

March 1998

DRUG ABUSE

Research Shows Treatment Is Effective, but Benefits May Be Overstated



**Health, Education, and
Human Services Division**

B-279062

March 27, 1998

The Honorable Newt Gingrich
House of RepresentativesThe Honorable J. Dennis Hastert
House of RepresentativesThe Honorable Rob Portman
House of RepresentativesThe Honorable Charles B. Rangel
House of Representatives

Each year, the federal government, states, and private entities invest billions of dollars in programs that combat the use of illicit drugs. Nevertheless, illicit drug use in the United States remains a serious and costly problem: It is estimated that in 1996, 13 million Americans were currently using illicit drugs. The costs of drug abuse to society—which include costs for health care, drug addiction prevention and treatment, preventing and fighting drug-related crime, and lost resources resulting from reduced worker productivity or death—are estimated at \$67 billion annually.

Given the serious health, economic, and social consequences of drug abuse for the nation, you asked us to report on (1) the level of federal support for drug abuse treatment activities; (2) the treatment approaches and settings most commonly used and what is known about an alternative approach—faith-based treatment; (3) research issues affecting drug abuse treatment evaluations; and (4) research findings on the effectiveness of drug treatment overall as well as what is known about the effectiveness of treatment for heroin, cocaine, and adolescent drug addiction.

To conduct our work, we reviewed and synthesized the findings on drug abuse treatment from the largest, most comprehensive studies, which the National Academy of Science's Institute of Medicine and the drug treatment research community consider to be the major evaluations of drug treatment effectiveness. It was beyond the scope of this review to comprehensively analyze the extensive literature on drug treatment research methodologies and study results for each specific group of drug abusers, such as drug-abusing prisoners and women. We did not independently evaluate the effectiveness of drug treatment programs, nor

did we verify the results reported in the studies we reviewed. With these limitations, we did our work from October 1997 to February 1998 in accordance with generally accepted government auditing standards.

Results in Brief

Billions of dollars are spent annually to support treatment for drug abuse and related research. In 1998, 20 percent of the federal drug control budget, \$3.2 billion, supported drug abuse treatment. Over half of federal drug treatment funds were allocated to the Department of Health and Human Services (HHS) to support block grants to the states, drug treatment services, and related research. An additional one-third of treatment dollars went to the Department of Veterans Affairs (VA) to support drug treatment services to veterans and their inpatient and outpatient medical care. To meet the requirements of the Government Performance and Results Act, agencies are beginning to set goals and performance measures to monitor and assess the effectiveness of federally funded drug treatment efforts.

Treatment services and research aim to reduce the number of current drug abusers. Experts recognize that not all drug users require treatment because some do not progress to abuse or dependence. Even among those who progress to the stage of abuse, some can stop drug use without treatment. Those who do need treatment can receive services in a variety of settings and via two major approaches: pharmacotherapy and behavioral therapy, with many programs combining elements of both. Other treatment approaches, such as faith-based strategies, are sometimes used but have not been sufficiently evaluated to determine their effectiveness.

Measuring the effectiveness of drug abuse treatment is a complex undertaking. The most comprehensive studies have used an observational or quasiexperimental design, assessing effectiveness by measuring drug use before and after treatment. Few studies have used the most rigorous approach—random assignment to treatment and control groups—to isolate the particular effects of treatment on drug abuse. In most studies, the conclusions researchers can draw are limited by factors such as reliance on self-reported data and the time frame planned for client follow-up. Furthermore, comparisons of study results are complicated by differences in how outcomes are defined and measured and differences in program operations and client factors.

A number of large, multisite, longitudinal studies provide evidence that drug abuse treatment is beneficial, but reliance on self-reported data may

overstate treatment effectiveness. Substantial numbers of clients report reductions in drug use and criminal activity following treatment. For example, a study of 11,750 people entering drug treatment from 1979 to 1981 found that 40 to 50 percent of regular (weekly or more frequent) heroin and cocaine users who spent at least 3 months in treatment reported near abstinence during the year after treatment, and an additional 30 percent reported reduced frequency of use. This study and others also found that clients who stay in treatment for longer periods report better outcomes. Research on treatment effectiveness relies heavily on client reports of drug use. When examining recent drug use, objective tests, such as urinalysis, consistently identify more drug users than self-reports do.

The research evidence to support the relative effectiveness of specific treatment approaches or settings for particular groups of drug abusers is more varied. Methadone maintenance—the approach that has been evaluated using the most rigorous studies, randomized clinical trials—has been shown to be the most effective approach to treating heroin abusers. Research on the best treatment approach or setting for other groups of drug abusers, however, is less definitive. For cocaine abusers, no pharmacological treatment has been found, but studies have shown that several cognitive-behavioral treatment approaches have promise. A growing body of research examining treatment interventions for adolescents indicates that family-based therapy has potential.

Background

Recent estimates indicate that illicit drug use in the United States remains a major problem.¹ In 1996, an estimated 13 million people were current drug users—that is, they had used illicit drugs in the past month—which was down from a peak of 25 million in 1979. The number of current illicit drug users has remained relatively static since 1992. Marijuana is the most commonly used illicit drug, with about 10.1 million users in 1996. About half (54 percent) of the 1996 illicit drug users used marijuana only, while another 23 percent used marijuana and one or more other drugs. The remaining 23 percent of illicit drug users used only a drug other than marijuana. The number of current cocaine users declined from 5.7 million people in 1985 to 1.75 million in 1996. The estimated number of crack cocaine users in 1996 was about 668,000 and has remained steady at about

¹The statistical information in this section is from HHS, Substance Abuse and Mental Health Services Administration, Office of Applied Studies, Preliminary Results from the 1996 National Household Survey on Drug Abuse (Washington, D.C.: HHS, July 1997). This is an annual survey examining drug use patterns and trends within a national sample of households, civilians living on military bases, and residents of noninstitutional group quarters (such as shelters, rooming houses, and dormitories). Survey results are limited by the exclusion of groups at high risk for drug use and reliance on self-reported data.

this level since 1988. However, the use of heroin has been increasing recently, rising from 68,000 current users in 1993 to 216,000 current users in 1996.²

Among 12- to 17-year-old adolescents, current drug use rose from 5.3 percent in 1992 to 10.9 percent in 1995 but declined in 1996 to 9.0 percent. This decline is attributable to reductions in use among youth aged 12 to 15; for those aged 16 and 17, there was no change in current use from 1995 to 1996. The rate of marijuana use among adolescents more than doubled from 1992 to 1995. By 1996, 7.1 percent of adolescents had used marijuana in the past month. The same year, 0.6 percent of adolescents were current cocaine users, and 0.2 percent were current heroin users. Previous month use of hallucinogens nearly doubled from 1994 to 1996, from 1.1 percent to 2 percent.

Billions of Federal Dollars Support Drug Abuse Treatment

As part of its overall drug control effort, the federal government provides significant support for activities related to drug abuse treatment, including grants to states, direct services, and research.³ Fiscal year 1998 federal funding for treatment of drug abuse is approximately \$3.2 billion, or about one-fifth of the total drug control budget. The Congress has authorized HHS and VA to spend the vast majority of federal drug abuse treatment funds.

One-Fifth of Federal Spending on Drug Control Supports Treatment Activities

Federal spending on drug control recognizes four general areas of emphasis: demand reduction (which includes prevention, treatment, and related research), domestic law enforcement, interdiction, and international cooperation. For fiscal year 1998, the federal government budgeted a total of about \$16 billion for drug control activities.⁴ The largest share of this budget—53 percent—supported domestic law enforcement activities. Drug abuse treatment accounted for 20 percent

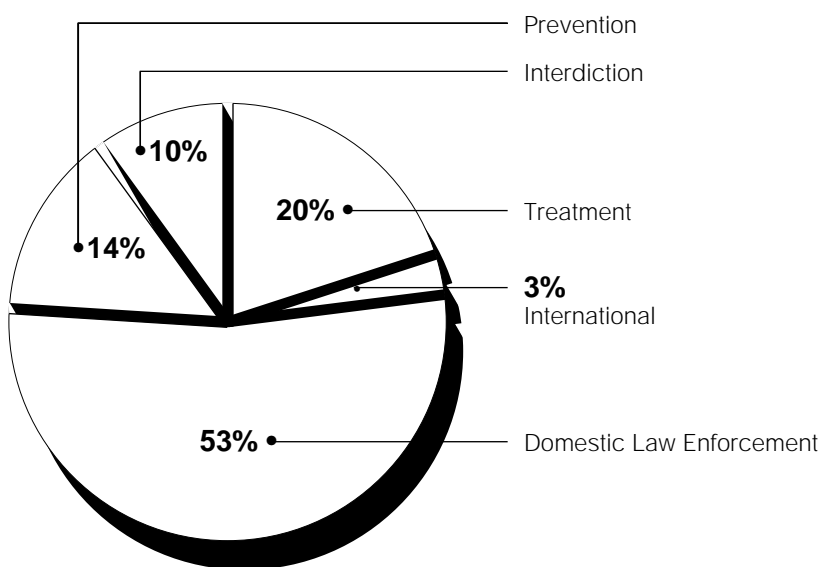
²Data from medical examiners, emergency departments, and drug treatment facilities suggest that methamphetamine abuse may be growing, although this has not been confirmed in national surveys.

³The data in this section were reported in Executive Office of the President, Office of National Drug Control Policy (ONDCP), *The National Drug Control Strategy, 1998: Budget Summary* (Washington, D.C.: ONDCP, Feb. 1998). Expenditures include some support for activities targeting underage alcohol abuse.

⁴State, county, and local governments and the private sector also contribute to annual spending for drug abuse treatment. State, county, and local governments spent about \$1.4 billion in 1994 for substance abuse treatment. Private funding sources provided about \$1 billion in 1993 (the most recent year for which data are available). The National Drug and Alcoholism Treatment Unit Survey indicated that over half of the private funding for drug abuse treatment services consisted of third-party payments by health insurers and health maintenance organizations, and about 40 percent came from client fees.

and prevention, for 14 percent; the remainder was allocated to interdiction and international efforts. (See fig. 1.) The proportion of drug control spending to reduce the demand for drugs has remained fairly constant since the mid-1980s at about one-third of the total.

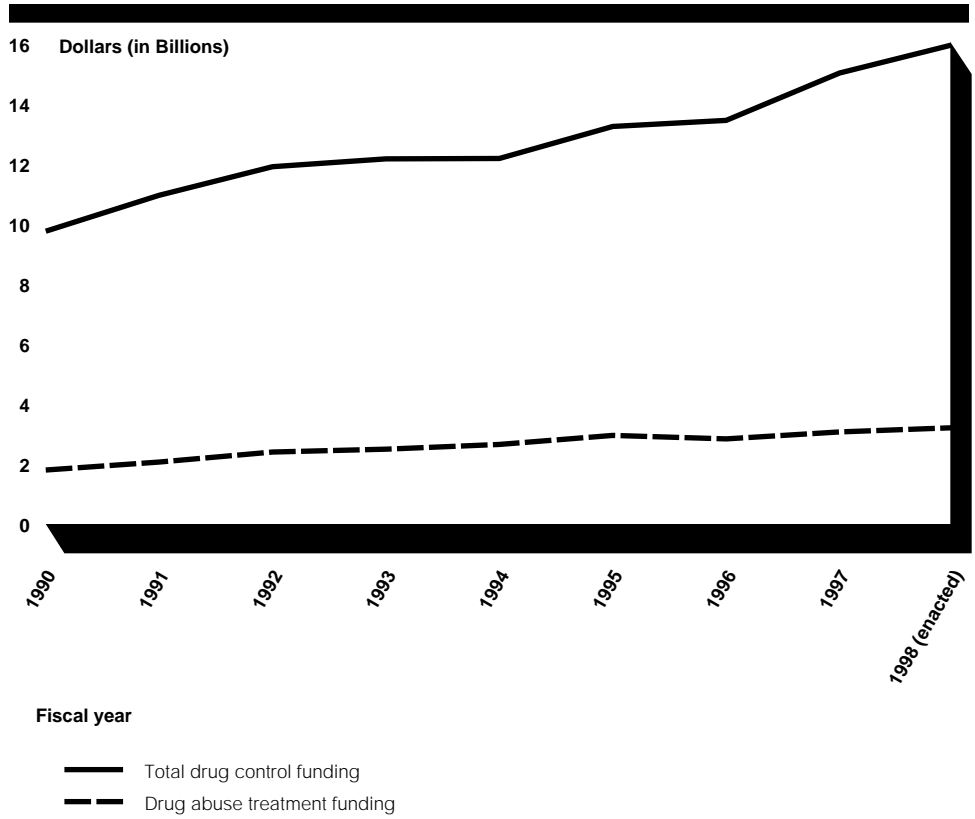
Figure 1: Distribution of Federal Drug Control Spending, Fiscal Year 1998



Source: ONDCP, *The National Drug Control Strategy, 1988: Budget Summary*.

Since the early 1990s, federal spending for drug control has grown steadily. Total federal drug control funding rose by 64 percent, from about \$9.8 billion in 1990 to about \$16 billion in 1998. (See fig. 2.) During this period, the drug treatment budget increased slightly faster, 78 percent, growing from about \$1.8 billion in fiscal year 1990 to \$3.2 billion in fiscal year 1998. An additional \$237 million above the 1998 level was requested for fiscal year 1999 treatment funding.

Figure 2: Total Federal Drug Control Funding and Drug Abuse Treatment Funding, Fiscal Years 1990-98



Source: ONDCP, *The National Drug Control Strategy, 1988: Budget Summary*.

HHS and VA Receive Most Federal Funds for Drug Abuse Treatment Activities

Although a number of federal entities—including the Department of Justice, the Department of Education, and the Judiciary—receive treatment-related funding, HHS and VA receive the bulk of federal drug abuse treatment dollars (see table 1). For fiscal year 1998, HHS has been authorized to spend about \$1.7 billion on drug abuse treatment—54 percent of all federal treatment dollars. For the same year, VA has received about \$1.1 billion for drug abuse treatment and related costs, which is 34 percent of the federal treatment budget. Of the total growth in federal expenditures for drug abuse treatment between 1994 and 1998—about \$557 million—increased funding to VA accounted for about 44 percent and to HHS, 33 percent.

Table 1: Federal Budget Authority for Drug Treatment Activities, by Agency, Fiscal Years 1994-99

Dollars in Millions

Agency	Fiscal year						1994-98 percent change
	1994 actual	1995 actual	1996 actual	1997 actual	1998 enacted	1999 requested	
Health and Human Services	\$1,532.9	\$1,559.5	\$1,471.1	\$1,660.2	\$1,717.7	\$1,832.4	12.1
Veterans Affairs ^a	853.8	966.1	1,080.9	1,056.4	1,096.9	1,138.7	28.5
Defense	6.2	6.2	5.8	6.4	6.2	6.0	0.0
Education	108.2	115.4	119.2	119.8	125.8	129.9	16.3
Housing and Urban Development	25.0	5.4	0.0	3.0	3.2	3.2	-87.2
The Judiciary	63.0	67.8	59.7	69.6	74.7	83.8	18.6
Justice	61.3	68.3	94.8	126.6	160.9	219.7	162.5
ONDCP	1.9	15.6	5.1	26.9	23.8	32.3	1,152.6
Total^b	\$2,652.3	\$2,953.2^c	\$2,836.6	\$3,068.9	\$3,209.1	\$3,446.0	21

^aIncludes 100 percent of medical costs provided to veterans with a diagnosis of drug abuse when treatment is provided in a specialized drug or substance abuse treatment program. For veterans with a secondary or associated diagnosis of drug abuse who receive care in other settings, only a proportion of medical costs are included.

^bExpenditures have been rounded, affecting percentages and totals.

^cIncludes \$148.9 million for the Social Security Administration.

Source: Compiled from data in ONDCP, The National Drug Control Strategy, 1998: Budget Summary.

Of HHS' \$1.7 billion drug treatment budget for 1998, more than half (\$944 million) was dedicated to the Substance Abuse and Mental Health Services Administration (SAMHSA) to support the treatment components of its Substance Abuse Performance Partnership Grants to states and the Knowledge Development and Application Program.⁵ Approximately 80 percent of SAMHSA's total budget is distributed to the states through block grants and formula programs. SAMHSA has requested an increase of \$143 million in fiscal year 1999 Substance Abuse Performance Partnership Grants funding to make treatment available to more of those who need it.

The Health Care Financing Administration received \$360 million in fiscal year 1998 to pay for drug abuse treatment services for Medicaid and Medicare beneficiaries. Eighty percent of this amount finances Medicaid treatment expenses, including all covered hospital and nonhospital

⁵HHS expenditures cited here do not include activities principally targeting treatment for alcohol abuse. However, for the National Institutes of Health, underage alcohol treatment activities are included in total spending.

services required. The remaining 20 percent covers Medicare hospital insurance treatment costs.

The National Institutes of Health (NIH) received about one-sixth of HHS's drug treatment funds to conduct research in the areas of drug abuse and underage alcohol use. For 1999, NIH has requested funding (\$51 million) for its Drug and Underage Alcohol Research initiative to expand research on underage alcohol and drug addiction among children and adolescents, as well as chronic drug users, and to support increased dissemination of research findings. Recognizing the need to improve research on the infrastructure that delivers treatment, the Congress mandated in 1992 that the National Institute on Drug Abuse (NIDA) obligate at least 15 percent of its funding to support research on the impact of the organization, financing, and management of health services on issues such as access and quality of services.

In 1998, VA was appropriated about \$1.1 billion for inpatient and outpatient medical care provided to veterans with a diagnosis of drug abuse, as well as for drug abuse treatment services. Special substance abuse treatment services are available at 126 medical facilities. Additional monies support treatment research in coordination with NIDA.

Other federal agencies that received drug treatment funds for fiscal year 1998 include the Departments of Education and Justice (each received more than \$100 million), the federal Judiciary (about \$75 million), and ONDCP (about \$24 million). From 1994 to 1998, Justice's funding rose 163 percent; moreover, its 1999 funding request would increase its funding by another third. The Department of Justice has requested about \$83 million for fiscal year 1999 to support its Drug Intervention Program, a new program that would support drug testing, treatment, and graduated sanctions for drug offenders, in an effort to break the cycle of drug abuse and violence.

The Government Performance and Results Act was enacted in 1993 in part as a means to improve performance measurement by federal agencies. It requires agencies to set goals, measure performance, and report on their accomplishments and thus should provide a useful framework for assessing the effectiveness of federally funded drug treatment efforts. However, demonstrating the efficient and effective use of federal drug abuse treatment funds is particularly challenging because most of these funds support services provided by state and local grantees, which are

given broad discretion in how best to use them.⁶ Regardless, federal agencies are now required by the Results Act to hold states accountable for achieving federal goals for effective treatment outcomes.

Drug Treatment Services Are Provided in a Variety of Settings

Drug addiction is a complicated disorder that includes physiological, behavioral, and psychological aspects. For example, the environmental cues that have been associated with drug use can trigger craving and precipitate relapse, even after long periods of abstinence. Despite the potential for relapse to drug use, not all drug users require treatment services to discontinue use. For those who do require treatment, services may be provided in either outpatient or inpatient settings, and via two major approaches: pharmacotherapy and behavioral therapy, with many programs combining elements of both. Other treatment approaches, such as faith-based strategies, have yet to be rigorously examined by the research community.

Nature of Drug Abuse

In general, drug abuse is defined by the level and pattern of drug consumption and the severity and persistence of resulting functional problems. A diagnosis of drug abuse is generally made when drug use has led to social, legal, or interpersonal problems. A clinical diagnosis of drug dependence—or addiction—is based on a group of criteria including physiological, behavioral, and cognitive factors.⁷ In particular, drug addiction is characterized by compulsive drug-seeking behavior. People who are dependent on drugs often use multiple drugs and usually have substantial impairment of health and social functioning. Furthermore, addiction is generally accompanied by withdrawal symptoms and drug tolerance, resulting in the need to increase the amount of drugs consumed.

Moreover, severe dependence is often associated with health conditions or impairments in social functioning, including mental health disorders that generally are serious and difficult to treat. Drug abusers are more likely than nonabusers to sustain injuries; be involved in violence and illegal activities; have chronic health problems, including a higher risk of contracting HIV (human immunodeficiency virus); and have difficulty holding a job.

⁶Substance Abuse and Mental Health: Reauthorization Issues Facing the Substance Abuse and Mental Health Services Administration (GAO/T-HEHS-97-135, May 22, 1997).

⁷For diagnostic criteria, physicians use the Diagnostic and Statistical Manual of Mental Disorders, DSM-IV (American Psychiatric Association, 1994), and the International Classification of Diseases, ICD-10 (World Health Organization, 1992). Both of these diagnostic manuals recognize drug abuse and dependence as medical disorders.

Most scientists agree that addiction is the result of chemical and physical changes in the brain caused by drug use. However, they recognize that addiction extends beyond physiological components to include significant behavioral and psychological aspects. For example, specific environmental cues that a drug abuser associates with drug use can trigger craving and precipitate relapse, even after long periods of abstinence. Therefore, people receiving treatment for drug abuse often enter treatment a number of times—sometimes in different approaches or settings, and sometimes in the same approach or even the same treatment facility. Often, the substance abuser reduces his or her drug use incrementally with each treatment episode.

Experts recognize that not all drug users require treatment to forgo drug use because some drug users do not progress to abuse or dependence. Even among those who progress to the stage of abuse, some can stop drug use without treatment. This issue was addressed in a study of Vietnam veterans' rapid recovery from heroin addiction. Forty-five percent of enlisted Army men had tried narcotics in Vietnam, and 20 percent reported the development of an addiction to narcotics. However, in the first year after their return home, only 5 percent of those addicted in Vietnam remained addicted in the United States. The author concluded that most addictions are relatively brief, and that most drug abusers are capable of discontinuing drug use without treatment.⁸ This view is controversial; others contend that the Vietnam veterans' experience is an anomaly resulting from the drastic change in environment when they returned home.

Drug Abuse Treatment Approaches and Settings

Data from 1992-93 on use of drug treatment in the United States (the most current available) show that about 1.4 million people received drug treatment during the previous year.⁹ According to SAMHSA, the individuals in drug treatment were those with the most extreme patterns of drug use: the highest frequency of drug use, use of the least typical drug types, and early initiation of use. Most of the group in treatment had received treatment in multiple settings, most commonly in drug treatment facilities and self-help groups. Only about one-fourth of those who needed drug treatment in the previous year reported having received it during that

⁸Lee N. Robins, "Vietnam Veterans' Rapid Recovery From Heroin Addiction: A Fluke or Normal Expectation?" *Addiction*, Vol. 88 (1993), pp. 1041-54.

⁹Data were collected as part of the National Household Survey on Drug Abuse in 1992 and 1993. See Dean R. Gerstein, Mary L. Foote, and Rashna Ghadialy, National Opinion Research Center, *The Prevalence and Correlates of Treatment for Drug Problems* (Washington, D.C.: HHS, SAMHSA, Office of Applied Studies, Apr. 1997.)

year.¹⁰ Adolescents (aged 12 to 17) were even less likely to receive needed treatment, with 18 percent of those needing treatment receiving it.

The treatment of drug addiction can be classified under two major approaches: pharmacotherapy and behavioral therapy. Pharmacotherapy relies on medications to block the euphoric effects or manage the withdrawal symptoms and cravings experienced with illicit drug use. One such widely used medication is methadone, a narcotic analgesic that blocks the euphoria of heroin, morphine, codeine, and other opiate drugs and suppresses withdrawal symptoms and craving between treatment doses. Methadone maintenance generally requires daily clinic visits to receive the methadone dose; over time, some clients are given take-home doses. Methadone maintenance can continue for as long as several years, and in some cases, maintenance may last a lifetime.

A number of other drugs have also been shown to be safe and efficacious in the treatment of opiate addiction. Levo-alpha-acetylmethadol (LAAM) suppresses withdrawal symptoms for 72 to 96 hours and thus can reduce clients' clinic visits to 3 days per week. Naltrexone, like LAAM, is long-acting and can be administered in small daily doses or in larger doses 3 times a week. Naltrexone is believed to be most effective for highly motivated clients, especially those with strong social supports. Buprenorphine has been effective in clinical trials in retaining patients in treatment and facilitating abstinence. In addition, buprenorphine has been shown to produce less physical dependence than methadone and LAAM.

Behavioral therapy includes various forms of psychotherapy, contingency-based therapy, cognitive therapy, and other types of therapies. It may include skills training and a variety of counseling approaches, from highly structured individual or family counseling to more informal group counseling. Some programs combine elements of both pharmacotherapy and behavioral therapy. For example, many methadone maintenance programs are designed to also provide counseling services, which may include psychotherapy or individualized social assistance. Participation in counseling facilitates regular monitoring of client behavior, appearance, and drug use. Some outpatient nonmethadone programs also use pharmacological treatment, such as medications for initial detoxification, medications to control craving, or drugs that address psychiatric disorders such as depression or schizophrenia. Drug abusers receiving pharmacotherapy, behavioral therapy, or both may also

¹⁰A person who met at least one of the following criteria was classified as needing treatment: dependence, needle use, having received treatment, and heavy use.

participate in self-help groups, such as Alcoholics Anonymous, Narcotics Anonymous, or Rational Recovery and are generally encouraged to continue participation in these groups after leaving formal treatment to help maintain abstinence and a healthy lifestyle.

A number of other, less commonly used approaches to drug treatment offer alternatives to these established approaches. One such example is the use of spirituality as a component of treatment. Some researchers have acknowledged that people with a strong spiritual¹¹ or religious involvement seem to be at lower risk for substance abuse, yet research in this area remains extremely limited. Experts have yet to agree on how to define faith-based drug treatment. Some define faith-based programs as those that are based on religious beliefs and practices, such as Teen Challenge,¹² while others consider any treatment approach that recognizes spirituality, such as Narcotics Anonymous or Cocaine Anonymous, to be faith-based.

Regardless of how faith-based treatment is defined, there has not been sufficient research to determine the results of this type of treatment. For example, a recent research conference assessed the evidence on spiritual treatment for alcohol and drug abuse.¹³ The panel found strong evidence for a few limited assertions: that better treatment outcomes correlate with Alcoholics Anonymous involvement after outpatient treatment and that meditation-based interventions are associated with reduced levels of alcohol and drug use. The panel concluded that the issues for future research in this area include the definition and measurement of spiritual variables and the possible spiritual factors that could play a role in recovery from substance abuse.

Regardless of the approach used, drug treatment services are provided in both inpatient and outpatient settings. Most people are served by

¹¹SAMHSA defines spirituality as involvement in socially desirable activities or processes that are beyond the details of daily life and personal self-interest. According to SAMHSA, ethical behavior, consideration for the interests of others, community involvement, helping others, and participating in organized religion are all ways in which spirituality can be expressed. See "Matching Treatment to Patient Needs in Opiate Substitution Therapy," *Treatment Improvement Protocol Series, No. 20* (Washington, D.C.: HHS, SAMHSA, Center for Substance Abuse Treatment, 1995).

¹²Teen Challenge is a drug-free residential treatment program for drug abusers. Founded in 1961, Teen Challenge bases its drug treatment approach on the belief that only devotion to Jesus Christ can form the basis for the development of a healthy personality and satisfying life. Through centers across the country, adolescents and adults receive drug detoxification, followed by rehabilitation and training. The program employs a strict system of rules and activities to build self-discipline and personal responsibility and Bible study to encourage spiritual growth and development.

¹³"Scientific Progress in Spiritual Research," a three-part series from July 1996 to July 1997, sponsored by the National Institute for Healthcare Research.

outpatient programs, where treatment can vary from psychotherapy at comprehensive health centers to informal group discussions at drop-in centers.¹⁴ People who enter outpatient drug-free treatment generally (though not always) have a less severe level of addiction and associated problems than those who receive treatment in inpatient settings. Although weekly counseling is the predominate treatment approach available at outpatient settings, some programs also offer pharmacological treatment and some give assistance with social needs, including education, job training, housing, and health care.¹⁵

Inpatient settings include hospitals as well as residential facilities, such as therapeutic communities. Hospital-based drug treatment is used for detoxification from drugs and to provide other services for individuals having severe medical or psychiatric complications. Data from 1992-93 show that, of the group reporting drug treatment during the past year, 28 percent received treatment in an inpatient hospital setting. Chemical dependency programs, one type of inpatient treatment program, recognize drug problems as having multiple causes, including physiological, psychological, and sociocultural aspects. Treatment may last up to several weeks and may include pharmacological intervention, education about drug addiction, counseling, participation in self-help groups, and medical or psychiatric services.

Long-term residential treatment programs are designed for people with more severe drug problems—those with dependence on one or more drugs who have failed previous treatment efforts. For example, therapeutic communities provide treatment that is generally planned for 6 to 12 months in a residential setting. Clients are generally chronic drug abusers who have failed at other forms of drug abuse treatment, while staff are largely previous drug abusers. Strict behavioral expectations and responsibilities are enforced to emphasize appropriate social and vocational norms.

¹⁴Typically called outpatient drug-free or outpatient nonmethadone treatment, this type of approach encompass all outpatient treatment except methadone maintenance. Although called drug-free, outpatient programs can include pharmacological treatment, such as desipramine to moderate cocaine craving and clonidine to treat withdrawal from narcotics.

¹⁵The Institute of Medicine reported in 1995 that there are opiate-dependent patients in outpatient drug-free treatment settings. Research from the early 1990s found that 10 percent of clients in outpatient drug-free settings reported having used opiates within the past 30 days. See Institute of Medicine, The Development of Medications for the Treatment of Opiate and Cocaine Addictions (Washington, D.C.: Institute of Medicine, 1995), p. 99.

Research Issues Make Assessment of Treatment Effectiveness Difficult

The study of drug treatment programs is complicated by a number of challenging methodological and implementation issues. Evaluations of treatment effectiveness can use one of several methodologies, depending on the specific questions to be addressed. Thus, the appropriateness of the study design and how well the evaluation is conducted determine the confidence to be placed in the research findings. In particular, studies of the validity of self-reported data demonstrate that information on treatment outcomes collected by self-report should be interpreted with some caution. The ability to compare the results of effectiveness studies is also influenced, and often limited, by differences in how outcomes are measured, how programs are operated, and client variables.

Quality of Evidence Varies by Study Design

Drug treatment effectiveness research conducted over the past 2 decades has used a variety of designs, including randomized clinical trials, simple or controlled observation, and quasiexperimental designs.¹⁶ Selection of the study design depends on a number of factors, including the questions being addressed and the resources available to fund the study. Methodologists agree that randomized clinical trials are the most rigorous study designs and therefore offer the strongest support for their findings. Studies that rely on a simple observational design produce less definitive findings but can provide a good indication of the operation of drug treatment programs as well as information on treatment outcomes. A quasiexperimental design, the most frequently used in field settings, falls somewhere in between.

Randomized clinical studies are designed to isolate the effects of a treatment by randomly assigning individuals to either a control group—receiving no treatment or an alternative treatment—or to a group that receives the treatment being studied. This study design has been used in the assessment of methadone maintenance for treating heroin addiction. Randomized trials are often used to study the efficacy of a treatment, asking the question, “Can it work?” Although such studies provide the most definitive information about whether particular treatments are effective, they are not widely used in drug treatment research. According to an analysis by the Lewin Group, among the reasons cited for the limited use of randomized trials are the difficulties in obtaining informed consent from drug abusers and the perceived ethical issue of randomly assigning

¹⁶One distinction among these methodologies is the analytic techniques that often are used. Quasiexperimental designs and controlled observations usually use multivariate analysis, whereas simple observations usually use only univariate or bivariate analysis. See Institute of Medicine, *Treating Drug Problems* (Washington, D.C.: Institute of Medicine, 1990), p. 186.

people who are seeking drug treatment to a control group in which no treatment or a treatment regimen not of the client's choice is provided.¹⁷

Simple and controlled observation designs typically employ a repeated-measures methodology, whereby the researchers collect information on drug use patterns and other criteria from clients before, during, and after treatment. Generally, controlled observation studies examine multiple treatment groups, and simple observation studies follow a single treatment group without a nontreatment comparison group. Observational studies provide information about the effectiveness of treatments when implemented in uncontrolled, or real-world, conditions. Observational design has been used to assess treatment provided in all four of the major treatment settings: residential therapeutic communities and outpatient methadone maintenance, outpatient drug-free, and inpatient chemical dependency programs.

Quasiexperimental study designs generally have a comparison group, a key feature of strong research design, but an investigator does not randomly assign individuals to treatment and comparison groups. Instead, comparisons are made between possibly nonequivalent client groups or by using statistical techniques that adjust for known differences in client characteristics. Even in a quasiexperimental design, a repeated-measures methodology might be used in comparing the behaviors of the same group of drug abusers before, during, and after treatment. A quasiexperimental design is often applied in evaluations of naturally occurring events, such as introducing a new treatment approach or closing a treatment program. Such a design allows greater confidence (than observation alone) that any differences detected are due to treatment but not as much confidence as random assignment of clients to treatment and comparison groups. Quasiexperimental study designs have been used to assess the effectiveness of both methadone maintenance programs and therapeutic communities as well as outpatient drug-free programs.

Treatment Evaluations Define and Measure Outcomes Differently

Treatment program goals generally include a wide range of issues, such as reducing drug use, reducing criminal behavior, and improving employment status. Most researchers have agreed that reducing drug use from the level it would have been without treatment (harm reduction) is a valid goal of drug treatment and an indication of program success. In addressing this issue, researchers acknowledge that abstinence from illicit drug

¹⁷Henrick J. Harwood, Sharon L. Carothers, and Christine Lee, *Random Assignment Studies of Drug Abuse Treatment: Progress in the Application to Psychosocial Components of Care*, Report to the National Institute on Drug Abuse (Fairfax, Va.: The Lewin Group, Inc., 1994).

consumption is the central goal of all drug treatment, but they contend it is not the only acceptable goal of treatment, since total abstinence from drug use may be unrealistic for many users. According to the Institute of Medicine, “an extended abstinence, even if punctuated by slips and short relapses, is beneficial in itself and may serve as a critical intermediate step toward lifetime abstinence and recovery.”¹⁸

Even with harm reduction as the common objective, treatment outcome measures vary among—and sometimes within—treatment programs. Operationalizing the outcome measures is also done differently across programs, which makes it difficult to compare treatment outcomes of different programs. For example, one program may measure reduction in drug use by examining the frequency of drug use, while another may choose to focus on reduced relapse time. Major drug treatment studies use other outcomes as well to measure treatment effectiveness, ranging from reductions in criminal activity to increased productivity. Indicators for these outcome measures also vary by study. (See table 2.)

Table 2: Types of Outcome Measures Used to Assess Effectiveness of Drug Treatment

Outcome measure	Indicator
Drug use	Reduced frequency of drug use
	Reduced amount of drug used
	Reduced relapse time
	Abstinence
Criminal activity	Fewer arrests
	Fewer convictions
	Parole or probation status
Health and safety	Improved medical status and general improvement in health (for example, fewer hospitalizations and doctor and emergency room visits)
	Improved mental health status (for example, improved mood, cognition, and personality traits and fewer psychotic states)
	Improved behavior associated with risk of HIV infection
	Improved public safety (for example, incidence of drug-related fires, car crashes, accidents, and trauma)
Social and interpersonal skills	Positive changes in social values and networks
	Improved relationships with family, friends, and employers
Productivity	Increased days of employment
	Enrollment in training program or school
	Increased school attendance
	Improved grades and overall performance

¹⁸Institute of Medicine, Treating Drug Problems, p. 129.

Another issue related to measuring treatment outcomes is concern about the time frame for client follow-up. Since drug addiction is commonly viewed as a life-long disease, many argue that long-term follow-up is needed to fully assess treatment outcomes. However, many of those who complete treatment programs are lost in the follow-up assessment period. Treatment assessment periods vary considerably, ranging from a 1-year follow-up for most studies to a 12-year follow-up for a subset of clients in one of the major studies we reviewed. The research literature indicates difficulties in tracking drug abusers even for 1-year follow-up periods. For example, of the group selected for follow-up interviews in the Drug Abuse Treatment Outcome Study (DATOS), only 70 percent actually completed the interview.

Reliance on Self-Reported Data Has Limitations

With all types of study designs, data collection issues can hamper assessments of treatment effectiveness. The central debate regarding data collection on the use of illicit drugs surrounds the common use of self-reported data. A recent NIDA review of current research on the validity of self-reported drug use highlights the limitations of data collected in this manner.¹⁹ According to this review, recent studies conducted with criminal justice clients (such as people on parole, on probation, or awaiting trial) and former treatment clients suggest that 50 percent or fewer current users accurately report their drug use in confidential interviews. In general, self-reports are less valid for the more stigmatized drugs, such as cocaine; for more recent rather than past use; and for those involved with the criminal justice system.

The largest studies of treatment effectiveness, which have evaluated the progress of thousands of people in drug treatment programs, have all relied on self-reported data. That is, the drug abuser is surveyed when entering treatment, and then again at a specified follow-up interval. In general, individuals are asked, orally or in writing, to report their drug use patterns during the previous year. Self-reports of drug use may be subject to bias both prior to and following treatment and can be either over- or understated. Drug abusers may inflate their current level of drug use when presenting for treatment if they believe that higher levels of use will increase the likelihood of acceptance into treatment. Drug use may also be underreported at treatment intake or follow-up. Motivations cited for underreporting include the client's desire to reflect a positive outcome

¹⁹HHS, NIH, The Validity of Self-Reported Drug Use: Improving the Accuracy of Survey Estimates, National Institute on Drug Abuse Research Monograph Series 167 (Washington, D.C.: HHS, 1997).

from treatment and the perception of a strong societal stigma associated with the use of particular drugs.

As questions have developed about the accuracy of self-reported data,²⁰ researchers have begun using objective means to validate the data collected in this manner, although these methods also have limitations. Generally, a subgroup of the individuals surveyed after treatment is asked to provide either a urine sample or a hair sample, which is then screened for evidence of drug use. The results from the urinalysis or hair analysis are then compared against self-reports of drug use. Some researchers believe that it may be possible to systematically adjust self-reported data to correct for the biases exposed by urinalysis or hair analysis, although this technique is not currently in use.

Recent major studies of drug treatment effectiveness have used urinalysis to validate self-reported data. For example, the National Treatment Improvement Evaluation Study (NTIES) found that self-reports of recent drug use (in the past 30 days) for opiates and cocaine were lower than current drug use as revealed by urinalysis. However, the self-reports of substance use over the entire follow-up period (that is, use on at least five occasions) yielded an equivalent or higher rate of use than the results of analyzing urine specimens collected at the follow-up interview. (See table 3.) Other studies found similar underreporting of drug use. The Treatment Outcome Prospective Study (TOPS), which followed people entering treatment in the early 1980s, reported that 40 percent of the individuals testing positive for cocaine 24 months after treatment had reported using the drug in the previous 3 days.

Table 3: Comparison of Drug-Positive Urine Tests With Self-Reported Drug Use, NTIES Study

Data collection method at follow-up	Cocaine (including crack)	Opiates (including heroin)
Urine test	28.7%	16.2%
Self-report of use in last 30 days	20.4	11.3
Self-report of use during period since treatment	33.5	16.5

Source: National Opinion Research Center at the University of Chicago and the Research Triangle Institute, NTIES Brief Report (Washington, D.C.: HHS, SAMHSA, Center for Substance Abuse Treatment, Feb. 1997).

²⁰The research literature prior to the mid-1980s showed drug use self-reports to be generally valid, while studies conducted since then have raised concerns about validity. The apparent change in validity may be due in part to improved urinalysis testing that now detects drug use more accurately. It is also possible that individuals were more willing to admit use of illicit drugs in the past, when societal reaction toward drug use was not as strong as it is today. Even today, researchers are not in agreement on the limitations of self-reported data. For example, the researchers for DATOS, the most recently completed study of drug treatment, acknowledged limitations to self-reported data but asserted that most data so obtained are reasonably reliable and valid.

Despite the discrepancies observed, each of the data collection methods used to measure treatment effectiveness has particular weaknesses. As shown above, validation studies indicate that self-reports of current drug use underreport drug use. At the same time, researchers emphasize that client reporting on use of illicit drugs during the previous year (the outcome measure used in most effectiveness evaluations) has been shown to be more accurate than reporting on current drug use. In comparison, urine tests can accurately detect illicit drugs for about 48 hours following drug use. However, urinalysis does not provide any information about drug use during the previous year. In addition, individual differences in metabolism rates can affect the outcomes of urinalysis tests. Hair analysis has received attention because it can detect drug use over a longer time—up to several months. However, unresolved issues in hair testing include variability across drugs in the accuracy of detection, the potential for passive contamination, and the relative effect of different hair color or type on cocaine accumulation in the hair.²¹

To examine the validity of self-reported data on other outcome measures, NTIES researchers compared self-reports on arrests to official arrest records and found 80 percent agreement, with underreporting of arrest histories most frequent among individuals interviewed in prison or jail and among men under 25 years of age. Researchers also compared self-reports of treatment completion, primary drug use, and demographic data with program records and found high levels of concordance between records and individual self-reports; for example, 92 percent agreed on whether a client completed the prescribed treatment.

Variation in Program Operations and Client Factors Makes Comparisons Difficult

Research results often do not account for the tremendous variation in program operations, such as differences in standards of treatment, staff levels and expertise, and level of coordination with other services. For example, surveys of the dosages used in methadone maintenance programs have shown that a large proportion of programs use suboptimal or even subthreshold dosages, which would likely result in poorer treatment outcomes than those of programs that provide optimal dosage levels to their clients. Similarly, outpatient drug-free programs operate with different numbers and quality of staff and have varying levels of coordination with local agencies that offer related services that are generally needed to support recovering abusers. An outpatient drug-free

²¹We have reported on the limitations of using self-reported data in estimating the prevalence of drug use. We concluded that hair testing merited further evaluation as a confirmatory measure. See *Drug Use Measurement: Strengths, Limitations, and Recommendations for Improvement* (GAO/PEMD-93-18, June 25, 1993).

program that has close ties with local services, such as health clinics and job training programs, is likely to have better treatment outcomes than a program without such ties.

Assessing treatment effectiveness is also complicated by differences in client factors. Researchers recognize that client motivation and readiness for treatment, as well as psychiatric status, can significantly affect the patient's performance in treatment. For example, unmotivated clients are less likely than motivated ones to adhere to program protocols and to continue treatment. In studies of pharmacotherapy for opiate addiction, researchers have found that patients with high motivation to remain drug-free—such as health professionals, parolees, and work-release participants—have better treatment outcomes.²²

Studies Indicate Benefits From Treatment, but Evidence Varies on Best Approaches for Specific Groups

Major studies have shown that drug treatment is beneficial, although concerns about the validity of self-reported data suggest that the degree of success may be overstated. In large-scale evaluations conducted over the past 20 years, researchers have concluded that treatment reduces the number of regular drug users as well as criminal activity. In addition, these studies demonstrate that longer treatment episodes are more effective than shorter ones. Research also indicates that the amount and strength of evidence available to support particular treatment approaches for specific groups of drug abusers vary.

Consistent Evidence Shows Drug Treatment Is Beneficial, but Outcomes May Be Overstated

Numerous large-scale studies that examined the outcomes of treatment provided in a variety of settings have found drug treatment to be beneficial. Clients receiving treatment report reductions in drug use and criminal activity, with better treatment outcomes associated with longer treatment duration. However, studies examining the validity of self-reported data suggest that a large proportion of individuals do not report the full extent of drug use following treatment. Therefore, the findings from these major studies of treatment effectiveness—all of which relied on self-reported data as the primary data collection method—may be somewhat inflated.

²²Much research has focused on the issue of matching patients to treatment with the goal of providing the most appropriate and highest quality care, while maximizing cost-efficiency by providing the least expensive effective treatment. However, research suggests that patient variables such as sociodemographics and drug use history have not been predictive of success in one treatment versus another. More recent research is focusing on program factors, including the services provided and the ability of programs to retain clients in treatment, since longer treatment episodes have consistently been associated with better outcomes.

Major Studies Report Reductions in Drug Use and Crime Following Treatment

Comprehensive analyses of the effectiveness of drug treatment have been conducted by several major studies over a period of nearly 30 years: DATOS, NTIES, TOPS, and the Drug Abuse Reporting Program (DARP) (see table 4). These large, multisite studies were designed to assess drug abusers on several measures before, during, and after treatment. These studies are generally considered by the Institute of Medicine and the drug treatment research community to be the major evaluations of drug treatment effectiveness, and much of what is known about typical drug abuse treatment outcomes comes from these studies.

Table 4: Characteristics of Major Drug Treatment Studies

Study	Study period ^a	Number of programs	Number of clients	Follow-up interval after treatment	Treatment approach/setting ^b	Research organization(s)	Research sponsor
DATOS	1991-93	99	10,010	1 year ^c	R(LT), MM, ODF, R(ST)	Research Triangle Institute	NIDA
NTIES	1993-95	78 ^d	4,411	1 year	MM, C, R(LT), R(ST), ODF	National Opinion Research Center at the University of Chicago; Research Triangle Institute	SAMHSA
TOPS	1979-81	41	11,750	1 year, 2 years, 3-5 years	R(LT), MM, ODF	Research Triangle Institute	NIDA
DARP	1969-73	52	44,000	1 year, then 3-12 years	TC, MM, ODF, D	Institute of Behavioral Research at Texas Christian University	National Institute of Mental Health ^e

^aClients were accepted into the study program during these years.

^bKey: C = correctional, D = detoxification, MM = methadone maintenance, ODF = outpatient drug-free, R(LT) = long-term residential, R(ST) = short-term residential, RSM = residential "social model," and TC = therapeutic community.

^cAdditional follow-up to determine long-term outcomes is planned through the DATOS cooperative, a set of agreements between NIDA and three collaborating research sites.

^dIncludes evaluations of facilities supported by the Center for Substance Abuse Treatment within SAMHSA.

^eDARP was transferred to NIDA when that agency was created in 1974.

Source: See appendix for bibliographic references.

These federally funded studies were conducted by research organizations independent of the groups operating the treatment programs being

assessed. Although the characteristics of the studies vary somewhat, all are based on observational or quasiexperimental designs. The most recently completed study, DATOS, is a longitudinal study that used a prospective design and a repeated-measures methodology to study the complex interactions of client characteristics and treatment elements as they occur in typical community-based programs.²³ NTIES, completed in March 1997, was a congressionally mandated, 5-year study that examined the effectiveness of treatment provided in public programs supported by SAMHSA.

All of these studies relied on self-report as the primary data collection method. That is, drug abusers were interviewed prior to entering treatment and again following treatment, and asked to report on their use of illicit drugs, their involvement in criminal activity, and other drug-related behaviors. As described previously in this report, studies examining the validity of self-reported data suggest that many individuals do not report the full extent of drug use following treatment.²⁴ Since results from the major studies of treatment effectiveness were not adjusted for the likelihood of underreported drug use (as revealed by urinalysis substudies), the study results that follow may overstate reductions in drug use achieved by drug abusers. Researchers contend that the bias in self-reports on current drug use is greater than the bias in self-reports on past year use and that therefore the overall findings of treatment benefits are still valid.

Each of these major studies attributed benefits to drug treatment when outcomes were assessed 1 year after treatment. They found that reported drug use declined when clients received treatment from any of three drug treatment approaches—residential long-term, outpatient drug-free, or outpatient methadone maintenance—regardless of the drug and client type.²⁵ As shown in table 5, DATOS, the study most recently completed,

²³The DATOS researchers note that this research methodology provides more rigorous evidence than is provided by simple observational design. In addition to descriptive information on clients when they enter treatment and their behaviors before, during, and after treatment, “the prospective cohort research design also provides strong support for evaluative and causal inferences.” See Patrick M. Flynn and others, “Methodological Overview and Research Design for the Drug Abuse Treatment Outcome Study (DATOS),” *Psychology of Addictive Behaviors*, Vol. II, No. 4 (1997), p. 233.

²⁴A large percentage of the clients participating in these studies were involved with the criminal justice system. For example, 56 percent of DATOS clients reported being on probation or parole or awaiting trial when they entered treatment, and 31 percent were referred into treatment by the courts. Research suggests that self-reported data tend to be the least reliable for those involved with the criminal justice system.

²⁵In 1990, the Institute of Medicine concluded there was no evidence to suggest that hospital-based chemical dependency programs, a type of inpatient treatment, were either more or less effective than chemical dependency programs not situated in hospitals.

found that the percentage of individuals reporting weekly or more frequent drug use or criminal activity declined following treatment.

Table 5: Percentage of DATOS Clients Reporting Regular Drug Use and Criminal Activity Before and After Treatment

	Year prior to treatment	Year following treatment
Heroin users in outpatient methadone treatment ^a	89.4	27.8
Cocaine users in long-term residential treatment	66.4	22.1
Cocaine users in outpatient drug-free treatment	41.7	18.3
Predatory illegal activity by clients in long-term residential treatment ^b	40.5	15.9

Note: In separate multivariate analyses, lower levels of drug use and crime for people in treatment for 3 months or more, when compared with those in treatment for less than 3 months, were shown to be statistically significant (that is, not likely to have occurred by chance alone).

^aLower levels of heroin use among people still in treatment during the follow-up year were statistically significant.

^bLess criminal activity among people in long-term residential treatment for 6 months or more was statistically significant.

Source: Robert L. Hubbard and others, "Overview of 1-Year Follow-Up Outcomes in the Drug Abuse Treatment Outcome Study (DATOS)," *Psychology of Addictive Behaviors*, Vol. II, No. 4 (1997).

Previous studies found similar reductions in drug use. For example, researchers from the TOPS study found that across all types of drug treatment, 40 to 50 percent of regular heroin and cocaine users who spent at least 3 months in treatment reported near abstinence during the year after treatment, and an additional 30 percent reported reducing their use. DARP found that in the year after treatment, abstinence from daily opiate use was reported by 64 percent of clients in methadone programs, 61 percent in therapeutic communities, and 56 percent in outpatient drug-free programs. NTIES found that 50 percent of clients in treatment reported using crack cocaine five times or more during the year prior to entering treatment, while 25 percent reported such use during the year following treatment.

The major studies also found that criminal activity declined after treatment. DATOS found that reports of criminal activity declined by 60 percent for cocaine users in long-term residential treatment at the 1-year follow-up. Only 17 percent of NTIES clients reported arrests in the year following treatment—down from 48 percent during the year before treatment entry. Additionally, the percentage of clients who reported

supporting themselves primarily through illegal activities decreased from 17 percent before treatment to 9 percent after treatment. DARP found reported reductions in criminal activity for clients who stayed in treatment at least 3 months.

Longer Treatment Episodes Have Better Outcomes, but Treatment Duration Is Limited by Client Drop-Out

Another finding across these studies is that clients who stay in treatment longer report better outcomes. For the DATOS clients that reported drug use when entering treatment, fewer of those in treatment for more than 3 months reported continuing drug use than those in treatment for less than 3 months (see table 6). DATOS researchers also found that the most positive outcomes for clients in methadone maintenance were for those who remained in treatment for at least 12 months.

Table 6: Impact of Treatment Duration on Outcomes for DATOS Clients

Treatment setting and duration	Percentage reduction in the number of self-reported heroin users in the year following treatment	Percentage reduction in the number of self-reported cocaine users in the year following treatment	Percentage reduction in the number of clients reporting criminal activity in the year following treatment
Outpatient methadone			
Less than 3 months	57.7	68.2	80.8
More than 3 months	72.1	64.6	71.9
Long-term residential			
Less than 3 months	54.9	54.5	69.5
More than 3 months	81.6	82.2	78.5
Outpatient drug-free			
Less than 3 months	56.2	57.2	70.1
More than 3 months	86.4	86.8	82.5

Note: Percentage reductions are based on the number of clients reporting drug use or predatory criminal activity in the year before treatment (weighted).

Source: Hubbard and others, "Overview of 1-Year Follow-Up Outcomes in DATOS," *Psychology of Addictive Behaviors*, p. 271.

Earlier studies reported similar results. Both DARP and TOPS found that reports of drug use were reduced most for clients who stayed in treatment

at least 3 months, regardless of the treatment setting. In fact, DARP found that treatment lasting 90 days or less was no more effective than no treatment at facilitating complete abstinence from drug use and criminal behavior during the year following treatment.

Although these studies show better results for longer treatment episodes, they found that many clients dropped out of treatment long before reaching the minimum length of treatment episode recommended by those operating the treatment program. For example, a study of a subset of DATOS clients found that all of the participating methadone maintenance programs recommend 2 or more years of treatment, but the median treatment episode by clients was about 1 year. Long-term residential programs participating in DATOS generally recommended a treatment duration of 9 months or longer, while outpatient drug-free programs recommended at least 6 months in treatment; for both program types, the median treatment episode was 3 months. TOPS found that in the first 3 months of treatment, 64 percent of outpatient drug-free program clients and 55 percent of therapeutic community clients discontinued treatment. For clients receiving methadone maintenance treatment, drop-out rates were somewhat lower—32 percent—in the first 3 months.

Researchers note that drug abuse treatment outcomes should be considered comparable to those of other chronic diseases; therefore, significant dropout rates should not be unexpected. These results are similar to the levels of compliance with treatment regimens for people with chronic diseases such as diabetes and hypertension. A review of over 70 outcome studies of treatment for diabetes, hypertension, and asthma found that less than 50 percent of people with diabetes fully comply with their insulin treatment schedule, while less than 30 percent of patients with hypertension or asthma comply with their medication regimens.²⁶

Research Suggests That Outpatient Treatment Reduces Drug Use as Much as Residential Treatment, but Costs Vary Widely

A 1990 Institute of Medicine assessment of the treatment literature concluded that despite the heterogeneity of the programs and their clients, treatment outcomes are “qualitatively similar” regardless of whether treatment is provided in a residential or outpatient setting.²⁷ In 1997, an ONDCP report showed that 34 percent of clients in outpatient treatment were no longer “heavy users” following treatment, while 38 percent of

²⁶Charles O’Brien and A. Thomas McLellan, “Myths About the Treatment of Addiction,” *The Lancet*, Vol. 347 (1996), pp. 237-40.

²⁷Institute of Medicine, *Treating Drug Problems*, p. 15.

clients in residential settings reported the same.²⁸ Evidence from the recent DATOS study confirmed that reported reductions in cocaine use were similar for outpatient drug-free and residential settings when clients remained in treatment for at least 3 months. Researchers point out, however, that more severe drug abusers may receive treatment in residential treatment settings than in outpatient settings, making such comparisons difficult.

However, analysis of the data from DATOS showed mixed results on the impact of treatment on drug-related criminal activity.²⁹ Clients in long-term residential treatment for at least 6 months were significantly less likely than clients who did not complete more than 13 weeks of treatment to report engaging in an illegal activity in the year after treatment. In contrast, clients in methadone or drug-free treatment in an outpatient setting who remained for at least 6 months were not significantly less likely to report engaging in illegal activity than clients who did not complete more than 13 weeks of treatment in these settings.

Although the available evidence does not show sharp differences in outcomes, studies do show wide variation in treatment costs for inpatient and outpatient settings. A recent NTIES study found that costs per day were lowest in outpatient settings, where the average treatment period is several months. In contrast, short-term (1 month) residential treatment costs were much higher, resulting in a cost per treatment episode that was double the cost of outpatient treatment episodes. (See table 7.)

Table 7: Costs of Substance Abuse Treatment by Approach and Setting

Treatment setting	Cost for one day of treatment	Approximate treatment duration	Approximate cost for treatment episode
Outpatient methadone	\$13	300 days	\$3,900
Outpatient drug-free	15	120 days	1,800
Long-term residential	49	140 days	6,800
Short-term residential	130	30 days	4,000

Source: National Opinion Research Center at the University of Chicago and the Research Triangle Institute, NTIES Brief Report.

²⁸ONDCP, Reducing Drug Use in America (Washington, D.C.: ONDCP, Oct. 1997).

²⁹Multivariate analytic techniques were used to adjust for differences in the population characteristics of the treated and comparison groups. For these analyses, the comparison group was all clients completing 1 to 13 weeks of treatment.

Regardless of the findings of similar outcomes and great variation in costs, there is still reason to support residential treatment for certain patients. In some cases, residential treatment may be required for optimum treatment outcomes, such as for drug abusers with severe substance-related problems, those who have failed in outpatient treatment, or those with severe psychosocial impairments. In contrast, patients with greater psychosocial stability and less substance-related impairment appear to benefit most from nonhospital and nonresidential treatment.³⁰

Evidence Varies on the Best Treatment Approaches for Specific Groups of Drug Abusers

Research provides strong evidence to support methadone maintenance as the most effective treatment for heroin addiction. However, research on the most effective treatment interventions for other groups of drug abusers is less definitive. Promising treatment approaches for other groups include cognitive-behavioral therapy for treatment of cocaine abuse and family-based therapy for adolescent drug users.

Research Supports Methadone Maintenance as the Most Effective Treatment for Heroin Addiction

A number of approaches have been used in treating heroin addiction. Methadone maintenance, however, is the treatment most commonly used, and numerous studies have shown that those receiving methadone maintenance treatment have better outcomes than those who go untreated or use other treatment approaches—including detoxification with methadone.³¹ Methadone maintenance has been shown to reduce heroin use and criminal activity and improve social functioning. HIV risk is also minimized, since needle usage is reduced. Proponents of methadone maintenance also argue that reductions in the use of illicit drugs and associated criminal behavior help recovering drug abusers focus on their social and vocational rehabilitation and become reintegrated into society.³²

³⁰Mim J. Landry, *Overview of Addiction Treatment Effectiveness* (Washington, D.C.: HHS, SAMHSA, Office of Applied Studies, 1997), pp. iv-v.

³¹The Institute of Medicine noted that “the most convincing results about the efficacy of methadone maintenance . . . come from a handful of clinical experiments that are widely separated in time and place but that consistently yield very distinctive findings. In these studies, heroin-dependent, heavily criminally involved populations who were randomly assigned to methadone maintenance or a control condition (an outpatient nonmethadone modality) demonstrated clinically important and statistically significant differences in favor of methadone on the gauges of drug use, criminal activity, and engagement in socially productive roles such as employment, education, or responsible child rearing.” See Institute of Medicine, *Treating Drug Problems*, p. 143.

³²Experts recognize that a large percentage of patients in methadone programs are also cocaine users. One study found that 39 percent of patients reported having used cocaine prior to methadone treatment; while in methadone treatment, cocaine use varied widely.

However, outcomes among methadone programs have varied greatly, in part because of the substantial variation in treatment practices across the nation. Many methadone clinics have routinely provided clients dosage levels that are lower than optimum—or even subthreshold—and have discontinued treatment too soon. In late 1997, an NIH consensus panel concluded that people who are addicted to heroin or other opiates should have broader access to methadone maintenance treatment programs and recommended that federal regulations allow additional physicians and pharmacies to prescribe and dispense methadone.

Similarly, several studies conducted over the past decade show that when counseling, psychotherapy, health care, and social services are provided along with methadone maintenance, treatment outcomes improve significantly. However, the recent findings from DATOS suggest that the provision of these ancillary services—both the number and variety—has eroded considerably during the past 2 decades across all treatment settings. DATOS researchers also noted that the percentage of clients reporting unmet needs was higher than that in previous studies.

There are other concerns associated with methadone maintenance. For example, methadone is often criticized for being a substitute drug for heroin, which does not address the underlying addiction. Additional concerns center on the extent to which take-home methadone doses are being sold or exchanged for heroin or other drugs.

Cognitive-Behavioral Treatments Show Promise for Cocaine Addiction

Evidence of treatment effectiveness is not as strong for cocaine addiction as it is for heroin addiction. No pharmacological agent for treating cocaine addiction or reducing cocaine craving has been found. However, an accumulating body of research points to cognitive-behavioral therapies as promising treatment approaches for cocaine addiction.

In an earlier report, we noted that treatments used for other drug dependencies, such as methadone maintenance, have not proven useful for treating cocaine dependency.³³ Although a number of pharmacotherapies have been studied and some have proven successful in one or more clinical trials, no medication has demonstrated substantial efficacy once subjected to several rigorously controlled trials. Nor has any medication used in combination with one or more cognitive-behavioral therapies proven effective in enhancing cocaine abstinence. Researchers

³³Cocaine Treatment: Early Results From Various Approaches (GAO/HEHS-96-80, June 7, 1996).

are hopeful, however, that a pharmacological agent for treating cocaine addiction will be developed.³⁴

Without a pharmacological agent, researchers have relied on psychotherapeutic approaches to treat cocaine addiction. Studies have shown that clients receiving three cognitive-behavioral therapies have demonstrated prolonged periods of abstinence and high rates of retention in treatment programs. The cognitive-behavioral therapies, based largely on counseling and education, include (1) relapse prevention, which focuses on teaching clients how to identify and manage high-risk, or “trigger,” situations that contribute to drug relapse; (2) community reinforcement/contingency management, which establishes a link between behavior and consequence by rewarding abstinence and reprimanding drug use; and (3) neurobehavioral therapy, which addresses a client’s behavioral, emotional, cognitive, and relational problems at each stage of recovery.

These programs have shown promise in curbing drug use. One relapse prevention program showed cocaine-dependent clients were able to remain abstinent at least 70 percent of the time while in treatment. A community reinforcement/contingency management program showed that 42 percent of the participating cocaine-dependent clients were able to achieve nearly 4 months of continuous abstinence, while a neurobehavioral program showed that 38 percent of the clients were abstinent at the 6-month follow-up.

Family Therapy Is Under Study for Adolescent Drug Abusers

Adolescent drug abusers are similar to adult drug abusers in that they are likely to use more than one type of illicit drug and to have coexisting psychiatric conditions. In other ways, they differ from adult drug abusers. Adolescents may have a shorter history of drug abuse and thus less severe symptoms of tolerance, craving, and withdrawal. In addition, they usually do not show the long-term physical effects of drug abuse. Despite a number of studies on the topic, little is known about the best way to treat adolescent drug abusers. Researchers believe that adolescents have special treatment needs; however, research has not shown any one method or approach to be consistently superior to others in achieving better treatment outcomes for adolescents. Among the wide variety of

³⁴For example, in recent animal research, a new immunization procedure has demonstrated positive effects in blocking the stimulant effects of cocaine. When vaccinated, rats produced antibodies that acted like biological “sponges” or blockers, diminishing by more than 70 percent the amount of cocaine reaching the brain. NIDA has reported that the cocaine vaccine project was expected to have begun human studies in the first quarter of 1998.

treatment approaches and settings used for adolescents, family-based therapies show promise.

Historically, adolescents have been referred to residential treatment settings, which may range from group-home living with minimal professional involvement to a setting that provides intensive medical, psychiatric, and psychosocial treatment 24 hours a day. Experts now recognize that many adolescents can be successfully treated in an outpatient treatment setting, where treatment may range from less than 9 hours per week to regular sessions after school to intensive day programs that provide more than 20 hours of treatment per week. Although not thoroughly evaluated, pharmacotherapy may also be used to treat adolescent drug abuse. Researchers believe that self-help or peer support groups, such as Alcoholics Anonymous, are important adjuncts to treatment for adolescents.

The relative effectiveness of alternative approaches for treating adolescents remains uncertain.³⁵ An earlier study of adolescents found that residential treatment resulted in more substantial and consistent reductions in drug use, drug-related problems, and illegal activity than did outpatient drug-free programs.³⁶ In contrast, the American Academy of Child and Adolescent Psychiatry acknowledged in its 1997 treatment practice parameters that research on drug treatment for adolescents has failed to demonstrate the superiority of one treatment approach over another.³⁷ Studies show that success in treatment seems to be linked to the characteristics of program staff, the availability of special services, and family participation.

Many experts believe that family-based intervention shows promise as an effective treatment for adolescent drug abusers. Family-based intervention is based on the assumption that family behaviors contribute to the adolescent's decision to use drugs. Many researchers believe that family interventions are critical to the success of any treatment approach for adolescent drug abusers, since family-related factors—such as parental

³⁵As a component of the DATOS study, the Research Triangle Institute is gathering information on treatment outcomes for 3,300 adolescents in treatment at 30 programs in six cities. Results have not yet been reported.

³⁶These findings result from a study of a subset of TOPS clients, consisting of 375 participants aged 19 or below.

³⁷Oscar Bukstein, M.D. (principal author) and the Washington Group on Quality Issues, "Practical Parameters for the Assessment and Treatment of Children and Adolescents With Substance Use Disorders," *Journal of the American Academy of Child and Adolescent Psychiatry*, Vol. 36, No. 10, Supplement, Oct. 1997, pp. 1405-1565.

substance use, poor parent-child relations, and poor parent supervision—have been identified as risk factors for the development of substance abuse among adolescents. Family relationships may be the primary target for intervention or one of many target areas. A 1995 literature review suggests that family intervention can engage and retain drug abusers and their families in treatment, significantly reducing drug use and related areas of problem behavior.³⁸ Further, a 1997 meta-analysis and literature review held family therapy to be superior to other treatment modalities.³⁹ However, NIDA points out in a soon-to-be published article that further research is needed to identify the best approach to treating adolescent drug abusers.⁴⁰

Conclusions

With an annual expenditure of more than \$3 billion, the federal investment in drug abuse treatment is an important component of the nation's drug control efforts, and monitoring the performance of treatment programs can help ensure that progress toward the nation's goals is being achieved. Research on the effectiveness of drug abuse treatment, however, is highly problematic, given the methodological challenges and numerous factors that influence the results of treatment. Although studies conducted over nearly 3 decades consistently show that treatment reduces drug use and crime, current data collection techniques do not allow accurate measurement of the extent to which treatment reduces the use of illicit drugs. Furthermore, research literature has not yet yielded definitive evidence to identify which approaches work best for specific groups of drug abusers.

Agency and Other Comments

NIDA, SAMHSA, VA, and a private consultant with expertise in drug treatment issues generally acknowledged that methodological and implementation issues make the evaluation of treatment effectiveness difficult. SAMHSA and NIDA also provided extensive and helpful technical comments, which we incorporated into a substantially revised final report.

As agreed with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from the

³⁸Howard A. Liddle and Gayle A. Dakof, "Efficacy of Family Therapy for Drug Abuse: Promising but Not Definitive," *Journal of Marital and Family Therapy*, Vol. 21, No. 4 (1995), pp. 511-43.

³⁹M.D. Stanton and W.R. Shadish, "Outcome, Attrition, and Family/Couples Treatment for Drug Abuse: A Meta-Analysis and Review of the Controlled, Comparative Studies," *Psychology Bulletin*, Vol. 122 (1997), pp. 170-91.

⁴⁰Naimah Z. Weinberg, M.D., and others, "Adolescent Substance Abuse: A Review of the Past 10 Years," *Journal of the American Academy of Child and Adolescent Psychiatry* (forthcoming).

date of this letter. At that time, we will send copies to interested parties and make copies available upon request.

If you have any questions about this report, please call me at (202) 512-7119. Other contributors to this report include Rosamond Katz and Jenny Grover.

Marsha Lillie Blanton

Marsha Lillie-Blanton
Associate Director
Health Services Quality and
Public Health Issues

Contents

Letter		1
Appendix Bibliographic References for Selected Studies		36
Related GAO Products		40
Tables		
	Table 1: Federal Budget Authority for Drug Treatment Activities, by Agency, Fiscal Years 1994-99	7
	Table 2: Types of Outcome Measures Used to Assess Effectiveness of Drug Treatment	16
	Table 3: Comparison of Drug-Positive Urine Tests With Self-Reported Drug Use, NTIES Study	18
	Table 4: Characteristics of Major Drug Treatment Studies	21
	Table 5: Percentage of DATOS Clients Reporting Regular Drug Use and Criminal Activity Before and After Treatment	23
	Table 6: Impact of Treatment Duration on Outcomes for DATOS Clients	24
	Table 7: Costs of Substance Abuse Treatment by Approach and Setting	26
Figures		
	Figure 1: Distribution of Federal Drug Control Spending, Fiscal Year 1998	5
	Figure 2: Total Federal Drug Control Funding and Drug Abuse Treatment Funding, Fiscal Years 1990-98	6

Abbreviations

DARP	Drug Abuse Reporting Program
DATOS	Drug Abuse Treatment Outcome Study
HHS	Department of Health and Human Services
HIV	human immunodeficiency virus
LAAM	levo-alpha-acetylmethadol
NIDA	National Institute on Drug Abuse
NIH	National Institutes of Health
NTIES	National Treatment Improvement Evaluation Study
ONDCP	Office of National Drug Control Policy
SAMHSA	Substance Abuse and Mental Health Services Administration
TOPS	Treatment Outcome Prospective Study
VA	Department of Veterans Affairs

Bibliographic References for Selected Studies

For additional information on the four major studies that we reviewed, see the sources cited below.

Drug Abuse Treatment Outcome Study

“Drug Abuse Treatment Outcome Study (DATOS).” Psychology of Addictive Behaviors, Vol. 11, No. 4 (1997), pp. 211-323.

The National Treatment Improvement Evaluation Study

National Opinion Research Center at the University of Chicago. The National Treatment Improvement Evaluation Study—Final Report. Prepared for the Center for Substance Abuse Treatment, SAMHSA, in collaboration with the Research Triangle Institute, Mar. 1997.

Treatment Outcome Prospective Study

Hubbard, R.L. “Evaluation and Treatment Outcome.” Substance Abuse: A Comprehensive Textbook, 2nd ed. Baltimore, Md.: Williams & Wilkins, 1992, pp. 596-611.

Hubbard, R.L., and others. Drug Abuse Treatment: A National Study of Effectiveness. Chapel Hill, N.C.: University of North Carolina Press, 1989.

Ginzburg, H.M. “Defensive Research—The Treatment Outcome Prospective Study (TOPS).” Annals of the New York Academy of Sciences, Vol. 311 (1978), pp. 265-69.

Drug Abuse Reporting Program

Simpson, D.D. “Drug Treatment Evaluation Research in the United States.” Psychology of Addictive Behaviors, Vol. 7 (1993), pp. 120-28.

Simpson, D.D., and S.B. Sells, eds. Opioid Addiction and Treatment: A 12-Year Follow-up. Malabar, Fla.: Robert E. Krieger, 1990.

Simpson, D.D., and S.B. Sells. “Effectiveness of Treatment for Drug Abuse: An Overview of the DARP Research Program.” Advances in Alcohol and Substance Abuse, Vol. 2 (1992), pp. 7-29.

Related GAO Products

Drug Courts: Overview of Growth, Characteristics, and Results
([GAO/GGD-97-106](#), July 31, 1997).

Drug Control: Observations on Elements of the Federal Drug Control Strategy ([GAO/GGD-97-42](#), Mar. 14, 1997).

Substance Abuse Treatment: VA Programs Serve Psychologically and Economically Disadvantaged Veterans ([GAO/HEHS-97-6](#), Nov. 5, 1996).

Drug and Alcohol Abuse: Billions Spent Annually for Treatment and Prevention Activities ([GAO/HEHS-97-12](#), Oct. 8, 1996).

Cocaine Treatment: Early Results From Various Approaches
([GAO/HEHS-96-80](#), June 7, 1996).

At-Risk and Delinquent Youth: Multiple Federal Programs Raise Efficiency Questions ([GAO/HEHS-96-34](#), Mar. 6, 1996).

Ordering Information

The first copy of each GAO report and testimony is free. Additional copies are \$2 each. Orders should be sent to the following address, accompanied by a check or money order made out to the Superintendent of Documents, when necessary. VISA and MasterCard credit cards are accepted, also. Orders for 100 or more copies to be mailed to a single address are discounted 25 percent.

Orders by mail:

U.S. General Accounting Office
P.O. Box 37050
Washington, DC 20013

or visit:

Room 1100
700 4th St. NW (corner of 4th and G Sts. NW)
U.S. General Accounting Office
Washington, DC

Orders may also be placed by calling (202) 512-6000 or by using fax number (202) 512-6061, or TDD (202) 512-2537.

Each day, GAO issues a list of newly available reports and testimony. To receive facsimile copies of the daily list or any list from the past 30 days, please call (202) 512-6000 using a touchtone phone. A recorded menu will provide information on how to obtain these lists.

For information on how to access GAO reports on the INTERNET, send an e-mail message with "info" in the body to:

info@www.gao.gov

or visit GAO's World Wide Web Home Page at:

<http://www.gao.gov>

**United States
General Accounting Office
Washington, D.C. 20548-0001**

**Bulk Rate
Postage & Fees Paid
GAO
Permit No. G100**

**Official Business
Penalty for Private Use \$300**

Address Correction Requested

