The phenomenon of so-called 'other drug use' among opiate addicts in the North American context: Evidence, consequences, questions

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Inhalt

Vorwort der HerausgeberInnen 9

Grußwort 13
I. I. Michels

Grußwort 19
E. Koller

Grußwort 23
G. Andersen

„Beigebrauch“? Einführung in ein merkwürdiges Thema 25
B. Westermann

Substitutionsprogramme: Die Therapie im double bind 33
H. Fleischmann

Nebenkonsum und Beendigung der Substitution, Behandlungsabbruch und Konsequenzen 43
J. Gölz

Einschränkung von Beigebrauch als Therapieziel: Substitutionssubstanzen im Vergleich 51
M. Gastpar

„Drug Interactions“: Gefährdung der Substitution 57
H. Sourgens

Der Einfluss von Stimmung, Stress und Ängstlichkeit auf das Verlangen nach Heroin und Substanzen des Beikonsums bei Opiatabhängigen 65
S. Grüsser

Neueste Entwicklungen in der HIV-Therapie 71
A. Haberl

Alkoholbeikonsum/Alkoholismus bei substituierten Drogenabhängigen und daraus resultierende Probleme bei der Behandlung von HIV- und HCV-Infektionen 81
R. Baumgarten

Use and prescription of benzodiazepines among substance abusers in opiate maintenance treatment in Geneva 87
B. Broers

The Phenomenon of So-called 'Other Drug Use' among Opiate Addicts in the North American Context: Evidence, Consequences, Questions 95
B. Fischer

Konsummuster Rotterdamer Drogenabhängiger 119
C. Barendregt

Erfahrungen mit Beikonsum bei der Substitution in Großbritannien 129
N. Seivewright

Heroingestützte Behandlung und Beikonsum 133
A. Moldovanyi

Polytoxikomanes Verhalten, Mischkonsum, Beikonsum – Was ist das? 141
H. P. Tossmann

Methadonsubstitution und Beigebrauch aus rechtsmedizinisch-toxikologischer Sicht 153
G. Kauert

Beigebrauch in der ambulanten medizinischen Rehabilitation unter Substitution 159
H. Küfner

Ist Beigebrauch unmoralisch? Versuch einer ethischen Orientierungshilfe 175
Th. Wallimann

Kriminologische Aspekte des Beigebrauchs von Drogen 185
H.-J. Albrecht

Drogengebrauch zwischen Hedonismus und Traumatisierung 191
H. Menger

Scheitern des Substitutionsansatzes oder Mitagieren des Therapeuten im Theater der Süchtigkeit 195
T. Berthel

„Sie konnten zusammen nicht kommen, das Wasser war viel zu tief." 207
B. Westermann

The Phenomenon of So-called 'Other Drug Use' among Opiate Addicts in the North American Context: Evidence, Consequences, Questions

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1. Social History of Opiate and Poly-Drug Use

The illicit use of opiates is a serious and on-going public health problem, and the subsequently pathological phenomenon of 'opiate addiction' is a century-old issue in North America. In the past, researchers and clinicians were rather narrowly focused on the task of investigating and treating opiate addiction rather than multiple drug use among the users of opiate drugs (Gould & Kleber 1974). The introduction of opiates to North America has been traced back to the 1850s when a large number of Chinese immigrants came to the United States and Canada and brought with them the opium-smoking habit (Lindesmith 1947; Solomon and Green 1988). By the late 1800s, this habit was considered to be reserved primarily for prostitutes and criminals, but as more opium-smoking dens were established in the early 1900s, the habit made its way to popularity with other social classes. At this time, a transformation appeared to occur in the type of individual who used opiates. In the early 1900s, a large number of opiate users were typically middle-aged, middle- or upper-class women who used opiates for medical purposes, namely for respiratory problems. However, in the 1920s and the 1930s the typical opiate addict was increasingly reported to be the young, lower-class male who engaged in recreational opiate use for non-medical purposes (Courtwright 1982; Giffen, Endicott & Lambert 1991). This transformation was brought about by the passing of the Harrison Narcotic Act in the United States in 1914, and the emergence of the Opium and Other Drug Act in Canada around the same time, which sought to tighten the control of opiates and their prescription, and this newly strict control subsequently drove opiate use into an illicit underground (Musto 1987; Giffen, Endicott & Lambert 1991). This transformation was also facilitated by the now widespread availability of hypodermic needles, which allowed illicit opiate users to inject their drug of choice. By the 1940s, the drugs most commonly used by drug 'addicts' were heroin or morphine, thus introducing the pure heroin 'junkie' as the predominant addict in the underworld drug scene (Courtwright 1982).

Despite the distinct research focus placed on addiction to opiates in the early twentieth century (Lindesmith 1947, Musto 1987), some investigation was being done with respect to poly-drug addiction at this time, which would imply that the idea of the exclusive heroin 'junkie' was a myth of sorts. When poly-drug use by drug addicts was addressed in the early twentieth century, it was often discussed within the context of sequential or 'stepping stone' theories of multiple drug use. The first 'stepping stone' or 'progression' theory of poly-drug use was developed by Prohibitionists in the early 1900s in the United States, who argued that among drug users, tobacco use leads to the use of alcohol which

eventually leads to the use of opiates (Towns 1917). Cannabis was soon introduced into this causal hypothesis in the 1930s when marijuana use became more common in the United States, and this theory that marijuana is a precursor to opiate use was popular among researchers during the 1940s and 1950s (Grinspoon 1971). The increase in use of LSD, barbiturates and amphetamines in the 1960s led to the addition of these substances into the marijuana–heroin 'progression' theory, and contributed to the development of different 'stepping stone' models discussing a variety of drug sequences as leading to the use of opiates (Grinspoon 1971). However, a number of studies addressing and supporting the particular marijuana–heroin 'stepping stone' theory were still being produced in the late 1960s and early 1970s (see Robins & Murphy 1967; Ball 1967; Ball, Chambers & Hall 1968; Goode 1969; Whitehead, Smart & Laforest 1972; Grupp 1972).

In the 1970s, theories and research describing the concurrent (simultaneous or consecutive) use of illicit drugs, including opiates, began to emerge. For example, the theory of the 'garbage head syndrome' was developed at this time based on government field workers' observations of concurrent poly-drug use among Canadian youth. They noted that this 'syndrome' involved the consecutive or simultaneous consumption of a variety of different drugs by young people with the sole intent of 'getting stoned', regardless of the consequences (Le Dain Commission 1973). During the 1970s, researchers also began to explore concurrent poly-drug use among opiate addicts more in depth after a growing number of staff reports concerning other drug use among drug treatment patients began to materialize (Gould & Kleber 1974). Since then, the research literature has emphasized concurrent poly-drug use to be one of the most serious problems with respect to opiate addiction, treatment and associated interventions (Rosenblum, Foote, Magura et al. 1996; Wilkinson, Leigh, Cordingley et al. 1987; Stitzer et al.1986; Brewer et al. 1998; Petry & Bickel 1998; Saxon, Calsyn, Kivlahan & Roszell 1993; Glosser 1983; Gould & Kleber 1974).

2. 'Other Drug Use' Among Opiate Addicts in North America Today: Empirical Evidence

Opiate addiction remains a serious and ongoing public health and social problem in North America (Kuo, Fischer & Vlahov, forthcoming). It is estimated that there are currently 600,000 people dependent on opiates in the United States (NIH 1998) and 50,000-90,000 illicit opiate users in Canada (Fischer & Rehm 1997). In 1996, nearly 4,000 heroin-related drug abuse deaths were reported in the U.S. (SAMHSA 1996), and approximately 500-1,000 such deaths are estimated per year in Canada (Millar 1998; Fischer, Rehm & Blitz-Miller 2000). Furthermore, researchers have determined that, due to limited availability and appeal, only 25% of the estimated 600,000 American opiate user population are currently in treatment (NIH 1998), and that only 15-20% of the 50,000-90,000 opiate users in Canada are enrolled in treatment (Fischer, forthcoming).

It has been prominently emphasized recently in the research and treatment literature that the problem of poly-drug use among opiate users compounds the social harms and costs associated with the opiate addiction problem in North America (Wilkinson, Leigh, Cordingley et al. 1987; Chutuape,

Silverman & Stitzer 1999; Saxon, Calsyn, Kivlahan & Roszell 1993; Fairbank, Dunteman & Condelli 1993). In fact, ever since the beginnings of opiate pharmacotherapy for opiate addiction, 'poly-drug' use among opiate addicts had been framed and understood as a form of secondary drug use in addition to the principal habit or problem of opiate use. This 'opiate-centric' view of poly-drug use among opiate users, nevertheless, implied that such poly-drug use constituted an additional and aggravating form of risk and harm, and subsequently underlined its elimination as one of the key objectives of the various forms of opiate addiction treatment. However, it will be discussed below, on the basis of the empirical data on such 'other drug use' among opiate users, whether such an 'opiate-centric' framing still appropriately reflects the reality of the situation.

It is important to note that, in terms of empirical documentation, the prevalence of poly-drug use among opiate users has been researched and documented primarily in the following three distinct cohorts of opiate addicts: a) users outside of treatment, b) users entering treatment, and c) users in treatment, with the vast majority of research data coming from the latter two categories. This, when considering the limited proportion of opiate users actually in touch with the treatment system (see proportions cited above), has substantial implications for the representativeness and overall validity of these data and its descriptors.

Drawing on large-sample cohort studies for a basic overview on the opiate poly-drug use situation in the North American context, the Treatment Outcome Prospective Studies (TOPS) indicated that 78.6% of the 4,184 opiate addicts in the outpatient methadone treatment sample reported that they were using two or more different drugs on a weekly or daily basis in the year before treatment entry, and that 32.2% of the sample were using four or more drugs (Craddock et al. 1997). The Drug Abuse Treatment Outcome Study (DATOS) reported that 67.3% of the 1,540 patients in the methadone treatment sample were using two drugs or more in the year before entering treatment, and that 11.7% of the patients in the sample were using four or more different drugs prior to treatment entry (Craddock et al. 1997). The Drug Abuse Reporting Program (DARP) study revealed that 54% out of the 895 subjects in treatment reported the use of other non-opioid drugs two months before treatment. Furthermore, 49% of this sample reported one or more previous months of treatment (Simpson & Sells 1982).

Brooks-Nelson, Kotranski, Semaan et al. (1998), measuring the extent of cocaine and opiate use among a sample of 1,015 out-of-treatment drug users in Philadelphia, found that within the 48 hours prior to data collection, 35% of the sample reported using opiates, 73% reported using cocaine, and 11% reported using speedballs. The extent of poly-drug use outside of treatment was also examined in a recent Canadian cohort study of untreated illicit opiate users in Toronto. The researchers determined that 79.8% of the sample of 114 users simultaneously used prescription opiates, alcohol, cannabis, benzodiazepines and/or cocaine on a regular basis, and that 57.1% of the sample were concurrently using opiates and cocaine (Fischer, Medved, Gliksman & Rehm 1999).

On the basis of these large-scale observational cohort study data, it appears well established that poly-drug use among opiate addicts is a rather prevalent and common phenomenon. As indicated above, it is empirically shown that the great majority of such 'other drug use' among opiate users involves four categories of psychoactive substances: cocaine, alcohol, sedatives and marijuana (Rettig & Yarmolinsky 1995). A rather large amount of research literature has been devoted to documenting the extent and etiology of such other drug use, and some more specific empirical evidence on the use and prevalence of these distinct drugs in opiate user populations is presented below.

2.1 Cocaine Use

Cocaine has become an increasingly popular drug of choice among untreated opiate users as well as methadone treatment patients (Kosten et al. 1986; Hanlon et al. 1990; Kolar et al. 1990; Rosenblum et al. 1996; Robles et al. 2000; Fischer, Gliksman, Rehm, Daniel & Medved 1999). Cocaine use is a serious concern due to its suggested correlation to negative treatment outcomes and its public health implications, as cocaine is usually frequently injected by this population, contributing to the transmission of HIV and other bloodborne diseases through needle and paraphernalia sharing (Kolar et al. 1990; Rosenblum et al. 1996).

Cocaine use among methadone treatment patients became more prevalent in North America in the late 1980s when cocaine became cheaper and more widely available (Condelli et al. 1991). In 1993, it was estimated that out of 33,700 methadone treatment patients in New York City, 73% were using cocaine at treatment entry (NYS Office of Alcohol and Substance Abuse Services 1993 & 1995; Rosenblum et al. 1996). Kosten et al. (1986) found in their study that 74% out of 533 opiate addicts applying for methadone maintenance treatment (MMT) were using cocaine, and that 49% of cocaine-using addicts in the study reported the use of at least one other type of drug. The TOPS studies determined that 27.6% of the 4,184 patients in the methadone treatment sample were using cocaine on a daily or weekly basis in the year before treatment entry, and the DATOS studies found that 41.7% of the 1,540 sample patients were using cocaine in the year prior to treatment (Craddock et al. 1997). A follow-up study of the Toronto 'Smack' cohort of opiate addicts indicated that 45% of the untreated addicts and 27.6% of the addicts who had entered treatment reported cocaine use in the last 30 days before interview (Fischer, Gliksman, Rehm et al. 1999).

2.2 Alcohol Use

It has been highly debated in the literature as to whether the use of alcohol amongst opiate addicts is increased as a substitute for heroin by patients during treatment, whether alcoholism is part of a pattern of previous alcohol problems and illicit drug use that continues during and after treatment (Lehman, Barrett & Simpson 1990), or whether alcohol is used as a means to manipulate the effects of other drugs. Varying study results have left this debate unresolved (Lowe & Shewan 1999). Depending on how alcoholism is defined, research studies have estimated that rates of alcoholism amongst opiate addicts in treatment can widely range from 5% to 49% (El-Bassel et al. 1993; Gelb,

Richman & Peyser 1979), and approximately range from 20% to 30% of opiate addicts not in treatment (Lehman et al. 1990; Belenko 1979). In support of these estimates, the TOPS studies reported that 47.4% of the MMT patients used alcohol in the year before entering treatment, and that 25% engaged in heavy alcohol use during this time. The DATOS studies revealed that 28.9% of MMT patients used alcohol, and that 15.1% of MMT patients used alcohol heavily, in the year before treatment entry (Craddock et al. 1997). The Toronto 'Smack Study' follow-up determined that 70% of the untreated opiate addicts and 44.8% of the addicts who had entered MMT indicated alcohol use in the last 30 days before interview (Fischer, Gliksman, Rehm et al. 1999).

2.3 Marijuana Use

It has been noted in research studies that marijuana is prominently used by opiate addicts both in and out of treatment (Budney, Bickel & Amass 1998; Kosten et al. 1986; Saxon, Calsyn, Greenberg et al. 1993; Nirenberg et al. 1996). Rates of the concurrent use of marijuana by opiate addicts have been estimated to range from 50% to 85% (Budney et al. 1998; Darke & Hall 1995; Ball, Chambers & Hall 1988; Saxon, Calsyn, Greenberg et al. 1993; Nirenberg et al. 1996; Petry & Bickel 1998). The TOPS studies in particular indicated that 55% of the MMT sample patients were using marijuana daily or weekly in the year before treatment admission (Craddock et al. 1997). The follow-up study to the 1999 Toronto 'Smack Study' revealed that 62.5% of the untreated opiate addicts and 44.8% of addicts who had entered treatment reported marijuana use 30 days prior to interview (Fischer, Gliksman, Rehm et al. 1999). Despite these estimates of prevalence of use, not much is known about the impact of marijuana use on opiate addicts' health or performance in treatment (Budney et al. 1998; Nirenberg et al. 1996).

Some researchers have argued that marijuana use by opiate addicts in methadone treatment does not have a negative impact on the overall effectiveness of MMT at achieving program goals, and thus do not see the need to test for marijuana use. Similarly, some researchers have found no evidence of increased illicit drug use amongst those who tested positive for marijuana in their treatment study samples and thus have concluded that THC testing is not justified in methadone treatment programs (Nirenberg et al. 1996; Saxon, Calsyn, Greenberg et al. 1993).

2.4 Use of Benzodiazepines

Consistent with research findings that psychiatric problems are highly prevalent among psychoactive substance dependent individuals (Busto, Romach & Sellers 1996; Kosten et al. 1986; Darke, Swift, Hall & Ross 1993), it has been found that many opiate addicts also use benzodiazepines in and out of treatment. The research data are not always clear about the prescribed (licit) or illicit nature of benzodiazepine use. It has been suggested that such use often occurs to self-medicate such conditions as depression and personality disorders (Busto et al. 1996; Stitzer et al. 1981). Studies have shown that the general prevalence of concurrent use of benzodiazepines among opiate addicts is high (Busto et al. 1996; Stitzer et al. 1981), and that average rates of benzodiazepine use among

methadone treatment patients can range from 30-40% (Stitzer et al. 1981). The TOPS studies reported that in the year before treatment entry, 28% of MMT patients in the sample were using sedatives or barbiturates on a daily or weekly basis (Craddock et al. 1997). The Toronto 'Smack Study' follow-up determined that 62.5% of the untreated opiate addicts and 37.9% of the addicts who entered MMT reported benzodiazepine use in the 30 days before interview (Fischer, Gliksman, Rehm et al. 1999). Stitzer et al. (1981) discovered in their study that 65-70% of their sample of 29 patients in two methadone maintenance programs used non-prescribed benzodiazepines in a given month.

Researchers argue that many opiate addicts in treatment use benzodiazepines within therapeutic limits (Stitzer et al. 1981; Woody et al. 1975), but that there is a considerable number of patients who abuse benzodiazepines, particularly diazepam (Busto et al. 1996; Stitzer et al. 1981).

3. Canadian Data on Poly-Drug Use among Opiate Users

There are additional data available that outline in considerable depth the extent and variation of 'other drug use' among opiate addicts in the specific Canadian context. Treatment admissions data from the Addiction Research Foundation in Toronto, Canada, revealed that 41.4% of all 904 individuals applying for treatment and indicating 'opiates' as their primary problem substance during 1992-1995 reported the problematic use of one or more drugs other than opiates. Out of the total opiate user treatment sample of 904 subjects, 10.5% reported benzodiazepine use, 8% indicated marijuana use, 5% indicated alcohol use, and 5% reported using cocaine as their secondary drug of choice (ARF, unpublished data, 1992-1995). Due to the open-ended/self-report nature of the intake questionnaire, which was applied to patients in the ARF's 'high threshold' clinical setting, specific data on the prevalence of use of each of these drug categories among the 904 opiate users were not isolated. Despite this likely under-reporting, these data do reveal that poly-drug use was relatively common among this sample. It must be pointed out here that, during this time, the ARF drug treatment clinic operated as a 'high threshold' institution, primarily specializing in special referral cases thus attracting and featuring a distinct client population profile.

The Vancouver Injection Drug Use Study (VIDUS) is an open cohort of over 1,400 injection drug users in Vancouver, Canada (Tyndall, Currie, Johnston, Li, O'Shaughnessy & Schechter 2000). At recruitment, the participants complete an in-depth semi-structured questionnaire and are tested for HIV, Hepatitis C, and tuberculosis. Semi-annual follow-up is conducted to determine patterns of drug use, needle exchange utilization, sexual risk behaviours, needle sharing, and participation in drug treatment. At the inception of the cohort in May 1996, 82% were injecting cocaine, 66% were injecting heroin, 32% were injecting speedballs, and 29% were smoking crack cocaine. This cohort study illustrates that opiates are just one of a number of substances regularly consumed in this urban setting, and thus makes a clear empirical case for a 'poly-drug use' rather than an 'opiate-centric' drug use or even a 'mono-drug use' situation among opiate users in North America.

More generally, the overall high prevalence of poly-drug use in North America among those opiate users outside of treatment, entering treatment and in treatment begs the question as to whether it makes sense to frame the phenomenon of poly-drug use among opiate users as a form of 'other', 'additional' or 'subordinate' drug use. It increasingly appears that while many of the individuals in or out of illicit or injection-drug treatment indicate opiates as their primary problem substance, or are seeking treatment for opiate addiction specifically (e.g., methadone treatment), opiates are most often just one of many drugs being used by this population. Conceptually, it would thus seem much more appropriate to address this issue in the broader context of 'poly-drug use' among illicit drug addicts, which seems to be the practical rule rather than the exception, and which provides a much more realistic reflection of the contemporary drug use reality of most illicit drug users in North America today.

4. Poly-Drug Use Among Opiate Addicts: Various Explanation Models

Numerous theories have been developed over the years to explain patterns and motivations for poly-drug use among drug addicts in general, and more specifically among opiate users. Several theories emerged during the 1930s to late 1960s to explain sequential or 'progressional' poly-drug use by drug addicts; these theories commonly treated marijuana use as a critical threshold and stepping stone into the realm of illicit drugs and opiate use (Grinspoon 1971). The psychopharmacological effects model was the first and most popular theory to explain sequential drug use from marijuana to opiates. This type of theory proposed that one of the side effects of marijuana use was a loss of self-control or the development of a tolerance to the drug that could make the user more susceptible and attracted to the consumption of other, more potent drugs like heroin (Giordano 1968; Maurer & Vogel 1967).

Another group of theories that sought to explain the progression of marijuana use to opiates were the personality abnormality theories. These theories claimed that individuals using marijuana were psychologically disturbed and featured personality disorders, and that eventually, for those with more serious personality deficits, marijuana would no longer be sufficient, and they would go on to use heroin to better treat their condition (Cohen & Klein 1970).

Many social/cultural theories to explain sequential drug use have been offered. Generally, they assert that drug use is determined by and is the product of subcultures and their distinct social forces that condition for, promote, and facilitate certain kinds of drug use related to additional factors like social situations, cultural habits, values and norms, and drug availability in these contexts. One such theory argued that through the use of illicit substances and subsequent exposure to the illicit market, the new drug user eventually establishes social relations with drug users who use a variety of drugs, and is thus gradually ushered into a drug subculture that encourages the use of several different substances (Blumer, Sutter, Ahmed & Smith 1967; Becker 1963; Glaser, Inciardi & Babst 1969; Whitehead, Smart & Laforest 1972).

Several theories have evolved in recent years that address the concurrent poly-drug use patterns of opiate addicts observed by researchers and clinicians today. A substitution/cost-effectiveness theory has been further developed that draws from economic theory and states that, during treatment episodes or fluctuations in market price, opiate addicts flexibly substitute other drugs for opiates on the basis of the assumption of a basic elasticity of the users‘ demand for opiates specifically. It has been found that opiate addicts in treatment may successfully stop using heroin, but then begin to use other drugs or increase the frequency of their other drug use as a substitute for heroin (Fairbank et al. 1993; Lehman et al. 1990). Those addicts in methadone treatment may also choose to use a cheaper substance to reduce costs, as larger amounts of drug are required in order to feel any effects over the cross-tolerance that methadone creates (Hunt et al. 1984; Kosten et al. 1986; Langrod 1970). Furthermore, along the same lines, it has been suggested that when the price of heroin increases, opiate addicts substitute more cost-effective drugs for heroin (Petry & Bickel 1998).

The self-medication model explains poly-drug use among opiate addicts from a distinct and behavioural–phenomenological perspective on the part of the user. This theory is based on the findings that opiate addicts tend to have more psychiatric problems than the general population and thus use other drugs (such as benzodiazepines, alcohol, cocaine and marijuana) to actively and consciously self-medicate their psychiatric disorders, personal stress, and/or difficult moments in addiction treatment (Shaffer & LaSalvia 1992; Kosten et al. 1986).

Similar to the self-medication model, research has also found evidence for a stabilization function theory that implies poly-drug use as driven by distinct interactions between drugs and their effects. For example, some opiate users engage in the use of cocaine, alcohol, marijuana and/or benzodiazepines to prevent or postpone the withdrawal symptoms associated with heroin use and thus stabilize themselves until more heroin can be acquired (Hunt et al. 1984; Langrod 1970). Some opiate addicts ‘speedball’ by injecting cocaine and heroin together to receive the instant rush and manage the undesirable sensation of a cocaine ‘crash’ (Kosten, Rounsaville & Kleber 1987; Strug, Hunt, Gold-smith, Lipton et al. 1985). The stabilization function theory has also been applied to opiate addicts in methadone treatment, in that certain drugs (e.g., benzodiazepines, cocaine, crack, marijuana, alcohol) provide intoxicating effects when used with methadone (Stitzer et al. 1981; Condelli et al. 1991; Hunt et al. 1984; Kosten et al. 1986). Many patients use other drugs while in treatment to postpone feelings of withdrawal and to manage the negative side effects they associate with methadone, such as backaches, headaches, nausea, drowsiness, nervousness, seizures, numbness and boredom (Fischer, Chin, Kuo et al., forthcoming; NIDA 1995).

What seems important to note here is that while the former explanation models imply that ‘other drug use’ is an ‘additional’ or aggravating problem in the pathology of drug addiction, the latter theories concede a potentially or partially constructive, conscious, and even positive role or function for such use from the user’s perspective. The use of ‘other drugs’ may be initiated consciously by the user to deal with or compensate the effects, or lack of availability, of other substances (e.g., heroin to “come down” from cocaine), or to deal with and reduce the undesirable side effects of methadone

treatment, the by far predominant treatment regime utilized for opiate addiction. These proposed constructive functions may require a cautious reconsideration of the uniformly negative connotation and judgment ascribed to 'other drug use' in the traditional research and treatment literature.

5. Reduction of 'Other Drug Use' through Opiate Addiction Treatment: Empirical Evidence

The reduction or elimination of 'other (illicit) drug use' has been proclaimed and emphasized as one of the central goals of opiate pharmacotherapy treatment (methadone treatment, etc.). In turn, the alleged effectiveness of methadone treatment and other forms of pharmacotherapy in reducing such other drug use has been widely emphasized as one of the fundamental success indicators of this form of intervention (see NIDA 1995; Swiss Methadone Report 1997; NIH 1998). Ball & Ross (1991) have claimed that a general reduction of all illicit drug use during methadone treatment indicates this form of treatment's effectiveness, and it has been argued that "Methadone maintenance has been demonstrated to result in substantial and sustained reductions in the use of illicit drugs… with a subsequent improvement in overall medical, social and vocational functioning" (O'Connor, Selwyn & Schottenfeld 1994: 454).

Over the past few decades, a large amount of research has been conducted and data produced exploring the effects of methadone and other opiate pharmacotherapy treatment, much of which focus on 'illicit drug use' as a central outcome measure (NIDA 1995; Bertschy 1995; Ward, Hall & Mattick 1999).

Only a few researchers have a priori pointed to the fact that many opiate addicts enter treatment while addicted to several different (non-opiate) substances for which opiate pharmacotherapy is not appropriate treatment and thus has ambiguous effects on the patients' ability to reduce their overall drug use during and after treatment (Rosenblum et al. 1996). Generally, it can be said that research studies and the empirical evidence they offer on the effectiveness of methadone treatment at reducing poly-drug use by opiate addicts have produced 'mixed' results at best (NIDA 1995). A brief review of some of the key studies examining the effects of methadone treatment on 'other/illicit drug use' is provided below.

Ball & Ross (1991) discovered in their study that opiate use and the use of other drugs by MMT patients, except for marijuana, decreased consistently with time in treatment. Condelli & Dunteman (1993) also considered the effect of length of methadone treatment on the reduction of opiate use in a sample of 526 patients in 17 MMT programs as part of the Treatment Outcome Prospective Study (TOPS). They found that when comparing short-term treatment episodes of 31 days, long-term treatment episodes of 233 days, and continuous treatment episodes of 723 days, the lengthiest stay in treatment brought about the most significant decrease in opiate use from 100% pre-treatment to 17% after continuous treatment. Simpson & Sells' (1982) Drug Abuse Reporting Program (DARP) study reported a 56% decrease in illicit opiate use in the first year of methadone treatment, compared to the

100% daily use that was noted among the 895 patients two months before treatment entry. The DARP studies reported a 13% reduction in the use of all non-opioid drugs except marijuana amongst the sample of MMT patients (Simpson & Sells 1982).

Fairbank et al. (1993) also found a decline in the use of illicit substances, except for alcohol, among their sample of 513 MMT patients after the first follow-up year (cocaine – 36% to 22%; illicit methadone – 21% to 5%; marijuana – 32% to 19%). Marsch (1998) found substantial evidence for a relationship between MMT and the reduction of illicit opiate use, HIV risk behaviours, and criminal activities. She analyzed the results of 11 studies investigating the effectiveness of methadone treatment and discovered that MMT had a moderate effect in reducing illicit opiate use, a small to moderate effect in reducing HIV risk behaviours, and a most significant effect in reducing drug-related criminality.

However, other studies have significantly isolated only a reduction in the use of illicit heroin and an increase or continuation of the use of other drugs, whether it is one drug or many. In the TOPS studies, a reduction in the use of illicit and non-prescription drugs during treatment was noted, but this reduction was followed by a sharp increase after treatment and then a gradually reduced rate after 5-year follow-up (Hubbard et al. 1989). Shaffer & LaSalvia (1992) found that, in their cohort of 41 MMT patients, cocaine and opiate use significantly decreased in the first year of treatment, but they noted an increase in the use of benzodiazepines by patients in the sample. Powers and Anglin (1993) reported stabilizing effects among 933 MMT patients with respect to opiate use in that their opiate use decreased in and out of treatment, but they found that marijuana and alcohol use increased and that these substances were being used as substitutes for opiates after treatment. Lehman et al. (1990) discovered similar findings in that 12 years after MMT, half of the 298 patients in the sample had stopped using opiates but were heavily using alcohol as a substitution for heroin. The Canadian VIDUS study indicated a slight decline in illicit substance use over time among 174 participants who were consistently enrolled in MMT. From 1996 to 1999, injection heroin use decreased from 67% to 52%, injection cocaine use declined from 60% to 37%, and speedball use decreased from 28% to 22%. During this same time period crack use increased from 18% to 36%. However, a comparison between this sub-sample of injection drug users in MMT (174) and those not in MMT (882) showed that drug use was essentially the same in the two groups (Tyndall, Brooks, Currie, Li, O'Shaughnessy & Schechter 2000). Although these observations do not allow for firm conclusions on the actual presence of 'other drug use' reducing effects of methadone treatment, they do suggest that poly-drug use remains common among those in MMT.

Despite the widely varying results put forward by the existing outcome research, it is predominantly asserted that methadone treatment is an effective method of reducing or eliminating illicit opiate and other drug use as well as other negative behaviours among opiate addicts (Ball & Ross 1991; Rosenblum et al. 1996; Simpson & Sells 1982; Shaffer & LaSalvia 1992; Fairbank, Dunteman & Condelli 1993). Similarly, based on this empirical evidence, methadone treatment has been assessed and proclaimed as an effective treatment modality for opiate addiction that reduces all

illicit drug use, criminal activity, HIV transmission, mortality and social costs, and that increases patients' social functioning and employment rates (Bertschy 1995; Nirenberg et al. 1996; Taylor et al. 1998; Ball & Ross 1991; Simpson & Sells 1982).

Within this empirical context of methadone treatment outcome research, several determinants have been identified on which the successful reduction of patients' illicit drug use in methadone treatment may depend. Some researchers and clinicians have found that those patients with less severe drug habits, in both frequency and history, are more capable of reducing their overall illicit drug use while in MMT than those who have more serious drug addiction careers (Fairbank, Condelli & Dunteman 1993; Bertschy 1995; Silverman et al. 1996; Rawson et al. 1994). Others have argued that effective and regimented disciplinary programs and contingency contracting procedures in MMT are a key factor in bringing about positive results in the reduction of illicit drug use among patients (Magura et al. 1988; Chutuape et al. 1999; Caplehorn et al. 1993). In addition, methadone dosages (>60 mg) have been linked to the reduction of illicit drug use by patients in treatment (Ball & Ross 1991; Maxwell & Shinderman 2000), and comprehensive services in treatment and effective treatment staff have also been suggested as leading to positive treatment outcomes (Ball & Ross 1991; Condelli & Dunteman 1993). Researchers have asserted a positive correlation between longer length of stay in methadone treatment and the reduction of illicit drug use (Ball & Ross 1991; Condelli & Dunteman 1993; Bertschy 1995; Reno & Aiken 1993; Simpson & Sells 1982). The DARP, TOPS, and Ball & Ross studies all pointed to evidence that illicit drug use was significantly reduced by patients after the first year in methadone treatment (Simpson & Sells 1982; Ball & Ross 1991; Condelli & Dunteman 1993).

6. Methadone Treatment Outcome Research: Methodological Issues

However, upon closer look it seems that many of these outcome research studies are fraught with fundamental methodological problems that severely limit the validity of their outcome measures and their conclusions with respect to the proclaimed effectiveness of methadone treatment. Specifically, one of the most important questions suggested by an evaluation of these research findings concerns whether the reduction of other drug use in opiate pharmacotherapy treatment programs is an effect of the treatment intervention itself or of biased patient (de-)selection over time. Most treatment studies suffer from high 'drop-out' or 'discontinued patient' rates of up to 50% after relatively short follow-up periods of one year, much of which are driven by the natural drop-out dynamics of patients who do not accept treatment rules with regard to 'other drug use' or who are discharged for lack of compliance with these rules. These circumstances, of course, have severe implications for the patient/subject base for whom the effects of treatment are assessed over time, the composition of this patient/subject base in terms of the outcome variable scrutinized, and the validity of the outcome data.

As one (randomly selected) illustrative example, Hubbard et al.'s (1997) outpatient methadone treatment outcome data reflect a 20% reduction in weekly cocaine use among patients after one year of treatment. However, the study sample size diminished through attrition from 1,203 patients at treatment admission to 727 patients at one-year follow-up, with 476 patients (39.6%) having dropped

out of treatment over the course of the first 12 months. This substantial reduction in follow-up sample size over time presents considerable problems in drawing accurate proof for significant reduction of 'other drug use' – here operationalized in the form of cocaine use – as an effect of opiate pharmaco-therapy itself.

This problem can be illustrated by two hypothetical yet realistic better-and-worse calculations. If 80% of the 476 treatment drop-outs in the Hubbard et al. (1997) study still used cocaine at the point of follow-up, then 45% of the total base sample (N=1,203) would be using cocaine after one year of treatment. This first hypothetical situation would indicate an overall increase in cocaine use over time when taking into account the behaviour of all original treatment patients. If, in a second hypothetical calculation, 60% of the 476 treatment drop-outs still used cocaine, then 37% of the total base sample would be using cocaine after one year of treatment. This second hypothetical situation would mean a minimal reduction of cocaine use in the treatment sample over pre-admission rates, likely below statistical significance levels. When such assumptions are considered about the behaviour of drop-outs in treatment outcome research studies, the so-called therapeutic effects of opiate pharmacotherapy – as illustrated in the above example – are minimized or may even totally disappear, and the proposed 'empirical conclusions' about the effectiveness of treatment may stand on methodologically weak ground. Therefore, the use of appropriate outcome research design and methods (i.e., true intent-to-treat analysis) that include assessment of drop-outs and their behaviour must be fundamentally called for in order to be certain of the overall extent and validity of opiate pharmacotherapy's praised and taken-for-granted effects. If these factors are not taken into account, self-selection cannot be ruled out as a possible explanation of positive treatment outcome results as shown above. It would appear that the currently applied scientific methodologies to assess the effects of MMT produce desirable data primarily through systematic retention of patients with compliant behaviour in the treatment research sample and not through the actual treatment modality effectively being applied to patients.

Another fundamental issue with respect to the perspectives applied to the assessment of 'other drug use' among opiate treatment patients concerns the types of instruments used to measure the prevalence of illicit drug use among those in treatment, and their inherent normative assumptions. Prominently used instruments like the Addiction Severity Index (ASI) (McLellan, Luborsky, Woody & O'Brien 1980), with a strict focus on assessing the mere quantitative prevalence of 'other drug use', are frequently used in treatment research settings. However, these instruments are largely insensitive to the risks and harms context of drug use or patients' quality of life, thus making them insufficient in measuring qualitative aspects of poly-drug use, or changes and modifications over the course of treatment, among opiate addicts in treatment.

7. Opiate Addiction Treatment (Pharmacotherapy) and Other Drug Use in North America: Views and Practices

The current methadone maintenance regulations and guidelines in Ontario, Canada, have been in effect since 1996 and involve regimented policies regarding urinalysis testing and take-home dose privileges as they relate to the issue of 'other drug use' with patients in methadone treatment. Methadone treatment patients in Ontario must undergo supervised urine testing twice a week during the initial three-month period of methadone treatment stabilization, and randomly thereafter. Patients are not eligible for take-home methadone doses within the first three months of treatment. After three months, patients are eligible for three take-home doses, and then up to six take-home doses are allowed for those patients who have remained active in treatment and have produced drug-free urine samples for 12 months (Ontario Methadone Maintenance Guidelines 1996). If continued drug use is detected, so the guidelines stipulate, physicians may either cancel patients' take-home dose privileges, increase methadone doses, or discharge patients from treatment (Ontario Methadone Maintenance Guidelines 1996).

There is great variability currently in North America, both in terms of ideological views and practical clinical response to poly-drug use among opiate addicts in treatment. Variability exists among North American methadone providers with respect to: definitions of and distinctions among substance use, abuse and dependence; poly-drug use detection and response practices; methadone treatment regulations and guidelines; and the level of training of methadone treatment providers. With respect to varying responses to poly-drug use (most commonly the use of cocaine, alcohol, marijuana, benzodiazepines, and sometimes methamphetamine), there are three main categories of clinical response employed in North American MMT settings. Responses rely on alterations to the methadone dose, increased intensity of counseling, or evaluation of the continued provision of methadone treatment which can result in either patient discharge or reduction in methadone dosage. By far the most common clinical response to poly-drug use among methadone maintenance patients is increased intensity of counseling (Brands & Brands 1998). All of the responses to poly-drug use outlined above, including the extent to which discharge from treatment occurs, vary depending on the drug used. Few methadone treatment providers apply any clinical response to cannabis use. The majority of research and clinical attention in the area of poly-drug use among methadone maintenance patients has focused on use of stimulants and particularly cocaine. In addition to the approaches described above, studies have looked at cocaine use by methadone maintenance patients treated with specific pharmacotherapy (Batki et al., AAAP meeting, 1998) and contingency management (Silverman et al. 1996). To date none of the approaches that attempt to address cocaine use among methadone maintenance patients have been consistently and persistently effective (Hser, Anglin & Fletcher 1998; Handelsman, Limpitlaw, Williams et al. 1995; Schottenfeld, Pakes, Oliveto et al. 1997; Kosten, Rounsaville & Kleber 1988).

A recent survey of 64 physicians in Ontario, Canada (60% of all physicians in the province providing methadone treatment at the time of study), practicing methadone treatment confirmed this situation of ambiguity or division with respect to attitudes and actions concerning poly-drug use among opiate addicts in treatment (Fischer, Bisceglia, Daniel & Gliksman, under review). Based on interviews, the survey revealed that if continued illicit opiate use occurred among their patients in treatment, almost half (45%) of the physicians reported that they would revoke take-home privileges and possibly increase the methadone dosage as well as counseling. Twenty-three percent indicated that they would discharge the patient from the methadone program. Ten percent of the physician sample stated that they would revoke the take-home dose privileges and take no other action, while only a few physicians indicated that they would disregard the illicit opiate use or simply increase the methadone dosage. In the case that continued illicit other (non-opiate) drug use had been detected in a patient's urine samples, 40% of the physicians said that they would revoke the patient's methadone take-home dose privileges, plus possibly increase the intensity of counseling. One third of the sample would discharge the patient from treatment entirely, while 13% would ignore the poly-drug use and take no action (Fischer, Bisceglia, Daniel & Gliksman, under review).

In light of patients' persistent poly-drug use as well as in the specific context of private and for-pay drug treatment programs in the United States, American clinicians utilize several additional strategies to control poly-drug use occurring with patients in methadone treatment. Among those mechanisms are: mandatory inpatient detoxification, a variety of different contingency contracting procedures, or treatment discharge/dis-continuation.

Inpatient detoxification has been deemed to be ineffective when not combined with other services and control strategies (Rosenblum et al. 1996), while one of the more popular and promising disciplinary measures being implemented in MMT to manage poly-drug use involves contingency contracting procedures (Magura et al. 1988; Nirenberg et al. 1996). Contingency contracting in methadone treatment is an operant conditioning or behaviour modification technique whereby patients are either rewarded for their abstinence from using illicit substances or punished for their poly-drug use based on urinalysis results (Rawson et al. 1994). These procedures commonly involve systems of reward in the form of take-home methadone dosages, increases in methadone doses, or vouchers redeemable for goods and services that will advance the patients' treatment goals, typically contingent on the patients' presentation of consecutive negative urine samples (Stitzer et al. 1986; Chutuape et al. 1999; Magura et al. 1988; Glosser 1983; Silverman et al. 1996; Robles et al. 2000). These mechanisms have shown mixed results in reducing illicit drug use in patients in treatment.

8. Summary and Outlook

This paper has argued and shown that 'other drug use' or 'poly-drug use' is a rather common phenomenon among today's illicit opiate (predominantly heroin) user populations in North America. The use of or dependence on drugs other than opiates in these populations is the rule rather than the exception, as vast empirical data clearly indicate (Craddock et al. 1997; Simpson & Sells 1982;

Brooks-Nelson et al. 1998; Fischer, Medved, Gliksman & Rehm 1999). A wide range of licit and illicit substances are sought and consumed regularly by most opiate users, predominantly falling into the categories of alcohol, cocaine, marijuana, and benzodiazepines (Rettig & Yarmolinsky 1995).

This simple but clear empirical constellation requires a fundamental conceptual correction to the 'opiate-centric' framework of 'other drug use' in the context of opiate dependence and its treatment. In light of the common, prevalent and regular use of 'other drugs' as evidenced in opiate-using populations in North America, the concept of 'other', 'secondary' or 'additional' drug use is a misnomer as well as a misleading perspective. It rather appears that the majority of opiate-involved injection drug users are best described by flexible and multiple drug use (and often dependence) and at best feature primary or temporary 'drugs of choice' of which heroin or other opiates can be one of many. The 'opiate-centric' view on poly-drug using individuals, which has dominated research and treatment for decades, is probably driven by two main factors: first, the long-lasting socio-medical construct of the pure heroin addict or 'junkie' who was addicted to and used nothing but 'smack', and second, the evolution of the predominantly 'opiate-centric' regime of treatment (methadone maintenance, other opiate pharmacotherapy) that defined and pathologized its target 'patients' according to the kind of indications and treatment they provided, not necessarily their actual drug use profiles or overall treatment needs (cf. Courtwright 1992).

A careful and reflective look is also in order from a research and treatment perspective in terms of theorizing, categorizing and understanding the use of drugs other than opiates by opiate-dependent individuals; both those in treatment as well as not in treatment. Most conventional theories automatically frame and label 'other' or 'additional' drug use as pathological as well as indications of an 'additional' problem or deviance. But the issue, and especially the relationships between the drugs used may be a bit more complex and not as simplistically black and white for all users. For example, as qualitative research shows, considerable proportions of opiate users choose and employ the use of other substances quite selectively and deliberately, aiming to utilize interactive effects between different kinds of substances in a positive and desired fashion (for example, to use heroin to 'come down' from cocaine, or in response to psychiatric disorders) within their often highly difficult life circumstances (Kosten et al. 1986; Shaffer & LaSalvia 1992). These scenarios point to the fact that, with some users, there may be a considerable range of constructive, even self-medicating aspects and rationales for the use of other substances in conjunction with heroin or other opiates. This may most relevantly be the case with patients in methadone treatment, who report the need for and use of other substances (e.g., marijuana, cocaine) in order to compensate for the various, substantial and well-known undesired and negative side effects of methadone (Hunt et al. 1986; Fischer, Chin, Kuo et al., forthcoming). This is not at all to suggest that many of the poly-drug using individuals in and outside of treatment do not feature most chaotic, destructive and harmful drug use habits. However, especially in light of a current lack of alternatives for more desirable and effective forms of opiate pharmacotherapies, the potentially constructive or externally necessitated role of 'poly-drug use' in many individual cases needs to be sensitively recognized and addressed in theory and practice, and not categorically condemned or punished.

Based on a clash of 'old' versus 'new' ideologies in methadone maintenance treatment in the North American context, there currently clearly exists a rather sharp split or divide in terms of treatment providers' approaches, attitudes and practices with regard to 'other drug use' by patients in methadone treatment. While a good portion of treatment providers still abide by the traditional 'abstinence' ideology and strictly control or punish 'other drug use' through the various mechanisms available (mandatory counseling, dosing, take-home 'privileges', contingency rewards, culminating in program discharge), others have arrived at a practice of (more or less helpless?) tolerance of other illicit drug use by simply accepting it under what is often referred to as a pragmatic 'harm reduction' umbrella. The flexibility and discretion of methadone treatment guidelines and rules in Canada specifically allow for both approaches (cf. Brands & Brands 1998). It seems highly questionable, however, whether the long-standing goal or expectation of methadone treatment or other opiate pharmacotherapy to reduce or eliminate non-opiate drug use is tenable or sensible on scientific or clinical – rather than on political or ideological – grounds, although this has been proclaimed and reinforced for decades. It is clinically or scientifically unreasonable to expect opiate pharmacotherapy to treat or cure non-opiate forms of drug dependence, and it is obscure that patients are held to such objectives, often with the harshest existential consequences.

While opiate pharmacotherapy treatment generally claims the reduction of illicit drug use as one of its key successes and main goals, this assertion has to be considered with particular caution. First, the vast scientific data examining the reduction of other drug use in methadone and other opiate pharmacotherapy treatment point to 'mixed results' at best (NIDA 1995; Bertschy 1996; Ward, Hall & Mattick 1999), in simple terms implying that, overall, some reduction occurs with some patients while in treatment, yet these effects vary highly within populations and not much is known about the (post-treatment) duration of such effects. More importantly, however, is the fact that most treatment effect evaluations of this kind are burdened with severe methodological problems. The great majority of treatment outcome studies follow and evaluate patients remaining in treatment over time and, in light of the substantial drop-out rates in North American methadone treatment programs, are characterized by an enormous selection bias. Since one of the principal reasons for which patients leave or are dismissed from treatment is 'other drug use', such assessments – and the findings and conclusions that methadone treatment, in fact, effectively reduces other drug use – become a tautology possibly driven by the dynamics of systematic selection of desired behaviour and results rather than real therapeutic effects. With these methodological problems in mind, a new and rigorous reassessment of the effectiveness of opiate pharmacotherapy treatment (utilizing meta-analyses or proper intent-to-treat methodology in new studies) is urgently called for in order to provide solid and much needed empirical grounds for future directions.

In summary, a few key fundamental research and treatment issues are on the agenda. First, new and appropriate scientific efforts, utilizing appropriate methods, are needed that investigate the contexts, rationales and motivations of drug use by poly-drug using opiate users in and out of treatment, specifically trying to understand the role and function that the use of other psychoactive substances play in users' lives, what harms and risks they entail, and how these individual

circumstances can be meaningfully responded to in treatment. Second, a fundamental reorientation of North American opiate pharmacotherapy treatment practices and values seems overdue that does not rely on punishment per se as a means and end in response to poly-drug use, but rather aims to understand the contexts and effects in individual cases and to provide proven and effective interventions where this is possible. In this context, finally, it also seems much advised that both the principles of opiate treatment as well as outcome research take the paradigmatic leap from a value system that relies on the simple prevalence of 'other drug use' as an automatic indicator of increased problems, harm or deviance to one that evaluates circumstantial risks, harms, and 'quality of life' indicators as the key measures of the effects of treatment and the patients' well-being and/or behaviour. This would, among other things, require the development and broad utilization of new treatment research perspectives and instruments, i.e., replacing standard evaluation instruments like the ASI (McLellan, Luborsky, Woody & O'Brien 1980) that narrowly link treatment success to the prevalence of other drug use, not the harms or risks associated with it. It is time that reality and reason again become the predominant forces in research and treatment regarding illicit opiate and other drug use.

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