

# HEADS UP REAL NEWS ABOUT DRUGS AND YOUR BODY

**W**ELCOME TO *HEADS UP: Real News About Drugs and Your Body*, a drug education series from Scholastic and the scientists of the National Institute on Drug Abuse (NIDA). Our mission is to bring you real news about the effects drugs can have on your brain, your body, and, ultimately, your life.

The theme of our series is **respect**—the respect we have for you, and the respect we hope you'll have for yourself. Here's how that respect is going to play out.

We're not going to just *tell* you to stay away from drugs. **We're going to bring you the true stories of teens** who've abused drugs. Then, you'll find out what science has to say. "What we're going to give you are the facts about how drugs can affect your brain and your body," says Dr. Tim Condon, Associate Director of NIDA.

Then, once you have the facts, we think you'll be more likely to respect yourself and make smart choices.

In this series, we're going in for close-ups on some common drugs of abuse. We begin with **nicotine**, which, as you'll learn, is a powerfully

addictive drug. It can also be deadly.

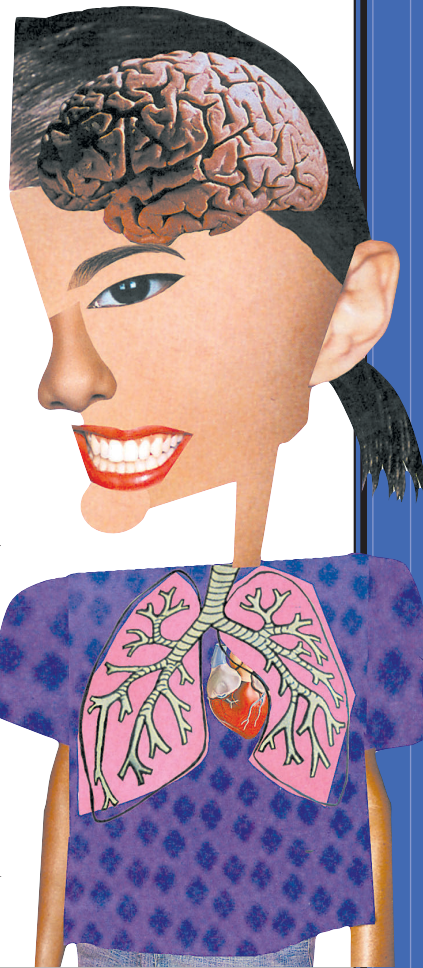
Next, we focus on **marijuana**. You'll meet Alby, a 19-year-old recovering marijuana abuser. He talks about why he turned to the drug, how it turned his life upside down, and how he's still struggling with the harmful effects of his abuse.

For each drug we present, we'll break down the science. That means we'll be getting into the gory details of damaged brain cells, funky lungs, and muscle spasms.

But first, let us introduce you to another important entity—**your brain**. Once you see

the ins and outs of this amazing organ, you won't want to mess with its delicate workings.

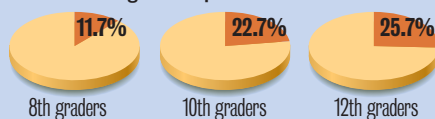
So, **heads up**. There's some powerful information coming your way. ▶



## DRUG STATS

You may be surprised to see that drug use is not that common among your peers. Check out the stats below from a 2001 NIDA-funded study.

### Used illicit drugs in the past month



# Meet Your Incredible Brain

By Kathy Kukula

Check out command central for everything you do.

What's that gray, wrinkled blob inside your skull? It's your brain—the body's most amazing organ, a three pound factory for feelings, memories, ideas, and movement. It makes your heart beat, stores the beat to your favorite song, and prompts you to “beat it” when you sense danger. Your muscles may seem

smart when you hit a home run or learn a dance step, but every instruction comes from your brain.

Your brain is always changing—and growing. New experiences create new connections between brain cells, adding to a dense web of brain tissue. There's no end to what you can learn: One brain

cell, or **neuron**, can have thousands of connections, or **synapses**, with other brain cells. Messages zip from neuron to neuron, carrying information to and from your muscles and sense organs, and from brain part to brain part.

In short, the brain is an intricate machine. Check out what goes on inside your head.

## YOUR BRAIN: PIECE BY PIECE

**IN CHARGE:** The *cerebral cortex* is the largest part of your brain. It sits like a mushroom cap on the rest of your brain and takes up about two thirds of the total mass. This is where you think and reason. It's where you create the kind of movements you have to think about, like playing the piano or flipping your skateboard. Parts of the cerebral cortex also control seeing, hearing, and touching.

**Plan and Reason:** The *prefrontal cortex* helps you plan ahead. This is where you consider the consequences of your actions. This part of your brain doesn't finish developing until you're 20.

**Move:** When you think about moving your body, the *motor cortex* tells your muscles what to do. Precise moves, like typing, or playing an instrument, use lots of brain cells.

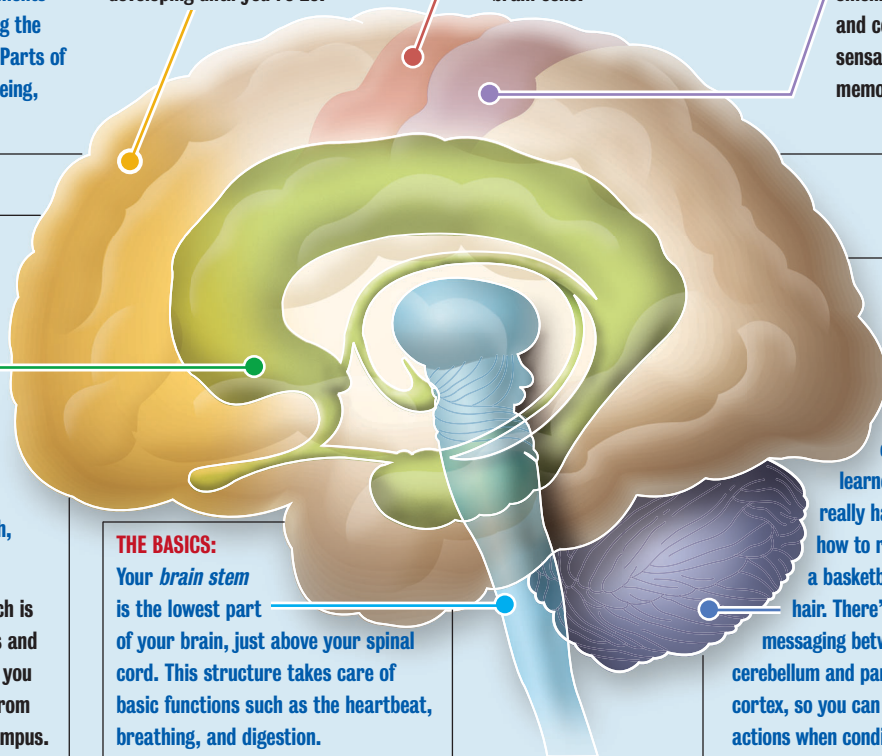
**Sense:** The *posterior parietal cortex* is a processing center that makes sense of what you're feeling, smelling, and hearing, and connects those sensations to memories and ideas.

**THE FEELINGS BRIDGE:** The *limbic system* is like a bridge between your thinking brain—the cerebral cortex—and the parts of your brain that control your body's physical systems. This makes it easy for strong feelings—such as pleasure, fear, or attraction to other people—to cause reactions in your stomach, muscles, and heart.

**Remember:** The *hippocampus*, which is part of the limbic system, receives and stores long-term memories. So, if you remember your teachers' names from last year, you're using the hippocampus.

**THE BASICS:** Your *brain stem* is the lowest part of your brain, just above your spinal cord. This structure takes care of basic functions such as the heartbeat, breathing, and digestion.

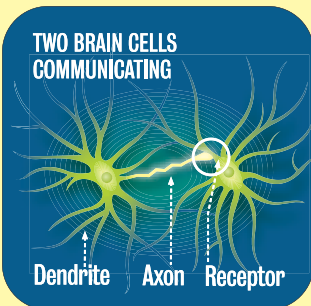
**IT'S A HABIT:** The *cerebellum* helps with everyday tasks you do over and over. Once you've learned how, you don't really have to think about how to ride a bike, dribble a basketball, or comb your hair. There's constant messaging between the cerebellum and parts of the cerebral cortex, so you can adjust your actions when conditions change.





## Instant Messages—IMs in Your Brain

**H**ow do brain cells get their messages across? Messages travel through brain cells, also called nerve cells or neurons, as electricity. Neurons have threadlike fibers called *axons* that send messages and branches called *dendrites* that receive them.



To make messages jump from cell to cell—when your brain signals your hand to scratch your head, for example—your brain creates chemicals called *neurotransmitters*. Whenever you think or act, axons release these chemicals. Dendrites have *receptors*, like custom-made garages, into which each chemical fits. A fatty white coating called *myelin* covers many axons; it helps messages move quickly, especially along the long axons that connect to muscles.

## The Pleasure Center

**I**f you've ever sunk a basket, held hands with someone special, or bitten into a juicy cheeseburger, you may remember the rush of pleasurable feelings those events created. These good feelings are a key to your survival—after all, if you eat well, you'll live longer, and most of us think of eating as a pleasurable experience.

Unlike remembering, say, your history homework, you remember pleasure more quickly because of a chemical called *dopamine*. Dopamine works in the pleasure center in the middle of your brain (see the limbic system on the diagram at left).

Once you've had a "feel-good" experience, your brain builds a new path, like a shortcut. That's why you'll start to feel good the next time you just pick up a basketball, smell the cheeseburger, or see your crush in the hall. Your senses send signals, and the dopamine starts flowing. You've wired your brain to repeat what brings good feelings. You smile just thinking about it!



## Drugs Fool Your Brain

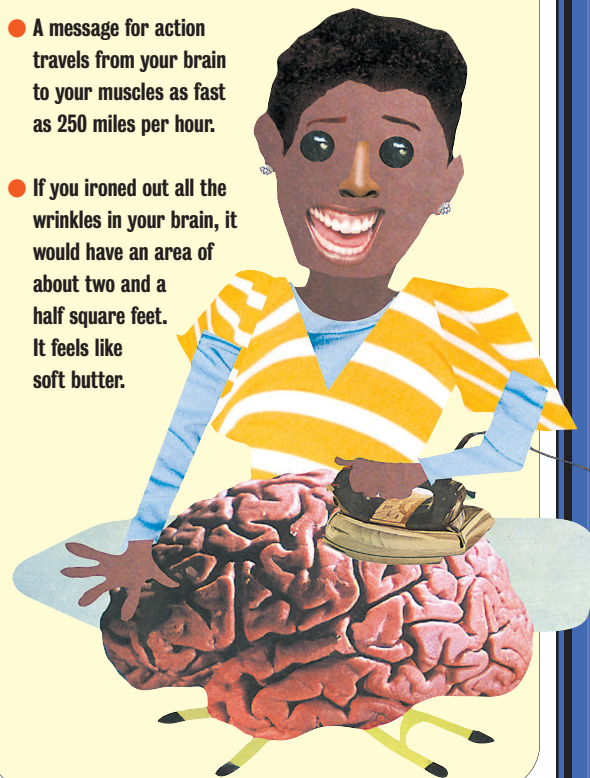
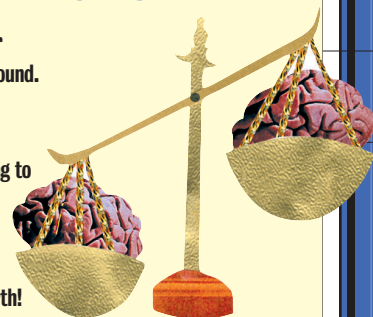
**D**ifferent drugs act on the brain in different ways. But all drugs of abuse have one thing in common: they act on the way the brain experiences pleasure. Drugs make people "high" by invading and manipulating the brain's pleasure circuitry. They fool your brain into good feelings that are a reaction to chemicals, instead of to real experiences.

The key word is "fool." Drug abuse can damage the brain's wiring for pleasure, making it unable to function in a healthy, normal way. You can become addicted, meaning that your craving for the feeling you get from a drug will become so strong that you'll risk serious consequences to get it. And your ability to feel pleasure the old-fashioned way—the real way—may be disrupted. Good food, real accomplishments—even true love—may leave you feeling flat.

In addition to damaging the way you process pleasure, drugs can damage your brain and body in many other ways. So don't be fooled. And keep reading to learn more.

## AMAZING FACTS

- When you're born, your brain weighs about a pound. But by age six, it weighs three pounds. What happens? Learning to stand, talk, and walk creates a web of connections in your head—two pounds worth!
- Your brain weight accounts for about two percent of your body weight. But your brain uses 20 percent of your body's oxygen supply and 20 to 30 percent of your body's energy.
- Your brain has about 100 billion neurons. A typical brain cell has from 1,000 to 10,000 connections to other brain cells.
- The right side of your brain controls the left side of your body, and the left side of your brain controls the right side of your body.
- Your brain is full of nerve cells, but it has no pain receptors. Doctors can operate on your brain while you're awake—and you won't feel a thing!
- A message for action travels from your brain to your muscles as fast as 250 miles per hour.
- If you ironed out all the wrinkles in your brain, it would have an area of about two and a half square feet. It feels like soft butter.



# Smoking Gun



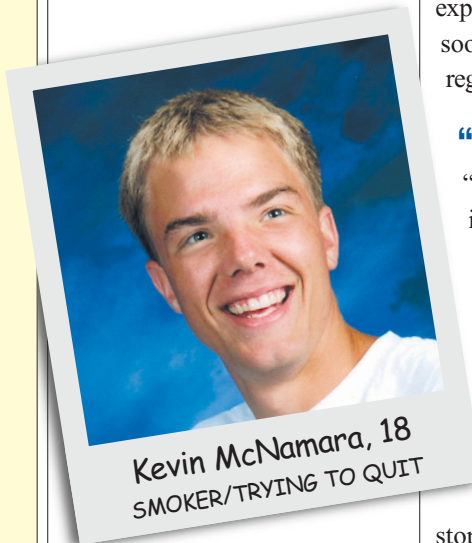
Cigarettes are addictive and deadly. So why are teens still smoking?

**CLOSE UP: NICOTINE**

## If you're looking for the Robinson

Rams baseball team during fourth period lunch, don't bother searching the cafeteria or the practice diamond. On most afternoons, you'll find a handful of the top players from Robinson

Secondary School in Fairfax, VA, huddled in a friend's nearby basement. They eat pizza. They play Tony Hawk video games. And always—



always—they smoke cigarettes.

"Kids hanging out. Whether it's a party or lunch, there are going to be smokes," says Kevin McNamara, an 18-year-old Robinson senior and a regular attendee at the basement brunch. Kevin is a star member of the school's golf team. He was also the Rams' ace pitcher until he tore a ligament in his knee.

And, until recently, he smoked two packs a day.

"Kevin's story is not unusual," says Dr. Bill Corrigan, Director of NIDA's Nicotine and Tobacco Addiction Program. "Many teens and even pre-teens begin to experiment with smoking, but soon find they are smoking regularly—they're addicted."

### "I WANT TO QUIT"

"I used to be able to run a mile in under six minutes. Now I'm lucky to make it in eight. And I'm wheezing all the way," says Kevin, who's cut his daily use down to ten cigarettes. "I want to quit. But it's not that easy."

More than ever, teens find that the best way to stop smoking is to never start at all. Teen smoking rates have steadily fallen since 1996, according to a NIDA-funded study.

That's the good news. The bad news, experts say, is that teen smoking numbers are still too high. Each day, more than 3,000 children and adolescents become cigarette smokers, notes the Centers for Disease Control and Prevention.

That's more than 1 million teens a year. Roughly one-third of them will die from a smoking-related illness.

"There's hard evidence that smoking leads to addiction, health problems, and death," says Dr. Eric Moolchan, director of NIDA's Teen Tobacco Addiction Treatment Research Clinic. "Teens have a choice: They can become victims, or they can stop before they go too far. Better yet, they never have to start at all."

### "I MUST HAVE BEEN CRAZY"

Even those who are well aware that smoking kills find cigarettes hard to resist. Sarah Millermon, an 18-year-old from Stockton, CA, knows the dangers of cancer first-hand.

When she was a baby, she developed leukemia, a blood-related cancer. She underwent chemotherapy until she was two. And, while she's been





# CIGARETTES: HOW THEY HOOK AND HURT

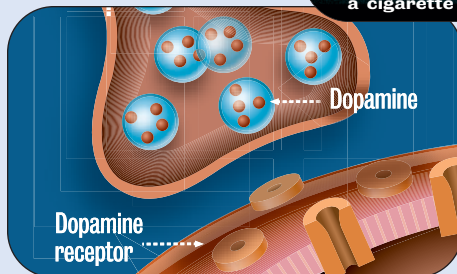
**C**igarette smoke contains more than 4,000 chemicals, including toxins like ammonia. But the chief culprit in cigarettes is nicotine, a powerfully addictive drug.

With every puff of a cigarette, nicotine alters how your brain functions. Like cocaine and heroin, nicotine stimulates the release of a molecule called dopamine, located in parts of the brain that are involved in addictive behaviors. Although a user does not get the high from cigarettes that one might get from drugs like cocaine and heroin, make no mistake: nicotine affects your brain.

Nicotine “primes” the brain for addiction. You can begin to crave cigarettes more than anything else. “Smoking becomes your sole focus,” says



A post-mortem cancerous lung of a cigarette smoker.



Dr. Cindy Miner, the Chief of NIDA's Science Policy Branch. “Nothing else is as pleasurable as it used to be.”

Indeed, your brain becomes so used to the presence of nicotine that, when you try to quit, it rebels and craves more.

But addiction may be just the tip of the iceberg when it comes to risks from smoking. When you inhale, cigarette smoke and the chemicals it carries are absorbed by the lungs and quickly move into the bloodstream, where they circulate through your heart to your brain and the rest of your body. Your lungs fill with chemical deposits.

“You’re taking tar into your lungs and there’s no way to clear out all that debris,” says Miner. “Suddenly you find that you are gasping for breath on the soccer field.”

Research suggests that nicotine is even more harmful to the developing heart, lungs, and brains of teens. “The younger you start, the more likely you will get hooked,” Miner says. “The younger you get hooked, the more cigarettes you will smoke. And the more cigarettes you smoke. . . Well, we know where that leads.”

Ashley Sobrinski, 14  
NON-SMOKER

cancer-free ever since, the prospect of a relapse is never far from her mind.

Still, as a teen, Sarah went on to smoke a pack a day, putting herself at risk for cancer of the lungs, mouth, esophagus, larynx, stomach, pancreas, kidney, and bladder.

“When you’re addicted to cigarettes, you can rationalize anything,” says Sarah, who hasn’t smoked in three months. “I’d tell myself: ‘Well, I beat cancer once. I can do it again.’ Now I look back and think I must have been crazy.”

## “A HORRIBLE THING TO SEE”

Unlike Sarah, some teens see the ravaging effects of cancer and vow never to pick up a cigarette. Ashley Sobrinski, a 14-year-old from Ocean City, NJ, watched her grandfather succumb to lung cancer.

“It’s a horrible thing to see,” she says. “The cancer just took over his body.” He began smoking as a teenager in the Navy. Ashley understands how a teen in the 1940s might have been tricked into taking up cigarettes. But she can’t see how today’s teens fall for it.

“With all the information that’s out there, with all the people who have died from smoking, it just puzzles me that kids keep doing it,” she says. “You know that if you put that cigarette in your mouth, it might kill you. But you do it anyway. That just doesn’t make sense.”

## By Any Other Name

**A**s if cigarettes aren’t bad enough, there are other hazardous tobacco products. Because of how they look or smell or how they’re used, some people might think they’re not as addictive or harmful as cigarettes. But here’s the truth:

- **Chewing tobacco:** Spit, snuff, dip, smokeless. The amount of nicotine in one pinch of dip can be five times as high as in a cigarette. Plus, dip comes with its own health risks. From the toxins in the juice created, chewers can develop painful lesions on their tongue, as well as cancer of the esophagus, pharynx, larynx, and stomach. Perhaps worst of all are cancers of the mouth and tongue, which often require surgery to remove parts of a user’s face. These cancers from chewing tobacco often occur earlier, rather than later, in a user’s life.
- **Cigars:** Cigars are puffed and not inhaled, but the smoke still gets into the lungs and does just as much damage as cigarettes, and cigar smokers

risk the same oral cancer and other irritation problems as people who chew tobacco. Also, a cigar delivers nicotine. In fact, it delivers about four times as much nicotine as a cigarette.

- **Bidis:** These hand-rolled cigarettes from India (pronounced “beedees”) are often packaged in cinnamon, orange, and chocolate flavors to appeal to kids. But don’t let the taste fool you. Bidis are generally unfiltered and can have 28 percent higher nicotine concentration levels than cigarettes.



# The Lows of Getting High

One teen's journey from street corner to jail to recovery

**CLOSE UP: MARIJUANA**

By Cate Bailey

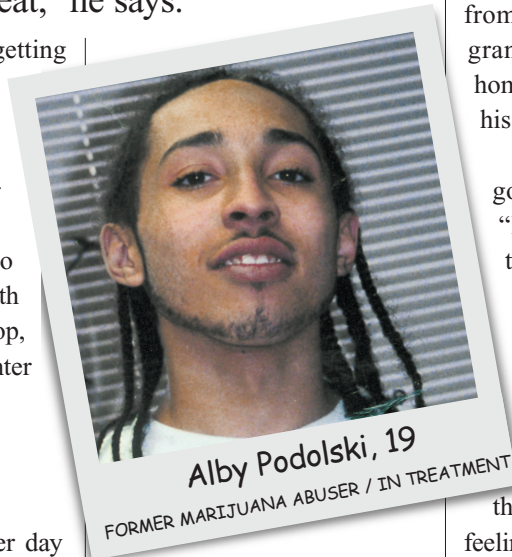
**At 18, Alby Podolski** was living a nightmare behind bars. He felt he was in constant physical danger. "I saw people get stabbed," Alby says. And he experienced daily indignities. "I couldn't eat the food they served. The potatoes were like blocks and the meat didn't taste like meat," he says.

Believe it or not, getting arrested was probably the best thing that could have happened to Alby. It got him into treatment for his drug problem.

When we spoke to Alby, he was one month into his recovery at Daytop, a drug rehabilitation center in Westchester, NY.

## GRUDGE AGAINST THE WORLD

It all started one summer day on a street corner in Yonkers when Alby was 13. "You need to get your mind right. Hit this blunt," a friend said.



Alby Podolski, 19  
FORMER MARIJUANA ABUSER / IN TREATMENT

Alby didn't have the strength to say no. He felt he had to smoke the blunt (a cigar hollowed out and

refilled with marijuana or a mix of cocaine and marijuana) to fit in. And he desperately wanted to belong.

His parents had never been there for him. They were drug addicts themselves and couldn't handle the demands of parenting. So, Alby bounced from a foster home to his grandmother's to a group home. When he was about 14, his mother died.

"I wasn't supposed to go through this," Alby says. "I had a grudge against the world."

After trying marijuana (also called weed, grass, pot, herb, boom, Mary Jane, and chronic) to fit in, Alby kept abusing the drug because he enjoyed the high, or intoxicated feeling, marijuana creates. "It had me in another state of mind," he says. "I was relaxed. All my problems seemed like they were disappearing."

## THE ADDICTION QUESTION

"I was definitely addicted," says Alby of his daily use of marijuana over a five-year period. For some people, this is a controversial idea.

They argue that marijuana is not addictive.

According to NIDA, addiction is characterized by "compulsive, at times uncontrollable, drug craving, seeking, and use that persist even in the face of extremely negative consequences."

Dr. Glen Hanson, the Acting Director of

NIDA, says that marijuana is indeed addictive. "I find it ironic that people say 'oh, it's not addictive' and yet it's the most commonly used of our illicit [illegal] drugs," he says.



Although Hanson concedes that not everyone who smokes marijuana becomes addicted, he points out that many people experience cravings for the drug and have withdrawal symptoms when they get off it. "For me, that defines addiction," he says.

ERIC O'CONNELLY/TAXI BY GETTY IMAGES/MARIJUANA



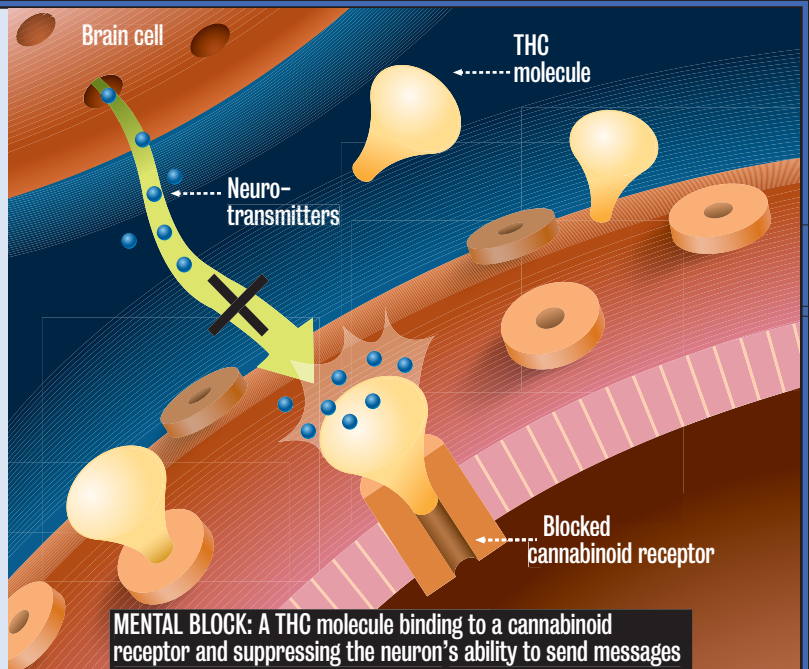
# THC INVASION

The relaxed feeling Alby describes was caused by THC (tetrahydrocannabinol), the active ingredient (most powerful chemical) in marijuana. But the chemical was also responsible for the negative effects he experienced.

Here's what happens: When a user smokes marijuana, the THC travels quickly through the bloodstream to the brain. That's when the problems start. In everyone's brain, there are special receptors, called cannabinoid receptors. They're located in several important brain regions (shown here in brown), including the area that helps you remember things. THC

attaches to the cannabinoid receptors and interferes with the brain's normal functioning.

Trying to remember a phone number? Forget it, if THC has taken over.



## THE PRICE

But Alby's problems weren't disappearing. They were getting worse. The good feelings he sought from marijuana would come at a price.

Over the next five years, Alby smoked marijuana every day, several times a day. He went to school high and eventually dropped out. "I was losing focus. My attention went from 100 to 0. I was depressed," he says.

Despite the consequences, Alby kept smoking marijuana. In fact, he was willing to do anything to get high. Eventually, he started dealing drugs to support his habit. That's what landed him in Valhalla Correctional Facility, a maximum-security jail in Westchester.


## NEW FRIENDS, LINGERING EFFECTS

Now, at Daytop, Alby has been able to address the real problems in his life by talking them out with counselors and

making new friends whom he describes as "positive."

But he still feels some of the effects of his drug use. "Sometimes I want to say things, and I can't get them out. I can't find the word," Alby says. "I never had that problem before I started smoking."

Alby's memory problems may improve with time. But for now, they are enormously frustrating. "I used to know things," says Alby. "But now, it's rusty. I forgot how to do division."

Frustrations aside, he is looking ahead and hoping to create a future for himself. Alby wants to pursue a career as a mechanic. 

## Tobacco Vs. Marijuana

You've read our report about cigarette smoking and the damage that can do to your lungs. But what *marijuana* does to your lungs may be news.

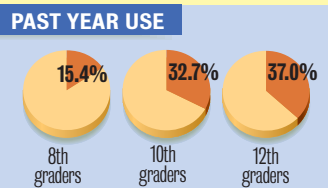
Here's some of what science tells us:

- Marijuana smokers can develop phlegm and a daily cough.
- Marijuana smoke contains 50 to 70 percent more cancer-causing chemicals than tobacco smoke.
- Puff for puff, smoking marijuana may increase the risk of cancer more than smoking tobacco does.
- People who smoke marijuana are at greater risk for lung infections, like pneumonia.
- Chronic marijuana smokers are vulnerable to bronchitis, emphysema, and bronchial asthma.
- Scientists have found signs of lung tissue injured or destroyed due to marijuana use.



## Marijuana: By The Numbers

Marijuana may be the most commonly used illicit drug. But it's NOT being used by most of your peers—not even close. In case you ever get that classic peer pressure line, "Everyone's doing it," here are the real numbers from a 2001 NIDA-funded study.





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

# "E" Is for Empty



Ecstasy use left Daniel feeling worthless and alone.

www.scholastic.com  
 /HEADSUP



# CLOSE-UP: ECSTASY

**Daniel Oerum**, 17, of San Clarita Valley, California, wanted prom night to be special. So, he reached into his tuxedo pocket and took out pills stamped with images of Tweety Bird and Buddha. Ecstasy (also called E, X, XTC, Adam, hug, love drug, and beans) looked harmless enough. But Daniel found out the hard way how dangerous it can be.

"My heart was racing so fast. I thought I was having a heart attack," Daniel said. A friend helped him into the prom because his legs wouldn't stop trembling. The dance floor was located on a Hollywood movie set. Daniel tingled from head to toe. "Then I hit a peak," he said. "I felt like a movie star."

Later at a friend's house, Daniel crashed into gloom and confusion. He swallowed two more "E" pills. Taking

multiple doses within a relatively short time multiplies the toxic risks of any drug. With ecstasy, "stacking," or doubling the dose, carries especially high risk. The level of ecstasy builds and the user's body can't keep up with the amount of drug in his or her blood. That's what happened to Daniel.

"I lay down and couldn't lift my head," he said. "My legs were rocking back and forth."

The following weekend,

Daniel dropped "E" at a rave where some 200 kids danced on a dirt clearing. Before long Daniel was selling ecstasy. "I'd walk into raves and yell 'E' and people would crowd around. I felt a sense of power." With the profits, he bought more ecstasy which he took often, always with other kids. "I did drugs so I didn't have to feel alone," he said.

When Daniel's father worked nights, friends flocked to his house. Adorned with glow-in-the-dark shirts and beads, they danced to trance music and chewed pacifiers to keep their teeth from grinding.

## LIVES DESTROYED

Soon Daniel was dropping up to five "E" pills a day. Desperate to feed his habit, he started selling

## CASUALTY OF ECSTASY

**N**ineteen-year-old Melissa Ross died after trying ecstasy for the first time. The Emory University sophomore had hoped to dance the night away with friends at an Atlanta club. Instead, she ended up in the morgue.

News of her death shocked Bill Gentry, a close friend who remembers singing and playing piano with Melissa in their dorm lobby. "Melissa was probably one of the cleanest people I'd ever known. She didn't do drugs, smoke, or even drink. She probably wanted to try ecstasy and see what it was like," he said. "I'm sure if she knew ecstasy could kill, she never would have taken it."

Melissa died from a fatal heat reaction, known as hyperthermia. Part stimulant, ecstasy acts on the brain's hypothalamus. It ramps up heart rate and blood pressure and disrupts the brain's ability to regulate body temperature. A brain unable to cool off an overexerted body on a jam-packed dance floor spells disaster. "The body sweats and the extreme loss of water causes dehydration," says Dr. Glen Hanson, Acting Director of the National Institute on Drug Abuse (NIDA). "Users tend to ignore some of these symptoms, partly because the drug masks them, and partly because they're distracted by the social setting."



EROWID.ORG/PILLS; GREG SMITH/AP WIDE WORLD PHOTOS(RAVE)

By Laura D'Angelo





Daniel Oerum, 17  
ECSTASY ABUSER/IN TREATMENT

## FAQS ON XTC

### 1 What is it?

Ecstasy, or methylenedioxymethamphetamine (MDMA), is part hallucinogen and part stimulant.

### 2 How many teens use ecstasy?

According to a 2001 NIDA-funded study, 5.2% of 8th-graders had tried ecstasy; 8% of 10th-graders had tried the drug; and 11.7% of 12th-graders.

### 3 How does it make a user feel?

In the short term, ecstasy can make some users feel confident, blissful, and uninhibited. Users may also have negative experiences, like anxiety attacks.

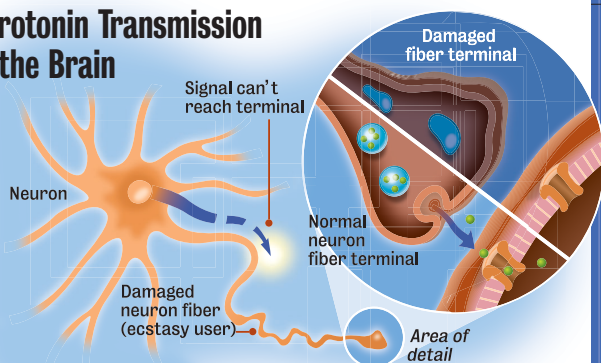
### 4 What are the side effects?

“E” can damage a user’s brain. “Moderate to heavy ecstasy users are likely to have memory and sleep problems and experience depression,” says Dr. Hanson. How does that happen? Ecstasy can “x-out” the fibers of neurons that carry serotonin, a chemical messenger that plays a big role in mood, pain, sleep, memory, and thinking.

### 5 Do the neuron fibers grow back?

Sometimes they do grow back, but not necessarily in the same parts of the brain. “It’s like cutting off a limb of a fruit tree,” says Hanson. “The tree’s still alive and can sprout a new limb somewhere else, but it may not bear as much fruit as the old one,” says Hanson.

## Serotonin Transmission in the Brain



Serotonin travels through the healthy brain by jumping from cell to cell along the fibers of **neurons** (brain cells). But ecstasy use damages the **terminals** (ends) of neuron fibers. Chemical messages relating to mood, sleep, memory, and more are disrupted.

cocaine and methamphetamine as well as ecstasy. “I was skinny. My skin was the color of paper. My teeth were rotting out,” Daniel said. “I would steal anything I could get my hands on. I stole valuables from my dad. I didn’t see anything wrong with the way I was acting.”

Once, a friend’s mother wanted to buy drugs from Daniel. When he delivered the bag of speed to the house, Daniel watched his friend’s face crumple in sadness. “I felt really bad. I saw lives being destroyed because of what I was doing,” he said.

On New Year’s Eve, Daniel’s girlfriend called him a “drug addict” and a “lowlife.” He jumped out of her car. “Staring at the city hotels and gas stations, I thought ‘I’m going to be living alone in the streets’ and that scared the daylights out of me,” Daniel recalled.

The next morning, he went to his father and said, “Dad, I need help.”

## NEW YEAR/NEW BEGINNING

A resident of Phoenix House, a drug-treatment center in Lake View Terrace, California, Daniel has been clean for six

months. He’s gained weight, and he cares about himself again. But he worries about ecstasy’s effects. “I feel like I’ve suffered brain damage,” he said. “Sometimes I get stuck in conversations, because I can’t find a word.” Other times he walks the unit and stops in horror, forgetting where he’s going.

Daniel is trying to understand his past and piece his life back together. “I got into drugs because I felt like no one liked me. Then nobody wanted to be around me because of the drugs, and I ended up completely alone,” he said. “I feel like a new person now.”



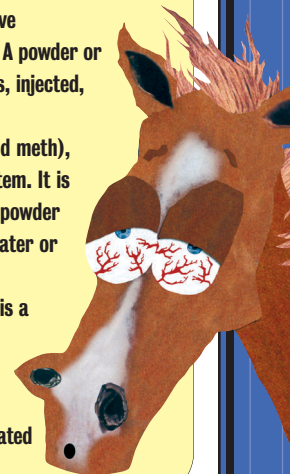
**in the mix**  
a national PBS weekly series for teens

Real teens talk about ecstasy in an upcoming episode of the award-winning reality series for teens. Check your local PBS listings or *inthemix.org*

## Beware of Club Drugs

Ecstasy and other so-called club drugs emerged from the underground rave scene. Some produce a sense of detachment from the user’s surroundings or self—or even real unconsciousness. Because of these “dissociative” effects, these drugs are often used in date rapes. All club drugs can cause serious health consequences or, in some cases, death. Combining them with alcohol is especially dangerous.

- **GHB or Gamma-hydroxybutyrate** (aka G, liquid ecstasy, and Georgia Home Boy) has euphoric, sedative, and anabolic (body building) effects. A liquid or powder with a salty taste, it may be added to spring water or concealed in mouthwash bottles. With flavorings, it can be passed off as a high-carb drink.
- **Ketamine** (aka Special K or K) is a dissociative drug commonly used as a horse tranquilizer. A powder or liquid, it is snorted, sprinkled onto cigarettes, injected, or hidden in drinks.
- **Methamphetamine** (aka speed, ice, chalk, and meth), a stimulant, excites the central nervous system. It is a white, odorless, bitter-tasting crystalline powder that is snorted or smoked, or dissolved in water or alcohol and injected or swallowed.
- **LSD or Lysergic Acid Diethylamide** (aka acid) is a hallucinogen, or drug that causes hallucinations. It may be distributed in breath-mint vials, treated sugar cubes, gel wafers called “windowpanes,” pills, or decorated blotter paper that is chewed or swallowed.





# HEADS UP REAL NEWS ABOUT DRUGS AND YOUR BODY

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# CLOSE-UP: INHALANTS

By Gate Bailey

## Pain Meets Poison

The true story of how one teen huffed her way to rock bottom and almost died

Until she was 12, Megan Hakeman had a simple life in Watertown, South Dakota, a small town with one mall and one movie theater. She described herself as a “regular, happy kid” who hung out with friends and watched TV. The only real suffering she’d known was losing her grandfather, but she said she accepted that as “part of life.”

Then, things got complicated. Megan was sexually abused by a trusted friend.

“I thought about it [the attack] a lot and I didn’t know what to do. I wanted it to go away,” she says.

Too afraid to tell her parents and unsure of how else to cope with her feelings, Megan decided to try to escape her pain. A friend showed her how to get high using inhalants.

Inhalants are, to put it simply, poisons. Most of them are common household products, like spray paints, air fresheners, paint thinner, correction fluid, and lighter fluid. All give off toxic fumes.

### HURTING HERSELF

Megan and a group of friends began “huffing” together often. They joined the 15.2% of their peers who have experimented with inhalants by the time they’re in 8th grade.



Megan Hakeman, 16  
FORMER INHALANT ABUSER

But Megan’s friends soon learned something terrifying: Huffing can kill you. So, they wisely quit.

Despite this scary news, Megan kept huffing alone. Her whole sense of self-worth was out of whack after the sexual abuse. “I figured why not hurt myself, if he [the attacker] hurt me,” she told Scholastic.

And she was indeed hurting herself and risking many medical consequences. Dr. David Shurtleff, the Acting

Director of Neuroscience and Behavioral Research at NIDA, says that inhalants can affect your ability to think, talk, remember, hear, and even walk. “Really what you’re doing is destroying nerve fibers throughout the brain,” he says.

### HURTING MOM

It wasn’t just Megan’s brain cells that were in danger. She ignored her schoolwork. Her best friend dumped her because of the drug use. And she lashed out at her mom.

“I always hit my mom when I was using,” says Megan. “I feel really bad because I should have never hit my mom. That’s something that nobody should ever do.”

These violent outbursts may have been an effect of the inhalants. According to Dr. Shurtleff, huffing can cause agitation, irritability, and even violent behavior.

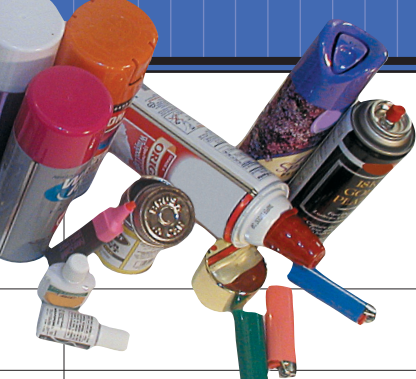
### EMBARRASSMENT TO THE FAMILY

Megan hit rock bottom one night. High on inhalants and other drugs, she rode on top of a friend’s car, fell off, and got a concussion.

Then, rock bottom got even lower. The next night, she fought with her brother. He said she was an embarrassment







## INHALANTS CAN KILL

**Y**ou can die the first time you try inhalants. There are a number of ways huffing can kill. The most common is called Sudden Sniffing Death syndrome. “The chemicals are acting neurologically to cause irregular heart rhythms that can lead to heart failure and then death,” says Dr. Shurtleff.

You can also die by *asphyxiation* (lack of oxygen). When you breathe in the fumes, you fill up the cells in your lungs with poisonous chemicals, leaving no room for the oxygen we all need to breathe and live. Lack of oxygen can lead to respiratory failure and death.

In this country, approximately 100 teens die each year from inhalant abuse. Last year, Johnson Bryant

became one of those teens. Still in shock, his parents talked to us about their tremendous loss.

Chris Bryant, father: “Johnson and I had an unusually close relationship. . . This was a child who went to a private school, had an A-/B+ average, played varsity sports, and made a very bad decision.”

Toy Bryant, mother: “It’s frightening to see your son in a body bag. . . When the coroner said it looked like he’d inhaled butane, I thought, ‘This is something I see on *20/20*.’ . . There is no pain like losing a child. . . Some mornings I can’t get out of bed. . . I talk to Johnson sometimes. Sometimes I yell at him. Sometimes I say ‘I miss you, baby.’”

to the family.

That struck a chord with Megan. “I knew it was true, but I didn’t want to hear it,” she says.

She was so upset that she attempted suicide. Luckily, she was rushed to the hospital in time.

After her trip to the ER, Megan finally got into treatment at a facility called Our Home, Inc., in Heron, South Dakota. Today, she’s 16, and she’s been inhalant free for almost two years.

### A NEW LIFE

On the day we spoke to her, Megan had plans to make “play-doh” with her friends. Why would a teenager want to do something so childish? Because for Megan, smiling over something silly is what her new life is all about.

But things are not as simple as they once were. Megan still suffers from some of the effects of her inhalant abuse. “I can’t really remember a lot of things,” she told us. “When I’m talking I’ll forget what I just said two seconds ago. It frustrates me a lot.”

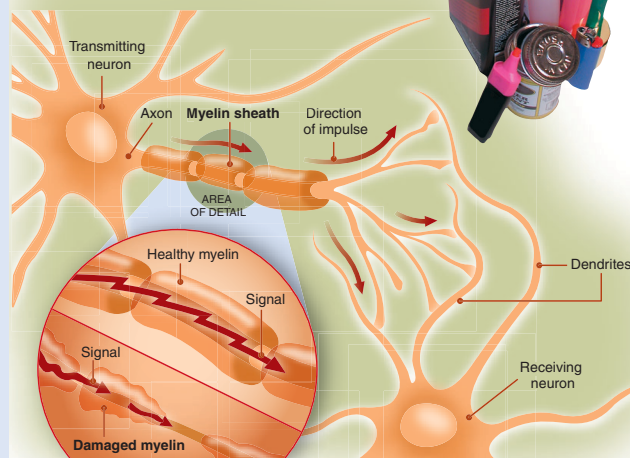
Whether or not her memory is restored, Megan will never be the same. She says she now appreciates every day because she knows that she is one of the lucky ones. She survived, and she easily could have died.

## WHO NEEDS MYELIN?

**I**nhalants can damage or destroy myelin. But who needs myelin? You do. Messages travel along the axons of your brain cells (or neurons) in the form of electricity. Think of myelin as the insulation around these electrical “wires.” It’s a fatty coating, or sheath, that protects the axons and helps conduct messages smoothly and speedily, ensuring that your muscles easily carry out your brain’s orders.

When myelin deteriorates, this smooth flow of signals is disrupted. The result? Muscle spasms and tremors, or even permanent difficulty with basic actions like walking, bending, and talking.

Healthy myelin helps speed messages smoothly from cell to cell in your brain. The messages cannot flow freely when myelin is damaged. This means that your muscles won’t be able to obey your brain.



## Over-the-Counter Horror

**F**orget the idea that if you can buy it at the grocery store it’s harmless. Inhalants can do serious and sometimes permanent damage to your brain, nerves, and body. Here’s just some of what research tells us.

**Inhalants can . . .**

- disrupt the flow of messages between brain cells by destroying myelin [see above].
- actually shrink parts of the brain. Where brain tissue disappears, brain cells have died. Effects may include difficulties with learning, thinking, and remembering.
- damage the lungs, kidneys, and liver.
- damage bone marrow.
- cause hearing loss.
- impair vision.
- cause limb spasms.
- cause muscle weakness.
- cause tremors and uncontrollable shaking.





# HEADS UP REAL NEWS ABOUT DRUGS AND YOUR BODY

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# CLOSE-UP: STEROIDS

By Gate Bailly

## Behind the Bulk

One young man's story of steroid addiction, body obsession, and getting clean

Every time he passed a mirror, Craig Costa flexed his muscles. He wanted to look “insanely big—like an action figure.”

“When I walked into a room, I wanted heads to turn,” he says. People did notice Craig’s 225-pound, 5-foot 9-inch frame. But what they didn’t see was the physical damage and psychological turmoil going on inside. The story behind the bulk was five years of steroid abuse and a struggle with muscle dysmorphia, a condition

in which a person has a distorted image of his or her body (see sidebar). Men with this condition think that they look small and weak, even if they are large and muscular.

### ILLEGAL AND GRIM

It all started when Craig was 18. Before a trip to Walt Disney World in Orlando, Fla., he was



feeling overweight. He wanted to look good with his shirt off, so he resolved to get fit. A student at Bristol Community College, in Fall River, Mass., he started going to a nearby gym. Running on the treadmill, he slimmed down fast, losing 20 pounds in a month.

But lean wasn’t Craig’s ideal. “My whole priority was, I wanted people to say, ‘That guy’s huge.’”

He lifted weights and experimented with steroidal supplements, also called dietary supplements. These drugs promise to build muscles. Despite potential risks and unclear effectiveness, they can be bought legally over the counter at many stores.

But what Craig was looking for couldn’t be bought in a store. So he turned to anabolic steroids, drugs derived from the male sex hormone testosterone.

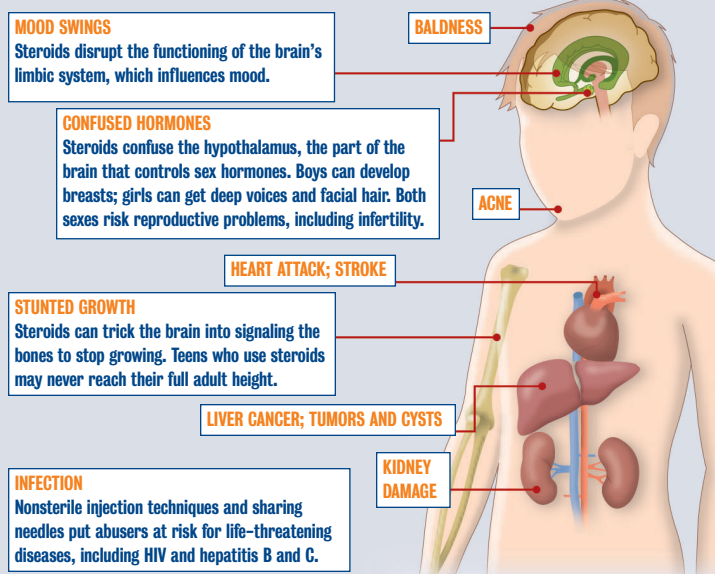
Under a doctor’s supervision, anabolic steroids have some legitimate medical uses, as do corticosteroids, a different type of steroid used to reduce swelling. But to use steroids as Craig did, for muscle-building in a healthy body, is illegal. This didn’t stop him. Neither did the many grim potential side effects (see sidebar, left).

Craig thought he knew exactly what he was getting into. And like 4 percent of high

## LOOKS CAN BE DECEIVING

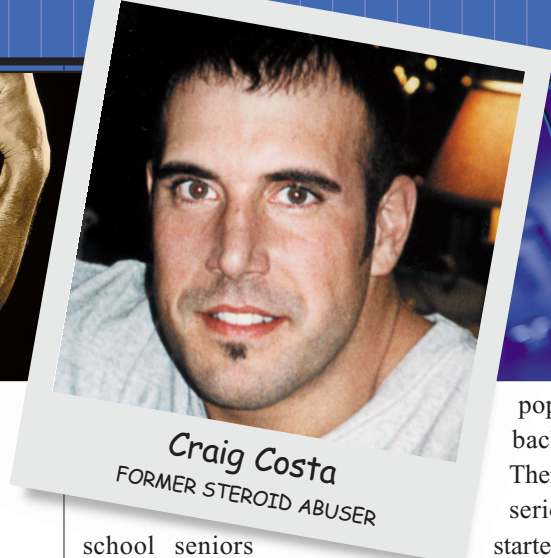
“Steroids unquestionably work extremely well—no denying it,” says Dr. Harrison Pope of McLean Hospital in Belmont, Mass. “But they will probably shorten your life expectancy. By how much, we still don’t know.”

On the outside, steroid abusers look big and strong, but on the inside, they’re weak. Their organs take a beating, and their bodies turn on them in all kinds of ways. Here’s some of the tough stuff that anabolic steroid users may encounter:



© DAVID MADISON/GETTY IMAGES/STERIOD USE/RY, 5W INFOGRAPHICS/DIAGRAM





**Craig Costa**  
FORMER STEROID ABUSER



popped up all over his back; his face swelled. Then, something even more serious happened: He started having chest pains.

Craig was having heart problems of the emotional sort, too. “I don’t even remember how much of a jerk I was,” he says.

### NEW PRIORITIES

There was a lot of screaming and yelling at home, and ultimately, the end of his marriage and a custody battle over his 1-year-old son, Jake. Craig’s wife

said that Craig, then 25, couldn’t see their child until he passed a drug test. That was the moment when everything changed for Craig. He knew he had to quit.

On Father’s Day, 2001, Craig went cold turkey. He knew he needed help, so his parents found him a psychiatrist, who treated him through the better part of a year.

Today, Craig’s priorities have changed. He still wants to be a head-turner, but for a different reason. “Now I’d rather be walking into a room with my son [who is now 2] and have people thinking, ‘Wow, he’s the greatest dad in the world.’”



school seniors (according to a 2002 NIDA-funded study) and an estimated hundreds of thousands of adults, he took steroids anyway.

### HEART PROBLEMS

Craig’s appearance was that important to him. “The scale was my enemy. Every pound meant so much to me,” he says.

Craig constantly compared himself to others. He drove his friends and family crazy asking, “Is that guy bigger than me? What about that guy?”

He never had complete satisfaction. “Some days, I’d be arrogant, wearing shorts to show off my quads. Other days, I’d be a disaster. On a non-lifting day, I’d have to wear big, baggy clothes.”

Craig’s steroid use escalated over time. He had begun by taking oral steroids (pills) exclusively. But when he heard that injectable steroids were more effective, he overcame a fear of needles. At his worst, he was injecting three to four times a day and taking 10 pills on top of that.

The drugs took their toll. Craig’s hair fell out; acne

## ROID RAGE

**S**teroids can mess with your head. They can even make you violent. Dr. Harrison Pope said, “I have consulted on several cases where previously non-violent individuals committed murders when under the influence of steroids.”

In 2000, Dr. Pope conducted a NIDA-supported study which showed that, along with violent behavior, high doses of steroids can cause extreme fluctuations in emotions, from euphoria (bliss) to rage.

These psychiatric symptoms may be a result of steroids’ effect on the brain. Steroids act on the limbic system, which is involved in mood, memory, and learning. There, the drug disrupts the normal functioning of neurons—hence, the overly aggressive behavior and mood swings.

### More Than a Bad Hair Day

**E**ver had a bad hair day or a pimple and felt that you couldn’t focus on anything else? Imagine if a small flaw (real or imagined) took over your life. That’s what it’s like for an estimated one to two percent of Americans with body dysmorphic disorder, or BDD.

Like anorexia nervosa, the eating disorder that causes people to see themselves as fat even as they starve their bodies into dangerous thinness, BDD involves a distortion in body image. In extreme cases, people with BDD can spend hours glued to a mirror or even become suicidal. As you’ve read, the disorder can also lead to steroid abuse.

We talked to Dr. Roberto Olivardia, the psychiatrist who treated Craig and Dr. Pope’s co-author, to find out more.

#### Q: What is BDD?

**A:** It’s when you’re very, very bothered by a part of your appearance. Craig focused on his muscularity, but BDD can be a preoccupation with any body part—your hair, skin, nose.

self-esteem is wrapped up in how I look? Does it prevent me from going to school? Am I still hanging out with friends?

#### Q: How can I get help for BDD?

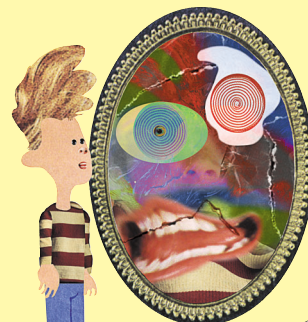
**A:** The best treatment for the disorder is psychotherapy (counseling).

#### Q: What causes BDD?

**A:** We live in a culture that praises a perfect appearance. But that’s only part of the picture. There are also deeper psychological roots.

#### Q: How do I know if I have BDD?

**A:** Ask yourself: How much of my



**in the mix**  
a national PBS weekly series for teens

Check your local PBS listings or [inthemix.org](http://inthemix.org) for a program on steroids, airing May 3-10.



**HEADS UP  
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**CLOSE-UP: HEROIN**

By John DiConsiglio

# Hooked on Heroin

For a Baltimore teen, one experience with heroin led to a living nightmare

## Judy was no stranger to drugs.

By the time she was 15, she smoked pot on a daily basis. She even tried ecstasy at a party or two. The Baltimore teen thought she was tough enough to handle anything that came her way.

But this was like nothing she'd ever experienced. And, suddenly, Judy was scared.

She was pressed into the mosh pit at an Incubus concert. The music was loud and she couldn't hear what her boyfriend said as he passed her a joint. Or, at least, she thought it was a joint. But, after a few puffs, Judy knew something was wrong.

"I felt this warm sensation flood over me, and then I went numb," says Judy, who is now 17 and asked that we not use her last name or picture. "The crowd was pushing me against the stage. I knew that I was getting squashed but I couldn't feel a thing. That's what really freaked me out."

The next morning, her boyfriend told her that he hadn't given her marijuana. It was heroin.

### HIGH-RISK HIGH

Judy had always been a little afraid of heroin. She'd seen the hollow, zombielike faces of friends who were strung out on the drug. She even knew a few people who had died from heroin overdoses.

So it shocked Judy to hear herself say, "I want to do it again."

"It wasn't even 24 hours later," she says, "and I was already craving it."

Call it smack. Or H. Or skag or junk. By any name, heroin is dangerous, addictive,



and illegal. About 3 million Americans have used heroin—including nearly 2 percent of 8th-, 10th-, and 12th-graders, according to the National Institute on Drug Abuse (NIDA). "It can be snorted, smoked, or injected," says Dr. Cathrine Sasek, coordinator of NIDA's science education program. "But in all forms, it can lead to an intense addiction, dangerous behavior, and health risks that range from heart infections, liver disease, and breathing problems to lethal overdoses."

Or, as Judy puts it, "When you are on heroin, your whole life is getting high, getting sick, and then doing anything to get more drugs."

### FAST TRACK TO ADDICTION

The day after she first smoked heroin, Judy found herself snorting white lines of the drug with her boyfriend. "I never felt anything like it. It just made me all warm and numb

## THREE DEADLY METHODS

**H**eroin users take the drug in three different ways: They may inject it directly into their veins or muscles with syringes; they may snort lines of it in powdered form; or they may smoke it in rolled, marijuana-like joints.

Most users inject heroin, believing it leads to a more intense high. But smoking and snorting have become popular among young people. That's because many mistakenly believe that heroin is only addicting when it is injected.

"That is a total myth," says Dr. Sasek. "Any way you take

heroin is going to hook you. That's just a fact."

The more heroin you take, the more you need.

Typically, an addicted individual uses it four times a day. Since the drug may be cut with anything from powdered milk to rat poison, users don't know how much they're really taking. That makes it easy to overdose. Too much of the drug will slow your respiratory system—until you stop breathing and die.



© GOODSHOOT/SUPERSTOCK(HEROIN TOOLS); © BRUCE AVRES/GETTY IMAGES(HEROIN SMOKERS); © ANDREW HUNTER/GETTY IMAGES(POPPY FIELD)





Judy, 17  
HEROIN ABUSER/IN RECOVERY

and sleepy” she says. “But even that second time, I didn’t feel the same rush as the first. And then I started needing more and more of it to get high.”

Only a few hours after a heroin high wears off, addicted people, like Judy, often start craving more of the drug. Their bodies turn on them, and they suffer through nausea, vomiting and diarrhea.

“It’s like the worst flu you’ve ever had—and then 10 times worse than that,” Judy says. “You think you are going to die. Even when you aren’t sick, you’re always a little pukey. Your skin feels uncomfortable on you and you’re always picking at it. The only thing that makes you feel better is more heroin.”

Within just a few weeks, Judy progressed from sampling heroin on the weekends to a daily habit. She dropped out of school and spent all of her time with her boyfriend and his heroin-addicted mother. On the rare occasions when she was home, Judy fought with her family. “My mother tried to get me to admit that I needed help, and I just beat her up,” Judy says. “I can’t believe I did that. But I was



so wild. It wasn’t me.”

Just nine months after she first tried the drug, Judy was breaking into houses to steal anything she could trade for heroin. “I never turned to prostitution, but I knew I was going down that line,” she says.

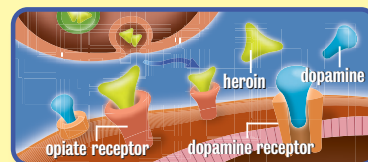
### GETTING A LIFE

Finally, Judy and her boyfriend decided to get clean together. They checked into separate drug treatment facilities. And while Judy has been drug-free for more than two months at the Lois E. Jackson Unit in Cumberland, Md., her real struggles are just beginning. Even talking about heroin during her counseling sessions makes her want to start using again.

Judy knows that she’ll always be an addict. But she’s mending fences with her family and planning on going back to school to study accounting or interior design. “I want a life. I want a family. I want children,” she says. “I want my parents to be proud of me. And the only way to do all that is to get off this stuff.”

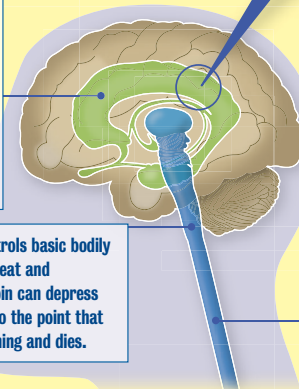


Heroin binds to opiate receptors on neurons (brain cells) in several parts of the brain. This creates a signal for the increased release of dopamine, a brain chemical linked to feelings of pleasure. The action of the drug triggers different responses in different parts of the brain.



#### THE LIMBIC SYSTEM

controls emotions and feelings of pleasure. Heroin acts here to produce an intense rush, which people addicted to the drug seek compulsively.



IN THE SPINAL CORD, heroin has an analgesic (pain-relieving) effect. It blocks the transmission of pain messages between neurons, preventing them from reaching the brain.

THE BRAIN STEM controls basic bodily functions, like heartbeat and breathing. Here, heroin can depress respiratory activity to the point that the user stops breathing and dies.

## HEROIN AND YOUR BRAIN

**H**eroin is an opiate, a kind of drug that’s culled from the seed of a poppy plant. Other opiates, like morphine, are used as powerful medications to relieve the intense pain of some illnesses, like cancer.

Depending on how the drug is taken, heroin can enter the brain very rapidly, leading to an intense rush. Within minutes—even seconds—heroin travels through the bloodstream to the brain. There, it latches on to opiate receptors located on neurons (see diagram). These cells help the body relieve pain, but can be overstimulated by drugs, such as heroin.

“Heroin floods the receptors,” NIDA’s Dr. Sasek says. “Eventually, the receptors become used to this overstimulation and need more heroin just to work normally.”

If an addicted person stops using the drug, withdrawal symptoms result—such as fevers, sweating, shaking, and chills. This is because of changes that have happened in the brain and body in response to repeated exposure to heroin. Without treatment, the withdrawal symptoms will subside after a week or so. But the cravings can remain for years.

### Added Risk: Deadly Infections

**A**ddiction and overdose aren’t the only dangers of heroin. It can also put you at risk of being infected with HIV, the virus that causes AIDS.

HIV is spread through bodily fluids, like blood. Heroin users who share needles can pass the virus to each other. They can also spread other blood-based diseases like hepatitis C and tuberculosis.

Even heroin users who don’t inject can become infected with HIV. The overpowering addiction makes them take crazy risks, like having unsafe sex. “When your whole life revolves around getting drugs, you may do anything for them,” says Dr. Sasek. “If that means sharing needles or trading sex for drugs, then that’s what many will do.”

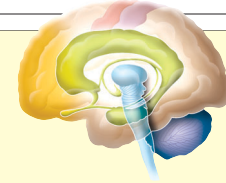
# Activities & Resources

\* Review: "Meet Your Incredible Brain"

## TOTAL RECALL

Which brain part do you need to remember what you learned from our diagram? The hippocampus. Put your hippocampus to work and see how much you can recall. Match each brain part with one of its functions.

- \_\_\_\_\_ 1. Prefrontal Cortex
- \_\_\_\_\_ 2. Cerebellum
- \_\_\_\_\_ 3. Brain Stem
- \_\_\_\_\_ 4. Motor Cortex
- \_\_\_\_\_ 5. Posterior Parietal Cortex



- a. controls the heartbeat
- b. takes care of everyday tasks
- c. helps plan ahead
- d. tells your body how to do precise movements
- e. processes senses

\* Review: "Smoking Gun"

## EXTRA! EXTRA!

Anything as harmful as cigarettes should make headlines. So try your hand at headline writing! Using information contained in our article, complete the headlines at right.

1. Teen Smoking Rates \_\_\_\_\_
2. Hard Evidence Shows That Smoking Leads to \_\_\_\_\_
3. Nicotine Stimulates the Release of \_\_\_\_\_
4. Cigar Smokers Risk \_\_\_\_\_
5. Research Suggests That Nicotine \_\_\_\_\_



\* Review: "The Lows of Getting High"

## TOP 5 LIES

Here are 5 myths about marijuana. Read each myth. Then, use the information provided in our article to find the reality. On a separate sheet of paper, write each reality.

1. Myth: Marijuana is not harmful to the brain.
2. Myth: Smoking marijuana doesn't damage the lungs.
3. Myth: Marijuana is not addictive.
4. Myth: Everyone's doing it.
5. Myth: The negative effects of marijuana always go away immediately after you stop using.



**If You Have a Problem:** Alby turned to drugs because he wanted to ease some real pain. If you're having a problem, dealing with a traumatic event, stressed, or depressed, drugs will only make your problems worse. Instead of turning to drugs, turn to a trusted adult, such as a parent, teacher, guidance counselor, or coach. If you're not comfortable confiding in any of the adults at home or school, you can always walk in to your local emergency room and ask to speak to the psychiatrist or social worker on call.

\*Answers are in your Teacher's Edition.

## THE BEST OF THE WEB

For More Information . . .

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Check out our *Heads Up* site for more information on drug abuse, pop-up diagrams, and more.

>> [www.drugabuse.gov](http://www.drugabuse.gov)

This is the NIDA Web site. There's tons of info about common drugs of abuse and how they affect the brain and body. Plus, there's a special section for students.

>> [www.health.org](http://www.health.org)

The National Clearinghouse for Alcohol and Drug Information's site offers many recent reports and much info about drug abuse.

>> [www.cdc.gov/tobacco](http://www.cdc.gov/tobacco)

You'll find great information about tobacco, plus links for tips on how to quit.

>> [www.whitehousedrugpolicy.gov](http://www.whitehousedrugpolicy.gov)

This is the office of National Drug Control Policy's site. It offers annual reports, drug facts, and more.

For Help With a Substance Abuse Problem . . .

>> [www.findtreatment.samhsa.gov](http://www.findtreatment.samhsa.gov)

If you think you may have a drug problem, check out this site. Run by the Substance Abuse and Mental Health Services Administration, it offers a facility locator. You can also call their national hotline at: 1-800-662-HELP.