

Special Back-to-School Issue

NEWS UPDATE

New Study Provides Insight to the Human Brain's Response to Methamphetamine Abuse

Current research suggests neuronal changes associated with long-term methamphetamine abuse, such as disturbances in memory and selective attention, may not always be permanent. In fact, these neurons may partially recover with prolonged abstinence.

Dr. Thomas Nordahl and colleagues from University of California at Davis Imaging Research Center used magnetic resonance spectroscopy (MRS) to examine metabolite levels in 2 brain regions responsible for selective attention, the anterior cingulum and the primary visual cortex.

A total of 24 abstinent methamphetamine abusers were matched with 13 controls and divided into 2 groups: distantly abstinent (1 year to 5 years) and recently abstinent (1 month to 6 months). The researchers examined correlations between years of usage, months of abstinence, and metabolites marking cell functions.

Abnormal metabolite levels were found in the brains of both recently and distantly abstinent methamphetamine abusers. Because certain metabolite levels often indicate neuronal health, low N-acetylaspartate (NAA)-to-creatine ratios over an extended period of drug abstinence may suggest long-lasting neuronal injury. Furthermore, the researchers observed that abnormally high choline-to-NAA ratios became normal in abstaining methamphetamine abusers following extended periods of remission. This finding suggests an adaptive response by the brain to neuronal changes following periods of abstinence.

- **WHAT IT MEANS:** This study provides additional insight on the human brain's ability to at least partially recover from methamphetamine abuse. If altered neuronal tissues are capable of recovery following sustained abstinence, new hope may exist for substance abuse treatment patients. Additional studies are needed to explore the possibility of neurochemical rehabilitation in recovering substance abusers.

This study was published in the April 2005 issue of *Archives of General Psychiatry*.

Drinking, Drug Abuse Higher in Fraternities and Sororities

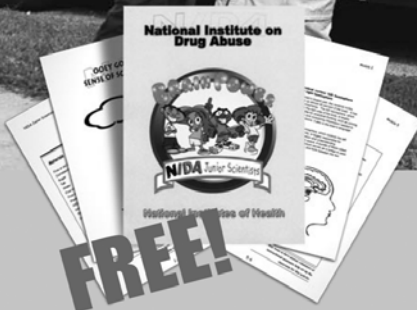
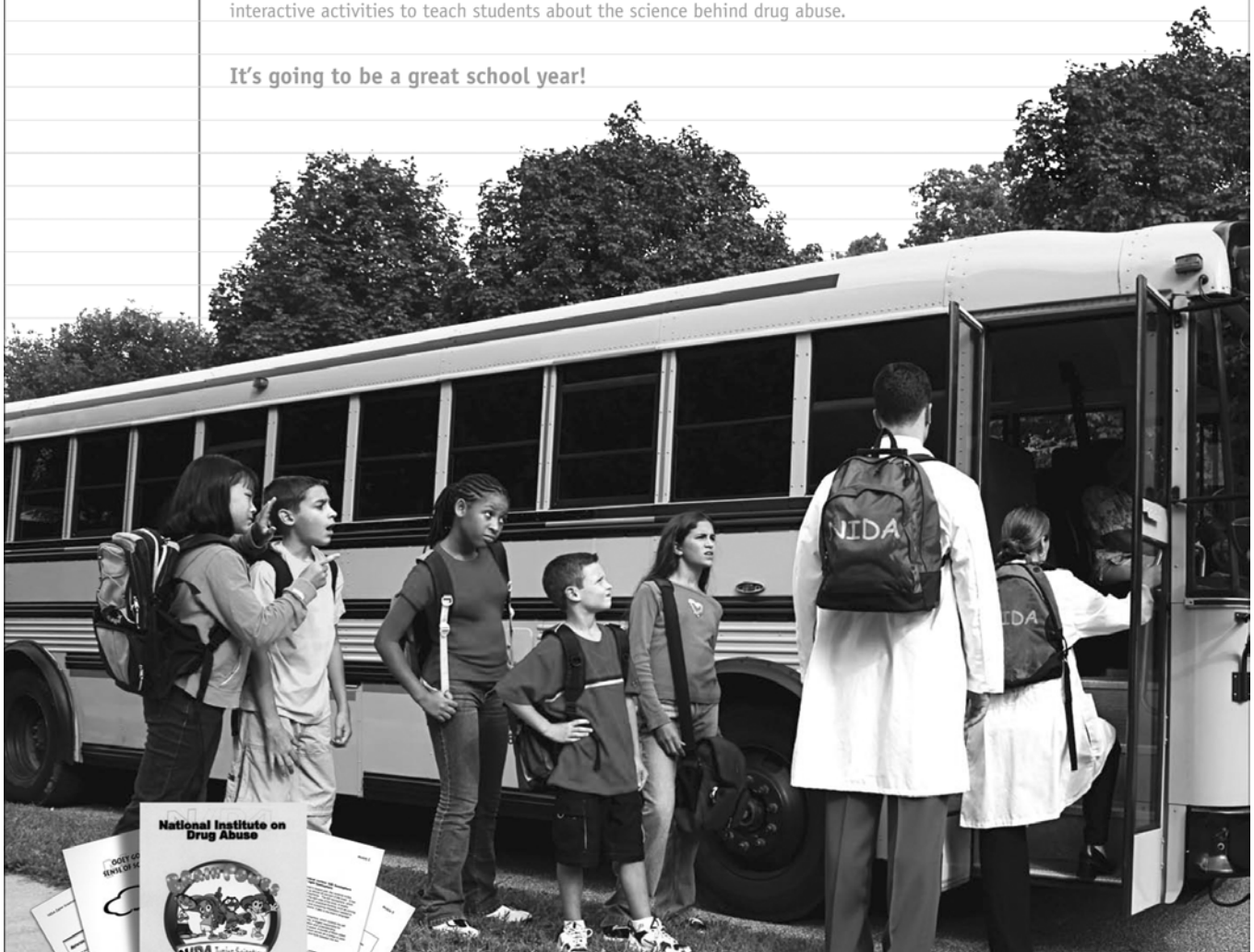
Analyses of drinking and drug abuse patterns of 4,299 young adults who were surveyed first as high school seniors and then during college confirm that members of fraternities and sororities engage in significantly higher rates of substance abuse than their college peers.

The young adults who participated in the study were part of NIDA's Monitoring the Future survey, an annual assessment of substance abuse patterns among 8th-, 10th-, and 12th-graders. Data show that fraternity and sorority members had elevated rates of substance abuse while they were in high school and higher levels of binge drinking, annual marijuana use, and current cigarette smoking during the college years than nonmembers. The study also indicates that the processes of selection (the influence of certain characteristics that steer an individual toward certain experiences, organizations, or environments) and socialization both contribute to the high levels of substance abuse seen among fraternity and sorority members.

Is it "Bring a Scientist to School" Day?

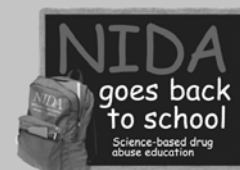
Actually, every day is because the National Institute on Drug Abuse (NIDA) is providing **FREE** science-based curricula to teachers and students. For more than 30 years, we've been at the forefront of research to help people understand how drugs of abuse affect the brain and behavior. We've developed the *NIDA Goes Back to School* program, which provides **FREE** materials that use creative, fun, and interactive activities to teach students about the science behind drug abuse.

It's going to be a great school year!



NIDA's interactive Brain Power curricula for grades K-1, 2-3, and 4-5 lay the foundation for scientific learning.

To order **FREE** educational resources, part of the *NIDA Goes Back to School* program, for your classroom, visit www.BacktoSchool.drugabuse.gov or call (800)729-6686. These materials are **FREE**, but supplies are limited.



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Although heavy drinking and abuse of substances other than tobacco tend to decline following college graduation, the scientists suggest that future research may determine whether this decline holds equally well for those individuals who were involved in fraternities or sororities in college.

- **WHAT IT MEANS:** The findings suggest that substance abuse intervention efforts targeting college students should be focused on individuals interested in joining fraternities or sororities before they arrive at college. Prevention efforts aimed at college students belonging to fraternities or sororities should especially target binge drinking and marijuana abuse.

Dr. Sean Esteban McCabe and his colleagues at the University of Michigan published their NIDA-supported research in the April 2005 issue of *Addiction*.

A Healthy Start: Some Parenting Practices May Protect Youth From Early Marijuana Use

Parenting practices during the middle years of elementary school, such as supervision and monitoring, may affect adolescent initiation of marijuana use, according to a new NIDA-supported study conducted by Dr. Chuan-Yu Chen and colleagues from the Johns Hopkins University Bloomberg School of Public Health.

The scientists followed 1,222 youth from elementary school through young adulthood to determine if early parenting practices protect youth from early onset of marijuana use. The researchers measured three dimensions of parenting—parental monitoring, parental involvement/reinforcement, and coercive parental discipline parenting (attempts to correct child behavior by using serious threats such as physical and nonphysical punishment)—as well as opportunity to first try marijuana.

The scientists found that children with the lowest levels of parental monitoring and parental involvement/reinforcement were almost 30 percent more likely to try marijuana for the first time when compared with the most highly monitored children. Similarly, children with higher levels of coercive discipline were more likely to try the drug for the first time. Overall, the scientists observed a delay and reduction in the opportunity to first try marijuana among children with the highest levels of parental involvement/reinforcement, which lasted through early adulthood.

- **WHAT IT MEANS:** Numerous studies have documented associations between parenting practices and an array of health-compromising behaviors in adolescents. The results of this study expand upon existing evidence and suggest that parenting practices such as early increased monitoring and supervision may have lasting effects by reducing and delaying marijuana use through young adulthood. Additional research is needed to better understand the role of parental practices in preventing and delaying adolescent drug use.

This study was published in the June 2005 issue of *Pediatrics*.

Adolescents Also Can Experience Marijuana Withdrawal Symptoms; Differences In Severity Between Teens, Adults Noted

Scientists at the University of Vermont report that adolescents who smoke marijuana regularly and are trying to quit can experience the same withdrawal symptoms as adults, although the prevalence and magnitude of these symptoms are lower than those seen in previous research among adults.

The scientists collected information from 72 adolescents—primarily young white males between 14 and 19 years of age seeking outpatient treatment for marijuana abuse. Their substance abuse behavior was measured by means of self-report questionnaires and interviews. The participants also rated the presence and severity of specific symptoms known to be associated with drug withdrawal.

The scientists observed that 78 percent of the participants reported having at least 2 symptoms, 58 percent reported at least 4 symptoms, and 44 percent reported at least 6 symptoms. The most common symptoms were craving for marijuana, depression, irritability, restlessness, sleeping difficulties, hostility, loss of appetite, increased aggression, anxiety, and headache. At least 22 individuals rated their marijuana craving, depression, irritability, and sleep problems as moderate, with craving for marijuana being the only symptom listed as severe.

- **WHAT IT MEANS:** Much of the research on marijuana withdrawal has been conducted in adults, yet youth age 20 and under comprise over half of all U.S. treatment admissions for marijuana abuse. This study shows that adolescents who abuse marijuana experience withdrawal symptoms similar to those seen in adults upon drug abstinence. However, difference in symptom severity in adolescents compared with adults may reflect less frequent use of the drug by teens. The withdrawal syndrome could have a negative impact on and contribute to its continued use in young people who attempt to stop.

Graduate student Ryan Vandrey, Dr. Alan Budney, and their colleagues published these NIDA-supported findings in the May 9, 2005 issue of *Drug and Alcohol Dependence*.

Co-Occurring Substance Abuse, Mental Disorders Increase AIDS Risk in Delinquent Youth

Young people in the juvenile justice system who are substance abusers and have major mental disorders—such as depression, mania, or psychosis—are very likely to engage in high-risk practices that greatly increase their chances of acquiring or transmitting HIV.

Dr. Linda A. Teplin, Owen L. Coon Professor of Psychiatry and Behavioral Sciences at Northwestern University's Feinberg School of Medicine, and her colleagues surveyed 800 adolescent males and females who were part of the Northwestern Juvenile Project, a long-term study that tracks 1,829 youth initially arrested between 1995 and 1998 in Chicago.

The scientists observed that the combination of co-occurring major mental disorders and substance abuse resulted in significantly more youth who engaged in high-risk behaviors that included unsafe sex practices. Among youth with co-occurring substance abuse and major mental disorders, almost all were sexually active, about two-thirds had multiple partners within the previous 3 months, and more than half had recent, unprotected vaginal sex.

- **WHAT IT MEANS:** The study suggests that juvenile detention may be a good place to provide educational interventions to reduce the likelihood of these young people engaging in AIDS-related, high-risk behaviors when they return to the community. The researchers suggest that future investigations look at how the co-occurrence of substance abuse and major mental disorders influence the onset, persistence, discontinuation, and recurrence of HIV/AIDS risk behaviors.

The NIDA-supported study was published in the July 2005 issue of *Psychiatric Services*.

New Research Highlights Patterns of Drug Abuse in Hispanic-American Youth

Recent research has shown that despite declining trends in drug use among American youth, drug use among Hispanic youth remains alarmingly high.

Dr. Jorge Delva and colleagues from the Institute for Social Research at Ann Arbor, Michigan, compared trends of marijuana, cocaine, and heavy alcohol use among adolescents within the largest subgroups of the Hispanic population in the United States (Mexican-American, Puerto Rican, Cuban, and other Latin American heritage). The research team examined data from 24,235 self-identifying Hispanic students in eighth grade from the 1991–2002 Monitoring the Future (MTF) surveys.

Although drug use trends for Hispanics were consistent among eighth-graders, drug use varied by subgroups and drug type. Past year marijuana use was 25 to 33 percent higher for boys than for girls of Mexican-American, Puerto Rican, and other Latin American (but not Cuban) ethnicities. However, there were no gender differences among these groups in past year cocaine use and heavy drinking. Hispanic students living in households with both parents were less likely to use cocaine than Hispanic students living with no parents. Mexican-American, Puerto Rican, and Cuban-American students in no-parent households were more likely to initiate heavy drinking than the other Latin American group, comprised mostly of youth with Central and South American heritage.

- **WHAT IT MEANS:** These findings may provide insight to potential intervention targets for Hispanic youth. In addition, prevention programs need to consider gender differences that exist among diverse Hispanic populations. Furthermore, this study suggests that preventive services are very important for youth living with relatives other than parents or in foster care.

The scientists published this paper in the April 2005 issue of the *American Journal of Public Health*.

Televised Anti-Tobacco Advertising Decreases Smoking in U.S. Youth

Reductions in state-sponsored anti-tobacco advertisements may provide short-term savings, but increased smoking and smoking-related diseases may result in long-term costs for states.

Using national and state-based data sets, including Nielson media research, state tobacco control policy data, and Monitoring the Future surveys, to compile data for 51,085 students in grades 8, 10, and 12, a team of NIDA-funded researchers from the University of Illinois at Chicago examined the relationship between tobacco-related beliefs, attitudes, and behaviors and exposure to state-sponsored, televised, anti-tobacco advertising.

Researchers found that students living in states with at least one televised, state-sponsored ad held greater anti-smoking attitudes and beliefs and were less likely to smoke than students who were not exposed to anti-tobacco ads. In addition, higher Targeted Rating Points (TRPs)—a national rating system that estimates frequency and reach of advertising to 12- to 17-year-olds—were associated with significantly greater odds of holding anti-smoking attitudes, beliefs, and behaviors.

- **WHAT IT MEANS:** Televised, state-sponsored, anti-tobacco media campaigns positively influence anti-smoking attitudes, beliefs, and behaviors in U.S. youth, and may be an effective strategy for preventing and reducing smoking in youth.

This study, led by Dr. Sherry Emery of the University of Illinois at Chicago, was published in the July 2005 issue of *Archives of Pediatric & Adolescent Medicine*.

Adolescent Smoking Cessation: Is Motivation Enough?

Despite declining trends in adolescent smoking, more than 25 percent of 12th-graders report smoking in the past month, and 17 percent report daily smoking. Now, a recent study indicates motivation is not enough by itself to keep teens away from cigarettes.

Dr. Suzanne Colby and colleagues from Brown University recruited 85 non-treatment-seeking adolescent smokers ages 14–19 who were randomly assigned to receive either one session of motivational interviewing (MI) or standardized brief advice (BA). At the beginning of the study, the teens were interviewed and completed questionnaires to determine their daily cigarette, marijuana, and alcohol use. Additional assessments were made at 1, 3, and 6 months postintervention. Trained interventionists presented the MI group with the pros and cons of smoking and quitting; and helped patients formulate detailed action plans, anticipate barriers, and develop strategies for overcoming them. Members of the BA group were advised to quit smoking and received a pamphlet on quitting and a list of local treatment referrals.

Overall, abstinence rates were low but consistent with findings from previous adolescent smoking cessation trials. Results showed reduced smoking for both groups at 6 months, but not at 1 month. At 3-month followup, only those in MI showed significant reductions compared to the beginning of the study.

- **WHAT IT MEANS:** Although teens who received MI fared better than those who received standardized BA, motivation alone did not sustain smoking cessation. Future research should examine the efficacy of MI paired with skills training and/or additional resources when helping teens quit smoking.

These NIDA-supported findings were published in the June 2005 issue of *Addictive Behaviors*.

Rat Study Shows Isolation During Infancy Causes Brain, Behavioral Responses to Cocaine

A new study by Dr. Therese Kosten and colleagues at Yale University indicates that early life stress of isolation during infancy has immediate and long-term effects in rats. The team of researchers examined neurochemical and behavioral effects of early life stress in 164 adult male rats exposed to isolation or non-handled during infancy.

The scientists found that isolated rats had higher dopamine levels after cocaine administration, when compared to controls. Although isolated and non-handled rats ate less food when cocaine doses were increased, the researchers observed that isolated rats were less responsive to food.

Similarly, isolation rats pretreated with eticlopride, a compound that binds to specific dopamine receptors (D2), were less likely to respond to scheduled food cues than when treated with a similar compound that binds to D1 receptors. Dopamine is a brain chemical involved in pleasure and reward. These study findings suggest that isolation decreases the number of available D2 receptors. Because cocaine addicts typically have lower D2 levels, this indicates a link between the D2 receptor and the likelihood of developing an addiction.

- **WHAT IT MEANS:** Isolation during infancy has immediate and long-term effects on behavior and chemical levels in the brain. The stress of isolation during infancy may increase one's risk for developing an addiction. Consequently, these findings suggest that prevention and treatment strategies should be tailored to address the presence or absence of early life stress.

These findings were published online in April 2005 in the *Journal of Pharmacology and Experimental Therapeutics*. It appeared in print in the August 2005 issue of the journal.

Buprenorphine Is Effective in Treating Opiate Withdrawal in Newborns of Opiate-Addicted Mothers

Preliminary results of a new study, supported in part by NIDA, suggest that buprenorphine is comparable to methadone for treatment of neonatal abstinence syndrome (NAS), a term for a group of health problems experienced by infants when withdrawing from exposure to narcotics.

Of the 20 pregnant, opioid-addicted women recruited into the study, 11 received methadone and 9 received buprenorphine during their second trimester. The study results showed no significant differences between the two groups regarding NAS scores or the total number of morphine drops administered to the infants to alleviate distress.

Twenty percent of the buprenorphine-exposed newborns were treated for NAS, compared with more than 45 percent of the methadone-exposed infants, though this difference was also not statistically significant. However, the scientists did observe that buprenorphine-exposed newborns were discharged from the hospital 1.3 days earlier than methadone-exposed newborns.

- **WHAT IT MEANS:** This is the first study to compare the effects of buprenorphine and methadone on NAS under rigorous scientific conditions. Although effects on the newborns were similar in some respects, the significant difference seen in neonatal length of stay suggest the economic benefits of using buprenorphine to treat pregnant opiate-addicted women could amount to an annual savings of \$7–\$11 million in the United States. The scientists say these results support the need for larger studies to detect potential differences between the two medications.

The study, led by Dr. Hendree Jones of The Johns Hopkins Medical Institutions, was published in the July 2005 issue of *Drug and Alcohol Dependence*.

Upcoming Meetings

NIDA's Health Disparities Conference Scheduled

NIDA's Health Disparities Conference—**Bridging Science and Culture to Improve Drug Abuse Research in Minority Communities**—will take place October 24–26, 2005 at the Hyatt Regency in Atlanta, Georgia.

The 2 and 1/2-day conference will address a wide range of health issues related to drug use and addiction in racial/ethnic minority and other health disparity populations.

Conference participants will have the opportunity to attend:

- Morning plenary sessions on genetic research, health disparities, HIV/AIDS and the criminal justice system, and community-based models/approaches to address drug use in racial/ethnic minority populations.
- Afternoon sessions on prevention, treatment, research careers, pharmacology, rural communities, HIV/AIDS, criminal justice, and many other topics relevant to addiction in health disparity populations.
- Poster session and a grants development workshop.

For more information on the conference or to register, please e-mail: jrichardson@encoreinc.com.

NOTES

For more information about any item in this *NewsScan*:

- Reporters, call Michelle Person at 301-443-6245.
- Congressional staffers, call Geoffrey Laredo at 301-594-6852.

The National Institute on Drug Abuse (NIDA) is a component of the National Institutes of Health, U.S. Department of Health and Human Services. NIDA supports most of the world's research on the health aspects of drug abuse and addiction. The Institute carries out a large variety of programs to ensure the rapid dissemination of research information and its implementation in policy and practice. Fact sheets on the health effects of drugs of abuse and other topics are available in English and Spanish. These fact sheets and further information on NIDA research and other activities can be found on the NIDA home page at <http://www.drugabuse.gov>.

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