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Fact Sheet for the Chairman, Select Committee on Narcotics Abuse and Control, House of Representatives

January 1991

DRUG ABUSE

The Crack Cocaine Epidemic: Health Consequences and Treatment

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GAO

United States
General Accounting Office
Washington, D.C. 20548

Human Resources Division

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January 30, 1991

The Honorable Charles Rangel
Chairman, Select Committee on
Narcotics Abuse and Control
House of Representatives

Dear Mr. Chairman:

The use of crack cocaine reached epidemic proportions in this country at the end of the 1980s. Due to the unique characteristics associated with crack addiction and the populations that use it, the epidemic created a host of new problems for the public health and drug treatment communities. In view of the devastating social and health effects created by the crack epidemic, you requested that we obtain information on the (1) health consequences of the epidemic and (2) types of treatment available for crack addicts.

Background

Once considered to be nonaddictive, recent studies show that cocaine is one of the most potent drugs of abuse. Cocaine is a powerful positive reinforcer. Such a drug increases behavior leading to its use. Smoking cocaine rather than sniffing it may lead more rapidly to its compulsive use.

Crack is made by converting cocaine hydrochloride to a chemical base by cooking it using ammonia or baking soda and water. When the substance hardens, it is placed in molds to dry and cut into chips or "rocks." Crack is off-white in color and resembles hard shavings similar to slivers of soap or chips of cracked paint.

Each rock of crack weighs about 100 milligrams and sells for $5 to $10 on the street. Typically, crack is sold in small plastic vials containing one, two, or three rocks. The user smokes the rocks in a glass pipe or crumbles them into tobacco or marijuana cigarettes. Crack use rapidly reached epidemic proportions because it is readily available, inexpensive, and produces an immediate and intense euphoria in its user. The most common means of ingesting cocaine before the mid-1980s was intranasal snorting. The effects of snorted cocaine are produced in about 1 to 3 minutes and last for about 20 to 30 minutes. When a user smokes crack, the drug is absorbed by the brain in a matter of seconds, producing an intense, extremely addictive euphoria that lasts for only a few minutes. As the euphoria quickly wears off, the user experiences depression and an intense craving for more crack.

The actual extent of crack use is unknown; however, survey estimates suggest that, despite a decline in casual cocaine use, a serious problem remains among frequent cocaine users or those who use the drug one or more times a week. Frequent use is considered a basic measure of addictive behavior.

We reviewed the changes in past-year cocaine use between 1985 and 1990 that were reported in the National Institute on Drug Abuse (NIDA) National Household Survey on Drug Abuse. The results show that the number of cocaine users declined by nearly 50 percent between 1985 and 1990 (from 12.2 to 6.2 million). In addition, the proportion defined as current users (those who used the drug within the month before the interview) declined from 47.1 to 25.8 percent. Frequent users, the proportion using cocaine on a weekly or daily basis, however, increased from 5.3 to 10.7 and 2.0 to 5.4 percent, respectively.

The NIDA survey provides valuable information about general population drug use trends, but it underestimates the extent of the actual cocaine problem. Because the survey does not include certain populations, namely patients at drug treatment centers, the homeless, and arrestees who have a high incidence of drug use, the actual extent of the problem could be much higher.

Although adequate information on the socioeconomic characteristics of crack users is unavailable, researchers have suggested that crack, unlike heroin, is particularly popular among women and youth.

Objectives, Scope, and Methodology

Due to your concern over the crack epidemic, we sought to answer the following questions: (1) What are the health consequences of crack use? (2) What types of treatment programs are available to address the crack epidemic? We interviewed numerous experts, including federal officials in Washington, D.C., who have responsibility for addiction prevention and treatment programs. The agencies we contacted include NIDA, the Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA), and the Office for Substance Abuse Prevention (OSAP).

Site visits and interviews with drug and alcohol association officials, local health officials, hospital staff, physicians, and leading researchers and treatment practitioners in 13 states provided us with information concerning the characteristics associated with the crack epidemic and

the physical and mental health problems of crack users. We also interviewed officials at 20 drug treatment centers to gather data on the treatment of crack addiction.

We conducted an extensive literature review and attended relevant national and local conferences to gather information on emerging issues related to the crack epidemic and the most current research activities and treatment strategies. The results of our work are summarized below and discussed more fully in sections 1 through 3 of this fact sheet.

Multiple Health Problems Associated With Crack Use

Cocaine and crack users suffer from a variety of health problems. A recent study found drug users are about six times more likely to suffer a drug-related stroke that may result in death or lifetime disability. Cocaine was identified as the drug used most often among these stroke victims. In addition to drug problems, cocaine abusers have also been found to have high rates of mental disorders. A 1990 National Institute of Mental Health study found that more than 76 percent of cocaine abusers had at least one serious mental disorder, such as schizophrenia, depression, or antisocial personality disorder.

Health professionals also have associated crack use with the spread of acquired immunodeficiency syndrome (AIDS) and other sexually transmitted diseases (STDs). A study of prostitutes found that crack users are as likely as intravenous cocaine users to test positive for the human immunodeficiency virus (HIV) infection that causes AIDS.

Many pregnant women who use drugs, including cocaine, do not receive enough or any prenatal care, thereby placing their health and that of their infants at risk. Infants born to drug-using women are more likely to have medical complications and longer hospital stays after delivery and may suffer from long-term developmental delays. However, recent studies show that if women are able to stop drug use during pregnancy, this will produce significant positive effects on the health of the infant. In fact, the risks of low birth weight and prematurity, which often require expensive neonatal intensive care, are minimized by drug treatment before the third trimester.

Multiple Approaches for Treating Crack Addicts

No state-of-the-art treatment method for crack abusers exists. Traditional drug treatment programs designed primarily for heroin addicts are being used to treat many crack addicts. Meanwhile, drug treatment researchers are experimenting with new strategies.

Researchers are pursuing two approaches to treatment: pharmacologic and nonpharmacologic or drug-free treatment. Research on the development of pharmacological treatments for drug addiction attempts to identify drugs that can: (1) serve as a replacement for abused drugs, (2) block the effects of abused drugs, (3) temper or eliminate the drug withdrawal process, (4) block or reverse the toxic effects of abused drugs, and (5) prevent addiction from developing. NIDA is sponsoring research on at least 13 drugs that may help in the treatment of cocaine addiction. For example, two experimental pharmacological treatments under study for crack addiction are carbamazepine[1] and flupenthixol decanoate[2]. Both drugs may help to reduce the craving for cocaine. However, it will be several years before any reliable drug is available to treat crack addiction.

Traditional nonpharmacologic treatments for cocaine addiction include residential treatment programs, such as therapeutic communities and short-term inpatient chemical dependency programs that follow the 12 steps of the Alcoholic Anonymous program. One experimental approach under study is acupuncture therapy. Acupuncture therapy is used to promote relaxation and to eliminate the drug from the user's body. This therapy, however, is not considered a treatment by itself but rather an adjunct to treatment.

Several relapse-prevention strategies are under study that may help addicts who have undergone treatment from returning to drug use. Extinction therapies, for example, focus on helping the addict identify "triggers" or cues that often encourage a return to drug use. Once the cue is identified, the addict is taught to relax and respond to these cues without resorting to drug use. The results of acupuncture and other nonpharmacological treatment experiments, however, are not yet available.

[1]Carbamazepine is used to treat epilepsy.

[2]Flupenthixol decanoate is used to treat psychiatric problems.

Unless you publicly release its contents earlier, we plan no further distribution of this fact sheet until 30 days after its issue date. At that time, we will send copies to the Secretary of Health and Human Services and other interested parties. We also will make copies available to others on request. Should you have any questions concerning this fact sheet, please call me at (202) 275-6195. Other major contributors to this fact sheet are listed in appendix II.

Sincerely yours,

Mark V. Nadel
Associate Director for National
and Public Health Issues

Contents

Abbreviations

AA	Alcoholics Anonymous
ADAMHA	Alcohol, Drug Abuse, and Mental Health Administration
AIDS	acquired immunodeficiency syndrome
CDC	Centers for Disease Control
CEWG	Community Epidemiology Work Group
DAWN	Drug Abuse Warning Network
DUF	Drug Use Forecasting
ER	emergency room
HIV	human immunodeficiency virus
GAO	General Accounting Office
NIDA	National Institute on Drug Abuse
NIJ	National Institute of Justice
OSAP	Office of Substance Abuse Prevention
STD	sexually transmitted disease
TC	therapeutic community
WACADA	Washington Area Council on Alcoholism and Drug Abuse

Background: Extent of the Crack Cocaine Epidemic

The Physiology of Cocaine Use

Cocaine was once thought to be nonaddictive. Recent studies have shown, however, that cocaine has a strong abuse potential because it is a powerful positive reinforcer. Such a drug increases behavior leading to its use and abuse. Even occasional use can sometimes lead to heavy, uncontrollable use of the drug. The mood elevation achieved from cocaine is temporary, and followed by a deep psychological depression or "crash" that leaves the user craving for more. As a result, cocaine use can create extreme craving for and psychological dependence on the drug.

Compulsive cocaine use may develop more rapidly if the drug is smoked rather than snorted. While regular snorting of cocaine may cause addiction in a few years, smoking cocaine can cause addiction within a few months. Users who believe that they have their intranasal cocaine use under control commonly become addicted after switching to a more rapid route of cocaine administration, such as smoking.

Smoking crack or freebase provides the user with a more rapid and intense drug experience than snorting cocaine.[1] When cocaine is snorted, the brain receives the drug in gradual amounts over a period of minutes. When cocaine is smoked, it is rapidly absorbed into the pulmonary circulatory system and is transmitted to the brain in less than 10 seconds, offering a high that lasts about 5 minutes. The concentrated dose of the drug hitting the brain within seconds produces a dramatic, rapid "jolt." Users often describe this sensation as "having the top of their head blown off."

In addition to providing a more rapid and intense high than other methods of ingestion, smoking appears to many users to be a less dangerous and invasive way of using a drug. The dangers associated with snorting cocaine (destruction of nasal membranes) and injecting cocaine (the threat of infections, including the human immunodeficiency virus [HIV] and hepatitis) also may contribute to the increased smoking of crack.

[1] Freebase is a cocaine product from which adulterants have been chemically removed.

Figure 1.1: Frequent Crack Use Is Still a Problem in the '90s

Obsessive drug-seeking behavior seems to be caused when cocaine and crack overstimulate the "reward center" of the brain. Cocaine influences dopamine, a chemical found naturally in the brain, causing it to remain active longer than normal. This retention of dopamine changes brain activity, signaling an intense craving for more of the drug. This craving causes the user to take crack or cocaine obsessively just to feel normal. In essence, the drug's euphoric effects are intensified and compressed into 5 minutes of intoxification, followed by equally acute feelings of malaise and depression, and intense craving. The cycle may promote a rapidly increasing pattern of compulsive use. The craving for crack ultimately may become more important than anything else in the user's life.

Many users take cocaine and crack in combination with other drugs, a practice known as polydrug use. Some cocaine and crack users subsequently use heroin; marijuana; or depressants, such as alcohol or valium, in order to ease the intensity of the post-cocaine crash. Other users combine cocaine or crack with other substances, such as heroin or PCP, and administer them together to create a different type of drug euphoria.

Indicators of Crack Use

The actual extent of crack use remains unknown. However, the results of various national surveys and other health and drug abuse indicators suggest that crack causes serious health and social problems among certain populations.

NIDA manages two national databases that monitor drug use in the population. These are the National Household Survey on Drug Abuse and the National High School Senior Survey. The results of these surveys suggest several concurrent trends. Drug use, including cocaine use, has been declining among the general population and high-school seniors since 1985. Cocaine use among "regular" users (those who use cocaine once a week or more) has increased and smoking has become a popular route of administration. Among high-school seniors who currently use crack, rates of use also have declined.

The most common means of ingesting cocaine before the mid-1980s was intranasal snorting. The effects of snorted cocaine are produced in 1 to 3 minutes and last for 20 to 30 minutes. Smoking cocaine became popular during the mid-1980s. Results of NIDA's 1985 National Household Survey on Drug Abuse show that of the individuals who had "ever used" cocaine 21 percent reported they had smoked it. Smoking the substance was found to be more popular among youth and among those who used cocaine frequently (100 times or more).

In December of 1990, the Secretary of Health and Human Services (HHS) reported a dramatic drop in past-year and current cocaine use since the 1985 National Household Survey. (See table 1.1 and fig. 1.2.) However, despite this decrease, weekly cocaine use doubled from 5.3 percent of cocaine users in 1985 to about 11 percent in 1990, and the daily use of cocaine more than doubled from 2.0 to 5.4.[2] (See fig. 1.3.)

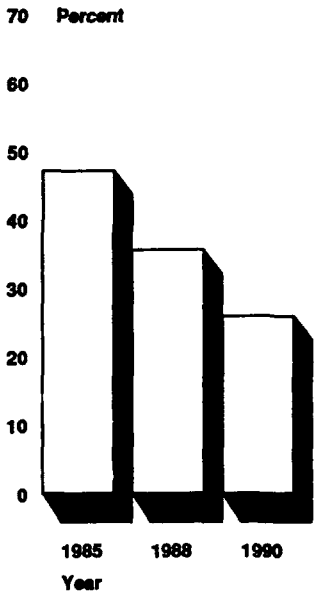
[2]Weekly cocaine use is defined as use at least once a week or more. Daily use is defined as daily or almost daily use.

Table 1.1: Current, Weekly, and Daily Cocaine Use Among People Who Used Cocaine During the Past Year

Year	Population using cocaine during past year	Current users		Weekly users		Daily users	
		Number	Percent	Number	Percent	Number	Percent
1985	12,200,000	5,750,000	47.1	647,000	5.3	246,000	2.0
1988	8,200,000	2,923,000	35.8	862,000	10.5	292,000	3.6
1990	6,200,000	1,601,000	25.8	662,000	10.7	336,000	5.4

Source: NIDA, National Household Survey on Drug Abuse, for 1985, 1988, and 1990.

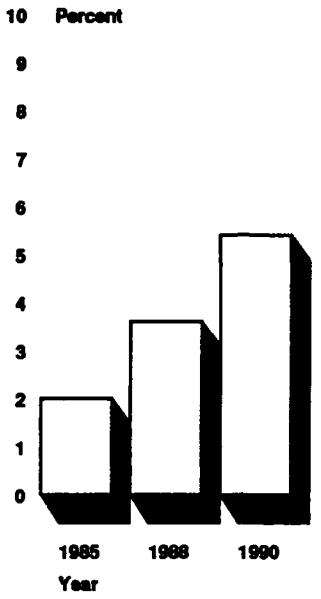
Figure 1.2: Current Cocaine Use Is Down



Note: Current cocaine users are individuals who have used cocaine during the 30 days before the interview.

Percentages are based on the total number of past-year cocaine users.
Source: NIDA, National Household Survey on Drug Abuse for 1985, 1988, and 1990.

Figure 1.3: Despite a Decrease in Overall Cocaine Use, Daily Use of Cocaine Is Up



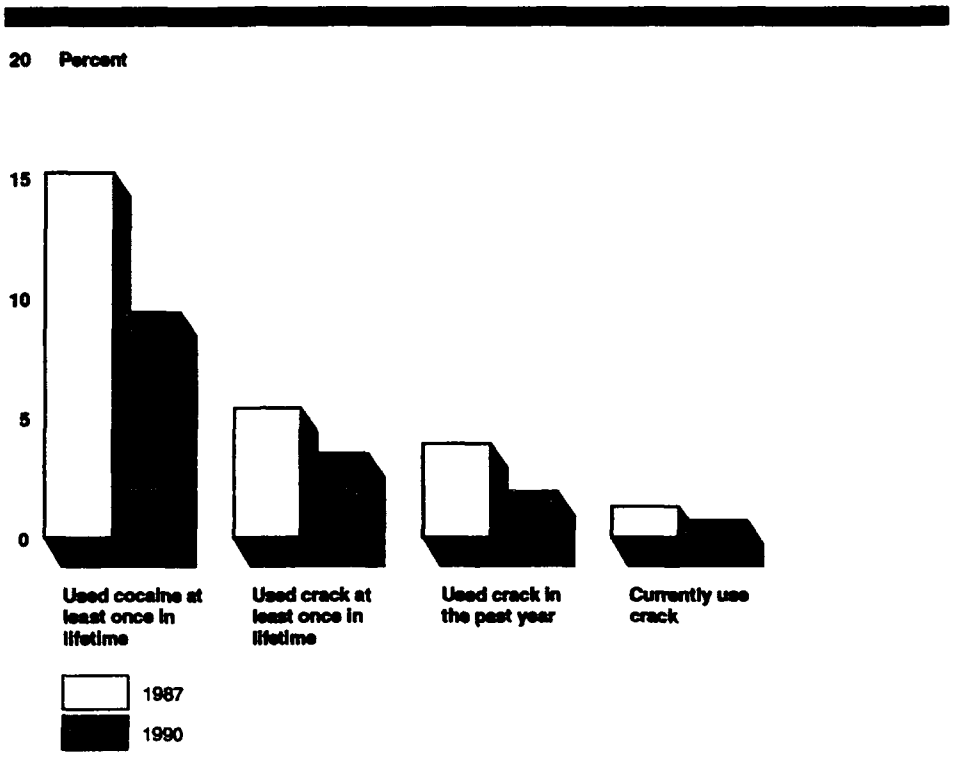
Note: Daily users are individuals who use cocaine daily or almost daily.

Percentages are based on the total number of past-year cocaine users.
Source: NIDA, National Household Survey on Drug Abuse, for 1985, 1988, and 1990.

In addition, crack use among past-year cocaine users increased from 6 to 8 percent between 1988 and 1990. As of 1990, there were nearly half a million current crack users among the 1.6 million current cocaine users. The persistence of these patterns of drug abuse has been acknowledged by the Secretary of HHS who described them as the "many pockets of serious drug problems" remaining.

The NIDA National High School Senior Survey showed that cocaine use declined between 1987 and 1990. During this period, the proportion of seniors who have used cocaine at least once in their lifetime dropped from about 15 to 9 percent. The use of crack, has also shown a similar decline. From 1987 to 1990 the proportion of high-school seniors having used crack in their lifetime fell from 5.4 to 3.5 percent, while the proportion who used crack in the past year fell from 3.9 to 1.9 percent. Current use of crack also declined over this interval from 1.3 and 0.7 percent. (See fig. 1.4.)

Figure 1.4: Cocaine and Crack Use Among High-School Seniors Has Declined



Source: NIDA, National High School Senior Survey, 1987 and 1990.

Because NIDA's surveys do not include certain populations, namely high-school senior dropouts, patients at drug treatment centers, the homeless, and arrestees, their numbers underestimate the actual extent of the cocaine problem. If these populations were considered, the estimate of the extent of the cocaine problem may be much higher.

Local arrestee data from the Drug Use Forecasting (DUF) system show that, as in 1988 and 1989, in 1990 cocaine continues to be the most prevalent drug found in both the adult and juvenile arrestee populations.[3] Using urine testing results during the period January through March 1990, the DUF system shows the percentage of male arrestees testing positive for cocaine when arrested ranged from 22 percent in Indianapolis to 70 percent in Philadelphia. Cocaine use among female arrestees ranged from 18 percent in Indianapolis and San Antonio to 80 percent in Cleveland.

[3]DUF is a data system for tracking drug use trends in arrestees in 23 participating cities. See app. I for more detailed information.

Data from the Juvenile Drug Detection and Monitoring Program of the Washington, D.C., Pretrial Services Agency indicate that, although the number of juveniles testing positive for cocaine has decreased since September 1989, cocaine still remains the most frequently detected drug in the juvenile (9-18 years of age) arrestee population in Washington. In May 1990, 68 percent of those testing positive for any drug use tested positive for cocaine.

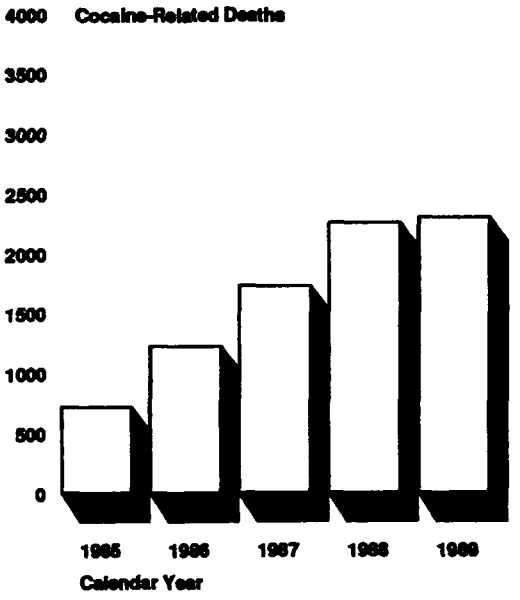
Data from various health indicators provide information on the extent of the crack problem and show that individuals who use cocaine place their health at serious risk. NIDA's Community Epidemiology Work Group (CEWG) reported in December 1989 that cocaine remains the major drug of concern among most of the 19 CEWG representatives participating in the network.[4] Increases in cocaine-related deaths were reported by Dallas, Detroit, Miami, Minneapolis, New York, Philadelphia, and St. Louis. Cocaine also continues to rank highest in emergency room (ER) mentions in every CEWG city, except for San Diego and San Francisco where it ranks second.

Data from NIDA's Drug Abuse Warning Network (DAWN) show that the number of deaths associated with cocaine increased from 717 in 1985 to 2,252 in 1988.[5] Preliminary data for 1989 indicate that the trend continues to rise, with 2,297 cocaine related deaths reported. (See fig. 1.5.) Also, ER drug abuse episodes where cocaine use was mentioned increased 58 percent from 1986 to 1988. These episodes decreased slightly in 1989 and it appears from data for the first 6 months of 1990 that they are continuing to decline. (See fig. 1.6).

[4]The 19 CEWG representatives are from Atlanta, Boston, Chicago, Dallas, Denver, Detroit, Los Angeles, Miami, Minneapolis/St. Paul, Newark, New Orleans, New York City, Philadelphia, Phoenix, St. Louis, San Diego, San Francisco, Seattle, and Washington, D.C. Atlanta figures for cocaine-related deaths were unavailable at this time.

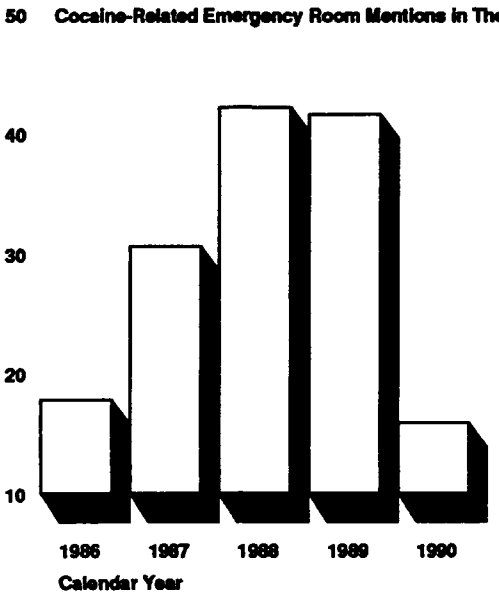
[5]DAWN is a large scale, ongoing drug abuse data collection system sponsored by NIDA. See app. I for further details.

Figure 1.5: Cocaine-Related Deaths Continue to Rise



Note: Data for 1989 are provisional.
Data are based on medical examiner's reports.
Data do not include information for New York City.
Source: NIDA, Drug Abuse Warning Network, 1985-89.

Figure 1.6: Cocaine-Related Emergency Room Drug Abuse Episodes Are Decreasing



Note: Data for 1990 include cocaine emergency room mentions for the first 6 months only.
Source: NIDA, Drug Abuse Warning Network, 1986-90.

Crack User Characteristics

The socioeconomic characteristics of crack users are unclear. Some experts claim that crack use has crossed all socioeconomic lines, from white-collar professionals to blue-collar workers and from middle-class suburban to inner-city residents. Experts believe that crack use is epidemic in many inner cities. Other experts believe that the cheap price of crack and the intense euphoria produced by it make crack popular in middle-class areas as well.

The national 1-800-COCAINE hotline operated by Fair Oaks Hospital in New Jersey provides data on user characteristics. Its research survey is based on a random sample of 500 callers during a 3-month period. Results from surveys conducted in 1983, 1985, 1987, and 1989 reveal significant changes in the population composition of those using cocaine. The survey shows that:

- In 1983, 61 percent of the callers were using cocaine intranasally and the majority of callers were white middle/upper-class employed males aged 25 to 35.
- In 1985, there was no longer a "typical" cocaine user; rather, a much broader cross-section of the U.S. population was being affected by

cocaine. Cocaine use increased among women, minorities, lower-income groups, and adolescents. There was also a tendency for users to shift from snorting cocaine to freebase smoking. Hotline staff attribute these changes in population composition and manner of using cocaine to the increasing availability of cocaine supplies at reduced prices.

- In 1987, only 16 percent of the callers were college-educated, and 54 percent were unemployed. Hotline staff attribute this population composition to the fact that in 1987 crack use was moving to the inner cities.
- By 1989, the number of college-educated crack addicts calling the hotline almost doubled; the number of unemployed callers remained fairly stable at about 55 percent; and, of those employed, the average family income was $25,000 and above. One hotline expert attributed these results to the fact that crack was becoming popular in the suburbs.

Crack Popular Among Women and Youth

A unique characteristic of the crack epidemic is that, unlike other drugs, crack is popular among women and youth. Researchers attribute crack's popularity among women to its cheap price and users' perception that smoking a drug is more acceptable and less intrusive than injecting a drug. Estimates from New York City indicate that many more crack users in early 1989 were women. Many cities also report an increasing rate of women in treatment. For example, Phoenix House in New York City reports that in 1985 20 percent of those seeking treatment were women, but by 1988 32 percent were women. Other experts report that about one-third of all adolescents who try crack are female.

Many crack users are young, unemployed school dropouts who are socially disorganized and lack family support systems. Crack appeals to these youth because it is affordable, accessible, and produces a strong euphoria. Drug use among youth often is initiated by other family members rather than at school.

In a 1986 Miami study of juvenile drug users,[6] the average age was 12.6 years for first crack use and 8.6 years for first substance abuse without an adult present. Those who initiate drug use at an earlier age use larger quantities of drugs, the same study also found. When the respondents were asked whether they preferred crack or cocaine, 75 percent of those who had ever tried crack preferred it over cocaine. The main reasons given for this preference were the drug's rapid onset, seemingly greater potency, ready availability, low cost, and ease of concealment.

[6]Inciardi, James, A., Ph.D., "Beyond Cocaine: Basuco, Crack, and Other Coca Products." Contemporary Drug Problems, Fall 1987, pp. 461-92.

Health Consequences of Crack Use

Effects of Crack on the Body, Brain, and Behavior

Cocaine's ability to stimulate the sympathetic nervous system[1] may result in increased heart rate and, in some cases, chest pain, heart attack, and even death. Smoking crack also may lead to a variety of pulmonary disorders. Chronic crack smokers may suffer from hoarseness, similar to the effects of marijuana or tobacco smoking, and from chest congestion with black sputum. Lung disease related to crack use is often referred to as crack lung.

Cocaine interferes with central nervous system functioning. For example, cocaine use may cause brain seizures. Brain seizures are a disturbance of the brain's electrical signals, some of which regulate the heart and muscles controlling breathing. At times, a state of confusion will accompany the onset of a seizure or other neurological disturbance.

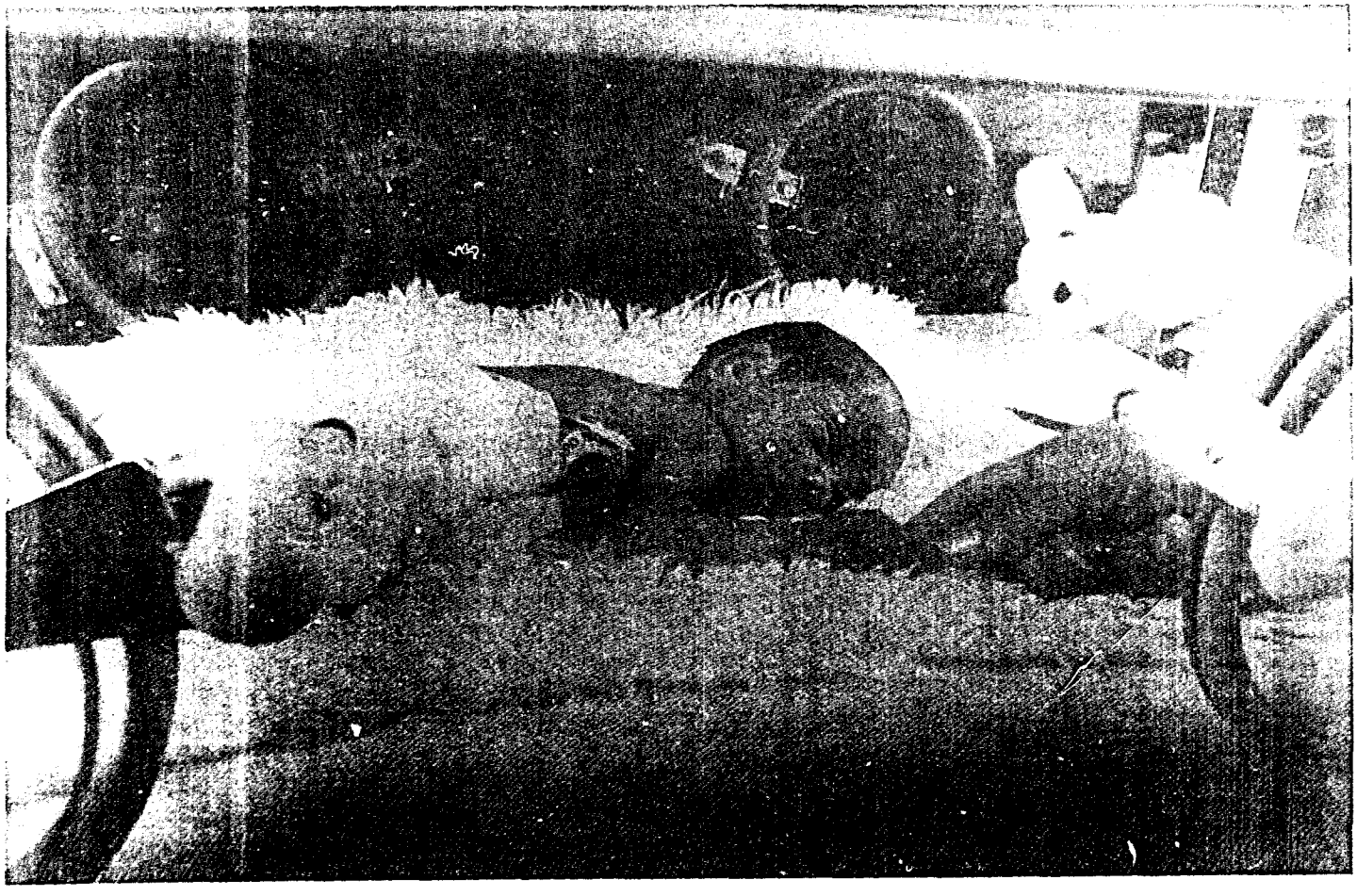
Cocaine users may experience a stroke after using the drug. A recent study of individuals aged 15 to 44 years who were admitted to an urban public hospital found that drug abuse is a growing risk factor for strokes in young adults.[2] The study showed that drug abusers are 6.5 times more likely to suffer a stroke than nondrug abusers. Cocaine was identified as the drug used most often in drug-related strokes. Those who suffer strokes often die while hospitalized or may be left with long-lasting neurologic handicaps and the need for costly health care.

Other neurological problems caused by cocaine include neurologic deficits and loss of consciousness. Focal neurological abnormalities include problems with sensory systems, such as motor and visual problems. Cocaine users' pupils may dilate, becoming more sensitive to light. Users often describe "snowlights," which are halos surrounding objects on which the user tries to focus.

[1]The sympathetic nervous system is part of the autonomic nervous system, which regulates the activity of the cardiac muscle, smooth muscle, and glands.

[2]Kaku, David A. M.D., and Daniel H. Lowenstein, M.D., "Emergence of Recreational Drug Abuse as a Major Risk Factor for Stroke in Young Adults." Annals of Internal Medicine, Vol. 113 (Dec. 1990), pp. 821-27.

Figure 2.2: Newborns Are the Latest Victims of the Crack Epidemic



Smoking crack may produce psychiatric complications in some users. Users may become confused, anxious, depressed, short-tempered, and suspicious. They also may have difficulty concentrating and remembering. Some users become aggressive and experience panic attacks. A recent study of 20,291 individuals sponsored by the National Institute of Mental Health found that cocaine abusers often have a co-occurring mental disorder.[3,4] The study showed that more than half the drug

[3]Regier, Darrel A., M.D., and others, "Comorbidity of Mental Disorders With Alcohol and Other Drug Abuse: Results from the Epidemiologic Catchment Area (ECA) Study," Journal of the American Medical Association, Vol. 264, No. 19 (Nov. 1990), pp. 2511-18.

[4]Mental disorders studied include schizophrenia, affective disorders, anxiety disorders, antisocial personality disorders, and severe cognitive impairment.

dependent individuals suffered from one or more mental disorders during their lifetime. Among cocaine abusers the rate was even higher, more than 76 percent had a mental disorder.

Crack Contributes to the Spread of AIDS and Other Sexually Transmitted Diseases

Many health professionals believe that crack is a significant factor in the transmission of sexually transmitted diseases and AIDS. No available data conclusively draw a causal link between crack use and AIDS and/or other STDs. But crack use promotes high-risk sexual behaviors, such as having sex with numerous partners, through which AIDS and other STDs can be contracted. Some crack users, for example, stay in crack houses for long periods of time smoking and having sex with many partners. Some crack users exchange sex for crack. As a result, sexually transmitted diseases and AIDS can be spread from one infected individual to many others.

The combination of smoking crack and engaging in sexual behavior also has been found to increase the risk of sexually transmitted diseases among teenagers. A recent study found that 96 percent of teenage crack users (between 13 and 19 years of age) were sexually active.[5] Among those who were sexually active, about half reported that they combined their crack use with sexual activity. The study also found that a history of STDs was more common among those teens who combined sex with crack use. The most commonly reported STDs were gonorrhea, trichonomas, chlamydia, and genital warts.

The number of reported cases of most STDs has increased nationwide. The Centers for Disease Control (CDC) reports that the number of cases of primary and secondary syphilis reported by state health departments has increased steadily, from 27,131 in 1985 to 44,540 in 1989. The number of cases of congenital syphilis[6] reported also has increased, from 329 in 1985 to 941 in 1989.

In some states and localities, the increase in syphilis cases has been particularly pronounced among cocaine users. Between 1985 and 1989, the number of primary and secondary syphilis cases in Connecticut increased steadily, from 215 to 1,139, and in Pennsylvania, from 513 to 2,578. Another CDC study showed that the increase in the prevalence of

[5]Fullilove, Mindy Thompson, M.D. and Robert E. Fullilove, III, Ed.D., "Intersecting Epidemics: Black Teen Crack Use and Sexually Transmitted Disease," Journal of the American Medical Women's Association, Vol. 44, No. 5 (Sept./Oct. 1989), pp. 147 and 151.

[6]Infants born with syphilis.

syphilis in Connecticut and the city of Philadelphia was noted primarily among drug users, most notably cocaine and crack users, and prostitutes.[7]

A study conducted by King County, Washington, health officials found that the number of cases of penicillin-resistant gonorrhea rose dramatically in 1987.[8] At the same time, several other trends were noted. The predominance of these cases associated with illicit drug use increased and also shifted from whites to blacks and from men to equal numbers of men and women. The percentage of penicillin-resistant gonorrhea cases associated with illicit drug use increased steadily from 19 to 82 percent from the first to fourth quarter of 1987. Sixty percent of the cases occurred in prostitutes or recent sexual contacts of prostitutes. King County health officials concluded that the primary transmitters of gonorrhea were predominantly young blacks, prostitutes, urban residents of lower socioeconomic census tracts, illicit drug users, and their sexual partners.

Recent studies have suggested that STDs that cause genital ulcers, such as syphilis, greatly increase the risk that HIV infection, when present, will be transmitted. As a result, the increased rate of syphilis associated with crack use has alarmed AIDS researchers. Findings from a study of prostitutes conducted in the New York/New Jersey metropolitan area indicate a significant relationship between nonintravenous use of cocaine and crack and HIV seropositivity.[9] Cocaine and crack users were as likely as intravenous drug users to be positive for HIV infection.

[7]Centers for Disease Control, "Relationship of Syphilis to Drug Use and Prostitution—Connecticut and Philadelphia, Pennsylvania," Morbidity and Mortality Weekly Report, Dec. 16, 1988, Vol. 37, No. 49, pp. 755-64.

[8]Handsfield, Hunter H., and others, "Localized Outbreak of Penicillinase-Producing Neisseria Gonorrhoeae—Paradigm for Introduction and Spread of Gonorrhea in a Community," Journal of the American Medical Association, Vol. 261, No. 16 (Apr. 1989), pp. 2357-61.

[9]Sterk, Claire, "Cocaine and HIV Seropositivity," The Lancet, May 7, 1988, pp. 1052-53.

Special Health Problems for Pregnant Women and Their Children

Unlike other drug epidemics, the crack cocaine epidemic has affected many women of childbearing age. Women who use crack cocaine and are pregnant expose their developing infants to the adverse health effects of the drug. Use of cocaine during pregnancy may cause constriction of blood vessels in the placenta and umbilical cord. This can result in a lack of oxygen and nutrients to the fetus, leading to poor fetal growth and development.[10]

Estimates of the number of infants prenatally exposed to drugs each year vary greatly. The administration's 1989 National Drug Control Strategy reported that an estimated 100,000 infants were exposed to cocaine each year. The president of the National Association for Perinatal Addiction Research and Education estimated that as many as 375,000 infants may be drug-exposed each year. Neither estimate, however, is based on a national representative sample of births.

The wide range in the estimates of drug-exposed infants may be associated with differences in hospitals' efforts to identify these infants. Research has found that when screening and testing is uniformly applied a much higher number of drug-exposed infants are identified. Hospitals serving primarily non-Medicaid patients often do not consider the problem of prenatal drug exposure serious enough to warrant implementing a drug-testing protocol. However, one study has found that the problem of drug use during pregnancy is just as likely to occur among privately insured patients as among those relying on public assistance for their health care. This study anonymously tested for drug use among women entering private obstetric care and women entering public health clinics for prenatal care and found that the overall incidence of drug use was similar between the two groups (16.3 percent for women seen at public clinics and 13.1 percent for those seen at private offices.)[11] The study also showed that illicit drug use among women is unrelated to race and socioeconomic status.

Infants prenatally exposed to drugs are more likely to need more medical services than infants whose mothers did not use drugs during pregnancy. Drug-exposed infants more commonly are born prematurely and

[10]In a GAO report, Drug-Exposed Infants—A Generation At Risk (GAO/HRD-90-138, June 28, 1990), the health and social effects of prenatal drug abuse are discussed in more detail.

[11]Chasnoff, Ira J., Harvey J. Landress, and Mark E. Barrett, "The Prevalence of Illicit Drug or Alcohol Use During Pregnancy and Discrepancies in Mandatory Reporting in Pinellas County, Florida." The New England Journal of Medicine, Vol. 322, Apr. 26, 1990, pp. 1202-06.

have low birth weights. They are more likely to have medical complications and longer hospitalizations, resulting in higher hospital charges. However, recent studies show that if women are able to stop drug use during pregnancy, there will be significant positive effects in the health of the infant. In fact, the risks of low birth weight and prematurity, which often require expensive neonatal intensive care, are minimized by drug treatment before the third trimester.

Although the long-term physical effects of prenatal drug exposure are not well known, indications are that some of these children will continue to need expensive medical care as they grow up. Many drug-exposed infants also may have long-term learning and developmental deficiencies that could result in underachievement and excessive school dropout rates leading to adult illiteracy and unemployment. As increasing numbers of drug-exposed infants reach school age, the long-term detrimental effects of drug exposure will become more evident.

Drug Abuse Treatments Available for Crack Addicts

Due to the unique characteristics associated with crack addiction many of the traditional treatment methods, which were designed for heroin addicts, may no longer be adequate. Meanwhile, researchers and practitioners are searching for new pharmacological and nonpharmacological treatment methods suitable for cocaine and crack addicts. However, to date, no state-of-the-art treatment method specifically designed to treat crack addiction exists. Due to the severe dependency created by crack use and the unique characteristics of crack addicts, experts state that it may be several years before treatment researchers discover an effective treatment for crack addiction. In the meantime, drug treatment programs use both traditional and experimental methods to treat crack addicts.

Unique Treatment Needs of Crack Addicts

The populations that use crack are both harder to treat and have special needs that many traditional treatment programs are not designed to meet. Cocaine users are often young and female and have other characteristics that distinguish them from heroin addicts and may affect the treatment process. Some of these characteristics include: severe cravings for crack that may last for months or years after the initiation of treatment and a tendency to binge or engage in high-dose use during a short period of time. Such binges make it easy to avoid detection through urine testing because testing can only detect cocaine use within the past 24-72 hours. In addition, polydrug use, which is common among crack addicts, may make the treatment process even more difficult.

Generally, the inner-city populations that abuse crack suffer from socioeconomic problems. Some experts suggest that inner city addicts might not respond well to any available treatment regardless of the drug being abused, unless treatment addresses their full range of needs. For instance, some female addicts require not only unique counseling and psychological services but also prenatal care, nutrition education, voluntary HIV testing, and generic job skills. They also may need such auxiliary services as transportation and child care. Many other addicts do not have basic social or job-related skills. Treatment for them can be enhanced if it provides an entire resocialization process and addresses the user's drug addiction.

Crack addicts are likely to relapse due to the ready availability of crack in their neighborhoods. Often, drug users who have undergone treatment and are confident they will not resume drug use are surprised to suddenly feel cravings or experience drug euphoria when they come in contact with people or places associated with their past drug use.

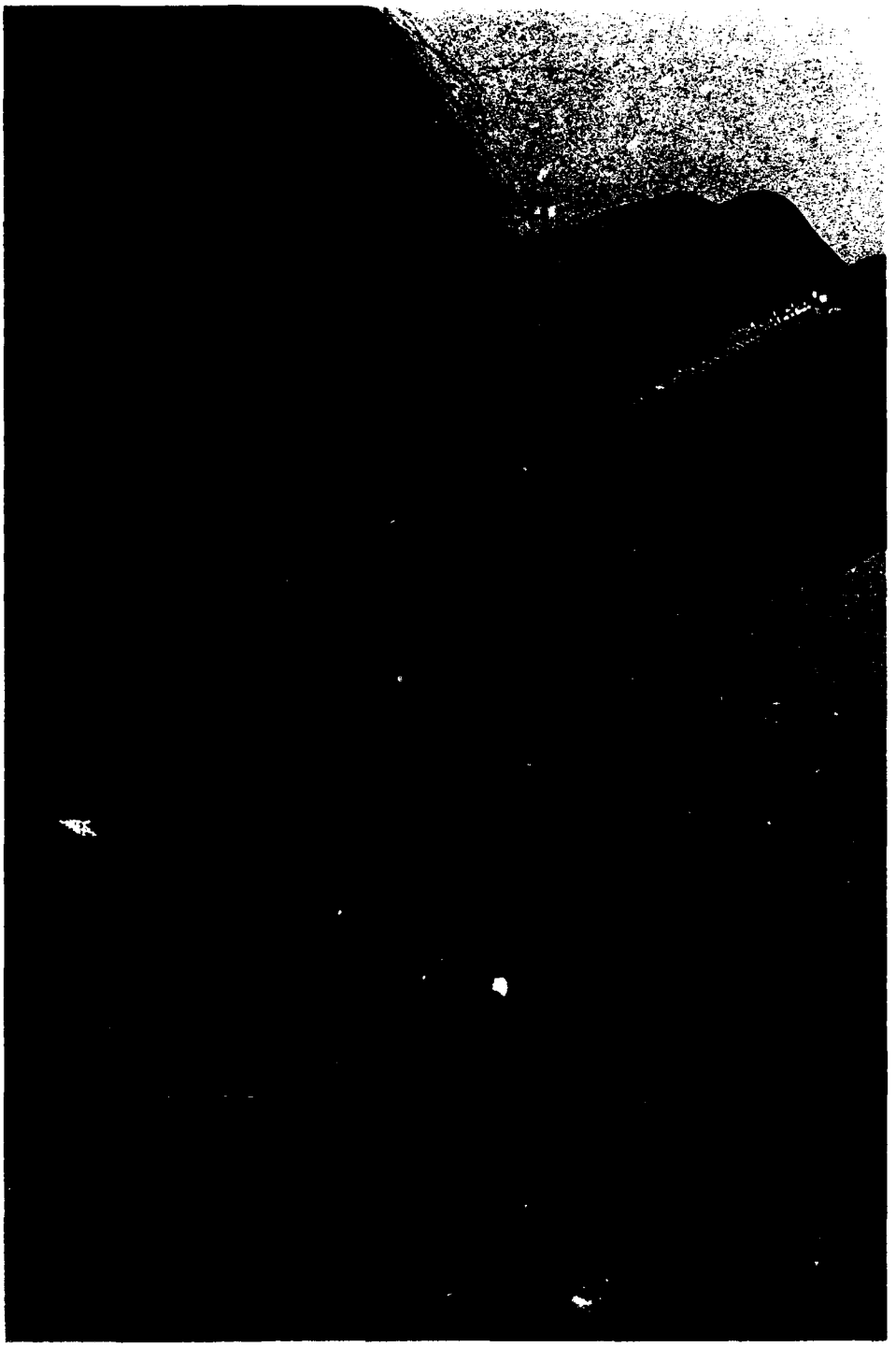


Figure 3.1: Acupuncture is an Experimental Treatment Approach to Crack Addiction

Traditional Treatment Methods

Three basic methods are used to treat cocaine addiction: detoxification, drug-free outpatient, and residential treatment. All three methods encourage abstinence among drug users. Other goals of treatment include reducing crime, increasing employment probability, and improving social skills.

Detoxification is part of the treatment process. The primary goal of detoxification is to alleviate the drug abuser's short-term withdrawal symptoms. Detoxification may be either drug-free or mediated by medication that alleviates the discomfort often associated with detoxification. Detoxification does not eliminate or reduce the addict's psychological dependence on the drug. Therefore, detoxification should not be considered a treatment by itself, but, rather, the first step in the treatment process.

The majority of patients attend treatment on a drug-free outpatient basis. Drug-free outpatient treatment varies according to patient needs. An addict may attend treatment on a daily basis for several hours of structured care or may make brief visits to the treatment center a few evenings per week. Most outpatient programs rely on various types of counseling. Patients are often offered individual psychotherapy, group therapy, family therapy, and behavioral therapies. Behavioral therapies focus on replacing the old behaviors associated with drug use with new behaviors that avoid drug use.

The therapeutic community (TC) is a drug-free residential treatment program that can vary in length from 9 months to 2 years, depending on the program and the needs of the addict. TCs aim at permanently modifying destructive patterns of thought and behavior and completely changing the addict's lifestyle. TC programs are highly structured in nature and usually combine an assortment of approaches, including milieu therapy, behavioral modification, occupational training, and sharing in communal maintenance responsibilities. The length of stay in residential treatment seems to be the most important predictor of improvement in behavior. Some experts believe that, among the traditional treatments, TCs may be the best choice for crack addicts because they provide a drug-free residence away from the addict's home environment. Due to the rigorousness of the treatment program, however, TCs have high dropout rates.

Many cocaine addicts are treated in short-term residential treatment programs. These programs are more often conducted within a hospital setting and are often referred to as chemical dependency programs or 28-day, 12-step programs. Chemical dependency programs are based on

the Alcoholic Anonymous principles or the 12 steps that lead to a new way of life without the use of alcohol or drugs. Chemical dependency treatment usually includes developing a recovery plan based on the 12 steps; education; counseling; and, in some programs, medical attention, if necessary. These programs are usually run by psychiatrists, psychologists, and other health professionals.

Experimental Pharmacological Treatments

Pharmacological treatments use a prescribed drug to either serve as replacement therapies for abused drugs, block the effect of abused drugs, reduce craving for abused drugs, temper or eliminate withdrawal, block or reverse the toxic effects of abused drugs, or prevent addiction from occurring. NIDA is currently investigating at least 13 drugs to determine their usefulness for treating crack cocaine addicts. An example of two drugs that are under study to treat crack addiction are carbamazepine and flupenthixol decanoate.

Carbamazepine has been used to treat epilepsy seizures for more than 20 years. The University of Minnesota Chemical Dependency Treatment Program has been using carbamazepine to treat cocaine addiction in an open clinical trial since 1987. Compliance with carbamazepine therapy has been associated with a significant reduction in the frequency of cocaine use. Patients taking carbamazepine have reported reduction in the frequency, duration, and intensity of cocaine craving.

Flupenthixol decanoate is a tranquilizer in high doses and an antidepressant in low doses. In an experiment in the Bahamas, flupenthixol was able to rapidly reduce craving in crack users. The rapidity of onset of action is the key factor that may make this drug useful for urban crack addicts who are constantly exposed to strong cues as well as to crack itself. Flupenthixol is injectable, reduces craving within a few days, and the effects of the drug can last from 2 to 4 weeks, obviating the need for frequent clinic visits and consequent problems with retention.[1]

Other drugs that are under study to reduce craving among cocaine addicts include antidepressants, notably desipramine, and dopamine

[1] Although it has been used worldwide for over a decade without reports of important adverse effects, flupenthixol is not yet licensed in the United States.

agonists,[2] such as bromocriptine and amantadine. Antidepressants and dopamine agonists help to alleviate the feelings of anhedonia or the insensitiveness to pleasure that occurs after a binge and cause the craving for cocaine to increase. However, there are no conclusive studies regarding their effectiveness. Although many drugs have shown some potential, it probably will be several years before any reliable drug is found that can treat crack addiction.

Acupuncture Therapy

Recently, practitioners have shown interest in using acupuncture therapy to treat cocaine addicts. The purpose of acupuncture is first to promote relaxation and then to detoxify. The acupuncture clinic we visited at Lincoln Hospital in the Bronx, New York, treats over 200 patients a day. The treatment regimen usually consists of about 10 or 15 days of acupuncture. For a 45-minute period each day, a patient must sit quietly in a chair with about five acupuncture needles placed in each ear. Supportive counseling is offered and participation in 12-step programs is encouraged. Drug use is monitored by daily urine testing.

After 10 days, if urine tests show no drug use, a patient is referred to the Lincoln Hospital Outpatient Department or other programs for further treatment. However, all further treatment is dependent upon abstinence. Some patients stay in acupuncture for up to 90 days before being referred out. In addition, after drug use has stopped, acupuncture may also be used to treat persistent physical ailments.

Acupuncture treatments are brief and require little specialized care. However, a treatment provider told us that acupuncture is not considered a replacement for long-term, psychosocial recovery. NIDA is funding two studies on the effectiveness of acupuncture in terms of getting addicts interested in treatment and keeping them in treatment. The results of these studies are not yet available.

[2]Some researchers believe that neurons adjust to the dopamine that floods them during chronic cocaine abuse by reducing their supply of dopamine receptors. When an addict stops taking cocaine, the supply of dopamine receptors remains reduced, leading to feelings of depression and cocaine craving. Antidepressant drugs are thought to return the dopamine receptors to their normal level, thereby allowing the addict to experience ordinary pleasure without cocaine. Other researchers believe that neurons can produce only a limited amount of dopamine. By using so much dopamine during cocaine abuse, the nerve cells deplete their supplies. As a result, the addict feels depressed and continues to crave the euphoric effects produced by cocaine. Dopamine agonists are used to substitute for the missing dopamine, thereby allowing the addict to experience normal pleasure.

Neurobehavioral Treatment

Another treatment that has gained the interest of some practitioners is the neurobehavioral treatment model, a 12-month intensive outpatient program. It educates patients as to the physiological and neurological bases of addiction and recovery and identifies the predictable stages of cocaine recovery occurring during the first 6 months of abstinence. Patients are given expectations about their feelings and behavior during these stages and provided guidance in coping with the problems associated with each stage. There are weekly relapse prevention and educational groups, as well as weekly urine testing.

Relapse Prevention Strategies Seek to Combat Cues

Relapse prevention strategies seek to determine what the "triggers" or conditioned cues[3] are that encourage addicts to return to drug use after treatment is completed and then help that person to develop alternative responses. Cocaine addicts suffer from numerous relapse cues such as depression, sex, and family and group pressures. For instance, it may be hard for the addict to enjoy sex without drugs or a family argument may trigger a drug use episode. Some cocaine addicts relapse if they are around their old drug-buying or drug-using neighborhood. Others have relapsed upon seeing something that physically reminds them of cocaine, such as a bowl of sugar.

Because most crack addicts also use other drugs, polydrug use serves as another risk factor for relapse. When an addict is using another drug, it often reminds him of his first drug of choice—crack—while at the same time lowering his ability to resist it.

Current Relapse Prevention Strategies

Various relapse prevention strategies are currently in use. The primary ones include:

- peer-support group strategies, such as those based on the Alcoholics Anonymous model;
- education, which follows the principle that those who understand the addiction cycle have better treatment outcomes; and

[3]Conditioned cues are independent stimuli present during past episodes of cocaine euphoria. Such cues evoke memories of extreme cocaine euphoria. The likelihood of continued cocaine smoking by an abuser is related to the strength of the craving experienced during the stage of anhedonia, or lack of interest in normally pleasurable activities, and from exposure to the conditioned cues.

- acceptance by the treatment staff and patient that the patient may nave to repeat episodes of treatment.[4]

One new relapse prevention strategy being studied is closer monitoring. This strategy involves frequent contact with the addict after treatment and sometimes conducting urine tests. Another prevention strategy is based on extinction methods.[5] Extinction therapies focus on exposing the addict to the cues in his old environment and helping the addict to overcome old responses to these cues. For example, an addict may be shown video tapes of individuals using drugs. If the addict responds to the tape by becoming anxious or develops cravings, the addict is taught to relax and deal with these feelings without resorting to drug use. In this way, the addict can overcome each cue and adjust to his or her old environment slowly.

[4]Multiple episodes in treatment are common among addicts. Some experts believe that each successive treatment episode, however, shapes the addict until he or she is able to change his or her lifestyle for good.

[5]Extinction refers to the clinical task of extinguishing the link between cues and euphoria by remaining abstinent when conditioned craving occurs. If cues are experienced but are not reinforced by euphoria, their potency in producing craving gradually dissipates.

Information Based on Surveys and Health and Drug Indicators

One way to monitor drug use in a community is to carry out specific surveys. Another is to use health and other drug abuse indicators to look at the impact of drug use on society. Such indicators include reports on drug-related deaths by medical examiners, drug-related emergency room episodes by hospitals, primary substance of abuse by clients at treatment admission, and arrestee urinalyses and arrest data from the Drug Enforcement Administration and state and local law enforcement agencies.

Information Based on Surveys

Two NIDA studies that are often used to reflect drug use trends result in an underestimate of the true extent of the cocaine problem. The subgroups of the population who would be at high risk for abusing crack are not included in NIDA's samples for these studies.

The National Household Survey on Drug Abuse, which NIDA has sponsored since 1974, covers the population age 12 and older living in households in the contiguous United States. The results of the survey are based on personal interviews combined with self-administered answer sheets from a representative sample of the household population. Not included in the survey are the homeless and people living in military installations; dormitories; other group quarters; and institutions, such as hospitals and jails.

NIDA also sponsors the National High School Senior Survey, which is conducted by the University of Michigan's Institute for Social Research. Approximately 16,000 seniors have been surveyed each year since 1975. Data collection takes place in 130 public and private high schools selected to provide an accurate cross section of high-school seniors throughout the United States, except in Alaska and Hawaii. The survey does not include youth who have dropped out of school or are in alternative settings, such as juvenile detention facilities.

Information Based on Health and Drug Indicators

Community Epidemiology Work Group

Through its Community Epidemiology Work Group (CEWG), NIDA helps states develop drug abuse surveillance networks to collect, analyze, and interchange information regarding drug abuse trends in each state. CEWG's purpose is threefold: to report on the current status of the major categories of drugs, to identify potentially emerging drugs of abuse, and to identify factors and consequences associated with the abuse of drugs. Because drug abuse problems often emerge locally, the focus of these reports is on community-level data from metropolitan areas throughout the United States.

Drug Abuse Warning Network Data

NIDA collects data for its Drug Abuse Warning Network (DAWN) from a nonrandom sample of emergency room and medical examiner facilities. The emergency room data come from facilities located primarily in 21 metropolitan areas throughout the continental United States and a national panel of emergency rooms sampled from locations outside these 21 metropolitan areas. The medical examiner data are collected from 27 metropolitan areas. Within each facility participating in the DAWN system, a designated DAWN reporter is responsible for identifying drug abuse episodes by reviewing official records and transcribing or submitting data on each case. The reporter is usually a member of the emergency room or medical records staff.

The major objectives of DAWN are to identify substances associated with drug abuse episodes reported by DAWN-affiliated facilities; monitor drug abuse patterns and trends; detect new abuse entities and combinations; assess health hazards associated with drug abuse; and provide data for national, state, and local drug abuse policy and program planning.

The popularity of crack among youth does not show up in DAWN's emergency room mentions, which involve people 18 years and older. Youth, who are usually in better physical condition, tend to have fewer problems with high blood pressure and other physical ailments related to crack use and they tend to metabolize stimulant drugs better than older persons.

Drug Use Forecasting Data

The National Institute of Justice (NIJ) established the Drug Use Forecasting (DUF) system in 1987. Although it began in New York City, 23 cities had entered the DUF program by 1990. DUF is designed to provide each city with estimates of drug use among arrestees and information for detecting changes in drug use trends. Drug use is tracked through urine testing for cocaine[1] and other drugs. From 200 to 250 new male arrestees and 50 to 100 new female arrestees are voluntarily sampled every 3 months. The Washington, D.C., Pretrial Services Agency, operating under an NIJ research grant, has responsibility for urinalysis testing of criminal defendants. The agency's purpose is to study the relationship between drug use and the likelihood that a defendant will be rearrested or fail to appear in court. Washington has the longest running program of arrestee drug testing of any jurisdiction in the country. On October 21, 1986, the Pretrial Services Agency expanded its drug testing program to include juvenile arrestees. The Juvenile Drug Detection and Monitoring Program is designed to test all juveniles arrested on criminal offenses from the time of arrest until the conclusion of their cases, through either disposition or the termination of probation.

[1]Urine testing cannot distinguish crack from cocaine because the metabolites are the same.

Major Contributors to This Report

Human Resources Division, Washington, D.C.

Janet L. Shikles, Director for Health Financing and Policy Issues, (202) 275-5451
Albert B. Jojokian, Assistant Director
Rose Marie Martinez, Assignment Manager
Andrea K. Kamargo, Evaluator-in-Charge

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