

## Methylenedioxyamphetamine (MDMA)



It is routinely sold in gelatin capsules but is also pressed into tablets. Price for one dose ranges from \$7.00 to \$30.00.

Slang or Street Names: Ecstasy, XTC, X, Adam, Clarity, Lover's Speed

MDMA was developed and patented in the early 1900s as an appetite suppressant, although it was never tested in humans. Chemically, MDMA is similar to the stimulant amphetamine and the hallucinogen mescaline. MDMA can produce both stimulant and psychedelic effects.

- Methylenedioxyamphetamine (MDA) and methylenedioxyethylamphetamine (MDEA) are drugs chemically similar to MDMA.
- MDMA is taken orally, usually in a tablet or a capsule. MDMA's effects last approximately 3 to 6 hours, though confusion, depression, sleep problems, anxiety, and paranoia have been reported to occur even weeks after the drug is taken.
- MDMA can produce a significant increase in heart rate and blood pressure and a sense of alertness like that associated with amphetamine use.
- The stimulant effects of MDMA, which enable users to dance for extended periods, may also lead to dehydration, hypertension, and heart or kidney failure.
- MDMA can be extremely dangerous in high doses. It can cause a marked increase in body temperature (malignant hyperthermia) leading to the muscle breakdown and kidney and cardiovascular system failure reported in some fatal cases at raves. MDMA use may also lead to heart attacks, strokes, and seizures in some users.
- MDMA is neurotoxic. Chronic use of MDMA was found, first in laboratory animals and more recently in humans, to produce long-lasting, perhaps permanent, damage to the neurons that release serotonin, and consequent memory impairment.

### What are some of the commonly abused prescription drugs?

Although many prescription drugs can be abused or misused, there are three classes of prescription drugs that are most commonly abused:

- [Opioids](#), which are most often prescribed to treat pain;
- [CNS depressants](#), which are used to treat anxiety and sleep disorders;
- [Stimulants](#), which are prescribed to treat the sleep disorder narcolepsy, attention-deficit hyperactivity disorder (ADHD), and obesity.

# Opioids

## **What are opioids?**

Opioids are commonly prescribed because of their effective analgesic, or pain-relieving, properties. Medications that fall within this class—sometimes referred to as narcotics—include morphine, codeine, and related drugs. Morphine, for example, is often used before or after surgery to alleviate severe pain. Codeine, because it is less efficacious than morphine, is used for milder pain. Other examples of opioids that can be prescribed to alleviate pain include oxycodone (OxyContin), propoxyphene (Darvon), hydrocodone (Vicodin), and hydromorphone (Dilaudid), as well as meperidine (Demerol), which is used less often because of its side effects. In addition to their pain-relieving properties, some of these drugs—for example, codeine and diphenoxylate (Lomotil)—can be used to relieve coughs and diarrhea.

## **How do opioids affect the brain and body?**

Opioids act by attaching to specific proteins called opioid receptors, which are found in the brain, spinal cord, and gastrointestinal tract. When these drugs attach to certain opioid receptors, they can block the transmission of pain messages to the brain. In addition, opioids can produce drowsiness, cause constipation, and, depending upon the amount of drug taken, depress respiration. Opioid drugs also can cause euphoria by affecting the brain regions that mediate what we perceive as pleasure.

## **What are the possible consequences of opioid use and abuse?**

Chronic use of opioids can result in tolerance for the drugs, which means that users must take higher doses to achieve the same initial effects. Long-term use also can lead to physical dependence and addiction—the body adapts to the presence of the drug, and withdrawal symptoms occur if use is reduced or stopped. Symptoms of withdrawal include restlessness, muscle and bone pain, insomnia, diarrhea, vomiting, cold flashes with goose bumps (“cold turkey”), and involuntary leg movements. Finally, taking a large single dose of an opioid could cause severe respiratory depression that can lead to death. Many studies have shown, however, that properly managed medical use of opioid analgesic drugs is safe and rarely causes clinical addiction, defined as compulsive, often uncontrollable use of drugs. Taken exactly as prescribed, opioids can be used to manage pain effectively.

## **Is it safe to use opioid drugs with other medications?**

Opioids are safe to use with other drugs only under a physician’s supervision. Typically, they should not be used with other substances that depress the central nervous system, such as alcohol, antihistamines, barbiturates, benzodiazepines, or general anesthetics, as such a combination increases the risk of life-threatening respiratory depression.

## CNS Depressants

### What are CNS depressants?

CNS depressants are substances that can slow normal brain function. Because of this property, some CNS depressants are useful in the treatment of anxiety and sleep disorders. Among the medications that are commonly prescribed for these purposes are the following:

- Barbiturates, such as mephobarbital (Mebaral) and pentobarbital sodium (Nembutal), which are used to treat anxiety, tension, and sleep disorders.
- Benzodiazepines, such as diazepam (Valium), chlordiazepoxide HCl (Librium), and alprazolam (Xanax), which can be prescribed to treat anxiety, acute stress reactions, and panic attacks; the more sedating benzodiazepines, such as triazolam (Halcion) and estazolam (ProSom) can be prescribed for short-term treatment of sleep disorders.

In higher doses, some CNS depressants can be used as general anesthetics.

### How do CNS depressants affect the brain and body?

There are numerous CNS depressants; most act on the brain by affecting the neurotransmitter gamma-aminobutyric acid (GABA). Neurotransmitters are brain chemicals that facilitate communication between brain cells. GABA works by decreasing brain activity. Although the different classes of CNS depressants work in unique ways, ultimately it is through their ability to increase GABA activity that they produce a drowsy or calming effect that is beneficial to those suffering from anxiety or sleep disorders.

### What are the possible consequences of CNS depressant use and abuse?

Despite their many beneficial effects, barbiturates and benzodiazepines have the potential for abuse and should be used only as prescribed. During the first few days of taking a prescribed CNS depressant, a person usually feels sleepy and uncoordinated, but as the body becomes accustomed to the effects of the drug, these feelings begin to disappear. If one uses these drugs long term, the body will develop tolerance for the drugs, and larger doses will be needed to achieve the same initial effects. In addition, continued use can lead to physical dependence and—when use is reduced or stopped— withdrawal.

Because all CNS depressants work by slowing the brain's activity, when an individual stops taking them, the brain's activity can rebound and race out of control, possibly leading to seizures and other harmful consequences. Although withdrawal from benzodiazepines can be problematic, it is rarely life threatening, whereas withdrawal from prolonged use of other CNS depressants can have life-threatening complications. Therefore, someone who is thinking about discontinuing CNS-depressant therapy or who is suffering withdrawal from a CNS depressant should speak with a physician or seek medical treatment.

### Is it safe to use CNS depressants with other medications?

CNS depressants should be used with other medications only under a physician's supervision. Typically, they should not be combined with any other medication or substance that causes CNS depression, including prescription pain medicines, some over-the-counter cold and allergy medications, or alcohol. Using CNS depressants with these other substances—particularly alcohol—can slow breathing, or slow both the heart and respiration, and possibly lead to death.

# Stimulants

## **What are stimulants?**

As the name suggests, stimulants are a class of drugs that enhance brain activity they cause an increase in alertness, attention, and energy that is accompanied by elevated blood pressure and increased heart rate and respiration. Stimulants were used historically to treat asthma and other respiratory problems, obesity, neurological disorders, and a variety of other ailments. But as their potential for abuse and addiction became apparent, the medical use of stimulants began to wane.

Now, stimulants are prescribed for the treatment of only a few health conditions, including narcolepsy, attention deficit hyperactivity disorder, and depression that has not responded to other treatments. Stimulants may be used as appetite suppressants for short-term treatment of obesity, and they also may be used for patients with asthma.

## **How do stimulants affect the brain and body?**

Stimulants, such as dextroamphetamine (Dexedrine) and methylphenidate (Ritalin), have chemical structures that are similar to a family of key brain neurotransmitters called monoamines, which include norepinephrine and dopamine. Stimulants increase the amount of these chemicals in the brain. This, in turn, increases blood pressure and heart rate, constricts blood vessels, increases blood glucose, and opens up the pathways of the respiratory system. In addition, the increase in dopamine is associated with a sense of euphoria that can accompany the use of these drugs.

## **What are the possible consequences of stimulant use and abuse?**

The consequences of stimulant abuse can be dangerous. Although their use may not lead to physical dependence and risk of withdrawal, stimulants can be addictive in that individuals begin to use them compulsively. Taking high doses of some stimulants repeatedly over a short time can lead to feelings of hostility or paranoia. Additionally, taking high doses of a stimulant may result in dangerously high body temperatures and an irregular heartbeat. There is also the potential for cardiovascular failure or lethal seizures.

## **Is it safe to use stimulants with other medications?**

Stimulants should be used with other medications only when the patient is under a physician's supervision. For example, a stimulant may be prescribed to a patient taking an antidepressant. However, health care providers and patients should be mindful that antidepressants enhance the effects of a stimulant. Patients also should be aware that stimulants should not be mixed with over-the-counter cold medicines that contain decongestants, as this combination may cause blood pressure to become dangerously high or lead to irregular heart rhythms.

## LSD

LSD (d-lysergic acid diethylamide), commonly called "acid," is the most powerful known hallucinogen - a drug that radically changes a person's mental state by distorting the perception of reality to the point where, at high doses, hallucinations occur. Although it is derived from a fungus that grows on rye and other grains, LSD is semi-synthetic. It is chemically manufactured in illicit laboratories, except for a small amount which is produced legally for research.

Even in very minute doses (for example, 50 to 100 micrograms - a microgram is 1/1,000,000 of a gram), LSD can significantly alter one's perceptions to the point of hallucination - that is, one sees or hears things that don't, in reality, exist. Hence LSD's classification as a hallucinogen.

Pure LSD is a white, odorless crystalline powder that dissolves in water. Because an effective dose of the pure drug is almost invisible, it is mixed with other substances, such as sugar, and packaged in capsules, tablets, or solutions, or spotted on to gelatin sheets or pieces of blotting paper.

The availability of LSD has increased in the United States in the last 2 to 3 years; the hallucinogen is available in at least retail quantities in virtually every state. The sources of supply for most of the LSD available in the United States are believed to be centered in northern California.

At the wholesale production and trafficking levels, LSD remains tightly controlled by relatively small, fraternal California-based organizations that have evaded drug law enforcement operations successfully for over two decades. Mid-level distribution networks generally are comprised of individuals who have known each other through long years of association and common interests. Over the past several years, an increasing number of individuals have attempted to manufacture LSD. Many of these individuals are not associated with the traditional northern California groups that are believed to have produced most of the LSD available in the United States since the late 1960's.

Compared with methamphetamine, PCP, and other illicit drugs manufactured in the United States, few LSD laboratories have been located or seized. Six illegal LSD laboratories have been confiscated by the DEA since 1981; however, there have been no seizures since 1987. This is due primarily to the shifting of law enforcement focus to target and dismantle the rising number of cocaine trafficking organizations established during the crack epidemic that began during the mid-1980's and continues into the present.

Public and private mail systems appear to be the primary means used for the transportation and distribution of wholesale and retail quantities of LSD. LSD is relatively inexpensive with an average street dosage unit or "hit" costing about \$5 and often as little as \$1 or \$2. Retail-level doses are available primarily in paper form; microdot tablets and gelatin squares also have been encountered.

LSD is ingested orally. A microdot tablet or square of the perforated LSD paper is placed in the user's mouth, chewed or swallowed. Paper squares are most common because their small size makes them easy to conceal and ingest. Also, because LSD is not injected or smoked, paraphernalia are not required.

## Inhalants

Inhalant abuse is hard to talk about because of the confusing terms used to describe it. Substances such as glue, gasoline, anesthetic gases and nitrites have all been discussed under the title of inhalant abuse. The only thing in common is the way in which they are taken into the body. Even calling them "inhalants" fails to describe the variety of ways people self-administer these substances.

There are at least three chemically different types of inhalants; volatile hydrocarbons, amyl and butyl (volatile) nitrites, and anesthetic gases. The users of these three types of substances use them for different reasons and experience different effects.

Volatile hydrocarbons (including lighter fluid and typewriter correction fluid) are primarily used as solvents, refrigerants, and propellants. They act as central nervous depressants, inducing a "high" similar to alcohol.

Volatile nitrites function as a vasodilator. They dilate blood vessels and increase heart rate. Butyl nitrite is marketed in room fresheners.

Anesthetic gases produce the loss of sensations and possibly loss of consciousness that is required for some dental and surgical procedures. Nitrous oxide is also used as an aerosol propellant and flavoring agent for whipping cream.

Inhaling vapors to alter one's state of mind dates back to the times of the ancient Greeks. In ancient Delphi, a priestess known as the pythoness inhaled vapors from a rock crevice as a part of her priestly activities.

In the 1840's the effects of diethyl ether and nitrous oxide were demonstrated to the general public in "ether frolics" and "laughing gas demonstrations." Experience with these early agents led to their use as anesthetics, and the new branch of medicine known as "anesthesiology." Evidence of inhalant abuse in the medical literature of the 1800's consists mainly of case reports. In 1849, Dr. Horace Wells died of chloroform abuse. He had introduced nitrous oxide and chloroform as dental and surgical anesthetics only five years before. A case of chloroform abuse in an adolescent was described in 1885.

In America, gasoline sniffing became popular among teenagers in the 1950's, primarily in rural areas where alcohol and other commonly used drugs were unavailable. Glue sniffing became widespread in California in the early 1960's. By 1965 glue sniffing was occurring in every state and in many foreign countries.

Inhalant abuse has experienced a steady increase in the United States, Mexico and Canada throughout the 1980's and early 1990's. Inhalant abusers begin using in early to middle adolescence. A significant minority continue into adulthood.

Inhalants are volatile substances that produce chemical vapors that can be inhaled to induce a psychoactive, or mind-altering, effect. Although other abused substances can be inhaled, the term "inhalants" is used to describe a variety of substances whose main common characteristic is that they are rarely, if ever, taken by any route other than inhalation. This definition encompasses a broad range of chemicals found in hundreds of different products that may have different pharmacological effects. As a result, precise categorization of inhalants is difficult. One classification system lists four general categories of inhalants—volatile solvents, aerosol, gases, and nitrites—based on the form in which they are often found in household, industrial, and medical products.

**Volatile solvents** are liquids that vaporize at room temperatures. They are found in a multitude of inexpensive, easily available products used for common household and industrial purposes. These include paint thinners and removers, dry-cleaning fluids, degreasers, gasoline, glues, correction fluids, and felt-tip marker fluids.

**Aerosols** are sprays that contain propellants and solvents. They include spray paints, deodorant and hair sprays, vegetable oil sprays for cooking, and fabric protector sprays.

**Gases** include medical anesthetics as well as gases used in household or commercial products. Medical anesthetic gases include ether, chloroform, halothane, and nitrous oxide, commonly called "laughing gas." Nitrous oxide is the most abused of these gases and can be found in whipped cream dispensers and products that boost octane levels in racing cars. Household or commercial products containing gases include butane lighters, propane tanks, whipped cream dispensers, and refrigerants.

**Nitrites** often are considered a special class of inhalants. Unlike most other inhalants, which act directly on the central nervous system (CNS), nitrites act primarily to dilate blood vessels and relax the muscles. And while other inhalants are used to alter mood, nitrites are used primarily as sexual enhancers. Nitrites include cyclohexyl nitrite, isoamyl (amy!) nitrite, and isobutyl (butyl) nitrite. Cyclohexyl nitrite is found in room odorizers.

Amyl nitrite is used in certain diagnostic procedures and is prescribed to some patients for heart pain. Illegally diverted ampules of amy! nitrite are called "poppers" or "snappers" on the street. Butyl nitrite is an illegal substance that is often packaged and sold in small bottles also referred to as "poppers."