



National Institute  
on Drug Abuse

# DrugFacts

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## Cocaine

Cocaine is a powerfully addictive stimulant drug made from the leaves of the coca plant native to South America. It produces short-term euphoria, energy, and talkativeness in addition to potentially dangerous physical effects like raising heart rate and blood pressure.



### How Is Cocaine Used?

The powdered form of cocaine is either inhaled through the nose (snorted), where it is absorbed through the nasal tissue, or dissolved in water and injected into the bloodstream.

Crack is a form of cocaine that has been processed to make a rock crystal (also called “freebase cocaine”) that can be smoked. The crystal is heated to produce vapors that are absorbed into the bloodstream through the lungs. (The term

“crack” refers to the crackling sound produced by the rock as it is heated.)

The intensity and duration of cocaine’s pleasurable effects depend on the way it is administered. Injecting or smoking cocaine delivers the drug rapidly into the bloodstream and brain, producing a quicker and stronger but shorter-lasting high than snorting. The high from snorting cocaine may last 15 to 30 minutes; the high from smoking may last 5 to 10 minutes.

In order to sustain their high, people who use cocaine often use the drug in a binge pattern—taking the drug repeatedly within a relatively short period of time, at increasingly higher doses. This practice can easily lead to addiction, a chronic relapsing disease caused by changes in the brain and characterized by uncontrollable drug-seeking no matter the consequences.

### How Does Cocaine Affect the Brain?

Cocaine is a strong central nervous system stimulant that increases levels of the neurotransmitter dopamine in brain circuits regulating pleasure and movement.

Normally, dopamine is released by neurons in these circuits in response to potential rewards (like the smell of good food) and then recycled back into the cell that

released it, thus shutting off the signal between neurons. Cocaine prevents the dopamine from being recycled, causing excessive amounts to build up in the synapse, or junction between neurons. This amplifies the dopamine signal and ultimately disrupts normal brain communication. It is this flood of dopamine that causes cocaine's characteristic high.

With repeated use, cocaine can cause long-term changes in the brain's reward system as well as other brain systems, which may lead to addiction. With repeated use, tolerance to cocaine also often develops; many cocaine abusers report that they seek but fail to achieve as much pleasure as they did from their first exposure. Some users will increase their dose in an attempt to intensify and prolong their high, but this can also increase the risk of adverse psychological or physiological effects.

### **What Are the Other Health Effects of Cocaine?**

Cocaine affects the body in a variety of ways. It constricts blood vessels, dilates pupils, and increases body temperature, heart rate, and blood pressure. It can also cause headaches and gastrointestinal complications such as abdominal pain and nausea. Because cocaine tends to decrease appetite, chronic users can become malnourished as well.

Most seriously, people who use cocaine can suffer heart attacks or strokes, which may cause sudden death. Cocaine-related deaths are often a result of the heart stopping (cardiac arrest) followed by an arrest of breathing.

People who use cocaine also put themselves at risk for contracting HIV, even if they do not share needles or other drug paraphernalia. This is because cocaine intoxication impairs judgment and can lead to risky sexual behavior.

Some effects of cocaine depend on the method of taking it. Regular snorting of cocaine, for example, can lead to loss of the sense of smell, nosebleeds, problems with swallowing, hoarseness, and a chronically runny nose. Ingesting cocaine by the mouth can cause severe bowel gangrene as a result of reduced blood flow. Injecting cocaine can bring about severe allergic reactions and increased risk for contracting HIV, hepatitis C, and other blood-borne diseases.

Binge-patterned cocaine use may lead to irritability, restlessness, and anxiety. Cocaine abusers can also experience severe paranoia—a temporary state of full-blown paranoid psychosis—in which they lose touch with reality and experience auditory hallucinations.

Cocaine is more dangerous when combined with other drugs or alcohol (poly-drug use). For example, the combination of cocaine and heroin (known as a "speedball") carries a particularly high risk of fatal overdose.

### **Learn More**

For more information on cocaine, visit: [www.drugabuse.gov/publications/research-reports/cocaine/letter-director](http://www.drugabuse.gov/publications/research-reports/cocaine/letter-director)