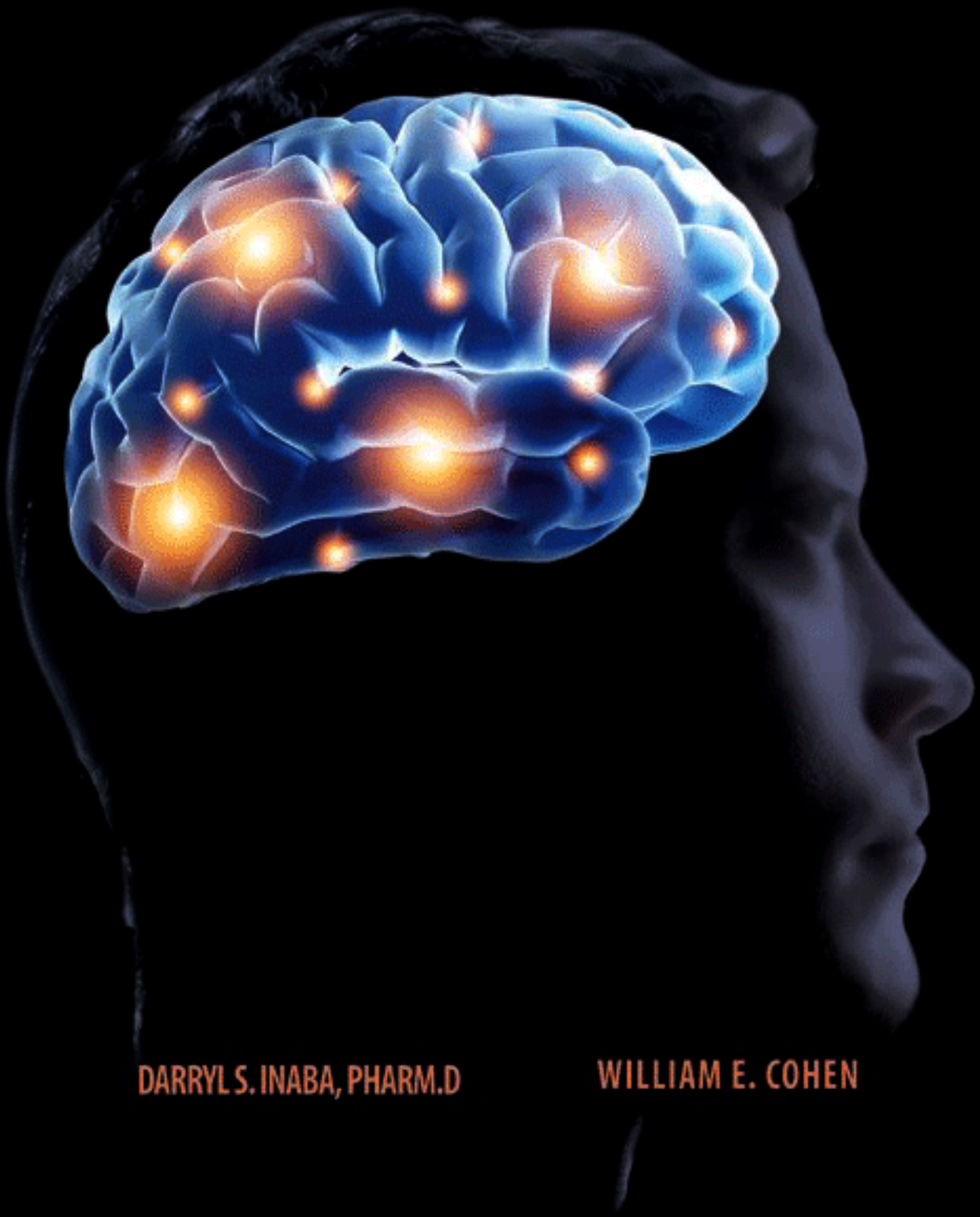
Uppers, Downers, All-Arounders

Physical and Mental Effects of Psychoactive Drugs



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This illustration of a nerve cell and its associated structures shows the complexity of the central nervous system, the part of the body most affected by psychoactive drugs. This cutaway view of a synapse between several nerve cells exposes the nucleus, Golgi apparatus, and mitochondria. Dendrites of other nerve cells terminate as synaptic endings (boutons) on the cell membrane.

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The Neurochemistry and the Physiology of Addiction

In This Chapter

We first explore the basic pharmacology of psychoactive drugs of addiction and detail how they are distributed through the blood, how they enter the brain, and how the body and the brain cells try to counter their effects by adapting, metabolizing, and ultimately excreting them.

The central nervous system (CNS)—the brain and the spinal cord—are examined to introduce the physiological framework for the evolving science of addiction and recovery. How psychoactive drugs and compulsive behaviors affect the brain's neurochemistry through neurotransmitters, receptors, and synaptic function involving the sciences of epigenetics, synaptic plasticity, and allostasis is explained. The survival/reinforcement circuit (also called the reward/reinforcement circuit) of the brain's addiction pathway is detailed because it is the heart of the addictive process.

Addiction is presented as anomalies of four areas of the addiction pathway:

- a survival/reinforcement circuit involving an overactive "go" switch in the old brain
- a damaged or underactive "stop" switch in the control circuit in the new brain
- impaired communication between these two key circuitries
- damaged, stay-stopped brain areas that make recovery extremely difficult for some addicts

The memory process of craving along with cognitive impairment of decision-making in early recovery is presented to explain the brain processes involved in craving, slips, and relapses.

This chapter also presents and defines the spectrum of drug use behaviors, from experimentation to abuse and addiction. The way these behaviors are classified and diagnosed in the 2013 *DSM-5* as "Substance-Related and Addictive Disorders" is discussed.

Also covered are the theories of addiction and how vulnerability to addiction is a combination of heredity, environmental stressors (trauma, stress, abuse, and nutritional imbalances), and exposure to drugs or certain compulsive behaviors that activate one's vulnerability.

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How Psychoactive Drugs Affect People

"I think one of the key things that both addicts and nonaddicts must understand is that this condition known as addiction (and related drug disorders) is an actual biological illness. There are real differences in the brains of some people that rob them of their ability to control their use of drugs or alcohol or compulsive behaviors and then conspire against them once they enter recovery, creating an overpowering need to resume using. It is important for them to know that they aren't stupid or crazy but that their brain functions and operates differently."

Darryl Inaba, Pharm.D., Addictions Recovery Center, Medford, OR

Eighty years ago Dr. William Silkworth, a physician at a hospital for alcoholics in New York City, suggested that **alcoholism [addiction] came from a combination of an obsession of the mind coupled with an allergy/illness of the body.**[1]

"All these [alcoholics], and many others, have one symptom in common: they cannot start drinking without developing the phenomenon of craving. This phenomenon, as we have suggested, may be the manifestation of an allergy which differentiates these people and sets them apart as a distinct entity. It has never been, by any treatment with which we are familiar, permanently eradicated. The only relief we have to suggest is entire abstinence."

William D. Silkworth, M.D., *Alcoholics Anonymous' Big Book*, 1939

To Dr. Silkworth an allergy implied that some susceptible individuals will automatically exhibit negative physiological reactions to alcohol with no regard to their personality, willpower, or morality. What is most remarkable about this viewpoint is that the science of addiction was in its infancy in the 1930s, but over time **Dr. Silkworth's observations and conclusions have been validated by modern neuroscience, psychological studies, brain-imaging techniques, and, most conclusively, the behaviors of those afflicted** with a substance use disorder (SUD). In 2008 President George W. Bush signed into law the **Addiction Equity Act**, validating addiction as a true medical disorder in hopes of ending the long-term stigma and discrimination targeted at those caught up in an addiction.[2]

"Me and her drank together, went out together, but she is the normal one and I'm the one that has that allergy. I cannot just have one. Over the years I started becoming a blackout drinker, obnoxious, violent. I could not admit I had a problem."

38-year-old male recovering alcoholic

"The inability to stop is the essence of what addiction is. My favorite drug was more and all."

Anonymous

In the 1930s Bill Wilson and Dr. Bob Smith incorporated Dr. Silkworth's theory into the creation of Alcoholics Anonymous (AA), a 12-step nonprofit organization aimed at helping alcoholics recover. AA has proven remarkably effective; and although AA describes itself as a spiritual program of recovery, it recognizes the need to understand the physiological roots of addiction.

"Why is it that laboratory animals, on whom social, economic, and educational variables are inoperative, voluntarily (indeed avidly) self-administer the same drugs that human beings use and abuse and will not self-administer other drugs? This argues compellingly for a profoundly important biologic basis for substance abuse."

Eliot L. Gardner, Ph.D., National Institute on Drug Abuse, Behavioral Neuroscience Research Branch

Over the years drug abuse and dependence have been examined from historical, sociological, psychological, moralistic, spiritual, physiological, and now neurochemical perspectives, which continue to confirm the wisdom of Dr. Silkworth's perception of addiction and suggest the direction of future research.

> Alcoholism [addiction] comes from a combination of an obsession of the mind coupled with an allergy of the body.

"To develop more-effective prevention and treatment strategies, we must deepen our understanding of how drugs affect the complex inner workings of the brain. Thanks to remarkable advances in bioscience, and particularly in the neurosciences over the past decade, this is a realistic goal."

Nora D. Volkow, M.D., Director of the National Institute on Drug Abuse

How Drugs Get to the Brain

Psychoactive drugs are natural, semisynthetic, and synthetic substances that directly affect the neurochemistry and the anatomy of the CNS, causing mental, emotional, and physical changes. The subfield of physiology that determines the drugs' effects and abuse potential is **pharmacokinetics**—the process by which a drug is absorbed, distributed, metabolized, eliminated, and excreted by the body. These are the key factors in this process:

- **route of administration**
- **speed of transit to the brain**
- **rate of metabolism**
- **process of elimination**
- **affinity for nerve cells and neurotransmitters**

The more rapidly a psychoactive drug reaches its target in the CNS, the greater its reinforcing (addictive) effect.[3]

Routes of Administration and Drug Absorption

The five most common ways drugs enter the body are **inhalation, injection, mucous membrane absorption, oral ingestion,** and **contact absorption** (Figure 2-1).

Table 3-2 Estimated Number of Hectares under Cultivation

COUNTRY	2002	2011
Bolivia	21,600	27,000
Colombia	102,000	64,000
Peru	46,700	64,000

inflation). Cocaine production increased from 0.75 lb. in 1883 to 158,352 lbs. in 1886.[16] Current prices have risen, making the money involved in the trade just as remarkable and difficult to calculate with accuracy.

- In recent years Americans spent an estimated $40 billion annually (retail) on cocaine.
- At the wholesale level, cocaine prices vary from $12,000 to $35,000 per kilogram ($23,000 average) of refined cocaine, with an average purity of 84%.
- At the street level, prices vary from **$50 to $200 per gram ($93-per-gram average) in the United States**, with an average purity of 56.5%.
- "Rocks" of crack cocaine, varying in size from 0.1 to 0.5 gm, sell for $10 to $20 each.
- The average hardcore cocaine user spends about $186 per week.[15,17,18,25b]

Estimates of the number of casual and hardcore cocaine users vary widely, depending on the survey and the definition of hardcore user. Is someone who binges once a month a hardcore user? For example, in 2012 the National Household Survey on Drug Abuse estimated that there were 1.65 million monthly cocaine users in the United States. The **Drug Use Forecasting program**, charged with questioning arrestees in city jails about their drug use and then confirming the findings with urinalysis, however, **estimated twice as many hardcore users**. The consistency of survey methods from year to year is more valuable in judging trends in use rather than absolute numbers.[19,20,21]

History of Use

Many landmarks in the history of coca and cocaine are associated with the purity of the substance and methods of use, which include:

- **chewing** the leaf or chopping it with ash and placing it on the gums
- **drinking** the refined cocaine alkaloid in wine or tea
- **injecting** a solution of the drug into a vein
- **snorting** cocaine hydrochloride
- **smoking** freebase or crack crystals

Chewing the Leaf

Remnants of coca leaves dating back to the Huaca Prieta settlement on the northern coast of Peru show that native cultures of South America have used coca leaves since 2,500 B.C. to lessen hunger, fight off fatigue, increase endurance, and enhance social occasions. **Natives chewed the leaf for the juice, adding some lime or ash (from ground shells) to increase absorption by the mucosal tissue in their cheeks and gums (it takes three to five minutes for the drug to affect the brain)**. A habitual user might chew 12 to 15 gm of leaves three or four times a day. The maximum amount of cocaine available for absorption would be well under 1 gm.

The Incas in Peru integrated the coca leaf into every part of their lives much as modern-day Americans integrate coffee and tea into everyday life. Use by the Inca civilization was originally confined to priests and the nobility, but when the conquistadors subjugated the Inca Empire in the sixteenth century, they mandated a large increase in cultivation of the leaf. **They grew it for personal profit, to generate government taxes, and to enable the subjugated Incas to work for them more efficiently at high altitudes**, particularly in the Spanish silver mines.[16,22]

Even today **90% of the Indians living in coca-growing regions chew the leaf**. In many native homes in Bolivia, visitors are ceremoniously offered pieces of leaves to chew before refreshments are served. The cocaine blood levels for a coca leaf chewer are about one-fourth those of cocaine smokers and one-seventh those of intravenous (IV) users.[14] In ad-

A shaman holds up coca leaves during a ritual for good luck in 2012 in Lima, Peru. Historically, chewing coca leaves is common in many ceremonies and celebrations and is the stimulatory substance for many social interactions.

dition to serving as a stimulant and controlling hunger, about 4 oz. of chewed leaves provide the recommended daily dose of all vitamins and minerals.[23] The cultivation, trade, and chewing or brewing of coca leaves is legal in Bolivia, Peru, and northwestern Argentina. *Coca y bica* (coca leaves and bicarbonate of soda or other alkaline substance) are sold at markets, newsstands, and other small shops.

Recently, **the United Nations Office on Drugs and Crime agreed to accept the traditional chewing of coca leaves as a permissible use of the drug**. This single exception to the 1961 Single Convention on Narcotic Drugs of the United Nations was a victory for Bolivian president Morales, who felt a cultural tradition of his country was being destroyed.

Coca to Cocaine

Back in 1859 Albert Niemann, a graduate student in Göttingen, Germany, isolated cocaine from the other chemicals in the coca leaf. This powerful refined alkaloid, **cocaine hydrochloride, was 200 times more powerful by weight than the coca leaf**, thus setting the stage for the widespread use and abuse of the drug. **The refined cocaine could be ingested, injected, or smoked. Twenty years later** word of the drug spread, due in part to the physician Karl Koller, who discovered its anesthetic properties, and to **Sigmund Freud, who promoted the medical and psychiatric uses of refined cocaine hydrochloride** in his book *Über Coca*. The drug was recommended to treat a variety of ailments, including depression, tuberculosis, gastric disorders, asthma, and morphine or alcohol addiction.[24] It was the drug's stimulating and mood-enhancing qualities that most interested Freud; but because cocaine was a new drug that had not been studied over time, he made a number of errors in judgment.

> *"Coca is a far more potent and far less harmful stimulant than alcohol and its widespread utilization is hindered at present only by its high cost. . . . I have already stressed the fact that there is no state of depression when the effects of coca have worn off."*
>
> Sigmund Freud (Freud, 1884)

The overly optimistic judgments of Freud and others were made early in the experimental process before cocaine dependence and addiction were recognized problems. As the drug became more widely available, some people became chronic users, making the true nature and liabilities of refined cocaine obvious even to Freud and his colleagues.

Drinking Cocaine

The fact that cocaine hydrochloride can be dissolved in water or alcohol made other routes of use possible, namely drinking, injecting, and contact absorption. **It takes 15 to 30 minutes for the metabolites of cocaine to reach the brain after oral ingestion**.

Beginning in the late 1860s, cocaine wines became popular in France and Italy; but it was not until a clever chemist, manufacturer, and salesman, Angelo Mariani, concocted Vin Mariani and promoted its use through the first celebrity

Coca-Cola® was introduced to the public as a patent medicine in 1886. It contained cocaine from the coca bush and caffeine from the kola nut, hence its name. Each 8 oz. glass contained 9 milligrams (mg) of cocaine vs. 50 to 100 mg for a line of snortable cocaine. The drink was advertised as a brain tonic until 1903, when the cocaine was removed and the beverage was touted simply as delicious and refreshing.

This 1897 postcard by Alphonse Mucha is an advertisement for a cocaine-laced wine, Wine of the Incas. There were dozens of cocaine wines at the end of the nineteenth century.

endorsements (e.g., Thomas Edison, Robert Louis Stevenson, and Pope Leo XIII) that the first cocaine epidemic began. Although the wine contained only a modest amount of cocaine (two glasses had the equivalent of one line of cocaine), its effect was more than modest because of the alcohol content.[16]

Suddenly, in the 1880s and 1890s, patent medicines laced with cocaine, opium, morphine, heroin, *Cannabis*, and alcohol became the rage. They were touted as cure-alls for ailments ranging from asthma and hay fever to fatigue, depression, anxiety, and dozens of other illnesses.

Because these patent medications controlled pain and induced euphoria, the perception that they cured illness rather than just controlled the symptoms was perpetuated. **In the late 1800s, the prolonged use of cocaine and other prescription medications created a large group of dependent users and addicts, most of whom were women.**[25]

Injecting Cocaine

The **invention of the hypodermic needle in 1853** had a more immediate effect on the use of morphine than on cocaine for two reasons. First, the refinement of morphine from opium occurred 50 years earlier than the refinement of cocaine, and, second, the use of an opiate such as morphine was commonly used during the Crimean War and the U.S. Civil War as a powerful painkiller for wounded soldiers.

Medically, the subcutaneous injection or application of cocaine on moist tissues caused topical anesthesia, useful for minor surgery. When physicians first began using cocaine medicinally, many were unaware of the overdose potential, even from topical use, and a number of deaths occurred. Some physicians, including William Halstead, one of the "fathers of modern surgery," became addicted to the substance.

Injecting cocaine intravenously results in an intense rush within 30 seconds and produces the highest blood cocaine level. The rush is more intense than when chewing the leaf, drinking cocaine wine, or snorting cocaine hydrochloride. If cocaine is injected **subcutaneously or intramuscularly, the high is delayed three to five minutes** and is not quite as intense.

Snorting Cocaine and Mucosal Absorption

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 delivers the drug to the nasal mucosa and into the brain in three to five minutes**. Peak effects take a few more minutes to occur.

> *"What snorting I have done irritates my nose and is very uncomfortable. It's much delayed, where shooting is quicker. In fact, after 20 minutes [with snorting], 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 use: the drug constricts the capillaries that absorb the drug, so the more that is snorted, the slower the absorption; blood levels of cocaine from snorting are much lower than those from IV use. As the constricting effect of cocaine wears off, **the nasal tissues swell, causing the runny, sniffling nose characteristic of cocaine snorters**. Chronic use can kill nasal tissues and in a few cases perforate the nasal septum that divides the nostrils.[26]

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 by some males in the gay community.[14] Cocaine can also be absorbed through the outer skin (epidermis)— not at levels high enough to cause effects in the brain but high enough to be detectable in the bloodstream, which could skew the results of a drug test.

Smoking Cocaine

Although there is some evidence that coca leaves were burned and the smoke inhaled by Peruvian shamans to alter their state of consciousness in order to commune with their gods, it was not until cocaine was refined that experimenters looked for ways to inhale the more concentrated smoke. In 1914 the pharmaceutical company Parke-Davis introduced cigarettes that contained refined cocaine; but the high temperature (195°C, or 383°F) necessary to convert cocaine hydrochloride to smoke resulted in the destruction of many of its psychoactive properties. Consequently, 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 sublimation point to 98°C and made the drug smokable.** Unlike the original cocaine hydrochloride cigarettes, 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 in only 5 to 8 seconds compared with the 15 to 30 seconds it takes when injected into a vein. Smokable cocaine reaches the brain so quickly that it causes more-dramatic effects before it is swiftly metabolized. This rapid up-and-down roller-coaster effect of **smoking results in intense craving and an extreme binge pattern of use**.

> *"The first time I smoked crack cocaine, when I put the glass pipe up to my lips, it made my lips burn, it made them numb, and the smell of smoking rock cocaine or crack is gross; it is the smell that you'll never forget. I felt glazed over and I felt like I escaped and I could just float."*
>
> 27-year-old female recovering crack smoker

Smoking crack cocaine and injecting cocaine hydrochloride are the most popular methods of using the drug. They are also the fastest and most powerful.

4

Downers: Opiates/Opioids & Sedative-Hypnotics

In This Chapter

The three major downers (depressants) are opiates/opioids, sedative-hypnotics, and alcohol.

This chapter focuses first on the relationship between physical/emotional pain relief, opioids, and drug dependence, exploring the history and the current use/abuse of opiates and opioids, including opium, morphine, codeine, oxycodone, hydrocodone, and heroin.

An investigation of sedative-hypnotics follows, particularly benzodiazepines and the Z-hypnotics. The benefits and the dangers of these drugs are outlined along with an examination of the pharmaceutical industry.

Chapter 5 provides an in-depth look at alcohol.

General Classification

"I got injured, and the doctor prescribed me Vicodin,® and I took that; and after a little while I realized that it had a nice effect. I liked how I felt and so I figured if I took more, the effect would be stronger and then when I ran out of that prescription, I found friends that were really into the opiates and the pills and so I started mixing them, taking different stuff like Percocet® and oxycodone and methadone just to get that stronger, more-intense effect."

21-year-old recovering opioid addict

- **The number one cause of preventable deaths in America is abuse of prescription drugs.** Almost half of those 40,000 deaths are due to prescription opioid painkillers, most of them diverted from legitimate sources (**Vicodin,®** Lortab,® Norco,® **oxycodone** [**OxyContin®**]), and **methadone**). Methadone prescribed for pain, rather than for methadone maintenance, leads the list.
- **"Pharm parties,"** gatherings of mostly teenagers who arrive with sedatives and opioid pills from their parents' medicine cabinets or from street dealers, are still widespread.
- **Afghanistan's opium harvest supplies 92% of the world's heroin** in spite of allied efforts to destroy the fields and the warehouses.
- Celebrity deaths from misuse of prescription drugs and heroin frequently make headlines—**Philip Seymour Hoffman** (2014), **Cory Monteith** (2013), **Whitney Houston** (2012), **Michael Jackson** (2009), **Brittany Murphy** (2009), and **Heath Ledger** (2008).

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- More than 4 billion prescriptions for drugs were written in 2012 in the United States, at an estimated cost of $340 billion. Worldwide that figure is expected to surpass $1.1 trillion by 2014.[1]

Unlike uppers, which stimulate the central nervous system (CNS), **downers depress the overall functioning of the CNS**, causing sedation, muscle relaxation, drowsiness, and, if used to excess, coma. Some downers induce a rush/high and often disinhibit impulses and emotions. Uppers release and enhance the body's natural stimulatory neurochemicals, whereas **depressants produce their effects through a wide range of biochemical processes** at different sites in the brain, spinal cord, and other organs such as the heart.

Some depressants mimic the body's natural sedating or inhibiting neurotransmitters (e.g., endorphins, enkephalins, and GABA [gamma amino butyric acid]); others directly suppress the stimulation centers of the brain; and some work in ways that scientists don't fully understand. Because of these variations, depressants are grouped into subclasses based on their chemistry, medical use, and legal classification.

- Major classes include opiates/opioids, sedative-hypnotics, and alcohol.
- Minor classes include skeletal muscle relaxants, antihistamines, and over-the-counter (OTC) downers.

Major Depressants

Opiates/Opioids

These drugs are **refined from or are synthetic versions of the opium poppy's active ingredients** and include opium, morphine, codeine, hydrocodone (Vicodin®), oxycodone (OxyContin®), Opana® (methyl morphine), methadone, and heroin. They were **developed mainly for the treatment of moderate and acute pain**, diarrhea, coughing, and a number of other conditions. Most illicit users take these opiate/opioid drugs **to avoid emotional and physical pain, to experience euphoric effects, and to suppress withdrawal symptoms**.

Sedative-Hypnotics

Sedative-hypnotics represent **a wide range of synthetic chemical substances developed to treat anxiety and insomnia**. The first, barbituric acid, was created in 1864 by Dr. Adolph von Bayer. Other barbiturates (phenobarbital and Seconal®) followed, until more than 2,500 had been created. Bromides, paraldehyde, and chloral hydrate were also widely used until the late 1940s. Since 1950 dozens of different sedative-hypnotics have been created, including meprobamate (Miltown®), glutethimide (Doriden®) methaqualone (Quaalude®), flunitrazepam (Rohypnol®), GHB, and especially benzodiazepines (e.g., Valium® and Xanax®). All have toxic side effects when misused and can cause tissue dependence. Methaqualone and flunitrazepam are illegal in the United States.

Benzodiazepines are the most widely prescribed sedative-hypnotic drugs. Newer, non-benzodiazepine sedative-hypnotics include the Z-hypnotics, such as zaleplon (Sonata), zolpidem (Ambien®), eszopiclone (Lunesta®), and zopiclone (Imovane®). Other recent additions are pregabalin (Lyrica®) and ramelteon (Rozerem®), although over the past 15 years nonsedative antidepressant medications including venla-faxine (Effexor®), citalopram (Celexa®), and escitalopram (Lexapro®) have taken over a substantial share of the market.

Alcohol (see Chapter 5)

Alcohol, the natural by-product of fermented plant sugars and starches, is the oldest psychoactive drug in the world. It has been widely used over the centuries in social, cultural, spiritual, and religious practices as well as for a medical remedy, from sterilizing wounds to lessening the risk of heart attack. Abuse makes alcohol the world's second most destructive drug in terms of health and social consequences. Tobacco is the most physically destructive substance.

Minor Depressants

Skeletal Muscle Relaxants

Skeletal muscle relaxants that act on the CNS include carisoprodol (Soma®), chlorzoxazone (Parafon Forte®), cyclobenzaprine (Flexeril®), and methocarbamol (Robaxin®). **These synthetically developed CNS depressants are aimed at areas of the brain responsible for muscle coordination and activity** and are used to treat muscle spasms and pain. Although abuse of these drugs is uncommon, their overall depressant effects on all parts of the CNS produce reactions similar to those caused by other abused depressants. One of the more often abused formulations, carisoprodol, is metabolized to meprobamate (a controlled-substance Schedule IV sedative-hypnotic) that has anxiolytic, anticonvulsant, and muscle-relaxing properties.

Sometimes **carisoprodol shows up in drug-screening urine tests, often in combination with other drugs**, particularly benzodiazepines and opioids. Because of the drug's abuse potential, 17 states rescheduled carisoprodol to Schedule IV; it remains an unscheduled drug at the federal level. **Abuse of carisoprodol caused more than 28,000 visits to emergency rooms** in 2011, up from 10,000 in 2002.[2] Other muscle relaxants are responsible for an additional 20,000 emergency room visits each year.

Antihistamines

Antihistamines are found in hundreds of prescription and OTC cold and allergy medicines, including Benadryl® (diphenhydramine), Actifed,® and Tylenol PM Extra.® They are synthetic drugs that were developed during the 1940s for the treatment of colds and allergic reactions; they are also used to prevent ulcers and to treat shock, rashes, motion sickness, and even symptoms of Parkinson's disease.[3] In addition to blocking the release of histamine, these drugs cross the blood-brain barrier to induce the common and oftentimes potent side effect of depression of the CNS, resulting in drowsiness. They are used in sleep-aids, to control anxiety, and to temper the side effects of some antipsychotics. **Antihistamines are occasionally abused for their depres-**

sant effects, often in conjunction with alcohol or opioids. Because of their sedating effects, it is recommended that the elderly use them only sparingly.

Over-the-Counter Downers

Nonprescription sleep-aids, such as Nytol,® Sleep-Eze,® Unisom,® Equate,® and Sominex,® are available everywhere. Depressants that were used in the 1880s are marketed as **sleep-aids or sedatives** today. Scopolamine in low doses, antihistamines, bromide derivatives, and even alcohol constitute the active sedating components in many of these products, and some are **occasionally abused for their sedating effects**.

Prescription Drug Epidemic

When Whitney Houston died suddenly in 2012, the autopsy showed high doses of cocaine and low levels of Flexeril® (muscle relaxant), Xanax® (a benzodiazepine), and Benadryl® (an antihistamine). The official cause of death was drowning (in a hotel bathtub).

Besides alcohol and tobacco, the number one cause of preventable deaths in America is abuse of prescription drugs.

Michael Jackson's death in 2009 was the result of cardiac arrest, but **the autopsy found a half dozen psychoactive drugs in Jackson's system**. He had taken four benzodiazepines and two muscle relaxants, but the real culprit was Diprivan® (propofol), a powerful anesthetic administered for short-duration surgical procedures.[4] His physician was convicted of involuntary manslaughter.

In Heath Ledger's system were two opioid painkillers, three benzodiazepines, and an over-the-counter sleep-aid.

These three high-profile cases illustrate how even those with access to good medical advice and care can die from prescription drug abuse. **In overdoses it is rare that only one psychoactive substance is involved**.

Prescription drug abuse has increased dramatically since 2004. Emergency room visits for CNS prescription medications went from 472,000 to 1,043,000 in 2011.[2] **More than half of these ER visits are due to opiates and opioids. Another 425,000 are attributed to benzodiazepines.** Deaths from prescription drugs have climbed to 40,000, half from opioid painkillers. We are in the midst of a prescription drug-abuse epidemic, where the consequences of misuse can be as deadly as those from any street drug.

"Today the craze is pharmaceutical. . . OxyContin,® oxycodone; and that's what you'll see a lot of young kids coming into detox for, more so than for heroin. But when they run out of the resource to get the pills, then they start shooting dope. Then they see what the real street life and being downtown at 3 in the morning just damning the police and nowhere to go. They see what that's like."

45-year-old male recovering opioid abuser and drug counselor

Prescription drugs were once considered the abusable drugs of choice for the middle and upper classes, but that is no longer true. **Prescription drug abuse is seen in every class and across every strata of society**. The majority of abused prescriptions are for pain and secondarily for sedative-hypnotics (benzodiazepines) and, to a lesser extent, stimulant prescription drugs (e.g., medications for attention-deficit/hyperactivity disorder [ADHD]). But most depressant psychoactive prescription drugs can create dependency in those who inadvertently or deliberately overuse them. Once dependent the abuser must **divert legitimate prescriptions, buy from street dealers, or find online sources**.

"My grandfather has really, really bad pain issues, and he is prescribed morphine and codeine, and so we always had that in the house growing up because he was getting really large prescriptions. And you know anytime we weren't able to get something from the doctor, we were stealing it from my grandparents. And when I say 'we,' I mean my brother and I."

22-year-old recovering opiate abuser

In the late 1800s and the early 1900s, tens of thousands of patients in the United States and Europe became dependent on a variety of psychoactive drugs containing **cocaine, opium,**

Whitney Houston, Michael Jackson, and Heath Ledger are just three of the stars who lost their lives due to psychoactive drugs, often downers, and always more than just one.