causes more dramatic effects before it is swiftly metabolized. This up and down rapid roller coaster effect results in intense craving.

“I prefer snorting because it would never get me that far out there. Freebase would get me out there more quickly and I didn’t really like that.”

17-year-old male recovering crack smoker

PHYSICAL & MENTAL EFFECTS

Metabolism

Because cocaine is metabolized very quickly by the body, effects disappear faster than with amphetamines and amphetamine congeners. Cocaine is metabolized to ecgonine methyl ester, benzoylecgonine, and if alcohol is present, cocaethylene. The half-life of cocaine is about 40–60 minutes. This means that half the drug is metabolized to pharmacologically inactive metabolites in that period of time. However, even after the drug has almost disappeared from the blood, effects continue to occur. Cocaine use is detectable in the urine for up to 36 hours.

Medical Use

As the only naturally occurring topical anesthetic with powerful vasoconstriction effects, cocaine is
matic increase in the number of methamphetamine labs raided by the authorities, particularly in California, Oregon, Texas, and more recently in the Midwest. While methamphetamine use in 2001 was less than half the peak level of the early 1980s, the current growth is troublesome (SAMHSA, 2002). An additional worry is that the age of first use has dropped. Some 10–13 year-olds are smoking, eating, and snorting “crank.” Some of the reasons for this upsurge are lower prices and increased availability.

While the use of methamphetamine has dropped, the use of MDMA (ecstasy), a psycho-stimulant, has increased dramatically, fulfilling the stimulant cravings of large numbers of young people although it is often also used to boost the effects of ecstasy (see Chapter 6).

The resurgence, particularly in the use of illicit methamphetamines (predominantly “crank” and “crystal meth”), has been signaled by the dramatic increase in the number of methamphetamine labs raided by the authorities, particularly in California, Oregon, Texas, and more recently in the Midwest. While methamphetamine use in 2001 was less than half the peak level of the early 1980s, the current growth is troublesome (SAMHSA, 2002). An additional worry is that the age of first use has dropped. Some 10–13 year-olds are smoking, eating, and snorting “crank.” Some of the reasons for this upsurge are lower prices and increased availability.

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“I started shooting speed and I couldn’t keep getting $20 bucks from my mom, you know. I had to either start selling it or start stealing stuff’ cause I had a big habit. So I was stealing cars and I was jacking stereos and I would rip

anybody off who gave me money just to get myself high. Incidentally, stealing the car was also a high.”

17-year-old recovering IV meth user

The profile of the typical user is a white male between the ages of 19 and 40. Recently there has been increased use among women. Historically, stimulant epidemics last about 10–15 years and go in waves from one coast of the United States to the other. Methamphetamine use swept towards the eastern and southern United States in the 1990s and to everywhere else in the 2000s although the heaviest use is still out West. Eventually, due to the intensity of the high and the severity of the side effects, amphetamine abuse becomes self-limiting and the rapid growth of use levels out.

Methamphetamine Manufacturing

Over the years much of the street manufacturing and dealing of methamphetamines was by biker gangs (Hell’s Angels and Gypsy Jokers) because of the money involved and the partiality of bikers to the drug. But there has been an ever-increasing involvement of Mexican gangs and drug cartels in the manufacturing and distribution of the drug.

Historically labs made methamphetamines with the P2P method (total synthesis) or by reduction of ephedrine or pseudoephedrine. In raided laboratories, only 3% still used the P2P method. One of the reasons for the resurgence in the use of methamphetamine is new, somewhat safer, cheaper, and almost odor-free manufacturing techniques (Marnell, 1997).

Illicit methamphetamine manufacturing used to be an extremely risky business. The fumes were toxic and explosions could and did occur if the chemicals were handled improperly. Foul odors that emanated from the “cookers” were of great help to law enforcement agencies in locating methamphetamine labs. Now methamphetamine can even be manufactured on a stove top. The DEA estimates that
of cocaine, heroin, or alcohol use is a very visceral very immediate process. Those of tobacco are very subtle and slow. The dangerous side effects weigh directly against the pleasure received. With tobacco that craving can only be countered by an intellectual appreciation of the long-term dangers. In most cases the craving and fear of withdrawal win out over common sense.

According to the Centers for Disease Control (CDC), smoking costs the United States about $150 billion each year in health costs and lost productivity or $7.18 for each of the 22 billion packs sold. That works out to about $3,391 per smoker per year.

Longevity

"It might be shortening my life. And I don’t breathe as well. I love to hike and that’s difficult. I get short of breath too easily. Get dizzy. I want to be around when my kids get older, my future grandchild. I’d like to be around and these don’t seem to be conducive to that.”

20-year smoker

The exceptional 75-year-old smoker who is healthy should not be seen as confirmation that smoking won’t shorten life span or impair health. One has to look at the overall statistics. On average, adult male smokers lost 13.2 years of life while adult women smokers lost 14.5 years of life (CDC, 2002). Internationally and in the United States the average life span loss to those smokers who die in middle age (before the age of 70) will be 22 years (WHO, 2002).

Almost as important as these premature death statistics is the issue of quality of life. Because of breathing difficulties, poor circulation, and a dozen other imbalances caused by tobacco, a smoker will have more medical complications, be less able to participate in physical activity, and will not be able to live life to the fullest.

Cardiovascular Effects

Smoking accelerates the process of plaque formation and hardening of the arteries (atherosclerosis), the major cause of heart attacks, by increasing low-density fats, increasing blood coagulability, and triggering cardiovascular arrhythmias (irregular beatings of the heart). The inhaled carbon monoxide created by tobacco combustion also accelerates the process of atherosclerosis. In addition since nicotine constricts blood vessels, it restricts blood flow and raises blood pressure increasing the risk of a stroke (ruptured blood vessel in the brain). The combination of nicotine and carbon monoxide also increases the risk of angina attacks (heart pain).

Respiratory Effects

Cigarette smokers have a much higher rate of bronchopulmonary dis-
In addition to countries that grow, refine, and sell the drug, several countries have major refining facilities or act as transshipment points for heroin. These transshipment countries include the Netherlands, Canada, Italy (especially Sicily), France, and Nigeria (the latter also produces its own heroin). Also many ex-Soviet republics and satellites (e.g., Armenia, Uzbekistan, Kazakhstan, Turkmenistan) are involved in transshipment as well as production of heroin (DEA, 2002b).

Alarmingly in the early 1990s a number of Colombian cocaine cartels diversified and started to grow and distribute opium/heroin (in addition to their fields of coca shrubs) in an effort to cash in on the growing heroin market. These transshipment countries include the Netherlands, Canada, Italy (especially Sicily), France, and Nigeria (the latter also produces its own heroin). Also many ex-Soviet republics and satellites (e.g., Armenia, Uzbekistan, Kazakhstan, Turkmenistan) are involved in transshipment as well as production of heroin (DEA, 2002b).

A small sample of Mexican tar heroin, the most common type of heroin sold in the United States, is packed in a little plastic bag. Courtesy of JACNET, Jackson County, Oregon

Three heroin drug smugglers in Thailand are posed with their dope. Under Thai law the jail sentence is tied to the number of grams found on them. For over 400 grams, the sentence is 66 years. If they plead guilty, their sentence is cut in half. Unfortunately the severity of the sentences leads to bribery and corruption. Courtesy of George Skaggard

(Note: For the rest of this chapter, we will use the generic term opioids to denote both natural and semisynthetic opiates and synthetic opioids.)

EFFECTS OF OPIOIDS

Medically physicians most often prescribe opioids to
- deaden pain,
- control coughing,
- stop diarrhea.

Nonmedically users self-prescribe opioids to
- drown out emotional pain,
- get a rush,
- induce euphoria,
- prevent withdrawal symptoms.

But to truly comprehend opioids, it is important to understand how pain and pleasure are connected to the nervous system.

PAIN

Whether caused by a wound, a disease, or a nerve problem, pain is a warning signal that tells us whether we are being damaged physically. Injury sends a message to the spinal cord and on to the brainstem and medial portion of the thalamus in our brain that in turn tells the body to protect itself from further damage (Jaffe, Knapp, & Ciraulo, 1997). The pain message is transmitted from nerve cell to nerve cell by a neurotransmitter called “substance P.” This neuropeptide, first discovered in 1931, signals the intensity of painful stimuli.

If the pain is too intense, the body tries to protect itself by softening the pain signals. It does this by flooding the brain and spinal cord with endorphins and enkephalins. These neurotransmitters attach themselves to opioid mu and kappa receptor sites on the membranes of sending nerve cells telling them not to send substance “P” (Fig. 4-2) (DeVane, 2001). However, many signals still get through.

If the pain remains unbearable, opioid medications can be used to relieve...
with some nasty threats to do them bodily harm. The next time, they gave me some Valium® and though I still felt nervous, it did calm me enough so I could have the scan done. It seemed like a dream.”

50-year-old female without any drug problem

NONMEDICAL USE OF BENZODIAZEPINES

Since the desirable emotional and physical effects of benzodiazepines are very similar to alcohol, they are sometimes used for the same reasons a person drinks. A double-blind study on nondrug addicts compared the effects of low-dose diazepam injections and alcohol injections. The subjects found the highs from each of the drugs to be extremely similar; however higher-dose diazepam produced more physical impairment (Schuckit, Greenblatt, Gold, & Irwin, 1991).

Benzodiazepines alone can be abused but they are most often abused in conjunction with other drugs. Methamphetamine and cocaine abusers often take a benzodiazepine to come down from excess stimulation. Heroin addicts frequently take a benzodiazepine when they can’t get their drug of choice and alcoholics use them or are given them to prevent convulsions and other life-threatening withdrawal symptoms. For example, depending on the study, 20% to 40% of alcoholics and 25% to 50% of heroin or methadone-maintained addicts abused benzodiazepines (Miller & Gold, 1990). In another study at a treatment center 10% of polydrug clients abused benzodiazepines. In one older study almost 100% of benzodiazepine addicts reported dependence on or addiction to other drugs (Busto, Sellers, Naranjo, et al., 1986). Benzodiazepine abusers are more likely to be older than 30 years of age, White, well-educated, and female.

“If I threw down 10 Valium®, I didn’t really feel that much. It wasn’t like taking Nembutal® or other barbiturates where you get a real rush. I would have to take an awful lot to feel anything. It relieved certain anxieties; it alleviated depression. You tell the doctor, ‘I’m depressed.’ ‘Okay, take some Valium®.’”

48-year-old recovering female benzodiazepine abuser

NEUROCHEMISTRY & GABA

Benzodiazepines have been shown to exert their sedative effects in the brain by potentiating (increasing the effects of) a naturally occurring neurotransmitter, called “GABA” (gamma amino butyric acid), in the cerebellum, cerebral cortex, and limbic system (Potokar & Nutt, 1994). GABA is recognized as the most important inhibitory neurotransmitter, so when a drug, like alprazolam (Xanax®), greatly increases the actions of GABA, it subsequently decreases anxiety-producing thoughts and over-stimulating neural messages (Stahl, 2000). Other sedating neurotransmitters, such as serotonin and dopamine, are also increased.

Most benzodiazepines are prodrugs. This means that the liver converts a certain percentage of a drug, like diazepam (Valium®), to a psychoactive metabolite (e.g., nordiazepam). The metabolites can be as active or even more active than the original drug itself. Nordiazepam can be further converted to temazepam and oxazepam (Jenkins & Cone, 1998). (These last two active metabolites are also manufactured separately by pharmaceutical companies as Restoril® and Serax®.) The metabolites, along with the original drug, are very fat-soluble (lipophilic) and therefore stay in the body for a long time.

Specific benzodiazepines have been developed to treat specific conditions. For example,

◊ short-term alprazolam (Xanax®) is used for immediate relief of the symptoms of generalized anxiety disorder, panic disorder, and depression resulting from anxiety (many patients are prescribed alprazolam just for depression);

◊ triazolam (Halcion®) is used for short-term (7–10 days) treatment of insomnia;

◊ diazepam (Valium®) is used to gain relief from skeletal muscle spasms caused by inflammation of the muscles and joints or to control seizures such as those that occur during severe alcohol or barbiturate withdrawal;

Some of the main benzodiazepines include alprazolam (Xanax®), diazepam (Valium®), clonazepam (Klonopin®), and triazolam (Halcion®).
24,000 Americans die each year from cirrhosis due to alcohol consumption (DeBakey, Stinson, Grant, & Dufour, 1996). The damaging effects of alcohol to tissues occur not only because alcohol itself is toxic but because the metabolic process produces metabolites, such as free radicals and acetaldehyde, that are even more toxic than alcohol itself (Kurose, Higuchi, Kato, Miura, & Ishii, 1996). Cirrhosis is even less amenable to treatment and cannot be reversed although abstinence can often arrest the progression of the disease.

“I was sick to my stomach and I threw up and little did I know because it was dark that it was blood and I turned on the light and I had a little garbage can there by the bed and the damn thing filled up. There was an artery in my liver that had just exploded I guess and they said when that happens it’s a gusher. And so after they put me out, they said you’ve got cirrhosis very bad. Well they put me on the transplant list. I didn’t know it at the time but you have to be sober for a year before they’ll even consider transplanting your liver.”

65-year-old recovering alcoholic

Over the years liver cirrhosis rates have gone up and down with the rise and fall of alcohol consumption. With the increase in hepatitis C however, many more nonalcohol-related cases of cirrhosis will be altering the statistics.

It is estimated that alcoholic cirrhosis is a major contributing factor in 44–80% of all cases of cirrhosis in the United States (Nidus Information Services, 2002). The prevalence of cirrhosis in the United States also varies from ethnic group to ethnic group, from male to female, and by age. For example, in one study by the National Institute on Alcohol Abuse and Alcoholism (NIAAA), Hispanic men showed the highest cirrhosis mortality rates followed by Black men, White men, Hispanic women, Black women, and White women. A majority of the Hispanic men were of Mexican ancestry. About 2½ times more men than women of all races die from cirrhosis (mostly because more men drink than women).

The drinking habits of various cultures worldwide have a strong effect on the incidence of cirrhosis. Heavy drinking countries such as France and Germany have rates of cirrhosis 2 to 3 times higher than the United States (Table 5-5).

A problem with estimates about drinking rates is that in many countries, particularly poorer countries, there are large amounts of unreported alcohol production and consumption. The World Health Organization (WHO) reports that in a country such as Kenya 80–90% of alcohol consumption is not officially reported. In the Russian Federation about one-half of the consumption is unreported, while in Slovenia 40% is unreported (WHO, 2003). In comparing the increase in drinking, the WHO report found that the largest increases in consumption were among developing countries and those in transition, such as former Soviet bloc countries.

Fatty liver, the accumulation of fatty acids in the liver, can begin to occur after just a few days of heavy drinking. Abstention will eliminate much of the accumulated fat.

When the liver becomes damaged due to cirrhosis, fatty liver, or hepatitis, its ability to metabolize alcohol decreases thus allowing the alcohol to travel to other organs in its original toxic form. Even persistent moderate drinking can damage the liver.

**TABLE 5-4 RATES OF CIRRHOSIS OF THE LIVER IN THE UNITED STATES**

<table>
<thead>
<tr>
<th>Year</th>
<th>Rate of Cirrhosis per 100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>1911</td>
<td>17.0</td>
</tr>
<tr>
<td>1932</td>
<td>8.0 (end of Prohibition)</td>
</tr>
<tr>
<td>1973</td>
<td>14.9</td>
</tr>
<tr>
<td>2000</td>
<td>9.6 (26,552 deaths)</td>
</tr>
</tbody>
</table>

(Grant, 1985; Saadatmand, Stinson, Grant, & Dufour, 2000; National Center for Health Statistics, 2002)

This fatty liver of a drinker is caused by accumulation of fatty acids. When drinking stops, the fat deposits usually disappear. Courtesy of Boris Ruebner, M.D.

Cirrhosis of the liver usually takes 10 or more years of steady drinking. The toxic effects of alcohol cause scar tissue to replace healthy tissue. This condition remains permanent even when drinking stops. Courtesy of Boris Ruebner, M.D.
### TABLE 6-1 ALL AROUNDERS (PSYCHEDELICS)

<table>
<thead>
<tr>
<th>Common Names</th>
<th>Active Ingredients</th>
<th>Street Names</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INDOLE PSYCHEDELICS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LSD (LSD-25 &amp; -49) (Schedule I)</td>
<td>Lysergic acid diethylamide</td>
<td>Acid, sugar cube, window pane, blotter, illusion, boomers, yellow sunshine</td>
</tr>
<tr>
<td>Mushrooms (Schedule I)</td>
<td>Psilocybin</td>
<td>'Shrooms, magic mushrooms</td>
</tr>
<tr>
<td>Tabernanthe iboga (Schedule I)</td>
<td>Ibogaine</td>
<td>African LSD</td>
</tr>
<tr>
<td>Morning glory seeds</td>
<td>Lysergic acid amide</td>
<td>Heavenly blue, pearly gates, wedding bells, olohiuqui</td>
</tr>
<tr>
<td>or Hawaiian woodrose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DMT (synthetic or from yopo beans, epena, or Sonoran Desert toad) (Schedule I)</td>
<td>Dimethyltryptamine</td>
<td>Businessman’s special, cohoba snuff</td>
</tr>
<tr>
<td>Yage, ayahuasca, caapi</td>
<td>Harmaline (also mixed with DMT)</td>
<td>Visionary vine, vine of the soul, vine of death, mih, kahi</td>
</tr>
<tr>
<td>Foxy</td>
<td>5-Me-DIPT</td>
<td></td>
</tr>
<tr>
<td>AMT</td>
<td>Alphamethyltryptamine</td>
<td></td>
</tr>
<tr>
<td><strong>PHENYLALKYLAMINE PSYCHEDELICS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peyote cactus (Schedule I)</td>
<td>Mescaline</td>
<td>Mesc, peyote, buttons</td>
</tr>
<tr>
<td>Designer psychedelics, e.g.,</td>
<td>Variations of methylenedioxy-amphetamines</td>
<td>Ecstasy, rave, love drug, XTC, Adam, Eve</td>
</tr>
<tr>
<td>MDA, MDMA (MDM), MMDA, MDE (Schedule I)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2C-B or CBR (Schedule I)</td>
<td>4-bromo-2,5-dimethoxy-phenethylamine</td>
<td>Nexus</td>
</tr>
<tr>
<td>2C-T-2 (Schedule I)</td>
<td>2,5-dimethoxy-4-ethyl-thiophenethylamine</td>
<td>Serenity, tranquility, peace pill</td>
</tr>
<tr>
<td>2C-T-7 (Schedule I)</td>
<td>2,5-dimethoxy-4-propyl-thiophenethylamine</td>
<td>Wedge series, orange and pink wedges, Harvey Wallbanger</td>
</tr>
<tr>
<td>STP (DOM) (synthetic) (Schedule I)</td>
<td>4 methyl 2,5 dimethoxy-amphetamine</td>
<td></td>
</tr>
<tr>
<td>STP-LSD combo</td>
<td>Dimethyl-amphetamine with LSD</td>
<td></td>
</tr>
<tr>
<td>PMA(Schedule I)</td>
<td>Paramethoxyamphetamine</td>
<td>Death, Mitsubishi Double-Stack</td>
</tr>
<tr>
<td>U4Euh (Schedule I)</td>
<td>4-methylpemoline</td>
<td>Euphoria</td>
</tr>
<tr>
<td><strong>ANTICHOLINERGICS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belladonna, mandrake, henbane, datura</td>
<td>Atropine, scopolamine, hyoscyamine</td>
<td>Deadly nightshade</td>
</tr>
<tr>
<td>(jimson weed, thornapple), wolfbane (Schedule I)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Artane⁸</td>
<td>Trihexyphenidyl</td>
<td></td>
</tr>
<tr>
<td>Cogentin⁹</td>
<td>Benztrpine</td>
<td></td>
</tr>
<tr>
<td>Asmador⁹ cigarettes</td>
<td>Belladonna alkaloids</td>
<td></td>
</tr>
<tr>
<td><strong>OTHER PSYCHEDELICS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ketamine (Schedule III)</td>
<td>Ketajet⁸, Ketalar⁸</td>
<td>Special K, K, vitamin K, super-K</td>
</tr>
<tr>
<td>PCP (Schedule II)</td>
<td>Phencyclidine</td>
<td>Angel dust, hog, peace pill, krystal joint, ozone, Sherms, Shermans</td>
</tr>
<tr>
<td>Nutmeg and mace</td>
<td>Myristicin</td>
<td></td>
</tr>
<tr>
<td>Amanita mushrooms (fly agaric) (Schedule I)</td>
<td>Ibotenic acid, muscimole</td>
<td>Soma</td>
</tr>
<tr>
<td>Salvia divinorum</td>
<td>Salvinorin A</td>
<td>Diviner’s sage, sage</td>
</tr>
<tr>
<td>DM in Romilar⁹, Coricidin⁹</td>
<td>Dextromethorphan</td>
<td>DXM, robo, red devils, dex, skittles</td>
</tr>
<tr>
<td><strong>CANNABINOLS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marijuana (Schedule I)</td>
<td>Δ-9-tetrahydro-cannabinol (THC)</td>
<td>Grass, pot, weed, Mary Jane, joint, reefer, honey blunt, chronic, sens, stink weed, herb, charas, ganja, grifa, the kind, bhang, ditch weed, Colombian, BC bud</td>
</tr>
<tr>
<td>(Marinol⁹ is legal prescription THC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sinsemilla (Schedule I)</td>
<td>High-potency THC</td>
<td>Sens, skunk weed, ganja</td>
</tr>
<tr>
<td>Hashish, hash oil (Schedule I)</td>
<td>High-potency THC</td>
<td>Hash</td>
</tr>
</tbody>
</table>
DEXTROMETHORPHAN
(Robitussin DM®, Romilar®, & other cough syrups)

Dextromethorphan is a nonprescription opioid cough suppressant that has been available in several cold and cough medications, such as Coricidin®, Romilar®, Robitussin DM®, and over 140 other liquids, tablets, and capsules since the 1960s. The effects of an excess dose can be euphoria, dissociation of mind and body, auditory and visual hallucinations, and a loss of coordination. Those who participate in the club drug scene say that a very high dose is somewhat similar to LSD or “magic mushrooms.” Alcohol is found in many of these cough medications, so the effects are of a drunken deliriant.

“I only took a capful and it was kind of a bluish tint. It kinda reminded me of acid sort of where like wherever I’d walk, I’d feel like the world was kinda rushing towards me. Wherever I looked, it was just like the visuals, almost like tracers, coming at me. I smoked a lot of weed with those.”

Recovering club drug user

Occasional yet persistent reports of dextromethorphan abuse have continued since the early 1960s resulting in the evolution of many street names for the drug like “CCC,” “robo,” “dex,” “DXM,” and even “red devils” (a street name used for Seconal® in the ’60s).

A normal therapeutic dose is 10–50 mg or up to 120 mg in a 24-hour period. A strong dose by a drug abuser who wants the psychedelic effects is 300–600 mg and the effects will last 6–8 hours. Some will take a heavy dose, 600–1,500 mg, in the search for more mental effects. Those who get totally carried away might use a dose of 2,500–20,000 mg and at that level death can occur particularly if used in conjunction with alcohol.

The drug can also dilate pupils, decrease orgasm, upset the stomach, and induce nausea. Additional negative results are itching, rashes, fever, and tachycardia. Tolerance does develop to dextromethorphan and when used in excess can be mildly addicting.

In addition to toxic side effects resulting in acute anxiety and panic reactions (“bad trips”), DXM is also an opioid and an overdose can result in coma and respiratory depression that is somewhat treatable with naloxone, an opioid antagonist (Elora, 2001). Dextromethorphan has also been studied as a treatment for heroin and opioid addiction both by addicts themselves and by researchers (see Chapter 9).

NUTMEG & MACE

At the low end of the psychedelic drug spectrum, nutmeg and mace—from the nutmeg tree (myristica fragrans)—can cause varied effects from a mild floating sensation to a full-blown delirium. So much has to be consumed (about 20 grams) that the user is left with a bad hangover and a severely upset stomach. The active chemicals in nutmeg and mace are variants of MDA (methylenedioxyamphetamine) (Marnell, 1997). Since this dose exposes a user to the nauseating and toxic effects of other chemicals in nutmeg, its abuse is extremely rare outside of prisons where convicts are driven to use it since they have limited access to other psychedelics.

MARIJUANA & OTHER CANNABINOLS

“A federal jury in San Francisco found Ed Rosenthal, one of the nation’s most prominent marijuana advocates, guilty Friday of felony conspiracy and cultivation charges — a triumph for federal prosecutors seeking to override California’s endorsement of pot as medicine.”

San Francisco Chronicle, Feb 1, 2003

© 1990 Alain Labrousse.
The second species, Cannabis indica, is a shorter bushier plant with fatter leaves and is generally not used for its fibers. It is especially plentiful in the Middle East and India and is the source of most of the world’s hashish. Modifications of Cannabis indica have resulted in a stronger smellier variety of this plant nicknamed “skunk weed.” Many illegal growers have come to prefer Cannabis indica as the base plant on which to use the sinsemilla-growing technique in the mistaken belief that Cannabis indica is legal since the law as written prohibits only Cannabis sativa. Legal challenges have resulted in the interpretation that it is marijuana that’s illegal regardless of the specific species.

The third species, Cannabis ruderalis, a small thin plant, has few psychoactive components and is especially plentiful in Siberia and Western Asia.

Sinsemilla & Other Forms of Marijuana

The sinsemilla-growing technique increases the potency of the marijuana plant and is used with both Cannabis indica and Cannabis sativa. The sinsemilla technique involves separating female plants from male plants before pollination. Female plants produce more psychoactive resin than male plants especially when they are unpollinated and therefore bear no seeds. Sinsemilla means “without seeds” in Spanish. The term “commercial grade” refers to marijuana that is not grown by the sinsemilla technique.

Dried marijuana buds, leaves, and flowers can be crushed and rolled into “joints.” They can also be smoked in pipes. In India and some other countries, marijuana in its various forms is smoked in chillums, which are coneshaped pipes made out of clay, stone, or wood. Marijuana can also be taken in food and in drinks or the leaves can be chewed. In India and several other countries, marijuana is divided into three different strengths, each one coming from a different part of the plant.

- **Bhang** is made from the stem and leaves and has the lowest potency.
- **Ganja** is made from the stronger leaves and flowering tops.
- **Charas** is the concentrated resin from the plant and is the most potent (Stafford, 1992; Blum, 1984).

When the sticky resin is pressed into cakes it is called “hashish”; the resin contains most of the psychoactive ingredients. This concentrated form of Cannabis is usually smoked in special pipes, called “bongs” or “hookahs,” or it can be added to a marijuana cigarette (joint) to enhance the potency of the weaker leaves. Bongs can also be used to smoke the less-concentrated parts of the marijuana plant. In India, Nepal, and other countries in the area, hashish use has been widespread. An early writer in the nineteenth century described five or six methods for collecting the resin and another dozen methods of preparing it for use, including pressed cakes, small pills, candies, or simply tiny balls of the dark brown resin (Biba, 1855/1995).

Hash oil can be extracted from the plant (using solvents) and added to foods. Most often it is smeared onto rolling paper or dripped onto crushed marijuana leaves to enhance the psychoactive effects.
company pharmacological relief of pain and inflammation.

**Asthma Medications (beta₂ agonists)**

Asthma affects 10% of the general population and is aggravated by heavy exercise in sports that require continuous exertion, e.g., cycling, rowing, middle- to long-distance running. It is also aggravated by the excess stress that comes from preperformance anxiety. A lesser condition, exercise-induced asthma (EIA), has been found. The incidence of EIA is 11–23% in athletes (Fuentes & DiMeo, 1996; Rupp et al., 1993). Because asthma is so widespread in athletics, permission to use certain asthma medications is given. Medications used to control asthma include beta₂ agonists like clenbuterol (banned) and albuterol (limited use). Beta₂ stimulation also increases muscle energy and growth but to a lesser extent than steroids. Asthma medications like ephedrine are stimulants and are therefore banned in sports. These drugs can slightly increase oxygen intake by bronchodilation that is helpful to the asthmatic. Other asthma medications such as theophylline and cromolyn are freely allowed by both the IOC and National Collegiate Athletic Association (NCAA) (Rosenberg, Fuentes, Wooley, Reese, & Podraza, 1996).

**ANABOLIC STEROIDS & OTHER PERFORMANCE-ENHANCING (ergogenic) DRUGS**

To this very broad general category of drugs we will add other substances and even techniques used to enhance performance. Most of these drugs, substances, and techniques are banned by various sports-governing bodies such as the IOC and the NCAA.

The goals that motivate users make these drugs different from alcohol and other psychoactive drugs. These ergogenic and energy-producing drugs, substances, and techniques are thought to possess various capabilities for boosting an athlete’s performance (e.g., muscle building, fatigue delay). They are also abused to enhance self-image by adding muscle mass (bulking up) and shaping one’s physique. Young adolescents might want them to hasten maturity or to develop a “buff” look. Unfortunately one of the side effects is to limit growth. The final reason performance-enhancing drugs are used is to increase confidence and aggression.

**Anabolic-Androgenic Steroids (AAS or “roids”)**

“it’s a performance-enhancing drug. I mean, that’s what it did. It enhanced my performance. There were a few side effects but for the most part I had pretty good results from them as far as gaining strength and power.”

24-year-old weightlifter

The most abused performance-enhancing drugs today, anabolic-androgenic steroids (AAS) are derived from the male hormone testosterone or are synthesized. Anabolic means “muscle building,” androgenic means “producing masculine characteristics,” and steroid is the chemical classification of the natural and synthetic compounds resembling hormones like testosterone and cortisone. AAS are used clinically to treat testosterone insufficiency, osteoporosis, certain types of anemia, some breast cancers, endometriosis, and a few other conditions (Lukas, 1998).

For the athlete, these drugs have marked benefits that include increases in body weight, lean muscle mass, and muscular strength. The drugs can also increase aggressiveness and confidence, traits that are of value in many sports.

Many students use AAS strictly to enhance personal appearance. As with any drug that’s misused, less desirable side effects occur such as bone weakness, tendon injury, cancer, sexual...
ment, and drug dealing. Their desperation causes them to play badly because they lose patience and common sense. They play too many hands in poker, they get mad at the poker or slot machines and swear they won’t let a machine beat them, and their sense of being lucky turns into a lament that they are the unluckiest people in the world.

“After 15 years, it got really bad in dollars, hundreds of thousands of dollars lost, loss of my marriage, my self-esteem of course, my vehicles, my homes. At one other point in time, I lost my mother’s home. I don’t even know how I got them [my parents] to sign on the dotted line.”

43-year-old recovering gambler

Gamblers often bankrupt their families and suffer divorce or separation because of deteriorating family relations, long absences from home, arguments over money, and indifference to the welfare of family members and others.

Giving-Up Phase

At this stage, pathological gamblers stop thinking they will win it all back and just want to stay in action so they don’t have to think. Gamblers can experience elated moods when they win and mania, depression, panic attacks, insomnia attacks, health problems, and suicidal thoughts or actual attempts when they lose. One study of Gamblers Anonymous members found severe depression in 72% of those who say they have hit bottom; suicide attempts occurred in 17–24% of them (Linden, 1985). In Gulfport, Mississippi suicide attempts went from 24 in 1992 before casinos came in, to 85 in 1995 after casinos opened, and 137 in 1996.

“Every time I get out from the casino I want to kill myself. Then it’s going to be over. Then it’s going to end. I tried to kill myself twice. I took my car to the mountains. I just wanted to— I decided I didn’t want the pain anymore.”

38-year-old recovering compulsive gambler

Often the problems become so overwhelming that they can precipitate the final crisis that hopefully leads the compulsive gambler into treatment rather than to suicide.

VIDEO POKER MACHINES

There are some things that make some games more potent and more powerful than others according to Robert Hunter, an expert in the field of pathological gambling. For the average gambler it means the game is more exciting or more interesting. For the 5% who are pathological gamblers what makes a game exciting for the average person makes it deadly for them:

◊ immediacy, finding out right now if you’re winning or losing;
◊ an ability to increase both the time and money to play longer as well as increase the amounts of bets;
Bulimia is **best treated in its early stages**. Unfortunately, people with bulimia often are in a normal weight range, so their problem may escape detection for years. After diagnosis, a decision is made to treat an individual in a hospital or on an outpatient basis.

Because of the multiple problems involved, a **multidisciplinary integrated treatment is generally used**.

- An internist advises on medical problems.
- A nutritionist provides help with diet and eating patterns.
- A psychotherapist provides emotional support and counseling and may begin therapy that involves changing attitudes and behaviors.
- A psychopharmacologist may counsel on which psychoactive medications might be effective (NOAH, 1996). In recent years antidepressants have been used, especially selective serotonin reuptake inhibitors, along with monoamine oxidase inhibitors (Goldbloom, 1997).

The Karolinska Institute in Sweden found that conditioning methods that focused on physical symptoms, not on psychological problems, were the most effective treatment for those with bulimia as well as anorexia. When patients were trained to eat, recognize satiation, not exercise after eating, and some other behavioral conditioning, remission rates were 75% (Bergh, Brodin, Lindberg, & Södersten, 2002).

**Family and group therapies are extremely useful** to provide understanding and emotional support to the patient. Group therapy may provide great relief for a person who doesn’t need to keep the disorder secret any longer. Family, friends, and colleagues can help an ill person start and complete treatment and then provide encouragement to make sure the disorder does not reoccur. There are also self-help and peer-support groups organized specifically for bulimia but these are currently less effective than groups for compulsive overeating.

**BINGE-EATING DISORDER** (including compulsive overeating)

“During your life, my child, see what suits your constitution, do not give it what you find disagrees with it; for not everything is good for everybody, nor does everybody like everything. Do not be insatiable for any delicacy, do not be greedy for food; for overeating leads to illness, and excess leads to liver attacks. Many people have died from overeating; control yourself, and so prolong your life.”

Sirach 37, 27, *The Bible*

The prevalence of obesity in the United States is increasing. One major study found that **obesity (more than 30 lbs. overweight) increased from 15% of the population in 1980 to 31% in 2000**. That figure is expected to rise to 38% by 2008 (Helmich, 2003). The greatest increase was found in 18-29-year-olds, in those with some college education, those of Hispanic ethnicity, and those from the south Atlantic states. In addition the prevalence of diabetes, one of the main consequences of obesity, was 7.3% (Mokdad et al., 2001). A study by the Centers for Disease Control also found that about **65% of the U.S. population was overweight (10–30 lbs.) or obese in 2003 compared to 45% in 1991**.

Internationally, for the first time in history, there are as many people overweight as underweight, about 1.1 billion of each in a worldwide population of 6 billion. In Europe overweight people outnumber those who are underweight by a ratio of 9 to 1, in North America, 12 to 1, and in Latin America, 5 to 1, while in Africa they are about equal and in Southeast Asia there are 5 times as many underfed as overfed people (Gardner & Halweil, 1999).

**Definition**

There is much debate on how to define obesity. For example:

- Is obesity a specific syndrome or is it a symptom of a number of conditions such as metabolic disorders, psychological disorders, or simply situational factors (there are too many fast-food restaurants and people don’t get enough exercise)?
- Is obesity an outcome of the metabolic changes wrought by excessive...
host's access to the agent. National antismoking, drunk driver, and HIV risk reduction campaigns, which constitute the bulk of the highly visible programs, seek to limit the influence of the environment on the host.

Other prevention activities aimed at the environment-host relationship are designed to reinforce the emotional strengths and protective elements already existing in people’s lives or to improve the economic and emotional environment of those most at risk.

Family Approach

Recently a family-focused approach has been embraced by treatment and prevention specialists. The family approach makes sense since susceptibility to addiction often stems from family dynamics. Family support, skills training, and therapy, along with parenting programs, seem to reduce the risk factors that lead to drug abuse and addiction (Kumpfer et al., 1998). Certainly any process that reduces abuse, decreases parental use of drugs, and helps the family members improve their relationships with each other must be of benefit to a potential abuser. Unfortunately much of the focus is on the potential addict rather than on the total environment and relationships that have the greatest effect on susceptibility to addiction.

PREVENTION METHODS

Whatever model is used, a good way to understand the effectiveness of the various approaches to prevent drug abuse and addiction is to examine supply, demand, and harm reduction in more detail.

SUPPLY REDUCTION

Supply reduction seeks to decrease drug abuse by reducing the availability of drugs through regulation, restriction, interdiction, and law enforcement. Supply reduction is the responsibility of

- state and local police departments;
- the Department of Justice (including the Federal Bureau of Investigation [FBI], the Bureau of Prisons, the Immigration and Naturalization Service [INS], and the Drug Enforcement Administration [DEA]);
- the Treasury Department (including the Bureau of Alcohol, Tobacco, and Firearms [ATF], the Internal Revenue Services [IRS], and the Customs Service);
- the Department of Transportation (including the U.S. Coast Guard and the Federal Aviation Administration [FAA]);
- the Department of Defense.

This complex network of agencies is coordinated by the Office of National Drug Control Policy (ONDCP).

Some of the supply reduction activities include

- interdicting drug smugglers by air, sea, and highway;
- increasing law enforcement activities at border crossings;
- interdicting and limiting the supply of precursor chemicals used in the manufacture of illicit drugs (e.g., ephedrine, a precursor of methamphetamines);
- identifying, disrupting, and dismantling criminal gangs and organized crime;
- supporting and passing more severe laws while trying to make sentencing policies fair;
- funding the addition of community police officers;
- supporting local and state police in high-intensity drug-trafficking areas (HIDTA) as well as coordinating intelligence information and activities;
- disrupting money laundering activities and seizing assets of drug dealers to limit the profits from illegal drug activities;
- breaking up domestic and foreign sources of supply by supporting eradication and the antidrug efforts of countries like Colombia, Pakistan, and Mexico.
• **Introduction:**
  ◦ **A Disease of the Brain:** The most prevalent mind disorder is substance abuse. It causes more illness, death, and social disruption than any other brain disease. Substance abuse also costs our society more financial loss than any other medical condition.
  ◦ **Current Issues in Treatment:**
    1. There is a rapidly expanding use of medications to treat detoxification, control withdrawal symptoms, lessen craving, and promote short- and long-term abstinence.
    2. Advanced imaging methods and other new diagnostic techniques are being used to visualize the physiological effects of addiction on the human brain.
    3. There is a lack of resources to provide the treatment that has been proven to be effective.
    4. Increasing research supports coerced treatment (e.g., drug courts) as being just as effective in promoting abstinence and recovery from drug addiction when compared to voluntary treatment admissions.
    5. The conflict between abstinence-oriented recovery and harm reduction as philosophies of treatment continues. Historically America has vacillated between temperance, individual abstinence, and societal prohibition.

• **Treatment Effectiveness:** Treatment has a 50% success rate and saves $4 to $20 for every $1 spent on treatment. It also reduces crime by 75%.

• **Principles & Goals of Treatment:** Certain principles for effective treatment include having a wide variety of treatment programs that are readily available, using medications in conjunction with individual and group therapy, and treating any coexisting conditions not just the addiction itself. Goals include motivating clients towards abstinence and reconstructing their lives in ways that exclude drug abuse.

• **Selection of a Program:** Correct diagnosis helps treatment professionals match the client to the best program. Providing a wide range of treatment approaches plus customizing treatment for culture, gender, ethnicity, and other traits dramatically improves outcomes. Programs include medical model detoxification, therapeutic communities, and harm reduction programs. About 1 1/2 million people are treated for substance abuse each year.

• **Beginning Treatment:** Breaking through denial is the crucial first step in treatment. Hitting bottom, especially when health, family, work, financial, or legal problems are involved, often gets the user into treatment. Direct intervention with an intervention specialist is also used to get the person into treatment.

• **Treatment Continuum:** Once addiction has occurred, treatment and recovery become a lifetime process.
  ◦ **Detoxification** uses medical care, emotional support, and medications to control withdrawal symptoms, reduce craving, and help the client to begin abstinence.
  ◦ **Initial Abstinence** uses counseling, anticraving medications, drug substitution, and desensitization techniques to rebalance body chemistry, continue abstinence, and prevent relapse due to environmental triggers.
  ◦ **Long-Term Abstinence** involves participation in continued counseling and groups to prevent relapse and begin to change living habits.
  ◦ **Recovery** is a lifelong process that involves rebuilding one’s lifestyle to live sober and drug free.
  ◦ **Outcome & Follow-Up** studies are used to judge the effectiveness of treatment programs.

• **Individual vs. Group Therapy:** Individual counseling, peer groups, 12-step groups, facilitated group therapy, and educational groups are all used in treatment.

• **Treatment & the Family:** Treatment should involve the whole family. The problems of codependency, enabling, and being the child of an alcoholic/addict must be addressed.

• **Adjunctive & Complementary Treatment Services:** Abuse and addiction of substances have a negative impact on the user’s family and on his or her physical, emotional, social and spiritual well-being. Treatment that effectively addresses all of these components through a comprehensive, integrated, and “wrap-around” service delivery design is being encouraged to increase positive outcomes.

• **Drug-Specific Treatment:** Certain psychoactive drugs call for specialized medical and counseling treatment techniques, e.g., methadone maintenance, stimulant abuse groups, or dual diagnosis groups. A behavioral addiction like gambling is treated with many of the same techniques that are used for substance addiction. Office-based opiate addiction treatment (O-BOAT) using buprenorphine has ushered in a new era of opiate addiction treatment.

• **Target Populations:** Treatment should be culturally specific (i.e., ethnicity, gender, language) since needs vary between men and women, old and young, and among Black, White, Hispanic, Asian, and Native American people.

• **Treatment Obstacles:** Developmental arrest, lack of cognition, conflicting goals, poor follow-through, and lack of facilities are the main problems in treatment.

• **Medical Intervention Developments:** More than 60 medications are being developed, focusing on aspects of treatment such as detoxification, replacement or agonist therapies, antagonist or vaccine effects, anticraving effects, and restoration of homeostasis.
(Zoloft®), citalopram (Celexa®), paroxetine (Paxil®), and fluvoxamine (Luvox®) are classified as selective serotonin reuptake inhibitors (SSRIs) that increase the amount of serotonin available to the nervous system. The amount needed to be effective varies widely from patient to patient and has to be adjusted. It generally takes 2–4 weeks for the full effect to be felt. The most common side effects are insomnia, nausea, diarrhea, headache, and nervousness. Most of the side effects are mild and will go away in a few weeks. Recently the Food and Drug Administration warned against the use of paroxetine (Paxil®) for those under age 18 due to increased risk of suicide. The drug is not approved for pediatric use but some physicians had been prescribing it anyway. However they did approve another SSRI, fluoxetine (Prozac®), for pediatric use (U.S. Food and Drug Administration, 2003).

### TABLE 10–2 THE RELATIONSHIP BETWEEN NEUROTRANSMITTERS, THEIR FUNCTIONS, STREET DRUGS, MENTAL ILLNESS, & PSYCHIATRIC MEDICATIONS

<table>
<thead>
<tr>
<th>COLUMN 1</th>
<th>COLUMN 2</th>
<th>COLUMN 3</th>
<th>COLUMN 4</th>
<th>COLUMN 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Neurotransmitter</strong></td>
<td><strong>Normal Functions</strong></td>
<td><strong>Street Drugs That Disrupt the Neurotransmitter</strong></td>
<td><strong>Associated Mental Illnesses</strong></td>
<td><strong>Some Examples of Medications to Rebalance Neurotransmitters</strong></td>
</tr>
<tr>
<td>Serotonin</td>
<td>Mood stability, appetite, sleep control, sexual activity aggression, self-esteem</td>
<td>Alcohol, nicotine, amphetamine, cocaine, PCP, LSD, MDMA (ecstasy)</td>
<td>Anxiety disorders e.g. PTSD, panic disorder, obsessive-compulsive disorder, generalized anxiety disorder; mood disorders, e.g., bipolar disorder, major depressive disorder, depression</td>
<td>Selective serotonin reuptake inhibitors (e.g. Prozac®, Zoloft®, Paxil®, Celexa®), BuSpar®, Elavil®, Desyrel®</td>
</tr>
<tr>
<td>Dopamine</td>
<td>Muscle tone/control, motor behavior, energy, reward mech., attention span, pleasure, mental stability, hunger/thirst/sexual satiation</td>
<td>Cocaine, nicotine, PCP, amphetamine, caffeine, LSD, marijuana, alcohol, opioid</td>
<td>Psychotic disorders, e.g., schizophrenia, schizoaffective disorder, Parkinson’s disease</td>
<td>Antipsychotics, e.g. Risperdol®, L-dopa, amantadine, bromocryptine</td>
</tr>
<tr>
<td>Norepinephrine, epinephrine</td>
<td>Energy, motivation, eating, attention span, pleasure, heart rate, blood pressure, dilation of bronchi, assertiveness, alertness, confidence</td>
<td>Cocaine, nicotine, amphetamine, caffeine, marijuana, MDMA, 2CB, CBR</td>
<td>Anxiety disorders, mood disorders, narcolepsy</td>
<td>Buproprion, desipramine, methylphenidate, clonidine, beta blockers</td>
</tr>
<tr>
<td>Endorphin, enkephalin</td>
<td>Pain control, reward mechanism, stress control (physical and emotional)</td>
<td>Heroin, other opioids, PCP, alcohol, marijuana</td>
<td>Psychotic disorders, mood disorders</td>
<td>Methadone, LAAM, naltrexone, buprenorphine</td>
</tr>
<tr>
<td>GABA (gamma aminobutyric acid)</td>
<td>Inhibitor of many neurotransmitters, muscle relaxant, control of aggression, arousal</td>
<td>Alcohol, marijuana, barbiturates, PCP, benzodiazepines</td>
<td>Anxiety, sleep disorders, narcolepsy</td>
<td>Benzodiazepines, glutamine, THC</td>
</tr>
<tr>
<td>Acetylcholine</td>
<td>Memory, learning, muscular reflexes, aggression, attention, blood pressure, heart rate, sexual behavior, mental acuity, sleep, muscle control</td>
<td>Marijuana, nicotine, alcohol, PCP, cocaine, amphetamine, LSD</td>
<td>Alzheimer’s disease, schizophrenia, tremors</td>
<td>Vistaril®, Artane®, Cognentin®, Benadryl®, tacrine (Cognes®), donepezil (Aricept®), rivastigmine (Exelon®), galantamine (Reminyl®)</td>
</tr>
<tr>
<td>Cortisone, corticotrophin</td>
<td>Immune system, healing, stress</td>
<td>Heroin, cocaine</td>
<td>Schizophrenia, depression, insomnia, anxiety</td>
<td>Corticosteroids (Prednisone®, cortisone), ACTH, cortisol</td>
</tr>
<tr>
<td>Histamine</td>
<td>Sleep, inflammation of tissues, stomach acid, secretion, allergic response</td>
<td>Antihistamines, opioids</td>
<td>Depressive illness</td>
<td>Antihistamines</td>
</tr>
<tr>
<td>Anandimide</td>
<td>Natural function is still unknown but several receptors still discovered</td>
<td>Marijuana</td>
<td>Not known</td>
<td>Marijuana antagonist (SR14176A)</td>
</tr>
</tbody>
</table>
Daryl S. Inaba, Pharm.D., is Chief Executive Officer of the Haight Ashbury Free Clinics, Inc., in San Francisco, California. He is responsible for the operation of five treatment/recovery health care programs at 22 different locations throughout the area, overseeing a 300-member staff and more than 900 volunteers. The Clinics provide treatment for more than 1,300 clients per month.

During his 35-year tenure, Dr. Inaba also maintained academic positions: Associate Clinical Professor at the University of California Medical Center and Instructor/Special Consultant at the University of Utah. Each year he gives more than 30 lectures and seminars around the country on the complex problems of substance abuse treatment and recovery. He has authored or been a senior consultant on many articles, books, films, and videos on the subjects of substance abuse and community health care over the past three decades. He has also served on many boards, commissions, and study groups to help develop research and treatment options in the field of substance abuse.

Dr. Inaba’s work has received over 80 individual awards and commendations.

Most notably are honors from:
- California’s Lieutenant Governor and both Houses of the State Legislature
- California Society of Addiction Medicine
- California Department of Rehabilitation
- Utah Association of Alcohol and Drug Abuse Counselors

Special awards include—
- Award of Merit and Certificate of Honor from the City of San Francisco
- Lang’s Foundation Outstanding Professor and Lecturer
- National Education Film Festival H. J. Kaiser Award
- Clyde and Marie Goodfellow Award

William E. Cohen started his career as a television news writer, cameraman, editor, and producer in Portland, Oregon and the San Francisco Bay area. He has been associated with CBS Productions, Inc. for more than 20 years during which time he has made over 30 films and videos for the company on the subject of psychoactive drugs, treatment and prevention in addition to co-authoring the books *Uppers, Downers, All Amunders and A Matter of Balance: Personal Strategies for Alcohol & Other Drugs.*

Beginning in 1989 and continuing to the present day, Mr. Cohen has also written and directed 200 documentaries and educational films and videos for clients ranging from ABC-TV, USA, the University of California Medical Center, in San Francisco, and the Haight Ashbury Clinics as well as other medical institutions and corporations. His film and video awards include two national Emmys, the Robert Kennedy Award for Journalism, and first places at the New York Film Festival, San Francisco Film Festival, and a dozen others. His shows have been aired on ABC, NBC, and NOVA on PBS. Mr. Cohen has also taught substance abuse courses at Southern Oregon University and continues to lecture on drug education and compulsive behaviors as a guest speaker.

“Addiction is an actual illness. When we see somebody with a physical ailment, we have compassion and some tolerance for what they have to go through. When we see a person who has a physical abnormality that’s hidden away in the brain, we jump to judgment very quickly. People say, why can’t they control their use of drugs? They don’t realize that there’s actually something organically wrong. There’s no doubt that addiction is a treatable and preventable illness.”

— DR. DARYL INABA