NIH National Institute on Drug Abuse
DrugFacts
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Cocaine

What is cocaine?

Cocaine is a powerfully addictive stimulant drug made from the leaves of the coca plant native to South America. Although health care providers can use it for valid medical purposes, such as local anesthesia for some surgeries, cocaine is an illegal drug. As a street drug, cocaine looks like a fine, white, crystal powder. Street dealers often mix it with things like cornstarch, talcum powder, or flour to increase profits. They may also mix it with other drugs such as the stimulant amphetamine.


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Popular nicknames for cocaine include:

- Blow
- Coke
- Crack
- Rock
- Snow

How do people use cocaine?

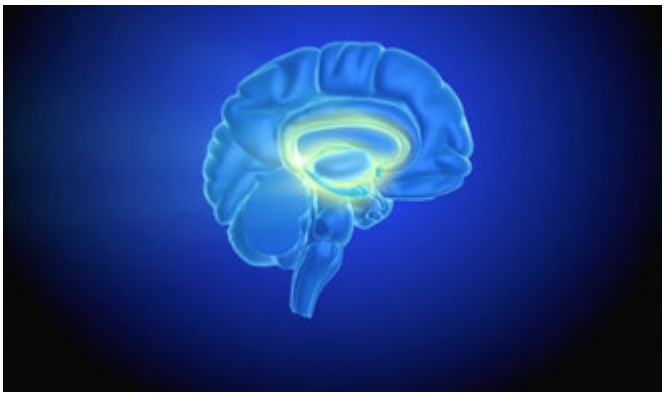
People snort cocaine powder through the nose, or they rub it into their gums. Others dissolve the powder in water and inject it into the bloodstream. Some people inject a combination of cocaine and heroin, called a Speedball.

Another popular method of use is to smoke cocaine that has been processed to make a rock crystal (also called "freebase cocaine"). The crystal is heated to produce vapors that are inhaled into the lungs. This form of cocaine is called Crack, which refers to the crackling sound of the rock as it's heated.

People who use cocaine often take it in binges—taking the drug repeatedly within a short time, at increasingly higher doses—to maintain their high.

How does cocaine affect the brain?

Cocaine increases levels of the natural chemical messenger *dopamine* in brain circuits controlling pleasure and movement.



The brain's reward circuit, which controls feelings of pleasure
Image by NIDA

Normally, the brain releases dopamine in these circuits in response to potential rewards, like the smell of good food. It then recycles back into the cell that released it, shutting off the signal between nerve cells. Cocaine prevents dopamine from recycling, causing excessive amounts to build up between nerve cells. This flood of dopamine ultimately disrupts normal brain communication and causes cocaine's high.

Short-Term Effects

Short-term health effects of cocaine include:

- extreme happiness and energy
- mental alertness
- hypersensitivity to sight, sound, and touch
- irritability
- *paranoia*—extreme and unreasonable distrust of others

Some people find that cocaine helps them perform simple physical and mental tasks more quickly, although others experience the opposite effect. Large amounts of cocaine can lead to bizarre, unpredictable, and violent behavior.

Cocaine's effects appear almost immediately and disappear within a few minutes to an hour. How long the effects last and how intense they are depend on the method of use. Injecting or smoking cocaine produces 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.

What are other health effects of cocaine use?

Other health effects of cocaine use include:

- constricted blood vessels
- dilated pupils
- nausea
- raised body temperature and blood pressure
- faster heartbeat
- tremors and muscle twitches
- restlessness

Long-Term Effects

Some long-term health effects of cocaine depend on the method of use and include the following:

- *snorting:* loss of sense of smell, nosebleeds, frequent runny nose, and problems with swallowing.
- *consuming by mouth:* severe bowel decay from reduced blood flow.
- *needle injection:* higher risk for contracting HIV, hepatitis C, and other bloodborne diseases. However, even people involved with non-needle cocaine use place themselves at a risk for HIV because cocaine impairs judgment, which can lead to risky sexual behavior with infected partners (see "Cocaine, HIV, and Hepatitis").

Cocaine, HIV, and Hepatitis

Studies have shown that cocaine use speeds up HIV infection. According to research, cocaine impairs immune cell function and promotes reproduction of the HIV virus. Research also suggests that people who are infected with HIV and use cocaine and are infected with HIV may be at also increased their risk for co-infection with contracting hepatitis C, a virus that affects the liver, even if they do not inject drugs.

Read more about the connection between cocaine and these diseases in NIDA's *Cocaine Research Report:* www.drugabuse.gov/publications/research-reports/cocaine.

Other long-term effects of cocaine use include being malnourished, because cocaine decreases appetite, and movement disorders, including Parkinson's disease, which may occur after many years of use. In addition, people report irritability and restlessness resulting from cocaine binges, and some also experience severe paranoia, in which they lose touch with reality and have *auditory hallucinations*—hearing noises that aren't real.

Can a person overdose on cocaine?

Yes, a person can overdose on cocaine. An overdose occurs when the person uses too much of a drug and has a toxic reaction that results in serious, harmful symptoms or death. An overdose can be intentional or unintentional.

Death from overdose can occur on the first use of cocaine or unexpectedly thereafter. Many people who use cocaine also drink alcohol at the same time, which is particularly risky and can lead to overdose. Others mix cocaine with heroin, another dangerous—and deadly—combination.

Some of the most frequent and severe health consequences leading to overdose involve the heart and blood vessels, including irregular heart rhythm and heart attacks, and the nerves, including seizures and strokes.

How can a cocaine overdose be treated?

Because cocaine overdose often leads to a heart attack, stroke, or seizure, first responders and emergency room doctors try to treat the overdose by treating these conditions, with the intent of:

- restoring blood flow to the heart (heart attack)
- restoring oxygen-rich blood supply to the affected part of the brain (stroke)
- stopping the seizure

How does cocaine use lead to addiction?

As with other drugs, repeated use of cocaine can cause long-term changes in the brain's reward circuit and other brain systems, which may lead to addiction. The reward circuit eventually adapts to the excess dopamine brought on by the drug. As a result, people take stronger and more frequent doses to achieve the same high and feel relief from initial withdrawal. Withdrawal symptoms include:

- depression
- fatigue
- increased appetite
- unpleasant dreams and insomnia
- slowed thinking

How can people get treatment for cocaine addiction?

Behavioral therapy may be used to treat cocaine addiction. Examples include:

- cognitive-behavioral therapy
- contingency management, or motivational incentives—providing rewards to patients who remain substance free
- therapeutic communities—drug-free residences in which people in recovery from substance use disorders help each other to understand and change their behaviors

While no government-approved medicines are currently available to treat cocaine addiction, researchers are testing some treatments, including:

- disulfiram (used to treat alcoholism)
- modanifil (used to treat *narcolepsy*—a disorder characterized by uncontrollable episodes of deep sleep)
- lorcaserin (used to treat obesity)

Points to Remember

- Cocaine is a powerfully addictive stimulant drug made from the leaves of the coca plant native to South America.
- Street dealers often mix it with things like cornstarch, talcum powder, or flour to increase profits. They may also mix it with other drugs such as the stimulant amphetamine.
- People snort cocaine powder through the nose, or rub it into their gums. Others dissolve it in water and inject it or inject a combination of cocaine and heroin, called a Speedball. Another popular method of use is to smoke Crack cocaine.
- Cocaine increases levels of the natural chemical messenger *dopamine* in brain circuits controlling pleasure and movement. This flood of dopamine ultimately disrupts normal brain communication and causes cocaine's high.
- Short-term effects include:
    - constricted blood vessels
    - nausea
    - faster heartbeat
    - extreme happiness and energy
    - irritability
    - paranoia
- Long-term effects include:
    - nosebleeds
    - severe bowel decay
    - higher risk of contracting HIV, hepatitis C, and other bloodborne diseases
    - malnourishment
    - restlessness
    - severe paranoia with auditory hallucinations
- A person can overdose on cocaine, which can lead to death.
- Behavioral therapy may be used to treat cocaine addiction.
- While no government-approved medicines are currently available to treat cocaine addiction, researchers are testing some treatments.

Learn More

For more information about cocaine, visit:
www.drugabuse.gov/drugs-abuse/cocaine

www.drugabuse.gov/drugs-abuse/commonly-abused-drugs-charts#cocaine

For more information about drug use and HIV/AIDS, visit:
www.drugabuse.gov/publications/drugfacts/hivaids-drug-abuse-intertwined-epidemics

Updated June 2016