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.

Inside this compilation:

- 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

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

- **Emotion, reward (limbic system)**: More change
- **Memory (hippocampus)**: Less change

**Areas of Greatest Change**

0% 3% 5%
Less Change More Change

**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.
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.

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)
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.

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.
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.

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.

**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.

**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.”

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

**Heads 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.

**Heads 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.

**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](http://www.drugabuse.gov) Scientific information from NIDA about all drugs of abuse and advice on how to quit.
- [http://monitoringthefuture.org](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/CEWGHome.html](http://www.nida.nih.gov/about/organization/CEWG/CEWGHome.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](http://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](http://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.
Prescription Drugs: Their Use and Abuse

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.
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.

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

**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 for having heart attacks at a young age.
5 percent said they had abused the powerful pain reliever OxyContin. 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 point and take the whole pill at once, which can be extremely dangerous. In fact, some abusers have died from taking too much OxyContin at once.

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.
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 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 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.
A Day in the Life of a Teen

Decisions at Every Turn

Drugs? No, Thanks.

On the way to school

...Wonder if I should go tonight?

Homeroom

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

Connect with friends in between classes

...Should I invite the new kid?

Study hall

...Do homework, then read?

Break for lunch

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

After-school activities

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

Homeroom

...Should I tell him about the party?

Homework

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

Dinner

...Do I go tonight?

On the way home from school

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

Homeroom

...Should I invite the new kid?

Study hall

...Do homework, then read?

Break for lunch

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

After-school activities

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

Homeroom

...Should I tell him about the party?

Homework

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

Dinner

...Do I go tonight?

On the way home from school

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

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**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 can wreak havoc on your body, your current and future health, and your social circles, which most teens want to preserve.

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**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.”
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: 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 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.

“Some people in our class started smoking marijuana. My friends and I agreed—we’d stick together and not try it.”—Tasha, age 14
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, the vast majority of teens make the smart choice for their bodies and their minds: They don’t use drugs.

**Ways to Give Drugs the Brush-off**

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

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:

- 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

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

**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.**
1. Methamphetamine is a
   a. hallucinogen.
   b. stimulant.
   c. narcotic.
   d. painkiller.

2. Which of the following organs or body systems can be seriously damaged by inhalant abuse?
   a. the nervous system (brain, spinal cord, and nerves)
   b. the heart
   c. the liver
   d. all of the above

3. A prescription drug cannot legally be bought or sold without
   a. a safety cap.
   b. a doctor’s permission.
   c. a pharmacist’s permission.
   d. a parent’s permission.

4. Abusing steroids can result in
   a. facial hair growth in women.
   b. premature heart attacks.
   c. psychiatric problems.
   d. all of the above

5. Most teens___________the amount of pressure others will put on them to use illicit drugs.
   a. underestimate
   b. overestimate
   c. don’t care about
   d. read about

6. Methamphetamine causes alterations in the areas of the brain responsible for
   a. memory and motor skills.
   b. breathing.
   c. sleep regulation.
   d. all of the above

7. When toxins from inhalants stay in the body for a long time, they are stored in
   a. fatty tissue.
   b. muscle tissue.
   c. the inner ear.
   d. the stomach.

8. Most inhalants are actually intended to be
   a. prescription drugs.
   b. household and office products.
   c. painkillers.
   d. cold medicine.

9. Methamphetamine can be responsible for
   a. violent behavior.
   b. burns.
   c. explosions.
   d. all of the above

10. As a teen, each time you repeat an activity or skill the pathways in your brain are
    a. strengthened.
    b. unchanged.
    c. weakened.
    d. not used.

11. The part of the brain known as the prefrontal cortex is fully developed
    a. around age 5.
    b. around age 10.
    c. around age 15.
    d. around age 25.

12. Opioids are prescription drugs used to treat
    a. viruses.
    b. obesity.
    c. infection.
    d. pain.
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.
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.

**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.