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Stimulant ADHD Medications

Stimulant medications including amphetamines (e.g., Adderall) and methylphenidate (e.g., Ritalin and Concerta) are often prescribed to treat children, adolescents, or adults diagnosed with attention-deficit hyperactivity disorder (ADHD).

People with ADHD persistently have more difficulty paying attention or are more hyperactive or impulsive than other people the same age. This pattern of behavior usually becomes evident when a child is in preschool or the first grades of elementary school; the average age of onset of ADHD symptoms is 7 years. Many people's ADHD symptoms improve during adolescence or as they grow older, but the disorder can persist into adulthood.

ADHD diagnoses are increasing. According to the U.S. Centers for Disease Control and Prevention, as of 2011, 11 percent of people ages 4–17 have been diagnosed with ADHD.

How Are Prescription Stimulants Used?

Prescription stimulants have a paradoxically calming and "focusing" effect on individuals with ADHD. They are prescribed to patients for daily use, and come in the form of tablets or capsules of varying dosages. Treatment of ADHD with stimulants, often in conjunction with psychotherapy, helps to improve ADHD symptoms along with the patient's self-esteem, thinking ability, and social and family interactions.

Prescription stimulants are sometimes abused however—that is, taken in higher quantities or in a different manner than prescribed, or taken by those without a prescription. Because they suppress ap-

Do Prescription Stimulants Make You Smarter?

A growing number of teenagers and young adults are abusing prescription stimulants to boost their study performance in an effort to improve their grades in school, and there is a widespread belief that these drugs can improve a person's ability to learn ("cognitive enhancement").

Prescription stimulants do promote wakefulness, but studies have found that they do not enhance learning or thinking ability when taken by people who do not actually have ADHD. Also, research has also shown that students who abuse prescription stimulants actually have lower GPAs in high school and college than those who don't.

petite, increase wakefulness, and increase focus and attention, they are frequently abused for purposes of weight loss or performance enhancement (e.g., to help study or boost grades in school; see box, previous page). Because they may produce euphoria, these drugs are also frequently abuse for recreational purposes (i.e., to get high). Euphoria from stimulants is generally produced when pills are crushed and then snorted or mixed with water and injected.

How Do Prescription Stimulants Affect the Brain?

All stimulants work by increasing dopamine levels in the brain—dopamine is a neurotransmitter associated with pleasure, movement, and attention. The therapeutic effect of stimulants is achieved by slow and steady increases of dopamine, which are similar to the way dopamine is naturally produced in the brain. The doses prescribed by physicians start low and increase gradually until a therapeutic effect is reached.

When taken in doses and via routes other than those prescribed, prescription stimulants can increase brain dopamine in a rapid and highly amplified manner (similar to other drugs of abuse such as methamphetamine), thereby disrupting normal communication between brain cells and producing euphoria and, as a result, increasing the risk of addiction.

What Are the Other Health Effects of Prescription Stimulants?

Stimulants can increase blood pressure, heart rate, and body temperature and decrease sleep and appetite. When they are abused, they can lead to malnutrition and its consequences. Repeated abuse of stimulants can lead to feelings of hostility and paranoia. At high doses, they can lead to serious cardiovascular complications, including stroke.

Addiction to stimulants is also a very real consideration for anyone taking them without medical supervision. Addiction most likely occurs because stimulants, when taken in doses and routes other than those prescribed by a doctor, can induce a rapid rise in dopamine in the brain. Furthermore, if stimulants are abused chronically, withdrawal symptoms—including fatigue, depression, and disturbed sleep patterns—can result when a person stops taking them. Additional complications from abusing stimulants can arise when pills are crushed and injected: Insoluble fillers in the tablets can block small blood vessels.

Do Prescription Stimulants Affect a Patient's Risk of Substance Abuse?

Concerns have been raised that stimulants prescribed to treat a child's or adolescent's ADHD could affect an individual's vulnerability to developing later drug problems—either by increasing the risk or by providing a degree of protection. The studies conducted so far have found no differences in later substance use for children with ADHD who received treatment and those that did not. This suggests treatment with ADHD medication appears not to affect (either negatively or positively) an individual's risk for developing a substance use disorder.

Learn More

For additional information on prescription stimulants, see http://www.drugabuse.gov/publications/research-reports/prescription-drugs