



National Institute
on Drug Abuse

DrugFacts

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Heroin

What is heroin?

Heroin is an opioid drug made from morphine, a natural substance taken from the seed pod of the Asian opium poppy plant. Heroin can be a white or brown powder, or a black sticky substance known as black tar heroin. Other common names for heroin include *dope*, *horse*, *junk*, and *smack*.



Photo by DEA/[1.usa.gov/11TaKtdj](https://www.fda.gov/11TaKtdj)

How do people use heroin?

People inject, snort, or smoke heroin. Some people mix heroin with crack cocaine, called a *speedball*.

How does heroin affect the brain?

Heroin enters the brain rapidly and changes back into morphine. It binds to opioid receptors on cells located in many areas of the brain, especially those involved in feelings of pain and pleasure. Opioid receptors are also located in the brain stem, which controls important processes, such as blood pressure, arousal, and breathing.

Prescription Opioids and Heroin

Prescription opioid pain medicines such as OxyContin® and Vicodin® have effects similar to heroin. Research suggests that misuse of these drugs may open the door to heroin use. Nearly 80 percent of Americans using heroin (including those in treatment) reported misusing prescription opioids prior to using heroin.^{1,2}

While prescription opioid misuse is a risk factor for starting heroin use, only a small fraction of people who misuse pain relievers switch to heroin. According to a national survey, less than 4 percent of people who had misused prescription pain medicines started using heroin within 5 years.¹ This suggests that prescription opioid misuse is just one factor leading to heroin use. Read more about this intertwined problem in our [Prescription Opioids and Heroin Research Report](#).

Short-Term Effects

People who use heroin report feeling a "rush" (euphoria) accompanied by effects that include:

- dry mouth
- flushing of the skin
- heavy feelings in the hands and feet
- clouded mental functioning
- going "on the nod," a back-and-forth state of being conscious and semi-conscious

What are the other health effects of heroin?

People who use heroin over the long term may develop:

- collapsed veins
- infection of the heart lining and valves
- abscesses (swollen tissue filled with pus)
- constipation and stomach cramping
- liver or kidney disease
- lung complications, including various types of pneumonia

In addition to the effects of the drug itself, street heroin often contains dangerous chemicals that can clog blood vessels leading to the lungs, liver, kidneys, or brain, causing permanent damage. Also, sharing drug injection equipment and having impaired judgment from drug use can increase the risk of contracting infectious diseases such as HIV and hepatitis (see "Injection Drug Use, HIV, and Hepatitis").

Can a person overdose on heroin?

Yes, a person can overdose on heroin. 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.

When people overdose on heroin, their breathing often slows or stops. This can decrease the amount of oxygen that reaches the brain, a condition called hypoxia. Hypoxia can have short- and long-term mental effects and effects on the nervous system, including coma and permanent brain damage.

Injection Drug Use, HIV, and Hepatitis

People who inject drugs such as heroin are at high risk of contracting the HIV and hepatitis C (HCV) virus. These diseases are transmitted through contact with blood or other bodily fluids, which can occur when sharing needles or other injection drug use equipment. HCV is the most common bloodborne infection in the United States. HIV (and less often HCV) can also be contracted during unprotected sex, which drug use makes more likely.

Read more about the connection between heroin and these diseases in our [Heroin Research Report](#).

How can a heroin overdose be treated?

Naloxone is a medicine that can treat an opioid overdose when given right away. It works by rapidly binding to opioid receptors and blocking the effects of heroin and other opioid drugs. Naloxone is available as an injectable (needle) solution, a hand-held auto-injector (EVZIO®), and a nasal spray (NARCAN® Nasal Spray). Friends, family, and others in the community can use the auto-injector and nasal spray versions of naloxone to save someone who is overdosing. Some states require a physician to prescribe naloxone. In other states, pharmacies may provide naloxone in an outpatient setting without a prescription.

Read more about naloxone at our [Naloxone webpage](#).

Can heroin lead to addiction, a form of substance use disorder?

Yes, heroin is highly addictive. People who regularly use heroin often develop a tolerance, which means that they need higher and/or more frequent doses of the drug to get the desired effects. A substance use disorder (SUD) develops when continued use of the drug causes issues, such as health problems and failure to meet responsibilities at work, school, or home. An SUD can range from mild to severe, the most severe form being addiction.

Those who have become addicted to heroin and stop using the drug abruptly may have severe withdrawal. Withdrawal symptoms—which can begin as early as a few hours after the drug was last taken—include:

- muscle and bone pain
- sleep problems
- diarrhea and vomiting
- cold flashes with goose bumps ("cold turkey")
- uncontrollable leg movements ("kicking the habit")
- severe heroin cravings



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Researchers are studying the long-term effects of opioid addiction on the brain. Studies have shown some loss of the brain's white matter associated with heroin addiction, which may affect decision-making, behavior control, and responses to stressful situations.³⁻⁵

How can people get treatment for heroin addiction?

A range of treatments including medicines and behavioral therapies are effective in helping people stop heroin use.

Medicines include buprenorphine and methadone. They work by binding to the same opioid receptors in the brain as heroin but more weakly, reducing cravings and withdrawal symptoms. Another treatment is naltrexone, which blocks opioid receptors and prevents opioid drugs from having an effect.

Behavioral therapies for heroin addiction include contingency management and cognitive-behavioral therapy. Contingency management (motivational incentives) provides vouchers or small cash rewards for positive behaviors such as staying drug-free.

Cognitive-behavioral therapy helps modify the patient's drug-use expectations and behaviors, and effectively manage triggers and stress. These behavioral treatment approaches have proven effective, especially when used along with medicines. Read more about drug addiction treatment in our [Treatment Approaches for Drug Addiction DrugFacts](#).

Points to Remember

- Heroin is an opioid drug made from morphine, a natural substance taken from the seed pod of the Asian opium poppy plant.
- Heroin can be a white or brown powder, or a black sticky substance known as black tar heroin.
- People inject, snort, or smoke heroin. Some people mix heroin with crack cocaine, called a *speedball*.
- Heroin enters the brain rapidly and changes back into morphine. It binds to opioid receptors on cells located in many areas of the brain, especially those involved in feelings of pain and pleasure.
- People who use heroin report feeling euphoria accompanied by effects that include dry mouth, heavy feelings in the hands and feet, and clouded mental functioning.
- Long-term effects may include collapsed veins, infection of the heart lining and valves, abscesses, and lung complications.
- Research suggests that misuse of prescription opioid pain medicine is a risk factor for starting heroin use.
- A person can overdose on heroin. Naloxone is a medicine that can treat a heroin overdose when given right away.
- Heroin can lead to addiction, a form of substance use disorder. Withdrawal symptoms include muscle and bone pain, sleep problems, diarrhea and vomiting, and severe heroin cravings.
- A range of treatments including medicines and behavioral therapies are effective in helping people stop heroin use.

Learn More

For more information about heroin, visit our:

- [Heroin webpage \(drugabuse.gov/drugs-abuse/heroin\)](http://drugabuse.gov/drugs-abuse/heroin)
- [Commonly Abused Drugs chart](#)

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