

PROSPECTS FOR STIMULANT MAINTENANCE IN VANCOUVER, CANADA

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Medical provision of orally-administered stimulants is a harm reduction technique that could reduce suffering and slow the spread of AIDS among cocaine misusers in Vancouver, B.C., Canada. However, experimentation with stimulant maintenance will be difficult to carry out until the public's exaggerated fears of cocaine and other stimulants, engendered by a prolonged "War on Drugs", have subsided. This article explores the prospects for stimulant maintenance by (1) reviewing the actual dangers and benefits arising from use of cocaine and other stimulants, (2) describing small scale stimulant maintenance programs that already exist in various countries, and (3) drawing from Vancouver's experience with methadone maintenance to propose first steps towards stimulant maintenance. Although we focus our analysis on Vancouver, we believe it has wider applicability.

Keywords: Harm reduction; AIDS; stimulant maintenance; agonist replacement; cocaine; methylphenidate; amphetamines

Medical provision of orally-administered stimulants in a "stimulant maintenance" or "agonist replacement" program for cocaine misusers could reduce several kinds of harm. Blood-borne transmission of HIV and hepatitis, a major consequence of needle-sharing, could be reduced for cocaine misusers who switch from injection to oral consumption. Other kinds of toxicity could be reduced for smoking as well as injecting misusers, because street drugs are often contaminated.

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Overdoses could be reduced, since stimulants that are orally administered cross the blood brain barrier more slowly than injected or smoked stimulants, decreasing the likelihood of accidental overdoses. The reliance of patients on the black market could be reduced, in turn reducing violence, poverty, prostitution, and criminality. Finally, offering cocaine misusers a legitimate role in society, as medical patients rather than criminals, could reduce the harm arising from chronic alienation.

The potential benefits of stimulant maintenance are most easily documented with respect to AIDS. Public health research has identified cocaine injection as a major contributor to rising HIV rates among injection users across North America (Bruneau *et al.*, 1997; Chaisson *et al.*, 1989; Fisher *et al.*, 1998; Kral *et al.*, 1998; Poulin *et al.*, 1998; Shoenbaum *et al.*, 1989). In Vancouver, prevalence of HIV-1 among injection drug users reached 23% and the incidence of new HIV infections reached 18.6/hundred persons in 1997 (Strathdee *et al.*, 1997b). Local researchers identified preference for cocaine as the primary cause, because it requires many more injections per day than heroin (Strathdee *et al.*, 1997a).

Vancouver's HIV epidemic occurred despite the city's well-established treatment and counseling services, large methadone maintenance program, and one of the biggest and oldest needle exchange programs in North America (Archibald *et al.*, 1997; Coppard, 1999). The failure of well-established services to control AIDS indicates that further innovation is needed (Strathdee *et al.*, 1997b). We believe that stimulant maintenance is the next innovation that should be tried.

The chief mechanism by which stimulant maintenance could help to control AIDS is changing the patients' mode of administration, i.e., replacing injection with oral administration. Since cocaine injectors tend to inject frequently, and since many social rituals are associated with injection, the likelihood of needle-sharing and the consequent spread of AIDs is high. Reducing reliance on the black market could also help control sexually-transmitted AIDS, since it reduces the necessity for cocaine misusers to raise money by prostitution.

The chief obstacle to pragmatic public discussion and experimentation with stimulant maintenance is a sensationalized view of cocaine and cocaine users engendered by a "War on Drugs". According to this view, anyone who uses cocaine more than a few times becomes addicted (unless they meet instant death from heart failure). Moreover,

cocaine addicts inexorably become depraved and devoid of human compassion. These problems are said to be multiplied when cocaine is used in the form of "crack". If these claims were accurate, the most reasonable response to cocaine would indeed be a single-minded pursuit of eradication and abstinence. But they draw more from indirect evidence, media sensationalism, and expensive advertising than from systematic research and analysis (Alexander, 1990, Ch. 5; Buchanan and Wallack, 1998; Reinerman and Levine, 1997; Trebach, 1987).

This article aims to establish three points: (1) Cocaine addiction can be managed with the same pragmatism as other social problems because, although cocaine is a dangerous drug, it is no more so than other stimulants in common use. Moreover, most cocaine addicts are not crazed psychopaths but suffering human beings who warrant pragmatic compassion more than fear, (2) Small-scale stimulant maintenance trials for users of cocaine and other stimulants have already shown promising results in England, Australia, South America, and the United States, and (3) The lessons of decades of methadone maintenance can enable Vancouver to avoid some pitfalls in launching effective stimulant maintenance programs.

A FRESH LOOK AT COCAINE AND OTHER STIMULANTS

This section of the article compares cocaine to other stimulant drugs, and particularly to amphetamines¹ and methylphenidate. It is intended to provide a fresh perspective on cocaine, on cocaine addicts, and on other stimulants that might be used in a stimulant maintenance program.

In the mainstream media and some of the professional literature, cocaine is depicted solely as a drug that causes addiction, depravity, and sickness. No beneficial effects are acknowledged. Amphetamines are depicted primarily as addictive, dangerous drugs, ominously

¹There are many different amphetamines. We use the term "amphetamines" in a limited sense in this article to apply to those that are currently in the focus of public attention: racemic amphetamine, dextroamphetamine (also called dexamphetamine), and methamphetamine. Methylphenidate is also an amphetamine, although many authors, including ourselves, find it useful to consider it separately.

street-named "speed" or "ice". In contrast, methylphenidate, under its tradename Ritalin, is depicted as an invaluable medication, administered on a very large scale to children and adults with Attention Deficit Hyperactivity Disorder (ADHD). However, these dramatic and contrasting pictures are profoundly misleading, because these three drugs are extremely similar. Cocaine, the amphetamines, and methylphenidate pose equally serious threats to misusers and addicts. Nonetheless, each of these three stimulants has been consumed safely and beneficially by the great majority of users, both medical and non-medical. Society can use all three drugs to help cope with certain kinds of problems, if it guides and controls their usage with calm intelligence. They are neither panaceas nor demon drugs.

To keep language consistent in this article, anyone who uses cocaine or another stimulant on a continuing basis will be called a *stimulant user*. Stimulant users who harm themselves and others in conjunction with their drug use will be referred to as *misusers*. Misusers whose consumption is regular and compulsive will be referred to as *addicts*. Users who are neither misusers nor addicts will be divided into *recreational users* (who use for pleasure), *circumstantial users* (who use to relieve sickness, sustain effort, control appetite for food, etc.), and *medical users* (who receive their stimulant drug as part of legitimate medical practice). Some stimulant users fit in only one of these categories; some occupy the gray areas between them, and some move from one category to another – in a variety of sequences – as their lives progress (Cohen and Sas, 1993). The usual routes of administration for stimulants are oral ingestion, nasal application (usually called "snorting"), smoking, injecting (intramuscular and intravenous), and, in the case of cocaine, chewing coca leaves, with primary drug absorption through the mucous membranes of the mouth.

Cocaine

Moderate use of cocaine produces numerous transient side effects, including excitability, sweating, and insomnia. Some cocaine users become severely addicted, with consequences that are disastrous for their health, families, and society. Overdose with cocaine can cause paranoid psychosis, severe cardiovascular damage, seizures, and overdose death (Finkle and McClosky, 1978; O'Brien, 1996, p. 570; Perrine, 1996).

Beyond these well established facts, there is some conflict in the literature² on the dangers of cocaine. A large clinical literature based on cocaine misusers in treatment identifies dozens of serious medical conditions as pharmacological effects of cocaine (see Crowley and Brewster, 1998, p. 415). However, other researchers have pointed out that the drug effects attributed to "cocaine" by this clinical literature could just as well be caused by the excessive, impoverished, violent, anxiety-ridden lifestyle typical of cocaine misusers who require treatment (Alexander, 1990; Boyd, 1999, pp. 27-35; Chasnoff *et al.*, 1992; Morgan and Zimmer, 1997a; Wong and Alexander, 1991). As Gorelick (1992) put it:

Almost all data on pathophysiological abnormalities associated with human cocaine use come from clinical observation and testing of cocaine abusers seeking treatment. Such data are subject to several confounding factors which preclude drawing definite conclusions about the pathophysiological mechanism for the observed abnormality... Confounding factors include the unknown purity of the cocaine used, uncertainty as to quantity and duration of cocaine exposure, effects of other substances frequently used by cocaine abusers, abnormalities associated with drug route of administration and drug abuse lifestyle, and selection bias (p. 97).

Detailed descriptions of the whole spectrum of non-medical cocaine users have been reported from various countries including Canada (Cheung and Erickson, 1997; Erickson *et al.*, 1994; Matthews *et al.*, 1994) the United States (Reinarman and Levine, 1997), the Netherlands (Cohen and Sas, 1993), and Australia (Mugford and Cohen, 1989). These studies, together with clinical studies of medical users, indicate that, whereas excessive use is undeniably harmful, the great majority of cocaine users never overdose, become addicted, seek or

²This article is limited to the human research literature. There is also a large animal literature in psychopharmacology, which is reviewed elsewhere (Alexander, 1990; Erickson and Alexander, 1989; Peele and DeGrandpre, 1998; Morgan and Zimmer, 1997b). The animal literature is also subject to different interpretations.

accept treatment for drug abuse, or experience any more than transient side effects (reviewed by Erickson and Alexander, 1989; Morgan and Zimmer, 1997a; Peele and DeGrandpre, 1998). In fact, most users report substantial transient benefits of cocaine use – including increased energy and self-confidence – and little difficulty with side effects (Erickson *et al.*, 1994, p. 120). Field studies are close to unanimous in their descriptions of recreational use of cocaine, which is by far the predominant form. A World Health Organization study of cocaine use in 22 cities in 19 countries, reputed to be “the largest global study on cocaine ever,” states:

Snorting cocaine was also most identified with casual, recreational, low-dosage users who take cocaine for leisure or diversion, at social gatherings or during sessions of sexual intercourse... Most participating countries and sites did not report significant cocaine-related problems among this group of users (WHO/UNICRI, 1995).

The widely-held view that violence is a pharmacological effect of cocaine use is unwarranted. People who become violent under the influence of cocaine are generally erratic and dangerous without cocaine as well (see Matthews *et al.*, 1994). Much of the violence attributed to cocaine in the media is not caused by cocaine itself, but by the exigencies of trafficking. Goldstein *et al.* (1997) have shown that only 3% of a sample of New York City homicides in which “crack” was involved were “psychopharmacological”, i.e., cases where violence was a result of the perpetrators or victims using the drug. On the contrary, 85% of these homicides were “systemic”, i.e., territorial disputes among dealers, robbery of dealers, collection of drug debts, etc., in which psychopharmacological effects were not the cause of homicide.

Although it is true that many desperate, dangerous people wander the world's cities and that many of them use cocaine or crack, the belief that these drugs can be blamed for reducing otherwise normal people to this state is unwarranted. For example, the grim history of American black ghettos would be more than adequate to explain the devastation found there, even if cocaine had never existed. Much of the sensational evidence that portrays social and physical pathologies as pharmacological effects of cocaine has been selected uncritically or simply fabricated to

support a "War on Drugs" (Alexander, 1990; Reinerman and Levine, 1997; Trebach, 1987; Wong and Alexander, 1991).

The most extensive evidence that cocaine can be used safely comes from the mountains of South America. Andean natives have chewed coca leaves or consumed coca tea for thousands of years, often on a daily basis (Grinspoon and Bakalar, 1976; Morales, 1989). Although the amount of cocaine in the blood stream of current indigenous users who chew coca leaves is about the same – every day – as that in the blood stream of occasional, recreational users in North America (Paly *et al.*, 1980), addiction has been rare for centuries in this cultural milieu and there are few signs of long term damage among either the young or the aged. It is sometimes argued that coca leaf consumption has benign consequences for Andean people because they chew unrefined coca leaves, rather than snorting, smoking, or injecting cocaine. However, this is at most a partial explanation.³

³ This argument need not be contentious when discussing prospects for oral stimulant maintenance, which is designed specifically to move misusers and addicts to oral use, the safest and least socially abhorrent route of administration by all accounts.

On the other hand, it is important to note, when interpreting historical evidence, that there are strong indications that some claims about the importance of different routes of administration have been exaggerated (Morgan and Zimmer, 1997a, p. 131). For simplicity, we will comment only on the claim that injected or smoked cocaine is much more "addictive" than snorted or orally consumed cocaine because of the quicker and more intense pleasurable reaction or reinforcement that is produced. Although there is a body of evidence to support this claim, it is largely "circumstantial" or indirect (see Gorelick, 1998). We find the evidence against it more persuasive. For example:

(a) Before cocaine injecting and smoking became popular, alarming amounts of severe, sometimes fatal addiction was reported in people who swallowed and snorted cocaine (Maier, 1926/1987, esp. pp. 31–38). When the problem of amphetamine addiction was first described in the US in the 1940s and 1950s, the majority of addicts swallowed amphetamine pills or sniffed amphetamine "inhalants" (Grinspoon and Hedblom, 1975). Currently, many cocaine addicts and amphetamine addicts in treatment in the US (although not a majority in most studies) report snorting as their only mode of administration (Dunn and Laranjeira, 1999; Huber *et al.*, 1997; Meyers *et al.*, 1995). Some studies report that cocaine addicts who are intranasal users have problems that are as serious as those who are IV users (Washton and Tatarsky, 1984) and that cocaine addicts who are IV users respond about as well to treatment as intranasal users (Budney *et al.*, 1993).

(b) On the other hand, many people smoke crack cocaine for long periods without becoming addicted (Matthews *et al.*, 1994). Numerous survey studies show that the proportion of crack smokers who become regular users is about the same as the proportion of cocaine "snorters" who become regular users (Morgan and Zimmer, 1997). Case studies suggest that cocaine users switch to crack because they want greater efficiency, less expense, and to make a more dramatic statement about social norms, and that many appear to be addicted before becoming smokers (Reinerman *et al.*, 1997).

Hurtado Gumucio (1995) recently observed that in many Andean areas, over three quarters of the male and female population chew coca leaves every day. Based on the amount of leaves chewed, the average consumption could be as high as 500 mg of cocaine per day (precise measurement is impossible, because an uncertain portion of the cocaine content of the coca leaf is absorbed through the buccal mucosa). Substantial daily intake produces no sign of mental or physical impairment. When people are abruptly withdrawn, (for example if they are hospitalized) there is no withdrawal or any other undue distress. Cocaine use in this situation is not only safe, but also an important part of a cultural tradition that benefits social, economic, and ritual aspects of rural life (Hurtado Gumucio, 1995, p. 18).

Besides its ritual, circumstantial, and recreational uses in South America, coca has been the major folk medicine in some regions for over a thousand years. Currently it remains the preferred herb for symptoms of hunger and cold, for stomach pains, for a depression-like condition called *el Soka*, for a wasting disease called *el Fiero*, for colic, diarrhea, cramps and nausea. Coca tea is often used by

(c) Drug addicts are not merely passive recipients of standardized doses of their drug. Rather they control the various parameters of self-administration to produce the effect they want. According to Cone (1998):

Research studies with experienced cocaine users indicated that an intranasally administered drug generally provides lower drug concentrations of drug and a slower onset of action compared to the intravenous route; however, intranasal doses are easily manipulated by the user and adequate bioavailability and increased drug effects can be achieved... Overall, these studies demonstrated that the smoked and intranasal routes are highly efficacious for the delivery of illicit drugs and produce a similar profile of drug action to the intravenous route of administration (p. 97).

(d) The underlying assumption that addiction is a pharmacological effect of using a particular drug via a particular route of administration, rather than as a last-ditch attempt at coping with desperate life circumstances is being rejected by an increasing number of addiction professionals and social scientists (Alexander, in press; Bourgois, 1997; Khantzian, 1985). In addition to its unsubstantiated deterministic metaphysics, there are other obvious problems with this theory. If behaviours that produce a short latency, intense positive reinforcement were highly addicting, millions of marijuana users would have become addicted when smoking high potency marijuana became the dominant form of using this pleasurable drug. Moreover, nobody would be addicted to alcohol, which is almost always consumed orally, or cigarettes, which do not produce intense pleasure. On the other hand, everything that produced immediate pleasure would be universally addicting, with consequences that boggle the imagination.

western tourists as well as local residents to combat altitude sickness in the high Andes. (Grinspoon and Bakalar, 1981; Hurtado Gumucio, 1995).

Cocaine has proven useful in western medicine as well. We will discuss two examples of successful 20th century medical use of cocaine – as a local anaesthetic and as a tonic for elderly patients with arthritis.

Despite pressure against medical use of cocaine in the US, topically applied cocaine has remained the local anaesthetic of choice for large numbers of otolaryngologists, particularly for nasal surgery. Cocaine has proven safer than other local anesthetics and has vasoconstrictive properties that they do not share (Chiu *et al.*, 1986; Gordon, 1987).

This medical application of cocaine reveals much about its safety, since doses are comparable to those used by recreational users in North America, and the doctors apply the drug to the nasal mucosa, much as recreational users do.⁴ The textbook maximum dose in the US is 200 mg (Catterall and Mackie, 1996), but doses of 400 mg and higher have been used frequently in practice with good results (Johns and Henderson, 1977). However, these medical users, who have blood levels of cocaine that are about the same as those of recreational users (Alexander, 1990; Van Dyke *et al.*, 1976), sometimes become agitated, sweaty, and – to their distress – register positive on drug screens for cocaine (Reichman and Otto, 1992).

All anaesthetics produce some risk of adverse reactions, but the safety record of topically applied cocaine is exemplary. In an extensive literature review, Schenck (1975) was able to find only 3 deaths attributable to topical application of cocaine as a local anesthetic.⁵ A survey mailed to every member of the American Society of Plastic and Reconstructive Surgeons, who had administered a total of 93,004

⁴ Cocaine in this application was in the past mixed with epinephrine to keep it from being rapidly absorbed into the blood stream, but this practice has been abandoned by many practitioners, without dire consequences (Schenck, 1975; Johns and Henderson, 1977).

⁵ Schenck undertook this review in response to publicity concerning a 1924 American Medical Association study that had found 26 deaths attributable to *injecting* cocaine as a local anesthetic, a practice that has been largely abandoned (Schenck, 1975, p. 69).

applications of cocaine in nasal surgery, found 34 severe non-fatal reactions and 5 deaths (Feehan and Mancusi-Ungaro, 1976). A survey mailed to every member of the American Council of Otolaryngology (Johns and Henderson, 1977) found a total of 1 death definitely attributable to nasal application of cocaine and 7 that may have been due to nasal application, although the exact site of application was not reported. Chiu *et al.* (1986) reported a single non-fatal myocardial infarction following topical application of cocaine anesthesia during nasal surgery. As this was the first such occurrence that had ever been reported, they stressed the safety of cocaine anesthesia in clinical practice (cf. Grant and Hoffman, 1992, pp. 128–129).

Cocaine also appears to be a valuable treatment for older people who suffer from chronic rheumatoid arthritis. A small group of doctors in California in the 1970s reported good success in relieving the pain and depression of this disease with "Esterene" which is simply "free-base" cocaine prepared for nasal application. In this form, cocaine is released slowly into the blood stream. The arthritis sufferers recovered some strength and showed some reduction of inflammation. In the most successful cases, bedridden patients were sometimes able to resume normal activities that they had given up years before. Every one of the two hundred or more patients used the drug only as directed, even though they did experience a mild euphoria from it (see *Arthritis News Today*, 1980). Ronald Siegel (1989, pp. 308–312), who reviewed the effects on the entire patient population, reported that Esterene seemed to have the same effect as chewing coca leaves.

When the Esterene story hit the newspapers, the government shut down the California clinic where Esterene was being administered and disciplined the doctors prescribing it, without investigating its efficacy. As well, sufferers from rheumatoid arthritis began to experiment with intranasal free base cocaine outside of the medical setting. Siegel (1989) was able to track down 175 illegal arthritic users in the Los Angeles area:

Surprisingly most were not experiencing problems. They reported antifatigue effects, as well as suppression of chronic pain and discomfort, but they failed to experience the rapid and reinforcing euphoria that gives cocaine its addictive potential. Unlike daily cocaine

hydrochloride users who repeatedly dose themselves throughout the day, people sniffing cocaine free base administered the drug infrequently and did not show signs of dependency. Some had financial or legal problems associated with their use; several also experienced loss of appetite or sleep. Yet their ability to maintain daily doses as high as 1,000 milligrams without severe dysfunction suggested that safe use was possible even in nonmedical settings (pp. 310–311).

In the 19th century, one of cocaine's major uses being was as a tonic for various forms of depression and "melancholia" (Mortimer, 1901/1974, pp. 492–504). However, 20th century reports on cocaine in treatment of clinical depression have not been promising. Post *et al.* (1974) found that cocaine provided temporary relief to some clinically depressed patients, provided that the doses were not too high, but was not helpful for others.

Amphetamines

Although amphetamines are not identical to cocaine, there are striking similarities between the two in: beneficial stimulant effects; harmful side effects; widespread usage inside and outside of medicine; potential for misuse, addiction and overdose; routes of administration (oral, nasal, smoking, injection); and physiological mechanisms. Like cocaine, amphetamines rarely produce serious physical withdrawal symptoms even after long periods of heavy use, although craving and depression can be intense (Perrine, 1996, Ch. 4). In some laboratory tests, experienced cocaine users were unable to tell the effects of amphetamines from those of cocaine (Fischman *et al.*, 1976). The major difference that users are likely to detect between the two stimulants is that the effects of amphetamines last much longer than those of cocaine, and produce greater tolerance.

A minority of amphetamine users become seriously addicted, sometimes with catastrophic consequences. There is currently a new wave of addiction to injectable and smokable methamphetamine in North America and in other areas of the world (Beebe and Walley, 1995; Hando *et al.*, 1997; Huber *et al.*, 1997). Acute amphetamine overdose

can produce paranoid psychosis accompanied by stereotyped behaviour, cardiovascular damage, brain damage, seizures and occasionally, death.

As with cocaine, there is a division between the clinical literature on amphetamine misusers who require treatment and the literature on non-addicted and medical users. The clinical literature often identifies ill health and/or violence of misusers in treatment as pharmacological effects of the drug, rather than results of the excessiveness, unhealthiness, and violence of their lifestyles, and rarely acknowledges that moderate use of amphetamines is well known and that moderate users rarely require treatment (e.g., Grinspoon and Hedblom, 1975, pp. 1–10; King and Ellinwood, 1992).

Amphetamines have a long history of medical and quasi-medical use with a good safety record. Shortly after they appeared on the US market as an over-the-counter drug in 1932, they were adopted by doctors for treatment of depression, with varying degrees of effectiveness. Amphetamines were routinely prescribed (and overprescribed) for depression after World War II (Brecher, 1972, p. 279; Grinspoon and Hedblom, 1975, pp. 219–226) until the invention of the tricyclic antidepressants in the 1950s. Some years after tricyclic antidepressants replaced amphetamines as the main drug in treatment of depression, they were themselves replaced by Prozac and other new antidepressants. Eventually it became clear, however, that neither amphetamines, the tricyclic antidepressants, nor the Prozac-like drugs are magic bullets for depression, which is rapidly increasing in prevalence everywhere (Cross-National Collaborative Group, 1992; Foss, 1998).

Faced with this intractable problem, some physicians are again using amphetamines in the treatment of depression for patients who do not respond to treatment with more conventional anti-depressants (Chiarello and Cole, 1987; Frierson *et al.*, 1991; Little, 1993). For some of these patients, amphetamines provide relief, with rapid onset of therapeutic effects, little problem of side effects and minimal risk of addiction. Other physicians advocate amphetamines for depression only in combination with other types of antidepressants (Grinspoon and Hedblom, 1975; King and Ellinwood, 1997).

Amphetamines are also widely used in the treatment of narcolepsy and ADHD (Safer and Zito, 2000). They were distributed in huge quantities during World War II to control fatigue, particularly to

pilots in British, American, German, and Japanese armies (Perrine, 1996, pp. 195–196) and to American soldiers in Vietnam (King and Ellinwood, 1992, p. 253).

Recreational and circumstantial use of amphetamines was popular when it was legal. In the US, amphetamines were sold legally, both in inhalers and pills, until after World War II. Although non-medical use of these drugs was often regarded with distaste by non-users, three-and-one-half billion amphetamine pills were legally manufactured in 1958. They were used in huge quantities in the US, Canada, Sweden, and Japan, as wake-up pills and diet pills, notably by students and truck drivers, in most cases moderately and safely (Brecher, 1972, pp. 294–298; Goldberg, 1968; Ledain, 1973, pp. 334–348).

When amphetamines were legal, misuse and addiction did occur among a small percentage of users, but primarily among the disaffected and marginalized. The number of addicted users was small enough relative to the millions of non-addicted users that amphetamine misuse did not become a serious issue for several years (Brecher, 1972, p. 281). Amphetamine addiction was first described in the medical literature in a study of prison inmates published in 1947. In the tumultuous 1960s, injectable amphetamines, then widely known as “speed”, became prominent in the illicit drug culture across North America, greatly increasing public alarm.

Although amphetamines are often said to incite violence, the evidence for this claim is inconsistent. For example, amphetamine treatment reliably *reduces* violence in hyperactive children and sometimes in adults and experimental animals as well. King and Ellinwood (1992) have summarized the evidence as follows:

The overall pattern of research indicates that the effects of amphetamine on aggressive behavior are complex and that these effects are not solely determined by the pharmacology of amphetamine but seem to be determined by various environmental factors . . . (p. 250).

Methylphenidate

The standard pharmacological treatment for Attention Deficit Hyperactivity Disorder (ADHD) in children is methylphenidate, in a

preparation called Ritalin. By 1999, about 2,000,000 American children were "on Ritalin" in the United States, which consumes 80–90% of the world's supply (DeGrandpre, 1999). Canada is the world's second largest consumer of methylphenidate (Rees, 1998). This medical application of methylphenidate is controversial (Meier, 2000), but it is well documented that important behavioural goals are achieved in many patients and that some otherwise unmanageable children can remain in school (Greenhill and Osman, 2000). Methylphenidate is also the standard treatment for a condition that is becoming known as "adult ADHD" (Levin *et al.*, 1998a; Maté, 1999; Riordan *et al.*, 1999).

Methylphenidate is not the only stimulant that is used to treat ADHD. Amphetamines are also used (Findling, 1996), as are other stimulants. Cocaine has not been prescribed in treatment of ADHD, but people with ADHD frequently report that cocaine provides "a temporary relief from hyperactive symptoms" (Plume, 1995, pp. 3, 15). In addition to its use in treatment of ADHD, methylphenidate is being used successfully in treatment of depression, both alone and in combination with other antidepressants (Frierson *et al.*, 1991; Frye, 1997; Safer and Zito, 2000, p. 13; Thase and Rush, 1995). It is also prescribed for treatment of narcolepsy, obesity, and the "affective and cognitive symptoms" of AIDS (Fernandez *et al.*, 1997).

Like cocaine and the amphetamines, methylphenidate is widely used outside of medical practice, often by school children who obtain it from classmates with ADHD. It can also be administered orally, snorted, or injected (Jaffe, 1991; Sannerud and Feussner, 2000). The desired stimulant "high" produced by administration of methylphenidate is described as similar to, or indistinguishable from, that produced by cocaine and amphetamines. As well, the three drugs are about equally reinforcing to laboratory rats, and bind to some of the same sites in the brain. Overdoses of methylphenidate can produce "psychomotor stimulant toxicity", psychosis, and death (Volkow *et al.*, 1995; Sannerud and Feussner, 2000).

Methylphenidate misuse, although not a topic of great public attention, has been well documented, particularly the US and Sweden (Sannerud and Feussner, 2000). Many street addicts describe the effects of methylphenidate and cocaine as essentially the same and some prefer to purchase methylphenidate from their dealers

because, manufactured as a standard pharmaceutical, it is less often adulterated.⁶

The long term deterioration of methylphenidate addicts described in clinical reports is as dire as that of cocaine and amphetamine addicts. Parran and Jasinski (1991) report that the "abuse pattern" of 22 methylphenidate abusing cases in Baltimore was similar to that of cocaine and amphetamine addicts, and that 3 of their 22 methylphenidate addicts died during the study, proportionally more deaths than among their cocaine or amphetamine addicts. The difference in mortality probably occurred because methylphenidate (known as "poor man's cocaine" in Baltimore), was a low status drug, misused by people with long histories of drug abuse, many of whom had been prescribed Ritalin as children. When injected without appropriate preparation, Ritalin was more dangerous than cocaine or amphetamines because, in addition to methylphenidate, the preparation contains an insoluble element that caused "peripheral venous sclerosis" in 20 of 22 of Parran and Jasinski's patients along with varying degrees of lung damage.

Summary

When used excessively or addictively, cocaine, the amphetamines, and methylphenidate can cause extreme agitation, psychotic-like behaviour, seizures, and death. However, when used prudently, these stimulants can serve beneficial, sometimes necessary purposes, both inside and outside of medical practice. These generalizations apply to many other stimulants as well. It seems inescapable that people and societies will continue to use cocaine and other stimulants for their benefits, while minimizing their very real dangers and side effects. The prospects for stimulant maintenance need to be assessed within this context.

⁶The street price in Vancouver's downtown eastside gives an indication of its value to addicts – a single dose of Ritalin by itself costs \$10–20, whereas the price for a single dose of cocaine (either powder or crack) is around \$9 or \$10 (Personal communication, 1998, Paul Alexander, Colleen Erickson, Melissa Eror.)

STIMULANT MAINTENANCE: RESULTS FROM ENGLAND, AUSTRALIA, SOUTH AMERICA, AND THE UNITED STATES

Stimulant maintenance with orally-administered amphetamines, coca leaf, coca tea, and methylphenidate has been tried in small populations of stimulant misusers. Although it is clear that more controlled studies are needed to establish the efficacy of stimulant maintenance, the results of these pilot studies are promising. Amphetamine maintenance, in particular, is proving its value in curbing the harms of intravenous amphetamine use. We review one controlled study indicating that stimulant maintenance can be as effective for injecting amphetamine addicts as methadone is for opiate addicts (Charnaud and Griffiths, 1998). Although some researchers have made compelling arguments against stimulant maintenance (e.g., Mattick and Darke, 1995), we believe that it can be an important addition to current harm reduction programs.

Amphetamine maintenance

Amphetamines have been widely prescribed for maintenance of stimulant misusers in England since 1988 (Fleming, 1998; Fleming and Roberts, 1994; Merrill, 1998; Strang and Sheridan, 1997). Recently, Fleming (personal communication, 1998) has gathered reports on this practice from over 200 English doctors who are prescribing amphetamine maintenance for about 1000 patients. Some of these prescriptions are written for injectable amphetamines, but the majority are for the oral form of the drug. Although these are not controlled studies, the doctors surveyed by Fleming generally regard their amphetamine maintenance as clinically successful.

McBride *et al.* (1997) published data on oral administration of dexamphetamine to 63 amphetamine injecting users in England. Users were prescribed daily doses up to 40 mg of dexamphetamine and changes in behavior were monitored over 11 months. There were significant reductions in amphetamine use, benzodiazepine use, frequency of injection, needle-sharing, and money spent on illicit drugs. Sherman (1990) also reported some success prescribing oral dexamphetamine to 14 methamphetamine addicts (12 used intravenously) in Australia.

The best controlled study compared 120 opiate addicts prescribed oral methadone maintenance with 60 amphetamine addicts prescribed oral dexamphetamine in Cornwall, England (Charnaud and Griffiths, 1998). Patients were discharged or left treatment at various times, ranging from 1 to 74 months. Few of the patients in either group were free of illicit drug use at the time of discharge, but many had stopped injecting (as determined by medical examination). Of the methadone patients, 67% were not injecting at the time of discharge and 21% were injecting less than they had been at the outset of treatment. For the amphetamine patients, 70% were not injecting at the time of discharge and 27% were injecting less. Thus, oral stimulant maintenance worked as well for stimulant misusers as methadone maintenance did for opiate misusers.

Although cocaine misuse does occur in Britain, it is much less of a problem than amphetamine misuse. Fleming (personal communication, 1998) has prescribed amphetamine maintenance for cocaine dependence with three patients, with successful results in two cases. Merrill (personal communication, 1998) has prescribed amphetamine maintenance for a single cocaine misuser, successfully.

These results are encouraging. Nonetheless, it is clear both that more controlled studies are needed and that successful British and Australian practices cannot be simply imported to North America because patterns of stimulant use there differ in important respects from North American patterns. Although cocaine is not widely available, amphetamines have become part of working class culture in the UK, comprising the second most popular illicit drug after cannabis (Pates, 1994). Amphetamines are the most widely used illicit drug in Australia (Lintzeris *et al.*, 1996). Most British amphetamine users are not considered dependent or addicted, but some are (Merrill, 1998). There are few amphetamine or cocaine misusers in these countries who are directly comparable to the sick, impoverished cocaine addict population in Vancouver.

Coca leaf maintenance

In Bolivia, there are few records of overdose or drug addiction associated with chewing coca leaves in the traditional manner, even in the coca producing regions where most people chew (Hurtado

Gumucio, 1995). However, there is a great deal of misery associated with smoking semi-purified cocaine sulfate paste that is locally called, "pasta" or "merca", particularly within displaced urban populations. The paste is about 30% cocaine and contains a variety of impurities. Addicted paste smokers go through a cycle of increasingly frequent use, and eventual paranoid reactions.

Hurtado Gumucio (1995) prescribed coca leaf chewing to 50 paste misusers in urban Bolivia. Some of his patients found it difficult to learn the chewing technique, which is repellant to some Bolivians because it is associated with lower class status. Three of Hurtado Gumucio's successful patients were Americans who were not repelled by chewing leaves, since it had no cultural associations for them. The patients continued the treatment for an average of 2 years. Of the 50 patients, 36 attained either a "good" or a "fair" level of coca leaf chewing. Of the 50 patients, 1 was rated with a "good mental state" at the beginning of treatment, and 18 had a "good mental state" at the end of treatment. Twenty-seven had a "bad mental state" at the beginning of treatment, and 16 had a "bad mental state" at the end of treatment. Many of the patients continued to smoke cocaine after treatment, but generally less often. Some patients abstained completely, and reported that they would chew some leaves whenever they felt a craving to use either "pasta" or cocaine hydrochloride.

Other preparations of cocaine could be suitable for maintenance. Hurtado Gumuchio (personal communication, 1998) has experimented with "sweets" that contain pulverized coca leaves, with the idea that they will overcome the reluctance of some people to chewing leaves. Cocaine capsules, being experimented with by some American researchers, could also be suitable (Gorelick, 1998). Ethan Nadelmann has suggested the use of cocaine lozenges or gum for a similar purpose (Freedman, undated).

Coca tea maintenance

There are reports of coca tea being used by cocaine misusers as a maintenance drug (Llosa, 1991; Siegel *et al.*, 1986). Llosa (1994; 1995) has reported on the treatment of coca paste smokers in Peru. The patients were averaging about 20 coca paste cigarettes/day, yielding about 1900 mg of cocaine/day. The patients were asked to buy coca

tea bags, which are legal in Bolivia, and drink two cups of coca tea per day (about 18 mg of cocaine/day) for at least three months. In addition, the 23 coca paste smokers attended one counseling session per week during the first three months of treatment and one counseling session every other week for the following 9 months. They always brought a family member with them to counseling who was asked to confirm or disconfirm the patient's self-reports. Eighteen patients completed all 360 days of treatment; 15 of the 23 patients improved to the point of achieving 6 months of abstinence from cocaine smoking during the treatment. Three patients remained in treatment, although they relapsed frequently.

Methylphenidate maintenance and ADHD

As a stimulant with proven medical efficacy, methylphenidate is a possibility for oral stimulant maintenance of cocaine addicts. Several clinical trials have already been undertaken, although the results are complicated by the interplay of cocaine addiction and ADHD.

Khantzian and co-authors reported success prescribing oral methylphenidate to three cocaine addicts (Khantzian, 1983; Khantzian *et al.*, 1984), one of whom also met the DSM-III criteria for attention deficit disorder. Patients received methylphenidate treatment for over a year with individualized dose schedules and dosages ranging between 50–70 mg per day. All three patients, including one who sometimes injected 2 ounces of cocaine per week, responded by abstaining from cocaine for at least two years and stabilizing their lives. The authors noted advantages of methylphenidate as a potential substitute drug for cocaine addiction, viz., the breaking of associations with the street addict lifestyle, controlled oral dosages, and financial stabilization (Khantzian *et al.*, 1984, p. 111). In a 1985 review article, Khantzian mentioned treating several additional cocaine addicts successfully with methylphenidate. He hypothesized that many cocaine addicts were using cocaine to self medicate an underlying psychological malaise and were therefore likely to respond well to methylphenidate substitution (Khantzian, 1985, p. 1263).

In the same year, Khantzian's three co-authors (Gawin *et al.*, 1985) explored the hypothesis that methylphenidate treatment would be helpful only in cocaine addicts who also suffered from ADHD. They

provided 5 cocaine addicts who did not have concurrent diagnoses of ADHD with methylphenidate treatment for 2–5 weeks. Doses were as high as 100 mg per day. Although some patients responded by reducing cocaine use initially, none abstained and cocaine consumption generally increased. The researchers concluded that methylphenidate prescription would not be an appropriate substitution treatment for cocaine addicts without ADHD (also see Levin *et al.*, 1998b, p. 304).

Gawin *et al.*'s hypothesis gained support in two further studies. In a double blind study, Grabowski *et al.* (1997) provided 49 cocaine addicts without an ADHD diagnosis with either sustained release methylphenidate (45 mg per day) or placebo for 11 weeks. No significant differences in outcome were found between the treatment and placebo group. The authors noted that the lack of success of the treatment group could be due to the low doses of methylphenidate administered and that no adverse effects followed from prescription of methylphenidate.

Levin *et al.* (1998b) reported success prescribing methylphenidate to cocaine addicts with dual diagnoses of ADHD in a 12 week trial. Among 12 recruited patients, 10 completed 8 weeks of treatment, and 8 completed the entire trial. Patients were initially prescribed methylphenidate in an immediate release preparation and then stabilized on sustained-release pills with individualized doses ranging between 40–80 mg per day. Patients also received weekly therapy sessions and regularly interacted with support staff. For the ten patients who completed 8 weeks of treatment, the results were generally positive. There was a consistent reduction of cocaine use measured by both self-report and urinalysis, and ADHD symptoms decreased.

It is difficult to draw unambiguous conclusions about prescribing methylphenidate to cocaine addicts from these reports, because important issues remain unsettled. First, the line separating cocaine addiction and ADHD is difficult to draw, since there is substantial comorbidity and similarity in symptoms (Levin *et al.*, 1998b; Maté, 1999) and there are many ways which the two conditions interact (Levin and Kleber, 1995). Second, the successful clinical reports can be read either as methylphenidate treatment for ADHD patients with co-morbid substance dependence (Gawin *et al.*, 1985) or as stimulant maintenance for cocaine addicts with attention difficulties (Khantzian,

1985). There is no conclusive reason to choose one interpretation over the other. Third, the medical models of both ADHD and addiction are controversial (Alexander, 1990; DeGrandpre, 1999; Meier, 2000).

The safest conclusion would be that methylphenidate maintenance can be valuable for some cocaine addicts who also are diagnosed with ADHD. Levin *et al.* (1999) conclude that methylphenidate is both a safe and effective means to treat substance abusers with ADHD, up to dosages of 1 mg per day kg of body weight. Daily doses and schedules are best tailored to individual patients, and maintenance is likely to be most effective when supplemented with therapy.

We believe that a good possibility remains, however, that methylphenidate maintenance could be beneficial for cocaine addicts without ADHD. The empirical evidence against this possibility that is reviewed above (Gawin *et al.*, 1985; Grabowski *et al.*, 1997; Levin *et al.*, 1998b) is inconclusive because of uncontrolled differences between patient samples, dosing, and treatment intervals.⁷ It is possible that dual-diagnosis of ADHD and cocaine addiction may simply be "dual-labelling" of a persistent form of anxiety or depression, which some patients relieve with regular doses of cocaine. Further controlled studies between cocaine addicts with and without ADHD are needed.

Other possibilities for stimulant maintenance

Perrine (1996, p. 202) has suggested many other stimulants and stimulant-like drugs that could be considered as substitutes for cocaine,

⁷When Grabowski *et al.*'s unsuccessful treatment of cocaine addicts is compared in detail with Levin *et al.*'s successful treatment of cocaine addicts with ADHD, numerous problems emerge, which could account for the apparent difference in success. A few are listed here to illustrate the problem. First, most of Grabowski's unsuccessful patients were American black and Hispanic crack users, whereas most of Levin's were white intranasal users. Second, all of Grabowski's patients received 45 mg of methylphenidate per day, whereas Levin's were given individualized doses averaging 68 mg per day. Third, Grabowski's patients were on a methylphenidate preparation that was about 90% "sustained release" methylphenidate from the start, whereas Levin's started on "immediate release" methylphenidate (which addicts describe as more pleasurable) and were switched to the sustained release form later. Finally, the results are not that different between the two studies. For example, whereas 12 of 25 of Grabowski's addicts completed 11 weeks of treatment, 8 of 12 of Levin's addicts with ADHD completed 12 weeks of treatment – hardly an impressive difference under these conditions.

including pemoline, phenmetrazine, fenfluramine, phenylpropanolamine, ephedrine, bupropion,⁸ etc. The most interesting is perhaps Qat, whose principle ingredient is cathinone. The drug is chewed in North Africa by large numbers of people. Although cathinone is as reinforcing for laboratory animals as cocaine, the Qat culture is quiet and respectful.

It is also possible that opioids and stimulants could both be used together in maintenance programs for patients who are addicted to both. Avants *et al.* (1998) have reported positive results with 6 HIV-positive, opioid and cocaine dependent patients who were maintained on both an opioid and a stimulant-like drug (buprenorphine and bupropion⁸) and also received group therapy twice a week. These patients showed significant decreases in cocaine use, craving, and depression, whereas a small control group of patients receiving methadone alone did not.

FIRST STEPS TOWARDS STIMULANT MAINTENANCE

In this section, we propose first steps towards a stimulant maintenance program for Vancouver, B.C., Canada. We have allowed ourselves to think freely, not limiting this proposal to techniques that have succeeded elsewhere. We have assumed that any new program is an experiment, to be retained if it works and changed if it fails. We have rejected the arguments that cocaine addicts are too unstable to be suitable for maintenance treatment, or that cocaine itself must be ruled out as a possible maintenance drug. We have drawn heavily from the lessons of three-and-one-half decades of methadone maintenance in British Columbia.

⁸ We will refer to bupropion as a stimulant-like drug for simplicity here. Although it was originally marketed as an antidepressant under the tradename "Wellbutrin", it has strong stimulant properties. For example, it has been described as follows:

... The antidepressant action of bupropion (Wellbutrin) is comparable to that of the tricyclics and MAOIs. However, its structure is unrelated to any of the other antidepressants, it has a stimulant rather than a sedative activity, and it seems to be less likely than the tricyclics to precipitate mania when given to patients with bipolar disorder in their depressed phase. The structure of bupropion actually is quite close to that of amphetamine and the psychostimulants (Perrine 1996, p. 237).

Learning from methadone maintenance

Methadone maintenance for heroin addicts was established in British Columbia in 1963 (Fischer, 2000). Over one-third of a century's experience has provided a fund of knowledge about what maintenance can and cannot accomplish, what kinds of people are suitable candidates for maintenance, and the best ways to establish a "maintenance culture".

Successful methadone maintenance offers a drug that is both safer than the illicit drug currently being misused and appealing enough to attract some misusers away from it. Successful methadone maintenance transforms the social role of its clients from outcasts into medical patients who are entitled to treatment and are expected to cooperate within the treatment milieu (Rosenbaum *et al.*, 1996; Springer, 1991). Compared to street addicts, maintenance patients are both more accepting of mainstream society and more accepted by it. A successful program also transforms doctors from fearful targets for deception or robbery into care providers for addicts. Thus, a successful maintenance program not only increases the safety of addicts and the larger community, it also commences construction of a bridge from both sides of the chasm that separates drug misusers from their society (Beauchesne, 2000).

Methadone maintenance never converts a heroin addict population *en bloc* into a group of model citizens. Rather, it only works for a minority of an addict population and enables a minority of this minority to reintegrate with mainstream culture (Alexander, 1990; National Consensus Development Panel on Effective Medical Treatment of Opiate Addiction, 1998). In being suitable for only a portion of the addict population, methadone maintenance is similar to other addiction treatments (Belding *et al.*, 1998; Corty and Ball, 1986; Hall *et al.*, 1996, pp. 91-2; Springer, 1991, pp. 151-5).

In our experience, the minority suitable for methadone maintenance comprises those who still require daily doses of an opiate drug but no longer find much glamour in street life (or never did), and who have failed at conventional treatment. Whereas there are many opiate addicts who fit this description, there many others for whom maintenance is inappropriate. There is no necessity for successful methadone patients to be users of heroin alone. Historically, most of Vancouver's methadone patients have been polydrug users.

Methadone maintenance is best understood as a compromise. Society compromises by allowing some heroin misusers access to a drug that is pharmacologically equivalent to heroin, which it abhors. Heroin misusers compromise by using their opiate drug orally, in the same regulated quantities each day, and reducing their consumption of other illicit drugs. They also give up some mystique, because, although methadone is pharmacologically equivalent to heroin, its name does not carry the same status in the criminal world. Both society and the drug addicts gain from the compromise because a group of outcasts is moved one big step towards reintegration with society, and further progress becomes possible.

There is intrinsic tension in all compromises. In methadone maintenance, those who provide the maintenance drug often want to impose conditions (e.g., "clean" urines, low doses, legitimate employment, regular attendance, compulsory counseling) that are unacceptable to most recipients, and recipients often want more freedom and respect than treatment providers are willing to give them. Since the inception of methadone maintenance, there has been a standing battle between those who favour stricter controls over methadone and those who favour a system of weaker controls, now known as "low threshold" treatment (Alexander, 1990, Chs. 1, 2). In the end, the low threshold treatment has carried the day (Fischer, 2000).

Opponents of low threshold methadone treatment raised many concerns in the 1960s, '70s, and '80s, including fears of methadone toxicity, of methadone being diverted to non-addicts, of general practitioners being too weak-willed to resist the demands of addicted patients, and of methadone prescribing being a signal of social approval for drug use (Alexander, 1990, Ch. 2; Fischer, 2000). These fears were inflamed by sensationalized news stories, but were eventually allayed as low threshold methadone maintenance proved its worth. In addition, pragmatism was fostered by fear of AIDS.

A kind of "maintenance culture" has been developing over the years among methadone patients in Vancouver. Some methadone users have created informal user groups and also a legally constituted non-profit association that existed over a 20-year period before its eventual demise in the 1990s. Currently two new non-profit associations, the "Western Methadone Patients Association" (WMPA) and the Vancouver Area Network of Drug Users (VAN DU) are struggling to

provide peer support for methadone users, to advance their interests in struggles over the policies that govern maintenance programs, and to garner support and recognition from the larger society. There are signs of progress. Strong leadership has emerged among former drug misusers. The provincial government now meets regularly with members of WMPA and has agreed to provide modest financial support. VANDU has received financial support through the city government.

In addition to representing the interests of methadone patients to politicians and doctors, these associations appear to provide a kind of therapeutic benefit. Individual patients find themselves in the role of community organizers and advocates, rather than junkies, and pass on this attitude to other drug addicts within the organization. The topic of conversation turns from the drug scene to more socially acceptable issues, like organizing meetings and finding somebody to repair the organization's computer. Along the way, drug misusers who come to meetings intoxicated find they do not function very well, and some re-arrange their priorities.

We believe that the degree to which stimulant maintenance will work has a great deal to do with encouragement of stimulant maintenance culture by government and treatment professionals. The development of a maintenance culture for opiate addicts was slower than it needed to be, largely because governments were so nervous about distributing narcotic drugs to addicts that they ignored the addicts' fledgling organizations until very recently. In addition, the news media of the 1970s and 1980s emphasized the direst fears about methadone maintenance. These errors can be avoided with stimulant maintenance, if cocaine can be de-sensationalized sooner rather than later.

It is important that future stimulant maintenance clients be given encouragement to discuss each other's views on their shared problems. Inevitably, a good portion of their discussion will be complaining about the quality of the service they receive, which will rankle the service providers. This is, however, a starting point that can further the emergence of a maintenance culture.

To be maximally effective, stimulant maintenance programs will need to provide places for clients to organize themselves and sort out their individual and community problems. To provide a good working atmosphere, such places need to be off the streets, out of the beerhalls, and out of earshot of police. To be inclusive, such places need to

be open to people who are intoxicated or carrying illegal drugs – including cocaine – as well as those who are “straight”. The cost of such spaces would be relatively small, since very modest rooms with minimum staffing and protection against violence would suffice. If people sometimes sell or use illegal drugs in such sites, nothing is lost – downtown streets are awash in drugs anyway. If, on the other hand, the maintenance patients should decide to impose some minimum standards of decorum or sobriety on each other during meetings, this would comprise a step in the evolution of their maintenance culture.

Choosing parameters for stimulant maintenance

As shown above, various drugs have already been used in stimulant maintenance and others have been proposed. It is difficult to guess which drug might provide the best starting point for Vancouver. Because different people respond differently to any drug, it is to be expected that some drugs would work better with some patients, and others with others. It is also necessary to make choices concerning selection of patients, mode and frequency of drug administration, ancillary services, safety and security requirements, etc. We limit ourselves here to proposing two starting points.

Methylphenidate for cocaine users with ADHD

Doctors already prescribe methylphenidate to patients with dual diagnoses of cocaine dependence and ADHD in Vancouver and elsewhere (Levin *et al.*, 1999; Maté, 1999). The data supporting such an intervention and the logic behind it should be widely known, so that these doctors are not vulnerable to unwarranted attacks from the media or justice system, which have occurred in Vancouver's past (Beyerstein and Alexander, 1985). Within the practice of prescribing methylphenidate, we recommend experimental prescription to cocaine addicts whose ADHD diagnosis is less firmly established, or who are not diagnosed with ADHD. The essential need is to determine the characteristics of addicts for whom methylphenidate prescribing can be helpful, whether or not it corresponds precisely with a diagnosis of ADHD.

Much research on methylphenidate prescription to addicts is based on "sustained release" methylphenidate, on the grounds that it has less "abuse potential" (Levin *et al.*, 1999; Kollins *et al.*, 1998). This logic should be re-examined. Patients in a stimulant maintenance program will already be longtime polydrug abusers – it is too late to protect them from "abuse potential". Moreover, stimulant maintenance works because the drug that is prescribed satisfies the same needs as the drug it is replacing. Rapid onset of action apparently provides pleasure to addicts (Gorelick, 1998). The onset of action from orally administered methylphenidate is far slower than injected or smoked cocaine. To make the onset slower still by using the sustained release form is only to make the stimulant maintenance program less likely to break the strong ties of habit and ritual that comprise the addict lifestyle.

A Choice for addicts and doctors

Many orally administered stimulants could be suitable candidates for a stimulant maintenance program in Vancouver. Because stimulants are so similar pharmacologically, the basis of choice should be cultural as well as medical. In the interest of accommodation between doctors and addict patients – an important aspect of an emerging maintenance culture – we suggest a consultation process. A committee composed of doctors experienced in treatment and methadone maintenance, of researchers, and of prospective addict patients could review experiences with stimulant maintenance in other localities, invite presentations from practitioners, researchers, and local residents, and work out the best parameters for stimulant maintenance in Vancouver. The goal would be a committee-generated proposal that makes sense to both doctors and patients and that can be evaluated by the larger community through the normal political process.

News media should be involved in this process from the outset to involve the public. A recent survey of the attitudes of a portion of Vancouver's injecting drug addict population found that injecting addicts expressed as much approval for stimulant maintenance programs as for current methadone maintenance programs. There was evidence that cocaine, amphetamines, or methylphenidate would all be valued as oral replacement drug (Tsou, 2000). Perhaps surprisingly, a sample of university students were generally neutral about stimulant

maintenance, although their approval scores were significantly less than those of the injecting addicts (Tsou, 2000).

We believe the committee proposed here should be encouraged to think freely and imaginatively in the hopes of devising a safe and beneficial innovation. For example, it might be time to evaluate the prospects that cocaine itself, administered orally, might prove the best drug for stimulant maintenance in Vancouver. Cocaine can be administered in pills, chewing gum, tea, or even wine. Cocaine maintenance would be unprecedented outside of South America, but it would be no more radical than providing heroin maintenance for heroin addicts, a technique that is working well in small scale studies in Australia, the Netherlands, and Switzerland (Bammer *et al.*, 1999; Lindesmith Center, 1998) and that worked well for decades in England before it went out of control in the 1960s (Trebach, 1982).

One reason for using cocaine itself would be that it still carries an aura of elegance and mystery that makes it attractive to potential clients who have little in their lives that is not shabby. The other side of this coin is that, administering cocaine in the medical and bureaucratic context of a maintenance drug could gradually erode its mystique, making it less enticing to young, glamour-seeking experimenters. Moreover, when purchased through medical channels, cocaine is also inexpensive.

Outside experts could easily try to impose guidelines on such a committee, but we believe that success is more likely with a less directed form of social evolution, which would guide itself and build community support as information accrues, communication increases, and sensationalized fears gradually give way to the pragmatism of harm reduction. Safety concerns would of course be reviewed by government before any proposal was approved for implementation.

CONCLUSION

Twentieth century thinking often reduced complex social problems to a simple "drug problem" and attempted to solve this problem by enforcing abstinence from certain demonized drugs, including

cocaine. Twenty-first century society needs to think more clearly than this.

Some addiction professionals oppose stimulant maintenance on the basis of its possible effects on drug abstinence, rather than on a comprehensive assessment of all its costs and benefits (Baker *et al.*, 1998). It is certainly possible that a few more cocaine addicts might successfully undergo abstinence treatment if stimulant maintenance is unavailable, but a sensible stimulant maintenance program will not select patients who are likely to succeed at abstinence treatment. Moreover, any effects of introducing a stimulant maintenance program on the number of patients succeeding in abstinence treatment programs will surely be noticed, and corrective actions can be taken. But most fundamentally, single-minded attention to drug abstinence draws more from War on Drugs thinking than from either pragmatism or science. There are many other outcomes to consider.

A more general argument made against stimulant maintenance and harm reduction is that it "sends the wrong message to society" (Crowley and Brewster, 1998). As Robert Dupont (1996) put it: "[w]hile attractive as a reasonable sounding compromise, harm reduction carries a high price because it undermines the social signal of prohibition" (p. 1929). This view ignores the facts that prohibition has failed to achieve its promised results and exacerbated the harms associated with drug use. A century of drug prohibition in the US has: compromised basic human rights, created and sustained a huge black market for illicit drugs, marginalized millions of responsible drug users, multiplied the prison population, and exacerbated an epidemic spread of AIDS infection among intravenous users (DeGrandpre, 1996; Drucker, 1996; Erickson *et al.*, 1997; Nadelmann, 1996; 1997; Peele, 1996; Reinerman and Levine, 1997; Rosenbaum *et al.*, 1996; Szasz, 1992; Trebach, 1987). The "social signal of prohibition" – i.e., the claim that personal and social well-being depends on total abstinence from the currently demonized drugs – should not only be undermined, but deeply buried. Because a generation of critical scholars has enabled us to look more carefully at the past, we are no longer condemned either to repeat its slogans or perpetuate its mistakes. We can instead turn to pragmatic innovation.

References

- Alexander, B. K. (1990). *Peaceful Measures: Canada's Way Out of the War on Drugs*. Toronto: University of Toronto Press.
- Alexander, B. K. (in press). The globalization of addiction. *Addiction Research*.
- Archibald, C. P., Ofner, M., Strathdee, S. A., Patrick, D. M., Sutherland, D., Rekart, M. L., Schechter, M. T. and O'Shaughnessy, M. (1998). Factors associated with frequent needle exchange program attendance in injection drug users in Vancouver, Canada. *Journal of Acquired Immune Deficiency Syndromes and Human Retrovirology*, **17**, 160-166.
- Arthritis News Today* (1980). Esterene in the treatment of rheumatoid arthritis (editorial). **2**, 5.
- Avants, S. K., Margolin, A., DePhillippis, D. and Kosten, T. R. (1998). A comprehensive pharmacologic-psychosocial treatment program for HIV-seropositive cocaine- and opioid-dependent patients. *Journal of Substance Abuse Treatment*, **15**, 261-265.
- Baker, R., Anderson, J., de Vlaming, S., Hickey, P., Ross, B. and Wong, C. (August 15, 1998). No further harm - A report of the BCMA's temporary sub-committee on narcotics harm reduction. Report to the professional advisory committee of the British Columbia Medical Association, 20 pp. <http://www.bcma.org/committees/nofurtherharm.asp>.
- Bammer, G., Dobler-Mikola, A., Fleming, P. M., Strang, J. and Uchtenhagen, A. (1999). The heroin prescribing debate: Integrating science and politics. *Science*, **284**, 1277-1278.
- Beauchesne, L., (2000). Une politique publique de réduction des méfaits en matière de drogues: les pièges à éviter. Unpublished manuscript, Department of Criminology, Carleton University, Ottawa.
- Beebe, D. K. and Walley, E. (1995). Smokable amphetamine ("ice"): An old drug in a different form. *American Family Physician*, **51**, 449-453.
- Belding, M. A., McLellan, A. T., Zaniz, D. A. and Incmikoski, R. (1998). Characterizing "nonresponsive" methadone patients. *Journal of Substance Abuse Treatment*, **15**, 485-492.
- Beyerstein, B. L. and Alexander, B. K. (1985). Why treat doctors like pushers? *Canadian Medical Association*, **132**, 337-341.
- Bourgeois, P. (1997). In search of Horatio Alger: Culture and ideology in the crack economy. In C. Reinerman and H. G. Levine (Eds.), *Crack in America: Demon Drugs and Social Justice* (pp. 57-76). Berkeley: University of California Press.
- Boyd, S. C. (1999). *Mothers and Illicit Drugs: Transcending the Myths*. Toronto: University of Toronto Press.
- Brecher, E. M. (1972). *Licit and Illicit Drugs*. Boston: Little, Brown.
- Bruneau, J., Lamothe, F., Franco, E., Lachance, N., Desy, M., Soto, J. and Vincelette, J. (1997). High rates of HIV infection among injection drug users participating in needle exchange programs in Montreal: Results of a cohort study. *American Journal of Epidemiology*, **146**, 994-1002.
- Buchanan, D. R. and Wallack, L. (1998). This is the Partnership for a Drug-Free America: Any Questions? *Journal of Drug Issues*, **28**, 329-356.
- Budney, A. J., Higgins, S. T., Bickel, W. and Kent, L. (1993). Relationship between intravenous use and achieving initial cocaine abstinence. *Drug and Alcohol Dependence*, **32**, 133-142.
- Catterall, W. A. and Mackie, K. (1996). In J. G. Hardman, L. E. Limbird, P. B. Molinoff, R. W. Ruddon and A. G. Gilman (Eds.), *The Pharmacological Basis of Therapeutics* (9th edition, pp. 331-348). New York: McGraw-Hill.
- Chaisson, R. E., Bacchetti, P., Osmond, M. A., Brodie, B., Sande, M. A. and Moss, A. R. (1989). Cocaine use and HIV infection in intravenous drug users in San Francisco. *Journal of the American Medical Association*, **261**, 561-565.

- Charnaud, B. and Griffiths, V. (1998). Levels of intravenous drug misuse among clients prescribed oral dexamphetamine or oral methadone: A comparison. *Drug and Alcohol Dependence*, **52**, 79–84.
- Chasnoff, I., Griffith, D., Freier, C. and Murray, J. (1992). Cocaine/polydrug use in pregnancy: Two-year follow-up. *Pediatrics*, **89**, 337–339.
- Cheung, Y. W. and Erickson, P. G. (1997). Crack use in Canada: A distant American cousin. In C. Reinerman and H. G. Levine (Eds.), *Crack in America: Demon Drugs and Social Justice* (pp. 175–193). Berkeley: University of California Press.
- Chiarello, R. J. and Cole, J. O. (1987). The use of psychostimulants in general psychiatry. *Archives of General Psychiatry*, **44**, 286–295.
- Chiu, Y. C., Brecht, K., Dasgupta, D. S. and Mhoon, E. (1986). Myocardial infarction with topical cocaine anesthesia for nasal surgery. *Archives of Otolaryngology – Head and Neck Surgery*, **112**, 988–990.
- Cohen, P. and Sas, A. (1993). *Ten Years of Cocaine: A Follow-up Study of 64 Cocaine Users in Amsterdam*. Amsterdam: University of Amsterdam.
- Cone, E. J. (1998). Recent discoveries in pharmacokinetics of drugs of abuse. *Toxicology Letters*, **102–103**, 97–101.
- Coppard, P. (October 6, 1996). Health board to widen methadone program. *Vancouver Echo*, p. 13.
- Corty, E. and Ball, J. C. (1986). What can we know about addiction from the addicts we treat? *International Journal of the Addictions*, **21**, 1139–1144.
- Cross-National Collaborative Group (1992). The changing rate of major depression: Cross-national comparisons. *Journal of the American Medical Association*, **268**, 3098–3105.
- Crowly, T. J. and Brewster, J. T. (1998). Cocaine legalization: Designing the experiments. In S. T. Higgins and J. L. Katz (Eds.), *Cocaine Abuse: Behavior, Pharmacology, and Clinical Applications* (pp. 409–429). San Diego, California: Academic Press.
- DeGrandpre, R. J. (1996). The impact of socially constructed knowledge on drug policy. In W. K. Bickel and R. J. DeGrandpre (Eds.), *Drug Policy and Human Nature: Psychological Perspectives on the Prevention, Management, and Treatment of Illicit Drug Abuse* (pp. 251–278). New York: Plenum.
- DeGrandpre, R. J. (1999). *Ritalin Nation: Rapid-fire Culture and the Transformation of Human Consciousness*. New York: Norton.
- Drucker, E. (July 1996). The failure of prohibition as a drug control strategy: The case of AIDS. Paper presented at the 11th International Conference on Aids, Vancouver, British Columbia. <http://www.lindesmith.org/library/grdruc1.htm>.
- Dunn, J. and Laranjeira, R. R. (1999). Transitions in the route of cocaine administration – characteristic directions and associated variables. *Addiction*, **94**, 813–824.
- Dupont, R. L. (1996). Harm reduction and decriminalization in the United States: A personal perspective. *Substance Use and Misuse*, **31**, 1929–1945.
- Erickson, P. G., Adlaf, E. M., Smart, R. G. and Murray, G. F. (Eds.) (1994). *The Steel Drug: Cocaine and Crack in Perspective* (2nd edition). New York: Lexington Books.
- Erickson, P. G. and Alexander, B. K. (1989). Cocaine and addictive liability. *Social Pharmacology*, **3**, 249–270.
- Erickson, P. G., Riley, D. M., Cheung, Y. W. and O'Hare, P. A. (Eds.) (1997). *Harm Reduction: A New Direction for Drug Policies and Programs*. Toronto: University of Toronto Press.
- Feehan, H. F. and Mancusi-Ungaro, A. (1976). The use of cocaine as a topical anesthetic in nasal surgery: A survey report. *Plastic and Reconstructive Surgery*, **57**, 62–65.
- Fernandez, F., Maldonado, J. and Ruiz, P. (1997). Neuropsychiatric complications. In J. H. Lowinson, P. Ruiz, R. B. Millman and J. G. Langrod (Eds), *Substance Abuse: A Comprehensive Textbook* (3rd edition, pp. 207–223). Baltimore: Williams and Wilkins.

- Findling, R. L. (1996). Open-label treatment of comorbid depression and attentional disorders with co-administration of serotonin reuptake inhibitors and psychostimulants in children, adolescents, and adults: A case series. *Journal of Child and Adolescent Psychopharmacology*, **6**, 165-175.
- Finkle, B. S. and McClosky, K. L. (1978). The forensic toxicology of cocaine (1971-1976). *Journal of Forensic Sciences*, **23**, 173-189.
- Fischer, B. (2000). Prescriptions, power and politics: The turbulent history of methadone maintenance in Canada. *Journal of Public Health Policy*, **21**, 187-210.
- Fischman, M. W., Schuster, C. R., Resnekov, L., Shick, J. F. E., Krasnegor, N. A., Fennell, W. and Freedman, D. X. (1976). Cardiovascular and subjective effects of intravenous cocaine administration in humans. *Archives of General Psychiatry*, **33**, 983-989.
- Fisher, D. G., Fenaughty, A. M. and Trubatch, B. (1998). Seroconversion issues among out-of-treatment injection drug users. *Journal of Psychoactive Drugs*, **30**, 299-305.
- Fleming, P. M. (1998). Prescribing amphetamine to amphetamine users as a harm reduction measure. Unpublished manuscript, 17 pp.
- Fleming, P. M. and Roberts, D. (1994). Is the prescription of amphetamine justified as a harm reduction measure? *Journal of the Royal Society of Health*, **114**, 127-131.
- Foss, K. (November 17, 1998). New medical study questions benefit of choosing Prozac: Side effects of several leading antidepressants found to be similar to older, cheaper drugs. *The Globe and Mail*, p. A10.
- Freedman, D. (undated). Experts push legalization of cocaine gum to wean addicts. Report distributed by the Hearst News Service, 2 pp. <http://www.druglibrary.org/schaffer/cocaine/cocagum.htm>.
- Frierson, R. L., Wey, J. J. and Tabler, J. B. (1991). Psychostimulants for depression in the medically ill. *American Family Physician*, **43**, 163-170.
- Frye, C. B. (1997). Methylphenidate for depression in the elderly, medically ill patient. *American Journal of Health-System Pharmacy*, **54**, 2510-2511.
- Gawin, F., Riordan, C. and Kleber, H. (1985). Methylphenidate treatment of cocaine abusers without attention deficit disorder: A negative report. *American Journal of Drug and Alcohol Abuse*, **11**, 193-197.
- Goldberg, L. (1968). Drug abuse in Sweden. *United Nations Bulletin on Narcotics*, **2**, 9-36.
- Goldstein, P. J., Brownstein, H. H., Ryan, P. J. and Bellucci, P. A. (1997). Crack and homicide in New York City: A case study in the epidemiology of violence. In C. Reinerman and H. G. Levine (Eds.), *Crack in America: Demon Drugs and Social Justice* (pp. 113-130). Berkeley: University of California Press.
- Gordon, B. R. (1987). Topical cocaine in nasal anesthesia. *Archives of Otolaryngology - Head and Neck Surgery*, **113**, 211.
- Gorelick, D. A. (1992). Pathophysiologic effects of cocaine in humans: Review of scientific issues. *Journal of Addictive Diseases*, **11**, 97-110.
- Gorelick, D. A. (1998). The rate hypothesis and agonist substitution approaches to cocaine abuse treatment. *Advances in Pharmacology*, **42**, 995-997.
- Grabowski, J., Roache, J. D., Schmitz, J. M., Rhoades, H., Creson, D. and Korszun, A. (1997). Replacement medication for cocaine dependence: Methylphenidate. *Journal of Clinical Psychopharmacology*, **17**, 485-488.
- Grant, S. A. D. and Hoffman, R. S. (1992). Use of tetracaine, epinephrine, and cocaine as a topical anesthetic in the emergency department. *Annals of Emergency Medicine*, **21**, 987-997.
- Greenhill, L. L. and Osman, B. B. (2000). *Ritalin: Theory and Practice* (2nd edition). Larchmont, New York: Mary Ann Liebert.
- Grinspoon, L. and Bakalar, J. B. (1976). *Cocaine: A Drug and its Social Evolution*. New York: Basic Books.

- Grinspoon, L. and Bakalar, J. B. (1981). Coca and cocaine as medicines: An historical review. *Journal of Ethnopharmacology*, **3**, 149–159.
- Grinspoon, L. and Hedblom, P. (1975). *The Speed Culture: Amphetamine Use and Abuse in America*. Cambridge, MA: Harvard University Press.
- Hall, S. M., Clark, H. W. and Lea Sees, K. (1996). Drug abuse, drug treatment, and public policy. In W. K. Bickel and R. J. DeGrandpre (Eds.), *Drug Policy and Human Nature: Psychological Perspectives on the Prevention, Management, and Treatment of Illicit Drug Abuse* (pp. 77–98). New York: Plenum.
- Hando, J., Topp, L. and Hall, W. (1997). Amphetamine-related harms and treatment preferences of regular amphetamine users in Sydney, Australia. *Drug and Alcohol Dependence*, **46**, 105–113.
- Huber, A., Ling, W., Shoptaw, S., Gulati, V., Brethen, P. and Rawson, R. (1997). Integrating treatments for methamphetamine abuse: A psychosocial perspective. *Journal of Addictive Diseases*, **16**, 41–50.
- Hurtado Gumucio, J. (1995). *Cocaine, the Legend: About Coca and Cocaine*. Bolivia: Accion Andina.
- Jaffe, S. F. (1991). Intranasal abuse of prescribed methylphenidate by an alcohol and drug abusing adolescent with ADHD. *Journal of the American Academy of Child and Adolescent Psychiatry*, **30**, 773–775.
- Johns, M. E. and Henderson, R. L. (1977). Cocaine use by the otolaryngologist: A survey. *Transactions of the American Academy of Ophthalmology and Otolaryngology: Section on Ophthalmology*, **84**, 969–973.
- Khantizian, E. J. (1983). An extreme case of cocaine dependence and marked improvement with methylphenidate treatment. *American Journal of Psychiatry*, **140**, 784–785.
- Khantizian, E. J. (1985). The self-medication hypothesis of addictive disorders: Focus on heroin and cocaine dependence. *American Journal of Psychiatry*, **142**, 1259–1264.
- Khantizian, E. J., Gawin, F., Kleber, H. D. and Riordan, C. E. (1984). Methylphenidate (Ritalin) treatment of cocaine dependence – a preliminary report. *Journal of Substance Abuse Treatment*, **1**, 107–112.
- King, G. R. and Ellinwood, E. H. (1992). Amphetamines and other stimulants. In J. H. Lowinson, P. Ruiz, R. B. Millman and J. G. Langrod (Eds.), *Substance Abuse: A Comprehensive Textbook* (2nd edition, pp. 247–270). Baltimore: Williams and Wilkins.
- King, G. R. and Ellinwood, E. H. (1997). Amphetamines and other stimulants. In J. H. Lowinson, P. Ruiz, R. B. Millman and J. G. Langrod (Eds.), *Substance Abuse: A Comprehensive Textbook* (3rd edition, pp. 207–223). Baltimore: Williams and Wilkins.
- Kollins, S. H., Rush, C. R., Pazzaglia, P. J. and Ali, J. A. (1998). Comparison of acute behavioral effects of sustained-release and immediate release methylphenidate. *Experimental and Clinical Psychopharmacology*, **6**, 367–374.
- Kral, A. H., Bluthenthal, R. N., Booth, R. E. and Watters, J. K. (1998). HIV seroprevalence among street-recruited injection drug and crack cocaine users in 16 US municipalities. *American Journal of Public Health*, **88**, 108–113.
- Ledain, G. (1973). *Final Report of the Commission of Inquiry into the Non-medical Use of Drugs*. Ottawa: Information Canada.
- Levin, F. R., Evans, S. M. and Kleber, H. D. (1998a). Prevalence of adult attention-deficit hyperactivity disorder among cocaine abusers seeking treatment. *Drug and Alcohol Dependence*, **52**, 15–25.
- Levin, F. R., Evans, S. M., McDowell, D. M. and Kleber, H. D. (1998b). Methylphenidate treatment for cocaine abusers with adult attention-deficit/hyperactivity disorder: A pilot study. *Journal of Clinical Psychiatry*, **59**, 300–305.
- Levin, F. R., Evans, S. M. and Kleber, H. D. (1999). Practical guidelines for the treatment of substance abusers with adult attention-deficit hyperactivity disorder. *Psychiatric Services*, **50**, 1001–1003.

- Levin, F. R. and Kleber, H. D. (1995). Attention-deficit hyperactivity disorder and substance abuse: Relationships and implications for treatment. *Harvard Review of Psychiatry*, **2**, 246–258.
- Lindesmith, Center (1998). *Heroin Maintenance Treatment: Research Summary*. New York: The Lindesmith Center.
- Lintzeris, N., Holgate, F. and Dunlop, A. (1996). Addressing dependent amphetamine use: A place for prescription. *Drug and Alcohol Review*, **15**, 189–195.
- Little, K. Y. (1993). *d*-Amphetamine versus methylphenidate effects in depressed patients. *Journal of Clinical Psychiatry*, **54**, 349–355.
- Llosa, T. R. (1991). *Coca: Uses and Abuses*. COCADI, Lima: DESA.
- Llosa, T. R. (1994). The standard low dose of oral cocaine used for treatment of cocaine dependence. *Substance Abuse*, **15**, 215–220.
- Llosa, T. R. (1995). "Cocalization": The standard low dose of oral cocaine used for treatment of cocaine dependence. *Journal of Chemical Addiction*, **6**, 1–16.
- Maier, H. W. (1926/1987). *Cocaine Addiction* (O. J. Kalant, trans.). Toronto: Alcoholism and Drug Addiction Research Foundation.
- Maté, G. (1999). *Scattered Minds: A New Look at the Origins and Healing of Attention Deficit Disorder*. Toronto: Knopf Canada.
- Matthews, L. C. B., Dawes, G. A., Nadeau, B. G., Wong, L. S. and Alexander, B. K. (1994). The British Columbia Key Informant Study. Report to the World Health Organization, Geneva, Switzerland, 52 pp.
- Mattick, R. P. and Darke, S. (1995). Drug replacement treatments: Is amphetamine substitution a horse of a different colour? *Drug and Alcohol Review*, **14**, 389–394.
- McBride, A. J., Sullivan, G., Blewett, A. E. and Morgan, S. (1997). Amphetamine prescribing as a harm reduction measure: A preliminary study. *Addiction Research*, **5**, 95–112.
- Meier, B. (October 25, 2000). Suits charge conspiracy by maker and doctors' group to expand Ritalin use. The New York Times on the web, <http://www.nytimes.com/2000/09/14/science/14RITA.html>.
- Merill, J. (1998). Evaluation of prescribing dexamphetamine in the treatment of amphetamine dependence. Unpublished manuscript, 10 pp.
- Meyers, M. G., Rohsenow, D. J., Monte, P. M. and Dey, A. (1995). Patterns of cocaine use among individuals in substance abuse treatment. *American Journal of Drug and Alcohol Abuse*, **21**, 223–231.
- Morales, E. (1989). *Cocaine: White Gold Rush in Peru*. Tucson: University of Arizona Press.
- Morgan, J. P. and Zimmer, L. (1997a). The social pharmacology of smokable cocaine: Not all it's cracked up to be. In C. Reinman and H. G. Levine (Eds.), *Crack in America: Demon Drugs and Social Justice* (pp. 131–170). Berkeley: University of California Press.
- Morgan, J. P. and Zimmer, L. (1997b). Animal self-administration of cocaine: Misinterpretation, misrepresentation, and invalid extrapolation to humans. In P. G. Erickson, D. M. Riley, Y. W. Cheung and P. A. O'Hare (Eds.) (1997). *Harm Reduction: A New Direction for Drug Policies and Programs*. Toronto: University of Toronto Press.
- Mortimer, W. G. (1901/1974). *History of Coca: "The Devine Plant" of the Incas*. San Francisco: Fitz High Ludlow Memorial Library.
- Mugford, S. K. and Cohen, P. J. (1989). Drug use, social relations and commodity consumption: A study of cocaine users in Sydney, Canberra and Melbourne. Report to the Research into Drug Abuse Advisory Committee, NCADA.
- Nadelmann, E. A. (March 1996). On harm reduction. Paper presented at the 8th International Conference on the Reduction of Drug Related Harm, Paris, France. <http://www.ihra.org.uk/paris/proceedings/nadelmann.htm>.

- Nadelmann, E. A. (1997). Drug prohibition in the US: Costs and consequences. In C. Reinerman and H. G. Levine (Eds.), *Crack in America: Demon Drugs and Social Justice* (pp. 288–316). Berkeley: University of California Press.
- National Consensus Development Panel on Effective Medical Treatment of Opiate Addiction (1998). Effective medical treatment of opiate addiction. *Journal of the American Medical Association*, **280**, 1936–1943.
- O'Brien, C. P. (1996). Drug addiction and drug abuse. In J. G. Hardman, L. E. Limbird, P. B. Molinoff, R. W. Ruddon and A. G. Gilman (Eds.), *The Pharmacological Basis of Therapeutics* (9th edition, pp. 557–577). New York: McGraw-Hill.
- Paly, D., Jatlow, P., Van Dyke, C., Cabieses, F. and Byck, R. (1980). Plasma levels of cocaine in native Peruvian coca chewers. In F. R. Jeri (Ed.), *Cocaine 1980*. Lima, Peru: Pacific Press.
- Parran, T. V. and Jasinski, D. R. (1991). Intravenous methylphenidate abuse: Prototype for prescription drug abuse. *Archives of Internal Medicine*, **151**, 781–783.
- Pates, R. (1994). Speed on prescription. *Druglink*, May/June, pp. 16–17.
- Peele, S. (1996). Assumptions about drugs and the marketing of drug policies. In W. K. Bickel and R. J. DeGrandpre (Eds.), *Drug Policy and Human Nature: Psychological Perspectives on the Prevention, Management, and Treatment of Illicit Drug Abuse* (pp. 199–218). New York: Plenum.
- Peele, S. and DeGrandpre, R. J. (1998). Cocaine and the concept of addiction: Environmental factors in drug compulsions. *Addiction Research*, **6**, 235–263.
- Perrine, D. M. (1996). *The Chemistry of Mind-Altering Drugs*. Washington, D.C.: American Chemical Society.
- Plume, D. (1995). The self-medication hypothesis: ADHD and chronic cocaine abuse. Unpublished literature review, 19 pp. <http://www.druglibrary.org/schaffer/cocaine/addhyp.htm>.
- Post, R. M., Kotin, J. and Goodwin, F. K. (1974). The effects of cocaine on depressed patients. *American Journal of Psychiatry*, **131**, 511–517.
- Poulin, C., Fralick, P., Whynot, E. M., el-Guebaly, N., Kennedy, D., Bernstein, J., Boivin, D. and Rinchart, J. (1998). The epidemiology of cocaine and opiate abuse in urban Canada. *Canadian Journal of Public Health*, **89**, 234–238.
- Rees, A. (April 3, 1998). Ritalin use in Canada jumps 547%. *The Vancouver Province*, p. A17.
- Reichman, O. S. and Otto, R. A. (1992). The effect of intranasal cocaine on the urine drug screen for benzoylecgonine. *Otolaryngology: Head and Neck Surgery*, **106**, 223–225.
- Reinerman, C. and Levine, H. G. (Eds.) (1997). *Crack in America: Demon Drugs and Social Justice*. Berkeley: University of California Press.
- Reinerman, C., Waldorf, D., Murphy, S. B. and Levine, H. G. (1997). The contingent call of the pipe: Bingeing and addiction among heavy cocaine smokers. In C. Reinerman and H. G. Levine (Eds.), *Crack in America: Demon Drugs and Social Justice* (pp. 77–97). Berkeley: University of California Press.
- Riordan, H. J., Flashman, L. A., Saykin, A. J., Frutiger, S. A., Carroll, K. E. and Huey, L. (1999). Neuropsychological correlates of methylphenidate treatment in adult ADHD with and without depression. *Archives of Clinical Neuropsychology*, **14**, 217–233.
- Rosenbaum, M., Washburn, A., Knight, K., Kelley, M. and Irwin, J. (1996). Treatment as harm reduction, defunding as harm maximization: The case of methadone maintenance. *Journal of Psychoactive Drugs*, **28**, 241–249.
- Safer, D. J. and Zito, J. M. (2000). Pharmacoeconomics of methylphenidate and other stimulants for the treatment of attention deficit hyperactivity disorder. In L. L. Greenhill and B. B. Osman (Eds.), *Ritalin: Theory and Practice* (2nd edition, pp. 7–26). Larchmont, New York: Mary Ann Liebert.
- Sannerud, C. and Feussner, G. (2000). Is Ritalin an abused drug? Does it meet the criteria of a Schedule II substance? In L. L. Greenhill and B. B. Osman (Eds.),

- Ritalin: Theory and practice* (2nd edition, pp. 27–42). Larchmont, New York: Mary Ann Liebert.
- Schenck, N. L. (1975). Local anesthesia in otolaryngology: A re-evaluation. *Annals of Otolaryngology and Laryngology*, **84**, 65–72.
- Sherman, J. (1990). Dexamphetamine for "speed" addiction. *The Medical Journal of Australia*, **153**, 306.
- Shoenbaum, E. E., Hartel, D., Selwyn, P. A., Klein, R. S., Davenny, K., Rogers, M., Feiner, C. and Friedland, G. (1989). Risk factors for human immunodeficiency virus infection in intravenous drug users. *New England Journal of Medicine*, **321**, 874–879.
- Siegel, R. K. (1989). *Intoxication: Life in Pursuit of Artificial Paradise*. New York: Dutton.
- Siegel, R. K., Elsohly, M. A., Plowman, T., Rury, P. M. and Jones, R. T. (1986). Cocaine in herbal tea. *Journal of the American Medical Association*, **255**, 40.
- Springer, E. (1991). Effective AIDS prevention with active drug users: The harm reduction model. *Journal of Chemical Dependency Treatment*, **4**, 141–157.
- Strang, J. and Sheridan, J. (1997). Prescribing amphetamines to drug misusers: Data from the 1995 national survey of community pharmacies in England and Wales. *Addiction*, **92**, 833–838.
- Strathdee, S. A., Patrick, D. M., Archibald, C. P., Ofner, M., Cornelisse, P. G. A., Rekart, M., Schechter, M. T. and O'Shaughnessy, M. V. (1997a). Social determinants predict needle-sharing behavior among injection drug users in Vancouver, Canada. *Addiction*, **92**, 1339–1347.
- Strathdee, S. A., Patrick, D. M., Currie, S. L., Cornelisse, P. G. A., Rekart, M. L., Montaner, J. S. G., Schechter, M. T. and O'Shaughnessy, M. V. (1997b). Needle exchange is not enough: Lessons from the Vancouver injecting drug use study. *AIDS*, **11**, F59–65.
- Szasz, T. (1992). The fatal temptation: Drug prohibition and the fear of autonomy. *Daedalus*, **121**, 161–164.
- Thase, M. E. and Rush, A. J. (1995). Treatment-resistant depression. In F. E. Bloom and D. J. Kupfer (Eds.), *Psychopharmacology: Fourth Generation of Progress* (pp. 1081–1097). New York: Raven Press.
- Trebach, A. (1982). *The Heroin Solution*. New Haven: Yale University Press.
- Trebach, A. (1987). *The Great Drug War: And Radical Proposals that Could Make America Safe Again*. New York: Macmillan.
- Tsou, J. Y. (August 2000). Attitudes towards harm reduction among injection drug users in a Vancouver shelter. Report to the Portland Hotel Society, Vancouver, British Columbia, 32 pp.
- Van Dyke, C., Barash, P. G., Jatlow, P. and Byck, R. (1976). Cocaine plasma concentrations after intranasal application in man. *Science*, **191**, 859–861.
- Volkow, N. D., Ding, Y. S., Fowler, J. S., Wang, G. J., Logan, J., Gatley, J. S., Dewey, S., Ashby, C., Liebermann, J., Hitzemann, R. and Wolf, A. P. (1995). Is methylphenidate like cocaine? Studies on their pharmacokinetics and distribution in the human brain. *Archives of General Psychiatry*, **52**, 456–463.
- Washton, A. M. and Tatarsky, A. (1984). Adverse effects of cocaine abuse. *NIDA Research Monograph*, **49**, 247–254.
- WHO/UNICRI (1995). *Cocaine Project*. Geneva: World Health Organization. (Available from the World Health Organization)
- Wong, L. S. and Alexander, B. K. (1991). Cocaine-related deaths: Media coverage in the War on Drugs. *Journal of Drug Issues*, **21**, 105–119.

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