



REVISED EDITION

# drugs of abuse



an introduction to  
their actions  
& potential hazards

► a do it now foundation publication by samuel irwin, ph.d.

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# 1 Chapter

**M**ost discussions of drugs or the “drug problem” center around chemicals that society today defines as dangerous, destructive, or downright evil.

It’s a fairly well-defined chemical “club,” comprised of such old-school street-drug standbys as heroin, cocaine, and PCP—although newcomers (GHB, Rohypnol, ecstasy, and “Special K”) are endlessly promoted for membership by the media.

Although they qualify for membership in the problem-drug “club,” too, most of us probably wouldn’t mention aspirin, tobacco, alcohol, or such pharmaceuticals as Prozac® and Viagra® much in the conversation.

That’s interesting, because they all carry a level of risk to the individual and society when used improperly—or, in the case of tobacco, at least, when used at all.

A basic tenet of pharmacology is that any “drug” (in the broadest sense of that term) can be used improperly. Any chemical can be dangerous when taken by the wrong person, in the wrong dose, or at the wrong time or place.

Example: One of the drugs mentioned has been used and abused for more than a century, yet its mechanism of action is still poorly understood.

Research shows that it produces severe tissue damage and causes birth defects in animals. Even moderately-high doses can be fatal to adults and results in hundreds of injuries and deaths each year. Overdoses are a common cause of fatal drug poisoning in children.

Users can become dependent on the drug, which is known to doctors by a suspiciously psychedelic-sounding name: acetylsalicylic acid.

Its common household name is aspirin.

What’s our point? Well, it’s not to convince you that aspirin is “bad” or that other drugs are “good,” or to suggest that it’s okay to take heroin or dangerous to use aspirin.



By focusing on certain actions and ignoring others, any chemical can be made to look good or bad, calamity or cure-all.

We only want to show that, by focusing on certain actions and ignoring others, any chemical can be made to look good or bad, calamity or cure-all.

To make sense of the endlessly-expanding (but often-bewildering) body of knowledge about mind- and mood-altering chemicals, we need to try—at least as well as we can—to view drugs and the “drug problem” in their broader social and cultural contexts, free from as much hype and hysteria as possible. That means we’ll be leaving aside—at least for the time being—debating points about which drugs are “good,” which are “bad,” and whether drug use/abuse is moral or immoral.

That doesn’t mean that we think such questions are “good” or “bad,” either. It’s just that they often get in the way of a deeper understanding of the seemingly-endless fascination that psychoactive substances have held for human beings since human beings have been human beings.

In this booklet, we hope to help this process along by outlining the actions and effects of drugs of abuse to place their potential for risk in a rational and appropriate perspective.

We’ll also discuss recent shifts in substance use and availability and review what those changes mean—both to substance users and to those who mean to help or hinder them.

But we’ll start with another basic: clarifying the concepts and terms used in discussing the drug problem. And we’ll begin with a definition of the words on the cover of this booklet: “drugs” and “abuse.”

# 2

## Chapter

### DEFINING TERMS

Throughout the text, we'll be using a number of specialized terms and expressions that you may know better by other, "everyday" meanings.

To minimize confusion, we'll define terms this way:

**Drug:** Any non-nutritional chemical that alters body functions, producing physical, psychological, or behavioral change.

**Psychoactive Drug:** A natural or synthetic substance that affects mental processes or alters mood or behavior.

**Drug Use:** The intake of a chemical substance, whether or not the substance is used medically or legally.

**Drug Abuse:** The intake of a chemical substance under circumstances or at dosage levels that significantly increase risks of harm, whether or not the substance is licit or illicit.

**Psychological Dependence:** A tendency for repeated or compulsive use of a chemical, or involvement in an activity, because its effects are considered pleasurable or satisfying, or because it reduces undesirable feelings. A person may be psychologically dependent on drugs, food, television, sex, relationships, or recreational activities.

A further distinction can be drawn between *gratification dependence*, in which major withdrawal symptoms are generally minor or absent, and *emotional dependence*, in which serious withdrawal symptoms appear after use stops.

**Physical Dependence:** Adaptation of body tissues to the continued presence of a chemical, revealed in the form of serious, even life-threatening withdrawal symptoms. The extent of physical dependence and the severity of withdrawal symptoms can vary, from drug to drug, and by amount, frequency, and duration of use.

**Tolerance:** Development of body resistance to the effects of a chemical so that larger doses are required to reproduce the original effect. When tolerance develops rapidly (as with LSD), the user may be forced to stop use until tissues regain their responsiveness.

A hallmark of addiction is continued, compulsive use despite serious consequences—such as health problems and loss of job or family.

When tolerance develops slowly and the chemical also produces physical dependence (e.g. heroin, alcohol), the increased dose requirements speed up and intensify the development of physical dependence.

**Addiction:** A state of chemical abuse characterized by a high level of physical and/or psychological dependence.

When an addicting substance is abruptly stopped, withdrawal symptoms appear and additional doses are necessary to ease those symptoms or to produce the original effects.

A hallmark of addiction is continued, compulsive use despite serious consequences—such as health problems and the loss of job or family.

## ■ Classifying Drugs

An endless number of schemes could be (and have been, in fact) designed to classify the many drugs of abuse. Each grouping has its own strengths and weaknesses, but none ever sorts all substances into “perfect” categories.

We’ve chosen a relatively straightforward model that lumps substances into three simple categories: “over-the-counter drugs,” “prescription drugs,” and “street drugs.”

This is not to imply that drugs exist in only one category or another. There’s a great deal of movement across even the lines we’ve selected. For example, the nonprescription stimulants caffeine and phenylpropanolamine are listed alongside their chemical cousin methamphetamine in the “street drugs” category, to avoid endless redundancy and because of space limitations in the booklet format.

In the same way, narcotic analgesics are listed as “prescription drugs,” although they’re commonly bought and sold on the street, since treatment of pain is their primary purpose.

Still, and in spite of the confusion factor, we hope that what follows is a workable guide to the relative risks of common drugs of abuse.

# 3

## Chapter

### ■ Alcohol

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**Examples:** Wine, beer, whiskey, and spirits.

**Actions:** Alcohol is a central nervous system (CNS) depressant that alters a variety of activities in the brain. It produces anesthesia, coma, respiratory depression, and death at dosage levels 10 times above the psychoactive dose. Other effects include:

■ **Low Dose:** One or two drinks (0.05 percent blood-alcohol level).<sup>\*</sup> Feelings of relaxation and well-being, reduced reflex reactions, impaired driving skills.

■ **Moderate Dose:** Two to four drinks (0.10% BAL). Slurred speech, impaired judgment and coordination, reduced inhibitions, decreased emotional control.

■ **High Dose:** Large quantities (0.15% BAL). Gross intoxication, clearly-impaired gait, problems in thinking and memory, distorted judgment, emotional instability, aggression.

Alcohol carries a high risk of psychological and physical dependence with regular use. Tolerance develops to its depressant effects, and withdrawal symptoms occur within a few hours of heavy use—contributing to the hangover symptoms suffered by many drinkers.

**Medical Uses:** To sedate, promote sleep, and provide a medium for other therapeutic agents (e.g. elixirs, cough syrups, etc.). Alcohol is often self-administered to treat numerous ailments, including head colds, anxiety, and insomnia.

**Main Dangers:** Short-term hazards arise from impaired judgment, poor coordination, emotional instability, and risk of death by overdose (alcohol alone or in combination with other drugs).

Long-term dangers include irreversible damage to body tissue (brain, liver, pancreas, kidneys), memory problems, and nutritional deficiencies.

The drug also poses high risks of fetal damage—so much so that by law, alcohol producers must add warning labels to their bottles cautioning women against use during pregnancy.

**Withdrawal Symptoms:** Alcoholic withdrawal symptoms set in about three hours after the last drink. Early signs include tremors, nausea, anxiety, perspiration, cramps, hallucinations, and hyper-reflex reactions. A second phase, beginning within 24 hours, can involve convulsions.

The most severe form of withdrawal—delirium tremens (“DT’s”)—involves dangerously high fever, rapid heartbeat, hallucinations and delirium. Death can result from cardiac failure.

Alcoholic withdrawal is considered more life-threatening than withdrawal from heroin. Because of the risk of complications, particularly in the DT phase, withdrawal following extensive, long-term use should only be attempted under medical supervision.

**Symptoms of Use:** Incoordination, slurring of speech, emotional instability, decreased inhibitions, stupor.

## ■ Tobacco

**Examples:** Cigarettes, cigars, snuff, smokeless tobacco.

**Actions:** Tobacco’s main active ingredient is nicotine. An average cigarette yields 0.05-2.5mg of the drug; cigars can contain 120mg. Smokeless tobacco products

## ▶ Alcohol: How Much Is Too Much?

### Blood-Alcohol Levels (g/100 ml)

■ Highlighted areas indicate legal impairment at a BAL of 0.08 percent.

Drinks Consumed in One Hour	100 lb.		150 lb.		200 lb.	
	Male	Female	Male	Female	Male	Female
<b>1 beer</b>						
<b>1 glass of wine</b>						
<b>1.5 oz. 80-proof liquor</b>	0.04	0.05	0.027	0.03	0.02	0.024
<b>2 beers</b>						
<b>2 glasses of wine</b>						
<b>3 oz. 80-proof liquor</b>	0.08	0.10	0.05	0.06	0.04	0.05
<b>4 beers</b>						
<b>4 glasses of wine</b>						
<b>6 oz. 80-proof liquor</b>	0.16	0.20	0.10	0.12	0.08	0.09

*Blood and booze.* The amount of alcohol necessary to raise blood-alcohol level above 0.08 percent (the emerging national standard for legal impairment) varies according to sex and body size.



Today, 29.5 percent of American adults smoke, down from 43 percent in the mid-1960s, but up from 26 percent in 1994.

contain 6.9-14.4mg nicotine and produce similar blood-nicotine levels as smoked tobacco. Cigarette smoke also contains 1-5% carbon monoxide, and delivers 0.5-35mg of tar.

Nicotine exerts an immediate stimulant effect on the brain and central nervous system followed by a longer-lasting depressant action on the autonomic nervous system. Nicotine produces constriction of blood vessels, loss of appetite, and a sharp rise in blood pressure and heart rate.

**Demographics:** Movement away from tobacco has stopped, a reversal of a trend that began with the Surgeon General's first warning of the link between smoking and lung cancer in 1964. Today, 29.5 percent of American adults smoke, down from 43 percent in the mid-1960s, but up from 26 percent in 1994.

That means that more than 56 million Americans still smoke cigarettes, while 7 million more use snuff or smokeless tobacco.

**Medical Uses:** None. Nicotine is one of the most toxic of all drugs. Just a few drops of pure nicotine are lethal to adults.

**Main Dangers:** Tobacco is linked with more serious health problems than nearly all other psychoactive drugs, directly causing an estimated 440,000 U.S. deaths in 2002.

**Dependence:** Researchers—and ordinary smokers—have long known that smoking produces a high level of psychological dependence. But a 1988 Surgeon General's report went even further, describing nicotine as one of the most addictive of all drugs, producing true physical dependence in users.

**Disease:** Chronic smoking is causally linked to cancer (of the lungs, larynx, and mouth), heart disease, and respiratory problems, including bronchitis and pulmonary emphysema. Users of smokeless tobacco face a four times greater risk of cancers of the throat and mouth than nonusers, particularly with long-term use.

**Pregnancy Effects:** Risks of low birth weight, premature birth, and early fetal death (20-35 percent over nonsmokers). About 66 percent of all crib deaths (Sudden Infant Death Syndrome) in the U.S. may be attributable to tobacco use during pregnancy.

**Withdrawal Symptoms:** Can include irritability, anxiety, headaches, energy loss, problems in concentrating, drowsiness or insomnia, cramps, hunger, and tremors. While most successful efforts to stop depend largely on will power, nicotine-containing gum (Nicorette®) is helpful in reducing tobacco cravings and relieving withdrawal.

**Symptoms of Use:** Discolored fingertips, cough.

## ■ Inhalants

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There are two main categories of inhalants, volatile solvents (and aerosols) and the nitrites group, which includes amyl and butyl nitrite (and their act-alike chemical cousins) and nitrous oxide. Chemicals in the first group are most often used by young adolescents and those with limited access to other substances, while young adults are more likely to use nitrous oxide or the nitrites.

### ▶ Volatile Solvents & Aerosols

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**Examples:** Solvents: glue (toluene), typewriter correction fluid, gasoline, butane, paint thinner, lighter fluid, nail polish remover. Aerosols: spray paint, cooking sprays.

**Actions:** Volatile solvents and aerosols are CNS depressants that cause an alcohol-like intoxication. Effects last from 15 minutes to a few hours, and can include dizziness and exhilaration and sensations of floating.

Perceptual changes are often accompanied by reckless or aggressive behavior, a breakdown of inhibitions, and feelings of heightened power. Visual and sensory hallucinations may also occur.

**Demographics:** Solvents are used primarily by younger children and teens, typically from about age seven to 15. One 2002 national survey found that while only 4.5 percent of high-school seniors admitted using the chemicals during the previous year, 7.7 percent of 8th-graders did.

Aerosol use is much less prevalent today than in the past due to regulations mandating replacement of intoxicating (and environmental-destructive) propellants with non-intoxicating gases such as nitrogen and carbon dioxide.

**Medical Uses:** The solvents are generally too toxic for medical use, although ether and chloroform have been used as surgical anesthetics.

**Main Dangers:** Solvents and aerosols cause moderate psychological dependence, and mild withdrawal symptoms—including nausea, depression, insomnia and loss of appetite—may occur. Tolerance can develop after a few weeks of continuous use.

Solvent use poses a range of immediate and long-term hazards, including:

- ▶ **Accidents:** Impaired judgment, memory, and thinking create high risks of harm or accidental death by falls, drownings, or in other potentially-hazardous situations.
- ▶ **Tissue Damage:** High concentrations of toluene and other solvents can permanently damage the brain, bone marrow, liver, and kidneys. The chemicals may also produce nervous system damage and lingering problems in memory and thinking.
- ▶ **Sudden Sniffing Death:** Can follow sudden heart failure during physical activity

One 2002 national survey found that while only 4.5 percent of high-school seniors admitted using solvents during the previous year, 7.7 percent of 8th-graders did.

or stress following a heavy dose of volatile hydrocarbons.

► **Suffocation:** Plastic bags (used to concentrate solvent vapors) pose obvious hazards, and inhalation of aerosols, such as cooking sprays, can coat air passages in the lungs and cause suffocation.

**Signs of Use:** Odor of glue or other chemicals; plastic bags containing glue or other chemicals; alcohol-like intoxication: euphoria, poor coordination, slurred speech.

## ► Nitrites & Nitrous Oxide

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**Examples:** Amyl nitrite (“poppers,” “snappers,”); butyl nitrite, isopropyl nitrite (Rush™, Locker Room™); nitrous oxide (“laughing gas,” aka “whip-its”).

**Actions:** Nitrites are short-acting heart stimulants and vasodilators—chemicals that dilate arteries and blood vessels. Nitrous oxide is an anesthetic gas that relieves anxiety and reduces sensitivity to pain.

Both are sniffed for their brief intoxicating properties. Nitrites lower blood pressure and increase heartbeat, and reduce oxygen flow to the inner brain. Users report sudden, intense weakness and a dizzy sensation lasting 30-60 seconds. Sweating, flushing, and nausea can also occur.

While occasional use may pose few immediate risks to health—other than headaches and blackouts—excessive use is tied to serious health problems, including:

■ **Glaucoma:** Nitrites elevate blood pressure in the eyes, which researchers believe may contribute to this potentially blinding eye disorder.

■ **Blood Cell Damage:** The chemicals damage oxygen-carrying red blood cells and, when swallowed, can trigger an acute, often-fatal anemic condition (methemoglobinemia), in which blood cells can no longer transport oxygen.

■ **AIDS:** Researchers have linked nitrites to impaired immune system response, which may contribute to a rare form of cancer (Kaposi’s sarcoma) seen in AIDS patients.

Unlike nitrites, which pose their greatest dangers with long-term use, nitrous oxide hazards center on improper use. Sniffing nitrous oxide from pressurized tanks or masks



Unlike nitrites, which pose their greatest dangers with long-term use, nitrous oxide hazards center on improper use.

can cause blackout, brain injury, and suffocation from lack of oxygen.

Cold temperatures used to store the gas can freeze the lips and throat when inhaled, while high-pressure tanks may rupture the lungs and cause collapse. Other problems include nausea, vomiting, and disorientation.

Some tolerance may develop to the nitrites, which also carry a moderate potential for psychological dependence. Only nitrous oxide shows evidence of producing physical dependence.

**Medical Uses:** Amyl nitrite is available by prescription for short-term relief of angina pectoris and asthma. Nitrous oxide is used in minor dental surgery. Butyl nitrite and act-alike nitrite products have never been used medically, but found widespread acceptance in the 1970s and 1980s, primarily as a sexual stimulant.

Once legally-available over the counter as a so-called “liquid incense” or “room odorizer” in an attempt by marketers to avoid U.S. Food & Drug Administration jurisdiction and control, butyl and isobutyl nitrite are much less visible today due to a federal ban on the products in 1989. Since then, most distributors of the products have switched to isopropyl nitrite and cyclohexyl nitrite, which is now marketed euphemistically as a “head cleaner.”

**Main Dangers:** Suffocation or injury from blackout while sniffing nitrites or nitrous oxide. Severe, potentially fatal anemia related to swallowing nitrite compounds.

**Withdrawal Symptoms:** None.

**Signs of Use:** Sudden dizziness, flushing, sweating, odor of chemicals.

# 4 Chapter

## Depressants

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Perhaps the most widely-used category of psychoactive drugs in the world today, depressants are similar in their main actions, but different in the way they trigger those actions.

The two main types of depressants abused for their psychoactive effects are sedative-hypnotics (or sleeping pills) and tranquilizers.

### ► Sedative-Hypnotics

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**Examples:** Barbiturates: pentobarbital (Nembutal®), secobarbital (Seconal®), amobarbital (Amytal®). Non-barbiturates: glutethimide (Doriden®), ethchlorvynol (Placidyl®), chloral hydrate.

**Actions:** Sedative-hypnotics slow CNS functioning, causing drowsiness, sleep, and mild intoxication (euphoria, reduced inhibitions, poor coordination, slurred speech, impaired thinking and memory, increased aggressiveness) at moderate doses.

Higher dosage levels produce profound depressant effects and can dramatically slow breathing.

**Demographics:** The past decade has seen a decline in use, tied to new awareness of the hazards of traditional sedative-hypnotics and increased use of less-toxic substitutes. Methaqualone (Quaalude®), in particular, has almost vanished as a drug problem in the United States, since its manufacturer halted production in 1984. (See chart, opposite.)

**Tolerance:** Rapid development of tolerance is typical.

**Potential:** Sedatives intensify the effects of other depressants, raising risks of overdose, coma, and death.

**Overdose:** Although tolerance builds quickly, the overdose threshold stays relatively fixed, multiplying risks of overdose for regular users.

**Addiction:** Sedative-hypnotics are highly addictive, producing physical and psychological dependence following regular use for one or two months, or at doses above recommended therapeutic levels.

Other problems include suppression of rapid eye movement (REM, or dreaming) sleep, associated with increased anxiety, irritability and morning-after “hangovers” following use of barbiturates.

**Medical Uses:** To induce sleep, reduce anxiety, control epileptic seizures, and as an aid in the diagnosis of psychiatric disorders.

**Main Dangers:** Immediate hazards arise from faulty judgment and poor coordination and accidental overdose. Long-term risks include dependence and life-threatening withdrawal symptoms.

**Withdrawal Symptoms:** Sedatives, particularly barbiturates, produce a severe withdrawal syndrome considered more dangerous and potentially life-threatening than withdrawal from heroin. Symptoms include cramps, vomiting, shaking, insomnia, delirium, and convulsions. Withdrawal should only be attempted under medical supervision.

**Symptoms of Use:** Alcohol-like intoxication, including impulsiveness, increased aggression, poor coordination, slurred speech.

## ► Tranquilizers

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**Examples:** Minor Tranquilizers [benzodiazepine type]: diazepam (Valium®), alprazolam (Xanax®), chlordiazepoxide (Librium®), flurazepam (Dalmane®), lorazepam (Ativan®); [non-benzodiazepine type]: meprobamate (Miltown®). Major Tranquilizers: chlorpromazine (Thorazine®), thioridazine (Mellaril®).

**Actions:** Minor tranquilizers are mild CNS depressants that produce relaxation and reduce anxiety with limited suppression of breathing and moderate impairment of judgment and concentration. The drugs produce their effects by interacting with the body's internal systems for relaxation and stress control.

Low-dose effects include mild sedation, muscular relaxation, and feelings of enhanced well-being, while higher doses can produce drowsiness, confusion, and dizziness. Recent studies indicate benzodiazepines may block formation of long-term memories up to six hours after use.

While tranquilizers are relatively safe and effective when used properly under a doctor's supervision, the drugs still pose a variety of risks to users.

**Potentiation:** Tranquilizers intensify effects of other CNS depressants, raising risks of overdose even at nonintoxicating doses.

**Overdose:** Tranquilizers, particularly Valium, are consistently among the most widely used drugs in accidental and intentional overdose. Typically, about one-fifth of all hospital admissions for suicide involve benzodiazepines.

**Dependence:** All tranquilizers can cause psychological dependence with sustained use—even at therapeutic doses—and withdrawal can be an agonizing, prolonged pro-

All tranquilizers can cause psychological dependence with sustained use—even at therapeutic doses—and withdrawal can be an agonizing, prolonged process.

cess. Dependence is difficult to diagnose since symptoms of withdrawal—anxiety, depression, and insomnia—parallel the problems that the drugs are prescribed to treat.

Major tranquilizers are used to treat psychotic disorders and are rarely abused, since their effects are not felt as pleasurable.

**Medical Uses:** As a sedative, muscle relaxant, anti-convulsant, and anti-anxiety agent. The major tranquilizers are used in treatment of psychotic and major mood disorders.

**Main Dangers:** Hazards include risks of overdose (either alone or in combination with alcohol and other depressants) and high possibility of psychological dependence with long-term use.

**Withdrawal Symptoms:** With meprobamate, similar to the barbiturates. Benzodiazepine tranquilizers elicit a long-lasting withdrawal characterized by severe anxiety, insomnia, and depression.

**Symptoms of Use:** Disinhibition, loss of coordination, fatigue, reduced motivation, confusion.

## Narcotics

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**Examples:** Opium and derivatives: codeine, morphine, heroin. Synthetics: methadone, meperidine (Demerol®), hydromorphone (Dilaudid®), oxycodone (Percodan®), pentazocine (Talwin-Nx®).

**Actions:** Narcotics act on the central and parasympathetic nervous systems to slow body function, reduce sensitivity to pain, and induce sleep. Low-dose or infrequent use produces analgesia, euphoria, and stupor, blocking desire for food, sex, and other activities. Higher dose and regular use triggers a sense of detachment and reduced motivation.

Narcotics are associated with a range of unwanted side effects, including itchiness, constipation, and nausea and vomiting, arising from their direct action on parasympathetic nerves.

**Overdose:** High doses profoundly suppress breathing and heart rate, causing death by respiratory failure. Since users also quickly build tolerance to the drugs, overdose risks are high.

**Dependence:** All narcotics carry a high potential for physical and psychological dependence. Because a high level of tolerance to the drugs develops quickly, addicted individuals are able to take many times a normal lethal dose without significant adverse



A 'designer' substitute for heroin has been linked with more than 130 overdose deaths and the paralyzing disorder, Parkinson's disease.

effects. At this stage, the drugs are taken almost solely to ward off withdrawal.

**Medical Uses:** To relieve pain, cough, and diarrhea, and as a pre-anesthetic medication. Narcotics are also administered to reduce chronic pain in the terminally ill.

**Main Dangers:** Overdose and physical addiction. IV heroin users also face risks of AIDS and other needle-related diseases. Unpredictable potency of street heroin poses additional hazards. "Designer" forms of the drug—synthetic, lab-made, act-alike replicas of narcotics—carry serious risks of their own. One "designer" form of heroin has been linked to more than 130 overdose deaths and a paralyzing nervous system disorder, Parkinson's disease.

**Withdrawal Symptoms:** Withdrawal begins three to eight hours after the last dose (depending on the drug), and includes such flu-like symptoms as chills, watery eyes, runny nose, nausea and vomiting. Other symptoms include anxiety, irritability, cramps, and tremors. Withdrawal peaks in 36 to 72 hours, but symptoms can persist as long as 10 days. Convulsions, coma, and death may occur.

Withdrawal symptoms are quickly reversed by another dose of a narcotic drug.

**Symptoms of Use:** Constriction of pupils, low response to pain, nausea or vomiting, lethargy, slow breath, and alternating periods of wakefulness and sleep ("nodding out"). Judgment and coordination are not impaired markedly at low doses.

# Chapter 5

## STREET DRUGS

### Stimulants & Cocaine

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Smokable cocaine—freebase, “crack,” or “rock”—fueled the explosion in cocaine use, and these forms of the drug are now generally considered to be among the most dependence-producing drugs known.

**Actions:** Cocaine, amphetamine, and amphetamine-like drugs are CNS stimulants which elevate basic body processes—speeding up breathing and heart rate and raising blood pressure. Low doses produce increased alertness and talkativeness, feelings of power and energy, and decreased appetite and desire for sleep. Larger doses cause impaired judgment, insomnia, irritability, anxiety, and transient psychotic episodes and paranoia.

Since stimulant use is so reinforcing—and the drugs themselves so dangerous—continued use poses serious hazards to users, including:

- **Behavior:** Regular or heavy users may become suspicious, hostile, and paranoid. High doses may trigger full-blown psychotic episodes, characterized by aggression and violence, hallucinations, and delusions.
- **Overdose:** Coma and death can occur from cardiac arrest following high doses of amphetamine and methamphetamine. Cocaine overdose can occur at lower dosage levels, triggering sudden heart attack in otherwise-healthy users.
- **Depression:** Stimulant withdrawal involves deep depression and strong cravings for the drugs. Suicide rates are high among dependent individuals.

**Dependence:** All stimulants carry high psychological dependence potential. Tolerance develops quickly to the drugs.

**Medical Uses:** To reduce appetite and overcome chronic fatigue, although on a

much reduced scale from 20 years ago. Hyperactive children and adults with attention-deficit disorder may be prescribed Ritalin or Dexedrine to improve concentration. Cocaine was once widely used in dental surgery, while caffeine and PPA are ingredients in many nonprescription diet aids, “stay-awake” pills, and cold and allergy medications.

**Main Dangers:** Long-term amphetamine use can leave significant psychological scars, and permanently damage teeth, bones, lungs, liver, and kidneys, and deplete body stores of vitamins and minerals. Heavy cocaine use carries risk of overdose and dependence. Cocaine sniffing can damage nasal tissue and weaken the heart muscle, while freebase use is linked with chronic lung irritation.

Many users turn to CNS depressants to counter the hyperstimulation of constant amphetamine use. Stimulant-depressant combination use can result in multiple addiction.

**Withdrawal Symptoms:** Severe depression, anxiety, and exhaustion. Intense psychological craving for the drugs can persist for months following cessation of use.

**Symptoms of Use:** Dilated pupils, loss of appetite, compulsive behavior, belligerence, suspicion, confusion, insomnia.

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## Marijuana

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**Examples:** Marijuana (*Cannabis sativa*, *Cannabis indica*), hashish, hashish oil.

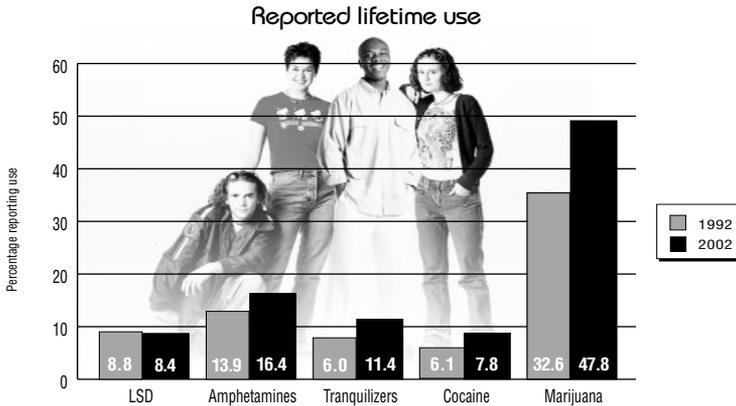
The principle psychoactive ingredient is  $\Delta$ -9 tetrahydrocannabinol (THC), which varies in concentration in different strains of the plant. Average potency of street mari-

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## Trendwatch: High School Highs

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Source: Institute for Social Research, 2003



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**Upside, downside.** Drugs have become so “normal” a part of growing up that, by 2002, 53% of high school seniors reported at least some illicit drug use during their lifetimes.

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Long-term amphetamine use can leave significant psychological scars, and permanently damage teeth, bones, lungs, liver, and kidneys, and deplete body stores of vitamins and minerals.

juana in 2001 was 5.32 percent (up from 2.38 percent in the early 1970s) and 9.55 percent for high-powered strains (sinsemilla).

**Actions:** Marijuana raises heart rate and lowers blood pressure, and causes reddening of the eyes. Low to moderate dose effects last from two to three hours and can range from euphoria and hilarity to mild lethargy, perceptual changes, and feelings of heightened sensitivity. High dose effects can simulate the perceptual and cognitive changes associated with more potent hallucinogens.

Since the drug's effects on performance—particularly on tracking ability and reaction speed—can last hours after intoxicating effects fade, pot use can pose significant safety risks. In addition, marijuana may cause problems in learning and social development for adolescent users.

Health risks linked to smoking marijuana include:

■ **Lungs:** Marijuana irritates lung tissues. One study found that it delivers three times the tar and five times the carbon monoxide of a tobacco cigarette, raising the risk of lung damage in long-term users.

■ **Immune System:** Studies suggest the drug may lower the body's natural defenses against disease.

■ **Central Nervous System:** THC and other ingredients disrupt the production and flow of neurotransmitters in the brain and central nervous system. Researchers suspect these changes may contribute to impaired memory and concentration and reduced motivation in chronic smokers.

■ **Hormonal Effects:** Marijuana reduces normal levels of hormones that regulate growth and sexual development. Such irregularities may change growth patterns in adolescents or affect fertility.

■ **Pregnancy Effects:** Studies tie maternal use of marijuana to higher levels of miscarriage, stillbirths, and low birth-weight babies, as well as problems in nervous system development.

Marijuana can cause psychological dependence and some tolerance. While it does not appear to produce serious physical dependence, a withdrawal syndrome—which can include irritability, depression, and insomnia—is reported following abrupt cessation of use.

**Medical Uses:** Marijuana has a long history of use as a medicinal agent. Today, research on the drug's possible therapeutic value focuses on its use in treating glaucoma, reducing muscle spasms and seizures, relieving the nausea and vomiting caused

by cancer chemotherapy, and reducing the “wasting syndrome” associated with AIDS.

**Main Dangers:** High dose or chronic use can trigger panic and anxiety episodes in some users. Regular use interferes with learning and concentration and contributes to low motivation and psychological dependence on the drug.

**Withdrawal Symptoms:** A slight withdrawal syndrome can follow long-term or heavy use (e.g. irritability, sleep disturbances, decreased appetite), but symptoms are mostly transient and disappear within a few weeks.

**Symptoms of Use:** Intoxication, euphoria, impairment of judgment and coordination, memory lapses, reduced attention span, and fatigue. Possession of marijuana paraphernalia (pipes, rolling papers, etc.). Reddening of the eyes.

## Hallucinogens

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**Examples:** Naturally-occurring: mescaline (peyote), psilocybin mushrooms, nutmeg, jimson weed. Synthetic: Lysergic acid diethylamide (LSD), dimethyltryptamine (DMT), methylenedioxymphetamine (MDA, MDMA, “ecstasy”), and related compounds.

**Actions:** The hallucinogens act on the central nervous system by altering the production and processing of chemical neurotransmitters in the brain. Effects can last anywhere from four to 12 hours (MDA, LSD) or as long as 24 hours (TMA, jimson weed).

Hallucinogens trigger intense perceptual and cognitive changes, which vary according to the individual, situation, and drug used. Other effects can include intense and unpredictable emotions, a sense of detachment from self, and feelings of profound insight. In addition, most users are highly suggestible under the influence of hallucinogens, which can further alter the experience.

Physically, hallucinogens increase blood pressure and body temperature, produce dilation of the pupils, and speed up heart and reflex rate. The compounds are also linked to tremors, weakness, profuse sweating, and dizziness.

Hallucinogens can profoundly impair judgment, coordination, and thought, so that driving or other complex activities can be risky, indeed. The drugs carry a slight potential for psychological dependence, but do not produce physical dependence. Some hallucinogens are derived from amphetamine (MDA, MDMA, TMA) and can cause overdose. Tolerance builds quickly and almost completely within a few days.

**Medical Uses:** LSD, mescaline, MDA, and MDMA have been tested in treatment of a range of psychological disorders and emotional problems, including alcoholism, autism, depression, and psychosis, although the drugs have no currently-accepted medical use.

**Main Dangers:** Hazards are mostly psychological, and include:

■ **Panic Attacks:** The intensity of emotional reactions can trigger anxiety, depression, and confusion, along with an inability to distinguish between reality and the drug’s effects.

■ **Psychotic Reactions:** Some users experience long-lasting psychological distress, including full-blown psychotic states.

Recent research indicates that MDA and MDMA may disrupt production of the neurotransmitter serotonin. Other risks derive from the sheer unpredictability of hallucinogens.

■ **Flashbacks:** Unexpected, short-lived recurrences of drug-like effects days or weeks after use of an hallucinogenic compound. LSD flashbacks are psychological in origin and may involve a conditioned response to situational cues associated with previous panic attacks.

Recent research indicates that MDA and MDMA may disrupt production of the neurotransmitter serotonin. Other risks derive from the sheer unpredictability of hallucinogens.

Some types (TMA, jimson weed) produce more intense and long-lasting effects than others. Yet because of the illegality of the drugs and a lack of controls associated with their distribution, users can't even be certain which drug they've consumed, much less factor in such considerations as dosage or quality.

**Withdrawal Symptoms:** None.

**Symptoms of Use:** Dilated pupils, emotional swings, nausea, impaired coordination, inability to carry on a conversation.

## Phencyclidine (PCP) and Ketamine

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**Examples:** 1-(1-phenylcyclohexyl) piperidine (PCP), also known as “angel dust,” “embalming fluid,” “tic,” “THC,” and other pseudonyms. Sold in pill, powder, and liquid form, or sprinkled on marijuana or tobacco cigarettes (“sherm”). Ketamine is commonly known as “K” or “Special K.”

**Demographics:** Although PCP is much less prevalent today than in the 1980s, ketamine has become a fixture of the current urban dance-club scene, due to its more-manageable effects.

**Actions:** Both PCP and ketamine were developed as surgical anesthetics, and are classified as “delirants” or “psychedelic anesthetics.”

Their effects are dose-dependent and can resemble stimulants, depressants, anesthetics, and hallucinogens, depending on the amount consumed. The drugs interact with receptors throughout the brain and central nervous system.

Easily the most unpredictable of all psychoactive drugs, PCP effects vary widely depending on the user and the dose:

■ **Low Dose:** At low doses (1-5mg), it produces stimulation, euphoria, numbness, and reduced inhibitions along with flushing, sweating, impaired coordination and

Although PCP is much less prevalent today than in the 1980s, ketamine has become a fixture of the current urban dance-club scene.

judgment, and slurred speech.

■ **Moderate Dose:** At higher levels (5-10mg), the drug's primary action is CNS depression, accompanied by an excited, confused intoxication. Body image distortion and reduced sensitivity to pain also occur.

■ **High Dose:** With larger doses (over 10mg), PCP causes agitation, increased aggression, paranoia, auditory and visual hallucinations, delusions, and near-complete insensitivity to pain. A sharp drop in blood pressure may occur, with muscular rigidity and convulsions, leading to coma and possible death.

Both drugs cause moderate psychological and physical dependence. The drugs' depressant effects are intensified by alcohol and other depressants. Breakdown products are fat-soluble and are stored—at full psychoactive potential—in the fatty tissues of the body, producing increased risks of overdose and physiologically-based flashbacks.

**Medical Uses:** Veterinary anesthetic (PCP). Human surgical anesthetic (ketamine).

**Main Dangers:** PCP is often sold as an additive to (or substitute for) more scarce drugs, such as LSD, cocaine, heroin, and mescaline, posing serious risks to users who do not realize they are taking PCP. But whether taken accidentally or intentionally, the drug carries a range of risks:

■ **Accidents:** PCP reduces sensitivity to pain, heightens aggression, and powerfully impairs judgment and coordination, producing high risk of injury or death by falls, drowning, etc.

■ **Panic Attacks:** “Bad trips” on PCP can involve confusion, mood swings, delusions and hallucinations. The attacks are difficult to treat and can lead to long-term emotional problems.

■ **Psychosis:** In some users, PCP can “unmask” underlying emotional and behavioral problems, and trigger psychotic states.

**Withdrawal Symptoms:** None.

**Symptoms of Use:** Intoxication, poor coordination, inability to carry on a conversation, bizarre behavior. Sweating, flushing, muscular rigidity, and occasional rhythmic rotation of the eyeballs (nystagmus) may occur. High-dose symptoms resemble schizophrenia.

# Chapter 6

## MEASURING RISK

All drugs with potential for abuse share an ability to induce some desired change in mood or perception. In general, the more desirable and seductive the change, the greater the potential for abuse and the higher the risks of physical or psychological dependence in users.

### ■ To the Individual

Until recently, researchers rarely approached evaluating and assessing the relative hazard potential of a drug to the individual, except in the most limited sense of possibilities for tissue damage, physical dependence, or death from overdose.

Such an assessment involves a series of complex judgments, often based on incomplete or inadequate information, and it is doubtful that experts would agree on any rank ordering of drugs or on decision-making priorities for doing so.

It can be reasonably attempted, however, by concentrating on objective criteria when possible and by trusting one's intuitive judgment, based on knowledge and experience, to subjectively score the individual items.

The evaluation presented in the table below is an attempt to identify the most significant variables and arrive at a relative ranking of the hazards of the major psychoactive drugs.

I've based this assessment on such criteria as the drug's overall potential to be used repeatedly or compulsively (or in a self-destructive manner), to produce physical dependence, impair judgment, predispose to social deterioration, produce irreversible tissue damage and disease, and cause accidental death via overdose.

In this ranking, 0 represents the absence of an effect or impairment; varying degrees of effect are represented from (1) very slight, to (2) slight, (3) moderate, (4) marked, and (5) extreme. It should also be noted that not all members of a single class of drugs are equally dangerous.

Another means of ranking the relative dangers of psychoactive substances is to review hospital emergency-room admission records and medical examiner reports to determine which substances pose the greatest immediate risks in terms of accidents and overdoses. The Drug Abuse Warning Network (DAWN) is a federally-sponsored information-sharing project that tracks trends in drug-related emergency room treatment and deaths. DAWN compiles data from 756 hospitals and 75 medical examiner facilities in 27 major metropolitan areas.

The statistics presented in the chart on the next page cover the top eight drugs mentioned in hospital emergency room incidents for the first half of 2002 (the most recent reporting period for which data is available).

## ■ To Society

Our purpose here is to begin to examine psychoactive drugs in their broader context as relative hazards to society. In the process, we may discover new possibilities in responding to the problems these substances represent and how to model drug and alcohol prevention, education, and treatment programs to best address—and alleviate—these problems.

The last chart (at the bottom of page 28) presents a rank ordering of drugs based on their scores for hazard potential to society.

## Risks, I: Hazards to the Individual

Drug	Dependence		Toxicity		
	Psych.	Physical	Behavioral*	Tolerance	Tissue Damage
Alcohol	4	4	4	3	4
Cigarettes	4	2	2	3	4
Sedatives	4	4	5	3	1
Heroin	5	5	2	4	1
Stimulants	5	3	4	4	4
PCP	3	1	5	2	1
Inhalants	3	2	5	3	2
LSD	2	0	5	5	0
Marijuana	3	1	2	2	2

*\*Refers to behavioral changes associated with use of a substance. Includes reckless and self-destructive behavior as an index of toxicity.*

All drugs with potential for abuse share an ability to induce some desired change in mood or perception. In general, the more desirable and seductive the change, the greater the potential for abuse and the higher the risks.

This order is based largely on the extent of a drug's probable misuse and subsequent harm to others arising from social apathy, driving accidents, aggression and crimes of violence, and so on.

I contrasted my own assessment with those of 22 representatives of law enforcement agencies (primarily district attorneys).

Since my personal bias is that alcohol is the most potentially hazardous substance to society, I assigned a 100 percent rating to alcohol. Not surprisingly, ratings by law enforcement personnel listed heroin as the highest, at 100 percent.

The estimate of hazard for other drugs was rated in relation to the values for alcohol and heroin, respectively (e.g., I rated heroin at a hazard level 68 percent that of alcohol).

As the ratings reveal, the law enforcement group tended to rate the relative hazards of the drug group in relation to existing laws and penalties associated with them. The only exception was marijuana, which was rated only slightly above alcohol on the scale.

Most remarkable was their low rating of alcohol, which has been listed as the fourth major public health hazard in the United States.

This was counter to my expectations, particularly considering their experience in

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## Risks, 2: Crisis & Consequences

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Source: Drug Abuse Warning Network, 2003

Drug	Ranking	Emergency-Room Mentions
Alcohol-in-combination	1	97,527
Cocaine	2	91,687
Marijuana	3	55,727
Heroin	4	42,571
Amphetamines	5	10,079
Methamphetamine	6	6,136
PCP	7	3,257
MDMA/Ecstasy	8	2,303

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*Another view of risk potential focuses on the immediate physical dangers produced by common substances.*

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law enforcement, and to data which links alcohol to more than half of all driving fatalities and to countless crimes of violence, taking up an estimated 50 percent of their enforcement time and about one-third of their total budgets.

## ■ The Fraud Factor

Most of the pills, capsules, and powders prepared and sold on the street are marketed with an appalling disregard for human safety. The level of fraud in the illegal drug marketplace is one of its most distinguishing features, a situation compounded by the lack of quality control over composition, dosage, and potential toxicity of most drugs sold.

The main outcome is that the street user faces dangerously high risks of unexpected or deadly reactions. And the greater the demand for a particular drug, the more expensive it becomes—and the greater the risk of substitution or adulteration.

According to analysis data collected over the past three decades, up to 50 percent of street drugs do not contain the primary ingredient they're alleged to contain—a figure that runs even higher with specialty drugs, such as opium and mescaline, or tightly-controlled substances, such as pharmaceutical amphetamine.

Similarly, samples are often found to contain unsafe dosage or to be cut with chemicals intended to mimic or boost another drug's action. And too often, these additives carry dangerous side effects all their own.

The hazard scores in our chart on individual risks were based on the availability of a drug in pure form, as with alcohol.

But there are no guarantees of the purity of drugs on the street. At the same time, users of certain drugs, particularly those producing strong physical or psychological dependence, may be forced to commit crimes to obtain money to supply a drug habit.

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## Risks, 3: Social Perspectives

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Drug	Irwin Ranking	Panel Ranking	Social Controls
Alcohol	100	11	Low
Sedatives	95	26	High
Stimulants	86	85	High
Heroin	68	100	High
Volatile Solvents	48	34	Low
Cigarettes	40	2	Low
LSD	36	56	High
Marijuana	27	16	Moderate

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*Perceived risk, like beauty, is in the eye of the beholder. Different substances can inspire different perceptions of social risk—and a range of social controls.*

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The level of fraud in the illegal drug marketplace is one of its most distinguishing features, a situation compounded by the lack of quality control over composition, dosage, and potential toxicity of most drugs sold.

Because of these conditions, there's a need for reordering hazard potential to factor in the mutual hazards to both the individual and to society. Here's one interpretation:

1. heroin
2. stimulants and cocaine
3. phencyclidine
4. solvents
5. sedative-hypnotics
6. alcohol
7. LSD
8. marijuana

Viewed from this perspective, the rating provided by the law enforcement panel comes closest to the ultimate hazard potential of drug use to society.

## ■ Stemming the Tide

A valid, rational criminal law is one that addresses itself to a real social problem, deals effectively with that problem, and is enforceable. Many would argue that at best, these criteria only occasionally describe current U.S. drug policy.

A main weakness of our ongoing “war on drugs” strategy has been our primary emphasis on only one side of the drug abuse equation—supply, rather than what must be regarded as the heart of the problem: demand.

As a result of “supply-side” enforcement policies, we've seen increased production of substitute substances, which can pose even greater risks to the individual and society.

The emergence of legal synthetic “designer” analogs of heroin and other narcotics is a case in point. Milligram for milligram, these compounds can carry 500 to 2,000 times the potency of heroin. Some have even been linked with a severe degenerative nervous system syndrome similar to Parkinson's disease.

So what are we to do? Learn from our mistakes. And act, if we have the wisdom.

According to the best available data, the frequency of alcohol or drug abuse by the population is continually distributed on a log normal basis.



A main weakness of our ongoing “war on drugs” strategy has been our primary emphasis on only one side of the drug abuse equation—supply, rather than what must be regarded as the heart of the problem: demand.

This is simply a complex way of saying what most of us know intuitively: that in any given using population, there are many light users, fewer moderate users, and even fewer heavy users. The curve is continuous, with no clear differentiation into users and abusers. The drug abuser is thus always a predictably small fraction of the total population of drug users.

Implications are intriguing. One obvious conclusion is that the only real way to reduce the actual incidence of drug abuse is by an overall reduction in the per capita consumption of drugs and alcohol by the total population and by less tolerance of gross intoxication.

And that moves us finally into an area that we can do something about.

# 7

## Chapter

### RATIONALE RESPONSE

It is possible to develop a rational approach to the drug abuse problem. It's also possible to design a rational drug control policy. But to be effective, each must be based on real alternatives to drug use. And those alternatives need to be incorporated into our educational system to better prepare our young people for living and coping with life's unavoidable stresses and crises.

Such alternatives might include training in perceptual awareness, in communication skills and interpersonal effectiveness, in problem-solving, decision-making, stress management, and personal growth.

It's a big order, but it will take big people and even bigger actions to fully counter the allure of drugs of abuse.

Because the simple fact is that drugs (and alcohol) *are* alluring, especially to those of us beset by problems or those with a high need for novelty and stimulation, so-called "sensation-seekers."

Chemicals promise to set right, in an instant or an hour, the accumulated failure and torpor and insecurity of a lifetime, or simply blast away the boredom of the moment.

And regardless of the many (and well-documented) drug tragedies involving rock stars and athletes, and the heart-rending testimony of abusers and abused alike, it's likely to continue to remain so. And that seems attributable to a flaw in our character even more pervasive than the flood of drugs on American streets.

Because the ultimate appeal of drugs and alcohol is deeply rooted in our national consciousness—or more properly, our national *unconsciousness*.

It springs from the media-fed belief that we somehow need something external to us—perhaps the right automobile or haircut or toothpaste, but certainly the right home or right mate—to somehow save us.

It won't, and it never has. Because when it comes to avoiding the deadly sweep of drugs and alcohol in our lives, the only possible thing powerful enough to save us is ourselves.

And saving ourselves (and each other) will require information, to combat the ignorance and intolerance that's swollen up around both sides of the issue.

It will require patience, because no problem that's grown to the dimensions that drug and alcohol abuse currently share is going to disappear overnight. And it will require hard work, because it's just plain hard to reverse the tide of time and history.

But that is the challenge, and that is the opportunity: to remind ourselves, for as long as it's needed, that there are—and always will be—many human alternatives to drugs of abuse for those who seek them. ■