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Marijuana: Facts
Parents Need to Know



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Revised

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National Institute on Drug Abuse
National Institutes of Health

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The human brain does not fully mature until the early twenties. Among the last areas to develop are those that govern impulse control and planning. So what might that mean for teens? On one hand, they may be more adventurous than adults, willing to take chances...on the other, this could involve risky behaviors, including drug use.

The trick is to find ways to encourage your kids to be the unique individuals they are, without exposing themselves to the dangers of experimenting with drugs—including marijuana. Talking openly about it is a good start.

—Nora D. Volkow, NIDA Director

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A Letter to Parents

Since 1975, the Monitoring the Future (MTF) survey has measured drug, alcohol, and cigarette use and related attitudes among adolescent students nationwide. Drug use is measured across three time periods: lifetime, past year, and past month; for some drugs, daily use is also reported. Initially, the survey included 12th-graders only, but in 1991 it was expanded to include 8th- and 10th-graders.

We at the National Institute on Drug Abuse (NIDA) are pleased to offer these two short booklets for parents and children to review the scientific facts about marijuana: (1) *Marijuana: Facts Parents Need to Know* and (2) *Marijuana: Facts for Teens*. Although it is best to talk about drugs when children are young—since that is when drug use often begins—it is never too late to start.

Marijuana remains the most abused illicit substance among youth. By the time they graduate high school, about 44 percent of U.S. teens will have tried marijuana at least once in their lifetime. Although use among teens has dropped dramatically in the past decade (to a prevalence of about 15 percent for past-month use in 2010), this decline has stalled and, in fact, may now be on the upswing. Recent survey data show that daily marijuana use is up among students in 8th, 10th, and 12th grades, compared to the year prior. A principal reason is that today's teens have come to view marijuana as less dangerous than before—even among 8th-graders, whose marijuana use increased

across past-year, past-month, and daily measures. These statistics were taken from the 2010 Monitoring the Future Survey, which has been tracking teen attitudes and drug use since 1975.

Survey results show that we still have a long way to go in our efforts to prevent marijuana use and avoid the toll it can take on a young person's life. NIDA recognizes that parents have an important role in this effort and can strongly influence their children's attitudes and behaviors. However, the subject of marijuana use has become increasingly difficult to talk about—in part, because of the mixed messages being conveyed by the passage of medical marijuana laws and calls for marijuana legalization in certain States. In addition, many parents of today's teens may have used marijuana when they were younger, which could make talking openly and setting definitive rules about its use more difficult.

Talking to our children about drug abuse is not always easy, but it is crucial. You can also get involved in your community and seek out drug abuse prevention programs that you and your child can participate in together. Sometimes, just beginning the conversation is the hardest part. I hope these booklets can help.



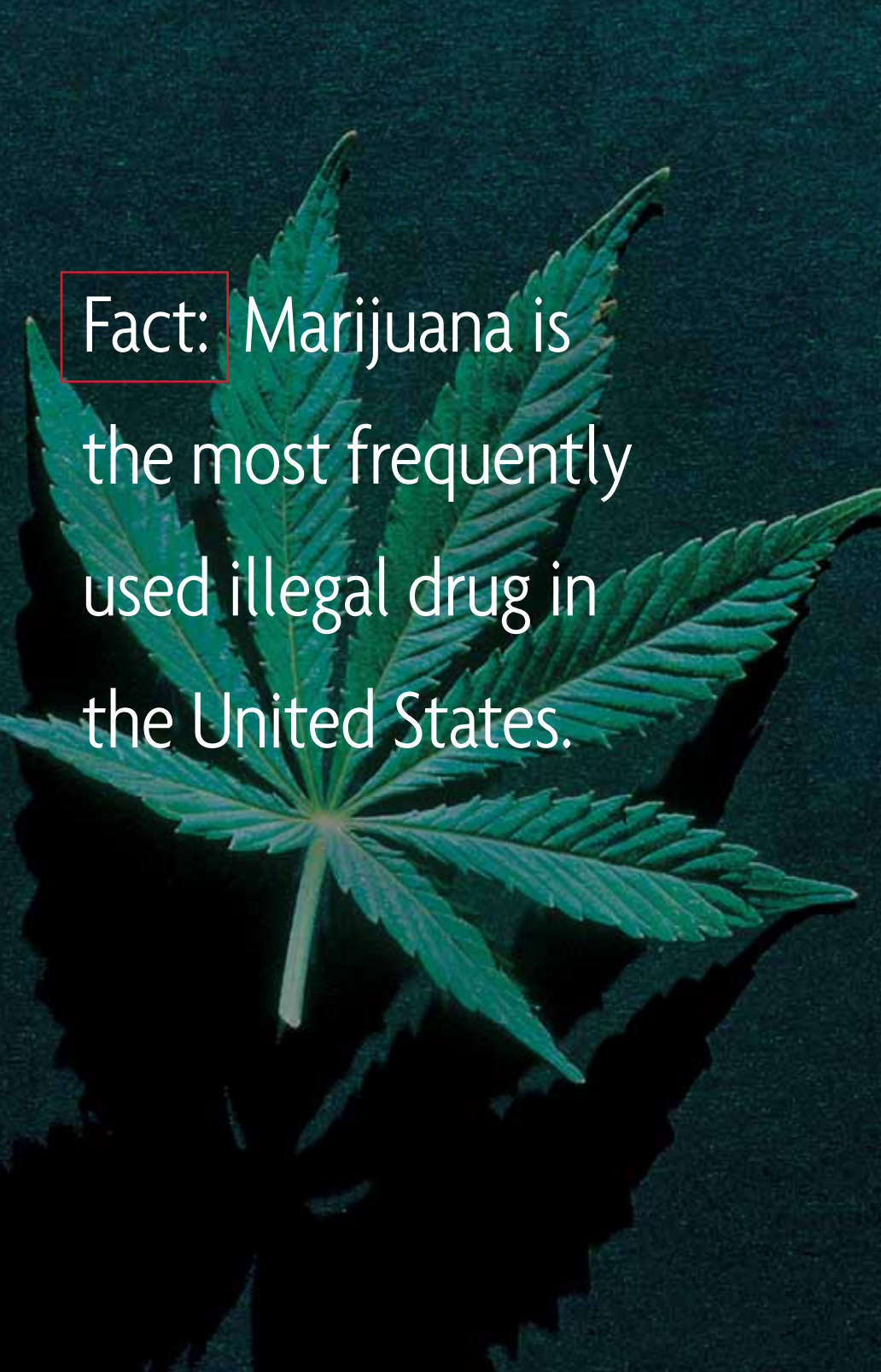
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Fact: Marijuana is the most frequently used illegal drug in the United States.

I. Talking to Your Kids— Communicating the Risks

Introduction

Why do young people use marijuana? Children and teens start using marijuana for many reasons. Curiosity and the desire to fit into a social group are common ones. Some have a network of friends who use drugs and urge them to do the same (peer pressure). Those who have already begun to smoke cigarettes and/or use alcohol are at heightened risk for marijuana use as well. And children and teens who have untreated mental disorders (e.g., ADHD, conduct disorder, anxiety) or who were physically or sexually abused are at heightened risk of using marijuana and other drugs at an early age.

For some, drug use begins as a means of coping—to deal with anxiety, anger, depression, boredom, and so forth. But in fact, being high can be a way of simply avoiding the problems and challenges of growing up. Research also suggests that family members' use of alcohol and drugs plays a strong role in whether children/teens start using drugs—making parents, grandparents, and older brothers and sisters models for children to follow.

So indeed, all aspects of a teen's environment—home, school, neighborhood—can help determine whether they will try drugs.

How can I prevent my child from using marijuana? There is no magic bullet for preventing teen drug use. But research indicates that parents have a big influence on their teens, even when it doesn't show! So talk openly with your children and stay actively engaged in their lives. To help you get started, below are some brief summaries of marijuana research findings that you can share with your kids to help them sort out fact from myth, and to make the best decisions they can based on the current evidence. These were chosen because they reflect the questions and comments that we receive from teens every day on our teen Web site and blog—what teens care about. Following this brief summary of research highlights, FAQs and additional resources are provided to equip you with even more information.


DID YOU KNOW....

Marijuana is addictive. Repeated marijuana use can lead to addiction—which means that people often cannot stop when they want to, even though it undermines many aspects of their lives. Marijuana is estimated to produce addiction in approximately 9 percent, or roughly 1 in 11, of those who use it at least once. This rate increases to about 1 in 6, or 16 percent, for users who start in their teens, and 25–50 percent among daily users. Moreover, 4.3 million of the more than 7 million people who abused or were addicted to any illicit drug in 2009 were dependent on marijuana. And among youth receiving substance abuse treatment, marijuana accounts for the largest percentage of admissions: 63 percent among those 12–14, and 69 percent among those 15–17.

Marijuana is UNSAFE if you are behind the wheel. Marijuana compromises judgment and affects many other skills required for safe driving: alertness, concentration, coordination, and reaction time. Marijuana use makes it difficult to judge distances and react to signals and sounds on the road. Marijuana is the most commonly identified illicit drug in fatal accidents (~14 percent of drivers), sometimes in combination with alcohol or other drugs. In fact, even small amounts of alcohol, when combined with marijuana use, can be very dangerous—more so than either one alone.

Marijuana is associated with school failure. Marijuana’s negative effects on attention, motivation, memory, and learning can last for days and sometimes weeks after its immediate effects wear off—especially in chronic users. Someone who smokes marijuana daily may be functioning at a reduced intellectual level most or all of the time. Compared with their nonsmoking peers, students who smoke marijuana tend to get lower grades and are more likely to drop out of high school. Long-term marijuana users report decreased overall life satisfaction, including diminished mental and physical health, memory and relationship problems, lower salaries, and less career success.

High doses of marijuana can cause psychosis or panic during intoxication. Although scientists do not yet know whether the use of marijuana *causes* chronic mental illness, high doses can induce an acute psychosis (disturbed perceptions and thoughts, including paranoia) and/or panic attacks. In people who already have schizophrenia, marijuana use can worsen psychotic symptoms, and evidence to date suggests a link between early marijuana use and an increased risk of psychosis among those with a preexisting vulnerability for the disease.



Fact: Marijuana has adverse effects on many of the skills required for driving a car. Driving while high can lead to car accidents.

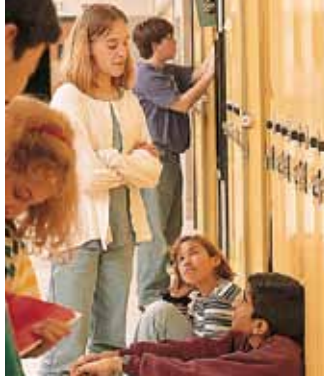
II. Want to Know More?— Some FAQs about Marijuana

Q. *What is marijuana? Are there different kinds?*

A. Marijuana is a green, brown, or gray mixture of dried, shredded leaves, stems, seeds, and flowers of the hemp plant (*Cannabis sativa*). Cannabis is a term that refers to marijuana and other drugs made from the same plant. Strong forms of cannabis include sinsemilla (sin-seh-me-yah), hashish (“hash” for short), and hash oil. There are many different slang terms for marijuana and, as with other drugs, they change quickly and vary from region to region. But no matter its form or label, all cannabis preparations are mind-altering (psychoactive) because they all contain THC (delta-9-tetrahydrocannabinol). They also contain more than 400 other chemicals.

Q. *How is marijuana used?*

A. Most users roll loose marijuana into a cigarette (called a joint or a nail) or smoke it in a pipe or a water pipe, sometimes referred to as a bong. Some users mix marijuana into foods, or use it to brew a tea. Another method is to slice open a cigar and replace the tobacco with marijuana, creating what is known as a blunt. Marijuana cigarettes or blunts sometimes are dipped in PCP or mixed with other substances, including crack cocaine.



Q. *How many people use marijuana?*

A. Before the 1960s, many Americans had never heard of marijuana, but today it is the most often used illegal drug in the United States. According to a 2009 national survey, more than 104 million Americans over the age of 12 had tried marijuana at least once, and almost 17 million had used the drug in the month before the survey.

Researchers have found that the use of marijuana and other drugs usually peaks in the late teens and early twenties, and then declines in later years. Therefore, marijuana use among young people remains a natural concern for parents and the focus of continuing research, particularly regarding its impact on brain development, which continues into a person's early twenties.

NIDA's annual Monitoring the Future Survey reports that among students from 8th, 10th, and 12th grades, most measures of marijuana use have decreased over the past decade; however, this decline has stalled in recent years as attitudes have softened about marijuana's risks. In 2009, 11.8 percent of 8th-graders reported marijuana use in the past year, and 6.5 percent were current (past-month) users. Among 10th-graders, 26.7 percent had used marijuana in the past year, and 15.9 percent were current users. Rates of use among 12th-graders were higher still: 32.8 percent had used marijuana during the year prior to the survey, and 20.6 percent (or about 1 in 5) were current users.

Q. *How does marijuana work?*

A. When marijuana is smoked, its effects are felt almost immediately. This is because THC (marijuana's psychoactive ingredient) rapidly reaches every organ in the body, including the brain. The effects of smoked marijuana can last from 1 to 3 hours. If consumed in foods, the effects come on slower and may not last as long.

Marijuana works through THC attaching to specific sites on nerve cells in the brain and in other parts of the body. These sites are called cannabinoid receptors (CBRs) since they were discovered by scientists trying to understand how marijuana, or cannabis, exerts its effects. THC is chemically similar to a class of chemicals that our body produces naturally, called endocannabinoids, and marijuana disrupts the normal function of this system. CBRs are found in brain areas that influence pleasure, memory, thinking, concentration, movement, coordination, appetite, pain, and sensory and time perception. Because of this system's wide-ranging influence over many critical functions, it is not surprising that marijuana can have multiple effects—not just on the brain, but on a user's general health as well. Some of these effects are related to acute intoxication while others may accumulate over time to cause more persistent problems, including addiction.

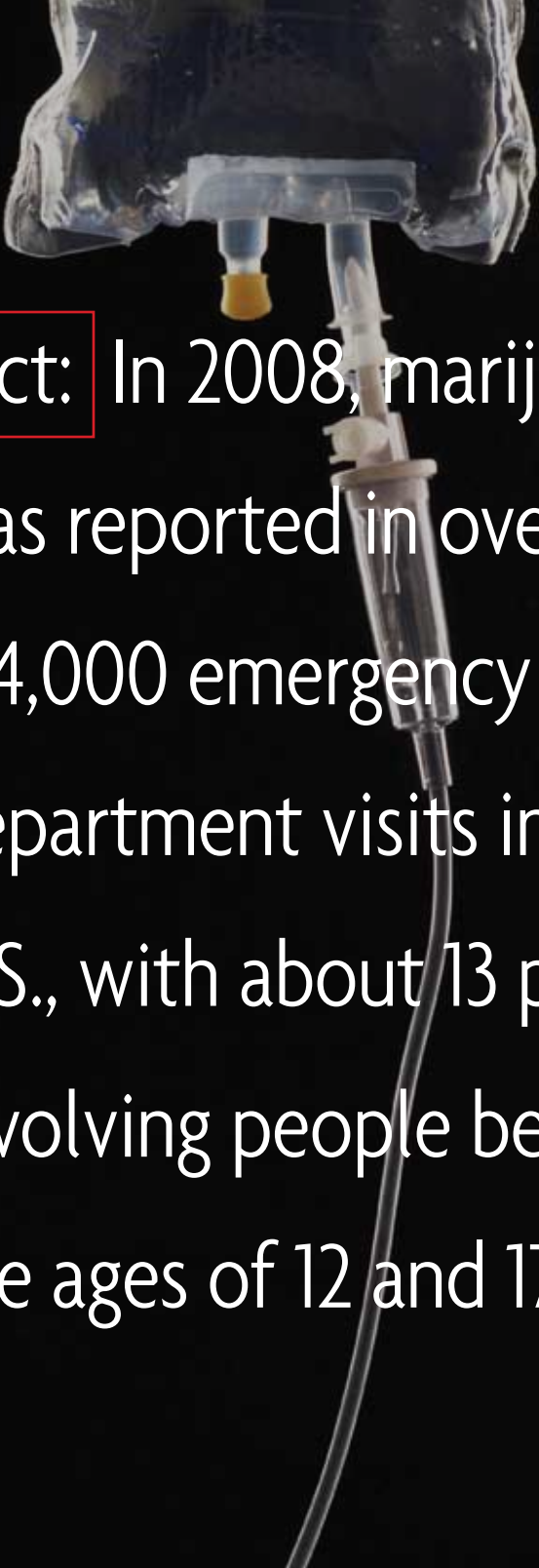




Q. *What are marijuana's short-term effects?*

A. The following are some effects that marijuana use can produce:

- Euphoria (high). THC activates the reward system in the same way that nearly all drugs of abuse do: by stimulating brain cells to release the chemical dopamine.
- Memory impairment. THC alters how information is processed in the hippocampus, a brain area responsible for memory formation, causing problems with short-term memory as well as difficulty with complex tasks requiring sustained attention/concentration. Prolonged use could therefore affect learning skills and academic achievement.
- Increased appetite (“munchies”).
- Increased heart rate.
- Dilation (expansion) of the blood vessels in the eyes, making them look red or bloodshot.
- Adverse mental reactions in some. These include anxiety, fear, distrust, or panic, particularly in those who are new to the drug or who are taking it in a strange setting; and acute psychosis, which includes hallucinations, delusions, paranoia, and loss of the sense of personal identity.



Fact: In 2008, marijuana was reported in over 374,000 emergency department visits in the U.S., with about 13 percent involving people between the ages of 12 and 17.



Q. *What determines how marijuana affects an individual? How important is marijuana potency?*

A. Like any other drug, marijuana's effects on an individual depend on a number of factors, including the person's previous experience with the drug (or other drugs), biology (e.g., genes), gender, how the drug is taken (smoked versus orally), and the drug's potency. Potency—determined by the amount of THC contained in the marijuana—has received much attention lately because it has been increasing steadily. In 2009, THC concentrations in marijuana averaged close to 10 percent, compared to around 4 percent in the 1980s. This is based on analyses of marijuana samples confiscated by law enforcement agencies. So what does this actually mean? For a new user, it may mean exposure to higher concentrations of THC, with a greater chance of an adverse or unpredictable reaction. In fact, increases in potency may account for the rise in emergency department visits involving marijuana use. For experienced users, it may mean a greater risk for addiction if they are exposing themselves to high doses on a regular basis. However, the full range of consequences associated with marijuana's higher potency is not well understood, nor is it known whether marijuana users adjust for the increase in potency by using less.

Q. *Does using marijuana lead to other drug use?*

A. Long-term studies of high school students' patterns of drug use show that most young people who use other drugs have tried marijuana, alcohol, or tobacco first. That said, many young people who use marijuana do not go on to use other drugs. It is clear that more research is needed to determine who is at greatest risk. For example, the risk of young people using cocaine is much greater for those who have tried marijuana than for those who have not (though teen cocaine use is low overall). We also know from animal studies that when rats are exposed to cannabinoids their brain reward system becomes less sensitive, or responsive, to that drug, which means that they would need more of the drug to achieve the same effect. An important aspect of this effect is a phenomenon called cross-tolerance (the ability of one drug to reduce responsiveness to a different drug). This was only seen if the rats that were given cannabinoids were young (e.g., adolescent) at the time of exposure. Prompted by the results of this animal study, researchers are now examining the possibility that early exposure to marijuana (e.g., in adolescence) may induce changes in the brain that make a person more vulnerable to subsequent marijuana addiction or to the risk of becoming addicted to other drugs, such as alcohol, opioids, or cocaine. It is important to point out, however, that research has not fully explained any of these effects, which are complex and likely to involve a combination of biological, social, and psychological factors.





Q. *Does smoking marijuana cause lung cancer?*

A. We do not know yet. Studies have not found an increased risk of lung cancer in marijuana smokers, as compared with nonsmokers. However, marijuana smoke does irritate the lungs and increases the likelihood of other respiratory problems through exposure to carcinogens and other toxins. Repeated exposure to marijuana smoke can lead to daily cough and excess phlegm production, more frequent acute chest illnesses, and a greater risk of lung infections. Marijuana also affects the immune system, although the implications for cancer are unclear. Moreover, many people who smoke marijuana also smoke cigarettes, which do cause cancer, and quitting tobacco can be harder if the person uses marijuana as well.



Q. *Since marijuana is addictive, does it produce withdrawal symptoms when someone quits using it?*

A. For many years, this was a subject of debate; but researchers have clearly characterized a set of symptoms that many long-term users experience when they stop using the drug. The symptoms are similar in type and severity to those of nicotine withdrawal—irritability, sleeping difficulties, anxiety, and craving—which often prompt relapse. Withdrawal symptoms peak a few days after use has stopped and dissipate within about 2 weeks. And while these symptoms do not pose an immediate threat to the health of the user, they can make it hard for someone to remain abstinent.

Q. *Are there treatments for people addicted to marijuana?*

A. Currently, no FDA-approved medications exist for treating marijuana addiction, although promising research is under way to find medications for treating withdrawal symptoms and alleviating craving and other subjective effects of marijuana. Behavioral therapies are available and are similar to those used for treating other substance addiction. These include motivational enhancement to engage people in treatment; cognitive behavioral therapies to teach patients strategies for avoiding drug use and its triggers and for effectively managing stress; and motivational incentives, which provide vouchers or small cash rewards for sustained drug abstinence. Unfortunately, treatment success rates are rather modest, indicating that marijuana addiction, like other addictions, may need a chronic care approach that varies treatment intensity in line with the person's changing needs over time.



Q. *What are other risks related to marijuana that my child should be aware of?*

A. Here are a few that you or your child may not have thought about:

- As with most drugs, marijuana use compromises judgment, which can mean a greater likelihood of engaging in risky behaviors and experiencing their negative consequences (e.g., acquiring a sexually transmitted disease, driving while intoxicated, or riding with someone else who is intoxicated and getting into a car crash).
- In addition to psychosis, chronic marijuana use has been *associated* with an array of psychological effects, including depression, anxiety, suicidal thoughts, and personality disturbances. One of the most frequently cited is an “amotivational syndrome,” which describes a diminished or lost drive to engage in formerly rewarding activities.

Whether this disorder occurs unto itself or is a subtype of depression associated with marijuana use remains controversial, as does the *causal* influence of marijuana. However, because of the endocannabinoid system's role in regulating mood, these associations seem plausible. More research is needed to confirm and better understand these linkages.

- Marijuana use during pregnancy may adversely affect the fetus. Animal research suggests that the endocannabinoid system plays a role in the control of brain maturation, particularly the development of emotional responses. In humans, the data are less conclusive—in part, because it is difficult to disentangle the drug-specific factors from the environmental ones. For example, pregnant women who use marijuana may also smoke cigarettes or drink alcohol, both of which can affect fetal development. Nevertheless, research suggests that babies born to women who used marijuana during their pregnancies may have subtle neurological alterations and, as children, can show diminished problemsolving skills, memory, and attentive processes. Although, the extent to which these effects reflect marijuana use or other drugs is unclear.



Q. *How can I tell if my child has been using marijuana?*

A. Parents should be aware of changes in their child's behavior, such as carelessness with grooming, mood changes, and deteriorating relationships with family members and friends. In addition, changes in academic performance, increased absenteeism or truancy, lost interest in sports or other favorite activities, and changes in eating or sleeping habits could all be related to drug use—or may indicate other problems. See text box for a more detailed list of warning signs.



*If someone is high
on marijuana,
he or she might:*

- *seem dizzy or uncoordinated;*
- *seem silly and giggly for no reason;*
- *have very red, bloodshot eyes;*
- *have a hard time remembering things that just happened;*
- *be in possession of drugs and drug paraphernalia, including pipes and rolling papers;*
- *have an odor on clothes and in the bedroom;*
- *use incense and other deodorizers;*
- *use eye drops;*
- *wear clothing or jewelry or have posters that promote drug use; or*
- *have unexplained use of money.*



Fact: Marijuana is addictive.

About 1 in 11 people who try it, and 25–50 percent of those who use it every day, become addicted to marijuana.

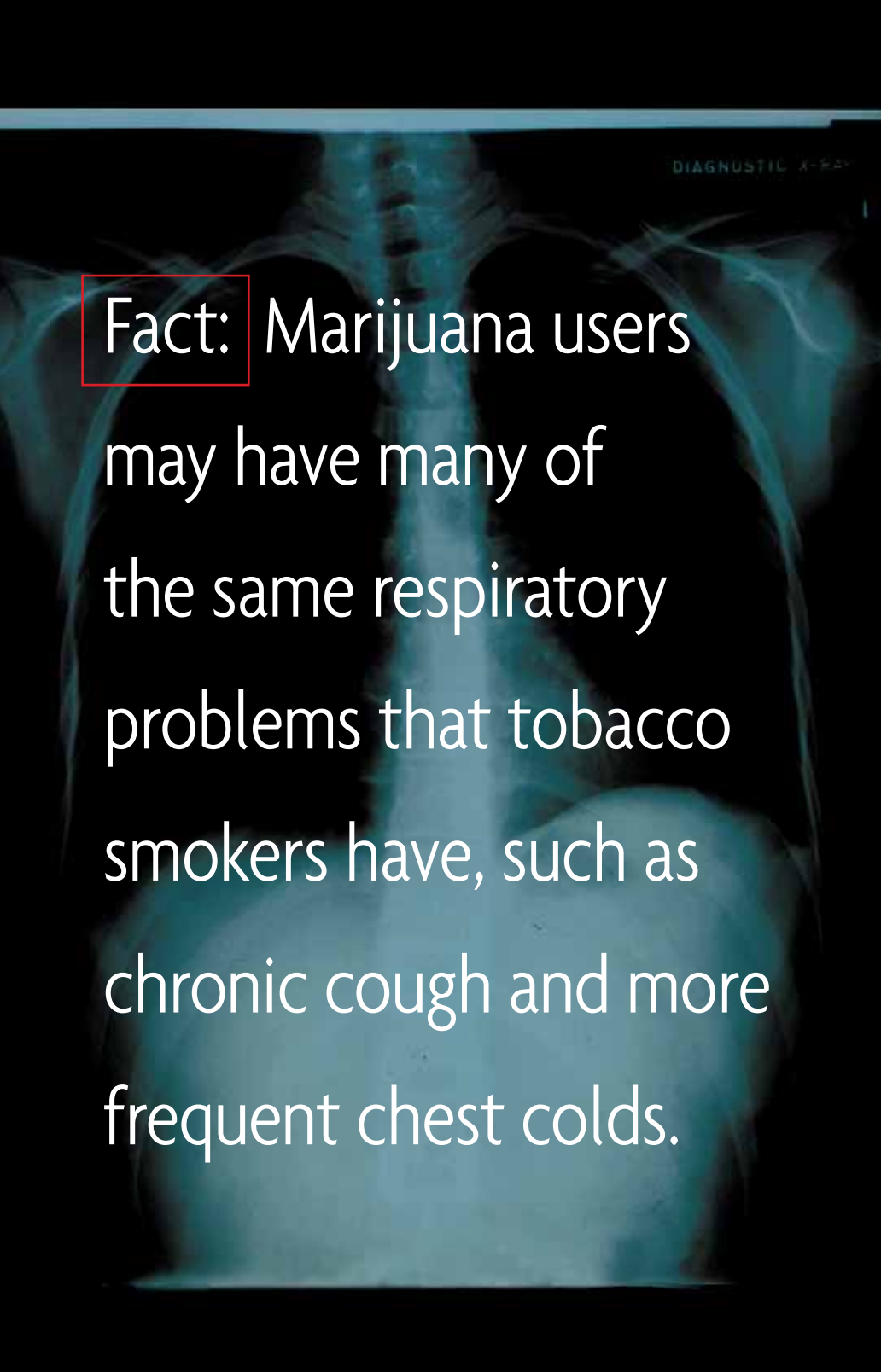
III. Starting the Conversation

As this booklet has shown, marijuana can pose a particular threat to the health and well-being of children and adolescents at a critical point in their lives—when they are growing, learning, maturing, and laying the foundation for their adult years. As a parent, your children look to you for help and guidance in working out problems and in making decisions, including the decision not to use drugs. Even if you have used drugs in the past, you can have an open conversation about the dangers. Divulging past drug use is an individual decision, but having used drugs should not prevent you from talking to your child about the dangers of drug use. In fact, experience can better equip us to teach others, including drawing on the value of possible mistakes.

Greater acceptance of marijuana use, compared with use of other illicit drugs, continues to underlie divergent opinions about its dangers, illegality, and potential value. Indeed, the ongoing public debate about smoking marijuana to ameliorate a wide range of ills—from pain and nausea to anxiety and sleep

disturbances—may complicate your discussion. However, as you have read, marijuana also has liabilities and as a medicinal formulation is not ideal. It contains numerous other compounds with unknown health effects; plus, smoking as a delivery method clearly is not optimal for lung health. Scientists continue to investigate the medicinal properties of THC and other cannabinoids to better evaluate and harness their ability to help patients suffering from a broad range of conditions, while avoiding the adverse effects of smoked marijuana.

Meanwhile, marijuana use can be particularly dangerous for adolescents and can alter the trajectory of a young life, diminishing a person's full potential. And that is reason enough to have this sometimes difficult conversation with your children. We hope this booklet can serve as a catalyst and helpful guide to beginning the dialogue and, more importantly, continuing it and keeping the channels of communication open.



Fact: Marijuana users may have many of the same respiratory problems that tobacco smokers have, such as chronic cough and more frequent chest colds.

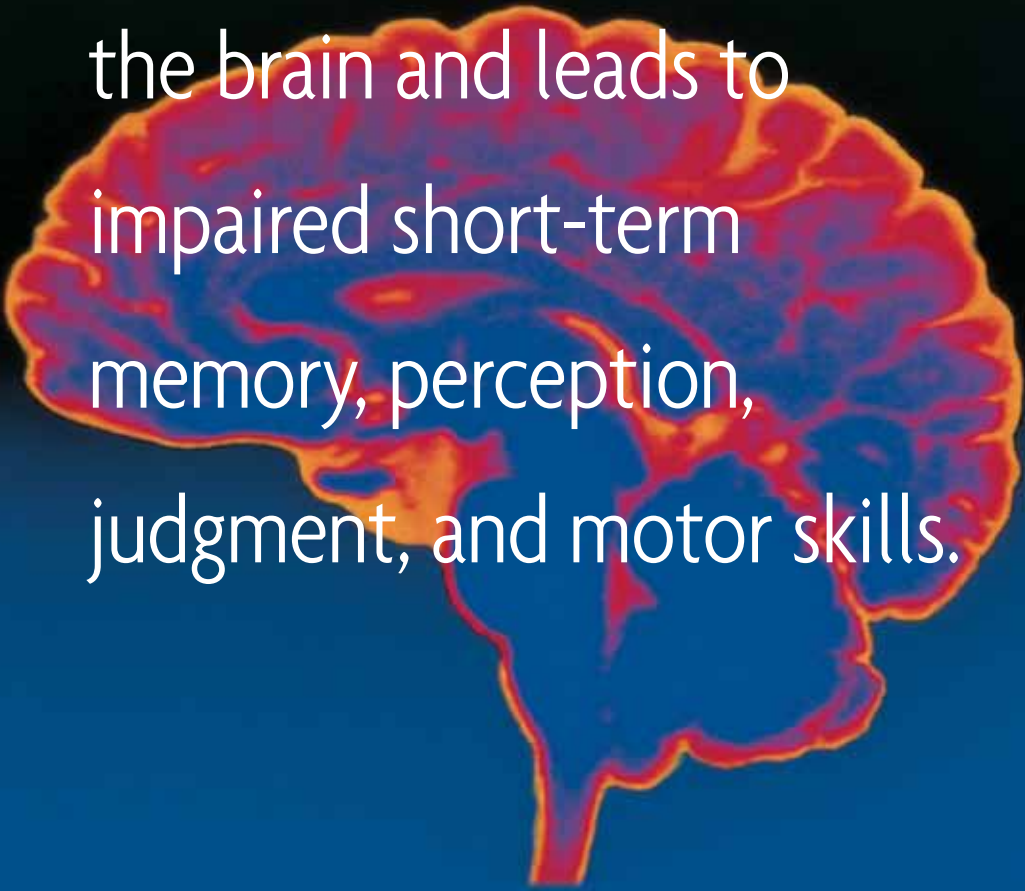
Fact: Marijuana affects

the brain and leads to

impaired short-term

memory, perception,

judgment, and motor skills.



IV. Other Useful Resources

There are numerous resources, many right in your own community, where you can obtain information to help you talk to your children about drugs. Consult your local library, school, or community service organization. You may also contact the governmental organizations listed below.

National Institute on Drug Abuse (NIDA)

NIDA's mission is to lead the Nation in bringing the power of science to bear on drug abuse and addiction. This charge has two critical components. The first is the strategic support and conduct of research across a broad range of disciplines. The second is ensuring the rapid and effective dissemination and use of the results of that research to inform policy and improve practice.

NIDA offers an extensive collection of publications, videotapes, and educational materials to help parents talk to their children about drug use. For general inquiries, contact NIDA's public information office at 301-443-1124 or visit the NIDA Web site at www.drugabuse.gov. For more information on marijuana and other drugs, visit www.marijuana-info.org and www.teens.drugabuse.gov. All NIDA publications are available free of charge through the NIDA DRUGPUBS Research Dissemination Center (<http://drugpubs.drugabuse.gov>; e-mail drugpubs@nida.nih.gov; or phone 1-877-NIDA-NIH [1-877-643-2644] or 1-240-645-0228).

Substance Abuse and Mental Health Services Administration (SAMHSA)

SAMHSA provides valuable information on its Web site, including resources for finding substance abuse treatment. Its treatment locator (<http://findtreatment.samhsa.gov/>) can help you find a drug abuse or alcohol treatment program near you. Visit <http://www.samhsa.gov> for more information on drug abuse prevention and treatment policies, programs, and services.

National Institute of Mental Health (NIMH)

NIMH provides numerous resources covering a variety of mental health disorders, which often co-occur with drug abuse and addiction. Visit www.nimh.nih.gov to access the latest research findings and other helpful mental health information.

National Institute on Alcohol Abuse and Alcoholism (NIAAA)

NIAAA conducts and supports research across many scientific areas, coordinating with other institutes on alcohol-related issues, which frequently intersect with other drug abuse/addiction problems. Visit <http://www.niaaa.nih.gov/> for information on a variety of alcohol-related topics.

Feel free to reprint this publication in any quantity you wish.

Tips for Parents

- *Be a good listener.*
- *Give clear no-use messages about drugs and alcohol.*
- *Help your child deal with peer pressure to use drugs.*
- *Get to know your child's friends and parents.*
- *Monitor your child's whereabouts.*
- *Supervise teen activities.*
- *Talk to your child often.*

Fact: More than 40 percent of teens try marijuana before they graduate from high school.

Fact: Among youth receiving substance abuse treatment, marijuana accounts for the largest percentage of admissions: 63 percent among those 12–14, and 69 percent among those 15–17.