Research Brief:
Methadone Maintenance Treatment

Methadone, a long-acting synthetic narcotic analgesic, was first used in the maintenance treatment of drug addiction in the mid-1960s by Drs. Vincent Dole and Marie Nyswander of Rockefeller University. There are now 115,000 methadone maintenance patients in the United States, 40,000 of whom are in New York State and about half that many are in California. (1). Methadone is widely employed throughout the world, and is the most effective known treatment for heroin addiction. (2).

The goal of methadone maintenance treatment (MMT) is to reduce illegal heroin use and the crime, death, and disease associated with heroin addiction. Methadone can be used to detoxify heroin addicts, but most heroin addicts who detox—using methadone or any other method—return to heroin use. Therefore, the goal of MMT is to reduce and even eliminate heroin use among addicts by stabilizing them on methadone for as long as is necessary to help them avoid returning to previous patterns of drug use. The benefits of MMT have been established by hundreds of scientific studies, and there are almost no negative health consequences of long-term methadone treatment, even when it continues for twenty or thirty years.

The success of methadone in reducing crime, death, disease, and drug use is well documented. (3).

- **Methadone is the most effective treatment for heroin addiction.** Compared to the other major drug treatment modalities—drug-free outpatient treatment, therapeutic communities, and chemical dependency treatment—methadone is the most rigorously studied and has yielded the best results. (4)
- **Methadone is effective HIV/AIDS prevention.** (5) MMT reduces the frequency of injecting and of needle sharing. (6) Methadone treatment is also an important point of contact with service providers and supplies an opportunity to teach drug users harm reduction techniques such as how to prevent HIV/AIDS, hepatitis, and other health problems that endanger drug users. (7)
- **Methadone treatment reduces criminal behavior.** (8) Drug-offense arrests decline because MMT patients reduce or stop buying and using illegal drugs. Arrests for predatory crimes decline because MMT patients no longer need to finance a costly heroin addiction, and because treatment allows many patients to stabilize their lives and obtain legitimate employment.
- **Methadone drastically reduces, and often eliminates, heroin use among addicts.** (9) The Treatment Outcome Prospective Study (TOPS)—the largest contemporary controlled study of drug treatment—found that patients drastically reduced their heroin use while in treatment, with less than 10% using heroin weekly or daily after just three months in treatment. (10) After two or more years, heroin use among MMT patients declines, on average, to 15% of pretreatment levels. (11) Often, use of other drugs—including cocaine, (12) sedatives, (13) and even alcohol (14) — also declines when an opiate addict enters methadone treatment, even though methadone has no direct pharmacological effect on non-opiate drug craving.
- **Methadone is cost effective.** MMT, which costs on average about $4,000 per patient per year, (15) reduces the criminal behavior associated with illegal drug use, promotes health, and improves social productivity, all of which serve to reduce the societal costs of drug addiction. Cost benefit analyses indicate savings of $4 to $5 in

health and social costs for every dollar spent on MMT. (16) Incarceration costs $20,000 (17) to $40,000 (18) per year. Residential drug treatment programs are significantly more expensive than MMT, at a cost of $13,000 to $20,000 per year, though it should be noted that treatment stays are typically no more than one year in these programs. (19) Finally, given that only 5 to 10% of the cost of MMT actually pays for the medication itself, (20) methadone could be prescribed and delivered even less expensively, through physicians in general medical practice, low-service clinics, and pharmacies.

Methadone is effective outside of traditional clinic settings.
Methadone in the U.S. is generally restricted to specialized methadone clinics, which are subject to a host of counseling and other service requirements mandated by federal, state, and municipal regulators. Though limited, experiments with providing methadone through alternate means have had positive results.

- **Limited Service Methadone Maintenance.** Limited service MMT is a low-cost method of providing methadone treatment services to addicts who cannot or will not access comprehensive methadone programs. Though limited service programs may not be as effective as the best full service programs, their patients do substantially reduce drug use and typically fare better than do illicit drug users not enrolled in any program. (21)
- **Physician Prescribing.** MMT as part of general medical practice is increasingly common throughout Europe, Australia, New Zealand, and Canada, but is severely restricted in the U.S. A few "medical maintenance" experiments in the United States, which permitted some long-term methadone recipients to transfer from traditional methadone clinics to office-based physicians, have achieved excellent treatment results. (22) Medical maintenance is also cost-effective, and patients often prefer it over traditional methadone clinics. (23)

Questions about methadone:

- **How does methadone work?** Methadone is an opiate agonist which has a series of actions similar to those of morphine and other narcotic medications. (24) Heroin addicts are physically dependent on opiate drugs and will experience withdrawal symptoms and narcotic craving if the concentration of opiates in the body falls below a certain level. The proper dose of methadone both wards off acute withdrawal symptoms and markedly reduces chronic narcotic craving by stabilizing blood levels of the drug and its metabolites, thereby permitting "normal" functioning. (25) In MMT, tolerance is deliberately induced to a stable dose of methadone that is sufficiently high to block the narcotic and euphoric action of methadone and other opiates. (26)
- **Does methadone make patients "high" or interfere with normal functioning?** No. Used in maintenance treatment, in proper doses, methadone does not create euphoria, sedation, or analgesia. (27) Methadone has no adverse effects on motor skills, mental capacity, or employability. (28)
- **What is the proper dose of methadone?** Doses must be individually determined, due to differences in metabolism, body weight, and opiate tolerance. (29) The proper maintenance dose is one at which narcotic craving is averted—without creating euphoria, sedation, or analgesia—for 24 to 36 hours. (30) Doses of 60 to 100 mg, and sometimes more, are required for most patients; (31) doses below 60 mg are almost always insufficient for patients who wish to abstain from heroin use. (32)
- **Is methadone more addictive than heroin?** Physical dependence and tolerance to a drug are part of addiction, but they're not the whole story. Addiction is characterized by compulsive use of a drug despite adverse consequences. (33) The MMT patient is no more an addict than the terminal cancer patient who is physically dependent on morphine, or the diabetic who is dependent on insulin. They do not seek out the drug

in the absence of withdrawal symptoms or pain, and their lives do not revolve around drug use.

- **Is methadone harder to kick than heroin?** Symptoms of abrupt withdrawal are qualitatively similar when the amount of drug used is pharmacologically equivalent, but withdrawal from heroin tends to be intense and fairly brief, while methadone withdrawal is less acute and longer lasting. (34) Withdrawal symptoms can be ameliorated by tapering the dose over an extended period of time. (35)
- **Is methadone maintenance treatment for life?** Some patients remain in methadone treatment for more than ten years, and even for the rest of their lives, but they constitute a minority (5 to 20%) of patients. (36)
- **How long should treatment last?** Generally, the length of time spent in treatment is positively related to treatment success. (37) The duration of treatment should be individually and clinically determined, and treatment should last for as long as the physician and the individual patient agree is appropriate. (38) Federal, and often state, regulations require annual evaluation of patients to determine whether they should continue in MMT. (39)
- **Is methadone a desirable street drug, with high potential for abuse?** Though methadone is sometimes sold on the illicit drug market, most buyers of diverted methadone are active heroin users who won't or can't get into a methadone program. (40) The extent of abuse associated with diverted methadone is small relative to heroin and cocaine, and primary addiction to methadone is rare. (41) While improper use of methadone, like that of almost any drug, can lead to overdose, overdose deaths attributed to methadone alone are few compared to heroin deaths. In its 1994 sample of emergency room incidents, the Drug Abuse Warning Network noted 15 methadone deaths, 251 heroin/morphine deaths, and 13 aspirin deaths. (42) Finally, not all methadone overdose deaths are necessarily caused by illicitly purchased methadone; some are undoubtedly the result of accidental or inappropriate consumption of legally obtained methadone, often in combination with alcohol or other drugs.
- **Does methadone interfere with good health?** Scientific studies have shown that the most significant health consequence of long-term methadone treatment is a marked improvement in general health. (43) Concerns about methadone's effects on the immune system (44) and on the kidneys, liver, and heart (45) have been laid to rest. Methadone's most common side effects—constipation and sweating—usually fade with time and are not serious health hazards. (46)
- **Is it safe to take methadone during pregnancy?** MMT during pregnancy does not impair the child's developmental and cognitive functioning, indeed it is the medically recommended course of treatment for most opiate-dependent pregnant women. (47)
- **Is methadone maintenance appropriate for all drug users?** No. Methadone is a treatment for opiate dependence, and is not appropriate for individuals who use heroin but are not, and have not been, dependent. (48) There are also drug-free treatment options and, increasingly, other medications—including buprenorphine, LAAM, and naltrexone—that may be appropriate for some users. (49) Outside the United States, some active drug users are being prescribed heroin, codeine, morphine, and injectable methadone. (50)