Published in final edited form as:

Int J Drug Policy. 2010 March ; 21(2): 122–124. doi:10.1016/j.drugpo.2009.10.004.

Methadone as HIV Prevention: High Volume Methadone Sites to Decrease HIV Incidence Rates in Resource Limited Settings

R Douglas Bruce, MD, MA, MSc
Yale University AIDS Programme

Abstract

The link between injection drug use and HIV has been extensively described. Despite worldwide prevention efforts, injection drug use continues to be a risk factor for HIV transmission and both HIV and injection drug use continues to spread across the globe. Although methadone has demonstrated multiple health benefits including the reduction in injection drug use and HIV acquisition, the utilization of methadone in many areas of the world remains one of secondary, rather than primary, HIV prevention. As a result, many who finally begin methadone enter treatment having accumulated medical and mental health problems as a result of delayed treatment. Rapid access to treatment and a more aggressive policy that realizes that methadone can help reduce opioid drug use is necessary if methadone is effectively going to act as primary HIV prevention. To delay access to methadone only increases the probability that the individual will acquire an infectious disease that is more costly to the individual in terms of morbidity and mortality and more costly to society as a whole.

Keywords

HIV prevention; methadone; opioid dependence; injection drug use

Introduction

The last twenty years have seen extensive documentation that the abuse of and dependence on opioids can promote behaviours, such as injection drug use, that lead to the acquisition of HIV (Metzger, et al., 1993). This link between injection drug use and HIV has been extensively described in areas of the world with older HIV/IDU epidemics such as North America (Anonymous, 1990; Battjes, Pickens, & Amsel, 1991), Europe (Loimer, Werner, & Presslich, 1991) and Australia (Hall, Darke, Ross, & Wodak, 1993). Currently, the world's emerging HIV epidemics are in areas fueled by injection drug use of opioids such as former states of the Soviet Union (Abdala, et al., 2003), Southeast Asia (Saelim, Geater, Chongsuvivatwong, Rodkla, & Bechtel, 1998), South America (Caiaffa, et al., 2003) and China (Zhang, et al., 2002). Despite worldwide prevention efforts, injection drug use continues to be a risk factor for HIV transmission. Approximately 15.9 million individuals in 148 countries inject drugs of abuse, and it is estimated that 3 million of these are HIV-infected (Mathers, et al., 2008).

© 2009 Elsevier B.V. All rights reserved.

Contact: R. Douglas Bruce, MD, MA, MSc, **Address:** 135 College Street, Suite 323, New Haven, CT 06510, **Phone:** 203.314.2860, Robert.bruce@yale.edu.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Injection drug use continues to spread across the globe as evidenced by recent trends in East Africa (McCurdy, Ross, Kilonzo, Leshabari, & Williams, 2006). Of particular concern is that many of these epidemics are among younger men and women within densely populated regions (Bruce & Altice, 2007).

Injection drug use is a vehicle for HIV transmission and, once infected, can act as a promoter of nonadherence to antiretroviral therapy (ARVs) through the competing priority of ongoing opioid use. For these individuals, evidenced based treatment of substance use disorders in the form of medication-assisted treatment, such as methadone, is important in improving health outcomes in this population. When opioid abuse/dependence is not addressed, patients are less likely to initiate ARVs. When methadone is provided, however, patients are equally likely to initiate ARVs and may have improved adherence, especially if ARVs and methadone are co-administered (Himelhoch, et al., 2007; Lucas, et al., 2006; Roux, et al., 2008; Tegger, et al., 2008).

Methadone as HIV Prevention

Methadone has been shown to decrease injection of drugs and therefore to moderate this HIV risk taking behaviour (Dolan, Hall, & Wodak, 1996; Donny, Walsh, Bigelow, Eissenberg, & Stitzer, 2002). Chronic maintenance with methadone prevents relapse to injection related behaviour and maintains patients in treatment (Murray, 1998). Methadone maintenance has been shown to be effective in decreasing psychosocial and medical morbidity associated with opioid dependence including increasing access to and retention on ARV and other therapies (Lucas, et al., 2006). Furthermore, in addition to its benefit in decreasing the spread of HIV among injection drug users, it improves overall health status, is associated with decreased criminal activity and improved social functioning (Davstad, Stenbacka, Leifman, & Romelsjo, 2009; Gossop, Marsden, Stewart, & Rolfe, 2000; Marsch, 1998; Stenbacka, Leifman, & Romelsjo, 2003). Methadone, therefore, is effective primary and secondary HIV prevention (Kerr, Wodak, Elliott, Montaner, & Wood, 2004) and is cost-effective to society (Doran, et al., 2003).

As mentioned above, multiple studies have demonstrated that the provision of methadone reduces injection related HIV risk behaviours. The most convincing was Metzger's report of the dramatic reduction in HIV incidence among those who entered methadone compared to those who continued to inject heroin (Metzger, et al., 1993). This experience continues to be seen in countries where methadone is introduced. For example, China has instituted methadone maintenance and has reported on a reduction of injection drug use related to methadone uptake (Qian, et al., 2008). Such reductions in injection will result in reductions in HIV acquisition.

Despite the overwhelming health benefits of methadone, the utilization of methadone in many areas of the world remains one of secondary, rather than primary, HIV prevention. Too often methadone is reserved for more "serious" opioid dependent patients who "fail" abstinence-based modalities. Instead of aggressively starting younger opioid dependent patients on methadone to avoid acquiring infectious diseases, the philosophy has been to defer using methadone until patients demonstrate a "need" for it by encountering the justice system, acquiring HIV or HCV, overdosing, engaging in other risk behaviours to support their drug dependence with resultant victimization (e.g., sex work), etc. As a result, many who finally begin methadone enter treatment having accumulated medical and mental health problems as a result of delayed treatment. Rapid access to treatment and a more aggressive policy that realizes that methadone can help reduce opioid drug use is necessary if methadone is effectively going to act as primary HIV prevention.

High Volume Sites for Risk Reduction

With the overwhelming evidence that methadone reduces HIV transmission by reducing injection related practices, it is critical for all countries where injection drug use of opioids such as heroin are occurring to make methadone rapidly available to as many as possible. Current policies in many countries make access to methadone more difficult than access to illicit opiates such as heroin. This is counter-intuitive if the goal is to reduce injection and reduce HIV transmission. In order to effectively compete with an illicit market and to effectively reduce injection related behaviours, methadone must be easily obtainable by those in need. Indeed, the only criteria for methadone admission should be injection of an opiate for any length of time. This low threshold concept of methadone access has been successfully tried in Hong Kong (Newman, 1985) and Amsterdam (Buning, Coutinho, van Brussel, van Santen, & van Zadelhoff, 1986). Rather than waiting to see if the drug user fails various abstinence only treatments and, in the process, acquiring HIV and HCV, rapid access to evidenced based therapies such as methadone which will reduce injection practices is critical. To delay access to methadone only increases the probability that the individual will acquire an infectious disease that is more costly to the individual in terms of morbidity and mortality and more costly to society as a whole. In all countries, methadone is much cheaper than HIV and HCV therapies.

In order to provide rapid assessment and dissemination of appropriately prescribed methadone, one possible way to achieve this is to create High Volume Sites. A High Volume Site's goal would be the rapid and effective dissemination of evidenced based pharmacological treatments for addiction (e.g., methadone) to as many opioid injectors as possible. Each site should focus initially on methadone treatment as a primary goal and would slowly add in additional pharmacotherapies for addiction, components of HIV medicine, tuberculosis treatment and mental health care with the secondary goal of becoming fully integrated healthcare sites. The first High Volume Site should be in the most populous city with the largest HIV incidence rate related to injection drug use.

One concern in the creation of a High Volume Site will be the establishment of sufficient psychosocial services for the large volume of patients entering the programme. Although it would be ideal if all patients entering methadone were provided with case management and psychosocial supports including substance abuse counseling, this is not always feasible given cost constraints in many countries seeking to roll-out methadone as primary HIV prevention. Delaying or refusing to admit patients because of a paucity of support services is not tenable as the consequence of this is likely the acquisition of preventable infectious diseases such as HIV. An approach more in line with HIV prevention efforts would be to remove any *a priori* requirements that patients on methadone treatment receive psychosocial services who are not requesting them. Instead, the programme would provide targeted psychosocial services to patients who are seeking those services and those who demonstrate in the first 30 days of treatment a need for such services. Patients may demonstrate a need for increased psychosocial support in the following ways: poor adherence to methadone, ongoing polysubstance use, criminal activity, and/or unaddressed medical/mental health problems. This triaged approach allows, in a resource constrained environment, clinic staff to focus on getting patients into treatment to reduce or cease injection practices and then providing services to those individuals who demonstrate the greatest need for services.

Yancovitz and colleagues examined rapid access to methadone and limited psychosocial services (termed interim methadone) in New York City and demonstrated a 50% reduction in opiate positive urine toxicology at 30 days (Yancovitz, et al., 1991). In Baltimore, subjects randomized to interim methadone showed greater reductions in drug use and criminal behaviour as compared to those assigned to wait for a more comprehensive form of treatment (Schwartz, Jaffe, Highfield, Callaman, & O'Grady, 2007). There is no evidence that delaying

treatment for more comprehensive psychosocial services improves outcomes. Indeed, such delays appear to have greater costs in morbidity and mortality.

High Volume Sites must have streamlined admission processes. With the focus on HIV prevention, the only admission criteria for methadone should be the injection of an opioid for any length of time. One important goal of pharmacologic therapies for opioid dependence is primary and secondary HIV prevention. Therefore, *any* injector of opioids is by definition at risk of HIV and should be offered methadone. Ideally, the admission process should be efficient so that patients presenting for treatment can be admitted within 24 hours of presentation. Because substance abuse occurs 7 days per week, clinics should admit 7 days per week. Because polysubstance users are often engaging in more risk than straight opioid dependent patients, polysubstance users and alcohol dependent patients should not be excluded from admission. Failure to bring them into treatment will result in ongoing HIV risk behaviour and further spreading of the HIV epidemic.

In many countries where methadone is being offered for HIV prevention, inadequate nursing may impede rapid enrollment. Ideally, clinics should have fewer physicians dedicated to methadone admission, which are more costly, and more nurses available to administer methadone.

High Volume centers will need to avoid discharging patients except for extreme cases. Because the goal of methadone remains to reduce the frequency of injection, discharging patients from pharmacological treatment only returns them to injection practices and threatens to worsen the HIV epidemic (Ball, 1991). Therefore, patients should *not* be discharged from treatment programmes for any reason except for acts of or threats of violence upon staff or fellow patients. Provision should be made for patients who act out or threaten to be transferred to another programme where they should be offered ongoing psychosocial support and continued treatment in methadone maintenance.

Conclusion

Medication-assisted treatment such as methadone maintenance is an effective primary and secondary HIV prevention effort for opioid injectors. Methadone providers should work to make methadone accessible to all patients as quickly as possible. Unfounded fears of methadone have resulted in reducing the accessibility of treatment. The risks of delaying or denying treatment with methadone and the resultant acquisition of preventable infectious diseases or overdose are far in excess of the risks of methadone itself. Rapid access to treatment and a more aggressive policy that realizes that methadone can help reduce opioid drug use is urgently needed if methadone is going to act as primary HIV prevention.

Acknowledgments

The author would like to thank the National Institute on Drug Abuse (K23 DA022143 RDB)

References

- Abdala N, Carney JM, Durante AJ, Klimov N, Ostrovski D, Somlai AM, et al. Estimating the prevalence of syringe-borne and sexually transmitted diseases among injection drug users in St Petersburg, Russia. *International Journal of STD & AIDS* 2003;14(10):697–703. [PubMed: 14596774]
- Anonymous. Risk behaviors for HIV transmission among intravenous-drug users not in drug treatment--United States, 1987–1989. *MMWR - Morbidity & Mortality Weekly Report* 1990;39(16):273–276. [PubMed: 2109173]
- Ball, J.; Ross, A. *The Effectiveness of Methadone Maintenance Treatment*. New York: Springer-Verlag; 1991.

- Battjes RJ, Pickens RW, Amsel Z. HIV infection and AIDS risk behaviors among intravenous drug users entering methadone treatment in selected U.S. cities. *Journal of Acquired Immune Deficiency Syndromes* 1991;4(11):1148–1154. [PubMed: 1753342]
- Bruce R, Altice F. Clinical care of the HIV-infected drug user. *Infect Dis Clin North Am* 2007;21(1):149–179. ix. [PubMed: 17502234]
- Buning EC, Coutinho RA, van Brussel GH, van Santen GW, van Zadelhoff AW. Preventing AIDS in drug addicts in Amsterdam. *Lancet* 1986;1(8495):1435. [PubMed: 2872527]
- Caiaffa WT, Proietti FA, Carneiro-Proietti AB, Mingoti SA, Doneda D, Gandolfi D, et al. The dynamics of the human immunodeficiency virus epidemics in the south of Brazil: increasing role of injection drug users. *Clinical Infectious Diseases* 2003;37:S376–S381. [PubMed: 14648451]
- Davstad I, Stenbacka M, Leifman A, Romelsjö A. An 18-year follow-up of patients admitted to methadone treatment for the first time. *J Addict Dis* 2009;28(1):39–52. [PubMed: 19197594]
- Dolan K, Hall W, Wodak A. Methadone maintenance reduces injecting in prison.[see comment]. *BMJ* 1996;312(7039):1162. [PubMed: 8620161]
- Donny EC, Walsh SL, Bigelow GE, Eissenberg T, Stitzer ML. High-dose methadone produces superior opioid blockade and comparable withdrawal suppression to lower doses in opioid-dependent humans. *Psychopharmacology* 2002;161(2):202–212. [PubMed: 11981600]
- Doran CM, Shanahan M, Mattick RP, Ali R, White J, Bell J. Buprenorphine versus methadone maintenance: a cost-effectiveness analysis. *Drug & Alcohol Dependence* 2003;71(3):295–302. [PubMed: 12957347]
- Gossop M, Marsden J, Stewart D, Rolfe A. Patterns of improvement after methadone treatment: 1 year follow-up results from the National Treatment Outcome Research Study. *Drug Alcohol Depend* 2000;60(3):275–286. [PubMed: 11053762]
- Hall W, Darke S, Ross M, Wodak A. Patterns of drug use and risk-taking among injecting amphetamine and opioid drug users in Sydney, Australia. *Addiction* 1993;88(4):509–516. [PubMed: 8485428]
- Himelhoch S, Chander G, Fleishman JA, Hellinger J, Gaist P, Gebo KA. Access to HAART and utilization of inpatient medical hospital services among HIV-infected patients with co-occurring serious mental illness and injection drug use. *Gen Hosp Psychiatry* 2007;29(6):518–525. [PubMed: 18022045]
- Kerr T, Wodak A, Elliott R, Montaner JS, Wood E. Opioid substitution and HIV/AIDS treatment and prevention. *Lancet* 2004;364(9449):1918–1919. [PubMed: 15566992]
- Loimer N, Werner E, Presslich O. Sharing spoons: a risk factor for HIV-1 infection in Vienna. *British Journal of Addiction* 1991;86(6):775–778. [PubMed: 1878627]
- Lucas GM, Mullen BA, Weidle PJ, Hader S, McCaul ME, Moore RD. Directly administered antiretroviral therapy in methadone clinics is associated with improved HIV treatment outcomes, compared with outcomes among concurrent comparison groups. *Clin Infect Dis* 2006;42(11):1628–1635. [PubMed: 16652321]
- Marsch LA. The efficacy of methadone maintenance interventions in reducing illicit opiate use, HIV risk behavior and criminality: a meta-analysis. *Addiction* 1998;93(4):515–532. [PubMed: 9684390]
- Mathers BM, Degenhardt L, Phillips B, Wiessing L, Hickman M, Strathdee SA, et al. Global epidemiology of injecting drug use and HIV among people who inject drugs: a systematic review. *Lancet* 2008;372(9651):1733–1745. [PubMed: 18817968]
- McCurdy SA, Ross MW, Kilonzo GP, Leshabari MT, Williams ML. HIV/AIDS and injection drug use in the neighborhoods of Dar es Salaam, Tanzania. *Drug Alcohol Depend* 2006;82:S23–S27. [PubMed: 16769441]
- Metzger DS, Woody GE, McLellan AT, O'Brien CP, Druley P, Navaline H, et al. Human immunodeficiency virus seroconversion among intravenous drug users in- and out-of-treatment: an 18-month prospective follow-up. *Journal of Acquired Immune Deficiency Syndromes* 1993;6(9):1049–1056. [PubMed: 8340896]
- Murray JB. Effectiveness of methadone maintenance for heroin addiction. *Psychological Reports* 1998;83(1):295–302. [PubMed: 9775685]
- Newman RG. Narcotic addiction and methadone treatment in Hong Kong: lessons for the United States. *J Public Health Policy* 1985;6(4):526–538. [PubMed: 4093503]
- Qian HZ, Hao C, Ruan Y, Cassell HM, Chen K, Qin G, et al. Impact of methadone on drug use and risky sex in China. *J Subst Abuse Treat* 2008;34(4):391–397. [PubMed: 17869049]

- Roux P, Carrieri MP, Villes V, Dellamonica P, Poizot-Martin I, Ravaux I, et al. The impact of methadone or buprenorphine treatment and ongoing injection on highly active antiretroviral therapy (HAART) adherence: evidence from the MANIF2000 cohort study. *Addiction* 2008;103(11):1828–1836. [PubMed: 18778390]
- Saelim A, Geater A, Chongsuvivatwong V, Rodkla A, Bechtel GA. Needle sharing and high-risk sexual behaviors among IV drug users in Southern Thailand. *AIDS Patient Care & Stds* 1998;12(9):707–713. [PubMed: 15468445]
- Schwartz RP, Jaffe JH, Highfield DA, Callaman JM, O'Grady KE. A randomized controlled trial of interim methadone maintenance: 10-Month follow-up. *Drug Alcohol Depend* 2007;86(1):30–36. [PubMed: 16793221]
- Stenbacka M, Leifman A, Romelsjo A. The impact of methadone treatment on registered convictions and arrests in HIV-positive and HIV-negative men and women with one or more treatment periods. *Drug Alcohol Rev* 2003;22(1):27–34. [PubMed: 12745356]
- Tegger MK, Crane HM, Tapia KA, Uldall KK, Holte SE, Kitahata MM. The effect of mental illness, substance use, and treatment for depression on the initiation of highly active antiretroviral therapy among HIV-infected individuals. *AIDS Patient Care STDS* 2008;22(3):233–243. [PubMed: 18290749]
- Yancovitz SR, Des Jarlais DC, Peyser NP, Drew E, Friedmann P, Trigg HL, et al. A randomized trial of an interim methadone maintenance clinic. *Am J Public Health* 1991;81(9):1185–1191. [PubMed: 1659236]
- Zhang C, Yang R, Xia X, Qin S, Dai J, Zhang Z, et al. High prevalence of HIV-1 and hepatitis C virus coinfection among injection drug users in the southeastern region of Yunnan, China. *Journal of Acquired Immune Deficiency Syndromes: JAIDS* 2002;29(2):191–196.