

## Crack and Cocaine

Cocaine is a powerfully addictive drug of abuse. Once having tried cocaine, an individual cannot predict or control the extent to which he or she will continue to use the drug.

The major routes of administration of cocaine are sniffing or snorting, injecting, and smoking (including free-base and crack cocaine). Snorting is the process of inhaling cocaine powder through the nose where it is absorbed into the bloodstream through the nasal tissues. Injecting is the act of using a needle to release the drug directly into the bloodstream. Smoking involves inhaling cocaine vapor or smoke into the lungs where absorption into the bloodstream is as rapid as by injection.

"Crack" is the street name given to cocaine that has been processed from cocaine hydrochloride to a free base for smoking. Rather than requiring the more volatile method of processing cocaine using ether, crack cocaine is processed with ammonia or sodium bicarbonate (baking soda) and water and heated to remove the hydrochloride, thus producing a form of cocaine that can be smoked. The term "crack" refers to the crackling sound heard when the mixture is smoked (heated), presumably from the sodium bicarbonate.

There is great risk whether cocaine is ingested by inhalation (snorting), injection, or smoking. It appears that compulsive cocaine use may develop even more rapidly if the substance is smoked rather than snorted. Smoking allows extremely high doses of cocaine to reach the brain very quickly and brings an intense and immediate high. The injecting drug user is at risk for transmitting or acquiring HIV infection/AIDS if needles or other injection equipment are shared.

### Health Hazards

Cocaine is a strong central nervous system stimulant that interferes with the reabsorption process of dopamine, a chemical messenger associated with pleasure and movement. Dopamine is released as part of the brain's reward system and is involved in the high that characterizes cocaine consumption.

Physical effects of cocaine use include constricted peripheral blood vessels, dilated pupils, and increased temperature, heart rate, and blood pressure. The duration of cocaine's immediate euphoric effects, which include hyper-stimulation, reduced fatigue, and mental clarity, depends on the route of administration. The faster the absorption, the more intense the high. On the other hand, the faster the absorption, the shorter the duration of action. The high from snorting may last 15 to 30 minutes, while that from smoking may last 5 to 10 minutes. Increased use can reduce the period of stimulation.

Some users of cocaine report feelings of restlessness, irritability, and anxiety. An appreciable tolerance to the high may be developed, and many addicts report that they seek but fail to achieve as much pleasure as they did from their first exposure. Scientific evidence suggests that the powerful neuropsychologic reinforcing property of cocaine is responsible for an individual's continued use, despite harmful physical and social consequences. In rare instances, sudden death can occur on the first use of cocaine or unexpectedly thereafter. However, there is no way to determine who is prone to sudden death.

High doses of cocaine and/or prolonged use can trigger paranoia. Smoking crack cocaine can produce a particularly aggressive paranoid behavior in users. When addicted individuals stop using cocaine, they often become depressed. This also may lead to further cocaine use to alleviate depression. Prolonged cocaine snorting can result in ulceration of the mucous membrane of the nose and can damage the nasal septum enough to cause it to collapse. Cocaine-related deaths are often a result of cardiac arrest or seizures followed by respiratory arrest.

### Added Danger: Cocaethylene

When people mix cocaine and alcohol consumption, they are compounding the danger each drug poses and unknowingly forming a complex chemical experiment within their bodies. NIDA-funded researchers have found that the human liver combines cocaine and alcohol and manufactures a third substance, cocaethylene, that intensifies cocaine's euphoric effects, while possibly increasing the risk of sudden death.

### Treatment

The widespread abuse of cocaine has stimulated extensive efforts to develop treatment programs for this type of drug abuse.

NIDA's top research priority is to find a medication to block or greatly reduce the effects of cocaine, to be used as one part of a comprehensive treatment program. NIDA-funded researchers are also looking at medications that help alleviate the severe craving that people in treatment for cocaine addiction often experience. Several medications are currently being investigated to test their safety and efficacy in treating cocaine addiction.

In addition to treatment medications, behavioral interventions, particularly cognitive behavioral therapy, can be effective in decreasing drug use by patients in treatment for cocaine abuse.

Providing the optimal combination of treatment services for each individual is critical to successful treatment outcome.

### Extent of Use

#### *Monitoring the Future Study (MTF)\**

The MTF assesses the extent of drug use among adolescents and young adults across the country.

The proportion of high school seniors who have used cocaine at least once in their lifetimes has increased from a low of 5.9 percent in 1994 to 9.8 percent in 1999. However, this is lower than its peak of 17.3 percent in 1985. Current (past month) use of cocaine by seniors decreased from a high of 6.7 percent in 1985 to 2.6 percent in 1999. Also in 1999, 7.7 percent of 10th-graders had tried cocaine at least once, up from a low of 3.3 percent in 1992. The percentage of 8th-graders who had ever tried cocaine has increased from a low of 2.3 percent in 1991 to 4.7 percent in 1999. Of college students 1 to 4 years beyond high school, in 1995, 3.6 percent had used cocaine within the past year, and 0.7 percent had used cocaine in the past month.

Cocaine Use by Students, 1999:

Monitoring the Future Study

	8th-Graders	10th-Graders	12th-Graders
<b>Ever Used</b>	4.7%	7.7%	9.8%
<b>Used in Past Year</b>	2.7	4.9	6.2
<b>Used in Past Month</b>	1.3	1.8	2.6

***Community Epidemiology Work Group (CEWG)\*\****

Although demographic data continue to show most cocaine users as older, inner-city crack addicts, isolated field reports indicate new groups of users: teenagers smoking crack with marijuana in some cities; Hispanic crack users in Texas; and in the Atlanta area, middle-class suburban users of cocaine hydrochloride and female crack users in their thirties with no prior drug history.

***National Household Survey on Drug Abuse (NHSDA)\*\*\****

In 1998, about 1.7 million Americans were current (at least once per month) cocaine users. This is about 0.8 percent of the population age 12 and older; about 437,000 of these used crack. The rate of current cocaine use in 1998 was highest among Americans ages 18 to 25 (2.0 percent). The rate of use for this age group was significantly higher in 1998 than in 1997, when it was 1.2 percent.

---

*\* MTF is an annual survey on drug use and related attitudes of America's adolescents that began in 1975. The survey is conducted by the University of Michigan's Institute for Social Research and is funded by NIDA. Copies of the latest survey are available from the National Clearinghouse for Alcohol and Drug Information at 1-800-729-6686*

*\*\* CEWG is a NIDA-sponsored network of researchers from 20 major U.S. metropolitan areas and selected foreign countries who meet semiannually to discuss the current epidemiology of drug abuse.*

*\*\*\* NHSDA is an annual survey conducted by the Substance Abuse and Mental Health Services Administration. Copies of the latest survey are available from the National Clearinghouse for Alcohol and Drug Information at 1-800-729-6686.*