



TEXAS TECH UNIVERSITY  
HEALTH SCIENCES CENTER™  
EL PASO



TEXAS TECH UNIVERSITY  
HEALTH SCIENCES CENTER™  
EL PASO

# Division of Child and Adolescent Psychiatry

Hanna Garza, MS, LPC

[Hanna.Garza@ttuhsc.edu](mailto:Hanna.Garza@ttuhsc.edu)

[tchatt.ep@ttuhsc.edu](mailto:tchatt.ep@ttuhsc.edu)

915-215-6170



TEXAS TECH UNIVERSITY  
HEALTH SCIENCES CENTER™  
EL PASO

# **The Influence of Substance Abuse on Adolescent Brain**

**TCHATT**

**(Texas Child Health Through Telemedicine)**



# Types of Drugs

- Most addictive drugs come in two general classes: **stimulants** and **depressants**. The most fundamental way in which these two types differ can be inferred by their names. Stimulants stimulate the central nervous system and depressants do the opposite, slowing it and all the parts of the body controlled by the central nervous system down.



# Stimulants

- Stimulants, often called “uppers,” are the kinds of drug that make people feel supercharged with energy and focus, even to the point of feeling invincible. They send the central nervous system into overdrive, increasing heart and breathing rates, suppressing appetite, and causing a spike in blood pressure. Certain stimulants can cause a rush of euphoria, especially if they are taken via common abuse methods like snorting, smoking, or injection.
- The most commonly used and abused stimulants include: Caffeine, Nicotine, Cocaine/crack cocaine, Methamphetamine (meth), MDMA (ecstasy), Adderall (used for treatment of ADHD), Ritalin (used for treatment of ADHD).



# Depressants

- Depressants, often called “downers,” come in several different categories, including legal and socially approved intoxicants, highly illegal street drugs, and different types of prescription anxiety medications and painkillers. They work by slowing the heart rate and respiratory and gastrointestinal systems. This results in a feeling of relaxation, peace, and often sleepiness. These drugs can also produce an intense euphoria, particularly if abusing opioids (pain medications, Heroin, etc).
- Common depressants with abuse potential include: Alcohol, Heroin, Morphine, Vicodin (pain medication), Codeine (pain medication), Valium, Xanax (medication for anxiety).



# Impact of Substance Abuse on the Brain

- Adolescence is characterized by risky behavior and impulsive decision making, which often exposes adolescents to psychoactive substances.
- During adolescence, a young person goes through biological and psychological changes. In addition to the physical changes that mark growing up, the teen's brain is also developing ways to work more effectively. The teenage years are vital to healthy cognitive function as an adult, so it is important to maintain a strict level of healthy behavior during these years. Drug abuse can impact the brain's ability to function in the short-term as well as prevent proper growth and development for later in life.



# Impact of Substance Abuse on the Brain

- Substance abuse affects teen brain development by: reducing the ability to experience pleasure or being happy, creating problems with memory, and causing learning problems.
- In addition to addiction risks, alcohol and drugs pose a serious risk to the physical health and growth of teens. Studies have shown that excessive drinking and drug use in teens can result in: delayed puberty and/or negative effects on the reproductive system, lower bone mineral density, higher levels of liver enzymes that indicate liver damage, and reduced growth potential.



# Social and Professional Risks of Teen Substance Abuse

- In addition to the physical risks of teen drinking and drug abuse, there are many other consequences that could haunt teens well into adulthood. Because substance abuse can muddy reasoning and encourage rash decisions, there are many side effects of substance abuse that go far beyond the biological and physiological aspects.
- Some of these include: criminal records that cannot be expunged, car accidents, assaults, sexually transmitted diseases, unplanned pregnancies, wasted academic opportunities, late start in chosen career path, damaged relationships with friends and family.



# Long-term Impact of Substance Abuse

- Studies have suggested that long-term stimulant abuse may lead to significant permanent changes in the brain, including a reduction of the white matter that's responsible for impulse control, stress management, and decision-making. Psychological symptoms related to stimulant abuse may also continue long after an individual quits, especially anxiety and depression. There's even increasing evidence of a link between stimulants like cocaine and Parkinson's disease.
- Long-term use of depressants can also lead to psychological depression and increases the chance of experiencing paradoxical effects like anxiety and panic attacks. Some long-term users have developed chronic fatigue syndrome that lasts even after they've gotten clean. Insomnia and sexual dysfunction are also common. At the same time, withdrawal symptoms from certain depressants can be seriously dangerous.



# Signs of Drug Overdose

- Nausea and vomiting, loss of consciousness, pain or tightness of the chest, profuse sweating, chills, racing pulse, irregular breathing, convulsions, feeling paralyzed, severe headache, panic attacks or extreme anxiety, intense paranoia, extreme agitation, aggression, hypervigilance, hallucinations, disorientation, floppy arms or legs, bluish lips or fingernails, cold or clammy skin, snoring or gurgling sounds, shallow or no breathing.



TEXAS TECH UNIVERSITY  
HEALTH SCIENCES CENTER.<sup>™</sup>  
EL PASO

# Questions