

Follow the Directions

Prescription painkillers, drugs to treat sleep disorders, anti-anxiety drugs, and stimulants are powerful drugs. It is important to follow a doctor's, health care provider's, or pharmacist's instructions about how much to take and what things to avoid. For example, taking more than the prescribed amount of any prescription drug can lead to an overdose. People who overdose may vomit or even fall into a coma, depending on the drug. In addition, a person may have serious side effects from mixing prescription drugs with other medicines, over-the-counter drugs, or alcohol.

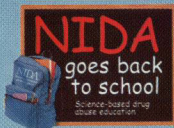
Surprising Facts

- Prescription painkillers can cause nausea and vomiting.
- Mixing anti-anxiety or sleep disorder drugs with other drugs, particularly alcohol, can slow breathing, slow heart rate, and possibly lead to death.
- Abusing stimulants while taking a cold medicine with decongestants can cause dangerous increases in blood pressure and irregular heart rhythms.



The Search Continues

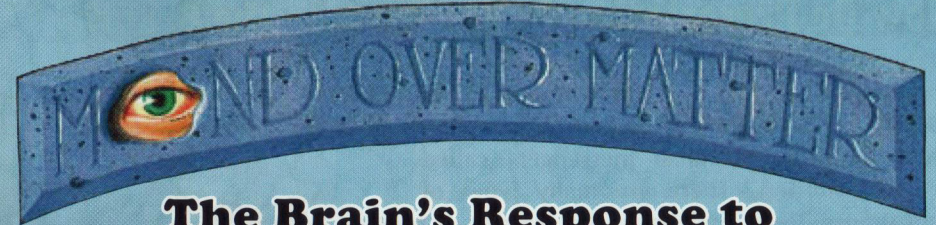
There is much that scientists have yet to discover about the effects of prescription drugs on the brain and body. Maybe you will make the next big discovery! Until then, follow me—Sara Bellum—in the other magazines in my series, as we explore how drugs affect the brain and nervous system.



For more information, visit:
www.teens.drugabuse.gov

To learn more about prescription drugs and other drugs of abuse, or to order materials on these topics, free of charge, in English or Spanish, visit the **NIDA Web site at www.drugabuse.gov** or contact the **DrugPubs Research Dissemination Center at 877-NIDA-NIH (877-643-2644; TTY/TDD: 240-645-0228).**

Mind Over Matter is produced by the **National Institute on Drug Abuse, National Institutes of Health, U.S. Department of Health and Human Services**. These materials are in the public domain and may be reproduced without permission. Citation of the source is appreciated. NIH Publication No. 09-7423. **Printed 2009.**



The Brain's Response to Prescription Drugs

Hi! My name is Sara Bellum. Welcome to my magazine series that explores the brain's response to drugs. In this issue, we will investigate fascinating facts about prescription drugs.

Prescription drugs are medicines that are prescribed to a person by his or her doctor to treat diseases. Some prescription drugs affect the brain—especially those used to treat pain, or mental disorders such as anxiety or

attention-deficit hyperactivity disorder (ADHD).

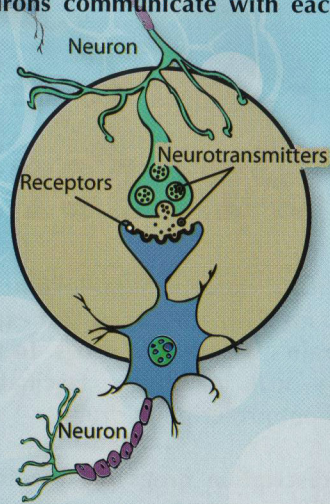
Doctors decide how much of a drug to give a person based on that person's age, size, and medical history. By doing so, doctors oversee the safe and proper use of prescription drugs. Abuse is when someone takes a prescription drug without a doctor's prescription or in a way or amount that is different from what was prescribed. Abuse of prescription drugs can have serious and harmful health effects, including poisoning and even death.



National Institute on Drug Abuse

How Do Prescription Drugs Work in the Brain?

Prescription drugs change the chemistry of the brain. The brain is made up of about 100 billion neurons, also known as nerve cells. Neurons communicate with each other by using chemical messengers called neurotransmitters. There are many types of neurotransmitters, and each one carries a specific message. Neurotransmitters deliver their messages by attaching to special places on nerve cells called receptors. Prescription drugs act by mimicking certain neurotransmitters. Below, we will learn more about specific types of prescription drugs that can be dangerous when abused.



Types of Prescription Drugs

Prescription Painkillers

Prescription painkillers are powerful drugs that reduce pain. These drugs are very helpful to people with severe pain from injuries, and cancer and other diseases.

Prescription painkillers attach to particular sites in the brain called opioid receptors, which carry messages about pain. With proper use of prescription painkillers, the pain messages sent to the brain are changed and are no longer perceived as painful. Patients who are prescribed painkillers for a long period of time may develop a “physical dependence” on them. This is *not* the same as addiction. Physical dependence happens because the body adapts to having the drug around, and when its use is stopped abruptly, the person can experience symptoms of withdrawal. That is why these drugs are carefully monitored and should be taken or stopped only under a doctor’s orders.

Prescription painkillers can be highly addictive when used improperly—without a doctor’s prescription or in doses higher than prescribed. Addiction means that a person will strongly crave the drug and continue to use it despite severe consequences to their health and their life. Prescription painkillers also affect the brain areas controlling respiration, and when used improperly (or mixed with other drugs) can cause a severe decrease in breathing that can lead to death.

Prescription Drugs for Sleep Disorders

Prescription drugs for sleep disorders increase levels of a neurotransmitter named gamma-aminobutyric acid (GABA). GABA sends messages that slow down bodily functions and make a person feel drowsy.

Prescription drugs for sleep disorders may have side effects, including headache, muscle aches, daytime sleepiness, trouble concentrating, and dizziness. Prescription drugs for sleep disorders should never be mixed with any other drugs that cause drowsiness, such as over-the-counter cold medicine, alcohol, or painkillers. If combined, they can slow a person’s heart rate and respiration, which can be fatal.

Prescription Anti-anxiety Drugs

Doctors may prescribe drugs to help people with anxiety disorders. Some anti-anxiety drugs affect the neurotransmitter GABA.

After taking anti-anxiety drugs for a long time and suddenly stopping, a person may experience withdrawal symptoms such as anxiety, shakiness, headache, dizziness, and, in extreme cases, seizures. Abusing prescription anti-anxiety drugs can result in addiction or overdose.

Prescription Stimulants

Prescription stimulants cause neurons to release two neurotransmitters: dopamine and norepinephrine. Dopamine carries messages in the brain about feeling good. Norepinephrine is a chemical in the brain that helps people pay attention and focus.

Doctors often prescribe stimulants to help people with attention-deficit hyperactivity disorder (ADHD). Many scientists believe that in people with ADHD, the dopamine system works slightly differently than in people without the disorder. Prescription stimulants can bring brain dopamine function back to normal and help people with ADHD focus better and pay more attention.

Stimulants can be addictive and dangerous when abused. In fact, abusing stimulants can cause chest pain, stomachaches, and feelings of fear or anger. They can also cause seizures and irregular heartbeats that can cause death.

