The merits and effectiveness of addiction treatment in the criminal justice system and methadone maintenance treatment (MMT) for opioid addiction, in particular, have not been universally understood and accepted. However, criminal justice populations are in critical need of treatment for opioid addiction and most still do not have access to it (CSAT 2005a).

Just as juries need evidence from reliable witnesses or forensic investigations to arrive at fair-minded verdicts, those working within the criminal justice system require valid evidence when evaluating the worthiness of treatments for drug addiction (Hora 2004). Therefore, this paper focuses on well-established evidence and credible commentary to provide a current and balanced perspective on MMT within court, jail, and prison settings.

Challenges, Consequences, & Opportunities

Opioid Abuse & Addiction Are Common Medical Problems in Offenders

Interactions with the criminal justice system are common experiences in the personal histories of drug addicts. Arrests for drug abuse violations have steadily increased through the years — in 2003 alone, there were 1.7 million arrests for drug law violations, making it the most numerous type of crime in America (CSAT 2005b). More than a quarter of all drug arrests each year involve serious risks of acute, distressful opioid withdrawal in detainees (Fiscella et al. 2005).

Among jail and prison populations today, 80% have substance abuse problems, 20% have histories of heroin abuse, and as many as 30% of all inmates are injection-drug users (Rich et al. 2005b). Increasingly, the illicit use of and addiction to prescription opioid medications is implicated in criminal activities, arrests, and incarceration.

While addiction treatment has sometimes been viewed as a form of social welfare, of questionable effectiveness, it actually extends beyond benefitting individual addicted offenders to serve the best interests of society (ONDCP 1999). However, during court supervision or incarceration, addiction must be treated as a medical problem through valid interventions targeted to the specific drug(s) of abuse (Maremmani et al. 2004).
Opinions vary regarding the use of medications for treating drug addiction among offenders (CSAT 2005b). Some hold a belief that ‘drugs’ of any sort should not be tolerated in the criminal justice system and it is important to learn how to live drug free (ONDCP 1999). However, while it is recognized that some of the therapeutic drugs are themselves dependency-producing, extensive evidence (discussed below) clearly demonstrates the validity of medication-assisted treatment approaches for addiction.

**Heroin Continues To Take A Toll**

Nearly one million Americans are estimated to be heroin-addicted, although this number is probably undercounted (ONDCP 1999; Parrino and McNicholas 2002). Reports from drug enforcement agencies indicate that high-purity heroin continues to be low in cost; a heroin “fix” can be purchased for as little as $5 and its purity exceeds 70% in some major cities (DoJ 2004; Nadelman and McNeely 1996). This has attracted many new users, and their experimentation with smoking or snorting the drug eventually leads to injection. A typical intravenous-heroin abuser may inject 4 or more times each day and this has been associated with high rates of communicable diseases — including HIV/AIDS, hepatitis, and tuberculosis — medical emergencies, and deaths from overdose (CSAT 2004; Kauffman and Woody 1995; NIDA 1997, 1999a; NIH 1997; NSDUH 2003; ONDCP 1999; Payte et al. 2003).

**Opioid Analgesics A Growing Concern**

One of the most troubling and increasing problems facing American communities is the abuse of opioid analgesics (pain relievers), which has been associated with addiction and drug overdoses. The prevalence of prescription-opioid abuse has surpassed illicit-drug abuse (CSAT 2004; Zacny et al. 2003). For example, in 2002 an estimated 4.4 million persons took prescription pain relievers for non-medical purposes, compared with 3.9 million individuals who abused substances such as heroin or cocaine (NSDUH 2003). The potential for prescribed opioid analgesics to be involved in addiction and criminal activities cannot be overlooked, and there have been sharp increases in hospital emergency department visits along with an upsurge in widely publicized overdose deaths attributed to those drugs — such as, oxycodone, hydrocodone, morphine, methadone, and others (CSAT 2004; SAMHSA 2002; Zacny et al. 2003). It should be noted that the methadone in most of those cases was prescribed by physicians for analgesia, rather than by methadone-maintenance programs for the treatment of addiction (CSAT 2004).

**Applying Science to Opioid Addiction Treatment**

**Addiction – A Brain Disease**

Based on the preponderance of evidence, medical experts have accepted drug addiction as a chronic, progressive, relapsing disease of the brain, which is influenced by genetic, neurobiological, psychosocial, and environmental factors. Outwardly, addiction is characterized by impaired control over continued drug use, compulsive use despite harmful consequences, and/or intolerable drug craving (Nestler and Malenka 2004; WHO 2004). These effects reflect actual changes in brain chemistry and function.

Addiction to opioid drugs is particularly insidious because the brain produces its own opioid substances (for example, endorphins) that are vital for survival. In effect, the brain is “tricked” by external, short-acting opioid agents into responding as if they...
are biologically essential. Once addiction sets in, brain chemistry becomes unbalanced, and the person is physically, emotionally, and mentally dysfunctional unless more opioid drug is regularly taken. These derangements are severe and enduring, lasting months or years after the last drug-taking episode. So, even if opioid-abstinence is achieved, relapses are common without ongoing therapy of some sort (Nestler and Malenka 2004; WHO 2004).

Recent advances in imaging technology have dramatically depicted how the addicted human brain is functionally abnormal. For example, SPECT (Single-Photon Emission Computed Tomography) images show altered blood circulation in the cerebrums of opioid addicts, denoting deficient mental functioning (see Swiss cheese appearance in the heroin Image; Amen 2001). This part of the brain is involved in judgement and impulse control; hence, the addicted brain is both physiologically and psychologically impaired, which influences the misbehavior so often associated with drug addiction, including criminal activity.

In this context, opioid “detoxification” — merely restoring the brain to its pre-addiction level of drug tolerance — is an ineffective therapy; psychological disturbances and opioid craving ingrained by addiction remain for an indefinite period of time making drug lapses and/or relapse largely inevitable (Maremmani et al. 2004). Opioid abstinence and drug-free therapies may be only partial measures, possibly ameliorating further brain damage, but they do not stabilize the chemical imbalances wrought by opioid addiction to permit more normal brain function.

**The Rationale Of Methadone For Treating Opioid Addiction**

During the more than 65 years since its development, methadone has become the most extensively studied medication worldwide, and the accumulated scientific evidence demonstrating its effectiveness and safety in treating opioid dependence is beyond doubt (CSAT 2005a; Parrino and McNichols 2002). In 1997, an independent panel of distinguished experts convened by the National Institutes of Health to reach a consensus on effective treatments for opioid addiction concluded, “Of the various treatments available [for opioid addiction], methadone maintenance treatment [MMT], combined with attention to medical, psychiatric, and socioeconomic issues, as well as drug counseling, has the highest probability of being effective” (NIH 1997).

Methadone was developed in the late 1930s and approved by the U.S. Food and Drug Administration (FDA) in 1947 as a painkiller. By 1950 oral methadone was also used to treat the painful symptoms of persons withdrawing from opioids, usually heroin (Joseph et al. 2000; Payte 1991; Rettig and Yarmalonsky 1995). In 1964, researchers at Rockefeller University, New York City, discovered that an ongoing, daily dose of long-acting oral methadone — maintenance treatment — offered a number of beneficial effects allowing otherwise debilitated opioid addicts to function more normally (see Box; CSAT 2005a; Dole 1988; Kreek 1993; NIH 1997; Payte et al. 2003; Stine et al. 2003).

From the outset, methadone maintenance has been portrayed as corrective therapy, rather than as a “cure” for opioid addiction (Dole 1988) — akin to insulin as remedial therapy for diabetes. And, methadone is only one component of a more comprehensive
program of addiction recovery. Yet, despite the accumulated scientific knowledge, methadone is sometimes falsely regarded merely as a substitute for heroin or other illicit opioids, trading one addiction for another (CSAT 2005a; NIH 1997; Maremanni et al. 2004).

Although it is true that methadone produces physiologic dependence, as do all opioids, it has unique pharmacologic properties that normalize aberrant brain chemistry and allow the person to live a life unencumbered by the cravings and loss of control characterizing addiction (CSAT 2005a). Methadone’s steady and long-term action in the brain contrasts sharply with the disruptive cycle of “highs” and “lows” produced by short-acting opioids that lead to addictive behaviors (Kreek 1993; Nadelman and McNeely 1996; Payte et al. 2003).

Oral methadone has demonstrated a favorable safety profile, with no serious adverse reactions or organ damage specifically associated with its continued use extending more than 20 years in some patients (Payte et al. 2003; Stine et al. 2003). Furthermore, at appropriate dose levels methadone does not hinder a patient’s intellectual capacities or physical abilities (Gordon 1994). If anything, methadone maintenance substitutes a stable existence for one of compulsive drug seeking and taking, criminal behavior, chronic unemployment, and high-risk sexual and drug-use behaviors (ONDCP 1999).

Adequate methadone dosing is critical for therapeutic success. Dozens of studies have demonstrated that dosing in the range of 80 to 120 milligrams of methadone per day, on average, results in desirable outcomes, such as better retention of patients in treatment and less illicit drug use (Nadelman and McNeely 1996; Payte and Khuri 1993; Stine et al. 2003). For a variety of reasons — such as, high tolerance to opioids, physical condition, mental status, concurrent medications, or prior use of high-purity heroin — many patients require much higher daily methadone doses for treatment success; sometimes exceeding 200 mg/day or more (CSAT 2005a; Leavitt 2003; Payte et al. 2003; Stine et al. 2003).

Ongoing MMT Is Essential & Cost Effective

Time in treatment is a critical factor for addiction recovery. Ongoing methadone may be required for a lifetime to maintain neurochemical balance, much like insulin is required to modulate blood sugar levels in a person whose body cannot do that for itself. Virtually all who abandon MMT and do not pursue further treatment eventually relapse (Rosenblum et al. 1991) and potentially overdose (CSAT 2004).

Patients treated for fewer than 3 months in MMT generally show little or no improvement (NIH 1997; Payte and Khuri 1993); whereas, reductions in illicit opioid use of up to 80% or more after several months have been demonstrated, with the greatest reductions for patients who remain in treatment more than a year (Federal Register 2001; CSAT 2005a,b).

An often-quoted study – the California Drug and Alcohol Treatment Assessment (CALDATA) – found that for every $1 spent on addiction treatment more than $7 in future costs were saved. MMT was determined to be the lowest-cost, most effective treatment modality for opioid addiction; whereas, programs offering only opioid detoxification showed no long-term benefits at all (CSAT 2005a; Kauffman and Woody 1995).

Others have noted a $4 cost savings for every $1 spent specifically on MMT (Parrino and McNicholas 2002). However, the latest evidence-based research — taking into
account the lifetime impact of criminal activity and potential incarceration, unemployment, health care utilization, and the possible need for multiple treatment episodes — found an economic benefit-to-cost ratio for methadone maintenance of nearly $38 for every $1 spent on this treatment (see Graph); more than a 9-fold greater return on investment in treatment than previously projected (Zarkin et al. 2005).

**Expanding Treatment Options: Buprenorphine**

In 2002, another opioid-class medication, buprenorphine, was approved by the government for prescription by qualified physicians to treat opioid addiction (SAMHSA 2004a; Stine et al. 2003). While multiple treatment options are desirable, well-designed clinical trials have repeatedly demonstrated that, at best, buprenorphine is equivalent to methadone for some individuals; although, in many cases buprenorphine has been inferior to methadone in terms of fostering retention in treatment, illicit-opioid abstinence, and reductions in risky behaviors (Barnett et al. 2001; Kristensen et al. 2005; Ling et al. 1996).

Buprenorphine has been recognized as “unlikely to be as effective as more optimal-dose methadone, and therefore may not be the treatment of choice for patients with higher levels of physical dependence [on opioids]” (Krantz and Mehler 2004; SAMHSA 2004a). To date, there is very little experience with buprenorphine in the criminal justice system, and without the close monitoring, psychosocial therapy, and other support services typically provided by a comprehensive MMT program, the long-term benefits of buprenorphine therapy must be considered cautiously in many opioid-addicted persons.

**The Role of MMT in the Criminal Justice System**

**The Drug Treatment Court (DTC) Movement**

The National Institute on Drug Abuse asserted, “Research has shown that combining criminal justice sanctions with drug treatment can be effective in decreasing drug use and related crime. Individuals under legal coercion tend to stay in treatment for a longer period of time and do as well as or better than others not under legal pressure” (NIDA 1999b). Such treatment may be effectively delivered prior to, during, after, or in lieu of incarceration.

In response to courts overburdened with drug-arrest cases, and accepting that coerced treatment for addictive disorders could be effective, the Drug Treatment Court (DTC) movement was founded in 1989 (CSAT 1993; Hora 2004). Today, there are more than 1,600 drug courts in the U.S., with 70,000 program participants and 16,000 annual ‘graduates’ — persons successfully completing their court-supervised programs (Huddleston et al. 2005).

Drug court participants undergo intensive substance abuse and mental health treatment, case management, drug testing, and probation supervision while reporting for regularly scheduled status hearings before judges familiar with the DTC model (CSAT 2005b; Huddleston et al. 2005). These courts have demonstrated that they “outperform virtually all other strategies that have been attempted for drug-involved offenders...” (Marlowe et al. 2003), and at very favorable benefit-to-cost ratios (Finigan 1999).

For offenders who qualify, methadone treatment is a cost effective alternative to incarceration (Federal Register 2001; Kreek 1993; ONDCP 1999). Studies have estimated that it costs about $40,000 per year if an offender is incarcerated and only about $3,500 for
MMT (Krantz and Mehler 2004). Further evidence found that up to 80% of MMT program participants eliminate or significantly reduce illegal activity and their full time employment increases by 24% (ONDCP 1999; Parrino and McNicholas 2002).

DTCs are facing increasing numbers of opioid-dependent offenders (Parrino and McNicholas 2002), and it has been suggested that outcomes can be improved by mandating ongoing program participation following completion of the primary, court-ordered treatment episode (Christoff 2005). Therefore, services delivered by community MMT programs are an ideal solution for meeting the needs of opioid addicts in recovery.

Unfortunately, some courts have historically viewed MMT programs with skepticism and have not welcomed their participation. There have been cases of judges, without prior medical consultation, ordering defendants to stop or taper their use of prescribed methadone as a condition of admission to or graduation from DTC programs. The outcomes in these offenders were predictably unfavorable (Hora 2004).

**Methadone in Jails/Prisons**

When the law leaves no alternative but detention, it still may create an opportunity to administer treatment for opioid addiction. A U.S. Department of Justice survey of inmates in local jails in 2002 found that 1 in 5 had used heroin or other illicit opioids in the past, 12% on a weekly basis, and 4% were using the drugs at the time of their offense (Karberg and James 2005).

The World Health Organization (WHO 2004) has asserted that, “Prisoners on methadone maintenance prior to imprisonment should be able to continue this treatment while in prison.” Furthermore, during incarceration and following release from jail or prison are ideal times to connect opioid-addicted inmates with MMT programs. As many as 70% of untreated parolees with histories of heroin abuse are reported to return to drug abuse within 3 months of their release, and are up to 6 times more likely to become infected with HIV (Rich et al 2005b). Conversely, opioid-addicts receiving treatment while incarcerated have demonstrated improvements in terms of frequency of re-imprisonment, number of detention periods, and the total time served while attending MMT (Maremmani et al. 2004).

However, as with the courts, many jail and prison authorities have been slow to adopt MMT as a therapy of choice for opioid addiction. One survey of state and federal prison medical directors found that 48% use methadone, however, this was almost exclusively on a short-term basis for pregnant inmates. Methadone maintenance was rarely implemented and only 8% of respondents referred opioid-dependent inmates to community MMT programs upon release (Rich et al. 2005a).

A national survey specifically of jail administrators found that very few used methadone (1%) or other opioid agents (2%) to assist in opioid withdrawal, and 85% did not continue methadone for inmates who were previously participants in community MMT programs. Three-quarters of jails did not even contact the MMT programs about inmates under their care to learn of their prior methadone dose level (Fiscella 2005; Fiscella et al. 2005).

Perhaps, the greatest advantage of MMT for opioid-addicted detainees is that jails and prisons can become therapeutic settings, starting offenders on treatment that will help assure ongoing recovery when they return to freedom.
controls exerted during incarceration can overcome the lack of compliance that sometimes causes treatment failures in outside society (Maremmani et al. 2004).

An innovative model developed in the New York Metropolitan area in 1987 – called, KEEP (Key Extended Entry Program) – enables opioid-dependent offenders to be maintained on methadone during their stay at Rikers Island Correctional Facility (CSAT 2005b). In 2001, it was reported that KEEP has 4,000 inmates admitted to MMT annually, and upon release approximately 80% of them report to their assigned community MMT programs for continued treatment, which has resulted in significantly decreased criminal recidivism among these individuals (Parrino and McNicholas 2002; Tomasino et al. 2001).

Several options have been recommended for consideration by jail and prison authorities throughout the U.S. for providing MMT within their facilities:

- Become a satellite of a community-based MMT program;
- Arrange for a local MMT program to deliver and distribute methadone;
- Become legally certified to operate an MMT program within the correctional facility, which is possible via the National Commission on Correctional Health Care (see NCCHC 2004).

Based on the successes of interventions such as the Rikers Island model, a small but growing number of correctional facilities in various states have expressed an interest in using or have already successfully tested methadone maintenance in treating chronic opioid dependence among inmates (Parrino 2005).

**A Continuing Commitment to Evidence-Based Approaches Is Needed**

Opioid addiction itself is likely to incur confrontations with authorities and legal problems, and these incidents may be viewed as opportunities to engage offenders in a therapeutic program of addiction recovery (Maremmani et al. 2004). Approaches seeking merely to achieve and enforce a drug-free state, without a component of relapse prevention, do not offer any assurances that abstinence will be maintained over time. And, in fact, research suggests that relapse is highly probable in opioid-addicts who do not receive effective and long-term medication-assisted therapies.

Evidence supporting the implementation of MMT within the criminal justice system is abundant and compelling. Combining court supervision and community-based treatment for opioid-addicted offenders reduces the risks of both relapse to illicit-drug use and recidivism to drug-related criminal behaviors (NIH 1999b; Rich et al. 2005a).

For incarcerated offenders, past and current experiences have demonstrated unequivocally that MMT is an extremely effective method of reducing relapse and recidivism. It also helps assure that offenders will gain access to important community services upon release for increasing their chances of becoming law abiding and productive citizens (Maremmani et al. 2004).

It is vital that criminal justice system authorities strengthen their commitment to evidence-based medication-assisted therapies and seek through ongoing education and training to overcome any ideological biases or unfounded beliefs that prevent the application of “good science” to addiction treatment. In sum, the realities of opioid addiction as a disease and the fact that it can be effectively treated via methadone maintenance should be more widely recognized and acted upon at all levels in the criminal justice system.