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CALIFORNIA SOCIETY OF ADDICTION MEDICINE

RECOMMENDATIONS TO IMPROVE CALIFORNIA'S RESPONSE TO METHAMPHETAMINE

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I. California's Methamphetamine Problem

Methamphetamine dependence starkly illustrates how a drug-induced disease process in the brain can result in chronic addiction, relapses early in treatment, and persistent depression and/or psychotic symptoms long after abstinence has been achieved. In 1989, a more powerful and smokeable form of methamphetamine emerged; it was easily synthesized from over the counter cold medications such as pseudoephedrine, and it has led to a rapid increase in methamphetamine users in California. This has increased the burden on California families, the healthcare system, social services and the criminal justice system.

The magnitude of methamphetamine's impact on California is pervasive.

- There are an estimated 500,000 methamphetamine users in California, evenly split between men and women, unlike the 2:1 ratio of men to women with other drugs of abuse.
- Among 11th graders, 7.6% have used methamphetamine.
- Methamphetamine has become the most common primary drug of abuse in California among those seeking treatment, surpassing alcohol and heroin.
- Over 33% of arrestees test positive for methamphetamine in some California cities. Fifty-three percent of Prop 36 participants list methamphetamine as their primary drug, and half of these are experiencing treatment for the first time.
- Violence is clearly associated with methamphetamine. Physical abuse is reported by 67-85% of women and 35-70% of men using methamphetamine. Among women using methamphetamine, 33-58% report sexual abuse and 28% report attempted suicide.
- From 30-50% of those with newly identified HIV-infection use methamphetamine.

The acute effect of methamphetamine is a state of extreme stimulation in the brain, leading to an experience of excitation, increased alertness, highly focused attention, decreased appetite and elevated motivation, confidence, mood, energy, and sexuality. Chronic use leads to profound exhaustion, depression, lethargy, anhedonia, and often produces a psychosis resembling paranoid schizophrenia.

Evidence of brain injury from methamphetamine use can be persistent and appears to be permanent in some individuals. Cognitive impairments include distractibility and impaired attention, memory and judgment. Thought disorders (paranoia, hallucinations and psychosis) often require psychiatric care and antipsychotic medications. Particularly when cognitive and psychiatric deficits are found together, treatment often requires 6-12 months to be effective.

II. The Emergence of a Public Health Model to Treat Methamphetamine Addiction

The War on Drugs became the backbone of America's drug policy in 1968. The public supported this emphasis on law enforcement efforts and by 1980 California began successfully implementing policies of increased arrests, prosecutions and imprisonment as its primary means to reduce drug use and street crime. The state went from imprisoning 379 of its citizens in 1980 for drug possession to 12,749 in 1999. The drug-offender prison population rose from 1,778 in 1980 to 45,455 in 1999. By the late 1990's, over half of Californians imprisoned for drug offenses were there for possession alone.

If incarceration were an effective policy for deterrence, those counties that most aggressively prosecuted all levels of drug possession would have demonstrated greater declines in crime rate and drug use. The data reveal, however, that increases in imprisonment for drug offenses have shown no discernible impact on crime rates. In fact, from 1980 – 1999, the six counties that increased their imprisonment rates the most for low level drug possession actually experienced greater increases in violent crime.

A reasonable conclusion that can be drawn from California's experience is that felony drug offenses reflect, rather than control, higher rates of drug abuse and crime. The United States Department of Justice recently concluded that higher rates of arrests, stricter laws, and more aggressive sentencing policies do not deter many drug users exposed to these penalties.

The economic costs of America's War on Drugs have been high. The average annual cost of incarceration in California is over \$30,000 per year. ONDCP reports that of the \$38 billion spent on corrections nationwide in 1996, more than \$30 billion (79%) was spent incarcerating people with a history of drug and/or alcohol abuse. While between 70-85% of inmates were estimated to be in need of substance abuse treatment, less than 11% received any.

By 2000, Californians had come to believe that simply quarantining drug users in prisons is not the most effective approach. Proposition 36 (Substance Abuse and Crime Prevention Act of 2000) was passed by 61% of voters despite opposition by virtually all criminal justice and court agencies. In doing so, the people of California expressed their will to replace the emphasis on incarceration with a public health model that emphasizes treatment.

The public health model combines concern for both the health of individuals and the safety of the general public. Good medical practice and society's right to be protected from the illness or excesses of a few have guided public health departments in their treatment of infectious disease (e.g., TB, syphilis, and HIV) and their pursuit of public sanitation. CSAM strongly supports a public health approach to California's methamphetamine problem.

The success of a public health approach, as embodied in Prop 36, has now been clearly demonstrated. In June 2000, prior to Prop 36, 28% of the California prison population were drug prisoners, for a total of 45,439. By June 2003, the number had declined to 35,540, or 22% of the total. An April 2006 UCLA cost analysis estimates that Prop 36 saves \$2.50 dollars for every dollar spent for those entering Prop 36 and \$4.00 for every dollar spent for treatment completers.

CSAM's recommendations are guided by a public health framework designed not to replace the law enforcement approach taken in the past, but rather to augment it with solid, evidence-based medical principles. Our recommendations are evidence-based and show documented superiority in cost-effectiveness.

The California Society of Addiction Medicine (CSAM) recommends five public health approaches:

1. Repeal of the Uniform Accident and Sickness Policy Provision Law (UPPL) in order to facilitate early identification and early referral to care through emergency rooms.

2. Additional non-incarceration improvements in Prop 36 that will stratify clinical and court responses for psychotic and recidivistic individuals.
3. Collaborative funding from Prop 36 and Prop 63 to appropriately manage psychotic and suicidally depressed methamphetamine users with professional care and appropriate medications.
4. Education strategies focused on identified high-risk populations.
5. Extended insurance and Medi-Cal coverage for treatment.

III. Evidence-Based Treatment of Methamphetamine Users

Treatment for methamphetamine is effective when judged against standards for similar chronic, relapsing medical disorders. Once it is understood that “cure” is not the appropriate goal, then effective management of addictive disease to ameliorate complications and reduce relapses becomes the legitimate measure of success. Even though treatment often requires repetition before a lifestyle of recovery is achieved, treatment compares very favorably to incarceration in terms of cost and in terms of socially desirable outcomes.

The most studied methamphetamine treatment is the Matrix Model, a 4-month, manualized, intensive outpatient abstinence-based program that combines cognitive-behavioral therapy, family education, 12-Step participation, urine monitoring and positive reinforcers. Overall methamphetamine use by treatment participants during the preceding 30 days fell from 11 to 4 days, a very significant reduction that was maintained through the six month follow-up period. The rate of methamphetamine negative urines at discharge and 6 month follow-up were 66-69%. Twelve months after discharge from treatment 55-59% of methamphetamine users were methamphetamine-free, with recovery rates similar to those of patients with other chronic illnesses.

The persistent brain injury produced by methamphetamine requires modifying and lengthening treatment programs to improve effectiveness. Difficulty with selective attention and memory during early abstinence slow the impact of therapy. When cognitive impairments are present, treatment needs to be extended (6-12 months). It is also the rule rather than the exception that psychiatric disorders accompany methamphetamine abuse, most notably mood disorders (depression), anxiety, paranoia and psychosis. Even with psychiatric care and appropriate antipsychotic or antidepressant medication, these conditions may clear slowly, again necessitating extended treatment.

The benefits to society of methamphetamine treatment are impressive.

- An episode of Prop 36 treatment costs \$4,500, far less than incarceration, and provides far greater benefit in terms of reduced drug use, reduced crime, reduced recidivism and reduced demand for methamphetamine.
- The UCLA analysis of Prop 36 data (April 2006) demonstrates that every dollar spent saves approximately \$2.50 for every arrestee mandated to treatment, and \$4.00 for every treatment completer.
- Without treatment, 85% of drug users relapse within the first year of release from prison, as opposed to the 55-59% found to be methamphetamine-free twelve months after discharge from treatment.
- Recovering individuals go from being tax-consumers to becoming tax-payers. Before entering Prop 36 treatment only 29.5% of participants were employed; twelve months after treatment, 54% are employed.
- A tangible benefit of treatment is the avoidance of a criminal record, which greatly facilitates employment and financial recovery. Among those receiving treatment there is a 74% decrease in crime.

IV. CSAM's Recommendations for Improving California's Response to Methamphetamine

CSAM's recommendations stem from a public health model. Our goal is to avoid incarceration, prolonged suffering, and the burdens on families and society caused by methamphetamine use by expanding early intervention and improving diversion from prison for non-violent drug-offenders.

1. EARLY INTERVENTION: ADDICTION MEDICINE – EMERGENCY MEDICINE COLLABORATIVE METHAMPHETAMINE RESPONSE

- Repeal the Uniform Accident and Sickness Policy Provision Law (UPPL) to remove insurance non-payment barriers to toxicology screening and encourage all physicians to use toxicology screening to help diagnose substance dependence.
- Require emergency physicians to order drug and alcohol screens for specific presenting problems.
- Methamphetamine-involved patients seeking emergency care should be referred to treatment.
- Clinical outreach contacts by professionals trained in brief intervention with substance abusers should be made as a follow-up to referral and should be tabulated in order to assess the aggregate level of response to clinical referrals.

Confidentiality of test results must be guaranteed and should not prejudice insurance coverage or law enforcement action. Patterned after the public health response to infectious diseases, follow-up will offer non-punitive contact with the healthcare system while demonstrating a compassionate response to patients' suffering. (See attachment pp. 6-7 for details of an Emergency Medicine – Addiction Medicine Collaborative Project)

2. IMPROVING PROP 36

- Increase funding to \$209 million to account for inflation and to meet current needs.
- Increase access to opiate agonist treatment (buprenorphine and methadone maintenance).
- Stratification of courts and treatment providers:
 - o Introduce case outreach for no-shows and drop-outs from care.
 - o Introduce clinical case management of high utilizers, most especially psychotic individuals.
 - o Rely on drug courts for more intensive supervision of repeat Prop 36 failures and chronic criminal recidivists, identified by UCLA as 1.6% of Prop 36 arrestees.
- Remove barriers to funding treatment and prescription medications for dual diagnosis participants.
- Urine toxicology testing should be directly funded by Prop 36.
- Prop 36 funds should be withdrawn from parole-based treatment. Parolees should be funded from existing Department of Corrections and parole funding sources.
- Improve central data collection and analysis. Prop 36 should fund a full-time data analyst at DADP and continuing university-based outcomes studies.

3. REMOVING BARRIERS TO DUAL-DIAGNOSIS TREATMENT

Current regulations restrict the use of mental health funding within substance abuse treatment programs. As a result, methamphetamine treatment programs are frequently unable to access the psychiatric services and medications required for treatment to be effective. A portion of Prop 63 funds should be earmarked to provide psychiatric assessments, management and medications to methamphetamine users in substance abuse treatment when psychosis or suicidal depression are present.

4. EDUCATION: AWARENESS AND PREVENTION CAMPAIGNS DIRECTED TOWARD HIGH RISK POPULATIONS

- Physicians and other healthcare professionals require education about methamphetamine and the special populations involved with its use.
- Education is often the first phase of treatment, especially when substance abusers are still in denial. To be effective, public information campaigns need to be developed and delivered in ways that are meaningful to at-risk sub-populations, including
 - o Women
 - o Adolescents
 - o MSM (men who have sex with men)
 - o Heterosexual males exhibiting high-risk sexual behavior
- School-based drug education programs should be reviewed and updated with guidelines for methamphetamine-specific information geared to different grade levels.

5. IMPROVING TREATMENT COVERAGE: INSURANCE COVERAGE FOR EXTENDED TREATMENT

- Up to 12 months for methamphetamine users covered by CALPERS
- Up to 12 months for adolescents covered by Medi-Cal
- Medi-Cal should also be modified to cover residential treatment for adolescent methamphetamine users when clinically indicated.

6. CSAM BLUEPRINT FOR THE FUTURE: THE PUBLIC HEALTH MODEL

CSAM views methamphetamine as the currently popular drug that has provoked a wave of fear in the general public. Yet methamphetamine is only one of a number of drugs that present a significant public health concern. Both CSAM and the AMA view all substance dependence as a primary disease. Consistent with this view, the Little Hoover Commission 2003 Report on Addiction concludes that the best approach to reducing addiction is to provide treatment to anyone requesting treatment.

CSAM is committed to advancing evidence-based treatment approaches that promote public health solutions to both the suffering of individuals and the social problems created by addictive disease. We strongly encourage all state efforts addressing substance abuse to be consistent with basic public health principles.

ADDICTION MEDICINE EMERGENCY MEDICINE COLLABORATIVE METHAMPHETAMINE RESPONSE

Fifty-six percent of hospitals nationwide say their costs have risen because of methamphetamine-related patient care, which is rarely covered by private insurance. Emergency rooms in Los Angeles, San Diego and San Francisco reported a 43% increase between 1998 and 2002 in medical record mentions of methamphetamine. UC Davis Medical Center found that methamphetamine-involved patients using the ER are three times more likely to arrive by ambulance, two and a half times more likely to require hospitalization and far less likely to be insured. Scripps Mercy Hospital in San Diego confirmed that screening, brief intervention and referral of trauma patients by a trauma center found 59% at risk for alcohol and other drug problems. However, ER physicians are often reluctant to order toxicology screens or to diagnose methamphetamine abuse because of legal implications for the patient, negative insurance implications for the hospital created by the UPPL law, lack of training in substance abuse, and inadequate resources for referral and follow-up.

As an important step toward improving California's response to its methamphetamine problems, CSAM recommends statewide implementation of confidential screening for methamphetamine (and other illicit drugs) in emergency rooms for specific presenting problems (e.g., trauma, psychosis) or when physicians' clinical judgment warrants. The optimal response to positive urine toxicology screens would be onsite drug and alcohol evaluations by a professional trained in substance abuse using proven brief intervention techniques. Referral to treatment should be offered when indicated, with follow-up contact to provide education and encourage acceptance of the referral.

A Washington State program (WASBIRT), funded by the Center for Substance Abuse Treatment (CSAT), has demonstrated that broad-based screening for alcohol and other drug problems in Emergency Departments, combined with brief intervention, referral and follow-up by trained chemical dependence professionals produces immediate benefits. Average days of both alcohol and illegal drug use decline, and days of total abstinence rise, even for those who receive brief intervention and do not accept treatment referral.

In order to demonstrate effectiveness of this approach and to provide guidelines for statewide implementation, an initial pilot project should be rapidly implemented. The Addiction Medicine-Emergency Medicine (AM-EM) Collaborative Methamphetamine Pilot Project would establish a two county (rural and urban) Emergency Room demonstration project to last two years – six months to initiate, one year to collect data, and six months to analyze data and produce a report. Methamphetamine positive tests would lead to substance abuse evaluation, treatment referral, and outreach follow-up by substance abuse professionals trained in brief intervention.

The rationale for this pilot project is:

1. The level of methamphetamine use in California constitutes a significant public health problem.
2. The impact of methamphetamine use falls heavily on our health care system and emergency rooms are a common portal of entry for more severe cases.
3. ER physicians have inadequate time, authority and often training to respond effectively to methamphetamine abusers in crisis.
4. By insuring proper diagnosis and initiating appropriate services in the emergency room, patients will be encouraged to access care they need.
5. It is well-established that brief counseling about addiction treatment has significant positive impact during and after periods of crisis.
6. Outreach contacts patterned after the public health model with infectious diseases keep people connected to the healthcare system while demonstrating a compassionate response to their suffering.
7. By locating the demonstration project in one rural and one urban county, impact of services can be evaluated on two different populations.
8. Confidentiality of test results is required to avoid erecting barriers to healthcare for methamphetamine users.
9. Emergency room interventions have the potential of engaging people in treatment before they enter the criminal justice system.

CSAM is committed to promoting a public health model as the most effective response to California's methamphetamine problem. The AM-EM Collaborative Methamphetamine Response is an innovative approach. It breaks new ground by treating methamphetamine as a public health hazard, not a legal or insurance matter. By requiring ER physicians to screen for drugs and alcohol in specified situations, or whenever their clinical judgment warrants, we can help patients identify one of the primary factors contributing to trauma, medical, or psychiatric illness. Since methamphetamine users may not be able to make use of this information while still under the influence of the drug, follow-up outreach is an essential component.

The three components to this public health model approach are:

1. Emergency room toxicology screening, followed by
2. Brief intervention and treatment referral, and
3. Outreach follow-up

METHAMPHETAMINE: THE EVIDENCE BASE

Methamphetamine (MA) dependence starkly illustrates how a drug-induced disease process within the brain can result in chronic addiction, relapses in early treatment, and depressive and/or psychotic syndromes long after abstinence has been achieved. The California Society of Addiction Medicine (CSAM) views drug addiction as a chronic, relapsing illness requiring continuous management, with the goal being self-management whenever possible [1]. Although all drug addiction begins with voluntary choices, the disease often leads to loss of control, freedom, judgment, sanity, and, occasionally, even of life itself. The motivations for continued use of any drug in the face of these serious adverse consequences are invariably different from those that initiate use.

The following paper provides the background and documentation underlying CSAM's Recommendations to Improve California's Response to Methamphetamine. CSAM believes that medical, public health, and criminal justice frameworks can be integrated into humane and effective treatments of addictive disease.

HISTORY

Amphetamine was first synthesized in 1887 [2]; and methamphetamine, from ephedrine by a Japanese pharmacologist in 1893 [3]. WWII ushered in its initial use as a stimulant by the German, Japanese and American military, as well as by Japanese factory workers [3]. Following the war, warehouses of the drug were made freely available in Japan, leading to 5% of the population being addicted during the early 1950's, with one out of ten experiencing florid psychosis [3]. During a two-month period, 31 out of 60 murders were amphetamine-involved [4] which presaged more recent American experiences of the association between amphetamine and violence.

The first period of MA abuse in the U.S. occurred in the 1960's, when the cumbersome, more dangerous P2P (phenyl-2-propanone) production method was still in use, primarily by motorcycle gangs such as the Hell's Angels, who lent it the name "crank" by transporting it in the crankcases of their bikes [3]. In 1970, MA was classified as a Schedule II Controlled Substance along with the other amphetamines; and, in 1988, the Federal Chemical Diversion and Trafficking Act regulated availability of precursors necessary for the P2P process.

In 1989, a report from Hawaii announced the emergence of a new, more powerful, more easily smokeable form of MA synthesized from ephedra/pseudoephedrine precursors [5]. Often called "Ice," because of its appearance, this pure form of dextro isomer MA was introduced to the West Coast and has moved inexorably eastward. The Comprehensive Methamphetamine Control Act of 1996 expanded the control of MA precursors to include ephedrine, pseudoephedrine and phenylpropanolamine, common ingredients in over-the counter cold preparations [6]. Further restrictions and increased criminal penalties were contained in the Methamphetamine Anti-Proliferation Act of 2000.

The Combat Meth Act, championed in the Senate by Diane Feinstein, was contained in the Patriot Act reauthorization in 2006. This federal measure imposes nationwide standards for the sale of medications containing pseudoephedrine, ephedrine and phenylpropanolamine. Sinus and cold remedies such as Sudafed and Nyquil will be relocated behind the counter. Purchasers will need to show a photo ID, sign a logbook, and be limited to 3.6 grams (approximately 120 pills) per day and 9 grams (300 pills) a month. States already imposing similar restrictions (Oregon, Oklahoma) report a plunge in the number of meth labs. The bill also provides \$99 million a year for five years to train and equip state and local law enforcement and \$20 million in 2006 and 2007 for rapid-response teams to assist and educate children affected by meth labs.

IMPACT OF METHAMPHETAMINE ON CALIFORNIA

Nationwide, in 2003 over 12 million adults reported ever having used MA, 5.2% of the population [7]. According to Monitoring the Future[8], in 2004 approximately 6.2 percent of 12th graders had ever used MA, and 1.4 percent had used in the past 30 days, although these figures may underestimate the incidence of use in this age group since it is difficult to remain in school while abusing this drug. Treatment centers report a five-fold increase in admissions for stimulant abuse between 1992 and 2002 [2]. Fourteen states now report more admissions for MA abuse than for heroin and cocaine combined [9]. More than one-half of 500 county law enforcement agencies in the U.S report that MA is their primary drug problem [10].

National statistics, however, understate the impact of MA on California, since the introduction of pseudoephedrine/ephedrine based MA to the continental US came through San Diego, spread quickly through California and is only now

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reaching the Northeastern U.S. National averages also do not adequately describe the devastating impact on select demographic sectors.

California Methamphetamine Use:

There are an estimated 500,000 MA users in California, evenly split between men and women, most of whom are in their child-bearing years [11]. The high proportion of women using MA is unique and significant. For alcohol and most other drugs of abuse, men are represented 2:1 over women. The increased susceptibility of women is believed to be based at least in part on MA's anorectic "benefit" for weight control, but other reasons may also be in play. Many gender specific public health concerns arise as a result of MA use among women, including increased rates of STDs and sexual trauma.

The discrepancy between national and California statistics is clearly seen in rates for adolescent use. State statistics provided by the California Healthy Kids Survey [12] in 2004 found that 7.6 percent of 11th graders had used MA and 5.0 percent had used in the past 30 days. Both rates are higher than the national average for adolescents one year older.

Substance Abuse Treatment Programs:

The California Department of Alcohol and Drug Programs, which monitors publicly funded treatment programs, reports that MA is now the most common primary drug of abuse in California among those seeking treatment, surpassing alcohol and heroin [13]. The percentage of clients admitted for primary MA treatment has increased from 20.6% in 2000-01 to 26.5% in 2001-02, and to 31.5% in 2003-04. This represents a rise from 29,470 clients to 51,818 over a three year period [13]. Much of this increase in treatment admissions for meth is due to an influx of court ordered clients through Prop 36, enacted in 2000; and, UCLA data reveal that this influx is continuing to grow [personal communication - ADP].

Criminal Justice System:

In the early 1980's California began a policy of incarcerating low level drug possession as a mainstay in its war against drugs. As a result, the state achieved a rate of drug offender incarceration that was 2.5 times the national average (132 vs 45 per 100,000) by 1996. The total prison population rose from 23,600 in 1980 to 159,000 in 2003. When MA increased in popularity through the 1990's, its users were caught in the same net already being cast over all other illicit drug users.

Methamphetamine abusers are now flooding the judicial system in California. For example, in 2002 one-third of male arrestees in Sacramento tested positive for MA, as did 43% of female arrestees in San Jose [6]. In 2003, 36.2% of adult male arrestees in San Diego tested MA positive; and 28.7% in Los Angeles. Nationally, 58% of counties report MA is their largest drug problem, with cocaine being mentioned only 19% of the time [14]. In California, Orange County reported that 60% of its 11,500 felony probation cases in 1995 were MA involved. Butte County reported the same rate of MA involvement in its approximately 1,800 new probation cases in 2003 [15].

Social Services:

The high incidence of violence and abuse documented with all substance abuse (e.g., alcohol, opiates, other stimulants) is present to a significant degree with MA as well, contributing to burdens on the social welfare system. Recent studies reveal problems with violent behavior in 46% of females and 40% of males dependent on MA [16]. Fifteen percent of women have had assault charges and 46% of men [16]. Physical abuse is reported by 67-85% of women and 35-70% of men [17]. Sexual abuse affects 33-58% of woman and 5-16% of men [17]. Attempted suicide is associated with 28% of women and 12% of men [16]. It appears that the chronic physiologic and emotional state of "fight or flight" amplified by MA often produces conditions that generate violent behavior.

Health Care:

Increased MA use has had a significant impact on health. Fifty-six percent of hospitals nationwide say their costs have risen because of MA related patient care, which is rarely covered by private insurance [14]. Between 1995 and 2002, SAMSHA's Drug Abuse Warning Network (DAWN) reported emergency room visits for medical and psychiatric complications of MA use increased 126% [18]. Emergency rooms in Los Angeles, San Diego and San Francisco [19] reported a 43.1% increase between 1998 and 2002 in medical record mentions of MA.

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Random urine toxicology screens at UC San Diego Medical Center in 1978 had a 3% positive rate for amphetamine; by 1987 the rate rose to 10% [20]. The UC Davis Medical Center conducted 3,102 random urine toxicology screens on 10% of emergency department patients over a six month period in 1996-7 and reported 14.9% positive for MA [21].

Chief complaints of MA-involved patients included blunt trauma (33%), altered level of consciousness and psychiatric problems (23%), abdominal pain (13%), suicide attempt (8%), chest pain (8%), skin infection (6%) and penetrating trauma (4%). Significantly higher rates of MA-involved patients arrived by ambulance (69% vs 22%) and required admission to the hospital (58% vs 22%) [21].

Infants and Children:

Thirty percent of child protection assessments involve meth use by a family member [14], leading to greater burdens being placed on the foster care system. During the past five years, 71% of California counties responding to a National Association of Counties survey reported an increase in out-of-home child placements associated with MA-involved parents [14].

The DEA claims that, during the past 5 years, more than 15,000 children nationwide have been present at sites where MA was being produced [22]. Within California in 2004, there were 221 children involved in illicit lab incidents [6], and studies have demonstrated that as many as 60% of children removed from MA labs test positive for the drug [13]. In addition to being exposed to the drug itself, children are often unsupervised, neglected, exposed to inappropriate levels of sexuality and dangerous toxic chemicals used in the manufacturing process.

Although the issue of fetal damage from MA use during pregnancy provides dramatic material for news media, scientific questions remain. David Lewis, MD, of Brown University and a blue ribbon panel of researchers and clinicians issued a consensus statement that contained the following cautions:

Although research on the medical and developmental effects of prenatal MA exposure is still in its early stages, our experience with almost 20 years of research on the chemically related drug, cocaine, has not identified a recognizable condition, syndrome or disorder that should be termed 'crack baby' nor found the degree of harm reported in the media and then used to justify numerous punitive legislative proposals. The term 'meth addicted baby' is no less defensible. Addiction is a technical term that refers to compulsive behavior that continues in spite of adverse consequences. By definition, babies cannot be 'addicted' to methamphetamines or anything else. The news media continues to ignore this fact. If a fetus is exposed to long term opiates during pregnancy, withdrawal symptoms of the Neonatal Narcotic Abstinence Syndrome after birth are readily diagnosable and treatable, however no such symptoms have been found to occur following prenatal cocaine or methamphetamine exposure [23].

In private correspondence, Dr. Lewis states that the letter does not claim that "harms will not be demonstrated," but is designed to prevent people from jumping to conclusions based only on their assumptions, not science.

On the other hand, Meredith [3] reports that fetal exposure to MA has been shown to lead to multiple complications, including behavioral effects in neonates, lowered visual recognition memory similar to cocaine in infants [24], and poor social adjustment, with increased aggressive behavior in 4 and 8 year olds despite normal psychometrics [25]. Deficits in delayed verbal memory and sustained attention were correlated with reduced volumes in the hippocampus and striatal nuclei in a cohort of children aged 6.9 (+/- 3.5 years) with prenatal MA exposure [26]. Final conclusions regarding the effects of prenatal MA exposure remain tentative and are likely dose and timing dependent. However, it is prudent to assume that any level of exposure to MA is undesirable, as is the case with alcohol, cocaine, nicotine and a variety of other drugs.

Environment:

Although illicit MA lab seizures have decreased in California from 1,749 in 1998 to 1,130 in 2002, rural counties remain high on the list (e.g., Stanislaus and Butte), reflecting that MA is no longer only an urban problem. "Super labs" in Mexico and California (usually operated by Mexican organizations) capable of manufacturing 10 pounds at a time supply 80% of MA used in the U.S.; although individual 'cookers' can produce an ounce for personal use from tools that fit into a suitcase [27].

No data could be found to establish what percentage of MA users manufacture their own supply.

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The production of one pound of MA creates 5 to 7 pounds of toxic waste, including lye, muriatic acid, ammonia, red phosphorous, acetone, ether and heavy metals. These toxic chemicals are usually dumped down household drains or discarded into the environment [6]. The California Department of Toxic Substances Controls (DTSC) Emergency Response Team handles about 800 meth labs annually, with no county being spared; and these figures do not take into account the larger labs responded to by federal agencies and cleaned up by the EPA. Approximately half of the emergencies responded to by DTSC involve clandestine MA labs.

The environmental cost to California in 2001 was \$5.5 million [28]. In 2002 MA lab cleanup in the combined Central Valley and Los Angeles areas alone cost nearly \$4 million. The most common symptoms suffered by first responders during incidents and raids on meth labs are respiratory and eye irritation, headaches, dizziness, nausea and shortness of breath [6].

PATHOPHYSIOLOGY OF METHAMPHETAMINE

The pathophysiology of today's MA stems from the dextro isomer of MA being 3-4 times more stimulating to the brain than its mirror image levo isomer. The advent of pure dextro MA came with street chemists' discovery that pseudoephedrine, an OTC decongestant, is essentially the MA molecule plus an oxygen atom. Simple reduction techniques convert readily available precursors into dextro MA. The fact that current forms of MA are more easily smokeable has contributed to its greater impact. Smoking meth produces effects within 10 seconds, while IV use takes 15 to 20 seconds. The duration of action from smoking is 8 to 24 hours, while snorting or IV use lasts 4 to 6 hours. The longer duration of MA's action (cocaine effects last 1-3 hours, and even shorter when being used in a binge pattern) is often cited as one reason for its preference.

MA impacts the brain by increasing catecholamine (epinephrine, norepinephrine, dopamine) and serotonin activity. This increase comes about via three mechanisms: (1) causing neurotransmitter release, (2) blocking their reuptake and (3) slowing their metabolic breakdown. Not only is reuptake of dopamine blocked, but the action of the dopamine transporter (DAT) system is reversed, pumping the neurotransmitter out of neuronal dendrites rather than vacuuming dopamine back up and recycling it into synaptic vesicles, which terminates its action on receptor sites.

The acute effect of MA is a state of catecholamine and serotonin excess, which leads to an experience of excitation and general well being, with increased alertness, highly focused attention, motivation, confidence, mood, energy, and decreased appetite. In MA-naïve subjects acute doses can produce improvements in cognitive processing, including reducing reaction times during sleep-deprivation [29]. The dysphoric aspects of this acute excitation can include anxiety, restlessness and insomnia. Within days of exposure to MA, biochemical alterations in the brain characteristic of chronic use begin to appear (e.g., reduced dopamine transporter and increased chemical markers indicating degeneration of dopaminergic nerve terminals)[30].

Chronic use quickly produces a state of catecholamine and serotonin depletion, which is experienced as profound exhaustion, depression, lethargy and anhedonia. Disruption to the integrity of central nervous system (CNS) neurons and neurotransmitter systems is significant and long-term with chronic MA use. Serotonin depletion, dopamine depletion, which lasts up to four years in primates [3], and reduction of dopamine transporter in the human caudate/putamen (20% lower), nucleus accumbens (29.6% lower), and in the prefrontal cortex (33% lower)[31] contribute to anhedonia, impairment of fine motor control (peg board tasks) and cognitive difficulties [32]. The decrease in dopamine transporter is directly related to the length of MA use [33]. Neurotoxic effects occur preferentially in the destruction of dopamine synaptic terminals rather than total cell loss [3]. The mechanism of this destruction appears to stem from MA's redistribution of dopamine from the reducing environment of synaptic vesicles into the oxidizing environment of the cell's cytoplasm, with the subsequent production of free radicals and other reactive metabolites that damage protein and cell membranes [3].

Functional impairments associated with the biochemical and structural changes produced by MA are both cognitive and psychiatric. Cognitive deficits include impaired verbal and visual memory, motor function, attention, and executive functions requiring abstraction, set shifting and inhibition [34, 35]. These deficits tend to worsen in early abstinence (5-14 days). Errors in selective attention have been demonstrated 2 months into abstinence [36], and decrements in psychomotor and verbal memory tasks require between 3-14 months of abstinence to improve [37]. Chronic use of MA contributes to a variety of psychiatric problems, including mood disturbances (depression, dysphoria, anhedonia), anxiety [16], paranoia, auditory and visual hallucinations and psychosis [38, 39].

In summary, MA impairs brain biochemistry, structure, and function, although details of the relationship among these three levels of impairment are still being investigated. At this point, research appears to show that the degree

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of biochemical impairment (i.e., reduced dopamine transporter in select brain areas) correlates with the duration of MA use and is directly related to the degree of dopamine cell damage (i.e., destruction of synaptic terminals) and the severity of cognitive and psychiatric dysfunction[31]. The correlations are less clear during abstinence, when the recovery of biochemical and functional health do not always proceed in parallel, if they recover fully at all.

CLINICAL PRESENTATIONS

As with all drugs, the clinical presentation of MA use varies greatly, depending on whether the user is a naïve or chronic user, whether the chronic user is in the early or late stages of a run, or is in withdrawal. A user may be seeking emergency care for burns from an illicit lab incident or an injury resulting from a car accident or interpersonal violence, needing treatment for an STD resulting from unprotected sex, or be seeking psychiatric care for anxiety, depression, paranoia or psychosis. The presenting problem also depends on whether you are an ER physician, internist, dentist, psychiatrist, obstetrician, pediatrician, policeman or family member. The same patient, with the same underlying primary illness, can present in a wide variety of ways in many places in our communities.

Methamphetamine produces an exaggeration of normal ‘fight or flight’ physiology of such intensity and duration that the body has difficulty sustaining the stress. The acute and chronic effects of MA have especially severe impacts on the cardiovascular system. An excessive level of monoamine excitation increases the heart rate, raises blood pressure, and diverts blood from the skin and gut to the skeletal muscles. As a result of this intense cardiovascular stimulation, palpitations, arrhythmias, cardiomyopathy, valvular disease, angina, myocardial infarctions, and cerebral vascular events may occur. The extreme CNS stimulation leads to increased incidence of headaches, hyperthermia, tremors, athetoid movements and seizures. Respiratory disorders such as pulmonary edema, bronchitis, pulmonary hypertension, hemoptysis and granuloma may be the presenting symptoms. The anorexic effects of MA can also lead to extreme malnourishment with its resultant decreased resistance to disease. Severe oral dehydration, teeth-grinding, poor oral hygiene and exposure to sugary beverages all lead to multiple dental problems typical of the MA addict. Deaths attributable to MA reported by the coroner’s office in San Francisco (1999) [33] were due to drug overdose 54% of the time; suicide 12%; trauma 10%; homicide 10%; and natural or undetermined 14%.

A stereotypic succession of symptoms with colorful names generally ensues when an individual uses MA. During a ‘run’, which can last from a couple days to a month or more, users typically begin ‘tweaking’, which is some form of obsessive, repetitive behavior. They develop stereotypic motor behaviors reminiscent of a cat’s repetitive pacing. Sometimes the tweaking is about obsessive orderliness, such as kitchen cleaning, or much more elaborate such as disassembling an automobile engine and putting it together again, and again. Other times tweaking may merely entail getting out of a chair, checking out the window, sitting again, then checking again, for hours.

Being on ‘window patrol’ usually means that paranoia has begun, a state of mind that produces distortions in perceptions of others’ motives, as an individual attempts to find rational explanations for their sustained fearfulness. It may also mean that hallucinations, both auditory and visual, have appeared. At first the auditory hallucinations tend to be whispers and murmurings, which can lead to urgent searches for the source (through walls, ventilation grates, putative electronic devices). Eventually the auditory hallucinations can become voices that are indistinguishable from another person’s speech. The presence of visual hallucinations, which help distinguish the psychotic state induced by MA from schizophrenia, often begin as shadows, or brief after-images of something that was almost there. Eventually they can take on the improbable dimension of engulfing demons or tiny police cars driving through the carpet. Tactile hallucinations may appear, usually taking the form of feeling insects crawling under the skin (formication). In early phases of addiction, psychotic experiences are generally dose-related and transient; however, in more advanced stages of addiction (and perhaps of neuronal damage) psychoses appear to “kindle” into very persistent or even permanent conditions, irrespective of use or abstinence.

Finally, one’s mind can disintegrate to the point of producing only very ‘sketchy’ thinking, disconnected fragments of thought that resemble a digital cell phone that is dropping out a progressively larger proportion of its transmission. Once a run comes to an end, users typically ‘crash’ into a state of extreme depression, prolonged sleep, and hunger. Unless an individual is willing to tolerate the gradual lifting of this intensely dysphoric state over several days, weeks, or even months, he or she is likely to use MA again as an antidote for the exhausted misery of withdrawal.

Multiple significant neurocognitive impairments from MA can persist well into abstinence and differ slightly from those produced by cocaine. Both impair verbal memory, but MA also impairs visual information processing and memory. There are deficits on tests of frontal lobe executive functions (e.g., Wisconsin Card Sorting, a measure of the ability to shift set) [3] leading to fixed ideas that defy refutation by fact or logic. MA abusers have been reported to have

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a 7.8% deficit in hippocampal volume, with the degree of memory impairment proportional to the degree of volume loss [40, 41]. These cognitive functions worsen during the first two weeks of abstinence and have been documented to persist up to 14 months of abstinence [37]. In addition, errors in selective attention have been shown to persist during the first two months of abstinence.

Clinically, MA users present a picture of distractibility and difficulty sustaining attention as measured by the Stroop Test, a measure of the ability to hold set and inhibit distractions [30]. The degree of difficulty with the Stroop is related to the amount of viable tissue in the anterior cingulate gyrus as measured by imaging techniques [30]. Even when dopamine transporter density fully recovers with abstinence, neurocognitive deficits do not necessarily disappear. This raises the issue of whether dendritic regeneration during abstinence represents the return of fully functional neural tissue. By analogy, the question remains whether new growth following the cutting down of a tree leads to a healthy tree, or merely to a bush. The existence of prolonged neurocognitive deficits has, of course, significant implications for psycho-social treatment strategies and duration.

METHAMPHETAMINE DEPENDENCE

Central to addiction is a drug's ability to activate the brain's reward circuitry. All addictive drugs increase dopamine in the Nucleus Accumbens (NA) beyond levels achievable by natural behaviors. Although different addictive drugs produce this increase by a variety of mechanisms, they all manage to activate a final common pathway that involves dopaminergic neurons with cell bodies in the ventral tegmental area (VTA) of the brain with axons that extend up to the NA. Chronic excessive stimulation of the reward circuitry by addictive drugs produces enduring, and possibly permanent, pathophysiologic changes within this circuitry – within its cellular microarchitecture, neurotransmitter levels, and response to stress. The result is an organism with a sustained priming to respond with increases of dopamine in the NA upon re-exposure to cues associated with drugs it has historically been dependent upon, as well as a more rapid development of tolerance and physiological dependence once these drugs are re-introduced.

Addiction is ultimately a brain disease, irrespective of the psychological reasons that first motivated a person to experiment with drugs. Drug experimentation is best viewed as a psychological phenomenon, while loss of control is best viewed as a brain-based phenomenon. Addiction is a brain disease for the same reason that a concussion is a brain disease, even if it occurs in a motorcycle accident with a rider who chose not to wear a helmet. Once the brain is primed or damaged, subsequent problematic behavior is best approached medically rather than in a moralistic or punitive manner.

The daily dose of MA varies widely, depending on the degree of tolerance of the user. Novices may start with snorting 10-30 mg and can make a gram last from 1-2 weeks. Long term users can get up to 1-3.5gm (an 'eight-ball') a day. Methamphetamine powder sells for \$50-\$60/gram and 'crystal meth' usually sells for \$80-100/gm, although it can go as high as \$300/gm [42]. In combination with heroin it is known as a speedball.

Methamphetamine is uniquely positioned to produce addiction, since it has been described as a 'dopamine machine'. It stimulates the release of dopamine, blocks dopamine reuptake and literally reverses the direction of dopamine transport. The resultant hyperdopaminergic state is believed to underlie the euphoria, heightened sense of attention, increased energy, hypersexuality, decreased appetite and hallucinations/psychosis associated with MA. Medical phenomena consistent with this hypothesis include the hypersexuality seen in Parkinson's patients being administered dopamine precursors and the ability of dopamine blockers to reduce hallucinations, paranoia and psychosis.

Chronic MA use soon results in significant catecholamine exhaustion, which in turn contributes to the rapid development of tolerance, to extreme craving and a powerful withdrawal state. The first 7-10 days following cessation of amphetamine use is marked by a high initial peak of symptoms and then a linear decline. Prominent symptoms consist of hypersomnia and extreme hunger, depressive equivalents, anxiety and craving [43]. Most symptoms tend to resolve spontaneously and medication is generally for symptomatic relief. Chronic withdrawal symptoms of anergia and dysphoria can be significantly worse than those caused by cocaine, a fact that is probably explained by the greater duration of action, longer periods of sleeplessness, and neurotoxicity seen with MA [3].

To date no medication has been developed to block the effects of MA, though several may provide benefit at different stages of treatment. Paranoia, aggressivity and hallucinations may persist for days, weeks, months, years, and perhaps remain permanently, but should be seen as either a premorbid condition or persisting drug-induced symptoms and not characteristics of withdrawal itself. Antipsychotics such as risperidone diminish hallucinations and paranoia and may be useful both in the immediate withdrawal period and when psychotic symptoms endure. Antidepressants

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are rarely useful during withdrawal, but may reduce prolonged depression. Careful use of ADHD medication has been advocated, although the incidence of pre-existing ADHD remains under debate [44].

CALIFORNIA'S EVOLVING RESPONSE TO DRUG ABUSE

The War on Drugs: Drug abuse often seems frustratingly resistant to the public's efforts to bring it under control. The public has often been guided by politics more than science in the drug policies it supports. During the presidential election of 1968, Richard Nixon introduced the War on Drugs, which soon became the backbone of America's drug policy. Initially the majority of funding was for treatment, but, over time, the proportions shifted to favor interdiction and law enforcement. By 1980 California began successfully increasing arrests, prosecutions and imprisonment as its primary means to reduce drug use and street crime.

Eventually, no state embraced this policy of incarceration more than California, which saw a 25-fold increase in the number of drug users sentenced to state prison between 1980 and 1999. Despite the arguments of opponents that simple punishment does not address the underlying medical causes of drug abuse, California went from imprisoning 379 of its citizens annually for drug possession in 1980 to 12,749 in 1999. The state's drug-offender prison population rose from 1,778 in 1980 to 45,455 in 1999 [45]. By the late 1990's, over half of Californians imprisoned for drug offenses were for possession alone. In June, 2000, 28% (45,439) of the California prison population were drug prisoners.

California counties differed widely in their adoption of strict enforcement practices. If incarceration were an effective policy, those counties that most aggressively prosecuted all levels of drug possession should have demonstrated greater declines in crime rate and drug use. The data reveal, however, that increases in imprisonment for drug offenses showed no discernible impact on crime rates [45]. In fact, the six counties that increased their imprisonment rates the most for low level drug possession actually experienced greater increases in violent crime from 1980-1999.

A reasonable conclusion from California's experience is that felony drug offenses appear to reflect, rather than control, higher rates of drug abuse and crime [45]. A recent United States Department of Justice drug policy study concluded that higher rates of arrests, stricter laws, and more aggressive sentencing policies do not deter many drug users exposed to these penalties. This leads to a revolving door scenario in which drug-involved offenders appear repeatedly before the courts. For example, without treatment 29.9% of substance abusing offenders released in 2002 in 15 states were rearrested for new offenses within 6 months; and 67%, within 1 year. Relapse to drug abuse occurs in 85% within the first year, and 95% within 3 years [46].

Policies promoting incarceration have not only been ineffective at solving the problems they are designed for, but they have also taken valuable resources away from more effective solutions, especially treatment. The average annual cost of incarceration is \$30,000 per prisoner [47]. The Office of National Drug Control Policy (ONDCP) reports that of the \$38 billion spent nationwide on corrections in 1996, more than \$30 billion was spent incarcerating people with a history of drug and/or alcohol abuse. While between 70% and 85% of inmates were estimated to be in need of substance abuse treatment, less than 11% received any [48].

The Public Health Model: Public opinion has shifted toward a public health approach to drug policy. The public health perspective combines concern for both the health of individuals and the safety of the general public. Good medical practice and society's right to be protected from the illness or excesses of a few have guided public health departments in their treatment of infectious disease (e.g., TB, syphilis, and HIV) and their pursuit of public sanitation. Diverse public health approaches to drug abuse have increasingly been implemented around the country based on solid, evidence-based medical principles.

In 2000, 61% of California voters passed Proposition 36 (the Substance Abuse and Crime Prevention Act of 2000 - SACPA) despite opposition by virtually all criminal justice and court agencies. In doing so, the people of California expressed their will to replace the War on Drug's emphasis on incarceration with a public health model that emphasizes treatment. Two measures are usually used for comparing the results of drug policies that emphasize incarceration to those that emphasize treatment: cost and outcome (re-arrest, recidivism, drug relapse, etc.). Prop 36 has performed well by both measures. The economic benefits are outlined below, and the favorable outcomes in the next section.

The cost of treatment depends upon the intensity of treatment provided. For example, the Drug Treatment Alternative-to-Prison (DTAP) Program in New York, a 15-24 month residential therapeutic community, is estimated to cost 50% less than incarceration. More than half graduate and have re-arrest rates that are 33% lower, reconviction rates that are 45% lower and recidivism rates that are 87% lower than a comparison group that was incarcerated without treatment [49].

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Washington State estimates that its average drug court participant produces \$6,779 in benefits that stem from an estimated 13% reduction in recidivism, avoided criminal justice system costs and avoided costs to victims [50].

In California, the average referral to Prop 36 treatment costs \$4,500 [51]. Researchers at UCLA reported in April, 2006, that every \$1.00 invested in the program has saved \$2.50. For those who complete the treatment program, the savings jumped to \$4.00 for every \$1.00 spent [52]. With savings during the first year alone amounting to \$173 million, Prop 36 is estimated to have saved state and local governments at least \$800 million to date. Add to these savings approximately \$500 million in prison construction costs that were avoided, and the total savings come to \$1.3 billion over 5 years. In addition, at the end of 2003 SACPA resulted in there being over 7,000 fewer prisoners incarcerated for simple drug possession than in 2000 [53].

EVIDENCE-BASED TREATMENT

Because MA dependence impacts social systems in multiple costly ways, the public has often viewed it as primarily a social problem, not a medical problem. As a result, policies emphasizing arrest and incarceration have often been turned to for remedies. McLellan et al. [1] argue that problems stemming from medical etiologies require medical solutions, including prevention and treatment.

The effectiveness of drug and alcohol treatment need to be measured against the standard set by treatments for other chronic, relapsing medical illnesses. McLellan states that “Outcome studies indicate that 30% to 50% of adult patients with type 1 diabetes and approximately 50% to 70% of adult patients with hypertension or asthma experience recurrence of symptoms [i.e., relapse] each year to the point where they require additional medical care to establish symptom remission.” He points out that chemical dependence treatment achieves similar results, with 40% to 60% being continuously abstinent at one year follow up and another 15% to 30% resuming use without full dependence.

The assessment of treatment for MA dependence should therefore be conducted within two contexts. First, the cost and outcome of treatment need to be compared to the standards used to evaluate other chronic medical illnesses. And second, it needs to be compared to the cost and effectiveness of the most common alternative, incarceration. Once we understand that “cure” is not the appropriate goal, then effective management to ameliorate complications and reduce relapses becomes a legitimate measure of success.

Data shows that treatment for MA dependence is effective. The most studied treatment modality for methamphetamine is Richard Rawson’s Matrix Model, a 4-month, manualized, intensive outpatient abstinence-based program that combines cognitive-behavioral therapy, family education, 12-Step participation, urine monitoring and positive reinforcers [9]. Originally developed and validated as effective treatment for cocaine dependence during the 1980’s, the Matrix Model was investigated in a multi-site randomized clinical trial funded by the Center for Substance Abuse Treatment’s (CSAT) Methamphetamine Treatment Project (MTP). The MTP, coordinated by UCLA, compared treatment outcome of the Matrix Model to treatment-as-usual at 6 different California sites and one each in Montana and Hawaii.

Completion of the program (defined as the participant having attended at least one session in her/his last scheduled week of treatment) was 40.9% for the Matrix program. The only treatment-as-usual site with a higher completion rate was a drug court in Hayward, CA. Overall MA use by study participants during the preceding 30 days fell from 11 to 4 days, a very significant reduction that was maintained through the six month follow up period. Except for the medical scale, all ASI (Addiction Severity Index [54, 55]) domains demonstrated significant improvement, with drug, alcohol, psychiatric and family domains remaining improved at the 6-month point. For all participants the rate of MA negative urines at discharge and 6 month follow up were 66-69%. Twelve months after discharge from treatment 55-59% of MA users were MA-free [11]. Treatment drop out rates, re-incarceration rates and other outcome measures for MA users have all been proven to be equivalent to individuals treated for other drug abuse problems. Rawson concludes that “There is absolutely no evidence that MA clients respond differently than cocaine clients to psychosocial treatments...” [11]. Treatment for MA dependence is effective.

The benefits to society of MA treatment have also been studied and deserve attention. Sustained abstinence reduces crime by 40-75% [56]. Among those receiving treatment there is a 74% decrease in crime [5]. Because 50-59% of those treated by the Matrix Model remain abstinent 1 year after discharge [9], demand reduction is also a tangible benefit.

Because MA possession in itself is a crime, and because aggressivity and criminality are highly associated with MA dependence, a cooperation between the judicial system and treatment has begun to evolve. The concept of ‘therapeutic jurisprudence’ illustrates some judges’ efforts to emphasize treatment over punishment. CSAM member

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John Chappel asserts: "Judges should coerce treatment until sobriety becomes tolerable." The data appear to support this approach. Drug treatment during incarceration, plus aftercare, cut 3-year recidivism rates from 75% to 27% in the California Amity Program [46].

The last decade has produced two new approaches to intervention in addictions – one in the Criminal Justice Model and the other in the Public Health Model. Judges developed the Drug Court Model because they recognized that simple sentencing usually leads to relapse and recidivism. Eighty percent of non-completers of Drug Court programs are re-arrested, while only 11% of completers are re-arrested [57]. Unfortunately, drug courts are more costly and more time-intensive than regular courts; they typically maintain close liaisons with treatment agencies and rely on frequent court visits for the arrestees. In California, Drug Courts have historically handled only ~3% of eligible arrestees, and may have some measure of selection bias.

Proposition 36 (The Substance Abuse and Crime Prevention Act) mandates treatment rather than incarceration for arrestees not complicated by current or prior felonies, drug dealing, or violence. UCLA has completed both outcomes (2004) and fiscal (2006) analyses of Prop 36 programs. Participants in Prop 36 who report MA as their primary drug of choice (53%) have shown completion rates and duration of treatment outcomes that are similar to participants abusing other drugs. Completion rates have been around 34%, with half of participants receiving at least 90 days of treatment [58]. The percent with gainful employment at 12 month follow-up (54%) was almost double the percent who had jobs when they entered SAPCA (29.5%) [58]. Among those who were referred to treatment but chose not to participate, 34.6% had drug felony arrests, and 20.5% had misdemeanor drug arrests within 12 months. Among treatment completers, felony drug arrests were reduced to 22%; and misdemeanor drug arrests, to 13.7% [58].

Like cocaine, MA treatment has no craving-reduction or relapse prevention medications (unlike opiates and alcohol that do). Treatment programs remain psychosocial in nature with a special emphasis on cue-induced craving and relapse prevention. McLellan [1] has persuasively argued that chronic medical illnesses without definitive cures require ongoing management. Whether public interventions begin through the judicial system or through the public health system, providers in both domains must be prepared to deal with high initial no-show rates, recurring attempts at social-recreational use, and thus intermittent relapses to this very rewarding drug. Nevertheless, outcomes are on a par with other major addictions.

The significant cognitive deficits often produced by MA complicate treatment and create a few specific treatment needs. Difficulty with selective attention and severe depression during early abstinence distract patients from full comprehension of therapy. Impaired verbal processing and memory and deficits in frontal lobe executive functions interfere with grasping and remembering psychoeducational lessons. Because these cognitive functions may worsen during the first two weeks of abstinence and persist for many months, treatment often needs to rely on external structure to maintain abstinence and frequent repetition of important topics over an extended period of time.

In addition to cognitive impairments, it is the rule rather than the exception that psychiatric disorders accompany MA abuse [59], most notably mood disorders (depression and anxiety), psychosis and paranoia. Kalechstein et al [60] reported in a survey of arrestees in the 14 most populous California counties that 29.4% of MA dependent subjects needed psychiatric care. Nearly 50% had a history of suicidal ideation, and in the previous year 57% had experienced depression, 27% had had violent behavior and 8.8% had had delusions. This high incidence of psychiatric comorbidity inevitably complicates treatment of the chemical dependence, again necessitating longer programs for maximum effectiveness similar to other dually diagnosed patients. Particularly when the severity of depression or psychosis warrants medication management, it is essential that MA addicts have access to psychiatric evaluation and management.

Addressing sexuality in sobriety is accepted as an important issue in all chemical dependence programs. Because of the hypersexuality often associated with MA, focusing on this issue plays a significant role in treatment, most especially in the gay community where MA, along with Viagra, is a ubiquitous sex performance aid. The extraordinarily high levels of dopamine produced by MA, combined with the decreased levels of inhibition, frequently produce a hypersexuality that profoundly affects an individual's relationship to sexuality long into sobriety. Memories of the compulsive, glorious, sexual athleticism of addiction often make sober sex pale by comparison. At the same time, the mere act of being sexual, viewing pornography, or even being the target of slick Victoria's Secret advertisements can serve as a trigger for craving. All of this might be quite differently experienced by those who traded sexuality for the drug (both women and men who have sex with men (MSM)). For them, sexuality during sobriety may trigger profound shame and craving for the drug that can counteract that shame. For many women, specific program components may be needed to deal with sexually related traumas incurred while using.

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Methamphetamine treatment programs must address these sensitive and difficult issues directly as part of relapse prevention. Again, prolonging the length of treatment and aftercare provides time to prepare patients to meet the stresses of sober living and develop confidence and trust to work on these difficult triggers. No consensus exists regarding the optimum duration of treatment, with the range being from 6 to 12 months (although some cognitive deficits have been shown to last up to 18 months). When psychiatric or cognitive deficits prove to be permanent, long term management becomes necessary.

Finally, MA users often confront treatment programs with more than the usual denial seen in all drug addiction. The presence of delusions, psychosis, paranoia and formal thought disorders also create a formidable barrier to developing a therapeutic alliance. These psychiatric symptoms are clear evidence of impairment from chronic MA use and strongly validate the need for abstinence-based treatment. Unfortunately, paranoia frequently lasts well past the point of acute intoxication, can complicate acceptance of treatment, and extend well into rehabilitation.

However difficult treatment might be, it is important to remember that, in June, 2000, prior to Prop 36, 28% of the California prison population were drug prisoners, for a total of 45,439. By June, 2003, due to the diversion of nonviolent drug offenders to treatment, the number of drug prisoners had declined to 35,540, which was 22% of the total California prison population.

CONCLUSION

California is once again experiencing a surge in popularity of methamphetamine. The media has stimulated a wave of public attention and uproar. But, from the perspective of addiction medicine, little has changed. MA is one of many stimulants, with a few unique features, and MA abuse can be treated with the same level of success as other drug addictions. While some individuals use MA without being overwhelmed, many others fall into a downward spiral of complications, disease and devastation. Society as a whole is burdened by their difficulties and thus has a stake in preventing and treating MA abuse.

Two approaches contribute to California's response to the MA problem. The Drug War, with its emphasis on incarceration, has been the dominant approach, producing an expensive increase in the prison population without reducing street crime, recidivism or drug use. The public health approach, with its emphasis on treatment, gained the public's support in 2000 through Proposition 36 and has demonstrated reduction in crime, recidivism and drug use – all at much less cost.

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