

DRUG ADDICTION

You may be curious about what causes drug addiction. Drug addiction is a disease of the body and brain. Also called substance use disorder, drug addiction triggers uncontrollable behaviors and renders a person unable to control their use of medication, alcohol, cigarettes, or drugs—whether they are legal or not. Addictive substances such as nicotine, alcohol, opioid medications, and marijuana are considered drugs just as much as heroin, cocaine, or methamphetamine. Once you are addicted to a substance, you will feel compelled to use it, regardless of the damage that use does to your body, your brain, and your life.

Drug addiction isn't always an instantly obvious problem; it often starts small. In fact, drug addiction sometimes begins with simple recreational use, or a "one-time" experiment, trying something new, or even a prescription for a much-needed painkiller after an accident or surgery. The trouble is that for some people—the ones who become addicted—the use of the addictive substance becomes frequent and a necessity.

How fast one can become addicted, and the overall risk of addiction, varies from person to person, and by drug. The method of administration also affects how addictive a drug is; injectable and smoked drugs, for example, affect the brain right away, and are therefore more addictive.

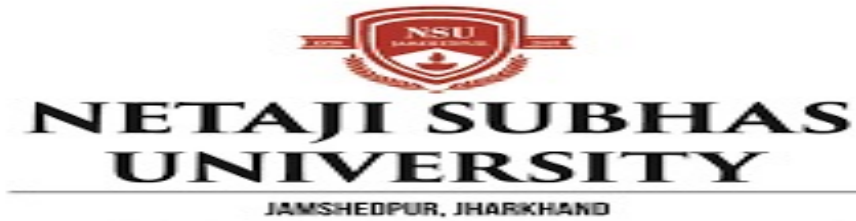
Over time, most users need more and more of the same drug simply to achieve the same effects they experienced when consuming a lower dosage less frequently. Eventually, the user must have the drug simply to function and avoid feeling sick or terrible; this is one of the hallmarks of addiction. Stopping use of the drug often causes intense cravings, which is another symptom of withdrawal and addiction.

Almost everyone needs help and support to beat addiction.

Causes of Drug Addiction

Like many other mental and physical health problems, multiple factors can and usually do contribute to drug addiction. The most frequently observed contributing causes of drug addiction include:

- **Genetics.** How your body and brain react to a particular drug is in part determined by your inherited traits, those encoded by your genes. Those traits can speed up or slow down the way the disease of addiction develops.
- **Environment.** Environmental factors, such as your access to healthcare, exposure to a peer group that tolerates or encourages drug abuse, your educational opportunities, the presence of drugs in your home, your beliefs and attitudes, and your family's use of



- drugs are factors in the first use of drugs for most people, and whether that use escalates into addiction.

Genetics and Drug Addiction

Genetics determine about 50 percent of your [drug](#) and [alcohol](#) addiction risk, according to the National Institutes of Health (NIH).

A person's disposition to engage in a specific behavior is influenced by three factors:

1. **Capability:** the psychological or physical ability a person has to engage in the behavior.
2. **Motivation:** both the automatic and reflective mental processes that guide behavior; this includes both the euphoric feelings you experience right after using the drug, and your more conscious, chosen attitudes about drug use.
3. **Opportunity:** physical and social factors in your environment, including age of first use, that either constrain or promote behavior.

Environment and Drug Addiction

Environment also plays an important part in developing an addiction, because environment influences behavior. The environmental factors which may contribute to drug addiction include:

1. Absence of social support
2. Use of drugs among peers
3. Socioeconomic status
4. Stress and ability to cope with it
5. Parental and familial involvement
6. History of abuse or neglect
7. History of compulsive behavior

It isn't easy to change environmental factors such as socioeconomic status, but there are ways to mitigate against unfavorable environmental factors and work to fight drug addiction or prevent it from happening in the first place. One tactic is to delay onset of drug use entirely. Another is to nurture environmental motivators for positive behavior, such as educational attainment and job training. Vigilant friends and family can also model positive behaviors and engage with at-risk users in sober activities.

All of these actions can help counter environmental factors that might contribute to causing drug addiction.

Drug Addiction and Changes in the Brain

Drug addiction often causes actual physical changes in the brain. Specifically, addiction alters the way the brain experiences pleasure, modifying certain nerve cells (neurons). Neurons communicate with each other and create moods and other sensations using chemicals called neurotransmitters, and drug addiction can change the way neurotransmitters work in the brain.

Historically, drug addiction and those suffering with it were maligned as morally weak people who made bad choices. This pure behavioral model, however, fails to account for the biological changes that addiction triggers in the body and brain. Furthermore, it overlooks the issue of comorbidity; many people who are addicted to drugs also suffer from mental health problems and use drugs to self-medicate for those problems.

Although the idea of drug addiction being a failure of will and sign of bad character is waning in most progressive areas of society, the idea does persist in many circles.

The Brain and Drug Addiction

The brain is the human body's most complex organ. [Substance abuse](#) and drug addiction affect the human brain in three central regions:

1. The brain stem controls basic motor functions, such as heart rate, sleeping, and breathing.
2. The limbic system controls the way we experience emotional rewards and doles out feelings of motivation and pleasure that enable us to undertake the day-to-day actions we must do to survive; in other words, we get pleasure from things like eating and sexual activity to ensure we will survive.
3. The cerebral cortex controls higher-level executive functions, such as planning, decision-making, and the processing of sensory information.

The limbic system functions with the help of neurotransmitters, and these play an important role in drug addiction.

Neurotransmitters and Drug Addiction

Neurons communicate with each other by sending messages along axons and dendrites via electrical impulses. The axons turn these impulses into chemical signals, sending

neurotransmitters across synapses. The receiving dendrite then converts neurotransmitters back into the right electrical signals, so we understand the message; for example, that bite of

pie was delicious, I'll take another one. These exchanges happen countless times in the brain, and they control mood, behavior, movement, and cognition.

Drugs are built to interfere with those messages, causing the release of too many neurotransmitters for the wrong behavior—taking drugs. This causes a huge spike in pleasure for a destructive activity that eclipses normally pleasant activities needed for survival. Drug use also prevents normal reuptake of these brain chemicals, throwing off the entire process and your natural balance, altering your mood. Soon, all that matters is to produce that flood of neurotransmitters again—and due to the addiction, there's just one way to do that: drug use.

Dopamine

Dopamine is the neurotransmitter that is responsible for motivation and reward, and therefore it is a crucial neurotransmitter related to addiction. Drug abuse causes the release of surges of dopamine, and these in turn produce feelings of euphoria, followed by cravings, major reinforcement of the same behaviors, and compulsions to repeat whatever behavior produced the surge.

The brain reacts to floods of dopamine by reducing the number of receptors for the neurotransmitter, which means your brain has reduced your ability to feel pleasure. Obviously, this leads to even more desperate drug abuse.

Serotonin

Serotonin is the neurotransmitter connected to your feelings of well-being, sensory experiences, and your ability to sleep. It can also play a central part in drug addiction. Lower levels of serotonin have been connected to aggression, anxiety, depression, intoxication, poor impulse control, and suicidal behavior.

Why Do Only Some People Become Addicted to Drugs?

Some people are more vulnerable to drug addiction than others, just as some people are more vulnerable to cancer or diabetes than others. There is no single factor that controls whether you will become addicted. Overall, though, the more risk factors you have, the greater your chance of drug addiction is; on the other hand, the more protective factors you have the less risk of addiction you face.

Risk factors and protective factors both can be biological or environmental.

Risk factors

People of any sex, age, race, or economic status can experience drug addiction. The ability to become addicted to substances is something we all share as humans. However, there are risk factors that increase your chances of addiction:

1. **Family history.** Drug addiction runs through families, perhaps in part for genetic reasons, and in part due to environmental influence. If you have a blood relative who is addicted, especially a parent or full sibling, you have a higher risk for drug addiction.
2. **Mental health problems.** If you suffer from a mental health problem, whether or not it has been diagnosed, and whether or not you take medication for it, you are at higher risk for addiction. Mental health problems include anxiety, attention-deficit/hyperactivity disorder (ADHD), depression, bipolar personality disorder, and post-traumatic stress disorder (PTSD), to name a few.
3. **Adverse childhood experiences (ACE).** Adverse childhood experiences such as emotional, physical, or sexual abuse increase your risk for drug addiction.
4. **Social pressure.** Social pressure from peers and friends is a serious risk factor, especially for young people in danger of starting to abuse drugs.
5. **Lack of family support or involvement.** If you lack family support or your family is not very involved in your life, you have a higher risk for drug addiction. In children this is especially true and extends to a lack of supervision.
6. **Early use of drugs.** People who begin to use and abuse drugs earlier in life are at a higher risk for addiction.
7. **Use of drugs that are highly addictive.** Drugs such as cocaine, stimulants, or opioids, can cause addiction more readily than other substances. Injecting or smoking drugs can also increase your risk of addiction.