

Neurodegenerative Adaptations Involved in Amphetamine Addiction

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Amphetamine addiction is a serious and complex health issue that affects individuals worldwide. Amphetamines are stimulant drugs that stimulate the central nervous system, increasing alertness, attention, and energy levels. While these drugs may have legitimate medical uses, such as treating attention deficit hyperactivity disorder (ADHD) and narcolepsy, they also carry a high potential for misuse and addiction [1].

The addictive nature of amphetamines lies in their ability to produce intense feelings of euphoria, increased confidence, and heightened energy. Over time, individuals may develop a tolerance, requiring higher doses to achieve the desired effects. This can lead to a vicious cycle of dependence, craving, and compulsive drug-seeking behaviour [2].

Amphetamine addiction can have profound negative consequences on various aspects of an individual's life, including physical health, mental well-being, relationships, and overall functioning. It can impact job performance, academic achievement, and personal responsibilities. Additionally, the misuse of amphetamines can lead to serious health risks, such as cardiovascular problems, psychosis, malnutrition, and overdose [3].

Recognizing the signs and symptoms of amphetamine addiction is crucial for early intervention and treatment. These may include increased drug tolerance, withdrawal symptoms when attempting to quit or cut back, inability to control or reduce drug use, neglecting personal responsibilities and relationships, engaging in risky behaviors to obtain drugs, and experiencing negative consequences as a result of drug use [4].

Treating amphetamine addiction requires a comprehensive approach that addresses both the physical and pre recovery [9].

Recovery from amphetamine addiction is possible with the right support, treatment, and commitment to change. It is crucial for individuals struggling with amphetamine addiction to seek professional help and access appropriate treatment services. Early intervention and a comprehensive approach to treatment can greatly improve the chances of successful recovery and long-term abstinence from amphetamines [10].

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Amphetamine addiction can manifest through a variety of

symptoms, which can be physical, behavioral, and psychological in nature. It's important to note that the presence of these symptoms alone does not definitively indicate addiction, but they can be indicators of a potential problem. Here are some common symptoms of amphetamine addiction

I a a Over time, individuals may require larger doses of amphetamines to achieve the desired effects. This tolerance can be a sign of developing addiction as the body adapts to the presence of the drug.

Withdrawal Symptoms: When attempting to stop or reduce amphetamine use, individuals may experience withdrawal symptoms. These symptoms can include fatigue, depression, irritability, anxiety, increased appetite, and disturbed sleep patterns. Withdrawal symptoms can be a strong indicator of physical dependence and addiction [12].

C a Individuals with amphetamine addiction often engage in compulsive drug-seeking behavior. They may spend significant time and effort obtaining the drug, neglecting personal responsibilities, and engaging in risky behaviors to sustain their habit [13].

Fa a ba Despite efforts to quit or reduce amphetamine use, individuals struggling with addiction may repeatedly relapse. They may express a desire to stop using but find it difficult to maintain abstinence on their own.

N b Amphetamine addiction can lead to neglect of personal, professional, and academic responsibilities. Individuals may neglect work or school obligations, experience financial difficulties, or have strained relationships due to their drug use [14].

C a b a a a a a Amphetamine addiction can cause noticeable changes in behavior and physical appearance. Individuals may become increasingly agitated, irritable, or paranoid. They may experience weight loss, poor hygiene, and neglect their overall physical appearance.

S a a Addiction can lead to social isolation as individuals may withdraw from friends, family, and previously enjoyed activities. They may prioritize drug use over maintaining relationships and participating in social engagements [15].

M a a a Amphetamine addiction can

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affect an individual's mood and overall psychological well-being. They may experience mood swings, irritability, restlessness, anxiety, and even symptoms of psychosis, such as hallucinations or delusions.

R b a Individuals struggling with amphetamine addiction may engage in risky behaviors to obtain drugs or support their habit. This can include stealing, driving under the influence, or engaging in unsafe sexual practices [16].

H a Prolonged amphetamine use can lead to various physical health problems, including cardiovascular issues, malnutrition, dental problems, and sleep disturbances (Figure 1).

It is important to note that the severity and combination of symptoms can vary among individuals. If you or someone you know is experiencing several of these symptoms and suspect amphetamine addiction, it is crucial to seek professional help and support from healthcare providers or addiction specialists. They can provide a comprehensive assessment and guide you toward appropriate treatment options [17].

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Amphetamine addiction can involve different types of amphetamines, which can vary in their chemical composition, method of administration, and legal status. Here are some types of amphetamine addiction:

Prescription Amphetamine Addiction: Prescription amphetamines, such as Adderall and Dexedrine, are commonly prescribed for medical conditions like attention deficit hyperactivity disorder (ADHD) and narcolepsy. However, misuse or abuse of these medications can lead to addiction. Individuals may take higher doses than prescribed, use them without a prescription, or use them for non-medical purposes to experience the stimulant effects.

M a a a Methamphetamine, commonly known as meth, is a highly potent and addictive stimulant. It is typically produced illegally in clandestine laboratories. Methamphetamine can be smoked, snorted, injected, or swallowed. Methamphetamine addiction is a serious concern due to its potent effects on the central nervous system and the significant health risks associated with its use [18].

I a a a Illicit amphetamines refer to amphetamine-based substances produced and distributed illegally. These include drugs like ecstasy (MDMA) and "speed." Ecstasy is often consumed in tablet form and is known for its stimulant and hallucinogenic effects. Speed, on the other hand, usually comes in

powdered or pill form and is used for its stimulant properties. Illicit amphetamines can be associated with a range of risks, including addiction, unpredictable effects, and potential adulteration with other harmful substances [19].

D a a a Designer amphetamines, also known as "research chemicals" or "legal highs," are synthetic substances designed to mimic the effects of amphetamines. These substances are created to circumvent legal restrictions by altering the chemical structure while still producing similar stimulant effects. However, their safety and long-term effects are often unknown, and they can pose significant risks to users, including addiction [20].

C b a b a ab Amphetamines may also be combined with other substances, such as alcohol or other drugs, leading to polydrug abuse. Mixing amphetamines with other substances can intensify their effects or create unique risks and complications. This type of addiction may involve a combination of amphetamines and other drugs, such as opioids, cocaine, or benzodiazepines [21].

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To help prevent amphetamine addiction or reduce the risk of developing dependency on these substances, it is important to take certain precautions. Here are some precautions that can be taken:

U a a If you have been prescribed amphetamines for a legitimate medical condition, it is essential to follow the prescribed dosage and instructions provided by your healthcare professional. Avoid taking higher doses or using the medication more frequently than recommended.

Educate Yourself: Learn about the potential risks and side effects associated with amphetamines. Understanding the potential dangers and consequences of misuse or abuse can help you make informed decisions about their use [22].

A a Amphetamines should only be used for legitimate medical purposes as prescribed by a healthcare professional. Avoid using these substances recreationally or without a valid prescription.

Responsible Use: If you are using amphetamines as prescribed, it is important to use them responsibly. Follow the recommended dosage and timing, and avoid taking them for longer durations than necessary. Communicate any concerns or side effects to your healthcare provider.

O a a a Maintain open and honest communication with your healthcare provider regarding your medication use. Discuss any concerns, changes in symptoms, or difficulties (et)-6(a)9(min)4(.9(s))T5thc)-13.9(d-7(ts)D(c)-3)-133(e)05(

