CHAPTER

6 Stimulant use in schizophrenia

Explore Chapter 6

This chapter explains how psychostimulants affect the brain and body, and how to recognize the signs of stimulant use disorder, intoxication, and withdrawal among people with schizophrenia. It also discusses the challenges and possibilities in managing these dual disorders effectively.

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What is behind psychostimulants' stimulating effects?

6.2
Spotting stimulant use disorder, stimulant intoxication, stimulant withdrawal: how to identify the red flags

6.3
How does stimulant use disorder impact health?

Fast Facts

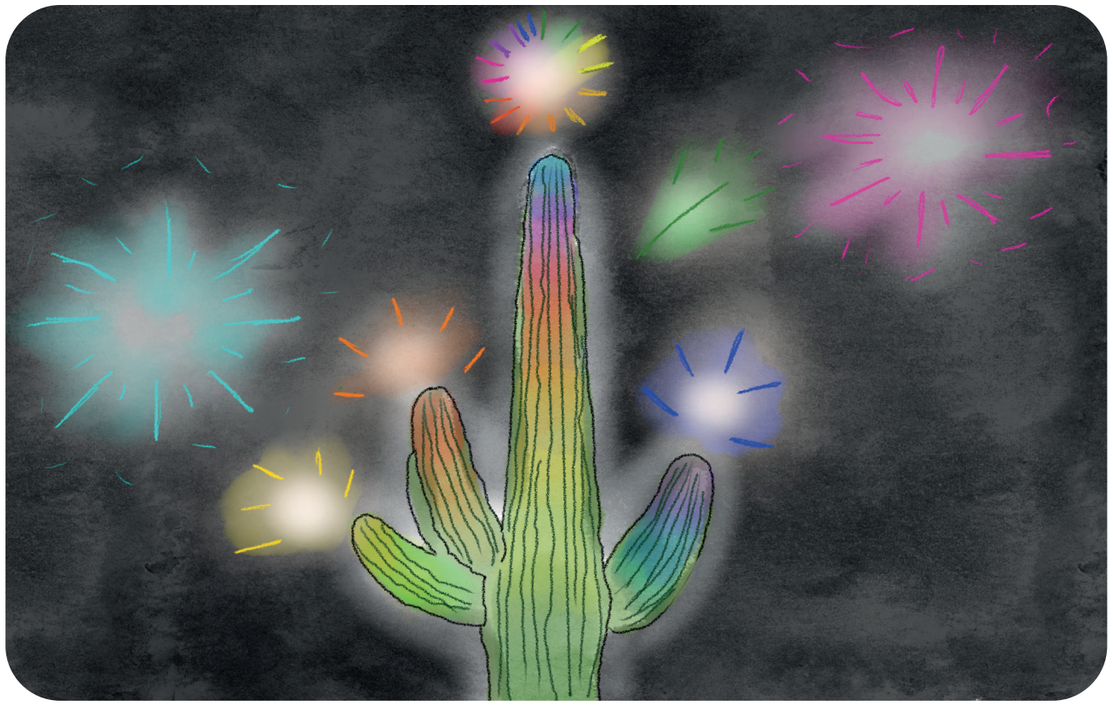
Stimulants supercharge the brain. Psychostimulants, like methamphetamine and cocaine, flood the brain with feel-good chemicals, boosting energy, pleasure, and alertness. But over time, they take over the brain's reward system, leading to addiction, risky behavior, and lasting mental health challenges.

Stimulants and Schizophrenia. For people with schizophrenia, stimulants worsen symptoms and blur the line between drug-induced psychosis and the illness itself. Treating both together is key.

Beyond addiction. From psychosis to heart disease and even prenatal risks, stimulant use affects not just the individual but families and entire communities.

Reducing drug urges. Antipsychotic medications may ease drug cravings in people with both schizophrenia and substance use disorders, offering a potential path to better treatment.

6.1 What is behind psychostimulants' stimulating effects?



Psychostimulants are drugs that activate the central nervous system, making you feel more alert, energetic, and even excited.

They work by **increasing the levels of key brain chemicals** like dopamine, norepinephrine, serotonin. This rise in activity **stimulates the brain's reward and arousal pathways**, enhancing feelings of pleasure and wakefulness.

Drugs like **cocaine and methamphetamine** (MAMPH) specifically target **dopamine and norepinephrine transporters**. They cause a rapid buildup of these chemicals in the brain, intensifying their effects and leading to a powerful, short-term high.

Schizophrenia and Stimulant Use: challenges and consequences

Recent studies on the overlap between schizophrenia and stimulant use disorders **reveal significant diagnostic and treatment challenges**.

Stimulants like **methamphetamine and amphetamines** can **worsen psychotic symptoms**, making it harder to distinguish between schizophrenia itself and drug-induced psychosis.

For individuals with schizophrenia, stimulant use **increases the risk of hospitalization and premature death**. This highlights the need for **specialized treatment approaches that address both disorders simultaneously**.

How do psychostimulants create addiction?

Humans have used drugs for various reasons throughout history, including **medicine**, **social interaction**, and **relaxation**.

Our brains have specific areas that respond to natural rewards like food, social connections, and sex - these form the **brain's reward system**. Interestingly, drugs activate these same regions, **triggering intense feelings of pleasure, such as euphoria and improved focus**.

Over time, the brain **learns to associate** drugs with pleasure, reinforcing repeated use.

For people with schizophrenia or stimulant addiction, the craving for these substances can persist even when they no longer bring pleasure, leading to compulsive drug-seeking behavior despite negative consequences.

What happens to the brain on amphetamines?

Amphetamines **interfere with** the brain's normal chemical balance by **blocking the reuptake** of dopamine and norepinephrine, which causes their **levels to rise in the brain**.

Amphetamines also affect the release of these chemicals **within brain cells**, further increasing their concentration.

This buildup creates a **spike of pleasure and euphoria**, which can lead to a cycle of **reward and addiction**.

However, **prolonged use can alter brain structures involved in decision-making and impulse control, particularly the prefrontal cortex**.

Research suggests that overstimulation of dopamine pathways may **increase glutamate levels**, disrupting brain function and contributing to psychotic symptoms, similar to those seen in schizophrenia.

> **"In essence, amphetamines not only trigger pleasurable sensations but can also disrupt important brain functions, potentially leading to serious mental health issues over time."**

The hidden dangers of amphetamines

Amphetamines, including drugs like **ecstasy** (3,4-Methylenedioxymethamphetamine (MDMA)) and **methamphetamine**, are known to **boost energy, focus, and alertness** while reducing the feeling of fatigue.

However, they come with **side effects** such as hyperactivity, anxiety, aggression, and sleep problems.

These drugs can also cause rapid heartbeats, high blood pressure, and other **heart-related issues**.

One of the **most severe** risks of amphetamine use is the potential for **psychotic disorders**.

The consequences of addiction affect not just the individual, but also **their family, community, and the healthcare system**.

How widespread is the global use of psychostimulants?

Psychostimulants like cocaine, amphetamines, and newer substances are widely used around the world.

Psychostimulants **like cocaine, amphetamines, and newer stimulants** are among the most widely used drugs worldwide. In 2019, the **United Nations** estimated **18 million people used cocaine globally**. **In the Americas alone, authorities seized over 1,200 tons of cocaine, methamphetamines, and amphetamines**, reflecting the scale of the issue.

While usage varies across regions, stimulant abuse remains **a persistent global challenge**.

Who is most affected by stimulant use disorder?

Stimulant use disorder (StUD), involving drugs like **cocaine and amphetamines**, affects a significant portion of the population.

Data from the U.S. show that approximately **0.2% of individuals aged 12 and older struggle with stimulant addiction**, with slightly higher rates among **teenage girls aged 12-17**. Among adults, young people aged **18-29** are the most affected.

Intravenous stimulant use is **more common among men** than women.

Non-prescribed stimulant use is widespread among high school and college students, with 5-35% reporting use in the past year.

Risk factors for developing stimulant use disorder

Risk factors for developing stimulant use disorder include both **personal and environmental** influences.

People with mental health conditions (i.e. bipolar disorder, schizophrenia), or other substance use disorders are at **higher risk** of developing stimulant addiction or relapsing.

Environmental factors play a big role, especially for teens. Those exposed to cocaine before birth or growing up in households where parents use drugs are more likely to develop issues with stimulants.

Exposure to **community violence**, living in **unstable homes**, having **mental health challenges**, or spending **time with drug users and dealers also** increases the risk.

How do stimulants lead to addiction?

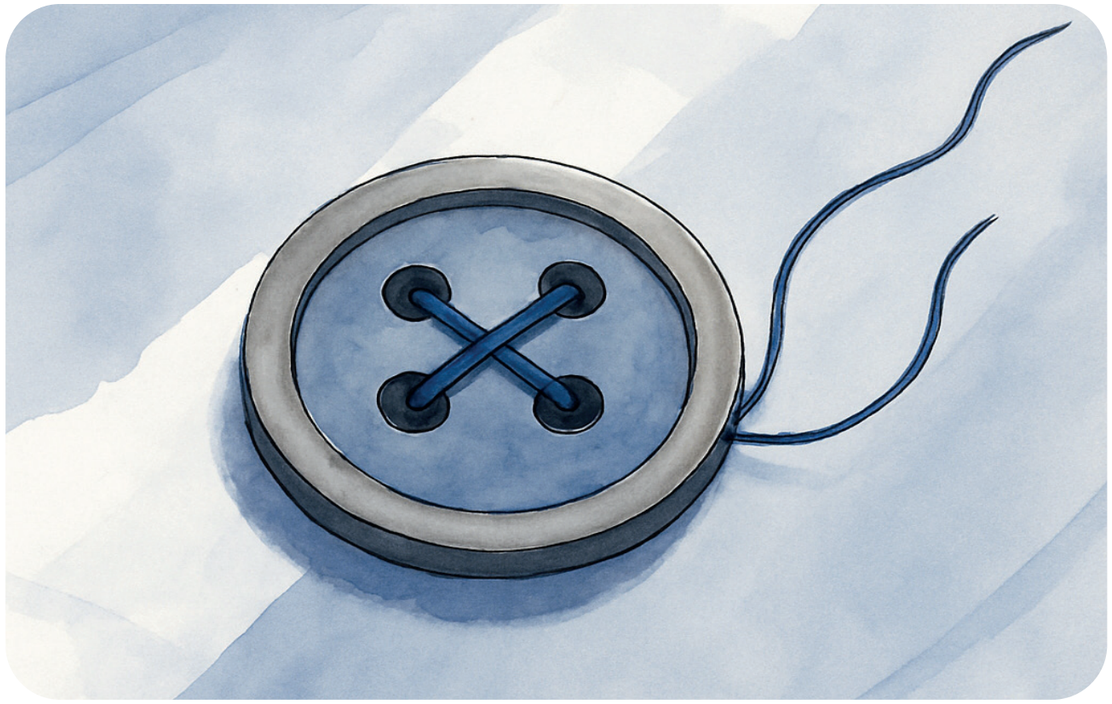
Substance use disorders affect people of all age groups and social classes but are **most common among those between the ages of 12 and 25**.

Many individuals **start using stimulant**s, like methamphetamine or prescription medications, in **their early twenties**, often to **manage weight** or **boost performance in school, work**, or **sports**.

Regular use can quickly lead to addiction, especially with smoking or injecting stimulants, which can result in **severe addiction within weeks or months**.

Patterns of use can range from **occasional bingeing to daily use**, with tolerance often reducing the pleasurable effects over time.

6.2 Spotting stimulant use disorder, stimulant intoxication, stimulant withdrawal: how to identify the red flags



Stimulant Use Disorder (StUD) refers to a pattern of using stimulants like amphetamines or cocaine that leads to significant problems in daily life.

How to recognize stimulant use disorder?

Stimulant Use Disorder (StUD) refers to a pattern of using stimulants like amphetamines or cocaine that leads to significant problems in daily life.

To be diagnosed, **AT LEAST TWO** of the following signs must occur within a year:

TAKING MORE of the stimulant or **USING IT LONGER** than was intended.

Wanting to cut down or stop using but **BEING UNABLE** to do so.

Spending a **LOT OF TIME** getting, using, or recovering from the stimulant.

Strong **CRAVINGS OR URGES** to use the stimulant.

Ongoing use despite it causing **PROBLEMS AT WORK, SCHOOL, OR HOME.**

Continuing use even when it causes **RELATIONSHIP OR SOCIAL ISSUES**.

GIVING UP IMPORTANT ACTIVITIES because of stimulant use.

Using the stimulant in **DANGEROUS SITUATIONS.**

Using despite knowing it's **WORSENING A PHYSICAL OR MENTAL HEALTH** problem.

DEVELOPING TOLERANCE, needing more to feel the effects or feeling less effect with the same amount.

Experiencing **WITHDRAWAL** symptoms or using the stimulant to avoid them.

Health risks of stimulant use disorder

Stimulant use disorder can lead to a variety of serious health issues depending on how the drugs are consumed.

- People who **snort** stimulants may experience **chronic sinus problems**, **nosebleeds**, and even a **perforated nasal septum**.
- **Smoking** stimulants often cause respiratory issues such as **coughing**, **bronchitis**, and lung **infections**.
- Injecting drugs leads to visible track marks, usually on the arms, and greatly increases the risk of **HIV**, **hepatitis**, and other **infections**.
- Users often suffer from **weight loss**, **malnutrition**, **chest pain**, and, in severe cases, **heart attacks**, **strokes**, **seizures**, or **sudden death** due to respiratory or cardiac issues.

Stimulant intoxication: key signs and symptoms

Stimulant intoxication occurs with recent use of a stimulant like amphetamines, cocaine, or similar substances.

This can lead to **noticeable changes in behavior and mental state**, such as:

- Feeling overly happy or emotionally numb
- Being more sociable or overly alert
- Experiencing increased anxiety, tension, or anger
- Poor judgment and repetitive behaviors may also emerge during or soon after using these substances.

In addition to behavioral changes, **physical symptoms often appear**. These may include:

- A rapid or slowed heartbeat
- Enlarged pupils
- High or low blood pressure
- Sweating or feeling unusually cold
- Nausea or vomiting
- Unexplained weight loss
- Restlessness or slowed movements
- Muscle weakness, chest pain, or irregular heartbeats
- Confusion, seizures, or even loss of consciousness

If someone exhibits **two or more** of these signs after stimulant use, they may be experiencing stimulant intoxication, which can be serious and require medical attention.

Stimulant withdrawal: what to expect

When someone **stops or cuts back on using stimulants** like cocaine, amphetamines, or similar drugs after extended use, they may experience **stimulant withdrawal**.

This process can bring about **intense sadness or dissatisfaction**, along with **several physical and emotional changes**.

These may **start within a few hours to a few days** after stopping use.

Common symptoms include:

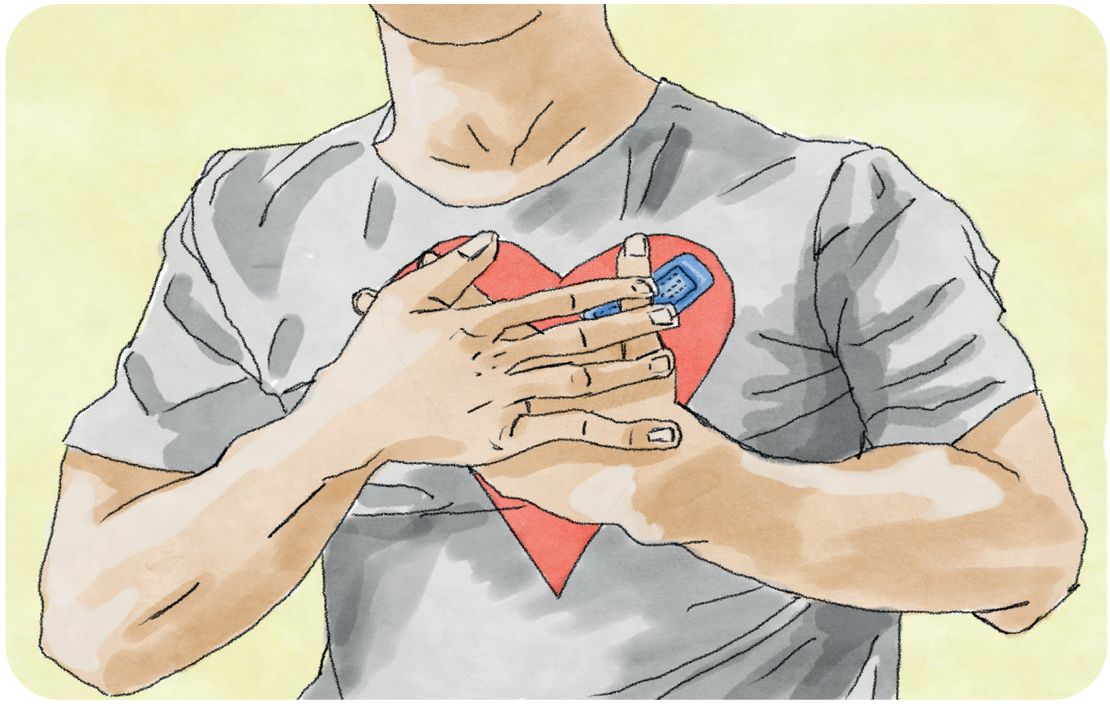
- Extreme tiredness
- Disturbing, vivid dreams
- Trouble sleeping or sleeping too much
- A noticeable increase in appetite
- Feeling unusually restless or sluggish

These withdrawal symptoms can cause **significant discomfort and disrupt daily life**, making it harder to work, socialize, or manage regular activities.

Importantly, these symptoms can't be explained by any other health or mental condition, nor by withdrawal from a different substance.

If someone is experiencing these signs after stopping stimulant use, it's essential to seek help and support.

6.3 How does stimulant use disorder impact health?



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How do stimulants impact heart health?

People with stimulant use disorders face a **higher risk** of developing **cardiovascular diseases**.

Stimulants like cocaine, can cause heart problems by **narrowing blood vessels** and **increasing the heart's workload**, leading to **reduced blood flow** (myocardial ischemia).

When alcohol is consumed alongside cocaine, the body produces a harmful substance called **cocaethylene**, which is **toxic to the heart** and **prolongs the effects of cocaine**.

Why do drug users face higher infection risks?

People who use stimulants are more vulnerable to infectious diseases like **hepatitis B and C, HIV, sexually transmitted infections (STIs), and tuberculosis**. This is largely due to **risky behaviors** such as sharing needles, unprotected sex, and poor hygiene.

Drug use can also increase **sexual activity**, sometimes leading individuals to trade sex for drugs, raising the likelihood of **multiple partners and unsafe practices**.

Unfortunately, many people with substance use disorders - especially those with mental health conditions - **rarely get tested or vaccinated** for these diseases.

Men with **severe mental illness** and **hepatitis C** are more likely to engage in needle sharing, while **women** in similar situations are more prone to **risky sexual behaviors**, such as unprotected sex in exchange for money or drugs. People with both **HIV and/or hepatitis C and substance use disorders** often experience additional mental health issues like anxiety, depression, mania, or even psychosis.

Stimulant use disorder and risks for mothers, babies, and long-term health

Pregnant women who use stimulants face serious risks, including **premature labor, placental complications, and low birth weight babies**. Cocaine use, in particular, **can harm both** the mother and the developing baby.

Beyond pregnancy-related risks, stimulant use can lead to **cognitive impairments and dental problems**, especially among methamphetamine users. A well-known example is **"meth mouth"** which causes extreme tooth decay and gum disease. Stimulant users are also at higher risk of **traumatic injuries**, often linked to **aggressive behavior**.

Many engage in **illegal activities, such as theft or prostitution, to sustain their drug habits**, increasing their likelihood of encountering violence and legal troubles.

Emergency room visits are common due to mental health crises, infections, and drug-related injuries.

Can stimulants cause schizophrenia?

Research shows that schizophrenia or other chronic psychotic disorders, which can develop after drug-induced psychosis, are **not exclusively caused by drug use**.

These substances may provoke psychosis in people who are **already at high risk**, rather than being the main cause.

Methamphetamine-induced psychosis vs. schizophrenia

Methamphetamine-induced psychosis (MIP) and schizophrenia **can look very similar**, which makes it hard to tell them apart.

Those experiencing methamphetamine-induced psychosis (MIP), usually have **less noticeable negative symptoms** (e.g. lack of motivation or social withdrawal).

While both conditions share similar symptoms, like hallucinations and delusions, this overlap suggests that there **may be both shared and distinct brain mechanisms** behind MIP and schizophrenia.

Can antipsychotics reduce drug cravings in dual schizophrenia?

Antipsychotic medications can help **manage drug cravings** in individuals with both schizophrenia and substance use disorders.

There are studies showing that people with schizophrenia who are in the **early stages of cocaine withdrawal** often **experience much stronger cravings for the drug** - sometimes twice as intense - compared to those without schizophrenia.

Research has shown promising results with **atypical and partial agonist antipsychotics** suggesting they may **help reduce cocaine, and cannabis cravings and usage** in people with schizophrenia.

Key takeaways for caregivers:

- **The use of stimulants boosts alertness and pleasure, but hijacks the brain's reward system.**
- **Over time, they increase the risk of addiction, psychosis, heart problems and risky behaviour.**
- **In people with schizophrenia, stimulants worsen symptoms and blur the lines between illness and drug effects.**
- **Antipsychotics may help reduce cocaine, and cannabis cravings and usage in people with schizophrenia.**

References:

1. Valeska Cid-Jofré, Bahamondes T, Agustina Zúñiga Correa, Ivalú Ahumada Arias, Reyes-Parada M, Renard GM. Psychostimulants and social behaviors. Frontiers in pharmacology [Internet]. 2024 Apr 25;15. Available from: https://pubmed.ncbi.nlm.nih.gov/38725665/
2. Ramasubbu C, Poonia S, Brady-Randle E, Schutz CG, Rafizadeh R. Psychostimulant Substitution Therapy for the Treatment of Stimulant Use Disorders in Patients with Schizophrenia or Schizoaffective Disorder: A Systematic Review. Journal of Dual Diagnosis [Internet]. 2025 Mar 14;21(2):167–81. Available from: https://pubmed.ncbi.nlm.nih.gov/40085427/
3. Dolan SB, Chen Z, Huang R, Gatch MB. "Ecstasy" to addiction: Mechanisms and reinforcing effects of three synthetic cathinone analogs of MDMA. Neuropharmacology [Internet]. 2018 May 1;133:171–80. Available from: https://pubmed.ncbi.nlm.nih.gov/29378213/
4. Stoneberg DM, Shukla RK, Magness MB. Global Methamphetamine Trends: An Evolving Problem. International Criminal Justice Review [Internet]. 2017 Oct 6;28(2):136–61. Available from: https://journals.sagepub.com/doi/10.1177/1057567717730104
5. DSM-V: American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders (5th edn). APA, 2013.
6. Ziedonis DM, Smelson D, Rosenthal RN, Batki SL, Green AI, Henry RJ, et al. Improving the Care of Individuals with Schizophrenia and Substance Use Disorders: Consensus Recommendations. Journal of Psychiatric Practice [Internet]. 2005 Sep;11(5):315–39. Available from: https://pubmed.ncbi.nlm.nih.gov/16184072/
7. Kendler KS, Ohlsson H, Sundquist J, Sundquist K. Prediction of Onset of Substance-Induced Psychotic Disorder and Its Progression to Schizophrenia in a Swedish National Sample. American Journal of Psychiatry [Internet]. 2019 Sep 1;176(9):711–9. Available from: https://pubmed.ncbi.nlm.nih.gov/31055966/
8. Cohen-Laroque J, Inès Grangier, Perez N, Kirschner M, Kaiser S, Sabé M. Positive and negative symptoms in methamphetamine-induced psychosis compared to schizophrenia: A systematic review and meta-analysis. Schizophrenia research [Internet]. 2024 May 1;267:182–90. Available from: https://pubmed.ncbi.nlm.nih.gov/38554698/
9. J Martinez-Raga, M Bajouco, D Kenzin, J Sahlsten, D De Berardis, G Tzeferakos, et al. Dual disorder: does expert clinical experience support the rationale for cariprazine use? PubMed [Internet]. 2024 Mar 1 [cited 2025 Jul 12];28(5):2095–106. Available from: https://pubmed.ncbi.nlm.nih.gov/38497891/

CHAPTER 6