

HEADS UP

REAL NEWS

ABOUT DRUGS

AND YOUR BODY

WELCOME TO *Heads Up: Real News About Drugs and Your Body*, a drug education program designed to bring you the latest science-based facts about drugs, addiction, and your health so that you can make informed choices about your life.

Research shows that when young people know the facts about drugs, they are more likely to make smart choices about their health and their futures. In other words, teens who know the facts about drugs, tend to stay away from them.

In the articles you're about to read, you'll learn about the drugs of abuse that researchers have determined are the greatest risk to teens. From the devastating effects of methamphetamine to the poisonous vapors of inhalants and the abuse of prescription drugs like OxyContin® and Vicodin®, you'll learn the facts and the consequences of these drugs. In the final article, you'll find techniques to prepare yourself so that you can say no to drugs when you're with your friends or in other social situations.

Brought to you by Scholastic and the scientists at the National Institute on Drug Abuse, you'll discover how the teen brain is wired and why it can make teens more susceptible than adults to drug abuse.

So **Heads Up!** The Real News is coming your way.

To order additional copies of this **Heads Up Student Edition** at no charge, call 800-729-6686 and refer to NCADI MS982.

Inside this compilation:

Methamphetamine: Toxic. Addictive. Devastating. Get the Facts!

Page 2



Poison Vapors: The Truth About Inhalants

Page 6



Prescription Drugs: Their Use and Abuse

Page 10



A Day in the Life of a Teen: Decisions at Every Turn

Page 14





**HEADS UP
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METHAMPHETAMINE

**Toxic. Addictive.
Devastating.
Get the Facts!**



Methamphetamine as a rock crystal—"ice."

Also known as "meth" or "ice," this highly addictive and brain-altering drug is a threatening scourge on individuals, families, and communities.

Big Heads Up: Across the United States, methamphetamine is leaving widespread damage in its path.

Make no mistake: this is a highly toxic, addictive, and devastating substance that poses serious health risks both to individuals who use it and to those who never do. Families, neighbors, communities, innocent children, the environment—all are affected by methamphetamine and the highly toxic chemicals that are used to produce it.

Heads Up: Methamphetamine Alters the Brain's Structure

Researchers have established that methamphetamine abuse causes changes in brain structure. The most affected areas are those that control memory, emotion, and reward.

From the image at right, we can see differences in the amount of change in a methamphetamine abuser's brain as compared with a nonuser's:

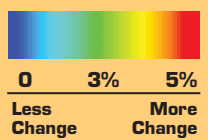
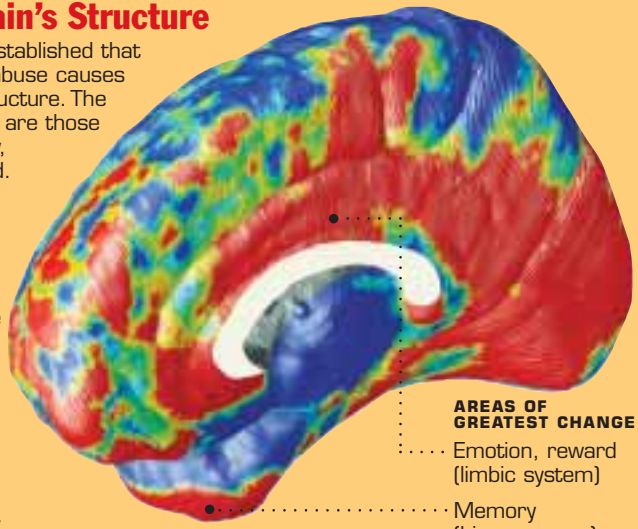


Photo credits: brain map courtesy of Paul Thompson, Kiratree Hayashi, Arthur Toga, and Edythe London/UCLA; rock methamphetamine ©DEA/AP Wide World; methamphetamine-making device ©The Grundy County Herald, C.E. Jones/AP Wide World.

AMPHETAMINE

1 lb of methamphetamine = 5 lbs of toxic waste

WHAT DOES IT LOOK LIKE?

Often referred to as “meth,” methamphetamine can be a white powder that easily dissolves in water. Another form of the drug, in clear chunky crystals, is called “crystal meth” or “ice.” The drug can also come in the form of small, brightly colored tablets known by the name “yaba.” Methamphetamine abusers inject, snort, smoke, or swallow the drug.

A SPREADING THREAT:

Whether teens live in the city or in the country, they are increasingly likely to be faced with methamphetamine. Until recently, methamphetamine in the United States was concentrated in a few cities and towns, most of them in the West. But now, health and law-enforcement officials see methamphetamine spreading to rural areas, cities, and towns across the nation.



Squalid-looking device used for making methamphetamine.

WIDE DEVASTATION:

Few substances are as harmful as methamphetamine. From the ravages facing abusers whose bodies, brains, and actions become altered, to burns, explosions, and toxic spills resulting from the chemicals used to produce methamphetamine, this is one dangerous drug.

According to Dr. Nora D. Volkow, director of the National Institute on Drug Abuse (NIDA), methamphetamine is “a stimulant drug that can have devastating medical, psychiatric, and social consequences.”

Partly because of the spread of methamphetamine across the country, NIDA has stepped up its research relating to the drug. Scientists are working to understand how the drug affects abusers and how best to treat people suffering from the disease of methamphetamine addiction.

Manufacturing methamphetamine always produces toxic waste. Ingredients might include toluene, iodine, red phosphorus (used in road flares), sodium hydroxide, lithium/sodium metal, hydrochloric acid, anhydrous ammonia (a fertilizer), drain cleaner, battery acid, lye, pool acid, and antifreeze—many of which are severe eye, nose, and throat irritants or cause skin burns or breathing difficulty.

A “meth lab” is an illegal site where the drug is manufactured. Meth labs have been found in garages, kitchens, vehicles, hotel and motel rooms, storage lockers, campgrounds, abandoned dumps, restrooms, and mobile homes. Children who grow up in places where methamphetamine is manufactured are at risk for acid burns and respiratory problems from exposure to toxic chemicals.

One in five of these sites is discovered because of chemical explosions. Because of the possibility of explosions and direct contact with toxic fumes and hazardous chemicals, law-enforcement officers who raid clandestine drug labs are required to take

(continued on p. 4)



HEADS UP REAL NEWS ABOUT DRUGS AND YOUR BODY

(continued from p. 3)

special training to handle hazardous materials (HAZMAT). Firefighters who respond to fires at these sites also risk serious injury from toxic fumes and gases.

Toxic contamination remains behind from the manufacturing process on surfaces in the meth lab itself, including furniture, curtains, bedspreads, flooring, air vents, eating surfaces, and walls. Cleaning up a meth lab site requires hazardous waste protection and costs an average of \$3,000—but can cost more than \$100,000. In 2004 alone, there were more than 10,000 meth lab cleanups at a cost of \$18.6 million.

Leftover chemicals and by-product sludge from methamphetamine manufacture have been found along highways, in parks and forests, in the ground and groundwater, and in sewer systems. These solvents and other toxic by-products pose long-term hazards to communities because they can persist in soil and groundwater for years. Of particular concern are labs in agricultural areas, because the hazardous wastes are often dumped where crops are grown and in the water sources used to nourish those crops.

HOW IS METHAMPHETAMINE HARMFUL?

Scientists know that methamphetamine can change the structure of a person's brain; it can change behavior; and it can even change feelings and emotions—effects that can last a long time. It can also cause people to do risky, disastrous things—things they'd never do if they weren't under the influence of the drug. There's even something called "meth mouth," which results from methamphetamine constricting blood vessels in certain areas of the mouth. The reduced blood flow over time can weaken the teeth and lead to tooth decay.

Methamphetamine abusers can experience a wide range of other potentially devastating effects for themselves—and others. These include violent behavior as well as anxiety, depression, confusion, insomnia, paranoia, auditory hallucinations, and delusions.

BRAIN CHANGE:

Recently, Dr. Paul Thompson, a NIDA-sponsored researcher at the University of California, Los Angeles, used Magnetic Resonance Imaging (MRI) to look inside the

brains of long-term methamphetamine abusers.

"The methamphetamine abusers Thompson studied experienced structural changes in the limbic regions of their brains—this is the area responsible for feelings, emotions, and cravings," explains Dr. Steve Grant, acting chief of NIDA's Clinical Neuroscience Branch, Division of Clinical Neurosciences, Development and Behavioral Treatments. The hippocampus, responsible for making new memories, also showed structural changes. Not surprisingly, those addicted to methamphetamine scored very poorly on memory tests.

TRICKING BRAIN CELLS:

Methamphetamine's effects—and some of the brain changes they ultimately cause—stem from the fact that the drug's chemical structure is similar to dopamine. Dopamine is the natural chemical released in certain areas of the brain in response to pleasurable experiences—like laughing with friends or dancing with a girlfriend

This law-enforcement officer wears a protective suit as he clears away bottles of toxic chemicals used to produce methamphetamine.



or boyfriend. Dopamine also helps the brain control movement, mood, and memory.

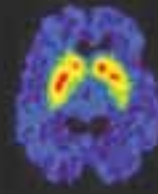
Methamphetamine tricks brain cells into pumping out very high, unnatural levels of dopamine. You won't be surprised to learn that these increases in dopamine make methamphetamine abusers feel great. But then comes a crash. This causes users to crave more of the drug—setting the stage for the chronic disease we call *addiction*.

Ironically, even though methamphetamine ups the amount of dopamine in the brain at first, it ultimately hinders the brain's ability to make and respond to dopamine.

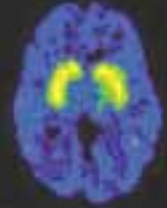
Brain imaging studies conducted by Dr. Volkow show that long-term methamphetamine abusers have lower-than-normal numbers of dopamine receptors and dopamine transporters in the brain. Receptors and transporters are important parts of normal brain communication.

This lower number of dopamine transporters results in not being able to perform simple actions as well. In one study, participants with the fewest transporter molecules had a tough time recalling simple word lists and were slower in walking a straight line. "In fact, the lower the levels of the dopamine transporter, the worse the performance," Dr. Volkow says. They had developed problems with the *striatum*, a part of the brain associated with control of movement, attention, motivation, and reward.

Wake-Up Call: Loss of Motor Skills and Memory



Normal Control



Methamphetamine Abuser
(1 month abstinent)

Researchers have found that long-term methamphetamine abuse is associated with a reduction in dopamine transporters, and that this damage appears to be linked to impaired motor skills and memory. The brain image on the left above is from a person who has never used methamphetamine. The brain on the right is from a methamphetamine abuser who abstained for 1 month. Yellow and red areas indicate the distribution of dopamine transporters (DATs), with red indicating higher distribution. Dopamine is released naturally in the brain in response to pleasure; it helps the brain control movement, mood, and memory. There is a slight recovery of DATs after 1 month of abstinence (see the light resurgence in red), and the researchers saw much more recovery after 14 months—but motor skills and memory had not returned to normal.

IMMUNE SYSTEM RISKS:

Immune system cells are the blood cells that help your body resist infections. Animal and test tube studies show that methamphetamine may suppress killer T cells, a type of white blood cell that fights off germs. On top of that, a recent long-term study found that, all other things being equal, people who abuse methamphetamine are twice as likely as nonusers to contract HIV if exposed to it.

IS JUST ONE USE SAFE?

The answer is **NO**.

To start with, people under the influence of methamphetamine may lose their normal inhibitions and sense of good judgment. As a result, they might take dangerous risks.

In animal studies, even a single high dose of methamphetamine can damage nerve terminals in

dopamine-containing regions of the brain. In humans, a big dose can raise your body temperature so high that your life can be in danger—it can lead to convulsions and coma. Also, says Dr. Volkow, a single dose of methamphetamine can cause “irreversible stroke-producing damage to small blood vessels in the brain.”

SMART CHOICE:

All in all, for the sake of your brain cells, your immune cells, and all your other cells—as well as for the sake of your family, neighbors, children, and the environment—the smart choice is never to try methamphetamine. Not even once.

For help with a drug problem or to locate treatment centers, go to www.findtreatment.samhsa.gov or call the national hotline at 1-800-662-HELP.



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POISON



VAPORS:

THE TRUTH

ABOUT INHALANTS

**Inhalants can cause harm to the whole body,
including long-lasting damage to the brain,
physical disabilities, and even death.**

One Harmful Effect of Inhalants

WHAT IS AN INHALANT?

Inhalants are toxic—that is, **poisonous**—chemical vapors that can be misused to produce mind-altering effects, often with disastrous results.

These harmful vapors can be found in a variety of common household and office products, including nail polish remover, gasoline, aerosol sprays, correction fluid, whipped cream canisters, computer spray cleaners, paint thinners, and markers. Even when used for their intended purposes, such as cleaning or painting, these products are so toxic that they are recommended for use only in well-ventilated areas. That's to prevent people from accidentally breathing in the poison. When they are intentionally inhaled in order to experience a "high," they are known as **inhalants**, and can cause serious harm to the whole body. Abuse of certain inhalants may result in irreversible effects, including hearing loss, limb spasms, bone marrow damage, and damage to the central nervous system and brain. Serious but reversible effects may include liver and kidney damage and depletion of oxygen in the blood. An adequate blood oxygen level is critical to the function of every organ and tissue in our bodies.



HEADS UP: ONE TIME IS ONE TOO MANY

Inhalants are incredibly effective poisons. They enter the bloodstream quickly and are then distributed throughout the brain and body. They have direct effects on both the central nervous system (brain and spinal cord) and the peripheral nervous system (nerves throughout the body).

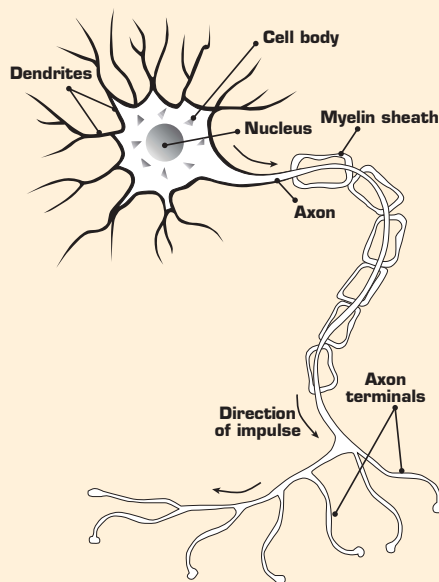
How severely can inhalants harm you? According to Dr. David Shurtleff, who heads the Division of Basic Neurosciences and Behavior Research at the National Institute on Drug Abuse (NIDA), they can affect your ability to think, talk, remember, hear, and even walk. They may be addictive, and they can wreak havoc on a healthy body from head to toe, causing hearing loss, vision loss, convulsions, and damage to the lungs, liver, kidneys, heart, bone marrow, and muscles.

Most frightening is that just one time can be one too many with inhalants. As explained by Dr. Nora D. Volkow, director of NIDA, "Even in an otherwise healthy person, a single session of abusing highly concentrated amounts of certain inhalants can lower oxygen levels enough to cause asphyxiation, or disrupt heart rhythms and cause death from cardiac arrest." There's a chilling name for this: *sudden sniffing death*. There are people—including teens and pre-teens—who have used inhalants and paid the ultimate price.

Consider Kyle Williams, a 14-year-old who kissed his mom goodnight and headed to his room one evening in March 2005. The next morning his

Inhalants destroy nerve fibers throughout an inhalant abuser's brain, which can lead to muscle spasms and difficulty with basic activities like walking and talking. How do inhalants destroy nerve fibers? Primarily by causing the myelin around them to deteriorate. Myelin is typically found in a thick layer around the axons, the long parts of nerve fibers through which impulses flow. If you picture nerve cells as your body's electrical wiring, then think of myelin as the rubber insulation that protects an electrical cord. When myelin breaks down, nerves become much less capable of transmitting messages. What happens? Imagine attaching heavy weights to your ankles just before leaving the starting blocks in a fifty-yard dash. When there's a normal heavy layer of myelin around the axon, nerve impulses travel as fast as 120 meters per second. Without myelin, these impulses slow to a crawl of only about 2 meters per second. Do the math—that's a deceleration of over 95 percent! In short, a losing pace.

Inhalant Abuse Breaks Down the Myelin Sheath Surrounding Nerve Fibers



INHALANTS: POISON VAPORS



HEADS UP REAL NEWS ABOUT DRUGS AND YOUR BODY

mother went in to wake Kyle up. Instead, she found him dead in bed, with a straw from the can of computer cleaner he had inhaled still in his mouth. One of Kyle's friends had shown him how to get high this way about a month before. Some might think such cans contain nothing but compressed air. They couldn't be more mistaken.

HOW INHALANTS DO THEIR DAMAGE

Inhalant vapors often contain more than one chemical, increasing the risk of serious harm. Some chemicals leave the body quickly, but others are absorbed by fatty tissues in the nervous system, including the brain. They can stay there for a long time.

One of these fatty tissues is myelin—a protective cover that surrounds many of the body's nerve cells (neurons). Nerve cells in your brain and spinal cord send and receive messages that control just about everything you think and do. Deterioration of myelin can lead to muscle spasms, tremors, or even difficulty with basic actions such as walking, bending, and talking.

Toluene, one of the most common chemicals in inhalants, is found in glue, spray paint, paint thinner, and a number of other products known as solvents.

Toluene can damage myelin—and also the liver, the kidneys, and the ability to hear.

Other inhalants such as benzene (found in gasoline) can compromise the body's ability to produce blood

Heads Up: Inhalants Are Poisons That Affect the Whole Body

Check out this diagram to learn about the damage the chemicals in inhalants can do.

Blackouts

Inhalants can cause rapid changes in blood pressure, which can lead to blackouts and fainting.

Hearing Loss

Inhalants can cause hearing loss, perhaps by damaging the hairs of the inner ear or by harming the protective coating (myelin) on the nerves that carry sound impulses to the brain.

Damage to Central Nervous System

Fumes from inhalants can change brain chemistry and permanently damage the central nervous system (brain and spinal cord).

Liver and Kidney Damage

Inhalants can cause serious harm to these organs, which have many vital functions, including filtering harmful substances out of the body.

Bone Marrow Damage

Inhalants can damage bone marrow, where blood cells are made, increasing the risk of leukemia and aplastic anemia (potentially fatal illnesses).

Limb Spasms

Inhalants break down the myelin needed for nerves to transmit messages, resulting in muscle spasms and tremors in arms and legs.

Inhalant	Sources	Harmful Effects
Toluene	<ul style="list-style-type: none"> Spray paint Glue Dewaxer Fingernail polish 	<ul style="list-style-type: none"> Hearing loss Damage to central nervous system Liver and kidney damage
Trichloroethylene	<ul style="list-style-type: none"> Cleaning fluid Correction fluid 	<ul style="list-style-type: none"> Hearing loss Liver and kidney damage Vision damage
Hexane	<ul style="list-style-type: none"> Glue Gasoline 	<ul style="list-style-type: none"> Limb spasms Blackouts
Nitrous Oxide	<ul style="list-style-type: none"> Whipped cream dispensers Gas cylinders 	<ul style="list-style-type: none"> Limb spasms Blackouts
Benzene	<ul style="list-style-type: none"> Gasoline 	<ul style="list-style-type: none"> Bone marrow damage Immune system damage

cells, which can lead to a life-threatening disease called aplastic anemia. Various chemicals in other inhalants can also cause hepatitis, liver failure, weight loss, muscle weakness, disorientation, inability to concentrate, loss of coordination, irritability, and depression. In short, *inhalants can seriously mess you up.*

HHEADS UP: THERE ARE NO SAFE INHALANTS

Some teens who understand the dangers of inhaling glue or computer cleaner may believe that inhaling nitrous oxide is safe—maybe because medical professionals sometimes administer it. **They are wrong.** Nitrous oxide, also known as laughing gas, is an odorless gas used by dentists as a painkiller, but when abused, it can be as dangerous as any other inhalant. It can damage your peripheral nerves, causing numbness, tingling, and even paralysis. It also causes blackouts.

When you breathe in pure

nitrous oxide, it binds with the oxygen in your blood. This means your body's tissues can't get the oxygen they need. Dentists never give pure nitrous oxide to patients. They always mix it with oxygen. People who sell balloons or little canisters filled with nitrous oxide on the street or at concerts don't know how to do this—and even if they did, they wouldn't bother. If you inhale nitrous oxide outside of a dentist's office, you'll likely be flooding your body with sulphuric acid, ammonia, and nitric oxide—all toxic substances.

HHEADS UP: YOUNGER TEENS ARE MOST AT RISK

It is vitally important that you tell your friends what you've learned about the risks of inhalants. While recent studies show that overall drug abuse is down among teens, the abuse of inhalants has increased, especially among younger teens. According to the most recent Monitoring the Future

survey, a study of youth drug trends sponsored by NIDA, twice as many 8th-graders as 12th-graders are using inhalants. In 2004, more than 17 percent of this age group reported having used inhalants at least once in their lives—a statistically significant increase compared with the previous year.

A key problem revealed by the Monitoring the Future survey is that more than **38 percent of 8th-graders didn't realize that regular use of inhalants is harmful.** More than 66 percent of this age group didn't think that using inhalants once or twice was risky. This lack of awareness can set the stage for disastrous health consequences. The more kids know about the harmful effects of inhalants, the more likely they'll be able to make the smart choice and avoid inhalants altogether.

For help with a drug problem or to locate treatment centers, go to www.findtreatment.samhsa.gov or call the national hotline at 1-800-662-HELP.

Cutting Edge: Drug-Abuse Statistics

To find out the data about dangers for teens regarding inhalants and other drugs of addiction, check out these Web sites for the latest statistics:

www.drugabuse.gov Scientific information from NIDA about all drugs of abuse and advice on how to quit.

<http://monitoringthefuture.org> Here you'll find data from the latest Monitoring the Future survey. Funded by NIDA, this survey of youth drug-use trends has been conducted annually by the University of Michigan's Institute for Social Research for more than 25 years.

www.nida.nih.gov/about/organization/CEWG/CEWGH.html Established by NIDA in 1976, the Community Epidemiology Work Group (CEWG) provides ongoing community-level surveillance of drug abuse through analysis of quantitative and qualitative research data.

www.drugabusestatistics.samhsa.gov Enter this site to access findings from the National Survey on Drug Use and Health, which investigates national drug-use trends among the general population age 12 and older.

www.cdc.gov/healthyyouth/yrbs/index.htm This will take you to the Youth Risk Behavior survey, which collects data from students in grades 9–12 nationwide. It includes questions on a variety of health-related risk behaviors, from drug use to seat-belt use.





HEADS UP
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Prescription Drugs: Their Use and Abuse



Rx PHARMACY
212-555-XXXX

A prescription label is not just a bunch of words.

It's a **doctor's** instructions to a patient: only this **person** can take this medication, in this amount, for this length of time. When the medication is taken **on purpose** for any other **reason**, that is called **abuse**.

IMPORTANT

MEDICATION SHOULD BE TAKEN WITH PLENTY OF **WATER**

300MG TABLET ORT Qty 36
Date 1/10/06

Prescription drugs have helped millions of people with any number of medical problems. Many people wouldn't even be alive without these medicines. But you've probably noticed that prescription drugs come with warnings such as: *Caution: Federal law prohibits the transfer of this drug to any person other than the patient for whom it was prescribed.... Do not drive or operate machinery.... Take with food.... Avoid prolonged sunlight.*

"The reason these drugs require a prescription is that they are powerful medications," says Wilson Compton, MD, director of the Division of Epidemiology, Services and Prevention Research, at the National Institute on Drug Abuse (NIDA).

Used at certain dosage levels in certain forms at certain times, prescription drugs are safe and effective. But when they are used for nonmedical purposes, that is called **abuse**, and abuse of prescription drugs is not safe. Abuse of a prescription drug—to get high, lose weight, or build up muscle—can have very serious health consequences and can even be deadly.

Abuse of a prescription drug can have very serious health consequences and can even be deadly.



HEADS UP: HEALTH RISKS FOR TEENS

Unfortunately, prescription drug abuse is on the rise. While it is important to note that most teens do not abuse prescription drugs, the current level of abuse of certain prescription drugs concerns NIDA scientists. In 2004, nearly 15 million Americans ages 12 and up—that's **6.1 percent of the population**—took a prescription drug for nonmedical purposes, according to a study by the federal government's Substance Abuse and Mental Health Services Administration.

The prescription drugs most often abused by teens are painkillers, antianxiety medications (benzodiazepines), stimulants, and steroids—powerful drugs that carry real health risks.

How many teens are abusing these drugs?

Enough to cause a lot of concern.

According to a 2004 NIDA study, 9.3 percent of high school seniors said they had abused the painkiller Vicodin in the past year. "That's a huge and frightening number," says Dr. Compton. Also disturbing

news is that 7.3 percent of 12th-graders had abused benzodiazepines at least once in the last year, 5.1 percent had abused Ritalin, and

Prescription Drug Health Alert for Teens

The following four categories show the dangers of the prescription drugs most abused by teens.

Opioids

OxyContin[®] and *Vicodin*[®] are **opioids**. These drugs are prescribed to treat severe pain.

Dangers When Abused

- Extremely addictive
- Slowing down one's breathing or stopping it altogether (death)
- Particularly dangerous with alcohol

Benzodiazepines

Xanax, *Valium*, and *Librium* are examples of **benzodiazepines**—central nervous system (CNS) depressants—prescribed to treat anxiety, acute stress reactions, and panic attacks. The more sedating benzodiazepines, such as *Halcion* and *ProSom*, are prescribed for short-term treatment of sleep disorders.

Dangers When Abused

- Can slow breathing and heartbeat, especially if combined with prescription pain medicines, certain over-the-counter cold and allergy medications, or alcohol
- Discontinuing prolonged use of high doses can lead to withdrawal and possible seizures

Stimulants

Ritalin and *Adderall* are prescribed mainly for attention-deficit/hyperactivity disorder. These drugs are known as **stimulants**.

Dangers When Abused

- Extremely addictive
- Extremely high body temperature

Anabolic Steroids

Anadrol, *Oxandrin*, and *Durabolin* are **anabolic steroids**—artificial versions of the hormone testosterone. They are prescribed in certain cases of delayed puberty or muscle wasting.

Dangers When Abused

- Infertility
- Breast development in males
- Facial hair in females
- Halted bone growth
- Liver tumors
- Cancer
- Premature heart attacks*

* Some of the health consequences of steroid abuse take months or years to develop, and they may occur long after a person has stopped taking these drugs. For example, people who abuse steroids increase their risk of having heart attacks at a young age.



HEADS UP REAL NEWS ABOUT DRUGS AND YOUR BODY

Tracking Prescription Drug Abuse

Wilson Compton, MD, heads NIDA's Division of Epidemiology, Services and Prevention Research. That means he's in charge of tracking drug-abuse trends in this country, then helping figure out what to do about them. We talked with him about his job and about prescription drug abuse.

Q: HOW DO YOU IDENTIFY TRENDS AMONG TEENS AND DRUG ABUSE IN THIS COUNTRY?

A: We go directly to teens and ask about their use of drugs. We go to homes and interview teens personally as well as to schools to administer questionnaires.

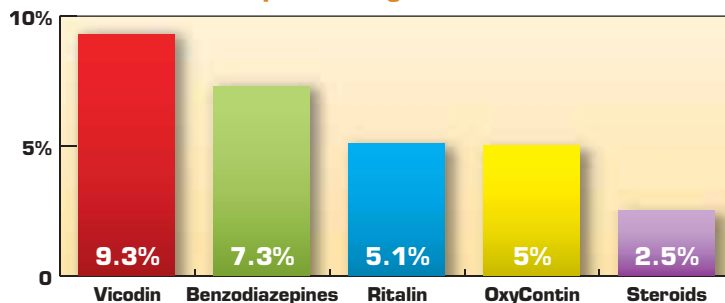
Q: WHAT ARE THE KEY RESEARCH AREAS REGARDING TEENS AND PRESCRIPTION DRUG ABUSE THAT YOU ARE INTERESTED IN TRACKING?

A: How many kids are using? What are their attitudes and behaviors? Knowing this is useful in predicting future behavior and drug patterns. Also, I'd like to know where kids get these drugs. Do they get them from their friends, the medicine cabinet, the Internet, drug dealers?

Q: WHAT WOULD YOU SAY TO A TEEN WHO SAYS, "I DON'T HAVE ANYTHING TO WORRY ABOUT. I ONLY TAKE PRESCRIPTION DRUGS OCCASIONALLY"?

A: If your friend said to you that they were only taking heroin occasionally, would you be concerned? If your friend said they were only taking crystal meth occasionally, would you be concerned? Prescription drugs have a lot of the same effects, and are just as dangerous as street drugs."

Percentage of High School Seniors Who Have Abused Prescription Drugs at Least Once in 2004



This data is taken from the 2004 Monitoring the Future survey, a yearly study of the behaviors, attitudes, and values of teens in America. For information on the latest findings, visit www.monitoringthefuture.org.

5 percent said they had abused the powerful pain reliever OxyContin. Adding to concern, teens in some communities are engaging in dangerous trading sessions, where they gather whatever medications they can find—old prescriptions of their own, pills from their families' medicine cabinets—and swap them. The bar graph above illustrates abuse among teens of five different prescription drugs.

HEADS UP: GET THE FACTS

NIDA scientists are searching for reasons why teens abuse prescription drugs. One reason may simply be availability. The number of prescriptions being written has gone way up in recent years, especially for pain relievers and stimulants.

Another reason is that abusers may mistakenly believe that prescription drugs, because they come from a pharmacy and not a drug dealer, are safer to take, even at high doses or without a prescription. And still another might be that abusing prescription drugs follows a pattern of behavior among people who abuse other drugs.

HEADS UP: KILLER PAINKILLERS

Just how harmful *are* the most abused prescription drugs? Extremely harmful.

One of the most dangerous is OxyContin, a pill that is designed to deliver pain relief over a 12-hour period. After the patient swallows the pill, medicine is released into the body little by little. But some abusers bypass the time-release

Myths About Prescription Drugs—and the Facts!

Myth: Prescription drugs come from a doctor and a pharmacy, so they must be safe.

Fact: If they are not taken responsibly and exactly as the doctor intended, prescription medicines can land you in the emergency room—or the morgue.

Myth: It's OK for me to use a prescription from the medicine cabinet that was prescribed for someone in my family.

Fact: Just because a medication has been prescribed doesn't mean it is appropriate and safe for everyone. Many prescribed medicines are custom fit to the patient's medical history, weight, allergies, etc. Bottom line: *Never take anyone else's prescriptions. It's not only unsafe—it's illegal.*

Wake-up Call: Steroid Abuse

If you follow the news, you've been hearing a lot lately about anabolic steroids in pro sports. These drugs are sometimes prescribed to treat body wasting in patients with AIDS and other diseases that result in loss of lean muscle mass. They are also prescribed to boys or men to treat conditions that occur when the body produces abnormally low amounts of testosterone, such as delayed puberty and some types of impotence.

But recently, some professional, amateur, and Olympic athletes

have been accused of abusing steroids to improve their performance—to cheat, in other words.

Why do some athletes take steroids? The drugs build muscle and bone mass—mainly by stimulating the muscle and bone cells to make new protein. Athletes who abuse steroids can train longer and build new muscle more quickly.

But when used for this reason, steroids are dangerous. Steroids can disrupt the normal production of hormones in the body and can



cause side effects ranging from stunted growth in young people, to facial hair in women or breast growth in males, to premature heart attacks, cancer, and serious psychiatric problems.

system by crushing or chewing the pills. That way, they get all of the drug in their system at one time, and the body responds very differently. It's like taking several doses of medicine all at once.

The risk of overdose then becomes huge. And an overdose of OxyContin can kill you.

To make matters worse, young people may abuse OxyContin at parties where alcohol is also on hand. This is a deadly situation because both OxyContin and alcohol can depress respiration (in other words, slow down a person's breathing or stop it altogether).

When the two substances are taken together, the risk of serious harm or death becomes much greater than with either taken alone.

Sadly, last year this combination claimed the life of a 20-year-old student at the University of California, San Diego. Daniel died in his dorm room after he took OxyContin to get high, then drank alcohol at a party. Daniel had a 3.2 grade-point average. He wanted to be a lawyer. Prescription drug abuse

killed that dream.

What about Vicodin, Ritalin, and Adderall? Can they kill you? Yes, definitely—but not nearly as easily as OxyContin can. Can they land you in the hospital? Yes. But the biggest known risk—and it is a real and serious risk—is addiction.

HEADS UP: LIFE OF ADDICTION?

When a person becomes addicted to a drug, his or her brain is changed. Normally, the brain's pleasure center releases the neurotransmitter dopamine in response to positive experiences like a walk on the

and diminish in importance. All that matters is finding and taking the drug that changed their brain to begin with.

"That's a terrible life sentence," says Dr. Compton. "It means your life gets narrower instead of bigger."

HEADS UP: USE AS DIRECTED

A recent NIDA-sponsored survey found that one in four teens with legitimate prescriptions said other kids had asked them for pills.

Students need to know that abusing prescription drugs is no different from abusing illegal drugs. If you wind up addicted to a

painkiller or hospitalized because you've stopped breathing, it makes no difference whether the drugs that got you there were picked up from a legitimate pharmacy or bought from a drug dealer.

Now that you have the facts about prescription drug abuse, share them with your friends and family. Everyone needs to understand that abusing prescription drugs is a prescription for disaster.

For help with a drug problem or to locate treatment centers, go to www.findtreatment.samhsa.gov, or call the national hotline at 1-800-662-HELP.

When a person becomes addicted to a drug, his or her brain is changed.



beach, a chat with friends, or victory in a big game. When a person becomes addicted to a drug, all those things lose their impact



HEADS UP REAL NEWS ABOUT DRUGS AND YOUR BODY

On the way to school



Homeroom

Connect with friends in between classes

...Wonder if I should go tonight?

...Should I finish studying for the quiz instead of talking with friends?

...Should I invite the new kids?

Break for lunch



A Day in the Life of a Teen

Decisions at Every Turn

Drugs?
No, Thanks.

Study hall

...Do homework, then read?



After-school activities

...Do I ask if I'm starting on Saturday?



Get together with friends



Surf Internet and check e-mail

...Should I tell him about the party?

...Is it a good time to tell Mom and Dad about the dent in the car?

...R U going 2night?...

Dinner

Homework

On the way home from school



Photos: clockwise from top: © COMSTOCK Images/age fotostock, inc.; © CONSTOCK Images/age fotostock, inc.; © Jaime Guez/age fotostock, inc.; © Royalty-Free/Corbis; © Nicole Katano/Brand X Pictures/age fotostock, inc.; © Masterfile Royalty-Free; © VStock LLC/age fotostock, inc.; © Bill Aloni/Photo Edit, inc. Background: © Rubberball Productions.

HEADS UP:
The Way to Go

As a teen, you lead a life jam-packed with a thousand things. All day long you may participate in activities and interactions in and out of school, including team sports, going to parties, going to the library, hanging out with friends at the mall, studying, surfing the Internet, group activities, and text-messaging. The list goes on and on. If you think about it, you make a lot of choices while you're doing these activities and during the rest of your day. Some are big and some are small, but everything you do and say involves making a decision.

While you may not ever be faced with this situation, someday you may be confronted by a friend or a stranger with an offer to take drugs. What would you do? This article discusses making tough decisions in social settings where drugs may be offered to you, as well as the harmful effects that those drugs cause. A big factor in deciding what to do is understanding what can happen—the outcome or consequence of your choices.

You'll find out the facts and dangers of drug abuse as you continue reading, and you'll learn what you can do—and say—to protect yourself and navigate through social situations. Making decisions that seem uncool in front of your peers can be hard. But making decisions that can harm you can lead to dangerous consequences—short-term and long-term.

“I just wanted to fit in, but it didn't feel right to go along with what everyone was doing.”—Stacey, age 13

“We got to the party, and it was so out of control. I should have just left.”—Casey, age 16

HEADS UP:
You're Normal

As part of their public-health mission to research the health effects and impact of drugs, scientists at the National Institute on Drug Abuse (NIDA) study trends on the number of teens abusing drugs, the kinds of drugs they abuse, and teens' perceptions of drug availability and the harmfulness of using drugs.

NIDA's mission is scientific but also includes sharing its research findings with the public, so its scientists seek to educate young people on the damage that drug

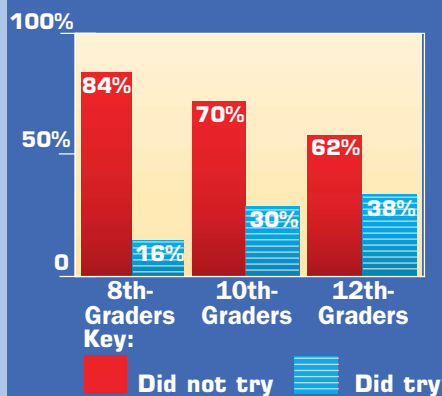
abuse and addiction can cause to their bodies and lives. Elizabeth Robertson, NIDA's

chief of prevention research, says that “teens tend to believe that other teens are using a lot more drugs, alcohol, and tobacco than they are.” In fact, researchers from the annual NIDA-funded Monitoring the Future (MTF) study found that more than 70 percent of 10th-graders in 2005 had not used illicit drugs in the year prior to their being surveyed.

This is important to know. When you *don't* abuse drugs, you are in the majority with other teens around the country. That's the good news. The reality is that one person using drugs is one too many: Drug abuse may destroy not only the life of the abuser, but the lives of those around him or her as well.

The MTF study also reveals the drugs that are most frequently abused by teens: prescription drugs, marijuana, alcohol, nicotine,

Percentage of Teens Surveyed in 2005 Who Did Not Try Any Illicit Drug in the Past 12 Months*—and Those Who Did



This information is from the 2005 Monitoring the Future survey, a yearly study of the behaviors, attitudes, and values of teens in America. For more survey findings, see www.monitoringthefuture.org.

*“Illicit” refers to any drug that is illegal or used illegally. The results above do not include cigarettes or alcohol.

methamphetamine, inhalants, and MDMA (ecstasy). While these may seem like harmless “party drugs,” each carries serious side effects, both in the short and long term. Drug abuse can wreak havoc on your body, your current and future health, and your social circles, which most teens want to preserve.

HEADS UP:
It's All in Your Head

When you're with your friends, why does it seem so hard to say or do something other than what they're doing? A big reason has to do with the way your brain is wired. “The brain is built to learn by imitating,” says Jay Giedd, MD, who has spent a lot of time researching teenagers' brains (see sidebar). “Young children imitate their parents; adolescents imitate their peers.”

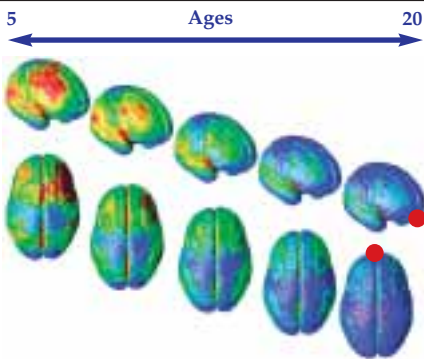


HEADS UP REAL NEWS ABOUT DRUGS AND YOUR BODY

The Teen Brain: A Work in Progress

Jay Giedd, MD, and his colleagues at the National Institute of Mental Health spent 15 years using MRI (magnetic resonance imaging) to map teens' brains. From early childhood through the teen years, participants came in every two years to have their brains scanned and studied.

This cutting-edge research gives the first-ever look inside the teen brain. It reveals that the teen brain is a work in progress. "The fact that your brain is still changing creates enormous abilities to learn," says Dr. Giedd, adding, "Following the living, growing brain in the same individuals over time really has been the key to understanding the path of development."



These images show 15 years of brain development for a healthy person, aged 5 to 20. The areas in red show parts of the brain that are still changing; the blue shows areas that are developed. The prefrontal cortex, indicated by the red circles, is the last part of the brain to develop. It is responsible for decision making and impulse control. As a person grows, his or her brain develops and matures, as the progression of the blue area shows.

© 2004 National Academy of Sciences, U.S.A. Gogtay, Nitin, Giedd, Jay N., et al. "Dynamic mapping of human cortical development during childhood through early adulthood." PNAS USA. 2004 May 25; 101(21): 8,174-8,179. Epub 2004 May 17, p. 8,178, fig. 3.

Dr. Giedd used brain-scanning techniques to determine that the prefrontal cortex—that's the part of the brain responsible for impulse control and decision making—does not fully develop in most people until around age 25.

Knowing this, picture yourself at a party watching friends abuse drugs. "Whatever else you might be reading or hearing, your brain is thinking, 'This is what my group does, and this is what I need to do to fit in,'" says Dr. Giedd. But is it?

Because a teen's prefrontal cortex is not fully developed, his or her brain relies on the limbic systems to make decisions. The limbic system is responsible for emotional reactions, especially those involving pleasure or excitement. But it also helps create feelings of drive and motivation, so that if you put your mind to something, you can accomplish it.

HEADS UP: *The Shape of Things*

Research shows that *when teens think things through, they make good choices about risk.* That's important to know, because when you're a teenager, the pathways in your brain are strengthened each time you repeat an activity or skill. Your daily experiences—and decisions—actually shape your brain. As you grow, the brain trims away pathways that aren't used. Those nerve connections that are used

frequently through repeating skills or experiences are made stronger. So, the key is to make your experiences as positive and safe as possible—and that means thinking about things beforehand. If someone offers you drugs, you'll be more likely to give the answer you want if you've planned it out in advance.



HEADS UP: *Make a Plan*

How do you plan it out in advance? There are many different strategies and ways to say no to drugs. One person who has studied

"Some people in our class started smoking marijuana. My friends and I agreed—we'd stick together and not try it."—Tasha, age 14

what influences kids to abuse drugs is NIDA-sponsored researcher Gilbert J. Botvin, Ph.D.,

professor at Weill Medical College of Cornell University and director of the school's Institute for Prevention Research. Dr. Botvin has developed successful prevention programs based on his research. He has proved that teaching kids to practice saying "no" in social settings is one of the best ways to help them avoid abusing drugs.

Most teens *start* using drugs in social situations. The first thing to do is learn how to say "no, thanks" in a casual way. You might think that other kids will make a big deal of it, but that's unlikely. "Kids and adults have an exaggerated view of the extent to which people are likely to pressure them to use substances," Dr. Botvin says.



Symptoms of Drug Overdose: Why You Must Act Immediately



But if you feel that a simple “no” won’t work, you have other choices. Dr. Botvin and his colleagues have developed some approaches that are presented in the chart below. These techniques have been tested with thousands of teens—and they work. Dr. Botvin says that kids who learn these techniques and use them are 50 to 60 percent less likely than others to abuse drugs.

HEADS UP: *The Choice Is Yours*

Now that you have the facts about what drugs can do to you, it’s time to give serious thought to how you’ll handle

social situations that may involve drugs. Talk about the techniques below with your friends and others close to you. Plan and practice what you will do in advance. And remember,

- **Abnormal pupil size (either too small or too large)**
- **Sweating**
- **Agitation (restlessness, increased tension, irritability)**
- **Tremors (involuntary shaking movements)**
- **Seizures**
- **Problems with walking**
- **Difficulty breathing**
- **Drowsiness**
- **Unconsciousness**
- **Hallucinations**
- **Delusional or paranoid behavior**
- **Violent or aggressive behavior**

If you suspect a friend may be suffering from an overdose or a toxic reaction to a drug, you must act. **Call 911 or get to a hospital.** You or your friend might get in trouble when an adult finds out that you’ve been around drugs, but that’s far better than your friend being dead, or in a coma.

It’s not possible for someone to sleep off an overdose. Taking a cold shower or drinking coffee will not help either. Drug and alcohol overdoses can stop the heart from beating or the lungs from breathing.

Drug overdose symptoms vary widely depending on the specific drug(s) used, but may include:

Remember, if you suspect a friend may be suffering from a drug overdose, **get help immediately.**

the vast majority of teens make the smart choice for their bodies and their minds: They don’t use drugs.

For help with a drug problem or to locate treatment centers, go to www.findtreatment.samhsa.gov, or call the national hotline at 1-800-662-HELP.

Ways to Give Drugs the Brush-off

THE TECHNIQUE	WHAT TO SAY
A Simple No Don’t make it a big deal. Be polite.	<i>No, thanks.</i>
Tell It Like It Is Be yourself and say it in a language that you’re comfortable with.	<i>No, thanks. I don’t drink or I don’t do drugs.</i>
Give an Excuse People make excuses all the time.	<i>I have to meet my friend or I’ll get kicked off the team.</i>
Change the Subject This can distract people.	<i>No, thanks. Hey—did you see that strange outfit Mary was wearing?</i>
Walk Away or Leave the Situation It’s common at parties to have a brief interaction, then wander off or leave entirely.	Say <i>no</i> , then walk to another group.
The Big Stall This works with escalating pressure. It doesn’t mean you will actually try it later.	<i>No, maybe later.</i>
The Broken Record Give one reason, then repeat the reason, but don’t get into a debate or argument—it doesn’t help.	<i>No, thanks—it makes me sick.</i> Repeat it if a person pressures you.



**HEADS UP
REAL NEWS
ABOUT DRUGS
AND YOUR BODY**

Activity Page

Test how much you know about drug abuse and addiction by answering the following questions below.

- Methamphetamine is a
 - hallucinogen.
 - stimulant.
 - narcotic.
 - painkiller.
- Which of the following organs or body systems can be seriously damaged by inhalant abuse?
 - the nervous system (brain, spinal cord, and nerves)
 - the heart
 - the liver
 - all of the above
- A prescription drug cannot legally be bought or sold without
 - a safety cap.
 - a doctor's permission.
 - a pharmacist's permission.
 - a parent's permission.
- Abusing steroids can result in
 - facial hair growth in women.
 - premature heart attacks.
 - psychiatric problems.
 - all of the above
- Most teens _____ the amount of pressure others will put on them to use illicit drugs.
 - underestimate
 - overestimate
 - don't care about
 - read about
- Methamphetamine causes alterations in the areas of the brain responsible for
 - memory and motor skills.
 - breathing.
 - sleep regulation.
 - all of the above
- When toxins from inhalants stay in the body for a long time, they are stored in
 - fatty tissue.
 - muscle tissue.
 - the inner ear.
 - the stomach.
- Most inhalants are actually intended to be
 - prescription drugs.
 - household and office products.
 - painkillers.
 - cold medicine.
- Methamphetamine can be responsible for
 - violent behavior.
 - burns.
 - explosions.
 - all of the above
- As a teen, each time you repeat an activity or skill the pathways in your brain are
 - strengthened.
 - unchanged.
 - weakened.
 - not used.
- The part of the brain known as the prefrontal cortex is fully developed
 - around age 5.
 - around age 10.
 - around age 15.
 - around age 25.
- Opioids are prescription drugs used to treat
 - viruses.
 - obesity.
 - infection.
 - pain.

Answer Key: 1. b; 2. d; 3. b; 4. d; 5. b; 6. a; 7. a; 8. b; 9. d; 10. a; 11. d; 12. d



Resources: Keep on Learning

If you'd like to find out more about the information discussed in these articles, or if you want to brush up on the brain and see how it is affected by drug abuse and addiction, check out these links and resources.

General Information

www.scholastic.com/headsup

At the Heads Up site, you'll find quotes from teens in recovery, pop-up activities, information about drugs, and more.

www.teens.drugabuse.gov

NIDA's Web site for teens focuses on the science behind all drugs of abuse. Find out how nicotine, prescription drugs, club drugs, and other substances act on the brain.

www.BacktoSchool.drugabuse.gov

NIDA's new site for science-based information on drugs of abuse is for teachers and students in all grades—and for parents, too.

www.drugabuse.gov/MOM/MOMIndex.html

Check out NIDA's online magazine series for teens. You can click on issues focusing on stimulants, hallucinogens, and more.

www.drugabuse.gov/consequences

NIDA's site highlights the variety of medical consequences of drug abuse and addiction, and explains how individual drugs can lead to these often serious health problems.

www.monitoringthefuture.org

This site has the latest findings from the Monitoring the Future survey, a NIDA-sponsored yearly study of the behaviors, attitudes, and values of teens in America.

Specific Drugs

www.thecoolspot.gov

Get the facts you need about alcohol at this Web site for teens, sponsored by the National Institutes of Health.

www.drugabuse.gov/ResearchReports/Cocaine/Cocaine.html

Visit this page to read NIDA's in-depth research report on cocaine abuse and addiction.

www.drugabuse.gov/ResearchReports/Hallucinogens/Hallucinogens.html

NIDA's research report on hallucinogens and dissociative drugs.

www.clubdrugs.org

NIDA's comprehensive site on drugs associated with the young adult rave scene.

www.marijuana-info.org

A compilation from NIDA of the latest research about marijuana, including sections for young people, teachers, and parents.

www.inhalants.drugabuse.gov

NIDA's research on inhalants, common household products that abusers inhale to get high—without being aware of the serious health consequences.

www.smoking.drugabuse.gov

NIDA's site on nicotine addiction and tobacco use.

www.steroidabuse.gov

Visit this NIDA site to learn about anabolic steroids and the consequences of their abuse.

FRIEND IN NEED If you are concerned that someone you know is abusing drugs or alcohol, talk to a trusted adult (such as a parent, teacher, or guidance counselor) for advice. Or, if your friend is ready to seek help, you may wish to offer the following resource: www.findtreatment.samhsa.gov or 1-800-662-HELP.



HEADS UP REAL NEWS ABOUT DRUGS AND YOUR BODY

Glossary

Power words to keep you in the know

Here are definitions of some terms that appear in *Heads Up: Real News About Drugs and Your Body*, as well as some other words that you may run across if you keep reading and learning about drug abuse, addiction, and the brain.

Addiction: A chronic, relapsing disease characterized by compulsive drug-seeking and abuse and long-lasting chemical changes in the brain.

Amphetamine: Stimulant drugs whose effects are very similar to those of cocaine.

Central nervous system: The brain and spinal cord.

Cerebellum: A portion of the brain that helps regulate posture, balance, and coordination.

Cerebral cortex: Region of the brain responsible for cognitive functions including reasoning, mood, and perception of stimuli.

Chronic: Refers to a disease or condition that persists over a long period of time.

Cocaine: A highly addictive stimulant derived from the coca plant.

Depressants: Drugs that relieve anxiety and produce sleep, including barbiturates and alcohol.

Dopamine: A brain chemical, classified as a neurotransmitter, found in regions of the brain that regulate movement, emotion, motivation, and pleasure.

Ecstasy (MDMA): A chemically modified amphetamine that has hallucinogenic as well as stimulant properties.

Hallucinogens: A diverse group of drugs that alter perceptions, thoughts, and feelings. Hallucinogenic drugs include LSD, mescaline, MDMA (ecstasy), PCP, and psilocybin (magic mushrooms).

Hippocampus: An area of the brain crucial for learning and memory.

Illicit: Refers to any drug that is illegal or used illegally.

Inhalant: Any drug administered by breathing in its vapors. Inhalants commonly are organic solvents, such as glue and paint thinner, or anesthetic gases, such as ether and nitrous oxide.

Limbic system: A set of brain structures that generates feelings, emotions, and motivations. It is also important in learning and memory.

LSD (lysergic acid diethylamide): A hallucinogenic drug that acts on the receptor for the neurotransmitter serotonin.

Medication: A drug that is used to treat an illness or disease according to established medical guidelines.

Methamphetamine: A commonly abused, potent stimulant that is part of a larger family of amphetamines.

Myelin: Fatty material that surrounds and insulates axons of most neurons.

Neuron (nerve cell): A unique type of cell found in the brain and body that is specialized to process and transmit information.

Neurotransmitter: A chemical produced by neurons to carry messages to other neurons.

Pre-frontal cortex: The region of the brain responsible for impulse control and decision making.

Prescription drug: see Medication

Receptor: A molecule that recognizes specific chemicals (normally neurotransmitters and hormones) and transmits the message carried by the chemical into the cell on which the receptor is located.

Stimulants: A class of addictive drugs that speed up the body's central nervous and circulatory systems. Stimulants include cocaine, methamphetamine, and Ritalin.

Withdrawal: Symptoms that occur after chronic use of a drug is reduced or stopped.