

A Collection of

NIDA NOTES

**NATIONAL INSTITUTE
ON DRUG ABUSE**

Articles That Address



**DRUG ABUSE
PREVENTION**

**Department of Health and Human Services
National Institutes of Health
National Institute on Drug Abuse**

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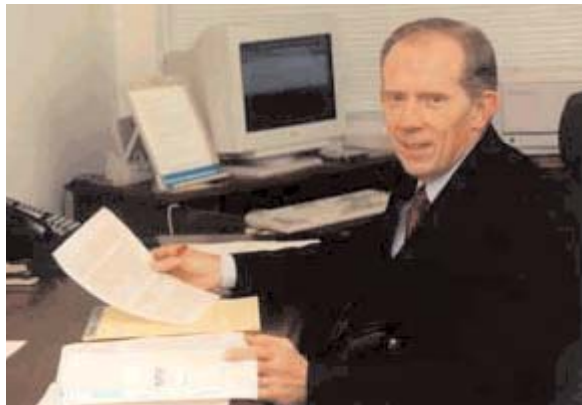
New Vistas in Drug Abuse Prevention

By NIDA Acting Director Glen R. Hanson, Ph.D., D.D.S.

"Prevention is the best treatment" is an oft-cited maxim, and one that certainly applies to drug abuse. Anyone who can be influenced to avoid abusing drugs is spared their harmful health and social effects, including increased risk for lethal infections, family disruption and job loss, confusion and despair, the difficult struggle of treatment, and—for many—the ravages of addiction and the ordeal of climbing back after relapse. From society's point of view, drug abuse prevention helps keep a tremendous burden—related to disease and premature death, lost capacity for productive work, and crime—from being even worse.

The bulk of current interventions to prevent drug abuse fall mainly into two groups. One set is designed to reduce risk factors associated with higher likelihood of drug abuse and increase protective factors associated with lower likelihood of drug abuse. When implemented in conformity with proven prevention principles (see "Risk and Protective Factors in Drug Abuse Prevention"), this strategy, the product of more than a decade of research and clinical experience, is effective and inclusive enough to apply to most populations. Moreover, researchers continue to learn more about how risk and protective factors relate, and practitioners are ever more adept at applying this knowledge. These efforts will continue to yield incrementally—perhaps even dramatically—higher impact interventions well into the future.

Nonetheless, there are limitations to the risk-and-protective-factors strategy. One feature that ultimately limits its impact, for example, is the nature of the factors themselves. They tend to be fundamental or deeply entrenched characteristics or experiences of a person, family, or community. Some are hidden, such as sexual victimization; others are prominent in society, such as adolescent



***New ideas and information
have emerged recently that
hold great promise for
enhancing the impact of
current prevention efforts.***

depression or ready access to drugs of abuse. As a result, traditional risk factors generally can be modified only by relatively broad and long-term interventions. Certain factors may not be susceptible to modification, such as a genetic predisposition to risk-taking. In addition, for the most part, traditional risk factors pertain to an individual's vulnerability to drug abuse, rather than the actual choice to use drugs. As important as it is to lower vulnerability, on a given day, even someone with a relatively low vulnerability may opt to use drugs.

The second important group of preventive interventions complements and extends the risk-and-protective-factors strategy by focusing on the dynamic of situations, beliefs, motives, reasoning and reactions that enter into the choice to abuse or not to abuse drugs. Important applications of this strategy include normative education to refute the common belief that

"everyone takes drugs," and equipping young people with the skills to refuse drug offers without feeling they are losing face. This strategy is full of untapped promise, and today likely offers the best prospects for rapid development of more effective prevention. A few of the many issues whose elucidation may yield improved interventions include why even very young children tend to expect positive experiences from drugs; how individuals' styles for processing language and visual images affect drug-taking decisions; the roles of curiosity and impulsivity in such decisions; and what logical processes people typically follow when deciding to use or not use drugs.

A recent dramatic finding in neurobiological research may greatly increase our understanding of adolescent decision-making and our ability to help adolescents choose wisely regarding drug abuse. Scientists have long suspected that the adolescent brain is still developing physically, and

researchers have now demonstrated that new neural tissue and connections continue to form throughout the transitional years between childhood and adulthood. Further investigation of this growth process undoubtedly will yield important insights relevant to some of the cognitive issues affecting the appeal of drugs and drug-taking decisions. The impact on drug abuse prevention could be tremendous, especially in light of the fact that adolescence often is a critical period for initiation of drug abuse. Most chronic drug abusers start experimenting with intoxication in adolescence or young adulthood. While populations are constantly changing—and while prescription drug abuse by older individuals today is a serious and mounting concern—it remains generally true that people who do not abuse drugs during the decisive years before age 25 are unlikely ever to develop a serious drug problem.

A tighter focus on decisionmaking regarding drug abuse should enable us to progress in a vitally important area: preventing escalation from early, experimental drug use to regular use, abuse, and addiction. We know that fewer than 10 percent of people who experiment with drugs become dependent or addicted. We also know that some of the factors that influence whether a person will become dependent or addicted are independent of the factors that influence whether he or she will initiate drug abuse. For example, research has suggested that, perhaps because of their particular brain chemistry, some individuals dislike the agitation cocaine can produce more than they like the euphoria it brings—and so discontinue use after their

initial experimentation. Interventions based upon such factors may curtail drug abuse before it reaches critical severity and thereby forestall most of its truly tragic health and social consequences.

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NIDA's prevention agenda is to aggressively pursue research on risk and protective factors while also seeking to identify, develop, and integrate new science-based approaches into existing prevention programs. To accomplish these goals, NIDA recently launched the three-part Drug Abuse Prevention Research Initiative. (See "NIDA Conference Reviews Advances in Prevention Science, Announces New National Research Initiative.")

Basic researchers will mine new neurobiological and other fundamental research discoveries for prevention applications. Basic, clinical, and applied researchers and practitioners will work together in Transdisciplinary Prevention Research Centers to synthesize knowledge from all the relevant scientific fields into powerful new prevention packages. Researchers and State and local practitioners will collaborate in Community Multisite Prevention Trials to rapidly assess proposed new prevention approaches and interventions in diverse communities and populations.

Exciting moments in science occur when the gradual accumulation of knowledge suddenly gives rise to new perspectives with the promise of new solutions to problems of living. In the area of drug abuse prevention, this is such a moment, and NIDA is moving swiftly to take full advantage of its potential. **NN**

NIDA Conference Reviews Advances in Prevention Science, Announces New National Research Initiative

By Barbara Cire, NIDA NOTES Associate Editor

A review of current, effective drug abuse prevention programs and the announcement of a new NIDA initiative were among the highlights of the Second National Conference on Drug Abuse Prevention Research held August 9 and 10 in Washington, D.C. Almost 900 participants from all 50 States, the District of Columbia, Puerto Rico, and 13 foreign countries attended the meeting, which was sponsored by NIDA and the Robert Wood Johnson Foundation.

"A particular focus of this conference is to examine how prevention programs can be implemented at the local level," said Dr. Elizabeth Robertson, chief of NIDA's Prevention Research Branch.

"In 20 years of research, we have learned that there are modifiable risk and protective factors, particular points of vulnerability to drug use and abuse, and some basic prevention principles which we summarized in the first-ever science-based guide to prevention, *Preventing Drug Use Among Children and Adolescents*," said then-NIDA Director Dr. Alan I. Leshner in his remarks to participants. "Research has answered many questions, but others remain. We now target risk and protective factors in our prevention programs, but what are the factors that influence the actual decision to use drugs?"

"Over the next 2 years, NIDA will establish the National Drug Abuse Prevention Research Initiative," said Dr. Leshner. "Our goal is to provide the resources to bring the full power of science to bear on the challenge of developing effective drug abuse prevention programs. The Initiative will have three components: Basic Prevention Science Research, Transdisciplinary Prevention Research Centers (TPRCs) and Community Multisite Prevention Trials."

The initiative is intended to stimulate research to translate new knowledge into new interventions, Dr. Leshner noted. The Basic Prevention Science Research component will examine ideas from the sociological, biological, behavioral,



"Messages should be pretested for their effectiveness and appropriateness to the target audience."

*Dr. Joseph Cappella
University of Pennsylvania,
Philadelphia*

and cognitive literature, looking for new information with the potential to inform the development and pilot-testing of new prevention interventions. The TPRCs will support collaborative projects by basic, applied, and clinical researchers across the country. They will focus on identifying and addressing the major knowledge gaps that affect the work of State and local prevention service providers.

The Multisite Trials will test the effectiveness of drug abuse prevention programs in diverse populations and locations. "The trials will examine the features that influence the successful adoption, adaptation, sustainability, and outcomes of science-based interventions in large-scale field trials," Dr. Leshner said.

The conference also featured panel discussions on using risk and protective factors in prevention, identifying effective features in prevention interventions, assessing substance abuse in the community, and building multicomponent community programs. Small-group workshops and lunchtime discussion groups gave participants an opportunity to learn about particular programs in detail and share lessons learned in their own communities.

Risk and Protective Factors

Dr. David Hawkins of the Social Development Research Group at the University of Washington in Seattle summarized the risk and protective factors that can influence whether young people will use drugs. "Over the last 20 years, longitudinal studies have identified many factors that predict youth violence, substance abuse, and other problem behaviors," he said. "Such factors exist in every domain of life: individual, family, peers, school, and community. We must reduce the risk factors and promote the development of protective factors on all levels: individual, family, school, peer, and community." (See "Risk and Protective Factors in Drug Abuse Prevention.") There is a growing list of tested, effective prevention programs that



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*Dr. David Hawkins,
University of Washington,
Seattle*

among first-graders is associated with later aggression, violence, drug abuse, and school dropout. The GBG was originally developed in the late 1960s to help teachers organize and manage classroom behavior and to teach young children how to behave as students. Accepting rules of classroom behavior, concentrating and being ready to work, participating appropriately in classroom teaching and with classmates, and learning were the focus of the GBG. In 1985–1986, Dr. Kellam and his colleagues implemented the GBG as a prevention intervention in 40 first-grade classrooms in 18 representative elementary schools in Baltimore.

First- and second-grade children were assigned to one of three teams in their classroom. During the game, teams were penalized if any team member did not follow the



"Previous research has shown that aggressive and disruptive behavior among first-graders is associated with later aggression, violence, drug abuse, and school dropout."

*Dr. Sheppard Kellam,
American Institutes for Research,
Washington, D.C.*

have been shown to reduce risks, enhance protection, and prevent adolescent substance abuse, Dr. Hawkins noted.

Dr. Sheppard Kellam of the American Institutes for Research in Washington, D.C., discussed a school-based intervention called the "Good Behavior Game (GBG)." Previous research has shown that aggressive and disruptive behavior

by speaking out of turn or getting out of their seats without permission. Teams with four or fewer penalties at the end of the game were rewarded with verbal praise from the teacher, special snacks, or extra time at recess; teams with more than four penalties were not rewarded. At first, the game was played three times a week for

10 minutes at a time. The length of time the game was played increased until it reached a weekly maximum of 3 hours.

Six years later, preliminary analysis of followup data revealed that aggressive behavior and smoking initiation were lower among children who received the classroom intervention compared to those who had not, particularly among boys who had been disruptive or aggressive in first grade. In a recent followup of the participants at age 19 to 22, preliminary analyses indicate that the prevalence of antisocial personality disorder among the most aggressive boys appears to be three to four times lower compared to aggressive boys who did not receive the intervention. These results underscore the importance of early socializing children into the role of student, particularly those at increased risk of learning and/or behavioral problems.

Implementation of Interventions



"We will examine how prevention programs can be implemented at the local level."

*Dr. Elizabeth Robertson,
chief of NIDA's Prevention
Research Branch*

Dr. Linda Dusenbury of Tanglewood Research, Inc., in Greensboro, North Carolina, discussed the effective implementation of interventions. She noted that effective programs are research-based and typically include social resistance training to help students refuse offers to use drugs, as well as information that counters their erroneous perceptions that drug use is widespread among their peers. Effectiveness also depends on the "dosage"—how much of a program is delivered—and the quality—how well the program is delivered, she said. "Ineffective prevention strategies include scare tactics and moral messages," Dr. Dusenbury said. "An exclusive focus on information about different drugs and testimonials from recovering addicts doesn't work very well, either."

Dr. Dusenbury noted that when programs are implemented, there is always a tension between fidelity to the program as it was originally designed and the flexibility required to adapt it to local needs. "If some aspect of a particular program is not working in your community and you want to change it, it's best to talk to the people who developed the program to make sure your adaptation does not violate key principles of the program," Dr. Dusenbury said. "This step helps you and provides the developers with useful feedback."



Dr. Christopher Ringwalt of the Pacific Institute for Research and Evaluation in Chapel Hill, North Carolina, reported preliminary results of a study to identify the prevention curricula being used in middle schools and junior high schools across the country and to determine how many schools were using research-based curricula. Data were collected in 1999 from 1,905 public and private schools via a questionnaire filled out by school staff who taught substance abuse prevention classes.

The study found that only 25 percent of the schools surveyed used at least one research-based curriculum. Respondents were more likely to use didactic instruction methods such as lectures and classroom discussions than interactive methods such as small-group discussions and role-playing activities when presenting information.

The most frequently emphasized content area was knowledge of drugs and their effects; the least emphasized area was drug refusal skills. "These results demonstrate a considerable gap between current school prevention practices and our understanding of effective curricula and their components," said Dr. Ringwalt.

Mass Media Campaigns

An overview of the key elements that make mass media campaigns effective was presented by Dr. Joseph Cappella of the Annenberg School of Communication at the University of Pennsylvania in Philadelphia. He began by noting that success is contingent upon clearly defining a target audience, understanding their prevailing attitudes and beliefs, and crafting engaging and persuasive messages that are presented over the long term. These messages should be pretested for their effectiveness and appropriateness to the target audience.

Well-designed campaigns, Dr. Cappella noted, can affect behavior, as demonstrated by research on smoking and drug use among teens. For example, an antimarijuana public service announcement (PSA) campaign developed by NIDA-supported researchers at the University of Kentucky in Lexington decreased marijuana use by more than 25 percent among high-sensation-seeking adolescents—a group particularly at risk for drug abuse. (See "Television Public Service Announcements Decrease Marijuana Use in Targeted Teens," V16-4, October 2001.) The PSAs included messages especially designed to appeal to the sensation-seeking teens and ran for 4 months during TV programs popular with this group. **NN**

The Many Faces of MDMA Use Challenge Drug Abuse Prevention

By Robert Mathias, *NIDA NOTES* Staff Writer

Three NIDA-funded ethnographic studies presented at the MDMA/Ecstasy Conference illustrate the diversity and complexity of MDMA use in the United States. The studies showed both similarities and differences in patterns of MDMA use and associated sexual behaviors among homosexual men in Boston and New York City, predominantly white heterosexual users in central Ohio, and a racially diverse group of users in Hartford, Connecticut. The studies employed a variety of research techniques, such as on-site observation and interaction with ecstasy users in clubs, informal and structured interviews, and small focus groups, to ascertain who uses MDMA, their patterns of drug use and related behaviors, and the settings in which they use drugs.

Preliminary findings from these studies suggest that targeted drug abuse prevention approaches that address specific factors that are associated with MDMA use by different types of users and in different regions of the country are needed to reduce MDMA abuse. Further research to understand the factors that increase or reduce the risks for drug use in these groups is needed to shape prevention initiatives, the researchers indicated.

MDMA Use Among Men Who Have Sex With Men

A field study conducted by Dr. Patricia Case of Harvard Medical School in Boston found considerable individual, group, and regional variations in patterns of MDMA use among club-drug-using men who have sex with men (MSM) in Boston and New York. More than 50 percent of men interviewed in the study frequently used MDMA in combination with other drugs and 11 percent had injected mainly anabolic steroids within the last 3 months. MSM reported that MDMA use usually occurs with other drugs, including ketamine, cocaine, methamphetamine, and Viagra. Some users primarily engage in uncontrolled drug use, others also take MDMA frequently but according to a set schedule with other drugs to achieve special effects, and still others use MDMA occasionally in connection with special circumstances or holidays.

The MSM in this study were very sexually active and reported unprotected sex while using MDMA although not so often as with other drugs, such as methamphetamine. MDMA prevention messages have had little effect on MSM. This population expressed more concern about the risks of GHB (gamma-hydroxybutyrate), a central

nervous system depressant, because of reported overdose deaths from that drug in both cities.

MDMA Use in Central Ohio

Dr. Robert Carlson and colleagues of Wright State University School of Medicine in Dayton, Ohio, conducted a pilot study of MDMA use among 28 individuals in 2 focus groups in Dayton and Columbus. Participants were evenly divided between men and women who were almost exclusively heterosexual. Like the MSM study, the Ohio study showed tremendous variations in patterns of MDMA use.

One-third of the study population said they had used other club drugs, such as ketamine and GHB, and high alcohol use was common. Dance clubs were popular settings for MDMA use among college students and other young adults, who tended to use MDMA to enhance sociability. MDMA users at raves were younger, less educated, and more likely to have a drug-using lifestyle than were the club-goers. Participants said they also used MDMA at parties, lakes, beaches, high schools, and in cars.

"MDMA is seen as a relatively benign drug," Dr. Carlson said. "Most people hear of very few negative consequences from friends, although they do express concern about adulterants in the pills they are getting." None of the participants reported any negative effects of MDMA use on memory, cognition, or work performance. Condom use during sex appeared to be the norm, but several women reported having sex with men they had not intended to be with after taking MDMA.

MDMA Use Among Urban Youth in Hartford, Connecticut

Dr. Jean Schensul, of the Institute for Community Research in Hartford, Connecticut, reported information from observations and interviews with urban youths in party and club settings combined with survey data obtained during a 15-month study of youths in Hartford. Study participants were 16 to 24 years old, 70 percent male, 40 percent Hispanic, 38 percent African American, and 22 percent Caucasian, Asian, and mixed race or ethnicity. MDMA use in this population is linked to their

social networks, club-going, and parties. MDMA is often used with other drugs, including marijuana, PCP, and alcohol.

"These youth have limited access to accurate sources of information and are uninformed about the risks of MDMA use and drug mixing," Dr. Schensul said. They are exposed to popular hip-hop magazines and rap music lyrics that promote the connection between ecstasy, the

"good life," and better sex. The study shows that MDMA use has spread from the suburbs to the city and is increasing the already high levels of risk of unprotected sex and sexually transmitted diseases among these economically vulnerable young people. The findings suggest that culturally and developmentally appropriate prevention approaches that focus on reducing harmful behaviors are needed for this population, Dr. Schensul said. **NN**

Television Public Service Announcements Decrease Marijuana Use in Targeted Teens

By Kimberly R. Martin, *NIDA NOTES* Contributing Writer

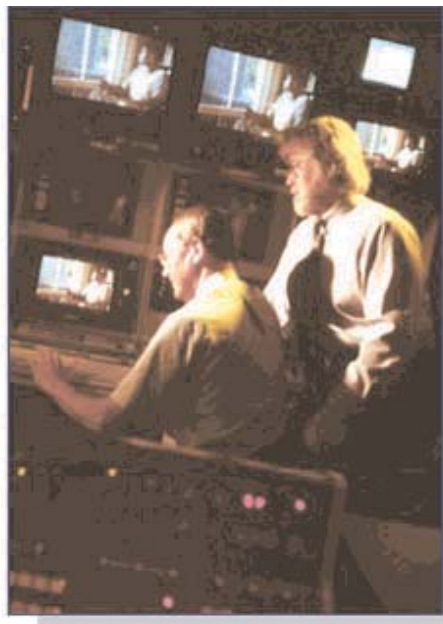
NIDA-supported researchers have helped clarify the necessary elements in effective anti-drug public service announcements (PSAs) directed at high-sensation-seeking adolescents.

NIDA researchers have previously shown that high-sensation-seekers—individuals characterized by their need for new, emotionally intense experiences and the willingness to take risks to obtain these experiences—are at greater risk for using marijuana and other drugs and for using them at an earlier age than other individuals.

Using a prevention approach developed from previous NIDA-supported studies, the researchers produced five anti-marijuana PSAs. The dramatic and attention-getting PSAs were aired during programs that appealed to high-sensation-seekers such as action-oriented television shows. The media placement was supported by paid as well as donated advertising to ensure the most effective outreach to the target audience.

“To appeal to high-sensation-seekers, a PSA must be dramatic, intense, and highly original,” says Dr. Philip Palmgreen, the research team leader at the University of Kentucky in Lexington. “An effective PSA needs to show the negative consequences that can occur as a direct result of drug use. For example, high-sensation-seekers need to see that they can end up in a wheelchair, lose their job, or lose their girlfriend or boyfriend as a result of drug use. We found that the threat of death is not a deterrent because high-sensation-seekers do not believe that death is a real possibility,” he says.

The PSAs were aired from January through April 1997 in Fayette County, Kentucky, and from January through April 1998 in Fayette County and Knox County, Tennessee. One hundred students in 7th through 10th grade were selected each month by random phone calls and asked to participate in the study. The students were interviewed to determine whether they saw the PSAs and their attitudes toward and whether they used marijuana and other drugs. Questions also were asked to determine their degree of sensation-seeking. More than 70 percent of the targeted age groups watched at least three PSAs per week, the researchers say.



Drs. Philip Palmgreen (left) and Lewis Donohew review a public service announcement at the University of Kentucky.

Marijuana use declined substantially among teens during the campaigns in both counties and residual effects of the campaigns were evident for several months. According to Dr. Palmgreen, the second campaign in Fayette County had a “booster effect,” resulting in further declines. Overall, marijuana use decreased by 38 percent in Fayette County. In Knox County, marijuana use declined among high-sensation-seeking teens by 26.7 percent.

“We have shown that, for PSAs to be effective, they must be designed for a specific audience and must air frequently during programs watched by that audience,” says Dr. Palmgreen. “PSAs typically are shown during donated airtime. However, the trend toward paid placements of PSAs, as in various campaigns across the country, is a very positive approach.”

Source

- Palmgreen, P.; Donohew, L.; Lorch, E.P.; Hoyle, R.; and Stephenson, M.T. Television campaigns and adolescent marijuana use: Tests of sensation seeking targeting. *American Journal of Public Health* 91(2):292-296, 2001. **NN**

NIDA Initiative Targets Increasing Teen Use of Anabolic Steroids

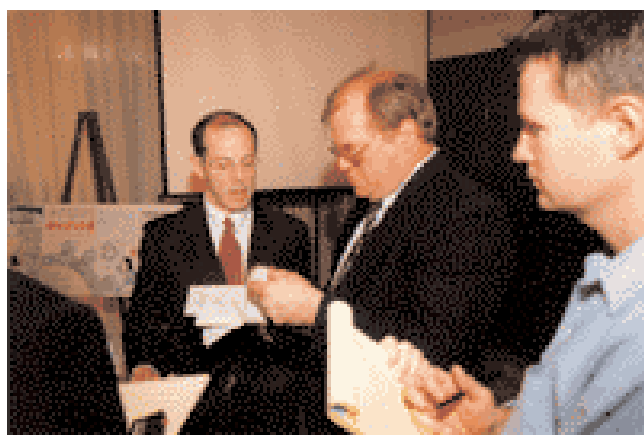
By Patrick Zickler, NIDA NOTES Staff Writer

To reverse the rising use of anabolic steroids by high school-age children, NIDA and seven national partners have launched an initiative designed to alert the public about the risks associated with anabolic steroid use.

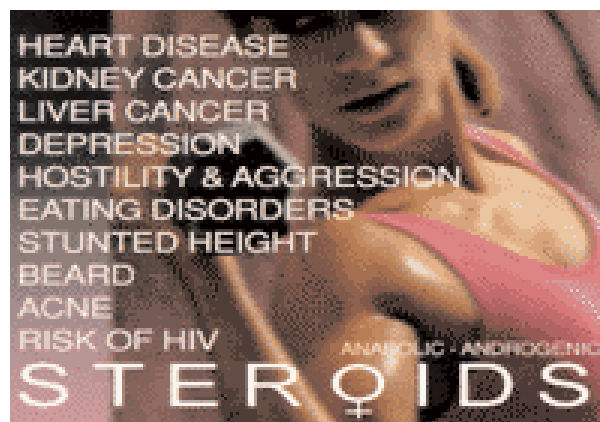
"The most recent data from our Monitoring the Future survey tell us that the trends in use of these drugs and in teenagers' attitudes about them are going in the wrong direction," said NIDA Director Dr. Alan I. Leshner at a Washington, D.C., press conference to announce the initiative. "More than a half million 8th- and 10th-grade students are now using these dangerous drugs, and increasing numbers of high school seniors say they don't believe the drugs are risky."

Anabolic steroids are synthetic compounds that mimic the action of the male sex hormone testosterone. The drugs have some medical uses, but they also are abused by some athletes and sports enthusiasts who want to increase muscle mass and improve performance. Some teens use them because of concern about body image.

In adolescents, anabolic steroid abuse can halt bone growth and has been associated with damage to the heart, kidneys, and liver. In males, steroid abuse can lead to impotence, shrunken testicles, and breast enlargement. In females, the drugs' effects include menstrual irregularities, growth of body hair and loss of scalp hair, a deepened voice, and reduction in breast size. Some of these biological



Dr. Linn Goldberg (left) of Oregon Health Sciences University, explains the Adolescent Training and Learning to Avoid Steroids (ATLAS) program to reporters at a science session following the NIDA press conference.



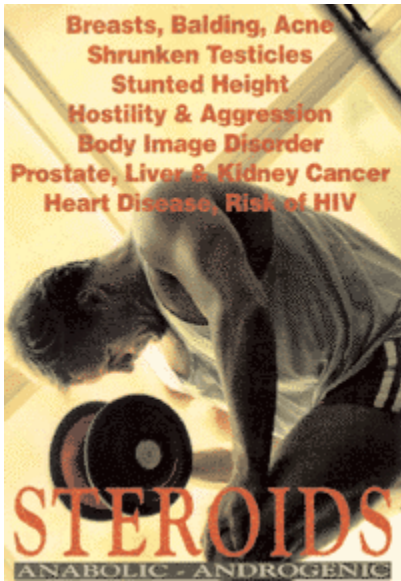
As part of NIDA's anabolic steroids initiative, the Institute has distributed more than 500,000 "art" cards—colorful postcards with messages about the harmful effects of steroid abuse—in gyms, restaurants, bookstores, and clubs.

effects are irreversible. Use of anabolic steroids also has been linked to increased and unpredictable levels of aggression in human and animal studies.

NIDA's initiative includes a new Web site—www.steroidabuse.org—that provides science-based information about the risks and prevention of steroid abuse. NIDA has also released an updated Research Report on anabolic steroids as part of the nationwide multimedia initiative (see "About Anabolic Steroid Abuse"). NIDA and its partners will distribute 250,000 copies of a special Community Drug Alert Bulletin on anabolic steroid abuse and will place 500,000 "art cards"—colorful postcards with messages about the harmful effects of steroid abuse—in gyms, bookstores, restaurants, and clubs in Washington, D.C., Los Angeles, Miami, Baltimore, Seattle, and Indianapolis.

The Institute's partners in the initiative include the National Collegiate Athletic Association, the American Academy of Pediatrics, the American College of Sports Medicine, the National Association of School Nurses, the National Federation of High Schools, International Students in Action, and Dr. Drew Pinsky, a physician who hosts discussions about relationships and sexual behavior on MTV's "Loveline" and the Web site www.drDrew.com.

The press conference announcing the initiative was followed by a scientific session at which NIDA-supported scientists presented summaries of research on anabolic steroids. Dr. Charles Yesalis of Pennsylvania State



"Art" cards like this and the one on page 1 help spread the word about the harmful effects of steroids.

University discussed the history and social context of steroid use and abuse. Dr. Linn Goldberg and Dr. Diane Elliot of the Oregon Health Sciences University in Portland described the Adolescent

Training and Learning to Avoid Steroids (ATLAS) program, a science-based prevention program that uses a team-centered approach to educate young male athletes about the risk and protective factors associated with steroid use. The researchers are currently developing a similar program—Athletes Targeting Healthy Exercise and Nutrition Alternatives (ATHENA)—to prevent eating disorders and abuse of steroids and other body-shaping drugs by young women on school-sponsored athletic, dance and

drill, and rally teams. Dr. Harrison Pope of the McLean Hospital in Belmont, Massachusetts, discussed results of a study designed to examine the effects of steroids on mood and increased aggression—a phenomenon referred to as "roid rage." The research, which involved 56 men who regularly work out at gyms and health clubs, revealed increased aggressive behavior in some participants who received testosterone in dosages smaller than those typically used by athletes or body-builders. Dr. Marilyn McGinnis of Mount Sinai School of Medicine in New York City provided additional evidence that steroid use can result in aggressive behavior. She described recently completed laboratory studies in which rats with elevated levels of steroids exhibited unprovoked aggression toward passive, nonthreatening rats as well as intensely aggressive responses to provocation.

For More Information

The NIDA Research Report "Anabolic Steroid Abuse" (NCADI publication #PHD561) can be obtained from the National Clearinghouse for Alcohol and Drug Information, P.O. Box 2345, Rockville, MD 20847; phone 800-729-6686; fax 301-294-5516; e-mail info@health.org. The report and other information about anabolic steroids can be found at the special NIDA Web site: www.steroidabuse.org. **NN**

Developing Successful Drug Abuse Prevention Programs

NIDA's research over the past 25 years has identified many factors that put young people at risk for drug abuse, and has also identified protective factors that decrease the likelihood that young people will use or abuse drugs. NIDA's drug abuse prevention research has shown how to develop, test, and implement programs that families, schools, and communities can use to successfully prevent drug use among young people.

Risk Factors

Research has shown that although there are many risk factors for drug abuse, the most crucial ones are those that influence a child's early development within the family. These risk factors include parents who abuse drugs or suffer from mental illness; lack of strong parent-child attachments in a nurturing environment; poor parental monitoring; and ineffective parenting, particularly with children who suffer from conduct disorders or have difficult temperaments. Other risk factors involve a child's interaction in environments outside the family—in school, among peers, or in the community at large. These risk factors include inappropriate classroom behavior or failing school performance, poor social skills or affiliation with deviant peers, and a perception that drug use is acceptable within peer, school, or community environments.

Protective Factors

The most important protective factors, like risks, come from within the family, but include factors that influence a child in other environments. Among protective factors identified by NIDA research are strong bonds and clear rules of conduct within a family, involvement of parents in a child's life, successful school performance, strong bonds with positive institutions such as school and religious organizations, and a child's agreement with the social norm that drug use is not acceptable.

Prevention Principles

Prevention programs include a wide variety of techniques depending on the target population, but NIDA research has identified several fundamental principles, such as:

- Prevention programs should enhance protective factors and reverse or reduce risk factors;
- Prevention programs should target all forms of drug



abuse, including use of tobacco, alcohol, marijuana, and inhalants;

- Prevention programs aimed at young people should be age-specific, developmentally appropriate, and culturally sensitive; and they should be long-term with repeat interventions to reinforce prevention goals originally presented early in a school career;
- Prevention programs should include a component that equips parents or caregivers to reinforce family antidrug norms;
- Family-focused prevention programs have a greater impact than those that target parents only or children only; and
- Prevention programs should be adapted to address specific drug abuse problems in the local community.

A full description of NIDA's drug abuse prevention research can be found in the online publication *Preventing Drug Abuse Among Children and Adolescents—A Research-Based Guide*. The publication can be viewed, downloaded, or printed from the Publications index at NIDA's home page at www.drugabuse.gov.

NIDA's Drug Abuse Prevention: Research Dissemination and Applications (RDA) materials include a core set of three resource manuals—*Drug Abuse Prevention: What Works*; *Community Readiness for Drug Abuse Prevention: Issues, Tips, and Tools*; and *Drug Abuse Prevention and Community Readiness: Training Facilitator's Manual* (PB97-209605, \$83)—and three related manuals—*Drug Abuse Prevention for the General Population* (PB98-113095, \$36), *Drug Abuse Prevention for At-Risk Groups* (PB98-113103, \$36.50), and *Drug Abuse Prevention for At-Risk Individuals* (PB98-124365, \$41). The core set of RDA materials and the related manuals can be ordered through the National Technical Information Service at (800) 553-6847, fax (703) 605-6900. **NN**

Putting Science-Based Drug Abuse Prevention Programs to Work in Communities

By Robert Mathias, *NIDA NOTES* Staff Writer

NIDA-supported studies are defining ways to get scientifically tested drug abuse prevention programs applied in communities across the Nation. This complex line of research is developing new partnerships and strategies that can enable both rural and urban communities to select and sustain effective prevention programs that promote young people's well-being and deter drug use and other harmful behaviors.

Scientists have shown that programs that help parents and children function better individually and as a family can reduce substance abuse among general populations of young people. However, the potential of such research-based family and school competency-building programs has not been fully realized because such programs are not being widely used in communities across the Nation.

"Many challenges must be overcome to implement empirically supported programs on a large scale," says Dr. Richard Spoth of Iowa State University in Ames. People seeking to adopt prevention programs often don't have good information about scientifically tested programs, he says. In addition, they often lack the personnel and time required to implement such programs faithfully.

Over the last 7 years, Dr. Spoth has led a series of interrelated studies called Project Family. The project, which is funded by NIDA, the National Institute of Mental Health, and other Federal agencies, has developed some promising ways to use existing community service delivery systems to facilitate putting youth- and family-focused prevention science into community practice. For example, Project Family researchers have developed partnerships with the Iowa Cooperative State Research, Education, and Extension Service of the U.S. Department of Agriculture.

The Strengthening Families Program addresses risk and protective factors for drug abuse and other problem behaviors. In the program, parents and children work together to improve their ability to communicate and to resolve problems at home and at school.

Extension Service agents work in nearly every county in the United States and are dedicated to serving families and youth. This network of professional practitioners has a long history of disseminating the latest scientific information for the benefit of residents of both rural and urban communities. Programming and information provided to local residents cover a wide spectrum of topics ranging from child development, family relations, and consumer economics to weed science and crop management.

The Extension Service network has helped Project Family researchers engage community residents to help with the project. For example, Extension Service agents have involved schools in research evaluating family and youth competency-building programs and have recruited and helped train local residents to deliver the programs. Extension Service agents also have assisted in such tasks as assessing family needs, identifying factors affecting family engagement in prevention programs, and carrying out strategies to disseminate effective family and youth programs.

One of the programs developed and disseminated through this research-Extension-community partnership is a brief family-focused prevention program called the Iowa Strengthening Families Program (ISFP). Adapted for general populations by Dr. Virginia Molgaard of Iowa State University from a prior, more intensive program, the seven-session ISFP was designed to improve parents'



family management practices and communications skills and children's personal skills, social skills, and ability to deal with peer pressure. The program was tested with 161 families of 6th graders enrolled in Iowa public schools.

**"Using the Extension Service...
is an exciting way to use an
existing delivery system to get
effective programming into the
local communities."**

Children who took part in the program when they were in sixth grade were significantly less likely to begin using drugs and alcohol or to progress to more serious substance use than their peers who did not participate in the program, according to followup studies conducted at regular intervals over the last 4 years. For example, 48 months after the initial assessment, the proportion of new marijuana users among youths who didn't participate in the ISFP was 2.4 times greater than it was among youths who did participate. Furthermore, the divergence in drug use between youths who received the program in the sixth grade and those who didn't has widened in the 4 years since the study's pre-intervention assessment, according to a recent evaluation.

Once Project Family research demonstrated the effectiveness of the Iowa Strengthening Families Program, the State Extension Service took the lead in disseminating the program through its statewide network, Dr. Spoth says. To date, the Extension Service has trained more than 600 group leaders to deliver the ISFP, and the program has been offered in 91 communities in Iowa.

"Using the Extension Service as the mechanism to replicate these programs in other communities is an exciting way to use an existing delivery system to get effective programming into the local communities," says

Dr. Elizabeth Robertson of NIDA's Division of Epidemiology, Services, and Prevention Research. "Similar types of service delivery systems across the country could be tapped in the same way," she says. "We're working to identify such systems and tap them to disseminate effective drug abuse prevention programs."

In the last 2 years, Project Family has been working extensively in Iowa with another major service delivery system—the public schools—to implement its latest study, the Capable Families and Youth project. This NIDA-funded study will assess whether adding the Iowa Strengthening Families Program to a scientifically proven school-based prevention component has a greater impact on children's substance abuse and other health behaviors than the school-based program alone.

"Comprehensive prevention programs that include school, family, and community components require effective partnerships to implement and sustain them," Dr. Spoth says. "We're integrating the school system and its technical assistance infrastructure with the Extension Service as a way to implement these kinds of programs," he says. (See "The Next Step in Dissemination Proven Prevention Programs?")

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NIDA Launches Initiative to Combat Club Drugs

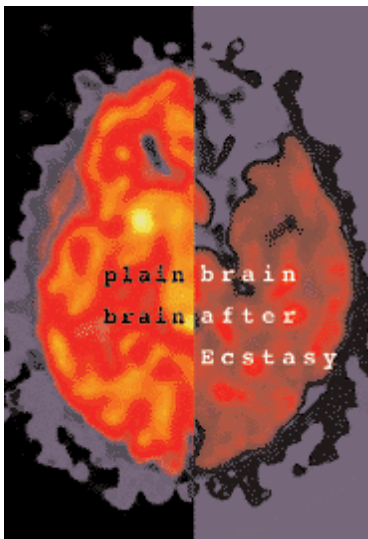
By Patrick Zickler, NIDA NOTES Staff Writer

Responding to the alarming recent rise in use of club drugs, NIDA has initiated a broad-based public initiative to inform and educate teens, young adults, parents, and communities about the dangers of drugs such as "ecstasy," "roofies," and GHB.

"Young adults believe club drugs can harmlessly enhance their experience at dance parties and 'raves,' but there is no safe way to use any of these drugs," said NIDA Director Dr. Alan I. Leshner. "Research shows that some of the so-called club drugs have long-lasting effects on the brain. Combined with alcohol, these drugs are even more dangerous, sometimes deadly. There is no such thing as a harmless club drug. There is no such thing as recreational drug use."

At a Washington, D.C., press conference, Dr. Leshner announced that NIDA was teaming up with the American Academy of Child and Adolescent Psychiatry, the Community Anti-Drug Coalitions of America, Join Together, and National Families in Action to increase public awareness of the effects of club drugs. As part of the initiative, Dr. Leshner said, NIDA is increasing its funding for club drug research by 40 percent, to \$54 million. In addition, NIDA has developed a multimedia campaign, including a new Web site—www.clubdrugs.org—to disseminate science-based information about the drugs.

"Accurate, credible information is the most powerful weapon we have to combat the increasing use of these dangerous drugs," said NIDA Associate Director Dr. Timothy P. Condon. "Our Web site will provide up-to-date information 24 hours a day. We are distributing 250,000 copies of a special



A NIDA "Hot Stamp" postcard uses actual brain images to show the damage caused by "ecstasy." The brain of a person who has never used drugs is on the left; the brain of a person who has used the drug many times is on the right.



This new Web site—www.clubdrugs.org—provides information on club drugs and their effects.

Community Drug Alert Bulletin that explains where these drugs are being used and what science has revealed about the way they work. And we are placing more than 330,000 free colorful 'HotStamp' cards—which show how using ecstasy can disrupt brain function—in restaurants, bars, coffee shops, and bookstores."

NIDA's initiative represents an important first step in reducing club drug use, said Dr. David Rosenbloom, director of Join Together, a project organized by the Boston University School of Public Health to serve as a national resource for information that community-level organizations can use to prevent drug use. "This is NIDA's early warning alarm. It sends a very clear signal to the Nation," Dr. Rosenbloom said. "We need to act quickly, distribute accurate scientific information, and reverse the pattern of increasing use of these dangerous drugs." **NN**

Teaching Community Leaders Strategies to Reduce Drug Abuse

NIDA representatives and 35 graduates of the Join Together National Fellows Program gathered in June for a 3-day "think tank" on how community leaders can use NIDA research in strategies to reduce drug abuse. Join Together is a Boston University-based organization that supports community efforts to reduce, prevent, and treat substance abuse across the Nation. The Fellows, local leaders recognized for their contributions to reducing drug abuse and its consequences, represented seven of the largest U.S. cities—Baltimore, Chicago, Cleveland, Detroit, New York, San Antonio, and San Francisco.

With participating Fellows serving as coteachers as well as students, the Institute aimed to increase participants'

understanding of emerging scientific knowledge about prevention and treatment of drug abuse, to identify concrete steps for applying that knowledge, and to develop strategies for disseminating scientific information and dispelling myths about drug abuse and addiction.

NIDA Associate Director Dr. Timothy P. Condon and Dr. Jack B. Stein, deputy director of NIDA's Office of Science Policy and Communications, discussed the science of drug addiction, the principles of drug abuse prevention, and the efficacy of treatment for drug abuse. Dr. Charlene Woodard, a former NIDA policy analyst, coached participants in critical thinking about science in the news. **NN**

Studying Comprehensive Drug Abuse Prevention Strategies



25 Years of Progress

In the early 1980s, NIDA began to encourage research on comprehensive drug abuse prevention programs that involve many components of a community. The theory behind this approach is that children are more likely to pay attention to antidrug messages that are repeated throughout the community than they are to heed messages from only one source, such as in school or at home.

One of the first of these comprehensive prevention programs was the Midwestern Prevention Project conducted by Dr. Mary Ann Pentz and her colleagues at the University of Southern California in Los Angeles. The research program was first implemented in Kansas City, Kansas, and Kansas City, Missouri, in 1984 and later replicated in Indianapolis, Indiana, starting in 1987.

The program involved schools, mass media, parents, community, and health policymakers. Sixth- and seventh-graders were taught in school how to resist social influences to use drugs. This learning was reinforced through public service announcements and news stories. Parents were encouraged to help their children on drug abuse prevention homework assignments and to talk with their children about drugs. Volunteers from the community provided leadership, developed community antidrug campaigns, and raised funds for related prevention activities. Finally, the community established policies that discouraged the use of drugs, cigarettes, and alcohol in schools, at work, and in public places.

Research findings indicated that students in the 107 participating schools in Kansas City and Indianapolis used significantly less marijuana, cigarettes, alcohol, and cocaine than did students whose schools did not participate. Substance abuse increased for both groups of students as they got older, but the increase was substantially less for students in participating schools.

Data from the Indianapolis study showed that the program could also reduce the use of marijuana, cigarettes, and alcohol by sixth- and seventh-graders who were already users of these substances. "Studies have shown that young people who use drugs and alcohol earlier than their peers are particularly likely to continue to abuse these substances later, so the fact that this program reduced substance use in this high-risk group was particularly promising," says Dr. William Bukoski of NIDA's Division of Epidemiology, Services, and Prevention Research.

"Our studies have shown that a substance abuse prevention strategy that involves many components of the community can slow the rate of increase of drug, alcohol, and cigarette use among early adolescents and also decrease the use of these substances by adolescents who are already using them," says Dr. Pentz. "This strategy works because it changes social norms and expectations. Changing social norms about drug use changes drug use behavior in turn."

NN

Student Use of Marijuana Linked to Perceptions of Risk

Many American teenagers today do not believe that smoking marijuana is dangerous. That was one of the conclusions of a recent study, by Dr. Jerald G. Bachman and colleagues at the University of Michigan in Ann Arbor, that examined changing attitudes of high school students toward the use of marijuana. The study is based on an extensive review of data from NIDA-supported annual surveys of 8th-, 10th-, and 12th-graders. The surveys, which together make up the ongoing Monitoring the Future project, have collected data on drug use from high school seniors since 1975. Data from 8th- and 10th-graders have been collected since 1991.

The percentage of high school seniors who used marijuana at least once during the past year decreased from 50.8 percent in 1979 to 21.9 percent in 1992, before rising steadily to 37.5 percent in 1998. While use rose, the perception of harm from use declined from 76.5 percent in 1992 to 58.5 percent in 1998. Those who disapproved strongly of regular use dropped from 90.1 percent in 1992 to 81.2 percent in 1998.

Dr. Bachman's group's statistical analysis showed that the simultaneous rise in use and decline in perceived harmfulness during the mid-1990s was more than simple coincidence. To account for this waning concern about the dangers of marijuana, the researchers suggest that the decline in drug use in the 1980s may have led to a "lowering of the guard" of government, schools, mass media, and families. News coverage of drug issues fell substantially in the early 1990s, and fewer antidrug messages were aired during prime-time television programs, the researchers note.

Young people pay close attention to realistically and creatively presented information about the risks of drug use, the researchers suggest. "Presenting this kind of information on the risks and consequences of marijuana use only once does not do the job," says Dr. Bachman. "The message must be repeated regularly so we don't lose students from one year to the next." **NN**

Educating Children and Adults About Drug Abuse and Science

NIDA NATIONAL INSTITUTE **25** Years
ON DRUG ABUSE 1974-1999*25 Years of Progress*

Eight years ago, NIDA funded the production of a video by a group of middle school students in Maryland that would answer their questions about drug abuse and the brain. Today that video, "If You Change Your Mind," is still being used by teachers across the country.

"'If You Change Your Mind' was the first product of NIDA's science education program," says Dr. Cathrine Sasek, who directs the program. The Institute established the program in 1991 to improve the quality of science education in grades K-12, to interest children in pursuing careers in scientific research, particularly drug abuse research, and to increase the general public's knowledge of the scientific facts about drug abuse and addiction. The information provided by the program enables children and adults to make educated decisions about drug use and other health matters.

In the years since "If You Change Your Mind" was created, the science education program has produced a variety of appealing materials that communicate information about science, drug abuse, and drug addiction to students, parents, teachers, and the general public. One of the program's most popular products is the Mind Over Matter series, which debuted in 1997. Mind Over Matter's eye-catching magazines showcase the adventures of a girl named Sara Bellum as she explores the brain's response to individual drugs of abuse and communicates key concepts of neuroscience. Other popular products developed through science education grants include:

- slide teaching packets with suggestions to help scientists communicate with middle and high school students about the brain and addiction;
- a traveling museum exhibit featuring an interactive CD-ROM that shows drugs working in the brain; and
- another CD-ROM-based program that parodies popular TV shows to counter myths and misconceptions about drug abuse and addiction.

In 1998, NIDA packaged a number of these and other educational resources into the "NIDA Goes to School" kit and mailed them to science teachers at more than 18,000 public and private middle schools across the country.



Scene One, Take One:

Maryland middle school students shoot "If You Change Your Mind," the video that helped launch NIDA's Science Education Program

The science education program accomplishes its goals through the in-house development of materials, Science Education Drug Abuse Partnership Awards (SEDAPA), and Small Business Innovation Research (SBIR) grants. Evaluations conducted by SEDAPA and SBIR grantees over the years show that NIDA's science education programs have improved scientific literacy and corrected misconceptions about drug abuse and addiction among school children and adults, Dr. Sasek says.

For More Information

Science education materials and additional information about drugs of abuse can be obtained from the "NIDA Goes to School" Web site on NIDA's home page on the World Wide Web at www.nida.nih.gov. A catalogue of NIDA's current science education materials and ordering information can be obtained by clicking on the Publications link on NIDA's home page. NIDA's science education materials also are available from the National Clearinghouse for Alcohol and Drug Information, P.O. Box 2345, Rockville, MD 20847. Phone: 1-800-729-6686; TDD: 1-800-487-4889; fax: 301-468-6433; email: info@health.org. **NN**

Ethnic Identification and Cultural Ties May Help Prevent Drug Use

By Patrick Zickler, *NIDA NOTES* Staff Writer

Among Puerto Ricans, African Americans, and Asians, cultural influences and ethnic identification may significantly influence drug use. Studies conducted by NIDA researchers in New York City suggest that Puerto Rican and African-American adolescents who strongly identify with their communities and cultures are less vulnerable to risk factors for drug use and benefit more from protective factors than do adolescents without this identification. In San Francisco, NIDA-supported research demonstrated different patterns of drug use among different subgroups of the Asian community. These findings suggest that incorporating ethnic and cultural components into drug abuse prevention programs can make these programs more effective.

In one study, Dr. Judith Brook at the Mount Sinai School of Medicine in New York City examined the extent to which ethnic and cultural factors influenced drug-related behavior in Puerto Rican adolescents. She and her colleagues interviewed 275 males and 280 females aged 16 to 24. The researchers asked the participants to describe the importance in their lives of cultural and ethnic factors such as observation of Hispanic holidays and customs, preference for speaking Spanish or English, feelings of attachment to their ethnic group, ethnic affiliation of their friends, and the value placed on the family. The participants also answered questions designed to assess their personal risk for drug use; these risk factors included the use of drugs by parents or siblings, peer use or tolerance of drug use, perception of the riskiness of drug use, and the availability of illegal drugs in their environment. The participants were categorized into stages of drug use: no reported drug use, used alcohol or tobacco only, used marijuana but no other illicit drug, or used illicit drugs other than or in addition to marijuana.

"Other studies have looked at ethnic identification in isolation, not as an interactive part of a young person's cultural and social context," Dr. Brook says. "We wanted to determine the extent to which ethnic and cultural factors

might mitigate risk factors or enhance protective factors and lead to lower stages of drug use. We found that strong ethnic identification acts to offset some risks, resulting in less drug use.

"For example, strong identification with Puerto Rican cultural factors offsets drug risks such as a father's drug use, peer tolerance of drugs, and the availability of drugs. Identification with Puerto Rican friends offsets risks associated with family tolerance for drug use and drug availability," Dr. Brook notes.

Ethnic identification also serves to amplify the effect of protective factors, Dr. Brook says. For example, among participants whose siblings were not drug users, those with a strong Puerto Rican affiliation were significantly more likely to be in a lower stage of drug use than those whose affiliation was weaker.

In a related study that focused on late-adolescent African Americans in New York City, Dr. Brook and her colleagues found a similar interaction between ethnic and cultural identification and drug use. The study involved 627 participants—259 males and 368 females—ages 16–25 years.

The researchers found that components of ethnic identity—such as awareness of African-American history and tradition, identification with African-American friends, or participation in African-American cultural activities such as Kwanzaa—interacted with other factors to reduce risk or to enhance protection.

"In isolation, few specific components of ethnic identity play a role as main effects on drug use. Instead, they act in combination with family, personality, or peer influences to blunt the negative impact of risk factors and magnify the positive value of protective factors," Dr. Brook says.

"Together, the research with Puerto Rican and African-American populations points out the importance of incorporating ethnic identity into drug programs," Dr. Brook concludes. "It can be a valuable part of drug prevention programs in communities and can also be applied to individual treatment programs."

Adolescents who strongly identify with their communities and cultures are less vulnerable to risk factors for drug use.

Cultural Differences Lead to Different Patterns of Drug Use

In another NIDA-supported study, Dr. Tooru Nemoto and his colleagues at the University of California, San

Francisco, have identified patterns of drug use among Asian drug users that are unique to ethnicity, gender, age group, and immigrant status.

"Large multiracial studies have not distinguished between Asian ethnic groups," Dr. Nemoto says. "The purpose of our study was to describe the patterns of drug use in Chinese, Filipino, and Vietnamese groups and to assess the relationship between cultural factors and drug use among the groups."

The San Francisco study was based on qualitative interviews with 35 Chinese, 31 Filipino, and 26 Vietnamese drug users who were not enrolled in treatment programs. All participants were 18 years or older, with an average age of 32.5, and had used illicit drugs more than three times per week during the preceding 6 months. Overall, immigrants and women represented 66 percent and 36 percent, respectively. However, all Vietnamese were immigrants.

Overall, participants born in the U.S. began using drugs at an earlier age—15 years—than did immigrant Asians—19 years—and were more likely than immigrants to use more than one drug. In general, women started drug use at about the same age as men—about 17.5 years—but ethnic groups showed a varied pattern. Chinese women began earlier—at 15.2 years—than Chinese men—at 18.5 years. Filipino women began using drugs later—at 15.5 years—than Filipino men—at 13.1 years. Vietnamese women in the study started drug use much later—at 27.8 years—than did Vietnamese men—at 19.9 years.

Dr. Nemoto and his colleagues identified differences in drug use among the ethnic groups. Filipino drug users were most likely to have begun drug use with marijuana, while Vietnamese drug users in the study most often

started with crack or powder cocaine. Chinese and Vietnamese were twice as likely as Filipinos to be using crack as their current primary drug. Filipinos were four times more likely to be using heroin than were Chinese or Vietnamese. Filipino study participants were more likely than Chinese or Vietnamese to be injecting and less likely to be smoking drugs. There were also significant differences in the characteristics of drug user networks among the ethnic groups. For example, Filipinos were more than twice as likely as Chinese or Vietnamese participants to use drugs in groups that included members of other races or ethnic groups.

"These differences among ethnic groups have important implications for the way we design programs aimed at Asian drug users," Dr. Nemoto says. "Prevention programs should address the common factors among Asian drug users, such as stigma associated with injection drug use, but we should also be careful to incorporate factors that are unique to each target group."

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Steroid Prevention Program Scores With High School Athletes

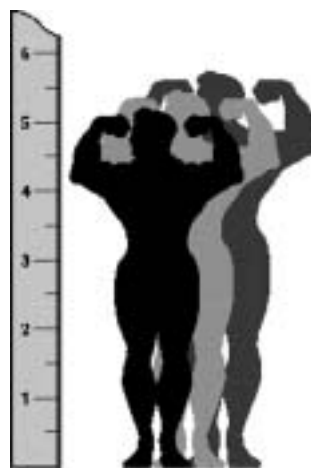
By Robert Mathias, NIDA NOTES Staff Writer

A NIDA-funded drug abuse prevention program is showing high school football players that they do not need to take anabolic steroids to build powerful muscles and improve athletic performance. By educating student athletes about the harmful effects of anabolic steroids and providing nutrition and weight-training alternatives to steroid use, the program has increased football players' healthy behaviors and reduced their intentions to use steroids.

Until now, anabolic steroids, drugs derived from the male hormone testosterone, have rarely been the focus of drug abuse prevention studies, says Dr. Ro Nemeth-Coslett of NIDA's Division of Epidemiology and Prevention Research.

This may be because steroids are not widely abused. Only about 2 percent of 8th-, 10th-, and 12th-grade students have ever used steroids, according to the NIDA-supported Monitoring the Future study for 1996. However, steroid abuse occurs more often among young people who are involved in physical training because anabolic steroids can increase muscle mass, strength, and stamina, Dr. Nemeth-Coslett points out.

Although adolescent boys, particularly those involved in athletics such as football or body building, make up the



Student athletes in the ATLAS program learn that stunted growth and many other harmful effects can result from steroid use.

majority of high school steroid users, national surveys show that adolescent girls also are vulnerable to the lure of steroid use. However, that lure contains a hook—anabolic steroid use can have severe physical and emotional consequences for both males and females. Physical effects can include stunted growth, high blood pressure, and liver tumors. Psychological effects can include wide mood swings that range from episodes of uncontrolled anger and aggressiveness to clinical depression when steroid use is

Adolescent Girls Abuse Steroids, Too

What do anabolic steroids have in common with amphetamines, tobacco, diet pills, laxatives, and anorectics? They all are drugs used by adolescent girls seeking to stay thin, says Dr. Linn Goldberg of Oregon Health Sciences University. The use of these drugs, which often goes hand in hand with eating disorders, is particularly prominent among adolescent girls engaged in athletic activities ranging from track and field, soccer, basketball, and volleyball to school dance and drill teams, Dr. Goldberg says.

Dr. Goldberg and his colleague Dr. Dianne Elliot have been conducting preliminary research, funded by NIDA, to identify risk factors that influence adolescent girls use of harmful drugs. Among other things, the researchers have found that many adolescent girls use drugs to maintain thinness, Dr. Goldberg says. National surveys indicate that girls account for about one-third of the high school students who abuse steroids, Dr. Goldberg says. The primary reason that these girls use steroids is to lose fat and gain lean muscle, he says.

Dr. Elliot and Dr. Goldberg have already developed an effective steroid prevention program for male high school athletes described beginning on the previous page. Now, they are developing a similar drug abuse prevention program for adolescent girls. In their future research, the researchers hope to test the effectiveness of the intervention in reducing drug use and eating disorders among female athletes in Oregon's public middle and high schools.

The prevention program gives student athletes the knowledge and skills to resist steroid use and achieve their athletic goals in more effective, healthier ways.

stopped. (See "Questions and Answers About Anabolic Steroids.")

"The Adolescents Training and Learning to Avoid Steroids (ATLAS) program uses a team-oriented educational approach that motivates and empowers student athletes to make the right choices about steroid use," says Dr. Linn Goldberg of Oregon Health Sciences University in Portland, who led the research team that developed and tested the program. The program consists of classroom, weight-training, and parent information components. Together, they give student athletes the knowledge and skills to resist steroid use and achieve their athletic goals in more effective, healthier ways, he says.

In ATLAS's classroom component, football coaches and student leaders conduct seven highly interactive sessions that explore the effects of steroids, the elements of sports nutrition, and strength-training alternatives to steroid use. These classes also hone the athletes' decision-making and drug-refusal skills. In a typical session, the football team is split into squads of six or seven students, with student squad leaders conducting the sessions and teaching most of the intervention, according to Dr. Goldberg. "It's kids talking to kids; that's an important ingredient in our program," he says. Coaches, who have a substantial influence on these student athletes, also play an important role on the steroid prevention team, Dr. Goldberg says. Coaches introduce topics and wrap up each session, he explains.

"The ATLAS program is voluntary, and students get no credit for it, so it better be entertaining," he says. As a result, ATLAS classroom sessions are designed to combine fun and games and learning. Coaches move from squad to squad and introduce a topic, such as the effects of anabolic steroids. Then squad leaders take over and initiate an action game that incorporates the topic. For example, players may toss a football to each other as they answer questions about problems that stem from steroid use. "Although they are playing a game, each one is paying attention and listening because someone is flipping the ball to them," says Dr. Goldberg. "No one is saying to them, 'Watch out, steroids cause liver disease, acne, and so forth,'" he notes. "But while they are laughing and having a good time, they are actually watching and learning at every step of the way."

"Football players are athletes; they like to compete," Dr. Goldberg notes. Therefore, several games pit squads against each other to try and earn the most points for correct answers about weight training, nutrition, and steroids. In addition to games, "students do mock public service announcements, they do 'rap,' they do songs, and they do newspaper articles in the classroom sessions," he says.

In ATLAS's weight-training component, research staff members conduct seven hands-on sessions that teach the students proper weight training techniques. These sessions are designed to help student athletes build the muscular strength and agility needed to achieve their athletic goals without using steroids.

In the parent information component, parents participate in an information and discussion session about the program with the ATLAS staff. The staff gives the parents a family sports nutrition guide and encourages them to support and reinforce the antisteroid and nutritional goals of the program at home. Students in the program say their parents are more opposed to steroid use after the intervention and often provide healthier meals at home, according to Dr. Goldberg.

Late last year, Dr. Goldberg reported results of an ongoing study of ATLAS's effectiveness in preventing steroid use among more than 1,500 football players from 31 high schools in the Portland area. Some 702 football players at randomly selected schools received the 7-week program during football season. Another 804 football players at matched schools served as a control group and received only a standard informational brochure on the dangers of steroid use.

Assessments conducted immediately after the intervention and 1 year later show that, compared with control students, student athletes who participated in the ATLAS program knew more about exercise, nutrition, and the harmful effects of anabolic steroids. ATLAS participants also had an increased sense of personal vulnerability to negative effects of steroids, more unfavorable attitudes toward their own and others' use of steroids, and reduced intent to use steroids. ATLAS students also showed greater improvement in their nutritional habits than did control students. For example, they were more likely to eat high-protein low-fat meals at school, home, and fast-food restaurants. In addition, ATLAS students were more likely than students who did not participate in the program to use established weight-lifting and strength-conditioning techniques.

"The program's positive effects flow from changing the student athletes' attitudes and perceptions about steroids and then changing their nutrition and exercise behaviors," Dr. Goldberg says. These changes in behavior are reinforced by conducting periodic tests of the athletes' body



Adolescents Training & Learning to Avoid Steroids

composition, strength, and power. "If they are training properly, they are a heck of a lot stronger. So, it's real positive reinforcement to them," he says.

"Student athletes who participate in the ATLAS program

achieve," Dr. Goldberg says. The year before they entered the program, the football teams that were randomly assigned to receive the intervention had much worse won-lost records in football than the teams in the control group had, he says. At the end of the first year, the two groups' records were about the same, but teams in the ATLAS program did slightly better. At the end of the second year, the won-lost records of the ATLAS teams were substantially better than those of the control teams, with some of the ATLAS teams making the playoffs at the end of the season. "I don't know whether these teams' improved performance is due to the ATLAS program,"

Dr. Goldberg says. "I do know some of those schools hadn't been to the playoffs in 25 years. The data showing improvements in program participants' body composition and muscle mass are consistent with these teams' success," he says.

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For More Information

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Specialized High School Prevention Programs Target At-Risk Adolescents

By Robert Mathias, *NIDA Notes* Staff Writer

Adolescents on their way to dropping out of school and abusing drugs can be diverted toward healthier, more successful lives, according to NIDA-supported researchers. By using interventions designed specifically to address the personal and social factors that place some high school students at risk of drug abuse, schools can reduce these young people's drug use and other unhealthy behaviors, these researchers say.

One such drug abuse prevention program under way in the Seattle area has improved academic performance and reduced drug involvement among high school students whose poor academic records and behavioral problems indicate they are at high risk of dropping out of school and abusing drugs. Another drug abuse prevention program in California is showing promising early results in reducing and preventing serious drug use among students in continuation schools. Continuation schools are alternative public schools where students with behavioral and other problems can complete their high school education.

Reconnecting Youth

"Our ethnographic studies show that kids who are at high risk of dropping out of school and abusing drugs are more isolated and depressed and have more problems with anger," says Dr. Leona Eggert of the University of Washington in Seattle. "They are disconnected from school and family and are loosely connected with negative peers," she says. Additional assessments indicate that many of these youths also have suicidal behaviors or thoughts, Dr. Eggert says. Universal drug abuse prevention programs that are aimed at all youths in a school are usually inadequate to meet the special needs and problems of these youths, she states.

Dr. Eggert and her colleagues have developed a high school-based drug abuse prevention intervention that is designed for students in the 9th through 12th grades who are skipping classes, doing poorly academically, and in danger of dropping out of school and abusing drugs. The program, called Reconnecting Youth, works to reattach at-risk youths to their schools, their families, and positive peer groups. The program also teaches them social and personal skills they can use to better manage their emotions and deal with their problems without resorting to drug use.

Reconnecting Youth's core element is a one-semester daily Personal Growth Class that is incorporated into the youths' regular class schedule. The class is led by a teacher who fosters the development of a mutually supportive peer group that encourages positive behaviors. The group encourages acceptance, respect, understanding for others, and a willingness to help other classmates solve their problems constructively. The class also focuses on enhancing the youths' self-esteem; improving their decision-making and communications skills; and improving their ability to manage stress, anger, and depression. The ultimate goals of the program are decreased drug use and increased school performance and emotional well-being.

Studies conducted among multiethnic populations of at-risk boys and girls in Seattle area high schools show that, compared to at-risk youths who did not receive the intervention, youths in the Reconnecting Youth program have increased academic performance and decreased drug involvement. The program also improves at-risk youths' ties to their schools and teachers and increases their self-esteem and social support. The program is equally effective with boys and girls but appears to have more of an effect on reducing girls' attachment to friends who skip school and use drugs. Determining the ramifications of this apparent gender difference requires more detailed analysis, which Dr. Eggert plans to do in future studies.

The latest version of the Reconnecting Youth program includes additional classroom and school components that address the needs of the substantial portion of these youths who also are at risk for suicide. The program has been shown to decrease depression, anger and aggression, stress, and suicidal thoughts and behaviors among these youths.

Project Toward No Drug Abuse

Adolescents completing their education in continuation or alternative public high schools are another group at high risk for drug abuse. In California, youths are transferred from regular schools to continuation high schools because of negative behaviors such as drug use, truancy, and fighting with schoolmates, explains Dr. Steven Sussman of the University of Southern California. These students report much higher levels of drug and alcohol use than do students in traditional schools, he says. Research by

Dr. Sussman and others indicates that about 36 percent of continuation high school students report weekly marijuana use compared to 9 percent of high school students in traditional schools. About 25 percent of continuation high school students in California also say they smoke marijuana daily, Dr. Sussman says.

Preventing drug abuse among these youths presents many difficulties, he says. First, drug abuse prevention programs that have worked with general populations of younger adolescents in junior high and middle school are less likely to be effective with these older, at-risk high school students. Second, students in continuation high schools present a complex mix of behavioral and social problems and come into daily contact with many other students who use drugs and have a favorable attitude toward drug use. Finally, many of these youths already have used, or currently are using, a variety of drugs.

To meet the needs of this at-risk population, Dr. Sussman has been developing a specialized school-based curriculum for continuation high school youths that forms the core of a program called Project Toward No Drug Abuse. To develop the curriculum, he relied heavily on extensive testing and the feedback of continuation high school youths themselves. This research sought to ensure that the curriculum would be acceptable and relevant to these youths, tailored to counteract their specific reasons for drug use, and practical for continuation high schools to implement.

The resulting curriculum consists of motivational activities, social skills training, and decision-making components. These components are delivered in nine classroom sessions over the course of three weeks to all students in the continuation high school by health educators trained by project staff. The program uses a variety of interactive teaching strategies such as role playing and self-scoring questionnaires to motivate students in the class against drug use, provide them with the skills they need to change their negative behaviors, and guide them toward decisions to not use drugs.

"What we're doing in the nine lessons is trying to find motivators for change that are personally relevant for these high-risk youths," says Dr. Sussman. For example, in one session, the students are encouraged to resist succumbing to negative stereotypes of continuation high school students as "losers" who abuse drugs and have no goals in life. In fact, continuation high school students say they have goals like anyone else, such as getting a job or attending college, Dr. Sussman says. Therefore, another session demonstrates how drug abuse can destroy their health and limit their ability to achieve their goals. "Basically, we are getting them to be more internally and externally consistent so their behavior matches what they think of themselves and what they want," he says.

The curriculum for Project Toward No Drugs is currently being tested among a multiethnic group of more than 1,500 boys and girls in 21 continuation high schools in southern California. An initial analysis conducted 1 year after the conclusion of the class indicates that the program has had significant preventive effects on drug and alcohol use, Dr. Sussman reports. Because the program was developed with feedback from boys and girls from a number of ethnic groups, there were no significant differences in effect by gender or ethnicity, he says.

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For more information

- About Reconnecting Youth, contact Psychosocial and Community Health Department, Box 357263, University of Washington School of Nursing, Seattle, WA 98195-7263, (206) 543-9455.
- About Project Toward No Drug Abuse, contact Institute for Health Promotion and Disease Prevention Research, University of Southern California, 1540 Alcazar St., CHP 207, Los Angeles, CA 90033, (213) 342-2589. **NN**

Multifaceted Prevention Programs Reach At-Risk Children Through Their Families

By June R. Wyman, *NIDA NOTES* Staff Writer

Two NIDA-funded studies are finding that working with the family is more effective in reducing risks of drug abuse than working with parents or children alone. Both projects target families at risk. The Strengthening Families Program works with parents and children in families where the parents abuse drugs, while Focus on Families works with parents who are in methadone treatment. Children from such families, research shows, are at risk for becoming drug abusers themselves.

Strengthening Families

The Strengthening Families Program is aimed at 6- to 10-year-old children of drug abusers and their parents.

"We work on improving parent-child relationships—their time together, their communication patterns," says Dr. Karol Kumpfer of the University of Utah in Salt Lake City, the project's principal investigator. "We try to change the family dynamics, to create a more democratic family where they actually have family meetings, talk together, and plan activities together. Then the child feels that he or she belongs to something, that 'we are a family... we believe certain things, we stand for certain things, and we work together as a unit.'"

Dr. Kumpfer devised her program after reviewing more than 500 family drug abuse prevention programs. From

this survey, she designed a study to compare three promising approaches: a 14-session parent training program; the same program combined with a children's skills training program; and a three-way merger of the parent and child programs with a family skills training program.

Her study, done in Salt Lake City, involved families with parents who were in methadone treatment programs or who were substance-abusing outpatients at community mental health centers. The research showed that the three-part intervention was the most powerful in reducing problem behaviors. Compared with families that did not receive any intervention, families that went through the three-part program showed significant improvements in adults' parenting skills, children's social skills, and family relationships. Children achieved significant reductions in aggressiveness and other problem behaviors. Older children significantly reduced their use of tobacco, drugs, and alcohol, and parents reduced their depression and drug use substantially.

The three-part curriculum became the Strengthening Families Program and has since been adapted and tested with different ethnic populations across the country. Although these modified versions of the program differ in cultural content, all use the same basic framework: parent training, children's training, and family skills training. In each of 14 weekly sessions, groups of parents and children

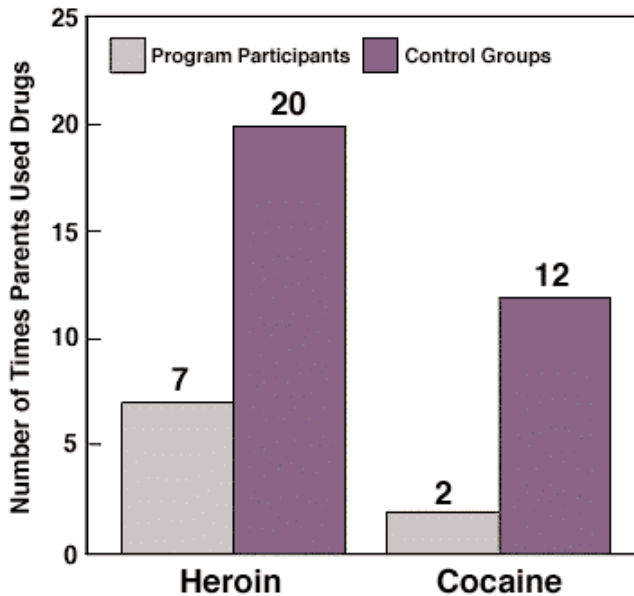
Defining Prevention Programs By Their Audiences

Any program works best when it is tailored to its audience—and the same is true of drug abuse prevention efforts. While some programs try to reach whole communities, others target specific at-risk subgroups. To describe the different approaches, researchers have adopted new definitions:

- Universal programs reach the general population, but in a defined setting. Example: all students in a school.
- Selective programs target groups within the general population that research has defined as at risk for drug abuse. Examples: children of drug abusers, poor school achievers.
- Indicated programs are designed for people who already have tried drugs or show other risk-related problem behaviors. Example: high school students at risk for dropping out because of multiple problems such as depression, poor grades, and substance abuse.

A project may use one, two, or all of these strategies. The family-focused programs on this page are selective prevention projects; the school-based programs described in "Specialized High School Prevention Programs Target At-Risk Adolescents" are indicated programs.

**Average Drug Use During Past 30 Days By Parents,
12 Months After Finishing Focus on Families Program**



Parents in the Focus on Families parenting program, all recruited from methadone treatment clinics, reported using heroin and cocaine less often than did clinic parents who did not participate in Focus on Families.

are taught separately for the first hour. In the second hour, they come together to practice their new skills. Afterward, the whole group shares dinner and a movie or other entertainment.

In their sessions, children learn how to be direct, to talk about problems, and to ask for what they need. For example, "A lot of the kids say that they would like to tell their parents to stop using drugs, and they just don't know how—so we teach them those skills," says Donna Lee Picaso, a caseworker with the Denver Area Youth Services Agency who led children's classes in the Denver study. Children also learn how to resist peer pressure, handle anger, deal with criticism, and cope with problems without resorting to drugs.

Parents are trained in techniques such as establishing goals, giving incentives and reinforcements, and setting limits. "They're right up front with saying they have very limited skills, and they're anxious to learn new ones," says Donna Martinez, a social worker in the Denver study.

Sessions are held in facilities that are easy for participants to reach such as family support centers in urban housing projects, community centers, local churches, and schools. Group size has ranged from 5 to 14 families. Session leaders are recruited from local social service agencies and have counseling or social work experience.

Focus on Families

A different approach is taken in Focus on Families, a parenting program for methadone treatment patients developed by Dr. Richard Catalano and his colleagues at the University of Washington in Seattle. The goal of this program is to reduce parents' use of illegal drugs by teaching them how to cope with problems without resorting to drug abuse and how to manage their families better.

The program was tested in Seattle with families recruited from two Seattle-area methadone clinics. Although all parents were in methadone treatment to reduce their drug use, 54 percent reported that they had used heroin, marijuana, cocaine, and other illegal drugs in the month before entering the family program. Families were randomly assigned to the experimental group, which went through the Focus on Families program, or the control group, which did not.

After families attended an initial 5-hour retreat, parents completed 4 months of twice weekly 90-minute training sessions. Children attended 12 of the sessions to practice communication skills with their parents.

Case managers visited each family at home every week for 9 months to help apply new skills and solve family problems. These house calls were critical, says Kevin Haggerty of Dr. Catalano's research team. "Families need hands-on coaching to reinforce the skills they learn and to deal with the never-ending crises in the lives of addicted parents."

To assess the program's impact, parents were interviewed before the program, right after their 4-month training, and again at 6, 12, and 24 months after the end of training. Children age 6 and older in the treatment families, as well as control group families, were interviewed at the same intervals.

"A lot of the kids say that they would like to tell their parents to stop using drugs, and they just don't know how—so we teach them those skills."

At the 12-month interview, program parents reported dramatic reductions in their heroin and cocaine use and significantly better parenting skills compared with the control group, Dr. Catalano reports. At the 24-month followup, parenting and problem-solving skills remained significantly better, but "we lost the significant treatment effects on drug use," says Haggerty. "Family interventions need to be ongoing with parents who are drug addicts," he concludes.

The program had a mixed impact on the children, who ranged in age from 3 to 14 years. At the 24-month followup, program children reported a trend toward less delinquent behavior and marijuana use, and those 9 years and older reported lower rates of alcohol initiation. The program appears to have had a greater impact on younger children than older ones. This finding suggests that children of addicts may benefit more if they are exposed to improved parenting earlier and longer, the researchers conclude.

Next Steps

Despite promising results from these models, there is much to learn about preventing drug abuse in families, says Dr. Rebecca Ashery of NIDA's Prevention Research Branch. More research is needed on issues such as:

- how to adapt successful programs to different cultural and ethnic groups as was done with the Strengthening Families Program;
- how males and females respond differently to drug abuse prevention training;
- how to attract and retain families in prevention studies;
- intervening with the extended family; and
- intervening with the most dysfunctional families—for example, parents who take drugs, are physically or emotionally abusive, and suffer from major mental illnesses.

Another next step is to put more emphasis on very young children. "Through research we're finding out that it's not

too soon to intervene early in school or even before school," says Dr. Ashery.

"In the long run, what it will take is a comprehensive approach. You can't do the family in isolation, the school in isolation, the community in isolation," she says. "You have to do it all in concert: school, family, and community together."

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For more information:

- About the Strengthening Families Program, contact Dr. Karol Kumpfer, Department of Health Education, University of Utah, Salt Lake City, UT 84112, (801) 581-7718.
- About Focus on Families, contact Kevin Haggerty, Social Development Research Group, University of Washington, 9725 Third Ave. N.E., Ste. 401, Seattle, WA 98115, (206) 543-3188. **NN**

Research Meets the Challenge of Preventing Drug Use Among Young People

By NIDA Director Dr. Alan I. Leshner

National surveys of drug abuse have brought disturbing news in the last few years: Drug use has increased among our Nation's youth. While some news media speculate about a possible return to the high levels of adolescent drug use that the Nation witnessed in the 1970s, they are missing an equally important and more hopeful story. NIDA-supported prevention research has made great strides in developing both the knowledge and the tools that can stem the tide of drug abuse and curb its devastating effects on our Nation's young people.

A growing body of scientific information shows that many factors can protect young people from drug use while other factors put them at risk of abusing drugs. Strong parent-child attachment, appropriate parental supervision, commitment to school, academic success, and friends who have conventional values are some protective factors. Chaotic family environments, ineffective parenting, poor academic performance, and deviant peer influences all put youths at risk. We also know that the impact of specific risk and protective factors may diminish or increase as young people develop, and their circumstances change.

Because risk and protective factors for drug use are found in the home, the school, and the community, NIDA has supported research on prevention programs in each of these domains. As a result, prevention practitioners now can select from a broad array of effective family-, school-, and community-based prevention programs to meet the needs of different groups in their communities.

Successful drug abuse prevention programs fall into three categories—universal, selective, and indicated—that describe their intended audience. "Universal" programs are meant for everyone in a school, a community, or a similar group and can reduce the overall prevalence of drug use. Our research indicates that universal community programs need to be comprehensive with well-coordinated components for the individual, the family, the school, the media, and community organizations. One such universal



Prevention practitioners now can select from a broad array of effective family-, school-, and community-based prevention programs.

community-based program, developed by NIDA-funded researchers at the University of Southern California in Los Angeles, has reduced drug use over a 5-year period among middle-school students in Kansas City, Missouri. In this comprehensive program, a classroom curriculum teaches students how to resist influences to use drugs. In addition, schools, parents, mass media, and community organizations work together to promote consistent antidrug messages, attitudes, and policies in the community.

Although universal drug abuse prevention programs can work with general populations, they may not meet the special needs of groups within those larger populations who are particularly at risk of drug abuse. NIDA-funded researchers have been identifying these at-risk groups and individuals and developing "selective" and "indicated" pro-

grams to meet their complex needs. A special section in this issue, "Children on the Brink: Youths at Risk of Drug Abuse," highlights some of the remarkable results of this research.

"Selective" drug abuse prevention programs target groups who are exposed to factors that place them at greater-than-average risk of future drug abuse. Such programs are tailored to reduce the identified risk factors and strengthen appropriate protective factors in these individuals' lives. Research shows that children of substance abusers make up one such at-risk group.

Armed with this knowledge, NIDA-supported researchers at the University of Utah in Salt Lake City have developed a selective prevention program for these children and their parents. The family-focused program works to improve interactions within families. As a result, the program has reduced family conflicts, youth problem behaviors such as aggression and delinquency, and substance abuse. (See "Multifaceted Prevention Programs Reach At-Risk Children Through Their Families.")

Early childhood programs could reduce risk factors and build resistance to drug use even before children enter school.

NIDA also has supported research to develop "indicated" drug abuse prevention programs for adolescents who already are exhibiting early signs of drug abuse and other problem behaviors such as school failure, antisocial behaviors, and psychological problems. Research shows that youths with these characteristics are at high risk of continued drug abuse. Successful indicated programs address these youths' specific problems, enhance protective factors, and reduce their substance use. A high school-based indicated program developed for such troubled youths by NIDA-supported researchers at the University of Washington in Seattle has reduced their problem behaviors, increased their academic performance, and reduced their drug involvement. (See "Specialized High School Prevention Programs Target At-Risk Adolescents.")

While NIDA research shows that drug abuse prevention can work, we need to expand the range of effective prevention approaches and strategies. In one such effort, NIDA's Division of Epidemiology and Prevention

Research is emphasizing the development of family prevention programs that intervene in early childhood to improve family functioning and parenting skills. Such early childhood programs could reduce risk factors and build resistance to drug use even before children enter school. Current studies also are testing new school-based programs that begin as early as kindergarten and extend through the primary grades. Several of these programs are aimed at children with conduct disorders, a known risk factor for later drug abuse.

We also are seeking and supporting research on the special needs of older children and adolescents who have dropped out of school, run away from home, become homeless, or been placed in juvenile court detention programs. This comprehensive research program will help us develop targeted interventions to meet the specific needs of diverse groups of youths at risk of drug abuse. (See "Drug Abuse Among Runaway and Homeless Youths Calls for Focused Outreach Solutions.")

The increased drug use we have seen among America's youth in recent years is a warning signal that it is time for new and effective solutions to address the problem. NIDA's prevention research program is providing the knowledge, guidance, and tools to States, communities, families, and individuals as they work to ensure that young people remain firmly on the road to healthy and productive lives. **NN**

Children on The Brink: Youths at Risk of Drug Abuse

Young people whose social and psychological problems put them at heightened risk of abusing drugs represent a complex challenge for NIDA-funded researchers who are looking for ways to protect them from drug abuse.

As youths at risk, these young people may exhibit problem behaviors such as school failure, delinquency, and other antisocial behaviors. Sometimes they suffer psychological problems such as depression and suicidal behavior. These youths even may be exhibiting early signs of drug use, although they may not have reached the point at which they can be diagnosed clinically as drug abusers.

These daunting personal problems are likely to be paired with any number of other difficulties in their lives. They may be on the verge of dropping out of school or already have dropped out. Their family lives often are chaotic. Sometimes their parents themselves abuse drugs. The young people may actually be living on the streets or in shelters.

How can these youths be prevented from abusing drugs? What are their special needs and what kind of drug abuse prevention programs can help them?

NIDA-funded research on youths at risk is seeking answers to these questions. In this special report, *NIDA NOTES* will look at some of these studies and the information and strategies they are using to help bring these children back from the brink of drug abuse.



Photo by Michael Chiabauda

A field interviewer gives a young man who lives on the streets of Hollywood, California, a referral card listing health clinics and other places where he can find help.

- "Multifaceted Prevention Programs Reach At-Risk Children Through Their Families," looks at two programs that are working with families in which parents are drug abusers or in methadone treatment programs.
- "Specialized High School Prevention Programs Target At-Risk Adolescents," describes a pair of programs that are succeeding with youths whose problem behaviors are causing them severe difficulties in school.
- "Drug Abuse Among Runaway and Homeless Youths Calls for Focused Outreach Solutions," examines studies that are revealing the severity of drug abuse problems among runaway and homeless youths. **NN**

Marijuana and Tobacco Use Up Again Among 8th and 10th Graders

By Robert Mathias, NIDA NOTES Staff Writer

The rise in marijuana and tobacco use that began in the early 1990s among America's young people continued last year, according to NIDA's 1996 Monitoring the Future study. The study found that 8th and 10th grade students increased their use of marijuana and tobacco in 1996, while 12th graders continued to use these two substances at generally the same level as they did in 1995. Students' use of other illicit drugs presented a mixed but overall unchanged pattern in 1996, the study indicated.

"The survey tells us that drug use among young people is at unacceptably high levels, that the core of the problem is marijuana, and that we must fight aggressively to change these trends," Health and Human Services Secretary Dr. Donna E. Shalala said at a press conference held in Washington, D.C., last December to announce the study's results. "The survey shows that our marijuana problem is fueled by teens who believe that marijuana is not harmful," Secretary Shalala said. The perceived risk of harm from using marijuana continued to decline among 8th and 10th graders in 1996, while perceived risk of harm from using other drugs either increased or remained level among these students, according to the study.

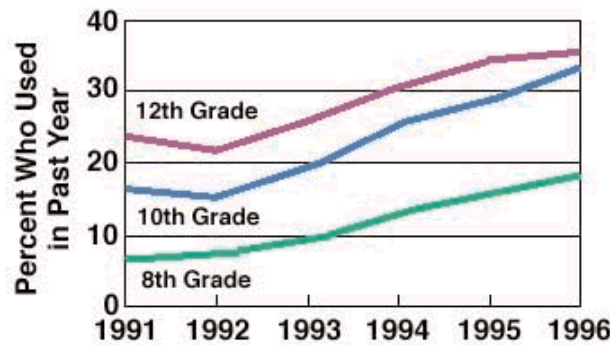
"It is important that young people understand the harm and danger caused by illicit drug use," NIDA Director Dr. Alan I. Leshner said. "Years of scientific research have made this risk ever clearer, not just for drugs such as cocaine and heroin but also for marijuana," he stressed. Clinical studies have shown that marijuana can have a host of acute and short-term effects including impairment of skills related to attention, memory, and learning as well as complex motor skills such as those needed to drive a car. Clinical studies also indicate that regular marijuana users may have many of the same respiratory problems that cigarette smokers have. Animal studies suggest that chronic marijuana use can affect the brain and immune system, but clinical studies are needed to verify these effects in humans.

The 1996 Monitoring the Future study showed increases in lifetime, annual, current, and daily use of marijuana for 8th and 10th graders from 1995 to 1996. Current marijuana use, which is use within the past 30 days, went from 9.1 percent to 11.3 percent among 8th graders and from 17.2 percent to 20.4 percent among 10th graders. Current marijuana use has increased more than 250 percent among 8th graders since 1991 and more than 150 percent for 10th graders since 1992.

For the first time since 1993, annual, current, and daily use of marijuana by high school seniors showed no significant changes. However, the percentage of high school seniors who had used marijuana at least once in their lifetimes increased from 41.7 percent in 1995 to 44.9 percent in 1996. In addition, 4.9 percent of seniors reported smoking marijuana every day, a statistically non-significant rise from 4.6 percent in 1995, but more than double the 2.0 percent of seniors who used marijuana daily in 1991.

Cigarette use has increased among students in all three grade levels since 1991, according to the study. Between 1995 and 1996, 8th graders' current use of cigarettes increased from 19.1 percent to 21.0 percent. Among 10th graders, current use of cigarettes increased from 27.9 percent to 30.4 percent. Current smoking rates among 12th graders remained statistically unchanged, rising 0.5 of a percentage point from 33.5 percent in 1995 to 34.0 percent in 1996. From 1991 to 1996, current use of cigarettes increased by nearly one-half among 8th and 10th graders and by nearly one-fifth among 12th graders, noted Dr. Lloyd Johnston from the University of Michigan, who conducted the study. These rates of cigarette smoking are "impressively high, especially compared to the 25 percent of all adults classified as current smokers," Dr. Johnston said.

Trends in Adolescents' Annual Use of Marijuana



Students in the 8th and 10th grades increased their use of marijuana in 1996, while 12th graders continued to use marijuana at generally the same level as they did in 1995. As this graph shows, past-year marijuana use has been increasing among all grade levels since 1992.

Young people's use of drugs other than marijuana and tobacco presented a mixed pattern in 1996:

- The percentage of 8th graders who reported having "been drunk" in the past month increased from 8.3 percent in 1995 to 9.6 percent in 1996. The percentage of 10th and 12th graders who said they had been drunk in the past month remained at high, though statistically unchanged, levels. In 1996, 21.3 percent of 10th graders and 31.3 percent of 12th graders reported having been drunk in the past month.
- Current use of all hallucinogens decreased among 12th graders from 4.4 percent in 1995 to 3.5 percent in 1996. Current use of LSD, a major component of the hallucinogen category, dropped among 12th graders from 4.0 percent to 2.5 percent, and among 10th graders, from 3.0 percent to 2.4 percent. Eighth graders' use of LSD remained unchanged.
- Seniors' current use of inhalants declined from 3.2 percent in 1995 to 2.5 percent in 1996. Use of inhalants by 8th and 10th graders remained unchanged. **NN**

From the 'Burbs to the 'Hood . . .

This Program Reduces Students' Risk of Drug Use

By Robert Mathias, *NIDA NOTES* Staff Writer

A school-based drug abuse prevention program that has been shown to lower drug use among white middle-class adolescents also reduces drug use among minority youths, according to soon-to-be-published results from a NIDA-funded study. The intervention had preventive effects on African-American and Hispanic youths' use of tobacco, marijuana, and alcohol and lowered their intentions to use drugs in the future, the study indicates.

While other drug abuse prevention studies have shown reduced drug use among populations that included inner-city minorities, "this is the first study of a prevention program focused exclusively on an inner-city minority population that has demonstrated effectiveness in reducing the use of multiple drugs among these youths," says Dr. Gilbert Botvin, who conducted the study. Dr. Botvin, who directs the Institute for Prevention Research at Cornell University Medical Center in New York City, has followed up this initial study with a large-scale study of the prevention program, called Life Skills Training, with a predominantly minority population in New York City schools.

Noting that the Life Skills program has been tested extensively and successfully with white suburban youths, Dr. Botvin says, "What we're trying to do is determine the extent to which an intervention that is fundamentally the same will work with many different kinds of kids." This is important when it comes to implementing prevention programs in the real world, he says. "Many cities are similar to New York, where you have more than 100 different minority ethnic groups living, working, and going to school together," Dr. Botvin notes. "This makes it virtually impossible to implement an intervention that focuses on one specific population."

Under the Life Skills program, which was developed by Dr. Botvin, regular classroom teachers teach junior high school students skills to resist social pressures to use drugs and foster students' antidrug attitudes and perceptions. The program also teaches a range of social and personal skills that increase young people's ability to handle the challenges of adolescent life more effectively and reduce the likelihood that they will use alcohol and drugs.

In the initial study, 721 7th grade male and female minority students in 7 New York City schools received either the



Photo by Frank Siteman

15-session Life Skills Training intervention or the standard school drug education program that provided students with information about drugs and the hazards of drug use. Students in both groups were predominantly Hispanic and African American, economically disadvantaged, and comparable on other variables such as academic performance and family structure.

About 3 months after the intervention, the researchers administered confidential questionnaires about drug use and carbon monoxide breath tests for cigarette smoking to both groups. These measures showed that youths in the Life Skills group had significant reductions in both current drug use and intentions to use drugs. Compared to students who received the standard program, students in the Life Skills group smoked cigarettes and marijuana and drank alcohol significantly less often. They also had used more than one of these substances less often in the previous month. In addition, they had lower intentions of smoking cigarettes or marijuana, drinking beer or wine, or using cocaine within the next year.

Previously, Dr. Botvin had conducted a series of studies that consistently showed that the Life Skills Training program reduces tobacco, alcohol, and marijuana use among white middle-class youths. Those studies indicate that the Life Skills program works equally well with boys and girls. One study, which followed students over a 6-year period, demonstrated that administering the intervention in the 7th grade and following it up with booster sessions in the 8th and 9th grades significantly reduced these adolescents' use of tobacco, alcohol, and marijuana, as well as use of more than one of these substances, through the end of

WHOSE OPINION COUNTS? (INFLUENCES ON YOUR DECISIONS)

1. Write a list of who or what you think about when you make a decision.
2. For each of the following decisions, check off all of the things that influence your choice. For example, when you decide what to wear, do you think about your own opinions, your friend's opinions, your mother's opinions, etc.? You can check more than one influence for each decision.

My Opinion	My Friends' Opinion	My Parents' Opinion	My Past Experience, Successes, Failures	What I See on TV	What I Read About	What It Costs (in Time, Money, Convenience)
What to Wear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How to Cut My Hair	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
What to Eat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
What Music to Listen to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
What Movies to See	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
What I Like to Do	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Look at all your answers. Where do you have the most checks? Your friends, parents, media? Sometimes you don't realize how much we worry what other people think. Are you REALLY making decisions that are right for you?

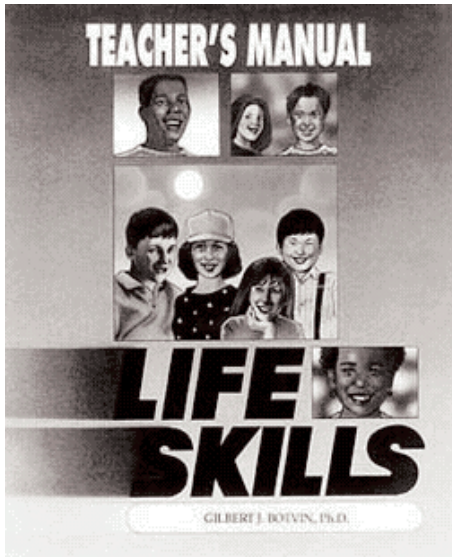
high school. (For more information on this study, see "School-Based Drug Abuse Prevention Program Shows Long-Lasting Results," V9-4, November/December 1994.)

The intervention used in the New York City study has been modified to ensure that the Life Skills program engages inner-city minorities, Dr. Botvin says. For example, program materials use illustrations of minority youths and change some of the scenarios in which students practice skills they can use to handle difficult situations. In addition, when teachers deliver the program to inner-city adolescents, they may use language that is more familiar to their students to bring the curriculum to life and better engage them, Dr. Botvin says.

Despite such surface modifications, "the underlying intervention strategy has remained the same throughout all of our studies," Dr. Botvin says. The research literature suggests that the factors that lead to drug abuse are largely the same in all adolescents, he says. Although there are minor differences among different groups, "basically the factors are similar enough to argue for using a common intervention strategy," he states. "This has enabled us to come up

with a prevention model that potentially is applicable to kids from many different ethnic groups across the country," he says. Ultimately, therefore, the studies with white middle-class youths and the studies with inner-city minority youths "may give us an intervention that we can use in cities and towns and villages across the United States without having to develop separate intervention approaches for each and every different population," Dr. Botvin says.

In this regard, early results from the full-scale study of the Life Skills Training program under way with minority youths in New York City schools are promising. Now in its third year, the study is testing the intervention's effectiveness with approximately 4,500 students from a wide range of racial and ethnic groups in 29 schools. The study also will examine possible gender differences in the program's impact. An initial analysis conducted 1 year after the intervention was administered in the 7th grade is "showing prevention effects comparable to the effects that we showed in the pilot study, including significant reductions in tobacco, alcohol, marijuana, and multiple drug use," Dr. Botvin reports.



The teacher's manual for the Life Skills Training program contains the curriculum and materials needed to implement the program.

Sources

- Botvin, G.J.; Baker, E.; Dusen-bury, L.; Botvin, E.M.; and Diaz, T. Long-term follow-up results of a randomized drug abuse prevention trial in a white middle-class population. *JAMA* 273(14):1106-1112, 1995.
- Botvin, G.J.; Epstein, J.A.; Baker, E.; Diaz, T.; and Ifill-Williams, M. School-based drug abuse prevention with inner-city minority youth. *Journal of Child and Adolescent Substance Abuse*, in press.

For More Information

To learn more about Life Skills Training, contact the Institute for Prevention Research, Cornell University Medical College, 411 E. 69th St., Room KB-201, New York, NY 10021, (212) 746-1270. **NN**

NIDA Designs Research Guide to Aid Community Prevention Efforts

By Sharon Cargo, NIDA NOTES Contributing Writer

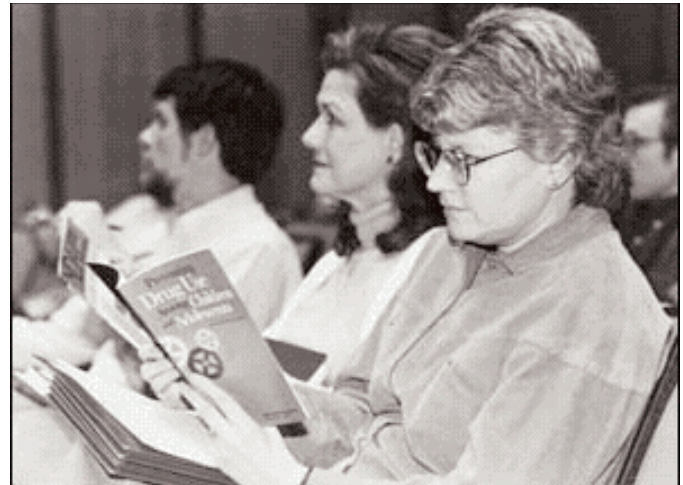
NIDA has released an important new resource to help community leaders, service providers, parents, and teachers prevent drug abuse among children and teenagers. Preventing Drug Use Among Children and Adolescents: A Research-Based Guide is a booklet designed by NIDA to help communities apply the results of drug abuse prevention research to their local prevention efforts. Approximately 100,000 copies of the guide will be distributed to schools and communities throughout the United States.

"Over the past 20 years, HHS and the National Institute on Drug Abuse have supported a rigorous research program to determine what really works to help prevent drug abuse among our youth," said Health and Human Services Secretary Dr. Donna E. Shalala. "Today we have assembled what we know, and we want to share it with families and schools in every community across America."

Written in a question-and-answer format, Preventing Drug Use Among Children and Adolescents is the first research-based guide to describe in plain language the elements of successful drug abuse prevention programs. It explains what researchers know about the risk and protective factors that differentiate those children who use drugs from those who do not. Various scientists and organizations representing drug abuse prevention and treatment providers, researchers, parents, teachers, counselors, and social workers collaborated with NIDA to develop the guide.

"With the growing problem of adolescent drug use," says NIDA Director Dr. Alan I. Leshner, "there is a need to make better use of scientific knowledge to produce more effective and enduring drug prevention approaches. While each community should choose a drug prevention program that best matches its needs, we hope these guidelines will help them identify and incorporate the proven critical elements."

The guide answers questions about how to design, implement, and assess drug abuse prevention programs and provides a checklist to help community leaders and agencies determine whether existing programs include any of the 14 research-tested principles for drug abuse prevention that are presented in the booklet. These principles have



A NIDA workshop participant checks out NIDA's new research-based prevention guide.

been tested and proven effective in family, school, or community settings.

One basic principle is that prevention programs must minimize or reverse drug abuse risk factors, such as poor social skills, aggressiveness, and poor school performance, and enhance protective factors, such as strong family relationships and success in school. For example, prevention programs can enhance protective factors by encouraging parents to talk to their children about drugs. Drug abuse prevention programs also strengthen protective factors by teaching adolescents communication and social skills to help them resist drug offers, increase their assertiveness, and enhance positive peer relationships.

The booklet points out that drug abuse prevention programs have proven to be cost-effective: "For every dollar spent on drug use prevention, communities can save \$4 to \$5 in costs for drug abuse treatment and counseling."

Copies of the guide are available free of charge from the National Clearinghouse for Alcohol and Drug Information (NCADI), P.O. Box 2345, Rockville, MD 20847-2345, 800-729-6686 or (800) 487-4889 for TDD. E-mail orders can also be sent to NCADI at info@health.org. Request NCADI Stock #PHD734. **NN**

Initiative Brings Lessons To Fight Drug Abuse Into Nation's Schools and Home

NIDA, the Department of Health and Human Services, and Scholastic, Inc., joined forces last year to give parents, teachers, and students knowledge they need to fight drug abuse. NIDA worked with Scholastic, Inc., to design and develop a science education package of drug abuse prevention materials that provide science-based information about inhalants, tobacco, and marijuana in an easy-to-use format. The prevention materials appeared in the November 1, 1996, issue of Scholastic News, a current events magazine. That issue of the magazine was distributed to more than 73,000 of the Nation's third- through sixth-grade teachers and reached about 2.3 million schoolchildren and their families.

"Our research shows that the increase in drug use among young Americans that has occurred since the early 1990s has been accompanied by a significant erosion in antidrug attitudes and knowledge among young people," said NIDA Director Dr. Alan I. Leshner. "This is why we are pleased to provide important science-based information about drug abuse and addiction that parents and teachers can use to arm students with knowledge about drugs and their harmful effects," he said.



The classroom poster is part of the package of materials NIDA developed with Scholastic, Inc., to foster antidrug attitudes among schoolchildren.

The package of materials is called "Don't Harm Yourself, Arm Yourself With Knowledge About Drugs." It consists of a classroom poster, a teaching guide for teachers, and a four-page take-home guide for parents.

The colorful 32- by 20-inch poster features cartoon schoolchildren making antidrug statements such as "drugs are for losers," "drugs slow you down and mess you up," and "cigarettes stink."

The flip side of the poster is a teacher's guide, which provides background information on drug abuse and suggests a variety of classroom activities to both increase children's understanding of the consequences of using drugs and encourage positive alternatives to drug use.

The parent guide includes key facts about inhalants, tobacco, and marijuana; easy-to-understand questions and answers that provide basic information about drug abuse; and specific suggestions of activities parents can engage in with their children to help them understand why drugs are dangerous and unhealthy.

For more information about the "Don't Harm Yourself, Arm Yourself With Knowledge About Drugs" materials for parents and for teachers, contact NIDA's Public Information Branch at (301) 443-1124. **NN**

National Conference Showcases Effective Drug Abuse Prevention Programs

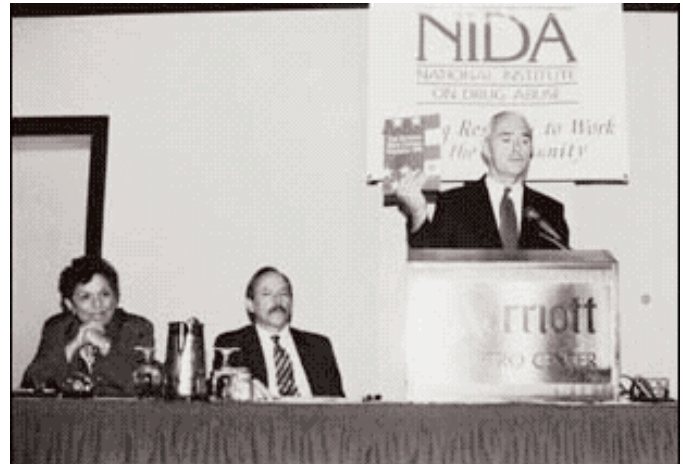
By Robert Mathias, *NIDA NOTES* Staff Writer

With antidrug attitudes eroding and drug use increasing among the Nation's youth in recent years, NIDA held the National Conference on Drug Abuse Prevention Research: Putting Research to Work for the Community to transfer effective drug abuse prevention approaches from research settings to communities. More than 400 community leaders, representatives of national organizations, and drug abuse prevention researchers and practitioners met in Washington, D.C., last September to attend the conference, which was cosponsored by The Robert Wood Johnson Foundation.

The overriding message keynote speakers Dr. Donna E. Shalala, secretary of Health and Human Services; General Barry McCaffrey, director of the White House Office of National Drug Control Policy; and NIDA Director Dr. Alan I. Leshner delivered to conference participants was that scientific research has shown that drug abuse prevention works. "More than 20 years of NIDA-funded research have given us powerful tools and guidance about how to prevent drug use," Dr. Leshner said. "Now we need to work with the community to put those tools to use," he stressed.

"Families, schools, and communities have a clear charge to take up these tools and help build drug-free environments," Dr. Shalala said. To help accomplish this, Dr. Shalala announced a new partnership between NIDA and Scholastic, Inc., a publisher of educational magazines and materials. As a result of the joint effort, a number of prevention materials containing the latest science-based information about commonly abused drugs have reached 2.3 million of the Nation's third- through sixth-grade students and their families. (See "Initiative Brings Lessons To Fight Drug Abuse Into Nation's Schools and Homes.")

Research presented at the 2-day conference indicates that the best drug abuse prevention results are achieved when comprehensive interventions built on scientific findings about the many factors involved in the initiation of drug use are implemented. Rigorous evaluations have shown that well-designed interventions that focus on influencing these factors in the family, the school, and the community can reduce drug use substantially among adolescents. Following are some of the key prevention findings highlighted at the conference.



Keynote speakers at NIDA's national prevention conference were, from left, Dr. Donna E. Shalala, secretary of Health and Human Services; NIDA Director Dr. Alan I. Leshner; and General Barry McCaffrey, director of the White House Office of National Drug Control Policy. Their message to conference participants: scientific research has shown that drug abuse prevention works.

- In separate presentations, Dr. Robert Pandina of Rutgers University in Piscataway, New Jersey, and Dr. William B. Hansen of Tanglewood Research in Clemmons, North Carolina, noted that research has identified a large number of biological, behavioral, family, and environmental factors that either increase or reduce the likelihood of drug use. Prevention programs need to assess and target these risk and protective factors in the individual, the family, the school, peer relationships, and the environment, while remaining flexible enough to respond to changes in these factors across the life span, Dr. Pandina said. Prevention programs that are based on changing these variables can result in significant reductions in drug use, Dr. Hansen said. Programs "based on scientific data are most likely to succeed," he said.
- Dr. Thomas Dishion of the Oregon Social Learning Center in Eugene said that families constitute one of the earliest and most important domains of drug abuse risk and protective factors. "We need to integrate families as early as possible in prevention programs," he said. "Parental monitoring" should be at

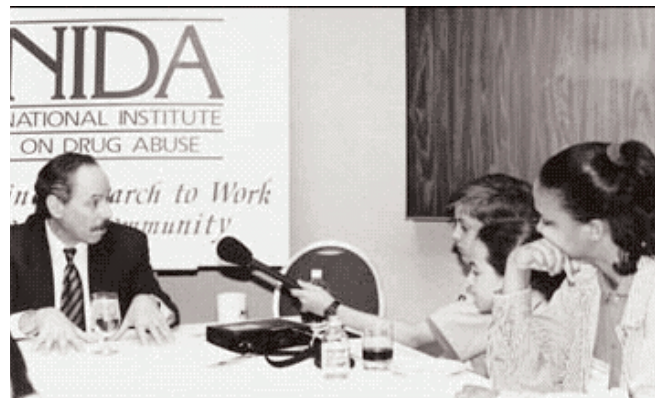
"More than 20 years of NIDA-funded research have given us powerful tools and guidance about how to prevent drug use."

the core of family intervention programs, Dr. Dishion stressed. Parental monitoring basically means that parents oversee what is going on in their children's lives, how they are doing in school, and who their friends are. Dr. Dishion's research shows that programs that help parents become more effective in setting limits, solving problems, and providing positive reinforcement for their children reduce early behavioral problems, adolescent delinquency, and substance abuse.

- Dr. Gilbert Botvin of Cornell University in New York City said that comprehensive life skills programs that teach self-management along with social and drug-resistance skills in middle and junior high school offer the most promise for school-based prevention programs. Evaluations of a life skills training program developed by Dr. Botvin show that students who received the initial intervention in middle school and subsequent booster sessions in succeeding grades had dramatic reductions in tobacco, alcohol, marijuana, and multiple drug use throughout the high-risk junior and senior high school years. (For more information on this program, see "School-Based Drug Abuse Prevention Program Shows Long-Lasting Results," V9-4, November/December 1994.)
- Dr. Mary Ann Pentz of the University of Southern California in Los Angeles stated that the best drug abuse prevention results are achieved when parents, schools, the mass media, and community organizations work together to foster the personal, social, environmental, and policy changes that result in reduced drug use. Long-term prevention research studies that Dr. Pentz has conducted in Kansas City and Indianapolis show that coordinated, multicomponent community-based programs can reduce adolescents' use of cigarettes, alcohol, marijuana, and cocaine, she said.

After their presentations, the scientists met in work group sessions with State and community representatives and other conference participants to discuss the practical aspects of applying their research findings in the community. The conference concluded with the scientists presenting summary reports of their work group discussions, including recommendations for expanded dissemination of prevention research and potential areas for new research.

NIDA will publish a report on the National Conference on Drug Abuse Prevention Research that will include



At a special press conference held during the prevention conference, NIDA Director Dr. Alan I. Leshner takes questions from reporters from Washington, D.C., area high school newspapers and from the cable television show, "Children's Express," shown here.

keynote speeches, comprehensive summaries of the scientific presentations, work group reports, and recommendations. *NIDA NOTES* will notify readers when the report is available.

The Institute has published a new research-based guide on preventing drug use among young people that is now available for distribution. For information about the guide and how to obtain it, see "NIDA Designs Research Guide to Aid Community Prevention Efforts." **NN**

Protective Factors Can Buffer High-Risk Youths from Drug Use

By Robert Mathias, NIDA NOTES Staff Writer

A NIDA-funded study has identified a number of protective factors that can help prevent high-risk youths from engaging in delinquency and drug use. An accumulation of these protective factors in different areas of an adolescent's life strongly predicts resistance to drug use and delinquency, the study indicates.

"Having protective factors in multiple domains, such as family, school, peers, and neighborhood, is what is particularly important" in buffering adolescents from the effects of earlier circumstances that place them at risk, says Dr. Terence Thornberry of the State University of New York at Albany, who directed the study.

Not all children exposed to known risk factors go on to drug use and abuse and delinquency during adolescence, notes Dr. Thornberry. However, while some research has been done on protective factors that increase resistance to

those risk factors, additional studies are needed. Identifying these protective factors may suggest possible new approaches to prevention interventions, he says.

In the study, Dr. Thornberry and his colleagues, Dr. Carolyn Smith, Dr. Alan Lizotte, and Dr. Marvin Krohn, looked at the relationship of various risk and protective factors to drug use and delinquency among adolescents who had grown up in disadvantaged families. The analysis used data from the Rochester Youth Development Study, a long-term investigation of drug use and delinquency that Dr. Thornberry and his colleagues have been conducting since 1988. The study has been following a culturally diverse sample of 1,000 high-risk male and female adolescents, who live in Rochester, New York, since the 7th and 8th grades. The analysis reported here is based on data collected from this sample through the 11th and 12th grades.

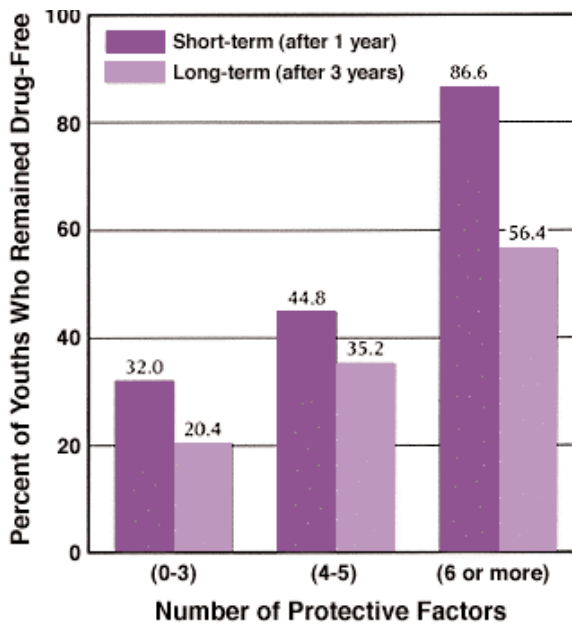
In the study, the researchers identified adolescents in the 7th and 8th grades who had been exposed to such risk factors as having an unemployed head of the household, family members who had experienced drug problems or trouble with the law, or an official record of child abuse or maltreatment prior to their 12th birthday. The researchers considered youths who had been exposed to five or more of these risk factors to be at very high risk of drug use and delinquency. The study found that in the short term, as early as 12 to 18 months after they were first surveyed, these high-risk youths were much more likely than were youths with zero to four risk factors to be seriously delinquent and to use drugs. Yet, over this same period, 60 percent of these high-risk youths were resilient, that is, they had not become involved with serious delinquency or drug use.

The researchers identified a number of educational, family, and peer factors during the 8th and 9th grades that contributed to these short-term positive outcomes for the resilient youths. Among educational factors, being committed to their education, having an attachment to teachers, and high reading and mathematics achievement levels consistently distinguished resilient from nonresilient youth.

PROTECTIVE FACTORS

Family Factors	Parental Supervision Child's Attachment to Parent Parent's Attachment to Child Parent's Involvement in Child's Activities
Educational Factors	Reading Percentile Mathematics Percentile Commitment to School Attachment to Teachers Aspirations to Go to College Expectations to Go to College Parent's Expectation for Child to Go to College Parent's Values About College
Peer Factors	Peers Have Conventional Values Parent's Positive Evaluation of Peers
Other Resources	Child's Self Esteem Child's Involvement in Religious Activities Child's Involvement in Prosocial Activities Child Is Close to an Adult Outside the Family
<p><i>The protective factors that are bold in this table consistently distinguished high-risk youths who remained drug free from high-risk youths who used drugs. The factors that are not bold did not have an impact on drug use among the high-risk youths in the study.</i></p>	

Effect of Number of Protective Factors on Drug Resistance to Use



Among family factors, closer parental supervision and a strong parent-child attachment were protective. Among peer relationships, peers having conventional values and parents' positive evaluation of peers were strongly related to resilience. Some protective factors that have been identified in the general literature on resilient youth, such as self-esteem and being close to an adult who does not live in the child's household, were not strong predictors of resistance to drug use and delinquency in this sample. The researchers have not yet examined risk and protective factors in relation to gender, race, and ethnicity, although they plan to do so.

The most important finding is that it is the accumulation of protective factors in school, family, and peer environments that has a positive effect on drug use over the longer term, Dr. Thornberry says. More than 56 percent of high-risk youths with six or more protective factors remained drug free up to 3 years after the protective factors were first measured in the 8th and 9th grades. By comparison, only a little over 20 percent of high-risk youths with three or fewer protective factors were still resistant to drug use 3 years later.

While a similar accumulation of protective factors also had a positive effect on delinquency in the short term, it did not significantly increase resistance to delinquency over the longer term of 3 years.

The study's findings suggest that the impact of specific protective factors may change during the life course, Dr. Thornberry says. As adolescents develop and new challenges arise, the effect of some protective factors may diminish and other factors may replace them. Thus, youths who are resilient at one stage of their development may not remain so in the face of changed circumstances, he says.

Nevertheless, the study's findings suggest possible areas for interventions to attempt to enrich the lives of at-risk youths, Dr. Thornberry says. However, he cautions that his study included relatively few of the individual-level factors, such as temperament, that have been linked with both risk and protective potential. Furthermore, although adolescents who have many protective factors in their natural environment do well, "we do not know if we can intervene to create those protective factors in the lives of youths who don't have them and, even if we can, whether it will have the same effect in reducing drug use," he says.

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NIDA Seeks New Keys of Preventing Drug Abuse Among Adolescents

By Dr. Alan I. Leshner, NIDA Director

Research has shown that some children raised in chaotic or disadvantaged environments make successful transitions to adulthood while others raised in similar circumstances go on to abusing drugs during adolescence. NIDA has been widening the scope of its risk and resilience research to find out why this is so.

Much of our research into the origins of drug abuse has focused on the psychological, behavioral, family, and social factors that are associated with drug use in children and adolescents. This research has identified a constellation of risk factors, such as shy, aggressive, and impulsive personality traits, chaotic family environments, ineffective parenting, poor academic performance, and deviant peer influences, that can lead to later drug involvement. Past research also has shown that certain factors, such as a stable temperament, strong family bonds, and school achievement, are associated with protection from drug abuse.

Thus, for several years, NIDA has been emphasizing a dual approach to developing preventive interventions that addresses both risk and protective factors. This approach has led to the development of effective drug abuse prevention programs for general populations, for children at risk of drug abuse, and for children who may already be experimenting with drugs or displaying other behavioral problems. However, we need to know much more about how protective factors work in real-life situations and if these factors continue to be helpful in different life circumstances to understand why most young people with many risk factors in their lives do not go on to use and abuse of drugs. Knowing more about protective factors and how they interact with risk factors to foster either vulnerability or resilience as young people face different stresses in their lives will enable us to develop drug abuse prevention programs that can more effectively reduce risk and drug abuse in the lives of young people.

Over the past few years, NIDA-funded scientists have begun looking more intently at the interaction of these risk and protective factors. In this issue of *NIDA NOTES*, we report on a long-term study that indicates that an accumulation of protective factors occurring in several



areas of adolescents' lives can help shield youths from the harmful effects of earlier family risk factors. (See "Protective Factors Can Buffer High-Risk Youths From Drug Use.")

Among other studies, a comprehensive, long-term, multifactor study involving high-risk youths is being conducted by Dr. Ralph Tarter, who directs the NIDA-funded Center for Education and Drug Abuse Research at the University of Pittsburgh. This study has been identifying many different biological, psychological, and environmental risk and protective factors and has been trying to determine how they interact in an individual to predict vulnerability or resistance to drug abuse.

To encourage more drug abuse prevention research that addresses both risk and protective factors, we formed a NIDA-wide resilience and risk work group, which is led by Dr. Zili Sloboda, who directs the Division of Epidemiology and Prevention Research (DEPR), and Dr. Meyer Glantz, associate director for science, DEPR. The work group brought together 15 leading epidemiologists and prevention researchers from medical schools and universities across the country to meet with me and NIDA policy and prevention research staff to discuss how to increase the use of resilience and risk data in the development of more effective prevention interventions.

A variety of research findings has shown that the family can be a strong influence on both vulnerability and resilience to drug abuse. Therefore, the work group made its strongest recommendation for more prevention programs that focus on the family, not merely as a medium for intervention with youths but as the direct target of interventions. Such interventions should build on the success of previous prevention models that have addressed deficits in family functioning and fostered the development of family strengths, particularly parental skills, the work group indicated.

Building on the work group's recommendations, NIDA's Prevention Research Branch has been augmenting its research on the family's role in vulnerability, resilience, and prevention. Earlier this year, more than 20 leading family prevention researchers and NIDA staff met

to discuss ways to improve future research on preventing drug abuse through family interventions. At this meeting, which was organized by Dr. Rebecca Ashery of DEPR, participants also emphasized the need for family drug abuse prevention interventions to improve parents' abilities to assess how their children are doing and set appropriate limits.

NIDA has already acted on the recommendations made at these two meetings by issuing two program announcements. Drug Abuse Prevention Through Family Intervention (PA-96-013) supports the development of new interventions aimed at reducing risk factors and fostering protective factors among families who have members at risk of abusing drugs. Drug Abuse Prevention


Intervention Research for Women and Minorities (PA-96-018) seeks more research to identify and address risk and protective factors that may be associated with norms and life experiences that are rooted in culture and gender. We also plan to encourage additional research to identify risk and resiliency factors and apply them in new prevention approaches.

The goal of our increased emphasis on studying protection from and resilience to drug abuse is to determine the configuration of individual, social, cultural, and gender-based factors that increase risk or strengthen resistance to drug abuse. This knowledge will give us additional tools we can use to develop a full range of more effective prevention interventions to help protect culturally diverse young people of both sexes from drug abuse and addiction. **NN**

Monograph Analyzes Economics of Prevention Programs

Research has shown that many theory-based drug abuse prevention programs reduce adolescent drug abuse, but few economic analyses of these programs have been conducted. Such analyses would allow policymakers to compare the cost-effectiveness of different programs and would demonstrate that resources spent on these programs reduce the health, crime, and other costs related to drug abuse.

To encourage more research in this field, NIDA convened experts in the areas of drug abuse prevention research and economic evaluation studies. The papers presented at this meeting have been published in a NIDA Research

Monograph, *Cost-Benefit/Cost-Effectiveness Research of Drug Abuse Prevention: Implications for Programming and Policy*. The monograph was edited by Dr. William Bukoski of NIDA's Division of Epidemiology and Prevention Research and Dr. Richard Evans of the University of Houston. This free publication is available from the National Clearinghouse for Alcohol and Drug Information, P.O. Box 2345, Rockville, MD 20847, (800) 729-6686. The monograph can also be downloaded from NIDA's home page on the World Wide Web at: <http://www.nida.nih.gov/PubCat/PubsIndex.html>. 

Institute Launches Science Education Campaign for Middle Schoolers

By Barbara Cire, *NIDA NOTES* Associate Editor

NIDA has launched a new science education campaign to provide middle school students with information about how drugs work in the brain. "NIDA Goes to School," a compilation of resource materials, is being mailed to science teachers at 18,084 public and private middle schools across the country and 256 Department of Defense schools overseas. The campaign, undertaken in partnership with the National Association of Biology Teachers, was announced in November at the National Leadership Forum of the Community Anti-Drug Coalitions of America in Washington, D.C. In December, at a national press conference about teen drug use, Health and Human Services Secretary Dr. Donna E. Shalala cited the campaign as an effective tool for teaching young people how drugs damage their minds and bodies and helping them to resist drugs.

"Science-based education about drug abuse should be a prominent part of the curriculum for all students," says NIDA Director Dr. Alan I. Leshner. "This new initiative provides teachers easily usable, student-oriented materials to help achieve this goal."

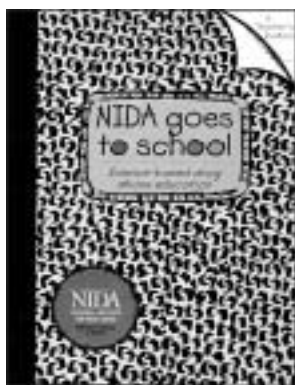
The "NIDA Goes to School" kit contains a variety of research-based materials for teachers and students about drugs and how they affect the brain. (See "A Toolbox for Teachers," below.) In addition, a "NIDA Goes to School" Web site has been established at NIDA's home page on the World Wide Web. Students and teachers can use this



HHS Secretary Dr. Donna E. Shalala praised the "NIDA Goes to School" campaign at a recent national press conference on teen drug use

interactive Web site to get additional information about drugs of abuse. The site also will serve as a major source of feedback from students, teachers, and parents. As new science education materials are developed, they will be added to the site.

"We are very excited about this project," says Dr. Cathrine Sasek, science education coordinator in NIDA's Office of Science Policy and Communications. "Science teachers want information and resources that they can use in their



A Toolbox For Teachers

The "NIDA Goes to School" kit contains the following publications and materials:

- Seven *Mind Over Matter* magazines and 40-page teacher's guide;
- "ATOD-TV" CD-ROM and 96-page teacher's guide;
- *Marijuana: Facts for Teens*, a 16-page brochure;
- *Marijuana: Facts Parents Need to Know*, a 28-page brochure;
- *Preventing Drug Abuse in Children and Adolescents: A Research-Based Guide*, a 38-page brochure; and
- Twenty *NIDA Infifax* information sheets on topics of interest to teachers, such as youth drug abuse trends, descriptions of more than 14 commonly abused drugs, and prevention and treatment methods.

classes. 'NIDA Goes to School' provides teachers with tools they can use to explain the neurobiology of substance abuse. We also hope that teachers will use NIDA as a source for additional fact-based information about drugs."

Many of the materials are written specifically for students in grades 5 through 9. Seven Mind Over Matter magazines feature the adventures of Sara Bellum, a girl who explores the brain's response to particular drugs and introduces key concepts in neuroscience. The series includes magazines on marijuana, opiates, stimulants, hallucinogens, inhalants, steroids, and nicotine. Each magazine unfolds into a poster with a quote from a noted scientist superimposed on a vivid color image of a brain area or neuron. For example, on the reverse side of the magazine on inhalants is a quote from Nobel Prize winner Albert von Szent-Györgyi (1893-1986): "Discovery consists of seeing what everybody has seen and thinking what nobody thought."

Also included in the materials is an interactive CD-ROM that features information on drugs of abuse in a variety of television show formats. Called ATOD-TV—ATOD stands for alcohol, tobacco, and other drugs—the CD-ROM was developed by Dr. Danny Wedding of the Missouri Institute of Mental Health with a NIDA Science Education Drug Abuse Partnership Award. In each ATOD-TV show, human and animated characters play

out scenarios that illustrate different aspects of drug abuse and addiction. For example, "Neuronet" is a news program that provides information about the brain and how it is affected by drugs. "The Torn and the Troubled" is a soap opera that challenges myths about drugs and addiction. "Wheels of Misfortune" uses a game-show format to supply statistical information about drug use by different populations. An accompanying teacher's guide suggests student activities and provides a comprehensive list of resources for further information.

"Our goal for this campaign is to enhance science education, increase science literacy, and encourage young people to pursue careers in the sciences," says Dr. Sasek. "By introducing students to the science of drug abuse, we hope to stimulate their interest in neuroscience and substance abuse research."

To Receive This Resource

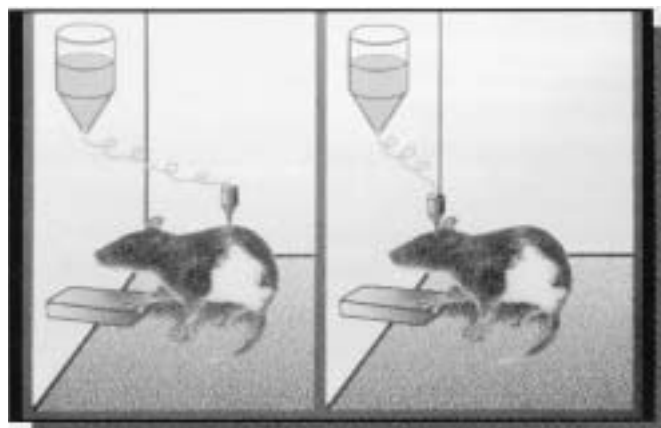
All materials in the "NIDA Goes to School" kit, with the exception of the ATOD-TV CD-ROM and teacher's guide, are available free from the National Clearinghouse for Alcohol and Drug Information. The materials also can be downloaded from NIDA's home page on the World Wide Web at <http://www.nida.nih.gov/>. The "NIDA Goes to School" Web site can be accessed from NIDA's home page. **NN**

NIDA Offers Free Slide Presentations for Teaching How Drugs Act in the Brain

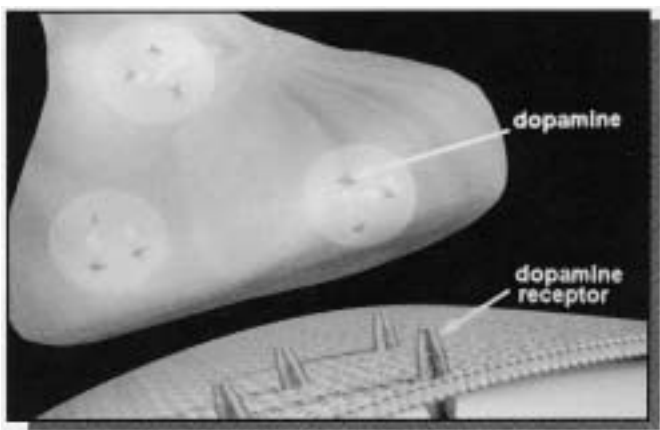
Two free public education slide presentations about the brain's response to a variety of drugs are now available from NIDA. The presentations are designed for health care practitioners, teachers, and scientists to use in clinical, community, and high school settings. The slides are the core components of two teaching packets that include a narrative script to accompany the slides, background information and instructions for the presenter, and additional references.

The Neurobiology of Drug Addiction is a four-part presentation on the basic function of the brain, the neurobiological basis for addiction, and how heroin and cocaine affect the brain. The presentation is designed for a general adult audience and can be modified to accommodate different knowledge and educational levels. The first part introduces the brain and presents basic neurobiology; the second part discusses how the brain's reward pathway reinforces certain behaviors with pleasurable feelings. The third and fourth parts show in detail how heroin and cocaine act in the brain and how they disrupt the reward system's normal activities.

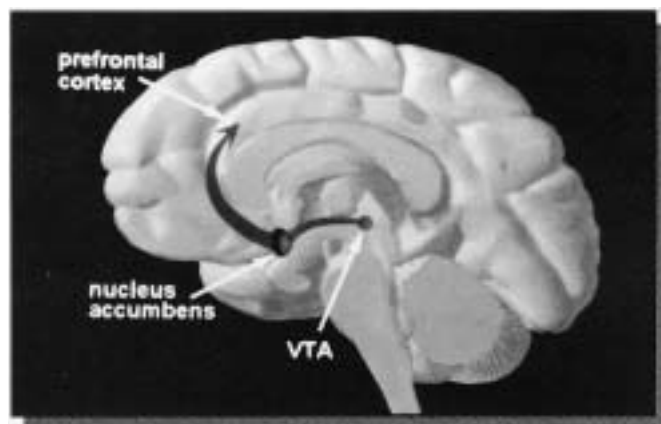
The Brain & the Actions of Cocaine, Opiates, and Marijuana is a three-part slide presentation designed primarily for high school students that describes how three drugs—cocaine, opiates, and marijuana—work in the brain. The first and second sections are similar to the first



The rats in this slide are self-administering cocaine. The accompanying script describes the concept of positive reinforcement—the rats keep administering the drug because the drug makes them feel good. The script uses the rat at right to show that specific areas of the brain are involved in the rewarding effects of cocaine and, thus, the rat will administer cocaine only if the syringe sends the drug directly to those specific brain areas.



This slide illustrates how chemical messengers, such as dopamine, transmit information from brain cell to brain cell.




This slide shows the prefrontal cortex, the nucleus accumbens, and the ventral tegmental area (VTA)—brain structures associated with the rewarding effects of cocaine.

parts of the *Neurobiology of Drug Addiction* presentation, discussing the brain, basic neurobiology, and how the reward pathway functions. The third part presents the mechanism of action for each drug and describes how each affects the reward system.

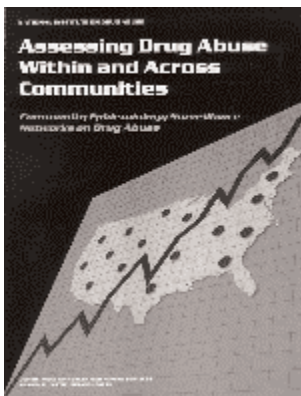
The scripts for both presentations were developed to be used as outlines so presenters can customize presentations for different audiences. Each presentation is designed to take approximately 30 to 40 minutes, plus additional time for audience questions.

The teaching packets can be previewed at and downloaded from NIDA's home page on the World Wide Web. Complete instructions are given for downloading and

producing the slides for these presentations. A limited number of free copies of the presentations can be obtained from the National Clearinghouse for Alcohol and Drug Information, P.O. Box 2345, Rockville, MD 20847-2345; (800) 729-6686 or (301) 468-2600; TDD number: (800) 487-4889; fax: (301) 468-6433; e-mail: info@health.org. 

New Drug Abuse Prevention and Treatment Resources for Communities and Treatment Providers

Three new NIDA publications offer research-based information on preventing and treating drug abuse for communities, drug abuse treatment providers, and others. The publications continue NIDA's campaign to disseminate current research information and expedite its use. All three publications are free of charge.



Assessing Drug Abuse Within and Across Communities: Community Epidemiology Surveillance Networks on Drug Abuse

(NIH Publication Number 98-3614)

Research has shown that to succeed, drug abuse prevention and treatment programs must be tailored to specific community needs. This new guidebook is designed to help

communities, cities, counties, and States determine the extent of drug abuse problems in their areas and develop the most effective prevention and treatment programs for their needs. The 124-page volume explains why community epidemiology surveillance networks are necessary and how communities can create their own networks to identify local drug use patterns and trends. The guidebook also tells how to obtain drug use data and contains sample forms and other tools to help with data collection and organization. *Assessing Drug Abuse* is based on the experience of NIDA's Community Epidemiology Work Group, a network of researchers that has monitored national drug abuse trends in the United States for more than 20 years.

Therapy Manuals for Drug Addiction Series

NIDA has released the first two manuals in this series, which is being developed to help treatment providers and mental health professionals obtain and use up-to-date research information on effective approaches to treating drug addiction.



Manual One. A Cognitive-Behavioral Approach: Treating Cocaine Addiction

(NIH Publication Number 98-4308)

This 127-page manual describes a cognitive behavioral therapy (CBT) program developed by researchers at Yale University in New Haven, Connecticut, for treating addiction. CBT is a short-

term, flexible approach and is clinically proven to help individuals recognize and avoid situations in which they may use drugs. The program teaches drug abusers in treatment to use coping skills to solve problems linked with drug use, such as difficult family relationships or losing a job. The manual provides an overview of the basic principles of CBT and explains the structure and topics to be used in treatment sessions.



Manual Two. A Community Reinforcement Plus Vouchers Approach: Treating Cocaine Addiction

(NIH Publication Number 98-4309)

This manual guides drug abuse treatment providers in using a community reinforcement plus vouchers approach, a behavioral strategy for treating cocaine addiction that has been

proven effective in clinical trials. This multicomponent treatment approach combines community reinforcement, including individual counseling and skills training, with an incentive program using vouchers. Therapists tailor the individual counseling and skills training sessions to each patient's needs. As long as the patient remains in treatment and abstinent from cocaine, he or she earns points

that can be exchanged for vouchers to receive incentives, such as fishing licenses or gift certificates to restaurants or shops. The 148-page manual gives step-by-step instructions for implementing the community reinforcement plus vouchers approach, including the style, technique, and structure of counseling needed. The manual also describes the format to be used for initial counseling sessions and training sessions on drug avoidance skills.

Free copies of these three publications are available by contacting the National Clearinghouse for Alcohol and Drug Information, P.O. Box 2345, Rockville, MD 20847-2345; (800) 729-6686 or (301) 468-2600; TDD number: (800) 487-4889; fax: (301) 468-6433; e-mail: info@health.org. **NN**

NIDA Materials to Help Communities Develop Drug Abuse Prevention Programs

To help communities develop drug abuse prevention programs for children and adolescents, NIDA has published a new comprehensive set of Drug Abuse Prevention Research Dissemination and Applications (RDA) materials. The materials are designed for drug abuse prevention program administrators, policymakers, community activists, parents, teachers, and other individuals who have an interest in drug abuse and its prevention. The materials consist of a core set of three handbooks that are packaged together and three separate stand-alone resource books that can be ordered individually.

The Core Handbooks (PB97-209605)

Drug Abuse Prevention: What Works describes drug abuse risk and protective factors and the strategies that have proven effective in preventing drug abuse. Research has shown that a combination of approaches that focus simultaneously on different levels within the community—such as families, schools, or the community as a whole—is more effective than a single approach. This 91-page handbook provides guidelines for selecting these multicomponent prevention programs and tailoring these programs to particular communities.

Community Readiness for Drug Abuse Prevention: Issues, Tips, and Tools addresses the concept of community readiness for implementing drug abuse prevention programs. The 172-page handbook defines community readiness, describes the stages of readiness, and lists the factors associated with readiness. The handbook also discusses how to assess a community's stage of readiness and offers strategies for increasing community readiness.

Drug Abuse Prevention and Community Readiness: Training Facilitator's Manual is a 325-page handbook to be used by training facilitators for a 9-hour training session that discusses drug abuse prevention theory, strategies for prevention, and techniques for assessing and increasing community readiness. The training program is designed for flexibility, with five modules, each lasting 1 to 2 hours, that can be presented all in 1 day or in a series of meetings.



The Resource Manuals

The three stand-alone resource manuals provide examples of prevention programs developed through NIDA-funded research that prevention practitioners might consider implementing in their communities.

Drug Abuse Prevention for the General Population (PB98-113095) reviews prevention programs that target the entire population of a community. As an illustration of this strategy, the 125-page manual provides details on the Midwestern Prevention Project, or Project STAR (Students Taught Awareness and Resistance), a comprehensive, multicomponent prevention program designed to teach middle schoolers how to resist the

influences that encourage substance abuse. The program consists of elements involving schools, parents, the mass media, and local policymakers.

Drug Abuse Prevention for At-Risk Groups (PB98-113103) discusses prevention programs that target at-risk subgroups of the population. As an example, the 136-page manual describes the Strengthening Families Program, designed for 6- to 10-year-old children of substance abusers.

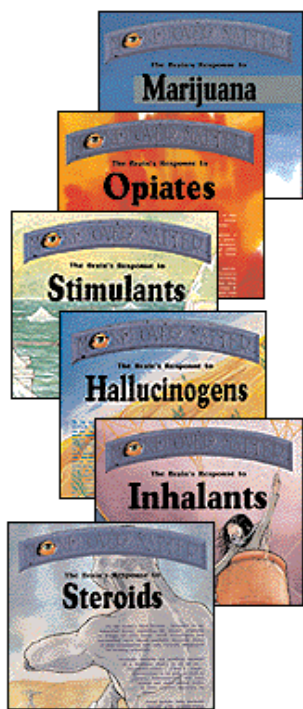
Drug Abuse Prevention for At-Risk Individuals (PB98-124365) provides material on prevention programs that target adolescents who are at risk for dropping out of school and other problem behaviors. As an example, the 165-page manual discusses the Reconnecting Youth Program, which targets 9th to 12th grade at-risk students.

A limited number of free copies of the RDA materials are available from the National Clearinghouse for Alcohol and Drug Information, P.O. Box 2345, Rockville, MD 20847-2345; (800) 729-6686 or (301) 468-2600; TDD number: (800) 487-4889; fax: (301) 468-6433; e-mail: info@health.org.

Copies may be purchased at cost from the National Technical Information Service, 5285 Port Royal Rd., Springfield, VA 22161; (703) 487-4650; fax: (703) 321-8547. Include NTIS order numbers listed with the titles on this page. For rush service, which involves an addition-

al charge, dial (800) 553-NTIS. The core handbooks cost \$67 for the set. The General Population and At-Risk Groups Resource Manuals are \$31 each; the At-Risk Individuals Manual is \$35. **NN**

New NIDA Drug Abuse Education Materials for Middle School Students



NIDA has released a new series of drug abuse education materials called *Mind Over Matter*. Designed for students in grades five through nine, the series consists of six full-color glossy magazines that unfold into posters. The package also includes a comprehensive teacher's guide. In each magazine, a girl named Sara Bellum—a play on "cerebellum," a section of the brain that helps control coordination—explores the brain's response to a particular drug and introduces key concepts in neuroscience.

The magazines teach students about the adverse effects of marijuana, opi-

ates, stimulants, hallucinogens, inhalants, and steroids. A seventh in the series, which will discuss nicotine, will be available early in 1998. The magazines are designed to excite students about science in general and neuroscience in particular.

The series uses illustrations and cartoons to provide useful information. Some illustrations show Sara Bellum scuba diving in the depths of the brain, watching drug molecules alter nerve cell activity. The cartoons often depict a nerve cell or body organ performing abnormally under the influence of drugs. For example, a heart playing drums in a rock band loses its rhythm due to cocaine.

The posters on the reverse side of each magazine can be seen after the magazine is unfolded. Each 18- by 38-inch poster has a quote from a well-known scientist superimposed over a vivid color photograph of a brain image or neuron. For example, on the back side of the opiates magazine and superimposed over a photograph of neurons in the brain is a quote from Jacob Bronowski, the late British mathematician, which reads, "The essence of science: Ask

an impertinent question, and you are on the way to a pertinent answer."

Following are the six magazines and their subjects:

- **The Brain's Response to Marijuana** shows how marijuana affects emotions, memory, judgment, balance, and coordination.
- **The Brain's Response to Opiates** discusses how opiates such as heroin act on many places in the brain and spinal cord and how addiction and withdrawal affect neurons.
- **The Brain's Response to Stimulants** demonstrates how cocaine and amphetamines change the way neurons in the brain communicate and disrupt the functioning of the heart and blood vessels.
- **The Brain's Response to Hallucinogens** explains how hallucinogens such as LSD and PCP affect the senses by disrupting the actions of chemical messengers in the brain.
- **The Brain's Response to Inhalants** illustrates how inhalants break down the electrical insulation surrounding many of the body's neurons, making it difficult for them to transmit messages.
- **The Brain's Response to Steroids** describes how anabolic steroids can make people look stronger on the outside and yet cause extensive damage on the inside.

The teacher's guide provides detailed information on the brain and how drugs of abuse affect it. It also lists resources and suggests activities to help students remember the principles discussed in the magazines.

Mind Over Matter is a product of NIDA's Science Education Program, which funds programs to interest children in pursuing careers in science and to increase knowledge about drug abuse and addiction among the general public. The six magazine-posters and the teacher's guide are available free. To order copies, contact the National Clearinghouse for Alcohol and Drug Information, P.O. Box 2345, Rockville, MD 20847-2345, (800) 729-6686 or (301) 468-2600; TDD number: (800) 487-4889; fax: (301) 468-6433; e-mail: info@health.org.



