

**Department of Health and Human Services
National Institutes of Health**

**Draft Outline for
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Associate Director, National Institute on Drug Abuse**

**Little Hoover Commission
Sacramento, CA
Thursday April 25, 2002**

- Drug abuse and addiction is one of this Nation's most complex and challenging public health problems.
- Drug abuse and addiction take a tremendous toll on society.
 - The cost of illegal drugs to our Nation was estimated by the White House Office of National Drug Control Strategy to be more than \$161 billion in 2000. When one adds the cost of the Nation's deadliest addiction -- use of tobacco products -- the cost soars to nearly \$300 billion each year.
 - Drug abuse is inextricably linked with the spread of infectious diseases such as HIV/AIDS, tuberculosis, and hepatitis C, and is also associated with domestic violence, child abuse, and other violent behavior.
- Drug abuse affects us all. Approximately 14 million Americans used an illegal drug in 2000.
- The National Institute on Drug Abuse, the largest supporter of the world's research on drug abuse and addiction, has a comprehensive research portfolio to address all aspects of this problem, from basic to clinical.
- Science has taught us much about drug abuse and addiction. (Examples of research findings will be presented showing that:
 - We know why people take drugs.
 - We know the biological mechanisms involved in drug abuse and addiction.
 - We know that the brain systems responsible for the initiation of drug abuse are quite different from those causing the compulsiveness of addiction.
 - We know drugs cause long-lasting changes to the brain.
- From these advances, science has concluded that drug abuse is a preventable behavior and that drug addiction is a treatable disease of the brain.

- Research continues to show that the disease process of addiction is similar to other common medical disorders such as Type II Diabetes, obesity, and many types of cardiovascular diseases and cancers.
- Treatments for addiction do exist and they work.
- NIDA is working to more effectively bring the public health and public safety approaches together through its criminal justice initiative.

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Statement by

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Mr. Chairman, and Members of the Commission, I am Dr. Timothy P. Condon, Associate Director of the National Institute on Drug Abuse (NIDA), one of the research institutes at the National Institutes of Health. I am pleased to have been invited here today to provide the Little Hoover Commission with an update on what science is teaching us about drug abuse and addiction, especially as it relates to treatment.

My goal this morning is to provide you with a National perspective of this complex public health problem and to share with you some of the science advances over the past decade that have evolved our thinking about drug abuse and addiction and have led us to conclude that addiction is in fact a treatable *disease* of the brain.

I would like to begin by telling you a little about the National Institute on Drug Abuse or (NIDA). NIDA supports over 85% of the world's research on the health aspects of drug abuse and addiction. It does this through a comprehensive research portfolio that incorporates many diverse fields of scientific inquiry and addresses the most fundamental and essential questions about drug abuse, ranging from its causes and consequences to its prevention and treatment. NIDA supports researchers all over the country who are working to understand and find solutions to the Nation's drug abuse problem. These researchers, with the aid of state-of-the-art technology, have made some extraordinary scientific discoveries, particularly in the past decade, which are significantly influencing the way this Nation approaches drug abuse and addiction. We are truly beginning to see science, rather than ideology or intuition, begin to drive the national discourse on these issues. The fact that researchers are invited to share scientific findings at an important policy-setting forum such as this and to help in the development of strategies that are as sophisticated and complex as the problem itself, attests to the value that is placed on science in helping to reduce the burden of drug abuse and addiction in this country.

As members of this Commission and the citizens of this State know, drug addiction and alcohol exacts a tremendous toll on our Nation and their consequences are pervasive throughout every aspect of society. Directly or indirectly, every family and community is affected by substance abuse and addiction. Today, in the United States, approximately 14 million people were current users of illicit drugs in 2000. Nearly 14 million adults meet diagnostic criteria for alcohol abuse or dependence.

The rate of abuse of drugs and alcohol by our youth is particularly disturbing. More than half (54%) of all Americans have tried an illicit drug by the time they finish high school; and more than 3 million young people between the ages of 14 and 17 have an alcohol problem. If inhalant use is included in the definition of an illicit drug, more than a third (35%) of high school students have done so as early as 8th grade—when most students are only 13 or 14 years old.

Drugs like methamphetamine and MDMA or “Ecstasy” are being used increasingly by our Nation’s youth. Although the rise in MDMA use among teenagers has slowed according to the 2001 Monitoring the Future Study, calculations based on the same study indicate that an alarming 1.1 million students in grades 8-12 used MDMA in the past year in 2001, and 630 thousand used methamphetamine. These emerging drug problems are also bringing increasing numbers of individuals to our Nation’s emergency rooms. For example, emergency department visits involving MDMA increased 58 percent, from 2,850 visits in 1999 to 4,511 in 2000. In 2000, the Substance Abuse Mental Health Services Administration’s Drug Abuse Warning Network reported that there were 601,176 drug – related emergency room visits that year, a number that continues to show increases each year.

We also know that there is dramatic evidence illustrating the extent of drug use in the arrestee population. Between 52% and 80% of adult male arrestees in 34 cities across the country tested positive for illicit drug use in 2000, according to data from the Arrestee Drug Abuse Monitoring Program (ADAM). According to urinalysis results, marijuana and cocaine are the drugs most commonly used by adult male arrestees (by an average of 40% and 29% of arrestees), followed by methamphetamine (9%), opiates (8%), and PCP (1%). Sacramento had one of the highest percentages of adult male arrestees in the country who were using drugs (74%).

And national surveys show that there are about 4 million people in need of addiction treatment in this country, which the current treatment system is not able to accommodate.

Not only is drug abuse pervasive, but it is costly at many levels as well. Recent estimates suggest that economic cost of substance abuse is more than \$484 billion per year when one includes illegal drug abuse, smoking and alcohol.

The newest estimates from the White House Office of National Drug Control Policy released this year found that illegal drugs (not including alcohol, tobacco, or prescription medications) sapped a staggering \$143.4 billion from the economy in 1998 and projects the loss for 2000 at over \$160 billion. The majority of these costs—\$98.5 billion—are from lost productivity due to drug-related illnesses and deaths, as well as from incarcerations and work hours missed by crime victims. The study also shows that illegal drugs cost the health care industry \$12.9 billion in 1998. As a result, illegal drug use strains the nation's health care resources and drives up health care costs for all Americans.

This multi-billion dollar cost estimate did not include the cost of the Nation’s deadliest addiction -- use of tobacco products -- which adds an additional \$138 billion annually to our country’s financial burden. It is addiction to the drug, nicotine, that drives the continued use of tobacco in this country and abroad, despite the known negative consequences. Cigarette smoking is also responsible for more than 400,000 deaths each year, or one in every five deaths.

According to the National Institute on Alcohol Abuse and Alcoholism, alcohol abuse and alcohol dependence cost U.S. society an estimated \$185 billion annually.

Drug use is also a major factor in crime and delinquency, and in some communities, drug use is now the major vector for the spread of HIV/AIDS, tuberculosis and hepatitis. The good news in this grim and extremely costly scenario is that scientific advances both in the laboratory and in the clinical setting are providing us with tools to slow the drain of drugs on society.

We now know more about abused drugs in the brain than is known about almost any other aspect of brain function. We have learned in tremendous specificity the biological mechanisms by which drugs of abuse exert their psychoactive effects and we have gained greater insight into why people use drugs in the first place. For example, we know that the immediate decision to use drugs is driven, basically by one of two main reasons. People use drugs to “feel good” or to “feel better.” The first group is seeking novelty and excitement; they are using drugs simply to have a good time and to feel good. The second reason people use drugs is to try to “feel better” or to try to compensate for untreated mental disorders like depression or for terrible living situations such as dysfunctional families or to deal with life’s problems. Instead of using drugs simply to feel good, they are using them in an attempt to counteract negative mood states. They are trying to “self-medicate” their moods. The prevention and treatment approaches directed at each group differ significantly. For individuals self-medicating, for example, attention must be paid to the underlying mental disorder or emotional state, as well as to the substance of abuse. Similarly in prevention, messages must be developed that are targeted to the individual’s motivation to use drugs.

In essence, we know that people take a drug because they like what it does to their brains. Each drug of abuse can change mood, perception, or emotional state. Two decades of research have spelled out in great detail the brain mechanisms by which this occurs. Although each drug has its unique way of changing the brain, they all also share critical common characteristics. Researchers have found there are in fact commonalities to all addictions. Whether someone becomes addicted to amphetamines, cocaine, nicotine, or alcohol, the brain mechanisms that are affected appear to be similar. They all elevate an important neurotransmitter called dopamine. Dopamine is an important brain chemical that allows us to feel the sensation of pleasure. Numerous studies, including those where neuroimaging techniques are utilized, show that there is a spike or increase in the functional activity of the neurotransmitter dopamine.

Prolonged use of these drugs eventually changes the brain in fundamental and long-lasting ways explaining why most people cannot just quit on their own, and why treatment is essential. In effect, drugs of abuse take over, or subsume the brain’s normal pleasure and motivational systems, moving drug use to the highest priority in the individual’s motivational hierarchy, which overrides all other motivations and drives. These brain changes, then, are responsible for the compulsion to seek and use drugs that we have come to define as addiction.

Once a person becomes addicted, they have moved into a different state of being where their main goal in life becomes seeking and using drugs, despite the negative consequences. They no longer have a voluntary behavior choice of whether or not to use a drug, their brains have been altered by drug use and they are compelled to use drugs. It is as if a threshold is crossed. Although we do not yet have a clear biological or

behavioral marker that pinpoints the transition that occurs when a person moves from voluntary drug user to addict, as mentioned earlier, accumulating evidence does point to an array of cellular and molecular changes common to all addictions. So we are beginning to better understand the “transition” to addiction phase, which has great implications for how we prevent and treat individuals who may be abusing drugs, but have not yet reached the actual state of addiction.

Neuroimaging studies do show us that the brains of addicts are in fact different from the brains of non-addicts. Significant effects of chronic use have been identified for many drugs at all levels: molecular, cellular, structural, and functional. The fact that addiction is tied to changes in brain structure and brain function is what makes it fundamentally a brain disease. Addiction, however, is not *just* a brain disease. It is a brain disease expressed as a compulsive behavior. Both developing and recovering from it depend on biology, behavior and social context.

What I mean by this is that all of the environmental cues surrounding initial drug use and development of the addiction actually become conditioned to the development and expression of addiction. This is what makes addiction the quintessential biobehavioral disorder. Almost everything comes into play—behavior, environment, physiology, and social context and all these factors have to be addressed in treatment as well. Exposure to conditioned cues can be a major factor in causing persistent or recurrent drug cravings and drug use relapses even after successful treatments.

Brain and behavioral changes resulting from prolonged drug use persist long after the individual has stopped using drugs. As one example, researchers found that methamphetamine abusers who were drug-free for up to eleven months still had significant memory and coordination deficiencies that were directly tied to brain changes produced by their prior drug use (see **Figure 1**).

Recognizing addiction as a chronic, relapsing disease of the brain, has broad implications for how we as a Nation perceive drug abuse and addiction and approach their prevention and treatment. The fact that addiction is rarely an acute illness and that relapses may occur, forces us to approach addiction like other common chronic medical disorders such as diabetes, hypertension and asthma.

An accurate understanding of the nature of drug abuse and addiction should affect our entire approach to treatment, especially in our criminal justice strategies. If addiction is believed to be the quintessential biobehavioral disorder like science demonstrates it to be, then not only must the underlying brain disease be treated, but the other behavioral and social context factors must be addressed as well. Treatment strategies must be comprehensive and address the whole person.

Science has brought to fruition many treatment approaches, both behavioral and pharmacological, that have been shown to be effective. Numerous studies have shown that addiction treatments are just as effective as those for other illnesses and have similar success rates. However, not anything called treatment will do. Our research also shows that comprehensive treatments that focus on the whole individual, and not just on drug use, have the highest success rates. These programs provide a combination of behavioral treatments, medications, and other services, such as referral to medical, psychological, and social services. The array of services provided must be tailored to the needs of the individual patient.

Scientific discoveries are continuing to fuel the development of more successful strategies to deal with addicted criminal offenders. The core phenomenon is that untreated addicted offenders have extremely high rates of post-release recidivism both to drug use and to criminality. However, providing science-based treatments while offenders are under criminal justice control can dramatically reduce recidivism, again both to drug use and to later crime. Thus, understanding addiction as a treatable, chronic illness has beneficial ramifications for both state and national drug control efforts. The blended public health/public safety approach of dealing with addicted offenders benefits not only the patient, but the family and community as well.

Perhaps the most visible example of the blending of public health and public safety approaches can be seen by the growing number of drug courts that have been established over the years. More than 600 drug courts, which mandate and arrange for treatment, monitor progress, and arrange for other necessary services as needed, are currently operating across the country. NIDA is establishing a research infrastructure to test models at multiple sites to establish a more integrated approach to the treatment of incarcerated individuals with drug abuse or addictive disorders.

To truly reap the benefits of this blended public health/public safety approach it is imperative that we adhere to science-based principles of effective drug treatment and offer programs that are comprehensive. Reports from the three largest prison-based treatment programs in Texas, California, and Delaware have supported the position that the most effective treatment strategy for drug involved criminal offenders is participation in a continuum of treatment. Each has persistently shown more positive outcomes for those individuals who participated in a full range of treatment programs, spanning the time of incarceration through reintegration into the community. Comprehensive treatment of drug-addicted offenders, when coupled with treatment after release from prison, can reduce drug use by almost 40% when compared to those who are untreated. Treated offenders are also 50-60% less likely to end up back in prison. Researchers are trying to tease out what components of the continuum are most effective in reducing criminal recidivism and relapse to illicit drug use. Is it the treatment program within the prison system itself or is it the transitional and aftercare component alone or in combination? A new paper just published this year, found consistent evidence of the overall positive outcomes associated with treatment programs that span the period from incarceration to community integration. Each of the components of a treatment continuum tailored to the changing needs of a population leaving prison was associated with reductions in subsequent criminal behavior and fewer lapses back into the use of illicit drugs.

These findings reinforce why treatment provided to prisoners must be comprehensive. It must attend to all the needs of the individual and help return him or her to becoming a fully productive member of society. This means that a continuum of care is crucial for success, including offering treatment and services to individuals as they transition to the community.

In the same way that we have developed and sent to the field general principles that define effective addiction treatment, we are now developing the principles of effective corrections-based treatment. In the interim, we recommend that the corrections systems use our publication *Principles of Effective Drug Addiction Treatment* as a guide in developing and evaluating programs.

Research has also shown that drug addiction treatment programs that adhere to scientific principles benefit not only the patient and his immediate community, but the larger society as well. Besides reducing criminality, our studies have established that drug treatment reduces the spread of infectious diseases such as HIV and hepatitis C, and restores the ability of addicted individuals to be functioning, contributing members of society. Science-based treatments are also extremely cost effective, since they can save millions of dollars that would have been spent on the public health and safety consequences of drug abuse and addiction.

I hope the examples I have provided in this statement demonstrate the progress that has been made in having science replace ideology, intuition and common sense as the primary basis for our national discourse on drug abuse and addiction. The advances that continue to emerge from our research portfolio are providing us with renewed hope that we will be able to prevent initial drug use and have a full clinical toolbox of treatments to offer those who do become addicted.

Thank you for the opportunity to testify before this Commission. I will be happy to respond to any questions you may have.