From Morphine to Methadone: Maintenance Drugs in the Treatment of Opiate Addiction
Ernest Drucker

AUTHOR'S NOTE: The author would like to thank Ethan Nadelmann and The Lindesmith Center/ Open Society Institute for their generous support of my work as well as the members and friends of the Princeton Working Group on Drug Policy for their productive inspiration and clarity on this very complex business. And a special thanks to Norman Zinberg, who bothered to come to the Bronx. Andy Weill, whose books The Natural Mind and From Chocolate to Morphine both served as a model of clear thinking and writing about drugs and obviously in the latter case) as a basis of this chapter's title.

By the end of the 19th century, millions of Americans and Europeans were regularly using patent medicines, tonics, salves, potions, and commercially available beverages containing some combination of opiates, cocaine, and alcohol (Berridge & Edwards, 1987: Courtwright, 1985: Musto, 1987). These substances were the frontline medicines of the time-almost universally prescribed by doctors and sold over the counter by pharmacists to remedy a wide range of real and imagined maladies and to treat the pain of injuries and chronic illnesses. Their psychoactive properties were also well recognized and exploited to relieve sleep disturbances, anxiety, and depression. These drugs had been known to have these beneficial effects for centuries-in some cases (such as alcohol) for millennia-and they were among the few effective tools of early medical practice.
The great 19th-century advances of chemistry spawned the modern pharmaceutical industry (aspirin is discovered and marketed as the first "wonder drug" in 1897), and this industry quickly turned its attention to the old botanical products already in such wide use. These were reprocessed and made more widely available in highly refined and far more potent forms-among them morphine and heroin (refined from opium poppies) and cocaine (from coca leaves). In both Europe and America, these products were heavily promoted, and they quickly developed huge markets because little else was available and they had such a powerful effect on symptoms-especially the opiates for pain (as they still do). But with increased use of these potent drugs, both within medicine and without, came growing public awareness of their addictive qualities.

This growing awareness of the addictive potential of narcotics led governments to begin to regulate their production and sales. This was done with a view to continuing their useful role in medicine (e.g., as painkillers) but eliminating the open market in the many commercial products containing them. However, although the professed goal of the new drug regulations associated with the Pure Food and Drug Act (1906) and the Harrison Narcotics Act (1914) was to retain narcotics’ still singular medical benefits and minimize the problem of addiction, these regulations quickly became part of a campaign for the prohibition of all drugs.

The same period also saw a surge of popular revulsion at the problem of addiction and growing hostility toward the addict—a demonization of drugs and those who used them. These sentiments were engendered and vigorously stoked by the lurid pulp journalism of the late Victorian age, with its overheated moralistic tales of "enslavement and depravity" associated with drug use, often with racial stereotypes of drug users (e.g., the Chinese and opium). It was also a period of moral crusades aimed at extirpating all sorts of "sinful" behavior from American society. Complicating matters further, these moral campaigns were also part of a powerful (and mostly positive) historical movement of the Progressive era, promoting social betterment and public health—ideas we take for granted in developed societies, even if we often have difficulty acting upon them.

**ADDICTION**

Although the word addiction does not appear in medical usage until the mid 19th century, by that time, millions of Americans and Europeans were habitual users of
these substances. and many were considered dependent on them (Berridge & Edward,, 1987: Courtwright.

Although this group represented only a minority of all those who used these drugs. even of those who used them often, "drug addicts" (generally a pejorative term) came to occupy the most prominent place in the public debate about drugs. It was clear that dependent individuals not only used a given drug to relieve the symptoms of illness and for the beneficial effects they undoubtedly produced as painkillers. stimulants. and mood alterers, but they also came to require their regular use in order to maintain a sense of well-being, to "feel themselves." And, in the absence of these drugs, these dependent users suffered prolonged anxiety, restlessness. Sleep disturbance. and other symptoms we now call withdrawal or the "abstinence syndrome." Sometimes called "chemical dependency," drug addiction today is defined in the standard textbooks and diagnostic manuals of both medicine and psychiatry as a disease (American Psychiatric Association. 199: WHO. 1995.

THE DISEASE CONCEPT OF ADDICTION

We now know that addictive phenomena are associated with certain drug actions within the nervous system and changes that occur in the regulation of the information that nerve signals carry-known as neurotransmission (Gardner, 1993). Biologically speaking, addiction may be understood as a disorder of neurotransmission associated with the effects of such drugs (including alcohol and tobacco) on particular parts of the brain. These areas normally produce similar substances, at minute levels, that are natural versions (called ligands) of most psychoactive drugs (e.g., endorphins)-a form of the opiates. Alterations of neurotransmission involving these ligands appears to form the basis for all of the long-term and short-term effects associated with externally administered psychoactive drugs. And, in the case of addiction (according to researcher Elliot Gardner), these drugs may hijack our natural systems and begin to alter the complex and subtle processes that normally regulate neurotransmission. These changes can endure for years, and the long-lasting (chronic) nature of addiction is one of its hallmarks. This can be seen in the tenaciousness of even selfdestructive drug use that the addict sincerely wishes to stop, the great difficulty many people have in stopping, and the persistence of a felt need for the drug even after periods of complete cessation-often leading to a return to drug use (relapse).
The disease model of addiction includes the development of a very specific set of problems often associated with the regular use of certain drugs: chief among them are tolerance, withdrawal, and craving (Lowinson, Ruiz, Millman, & Langrod, 1997).

Tolerance. With the regular use of an addictive drug, some people need more and more of the drug to produce the same effect or, conversely, get less of an effect from the same dose. When opiates are used as painkillers for a long period it is frequently necessary to increase the dose to produce the same analgesic effect. The regular coffee drinker may develop tolerance to caffeine and drink several cups at night without affecting his or her sleep, whereas the nontolerant coffee drinker will be up all night from a single espresso; likewise for the cigarette smoker who develops tolerance to nicotine and smokes several packs a day. With illicit drugs (whose cost is high), tolerance drives the addict to need more of the drug and to obtain more money to get enough of the drug just to feel normal (i.e., to avoid withdrawal).

Withdrawal (abstinence syndrome). This is the other face of tolerance and a clear marker of the body's memory of drug effects. In withdrawal, a regular user reacts adversely to the absence of the drug to which he or she has become tolerant. The withdrawal from most drugs has two phases: short term (acute) and long term (chronic). Withdrawal symptoms differ for the specific drug. The coffee drinker will experience headaches (which are quickly relieved by a cup or two), whereas the heroin addict, depending on the history of use, can suffer painful cramps, itching, sweating, and emotional jumpiness (once again reliably and quickly reversed by a dose of any opiate). But for most addictive drugs, the acute stage of withdrawal is characterized by a pervasive and highly distracting unease, often accompanied by sleep disturbance and diffuse anxiety that makes it difficult to think about much besides obtaining the drug (and instant relief). When in withdrawal, the dependent user has great difficulty in resisting the drug when it is available. The power of this need is formidable: Think about the cigarette smoker who will brave a winter storm to buy a pack in the middle of the night as an indication of the strength of what is often called "drug craving."

Drug craving. If addiction can be understood as a complex set of biological cues in which the body (in essence) says, "I need this drug to feel normal," craving is the person's psychological experience and conscious awareness of that fact. It is perhaps the most important phenomenon of addiction because it moti
vates the addict so powerfully and for so long to use the drug in order to get relief. Although the use of a drug
to feel at ease or to create a sense of well-being is not alien to most of us (think of the morning
coffee or the social use of alcohol or cigarettes to relax), in the case of dependence, one does
not feel normal without regular doses. And for illicit drugs, where society demands total
abstinence and the drug is difficult and dangerous to obtain, this virtually dictates insufficient
doses and frequent periods of prolonged craving.

LIMITATIONS OF THE DISEASE MODEL

But viewing addiction as a disease is a two-edged sword—useful but potentially dangerous. Its
usefulness comes from the value of having a consistent physiological explanation of what are
clearly powerful biological phenomena. Grounded in scientific research in both pharmacology
and brain functioning. However, that is not the whole story, and our biological understanding of addiction (as a disorder of neurotransmission) does not mean that the social and psychological issues in drug use and addiction are unimportant. Indeed, in an environment freighted with powerful moral and legal reactions to the use of drugs, the stigma attached to drugs may come to be a more important factor than the biology of addiction; the demonization of drugs and the criminalization of the drug user (i.e., the war on drugs) could be more damaging to the individual and society than drug use or addiction. Despite great advances in our scientific understanding of drug actions, the view of drug use and addiction as a primarily moral (and legal) problem still persists and shapes the public discourse on their meaning. These negative perceptions powerfully determine our social and political responses to addiction—usually at the expense of the biological or disease model and of the drug user (Peele, 1990. 1993: Szasz. 1985. Thus, although the disease model may be in all of the medical textbooks, it is still not the basis of our overwhelmingly punitive response to the addict. Today, most addicts spend more time behind bars than in treatment for their "disease."

Another shortcoming of the disease model is that it easily overlooks the beneficial effects of
many of the same drugs that it calls pathogenic (i.e., that are seen as the cause of the disease
of addiction). Some form of drug use is virtually universal, and we often fail to distinguish
between drug use and abuse or addiction. Although there is the potential for many drugs to
produce adverse outcomes (among them addiction and toxic poisoning), these represent the
minority of outcomes associated with even the use of some of the most powerful drugs. such as
heroin and cocaine. And although the phenomena of addiction may be understood biologically
in a disease model, this model is much less useful for understanding the full spectrum of drug
use, which includes individual experimentation and recreational use, the highly structured and
socialized patterns of psychoactive drug use seen in many tribal peoples. and the widespread
use of alcohol in Western society. Even though alcohol use is generally accepted in our society today, we can still recognize that alcoholism is a disease and only a part (albeit an important part) of the normal pattern of use of this particular drug. At this time, we have difficulty accepting this broad range of patterns of use for the illicit drugs (like the opiates and marijuana), and we tend to forget that alcohol was prohibited in the United States from 1920 to 1934, a time when marijuana use was quite legal.

THE NATURAL HISTORY OF ADDICTION

Most users of most drugs do not become addicted to them. In the United States, it is estimated that more than 20 million people have tried heroin and that 40 to 50 million have tried cocaine, but fewer than 3% are current users. And even addiction itself can be understood in less pathological ways than the rather hopeless view implied in the (incurable) disease model.

Addiction may be conceptualized as a long-term process lasting 10 to 20 years with a predictable series of stages (a natural history). The good news is that the natural history of addiction tends toward reduction and often ends in cessation of use with middle age. At each of these stages of addiction, there are opportunities for the affected individual to reduce or entirely cease the use of the drug—and this is what occurs in the majority of cases, even without treatment. Surprising as it may seem, even among those with prolonged use of opiates and cocaine, a favorable outcome is the norm (Courtwright, Des Jarlais, & Joseph, 1989; Reinarman & Levine, 1997; Waldorf & Biernecki, 1984; Waldorf, Reinarman, & Murphy, 1991). Accordingly, many now believe that drug treatment should be oriented to take advantage of this long-term natural history of drug use and exploit the multiple opportunities that it presents for effective intervention to help the addict through a long but finite period of "disease" with minimum harm to his or her health and social well-being.

ADDICTION TREATMENT

Early in this century, a wide range of treatments for the still poorly understood problem of addiction were considered and tried, but with little success. Dependence on opiates appearing particularly intractable. Soon, it became clear that once dependency had been established, doing without these drugs was extremely difficult for many regular users. Thus began the search for medications and strategies for using them that might loosen the bonds of addiction.
At first, doctors tried to deal with the most apparent symptoms of acute withdrawal by prescribing, gradually reducing doses of opiates over a period of weeks or months. The goal here was to soften the most unpleasant symptoms of acute withdrawal as the individual moved toward an abstinence state. This is called short-term detoxification (or tapering), and it is still an important tool for helping addicts gain control over their levels of use; it is also the most common form of initial treatment. Today, we are accustomed to celebrities entering expensive rehab centers (like The Betty Ford Center) for a few weeks to dry out and clear the drugs from their system. Often, detoxification is a prelude to attempts at drug-free treatment. But as often as not, relapse occurs, and the entire cycle recurs. Thus, although this approach can help those who have a life situation supportive of abstinence and can lessen the size and destructive potential of a drug habit, it is often inadequate in the longer term to prevent craving and a return to regular use of illicit drugs, especially in the case of the long-term user of opiates.

THE CONCEPT OF NARCOTIC MAINTENANCE

Among the very first approaches attempted for long-term treatment of dependency to opiates was the provision of controlled dosages of some form of the addictive drug itself. On the face of it, giving an opiate to one already addicted to its use seems a contradiction—"like giving alcohol to an alcoholic," some say. But this analogy does not really apply to opiate addiction. Unlike alcohol (which, in sufficient dosages, almost always adversely affects the individual's health and well-being), the opiates are not themselves physiologically damaging. Indeed, it is hard to make a case for opiates as pathogens: They cause no direct harm to any major organ system, nor do they affect mental functioning; adversely if taken in the right dosages. Therefore, instead of limiting our treatment goal to abstinence, we may ask if it is possible for the opiate addict to continue to take some form of opiates on a regular basis. And if there is a natural history of opiate addiction that tends toward reduction and eventual cessation of use after many years, what may we do to ease this passage and reduce the health and social risks associated with the dependency on illicit drugs?

Despite much posturing about addiction as a moral weakness (whose sole remedy is abstinence), one alternate solution has been to reorient drug treatment toward better managing the natural course of addiction through the use of safer maintenance drugs rather than attempting to stop drug use altogether. In this approach, the goal of addiction treatment is primarily interrupting or reversing the pathological social processes that go along with heavy use of an illicit substance and eliminating the damaging consequences of an endless cycle of withdrawal and drug craving (i.e., reducing drugs' harm rather than ending their use).
Maintenance treatment attempts to replace more dangerous illegal drugs with safer legal ones that are medically prescribed. Maintenance can interrupt the progressively worsening processes of addiction by permitting the drug dependent individual to end his or her reliance on illicit drug markets (with all of their dangers), and it can effectively neutralize the most negative physiological aspects of addiction—the endless cycles of craving and avoidance of withdrawal. Maintenance can permit addicts to get on with their lives even though their addiction has not been "cured."

Long-term maintenance treatment using medications similar to the substances to which the individual is addicted (opioids) is aimed at achieving permanent abstinence from illicit opiates by transferring the dependency to a more readily controlled dosage and safer forms of legal opiates. In addition to reduced reliance on more dangerous illicit drugs, effective drug maintenance also reduces the individual's exposure to the legal risks associated with obtaining them and the health risks from illicit use of drugs of unknown purity and potency (with the dangers of overdose) and use of unsterile injecting equipment. Most heroin addicts in the United States and Europe inject the drug, and sharing needles spread; infectious diseases like AIDS and hepatitis.

NARCOTIC MAINTENANCE IN PRACTICE

In Great Britain and the United States, some doctors recognized the value of this approach and instituted narcotic maintenance treatment early in the century. The British medical profession, under the leadership of Sir Humphrey Rolleston, President of the Royal College of Physicians, took pains to articulate a set of principles for the medical provision of opiates as a humane approach to "incurable" addiction. In 1926, they set up a Royal Commission that established the right of British practitioners to prescribe any and all drugs (including heroin in its injectable form) to their patients who were addicted and unable to cease all use on their own. This British system served them well for more than 40 years until changes in the drug scene of the 1960s led to its revision and the institution of greater controls. However, in the face of the AIDS epidemic, even the Conservative government of Margaret Thatcher saw the wisdom in maintenance programs and loosened the reins on medical prescribing, which led to a threefold increase in narcotic prescribing in Great Britain. This and other public health measures (such as needle exchange) may account for the low rate of HIV infection among heroin addicts in Britain for the past 10 years—less than 10% of the U.S. rates.

By contrast, in the United States, the drug maintenance approach has a troubled past, and the
historical role of the American medical profession was less laudatory. In part, this was because American doctors were, at the time, members of a much lower-prestige profession than we know today. Furthermore, the medical profession was in large part held responsible for the problem of addiction in this country. No less a personage than Supreme Court Justice Oliver Wendell Holmes (writing in 1856) blamed the drug problem on the "constant prescription of opiates by certain doctors" (Musto, 1987, p. 328). Although many American practitioners (out of a humane motive) quietly provided these drugs to their patients as needed, others (often referred to as "dope doctors" and regularly vilified in the press) exploited these same patients' dependency, reaped substantial profits, and discredited the approach. Nevertheless, in the period 1914 to 1924, some morphine maintenance programs were established in the United States in Shreveport, Louisiana; Jacksonville, Florida; and in New York City, where more than 7,000 patients were dispensed narcotic drugs under the auspices of the city's prestigious Department of Health.

But the general public reaction to this approach was negative, and soon, American medicine sought to distance the profession from narcotic maintenance and from the problem of addiction altogether. In 1910, the American Medical Association (still in its infancy) described the provision of drugs to the addict as "immoral" and declared the condition outside of its responsibility. Accordingly, the Harrison Act (passed in 1914 to regulate the manufacture and sale of narcotics) was soon interpreted as banning the medical prescription of opiates as addiction treatment. And this view, when challenged by concerned practitioners, was upheld in the U.S. Supreme Court throughout the 1920s. The effect was to outlaw this form of medical practice and to shut down the still young and inexperienced drug maintenance treatment programs that had begun to emerge in this country.

Just as medicine became the sole legitimate source of narcotic drugs (and their previous wide public availability began to contract dramatically in the early years of the 20th century), doctors began to shy away from prescribing narcotics outside of a very narrow range of uses as painkillers. And even there, narcotics were often prescribed at inadequate doses, which is a problem that perseveres in the medical use of opiates to this day and is one of the most troubling legacies of the old negative association of medicine with these important drugs.

METHADONE

It was not until 40 years later that we would see a reemergence of these old ideas of drug maintenance treatment within U.S. medical practice and the rediscovery and legitimation of maintenance treatment. In part, this change was due to renewed alarm about the heroin
“epidemic” of the 1960s, where, for the first time in modern memory, heroin use moved out of the sequestered ethnic groups and the artistic urban bohemian subculture and jazz scenes that had for decades characterized drug use in American society. Working in New York’s Harlem, Dr. Marie Nyswander (a young psychiatrist and jazz fan) was trying to help her addict patients, often prescribing (unorthodoxly) various opiate compounds to help them gain control of their use of illicit heroin. She was soon joined by Dr. Vincent Dole, a well-respected metabolic researcher at the prestigious Rockefeller University and New York Hospital. Together, they pioneered the use of a particular form of synthetic opiate, called Levoacetylate (methadon, or methadone), for narcotic maintenance.

Methadone is a synthetic drug having the same basic molecular structure as heroin and all naturally occurring opiates. As a long-term maintenance drug, however, methadone has two important advantages over heroin that make it well suited for maintenance prescription: It can be given orally, and it is long, lasting-24 to 36 hours for a single dose, compared to 2 to 3 hours for heroin (Ball & Ross, 1991; Newman, 1977).

A series of careful studies of methadone maintenance soon demonstrated that it did not lead to escalating tolerance and could therefore be used to achieve a stable daily dose without the ups and downs of shorter acting opiates like heroin or morphine—especially when these are taken in uncertain doses and unpredictable schedules. This meant that a single daily oral dose of an inexpensive medication could eliminate withdrawal, narcotic craving, and the destructive need for illegal heroin. Importantly, in the proper dose for an already tolerant user, methadone did not produce intoxication (a high). This permitted relatively normal functioning, despite the fact that the user was taking large daily doses of a narcotic that would affect a nontolerant individual profoundly, perhaps even lethally.

Given the American medical profession’s long antagonism to maintenance prescribing, the initial demonstration of the clinical efficacy of methadone had to convince the most skeptical of audiences. Accordingly, the first clinical trials of methadone selected the worst cases: several hundred heroin addicts who had tried every other option and had repeatedly become drug free. Most had 10 years or more of addiction, five or more previous treatment failures, and a multitude of problems linked to the criminalization of their addiction (i.e., long prison records, failed work histories, and shattered families). If methadone could help these hard-core addicts, it was reasoned, it would be taken seriously in America.

The initial results were spectacular—more than 90% retention in treatment and the virtual
cessation of heroin use. The first was critical because staying in the program is the necessary prerequisite to a positive outcome in any form of chronic treatment. Second, these patients' maintenance on methadone made the use of illicit opiates unnecessary, and the use of street heroin quickly dropped to virtually zero. At the levels of methadone dosage used in maintenance (60 to 120 mgs per day), the corresponding level of tolerance meant that street doses of heroin (generally smaller in dose) had little effect and would be a waste of money. After a few attempts to use heroin, methadone patients quickly came to realize that because their narcotic tolerance had adjusted to the often higher dosages and regular administration of methadone, a "narcotic blockade" had been created, and they stopped buying and using heroin. Arrest rates dropped precipitously because there was no longer a need to engage in acquisitive crime to get money for illicit drugs. More critically, as they began to relocate their source of drugs from the street drug scene to the clinic, and shift their dependency from illegal to prescribed drugs, addicts began to reorient their lives away from drug seeking and back to the worlds of family, work, and the community (i.e., to "get a life").

The landmark clinical trial of methadone maintenance (first published in the Journal of the American Medical Association in 1964) captured widespread public attention. This led to its rapid acceptance and to a certain amount of oversell (i.e., methadone as a miracle cure). But the results of Nyswander and Dole's first series of clinical studies firmly established methadone maintenance as safe, effective, and feasible for large scale implementation—indeed, this success was recognized by the award of the prestigious Lasker prize for its discovery. In the late 1960s, the United States saw a rapid expansion of methadone maintenance treatment programs, with clinics opening in dozens of cities and more than 75,000 patients in treatment by 1975 (115,000 by 1992). Today, methadone is the preeminent and (still) most successful treatment for heroin addiction, ending 40 years of therapeutic "nihilism" about addiction treatment in this country.

**HOW METHADONE TREATMENT WORKS**

The Patients
Methadone treatment is meant for adults who have used opiates continuously for at least 2 years and wish to stop its use. Most commonly, heroin is the drug upon which they have become dependent, but methadone is appropriate treatment for dependency to any narcotic (Preston. 1996. Ward. Mattick. & Hall, 1992).

The Treatment Program

In the United States, methadone treatment is organized around specialized methadone maintenance treatment programs (MMTPs), which are clinics (both public and private) that treat anywhere from 100 to 700 patients. These methadone clinics are mandated by federal and state regulations to provide counseling and social services, and some (a minority) also provide medical services. However, the main business is getting each patient the correct daily dose of methadone. Although methadone is long lasting (relative to heroin), missing a day's dose (or two) will destabilize a patient's blood level of the drug and may precipitate withdrawal. Accordingly, reliable access to the medication at the correct dose is the essential feature of methadone maintenance. Patients generally come into the clinic between one and seven times per week (the average is three to four), where they take the day's dose and get take-home doses for the other days of the week.

New patients' dosages are slowly built up over a few days or weeks to maintenance levels that may vary depending on the level of use of opiates on the street in the previous period of use and metabolic differences between individuals. The recommended minimal dose (by the FDA and N IDA) is 60 mg per day. The pharmacological objective is to find and establish a stable blood level of methadone such that the patient is neither too high (intoxicated) nor too low (in withdrawal). Study after study indicates clearly that when this proper dosage level is found and maintained, there is a precipitous and enduring decrease in heroin use.

Effect on the Abuse of Other Drugs

Methadone has no directly analogous effect on drugs other than the opiates, but by helping the heroin addict to leave the drug scene, the use of methadone often leads to reduction in use or abstinence from other drugs. However, the heroin addict on methadone can still use cocaine or alcohol or marijuana and experience their effects fully. Random urine tests (originally used to verify that the patient was, in fact. taking his or her methadone) have come to be used to detect the concurrent use of other illicit drugs: in the United States, concurrent use can be grounds for dismissal from treatment and withdrawal from methadone.
Medical Care

Methadone is a potent narcotic, and careful monitoring and a close clinical relationship between doctor and patient is essential to its proper use. Side effects may include sweating, constipation, and sexual dysfunction—all of which are also evident in heroin use—and the prescribing physician must be sensitive to the patient's experience with the medication and be prepared to alter dosage as needed. Methadone may be safely continued during pregnancy, but there is some disagreement over dosages. However, reflecting a widespread belief by both women in treatment and many of the caregivers (who should know better) that more methadone is "bad," some expectant mothers are persuaded to cut down their dose—a decision that often leads to using other, more dangerous drugs to compensate for the inadequate dosage of methadone. The many medical problems associated with heroin addiction dictate a closer integration of methadone treatment with routine and specialized medical care. For example, modern AIDS care involves complex and changing medical needs, and some of the most common tuberculosis drugs appear to affect the metabolism of methadone (which is highly variable from individual to individual anyway). For example, patients taking one tuberculosis drug (Rifampin) may need their methadone dosage doubled.

Ending Methadone Treatment

At the present time, we have no medical cure for addiction (in the narrow, biological sense). But methadone is a vastly preferable way to take a class of drugs upon which so many are dependent, thus allowing users to live normal lives and to stop using heroin. From this perspective, getting off methadone is not a goal of methadone treatment, any more than getting a successfully managed diabetic off a regime of insulin is the correct treatment goal for that condition. Studies following even the most successful methadone patients (i.e., those who have readjusted to community life, job, and family) have determined that many of these patients relapse to use of heroin-experiencing debilitating craving despite years of successful maintenance and very gradual tapering off. This is a testament to the long and tenacious grip of opiate addiction. On the other hand, fully 25% of admissions to methadone treatment are individuals who have been in methadone treatment in the past—often several times. In New York State, which has more than 40,000 patients in an MMTP system established in the 1960s, more than 120,000 different patients have used methadone at some point in their long struggle with opiate addiction. This suggests that, over time, many methadone patients do, in fact, become drug free, using methadone as a tool for achieving total abstinence from opiates. This is
powerful evidence of the eventual assertion of the natural history of addiction and its trend toward reduction of dependency with age.

**SNATCHING DEFEAT FROM THE JAWS OF VICTORY**

Although the United States was the pioneer in establishing methadone treatment, old attitudes that were hostile to maintenance approaches were never totally abandoned in America and soon began to reassert themselves with methadone as the target. It is important to realize that in addition to creating methadone treatment, the United States was also the birthplace and is still the spiritual center and home of the worldwide movement of drug-free therapeutic communities (TCs). Programs such as Synanon, Phoenix and other self-help approaches draw on the peer group and 12-step methods of Alcoholics Anonymous--programs that sprang up in America in the face of the vacuum in medical services for addiction. Total abstinence from the use of all mind-altering drugs was the principal goal of treatment and the only acceptable terms for drug users' participation. A sharp division between this philosophy and methadone maintenance increasingly took its toll on the conception and practice of drug treatment in this country. And because of the inordinate U.S. influence in international narcotics matters, this polarization was also replicated in treatment services abroad.

The dominance of this drug-free abstinence orientation grew further under the auspices of the U.S. war on drugs. This moral crusade soon found a natural ally in the TCs and among recovering addicts, who often became the most articulate and persuasive spokespeople for the "lust Say No" approach. Its founding principle was the "evil of drugs" and the demonization of drug users, and this view soon undermined the credibility of methadone in this country. Although the successful methadone patient generally kept it a secret, the worst cases were all too evident around their overly large and often conspicuous clinics in the midst of some of our nation's most embattled communities. Methadone treatment was commonly and publicly held in contempt. and an urban folklore of methadone's evil qualities soon became the conventional wisdom in the drug treatment world. Subsequent cutbacks in the funding of addiction treatment in the urban health centers that had originally sponsored many of the first methadone treatment clinics, as well as its continued marginalization within medicine, all contributed to methadone's problems in the United States.

Predictably, the quality of methadone treatment began to suffer. This could be seen in the steady lowering of dosages, below therapeutically recommended levels, and in the increasingly punitive and controlling character of many MMTPs, which were often large clinics of the inner city that became associated with concentrations of unemployed and (often) still-active users of other illicit drugs. When the crack epidemic arrived, in the mid to late 1980s, it amplified the role
of sex and drugs in the AIDS epidemic and produced a whole new group of drug users with particularly difficult-to-treat patterns of compulsive cocaine use. Crack also served to reinforce the strong attitudes already antagonistic to the use of methadone and further distracted attention from the treatment needs of the much older cohort of heroin addicts. The once rapid expansion of MMTPs in the United States ground to a halt, and stagnation set in; there has been little growth or innovation of methadone treatment in the United States since the 1970s.

Unfortunately, all of the old prejudices and antagonisms toward drug maintenance are still evident in the regulation of methadone maintenance in the United States. Methadone treatment is subject to many influences beyond the purely clinical responsibilities of getting the patient the right daily dose. Thus, a law enforcement agency (the DEA) rather than a health care agency controls many important aspects of the treatment program--and a set of government regulations, some of which are inordinately punitive, still governs methadone treatment in the United States. In response to this domination of methadone treatment by nonmedical forces, the National Association of Methadone Advocates (NAMA) was formed in 1980. It has been long in coming, but an active consumers' group of methadone patients and their advocates now exists that is fighting to normalize methadone treatment in the United States.

HARM REDUCTION: AIDS AND THE REINVENTION OF METHADONE

In the early 1980s, the AIDS epidemic appeared in the United States, Europe, Asia, and the Pacific--immediately changing the significance of drug use and addiction (Mann & Tarantola, 1997). Although it had always been true that drug addiction and public health were linked, the appearance of AIDS set the stage for a reconsideration of injection drug use and addiction, now seen as a method of spreading AIDS, and a reconsideration of drug treatment as a tool of AIDS prevention. This led to the birth of harm reduction, which was the modern public health model for dealing with addiction as a global public health problem. Harm reduction offers an alternative to abstinence as the sole objective of drug treatment. With harm reduction, the goal is the prevention of collateral health and social damage associated with drug use as well as the limitation of the other medical conditions that rampant and poorly treated addictions foster--especially AIDS and other infectious diseases hepatitis) associated with sharing injection equipment and other sexually transmitted diseases via prostitution by addicts. Methadone has emerged as the ideal tool for harm reduction among heroin addicts (Erickson, Riley, Cheung, & O'Hare, 1997; Heather, Wodak, Nadelmann, & O'Hare, 1993: O'Hare, Newcombe, Buning, &
In the case of AIDS, it soon became clear that drug addiction was the ignition point of a worldwide chain of transmission from addict to sex partner to newborn-a cycle that has already demonstrated the capability for the explosive spread of HIV in many areas around the world and especially the cities of the United States and Europe and throughout Asia, where this pattern was occurring in new populations for whom intravenous drug use had never been an issue. Faced with a burgeoning global heroin trade of huge proportions, and despite decades of massive expenditures on interdiction (supply reduction), the support of corrupt regimes (narcodictatorships), and the wholesale incarceration of drug users (up 400% in the United States since 1970), many governments and their public health and medical officials have realized the risk and adopted harm reduction as their national AIDS prevention strategy-with the notable exception of the United States.

Whereas the United States had embraced methadone maintenance early, other countries were slower to accept it, and it often faced prejudices similar to those of morphine maintenance in the United States during the 1920s. But in Great Britain, methadone maintenance was widely adopted in addiction treatment and was even provided in injectable forms in some instances. Hong Kong, which had no history of addiction treatment other than the residuals of the old Communist regimes approach and had brutally suppressed the drug trade and its addicts, as well as several other former British Commonwealth states (e.g., Australia, Canada, and New Zealand), also instituted modest methadone programs under state health department auspices. But continental Europe, with a few exceptions, had resisted the use of methadone, often at the insistence of their psychiatric associations-in Germany, France, and Belgium, its use by nonpsychiatrists was barred by law-and most psychiatrists disapproved of the maintenance approach.

NEW DIRECTIONS IN MAINTENANCE TREATMENT

The experience of the AIDS epidemic among injection drug users in the United States (which was fully documented in thousands of studies) served to alert health authorities around the world to the link of drugs to AIDS. Soon, they began to massively expand treatment programs for the addictive disorders, which differed greatly from place to place. However, most European and many Asian countries already had developed substantial heroin-using populations, and their health ministries and public health authorities rediscovered methadone, which was still the most effective and well-proven treatment available for heroin addiction.
The period 1985 to 1995 was the first decade of the AIDS epidemic among drug users in these parts of the world, whereas in the United States, HIV had entered the population in the mid 1970s. In response to this threat to public health, many countries instituted the rapid expansion of methadone treatment. Australia increased its availability of methadone tenfold, and in the Netherlands, methadone treatment services today reach more than 70% of Dutch addicts (compared to less than 15% in the United States). In addition to increases in treatment capacity, the international public health community developed new ways to improve the reach and efficacy of methadone treatment by breaking with the narrow, one-size-fits-all methadone clinic as the sole way of using this medication. A key step was the inclusion of methadone treatment as a part of the care rendered by primary care doctors within routine practices or medical clinics. In Europe and Australia today, the majority of methadone is prescribed by an ordinary doctor and dispensed by an ordinary pharmacy. In addition, new ways were devised to reach those who did not want to come to clinics but did want to use methadone to help control their addiction. Low-threshold approaches, such as The Methadone Bus in Amsterdam, extended treatment to new groups of addicts.

A recent study in Leicester, England suggests the direction that addiction treatment using maintenance drugs may take in the future-combining the pharmacological supports of maintenance drugs with the environment and psychological rehabilitation aspects of many drug-free programs. In this case, a therapeutic community, where no maintenance drugs were used, introduced methadone within the framework of the residential program. Whereas the program previously had a dropout rate of more than 60% (much of it in the first few months of the stay, when drug craving would be at its peak), retention jumped to more than 80% when maintenance doses of methadone were introduced. This example demonstrates that maintenance approaches can be used to support a range of treatment goals, including the more comprehensive life changes and rehabilitation that so many stigmatized and criminalized addicts now need, as much in response to our punitive and cruel reactions to their addiction as to any properties of heroin or of their biological dependency.

Furthermore, new forms of maintenance treatment for the opiates (and some other drugs) are emerging from the growing clinical experience with addiction treatment outside of the United States, fueling renewed confidence in medicine’s ability to help control the worst aspects of addiction with the help of a range of medications-most of which are already available. Thus, in Germany (which, a decade ago, imprisoned physicians for prescribing methadone), methadone clinics now serve 5,000 patients. More than 200 physicians maintain another 25,000 addicts on oral codeine syrup, which is a shorter acting opiate than methadone (i.e., one that is easier for the user to titrate, or control, the dosage according to his or her perceived need, as with any mood-altering medications). France, which had only 50 patients on methadone in 1990, now has 5,000 in care and another 5,000 coming in the next 2 years. Furthermore, many French physicians are now learning how to prescribe buprenorphine—a complex oral opiate that has both maintenance (agonist) and blocking (antagonist) actions that some doctors and their
From Morphine to Methadone
Written by Ernest Drucker

patients are finding helpful.

And in Switzerland (which has the highest AIDS rate in Europe), a bold experiment of injectable heroin maintenance is now in its second year, with more than 1,000 patients being seen in 20 clinics operated by the national Health Ministry. The program's careful evaluation already tells us that these patients are doing as well as Nyswander and Dole's first methadone patients in New York City, to whom they compare in terms of their long addiction histories and multiple treatment failures. But in this case, these are patients who had also tried methadone and still continued to use heroin. The preliminary studies of these patients indicates a high success rate as measured by retention in treatment (more than 80%) and a sharp reduction in their use of illicit drugs, with associated improvements in their reintegration into normal life (i.e., work, home, and family)-all while injecting an average of 400 mg of pharmaceutical heroin up to three times a day within a clinic setting.

CONCLUSIONS

Today, our scientific knowledge places us on the threshold of a comprehensive understanding of the neurophysiology of all drugs' actions in the brain and the biological basis of addiction. We are also beginning to understand potential genetic differences in susceptibility to addiction, which may explain, in part, why only a small minority of those who try these drugs become dependent upon them. These developments and important advances in pharmacology prefigure the development of a multitude of new and exquisitely specific psychoactive agents (Prozac is one of the first of these new drugs) that will someday help us to better treat and perhaps even "cure" addiction. But as long as we continue to view drug addiction primarily as a moral or psychological failing, rather than as a disorder of neurotransmission, we will continue to be handicapped in our ability to appreciate its biological reality and to fully employ the best tools of clinical medicine and public health that are at our disposal to minimize opiates' potential harms and take full advantage of their many real benefits. Until then, narcotic maintenance treatment offers a powerful tool for reducing the harms of opiate addiction and the array of public health and social problems that accompany it.

NOTE

1. For detailed discussions of normative and "controlled" drug use, see Vaillant (1968) and Zinberg (1984). For less pathological views of drugs and their widespread uses, see Brecher (1974); Weil (1974); Weil and Rosen (1993); and Zimmer and Morgan (1997).
REFERENCES


