



NIDA NOTES

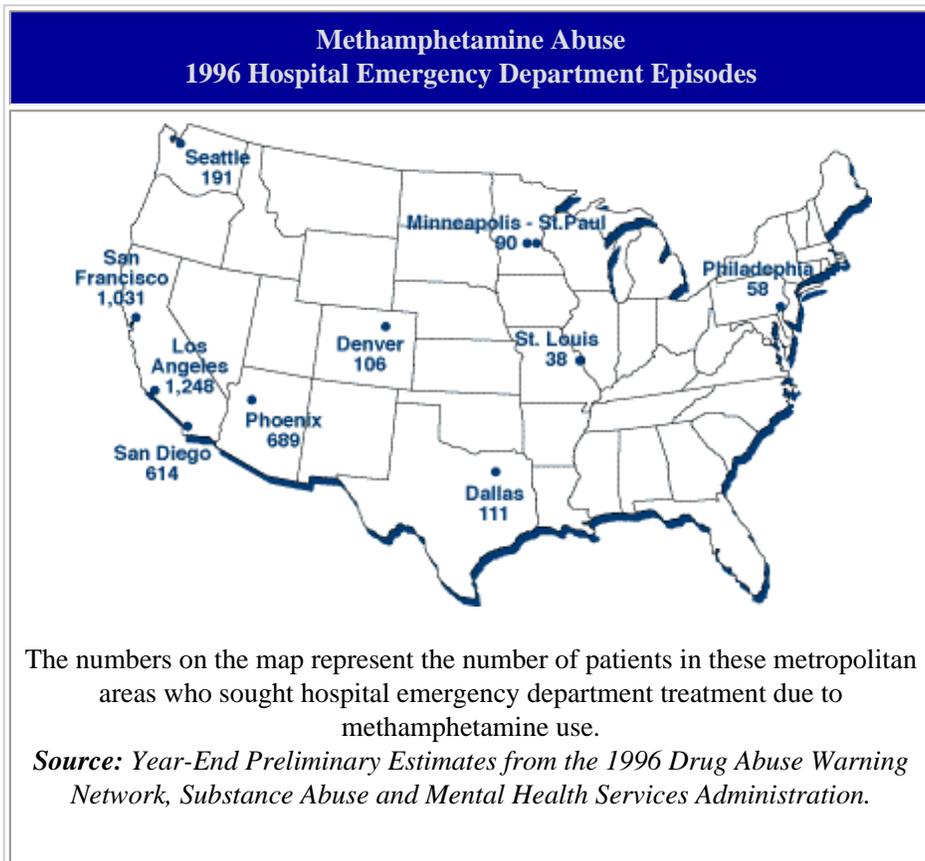
News

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NIDA Initiative Tackles Methamphetamine Use

By Robert Mathias, NIDA NOTES Staff Writer

In response to an upsurge in heroin use among America's young people in recent years, NIDA convened a national research-based conference on Heroin Use and Addiction in Washington, D.C., this past September. The well-attended conference drew more than 600 participants who examined all aspects of the changing nature of heroin use in the United States and shared scientific information and approaches to preventing and treating heroin abuse and addiction. Representatives of national drug abuse organizations, scientists, prevention and treatment practitioners, and criminal justice personnel took part in the conference.



NIDA has launched an Institute-wide initiative to expand scientific research on methamphetamine and apply the findings to the prevention and treatment of methamphetamine abuse. The Methamphetamine Initiative is aimed at increasing scientific knowledge about methamphetamine and providing the public and health care practitioners with the latest available information about the drug's use, consequences, prevention, and treatment.

Methamphetamine, also called "meth," is a potent, highly addictive form of amphetamine. Use of the drug has been a major problem in western areas of the United States since the mid- to late 1980s and has been increasing in other areas of the country, such as the South and Midwest, since the early 1990s, according to reports from NIDA's [Community Epidemiology Work Group \(CEWG\)](#). Traditionally, methamphetamine use has been centered among white working class males and men who have sex with men. However, recent CEWG reports and drug use surveys indicate that use of the drug also may be increasing among other groups such as Hispanics in Los Angeles and adolescents in rural areas.

"We know from research that methamphetamine is a powerfully addictive stimulant associated with serious health conditions including brain damage, memory loss, psychotic-like behavior, heart damage, hepatitis, and HIV transmission," NIDA Director Dr. Alan I. Leshner said in discussing the Initiative's opening thrust - a NIDA-sponsored western regional methamphetamine symposium held in San Francisco in December 1996.

At that meeting, scientists, civic leaders, policymakers, public officials, and drug abuse prevention and treatment professionals discussed ways to improve State and local prevention and treatment responses to methamphetamine abuse.

Last year, NIDA received \$4.2 million in supplemental funding from the White House Office of National Drug Control Policy to expand the Institute's program of methamphetamine research. This year, the Director's Office of the National Institutes of Health awarded an additional \$2 million in special funds to NIDA for methamphetamine research. NIDA is using these monies to broaden the Initiative's methamphetamine research in the following areas: basic and clinical neurobiology, long-term effects of abuse, epidemiology and prevention, drug abuse treatment and health services, and medications development.

The Initiative's basic and clinical neurobiology research is aimed at better understanding the mechanisms that underlie methamphetamine's addictive potential and the adverse consequences of its chronic abuse. Previous research has shown that methamphetamine, like cocaine, achieves its euphoric effect by increasing the extracellular concentration of the neurotransmitter dopamine in the brain. However, methamphetamine and cocaine achieve their dopamine-enhancing effects through different cellular mechanisms. In addition, methamphetamine remains in the brain much longer than cocaine does and damages brain cells of animals that have been chronically exposed to the drug. (See "[Comparing Methamphetamine and Cocaine](#)")

Researchers supported by NIDA's Division of Basic Research (DBR) under the Initiative, such as Dr. Paul Vezina at the University of Chicago, now are trying to unravel the underlying mechanisms through which animals chronically exposed to methamphetamine become more sensitive, or respond more strongly, to the drug. "The hypothesis in the field is that sensitization is linked to addiction," explains DBR's Dr. Jerry Frankenheim. Therefore, another basic research study, by Dr. Stephen Strakowski of the University of Cincinnati College of Medicine, is studying the process of stimulant sensitization in humans using amphetamine, which is closely related chemically to methamphetamine. The study is examining whether there is a link between stimulant sensitization in humans and their liking the drug and craving it later on. In other research, Dr. William Melega at the University of California at Los Angeles is examining how methamphetamine-induced neurotoxicity affects the behavior of animals.

"This basic research is key to understanding the differences between cocaine and methamphetamine," says Dr. Frankenheim. "The results of this research will help us determine if we need somewhat different approaches to preventing and treating methamphetamine and cocaine abuse," he says.

The Initiative also is trying to determine whether the methamphetamine-induced neurotoxicity that studies have shown in animals also occurs in humans. For example, Dr. George A. Ricaurte of The Johns Hopkins Medical Institutions in Baltimore is conducting brain imaging studies with long-term methamphetamine users to assess how chronic methamphetamine use affects the human brain, cognition, and other physiological functions. In addition, postmortem studies of the brains of chronic methamphetamine abusers are being conducted by Dr. Stephen Kish of the Clarke Institute of Psychiatry in Toronto, Canada. The studies will provide additional information about the long-term effects of methamphetamine abuse on human brain structure. In living humans, these effects on brain structure could affect brain function.

The Methamphetamine Initiative also is expanding NIDA's research on preventing methamphetamine abuse and addiction. For example, Dr. Steve Sussman of the University of Southern California has been developing a promising drug abuse prevention intervention for

students in continuation or alternative public high schools in southern California. More than 10 percent of students participating in Dr. Sussman's ongoing prevention study are known to have used methamphetamine in the past. Now, Dr. Sussman is expanding his research to examine current methamphetamine use among these youths and to assess whether the two experimental drug abuse prevention programs he has been developing can prevent methamphetamine use in this population. (For more information on Dr. Sussman's research, see "[Specialized High School Prevention Programs Target At-Risk Adolescents](#)," NIDA NOTES, May/June 1997)

The Initiative also is aiming to resolve puzzling patterns of methamphetamine abuse in the United States. "Why has methamphetamine use occurred predominantly in the western United States and Hawaii?" asks Dr. Zili Sloboda, who directs NIDA's Division of Epidemiology and Prevention Research (DEPR). To answer this and other questions about shifting patterns of methamphetamine use, DEPR is launching a study in five cities where methamphetamine use is high or where a methamphetamine problem may be emerging. This study will identify characteristics of methamphetamine users, patterns of initiation and use, and consequences of use, says Dr. Sloboda. Ultimately, the findings of this research will be used to develop more effective methamphetamine prevention programs, she says.

Development of behavioral treatments tailored to the specific needs of methamphetamine-abusing populations also is being emphasized under the Initiative. For example, men who have sex with men represent a significant target group for methamphetamine treatment interventions. Previous research shows that methamphetamine use is high in this population and is linked to high-risk sexual behaviors and the transmission of HIV. NIDA's Division of Clinical and Services Research (DCSR) has funded a new behavioral treatment research study among gay and bisexual male methamphetamine users in Los Angeles. This study, which is being conducted by Dr. Steven Shoptaw of the Los Angeles Treatment Research Center, will compare the relative effectiveness of contingency management, relapse prevention, and enhanced HIV counseling methods in reducing methamphetamine use and related high-HIV-risk sexual behaviors. DCSR also is expanding several studies that have been testing other promising behavioral treatments with cocaine-abusing populations. The goal is to see whether these treatments are appropriate and can be adapted to treat methamphetamine abuse and associated behaviors effectively, says the Division's Dr. Dorynne Czechowicz.

The development of medications to reduce methamphetamine abuse and craving and to repair brain systems damaged by chronic methamphetamine use is another major Initiative priority. In seeking potential treatment compounds to reduce methamphetamine abuse, NIDA's Medications Development Division (MDD) is capitalizing on the substantial research that has been done to develop cocaine treatment medications. Though the initial mechanisms of action for cocaine and methamphetamine differ, ultimately they both greatly increase the levels of dopamine between brain cells, points out Dr. Betty Tai of MDD. "From that point, the cascade of events from the cellular all the way to behavioral is quite similar," she says. Therefore, any compound that has shown promise for treating cocaine abuse by producing a milder dopamine effect could be tested as a potential methamphetamine treatment medication, Dr. Tai says.

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